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Groundwater Maps of the Hanford Site, December 1992

G. L. Kasza
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K. R. Simpson
D. C. Weekes

Date Published
September 1993

Prepared for the U.S. Department of Energy
Office of Environmental Restoration
and Waste Management

**Westinghouse
Hanford Company**

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INTRODUCTION

The *Groundwater Maps of the Hanford Site, December 1992* is the semiannual update of the series of reports that document the configuration of the uppermost unconfined aquifer beneath the Hanford Site (Figure 1). This series is based on water level measurements collected from site groundwater monitoring wells each June and December. These reports document the changes in the groundwater level at Hanford as the site transitions from a nuclear material production role to environmental restoration and remediation. In addition, these reports provide water level data to support the various site characterization and groundwater monitoring programs currently in progress on the Hanford Site. Groundwater Maps of the Hanford Site are prepared for the U.S. Department of Energy, Office of Environmental Restoration and Waste Management, by the Hanford Site Operations and Engineering Contractor, Westinghouse Hanford Company (WHC). This document fulfills reporting requirements specified by WHC (1988a) Section 8.0, "Water Quality" and also described in the environmental monitoring plan for the Hanford Site (DOE-RL 1991).

This report presents water level data collected mainly during December 1992. Several wells in the 300 and 1100 Areas were measured during early January 1993 due to delays caused by record-setting snow conditions in December. During the field work, the depth to the groundwater was measured in over 700 wells by personnel from the Environmental Field Services Group. The field procedure used for measuring the depth to water and recording the data is contained in WHC (1988b) environmental investigations instructions (EII) 10.2. This report and the accompanying groundwater maps were prepared by staff members of the Geosciences Function, Environmental Division.

The three major areas (the 100, 200, and 300-1100 Areas) where wastes were discharged to the soil are covered in this update. The water level measurements from the wells in these areas are portrayed on a set of maps to illustrate the hydrologic conditions and are also tabulated in an appendix. A summary discussion of the data is included with the well index map, the depth to water map, and the contoured map of the water table surface for each of the three areas. A map depicting the change in water table elevation since 1988 is included for the 200 Area. Appendix A lists the well identification number, depth to water, casing elevation, and the water level elevation for each well measured during December 1992. Appendix B lists the 1988 and 1992 water level measurements and the difference between those measurements for the 200 Area. For clarity, the locating prefixes have been omitted from all well numbers shown on the maps. Wells in the 100 Areas have the prefix 199; those in the 200 Areas have the prefix 299; wells in the 300 area have a 399 prefix; those in the 1100 Area have a 1199 prefix and the wells outside these areas have the prefix 699. An explanation of the Hanford well numbering system and a listing of the survey coordinates for each well drilled prior to 1989 is listed in McGhan (1989).

The National Geodetic Vertical Datum of 1929 is used as the vertical datum and Hanford Plant coordinates used for horizontal location of the wells. Both datums are in feet.

Water level data from June 1992 were reported by Kasza et al. (1993).

HANFORD SITE MAPS

100 AREAS

For the purposes of this report, the 100 Areas comprises the various 100 Area reactor facilities and the surrounding land south of the Columbia River and north of Gable Mountain and Gable Butte. Reactor operations have ceased and environmental restoration activities are in progress. Maps for this area include: (1) Figure 2, Index Map of the 100 Areas Groundwater Monitoring Wells; (2) Figure 3, 100 Areas Depth-to-Water Map; and (3) Figure 4, 100 Areas Water Table Map. The maps are based on December 1992 field measurements from wells that meet the following criteria:

- Wells north of Hanford Site coordinate N56,000
- Wells completed in the unconsolidated sediments
- Wells completed within 100 ft of the average water table.

Data were averaged for wells with multiple measurements in December. A representative set of wells from the reactor areas were chosen where there are heavy concentrations of wells (e.g., 100-N and 100-H Areas). Hydrographs were plotted for wells with anomalous head values. If the measurement was an outlier, the data point was not included in constructing the maps.

River stage recorders are located in the 100-B/C, 100-H, and 100-F Areas. River stage is measured hourly with pressure transducers. The averages of the December values are plotted on Figure 4 and were used in contouring the water table map.

Throughout most of the map area, groundwater flows from the unconfined aquifer into the Columbia River. West of the 100-B/C Area, water is believed to flow from the river into the aquifer.

The high water levels north of Gable Mountain are consistent with past measurements. Driller's logs indicate the presence of fine-grained sediments in this area. Groundwater in these wells may not be directly connected with the unconfined aquifer. The steep groundwater gradient in the southeastern portion of the map area is believed to result from the influence of the fine-grained sediments.

The match line at N65,000 is included on the maps of the 100 and 200 Areas for convenience.

200 AREAS

These maps encompass the 200 East and 200 West Areas and the surrounding vicinity on the Hanford Site that was once referred to as the Separations Area. The semiannual measurement of water levels in the 200 Areas was performed on the more than 180 selected wells that comprise the Operational Groundwater Monitoring Network (Serkowski and Jordan, 1989). The Operational Groundwater Monitoring Network provides water level measurements for the determination of the water table configuration and for the water quality sampling of the groundwater beneath and surrounding the active and inactive chemical processing and waste management facilities in the 200 Areas. Water

level data from the Resource Conservation and Recovery Act program, Comprehensive Environmental Response Compensation and Liability Act program, and outlying wells are included on the maps to provide supplemental information for a more complete interpretation. Wells selected for use were reviewed to assure that they were completed in the unconsolidated sediments and screened or perforated in the upper part of the unconfined aquifer.

The 200 Areas set of maps consists of: 200 Areas Monitoring Well Index Map (Figure 5), 200 Areas Depth-to-Water Map (Figure 6), 200 Areas Water Table Map (Figure 7) and the 200 Areas Change in Water Table Elevation - December 1988 to December 1992 (Figure 8). The "areas where the basalt surface is above the water table" has been revised on the 200 Areas maps to reflect the structural contour of the top of the basalt according to Connelly (1992a, 1992b). Representative wells were selected to portray the water level data on the maps where the concentration of monitoring wells would produce a crowded illustration.

Figure 8 depicts the change in the water table beneath the 200 Areas that occurred between December 1988 and December 1992. December 1988 was selected at that time because the Hanford Site had not ceased its defense production role and the water table was at the highest elevation in recent years. This map shows the general lowering of the water table in the 200 Areas in response to the decrease in disposal of process water. The location of the greatest decrease in the 200 West Area is the site of the abandoned U Pond while the greatest decrease in the 200 East Area corresponds to effluent disposal locations for the PUREX Plant. The water table in the area east of 200 East Area has not declined as rapidly due to the continued discharges at B Pond. Only data from monitoring wells measured during both December 1988 and December 1992 were used to construct the contours. The water level data used for this map are found in Appendix B.

300/1100 AREAS

This section contains December 1992 and January 4, 1993, water table measurements for the 300 Area and the adjacent 1100 Area and Horn Rapids Landfill. Wells used for obtaining the measurements were screened or perforated in the upper part of the unconfined aquifer, except in a few cases where the top of the screen was slightly below the top of the unconfined aquifer. A water table map of the unconfined aquifer in the 300 Area was produced from data from monitoring wells with pressure transducers in them on a specific date (January 4, 1992). The data from the 300 Areas wells was incorporated with the water level readings taken from wells without transducers in the 1100 Area to make a 300/1100 Areas water table map.

The major influences on water table elevations in the map area are river level fluctuations, water discharge to the 300 Area Process Trenches and sanitary system, and river water recharged into the city of Richland well field near the 1100 Area. Water table fluctuations also depend on recharge from the Yakima River to the west. The top of the unconfined aquifer is very close to the Hanford formation/Ringold Formation contact. Generally, west of an imaginary north-south line near the west boundary of the 300 Area the unconfined aquifer is within the Ringold Formation. East of the line it is within the Hanford formation.

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Figure 8 depicts the change in the water table beneath the 200 Areas that occurred between December 1988 and December 1992. December 1988 was selected at that time because the Hanford Site had not ceased its defense production role and the water table was at the highest elevation in recent years. This map shows the general lowering of the water table in the 200 Areas in response to the decrease in disposal of process water. The location of the greatest decrease in the 200 West Area is the site of the abandoned U Pond while the greatest decrease in the 200 East Area corresponds to effluent disposal locations for the PUREX Plant. The water table in the area east of 200 East Area has not declined as rapidly due to the continued discharges at B Pond. Only data from monitoring wells measured during both December 1988 and December 1992 were used to construct the contours. The water level data used for this map are found in Appendix B.

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The major influences on water table elevations in the map area are river level fluctuations, water discharge to the 300 Area Process Trenches and sanitary system, and river water recharged into the city of Richland well field near the 1100 Area. Water table fluctuations also depend on recharge from the Yakima River to the west. The top of the unconfined aquifer is very close to the Hanford formation/Ringold Formation contact. Generally, west of an imaginary north-south line near the west boundary of the 300 Area the unconfined aquifer is within the Ringold Formation. East of the line it is within the Hanford formation.

The data for this area are presented as the area index map (Figure 9), the depth-to-water map (Figure 10), and a water table map (Figure 11).

300 AREA DETAIL

Figure 12 is the index map and Figure 13 is the water table map of the unconfined aquifer as measured on January 4, 1993, for the 300 Area. The water table map was composed from the regular steel tape water level measurements taken for the semiannual water level monitoring program and measurements collected from an automated transducer/data logger system installed as part of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) 300-FF-5 Operable Unit Remedial Investigation.

Measurements taken by steel tape were performed at various times during the day while the transducer measurements were taken simultaneously at noon. Readings from pressure transducers are taken every hour and stored in a data logger that is down loaded to a computer for calculation of water level elevations. The transducer measurement system is fully described in Campbell and Newcomer (1992). Appendix C summarizes the water level data used in making the unconfined aquifer water table map and identifies which well has steel tape or transducer measurements. National Geodetic Vertical Datum of 1929 is used as the vertical datum for the maps and the Washington State Coordinate System of 1983 was used for horizontal position of the wells.

Wells used for obtaining the measurements for Figure 13 were screened or perforated in the upper part of the unconfined aquifer, except in a few cases where the top of the screen was slightly below the top of the unconfined aquifer.

Primary influences on the unconfined water table elevations in the map area of Figure 13 are river level fluctuations, water discharge to the 300 Area Process Trenches and sanitary system, and mechanical withdrawal. The Battelle Pacific Northwest Life Sciences Building withdraws up to 1 million gallons of water/day from the unconfined aquifer well 399-4-12 for biological research activities.

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Figure 1. Hanford Location Map

Figure 2

**100 Areas
Index Map
December 1992**

77-40 Identification of Groundwater Monitoring Well Used to Prepare Map

▲ River stage recorder

Areas where the basalt surface is above the water table (Connelly, et al. 1992A and 1992B)

The 100 Areas Index Map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

Figure 3

100 Areas Depth-to-Water Map December 1992

32.54
• Depth to water, as measured from the well reference mark (generally top of casing) to groundwater surface.

Areas where the basalt surface is above the water table (Connelly, et al. 1992A and 1992B)

The 100 Areas depth-to-water map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile
0 1 Kilometer

GEOSCI\081093-C

Figure 4

**100 Areas
Water Table Map
December 1992**

382.51 Average river elevation
▲ (feet above mean sea level)

388.60 Water table elevation,
• (feet above mean sea level)

~~400~~ Groundwater table elevation
Contour Interval = 5 ft

Areas where the basalt surface is above the water table (Connelly, et al. 1992A and 1992B)

The 100 Areas water table map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

Figure 5
200 Areas
Index Map
December 1992

W22-28 Identification of monitoring well used to prepare map. Well Numbers starting with E or W are prefixed by 299- and all others are prefixed by 699-.

○ Ponds

▨ Areas where the basalt surface is above the water table (Connelly, et al. 1992A and 1993B)

The 200 Areas index map has been prepared by the Geosciences Group, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile
0 1 Kilometer

Figure 6

200 Areas Depth-to-Water Map December 1992

126.45 • Depth to water in feet, as measured from well reference mark (generally top of casing) to ground water surface

○ Ponds

▨ Areas where the basalt surface is above the water table (Connelly, et al. 1992A and 1992B)

The 200 Areas depth-to-water map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile
0 1 Kilometer

GEOSCI\080993-E

Figure 7

200 Areas Water Table Elevation December 1992

- 411.49 Water table elevation (feet above mean sea level)
- 400 — Groundwater table elevation contour interval = 5ft
- Ponds
- ▨ Areas where the basalt surface is above the water table (Connelly, et al. 1992A and 1992B)

The 200 Areas water table elevation map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

Figure 8

200 Areas Change in Water Table Elevation 1988-1992

Change in water table elevation in feet, measured between December 1988 and December 1992.

Groundwater table elevation change contour interval = 0.5 ft

Ponds

Areas where the basalt surface is above the water table (Connelly, et al. 1992A and 1992B)

The 200 Areas index map has been prepared by the Geosciences Function, Environment Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

Figure 9
300/1100 Area
Index Map
December 1992

3-1 Identification of monitoring well used to prepare map. Well Numbers starting with S are prefixed by 699- and well numbers starting with a single digit are prefixed by 399-.

The 300 Area index map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

GEOSCI\082593-C

Figure 10
300/1100 Area
Depth-to-Water Map
December 1992

• 35.20 Depth to water in feet, as measured from well reference mark (generally top of casing) to ground water surface.

The 300 Area depth-to-water map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile
0 1 Kilometer

GEOSCI\082593-D

GEOSCI\082593-E

Figure 11
300/1100 Area
Water Table Map
December 1992

The 300 Area water table map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

Figure 12
300 Area
Index Map
January 4, 1993

1-3 Well Location (wells preceded by S have prefix 699-, all others have prefix 399-)

The 300 Area water table map has been prepared by the Geosciences Group, Environmental Division, of Westinghouse Hanford Company.

Notes: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

Washington State Plane Coordinates of 1983 (meters).

0 750 1500 Feet

0 250 500 Meters

Figure 13
300 Area
Water Table Map
January 4, 1993

- 352.56 Water table elevation
(feet above mean sea level)
- Water level measured with steel tape
 - ▲ Water level measured with Transducer at 12 Noon January 4, 1993
- 300 Groundwater table elevation contour interval = .5 ft

The 300 Area water table map has been prepared by the Geosciences Group, Environmental Division, of Westinghouse Hanford Company.

Notes: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

Washington State Coordinate System of 1983 (meters).

APPENDIX A
DECEMBER 1992 WATER LEVEL MEASUREMENT DATA

Appendix A: December 1992 Water Level Measurement Data
(Sheet 1 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
1199-41-13C		53.53	405.98	352.45
199-B2-12	P	45.67	439.06	393.39
199-B2-13	N	23.65	418.53	394.88
199-B3-1		45.97	439.19	393.22
199-B3-46	N	48.55	441.62	393.07
199-B3-47	N	46.15	438.78	392.63
199-B4-1	N	64.24	461.19	396.95
199-B4-3		64.91	461.75	396.84
199-B4-4		76.23	473.54	397.31
199-B4-6	N	84.64	481.92	397.28
199-B4-8	N	76.23	473.58	397.35
199-B4-9	N	74.18	471.45	397.27
199-B5-1		58.73	455.58	396.85
199-B5-2	N	62.06	458.91	396.85
199-B8-6	N	78.08	475.38	397.30
199-B9-1	N	98.99	496.12	397.13
199-B9-2	N	100.09	497.42	397.33
199-B9-3	N	95.71	493.06	397.35
199-D2-5		75.12	460.30	385.18
199-D2-6		84.74	469.28	384.54
199-D5-12		85.23	469.69	384.46
199-D5-13		87.09	471.49	384.40
199-D5-14	N	87.51	471.69	384.18
199-D5-15	N	87.11	471.53	384.42
199-D5-16	N	88.83	472.89	384.06
199-D5-17	N	84.58	469.49	384.91
199-D5-18	N	82.08	466.68	384.60
199-D5-19	N	79.87	464.80	384.93
199-D5-20	N	84.79	468.11	383.32
199-D8-3		67.67	449.06	381.39
199-D8-4	N	84.67	468.13	383.46
199-D8-5		69.98	452.48	382.50
199-D8-53	N	54.69	436.03	381.34
199-D8-54A	N	61.43	442.78	381.35
199-D8-54B	P	60.52	442.51	381.99

Appendix A: December 1992 Water Level Measurement Data
(Sheet 2 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
199-D8-55	N	58.06	439.35	381.29
199-D8-6		92.50	475.90	383.40
199-F1-2	N	27.75	397.95	370.20
199-F5-1		36.38	406.56	370.18
199-F5-3	N	39.44	408.62	369.18
199-F5-4	N	42.28	412.12	369.84
199-F5-42	N	21.95	391.26	369.31
199-F5-43B	P	25.48	394.87	369.39
199-F5-44	N	32.63	402.65	370.02
199-F5-45	N	45.02	414.31	369.29
199-F5-46	N	47.83	416.95	369.12
199-F5-47	N	48.89	419.03	370.14
199-F5-48	N	47.59	417.36	369.77
199-F5-6	N	43.68	412.95	369.27
199-F6-1	N	36.97	405.15	368.18
199-F7-1		14.99	389.74	374.75
199-F7-2	N	23.30	394.51	371.21
199-F7-3	N	21.91	394.84	372.93
199-F8-1		35.19	405.86	370.67
199-F8-2	N	40.22	410.74	370.52
199-F8-3	N	28.08	399.71	371.63
199-F8-4	N	43.69	410.93	367.24
199-H3-1	N	45.66	422.02	376.36
199-H3-2A	N	42.34	418.37	376.03
199-H3-2B	N	42.92	418.96	376.04
199-H3-2C	N	42.83	418.78	375.95
199-H4-10	N	30.42	404.44	374.02
199-H4-11	N	43.28	416.84	373.56
199-H4-12A	N	39.58	413.50	373.92
199-H4-12B	N	39.59	413.52	373.93
199-H4-12C	N	39.67	413.52	373.85
199-H4-13	N	44.82	418.20	373.38
199-H4-14	N	45.42	420.59	375.17
199-H4-15A	N	33.21	407.21	374.00
199-H4-15B	N	32.93	406.92	373.99

Appendix A: December 1992 Water Level Measurement Data
(Sheet 3 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
199-H4-15CQ	P	7.69	407.27	399.58
199-H4-15CR	P	33.68	407.37	373.69
199-H4-15CS	P	33.53	407.44	373.91
199-H4-16		49.60	424.23	374.63
199-H4-17	N	44.91	419.09	374.18
199-H4-18	N	47.63	421.82	374.19
199-H4-3	N	46.28	420.29	374.01
199-H4-4	N	39.91	413.70	373.79
199-H4-45	N	42.35	416.64	374.29
199-H4-46	N	48.73	424.19	375.46
199-H4-47		49.25	424.91	375.66
199-H4-48		50.13	426.02	375.89
199-H4-49		48.50	424.85	376.35
199-H4-5	N	42.43	416.21	373.78
199-H4-6		44.09	419.58	375.49
199-H4-7	N	45.86	420.59	374.73
199-H4-8	N	45.60	420.00	374.40
199-H4-9	N	44.01	418.08	374.07
199-H5-1	N	43.79	420.16	376.37
199-H6-1	N	43.70	418.10	374.40
199-K-11	Q	74.52	466.55	392.03
199-K-13	N	73.54	464.00	390.46
199-K-18	N	22.20	409.00	386.80
199-K-19		34.02	422.17	388.15
199-K-20		34.66	422.57	387.91
199-K-21	N	34.99	421.73	386.74
199-K-22	N	37.66	421.68	384.02
199-K-23	N	74.56	405.00	330.44
199-K-27	N	73.69	466.67	392.98
199-K-28	N	73.02	465.97	392.95
199-K-30	N	73.72	466.20	392.48
199-K-31	N	25.76	412.40	386.64
199-K-33		55.42	443.64	388.22
199-K-34		76.76	468.09	391.33
199-K-35	N	98.64	494.55	395.91

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
199-K-36		97.83	494.07	396.24
199-K-37		54.50	441.80	387.30
199-N-14		68.55	453.15	384.60
199-N-16	N	70.17	456.70	386.53
199-N-17	N	76.40	461.20	384.80
199-N-18	N	73.49	458.50	385.01
199-N-19	N	69.04	453.90	384.86
199-N-2	N	73.96	459.83	385.87
199-N-20	N	70.53	455.90	385.37
199-N-21	N	71.64	457.00	385.36
199-N-23	N	70.96	456.30	385.34
199-N-25	N	41.51	425.80	384.29
199-N-26		70.98	455.80	384.82
199-N-27	N	61.78	449.08	387.30
199-N-28	N	75.29	464.24	388.95
199-N-29	N	77.21	465.25	388.04
199-N-3	N	73.69	459.45	385.76
199-N-31	N	75.86	462.63	386.77
199-N-32	N	75.17	462.08	386.91
199-N-33	N	73.38	459.87	386.49
199-N-41	N	72.43	457.59	385.16
199-N-42	N	69.56	455.14	385.58
199-N-49	N	65.61	450.72	385.11
199-N-50	N	78.88	463.90	385.02
199-N-51	N	78.19	462.18	383.99
199-N-52		75.40	463.70	388.30
199-N-54	N	71.45	457.51	386.06
199-N-55	N	71.78	457.85	386.07
199-N-56	N	72.43	458.09	385.66
199-N-57	N	70.70	457.76	387.06
199-N-59		71.96	459.53	387.57
199-N-62	N	75.66	463.59	387.93
199-N-63	N	79.04	466.70	387.66
199-N-64	N	67.37	454.63	387.26
199-N-65	N	69.63	456.44	386.81

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
199-N-67	N	72.79	458.46	385.67
199-N-69	N	73.37	458.84	385.47
199-N-70	N	68.32	454.21	385.89
199-N-71		73.36	463.04	389.68
199-N-72	N	69.76	458.99	389.23
199-N-73	N	74.84	463.28	388.44
199-N-74		68.09	457.66	389.57
199-N-75	N	71.56	456.78	385.22
199-N-76	N	67.03	452.12	385.09
199-N-80	P	73.75	457.69	383.94
199-N-8S		20.71	404.57	383.86
299-E13-10		336.48	737.70	401.22
299-E13-12		330.60	733.49	402.69
299-E13-14		343.78	745.37	401.59
299-E16-1	Q	289.39	695.09	405.70
299-E17-1		317.10	719.17	402.07
299-E17-10		312.44	714.74	402.30
299-E17-12		319.72	721.70	401.98
299-E17-13		317.02	719.25	402.23
299-E17-14		319.96	722.18	402.22
299-E17-15		320.41	721.78	401.37
299-E17-16		318.51	720.58	402.07
299-E17-17	N	317.80	719.92	402.12
299-E17-18		318.57	720.65	402.08
299-E17-19		317.73	719.33	401.60
299-E17-20		317.07	719.23	402.16
299-E17-5		316.77	718.65	401.88
299-E17-6		317.68	720.10	402.42
299-E17-8		316.35	718.73	402.38
299-E17-9		315.46	717.64	402.18
299-E18-1		317.97	720.24	402.27
299-E18-2	N	319.21	720.24	401.03
299-E18-3		319.82	722.04	402.22
299-E18-4	N	319.26	721.57	402.31
299-E23-1		310.82	713.10	402.28

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
299-E23-2		318.61	721.26	402.65
299-E24-13		288.66	691.13	402.47
299-E24-14		288.85	691.31	402.46
299-E24-16		315.95	718.27	402.32
299-E24-17		317.56	718.69	401.13
299-E24-18		317.36	719.28	401.92
299-E24-19		291.22	693.65	402.43
299-E24-2	N	315.03	717.19	402.16
299-E24-20	N	286.59	689.28	402.69
299-E24-7		313.90	716.01	402.11
299-E24-8		286.34	688.81	402.47
299-E25-1		288.08	690.57	402.49
299-E25-10		253.53	655.84	402.31
299-E25-11		279.12	681.28	402.16
299-E25-13		279.91	682.43	402.52
299-E25-15		287.24	689.73	402.49
299-E25-18	N	276.73	679.05	402.32
299-E25-19		275.08	677.20	402.12
299-E25-2		272.84	675.45	402.61
299-E25-20		274.12	676.30	402.18
299-E25-21	N	274.67	677.27	402.60
299-E25-24		276.96	679.55	402.59
299-E25-25		266.45	669.42	402.97
299-E25-26		265.86	668.52	402.66
299-E25-27		273.48	676.08	402.60
299-E25-28		259.56	662.44	402.88
299-E25-29Q		270.22	672.62	402.40
299-E25-30Q		275.82	677.91	402.09
299-E25-31		270.13	672.53	402.40
299-E25-32P		267.31	670.04	402.73
299-E25-32Q		267.75	670.04	402.29
299-E25-34		260.13	662.87	402.74
299-E25-35		271.85	674.39	402.54
299-E25-36		305.24	707.39	402.15
299-E25-38		270.88	673.52	402.64

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
299-E25-39	N	268.07	671.23	403.16
299-E25-4		258.54	659.39	400.85
299-E25-40		263.11	665.71	402.60
299-E25-41		268.58	671.26	402.68
299-E25-42		280.65	683.29	402.64
299-E25-43	N	246.90	649.89	402.99
299-E25-46	N	292.12	694.81	402.69
299-E25-6		258.60	658.31	399.71
299-E25-9		254.57	654.17	399.60
299-E26-1		214.39	617.25	402.86
299-E26-10	N	198.59	601.73	403.14
299-E26-11	N	194.13	599.94	405.81
299-E26-12	N	227.58	630.74	403.16
299-E26-13	N	201.93	605.02	403.09
299-E26-2		232.73	635.30	402.57
299-E26-4		245.18	647.76	402.58
299-E26-8	N	217.06	619.85	402.79
299-E26-9	N	199.95	603.15	403.20
299-E27-1	N	280.24	682.55	402.31
299-E27-10		221.81	624.47	402.66
299-E27-11		241.04	643.29	402.25
299-E27-12		258.67	660.95	402.28
299-E27-13		266.54	668.99	402.45
299-E27-14		256.03	658.34	402.31
299-E27-15		250.75	652.67	401.92
299-E27-16	N	249.98	652.13	402.15
299-E27-17		232.15	634.72	402.57
299-E27-7		232.20	634.67	402.47
299-E27-8		235.48	637.83	402.35
299-E27-9		226.77	629.21	402.44
299-E28-12		305.92	708.60	402.68
299-E28-17		305.36	708.56	403.20
299-E28-18		290.23	692.58	402.35
299-E28-26		285.21	687.26	402.05
299-E28-27		278.32	680.37	402.05

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
299-E28-28		284.61	686.55	401.94
299-E28-4		289.07	691.55	402.48
299-E28-6		297.67	700.11	402.44
299-E28-7		284.31	685.91	401.60
299-E28-9		298.41	700.77	402.36
299-E32-1		253.89	656.17	402.28
299-E32-2		268.19	670.06	401.87
299-E32-3		274.73	676.51	401.78
299-E32-4		284.05	685.88	401.83
299-E32-5		280.20	682.14	401.94
299-E32-6	N	265.21	667.45	402.24
299-E32-7	N	256.23	658.42	402.19
299-E32-8	N	243.47	645.59	402.12
299-E32-9	N	241.15	643.33	402.18
299-E33-1	N	229.68	632.11	402.43
299-E33-12	P	220.61	623.45	402.84
299-E33-13	N	226.15	628.39	402.24
299-E33-14		219.75	622.05	402.30
299-E33-15		224.93	627.29	402.36
299-E33-17	N	229.40	631.65	402.25
299-E33-18	N	249.34	651.86	402.52
299-E33-2	N	229.29	630.00	400.71
299-E33-21		265.85	668.39	402.54
299-E33-24		235.50	637.97	402.47
299-E33-26		231.47	632.77	401.30
299-E33-28		262.13	664.23	402.10
299-E33-29		271.70	673.77	402.07
299-E33-3	N	228.25	630.62	402.37
299-E33-30		261.64	663.70	402.06
299-E33-31		245.14	647.28	402.14
299-E33-32		257.75	659.83	402.08
299-E33-33		237.98	640.17	402.19
299-E33-34		231.38	633.33	401.95
299-E33-35		241.11	643.01	401.90
299-E33-36		245.78	646.67	400.89

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
299-E33-37		250.76	653.01	402.25
299-E33-38	N	229.72	631.95	402.23
299-E33-39	N	221.35	623.32	401.97
299-E33-4	N	227.52	629.84	402.32
299-E33-40	N	221.99	624.58	402.59
299-E33-41	N	252.59	654.95	402.36
299-E33-42	N	251.93	654.30	402.37
299-E33-43	N	260.47	662.68	402.21
299-E33-5	N	232.24	634.72	402.48
299-E33-7	N	225.53	627.82	402.29
299-E33-8		248.57	650.73	402.16
299-E34-1		227.07	629.45	402.38
299-E34-10	N	237.28	639.78	402.50
299-E34-11	N	215.42	617.93	402.51
299-E34-2		228.62	630.80	402.18
299-E34-3		208.88	611.52	402.64
299-E34-5		187.46	590.79	403.33
299-E34-6		195.41	597.83	402.42
299-E34-7		201.77	604.25	402.48
299-E34-8		238.60	640.52	401.92
299-E34-9		226.23	628.69	402.46
299-E35-1		195.44	598.30	402.86
299-E35-2	N	199.17	602.36	403.19
299-W10-10		213.24	675.35	462.11
299-W10-11		213.18	675.26	462.08
299-W10-12		212.82	675.01	462.19
299-W10-13		236.54	699.04	462.50
299-W10-14		237.36	699.43	462.07
299-W10-15		213.82	675.64	461.82
299-W10-16		210.42	672.76	462.34
299-W10-17	N	208.15	670.84	462.69
299-W10-18	N	207.48	670.93	463.45
299-W10-2		211.99	674.25	462.26
299-W10-3		209.16	671.72	462.56
299-W10-5		209.38	673.31	463.93

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
299-W10-8		218.36	680.31	461.95
299-W10-9	N	212.61	674.93	462.32
299-W11-10		274.74	728.89	454.15
299-W11-12	N	217.40	679.52	462.12
299-W11-14		257.00	715.16	458.16
299-W11-19		249.34	707.00	457.66
299-W11-23		224.11	685.68	461.57
299-W11-24		225.36	687.43	462.07
299-W11-27	N	223.37	685.27	461.90
299-W11-6		257.81	716.23	458.42
299-W11-7		248.01	709.11	461.10
299-W11-9		266.54	722.94	456.40
299-W12-1		276.45	726.46	450.01
299-W14-1		205.00	671.86	466.86
299-W14-12	N	206.32	670.52	464.20
299-W15-12		206.37	670.07	463.70
299-W15-13	N	206.53	670.12	463.59
299-W15-15	N	233.25	697.96	464.71
299-W15-16	N	219.63	684.89	465.26
299-W15-17	N	219.70	684.64	464.94
299-W15-18		220.29	685.71	465.42
299-W15-20		234.01	698.36	464.35
299-W15-22	N	205.00	670.77	465.77
299-W15-23		234.93	699.49	464.56
299-W15-24	N	234.56	699.37	464.81
299-W15-3	N	206.86	670.50	463.64
299-W15-4		200.07	662.00	461.93
299-W18-15	N	195.45	660.96	465.51
299-W18-21	N	203.81	668.62	464.81
299-W18-22		204.35	668.49	464.14
299-W18-23		231.95	696.81	464.86
299-W18-24	N	218.89	684.35	465.46
299-W18-25	N	199.85	666.04	466.19
299-W18-26		234.19	699.05	464.86
299-W18-27	N	225.36	690.25	464.89

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
299-W18-28	N	214.85	679.99	465.14
299-W18-29	N	125.88	674.14	548.26
299-W18-30	N	206.94	672.84	465.90
299-W18-31	N	198.02	664.16	466.14
299-W19-12	P	207.36	673.25	465.89
299-W19-14		232.21	693.21	461.00
299-W19-15	N	231.49	693.28	461.79
299-W19-2		236.88	694.04	457.16
299-W19-20		235.11	691.04	455.93
299-W19-21		212.50	678.53	466.03
299-W19-24		239.52	696.95	457.43
299-W19-27		218.26	683.65	465.39
299-W19-28		244.09	703.09	459.00
299-W19-29		243.34	701.87	458.53
299-W19-31	N	208.35	674.19	465.84
299-W19-32	N	208.83	674.90	466.07
299-W19-4		257.68	715.52	457.84
299-W19-6	N	225.09	686.60	461.51
299-W19-91	N	112.40	677.90	565.50
299-W19-92	N	111.66	677.90	566.24
299-W19-93	N	95.82	677.43	581.61
299-W21-1		246.35	699.26	452.91
299-W22-19		225.55	681.26	455.71
299-W22-21		212.64	670.00	457.36
299-W22-22		232.84	690.31	457.47
299-W22-26		220.39	680.30	459.91
299-W22-28		231.00	689.00	458.00
299-W22-39	N	208.48	668.26	459.78
299-W22-40		235.44	692.49	457.05
299-W22-41		234.47	692.00	457.53
299-W22-42		235.01	691.42	456.41
299-W22-43		233.34	691.61	458.27
299-W22-44	N	216.27	678.13	461.86
299-W22-45	N	205.64	666.21	460.57
299-W22-46	N	211.75	671.18	459.43

Appendix A: December 1992 Water Level Measurement Data
(Sheet 12 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
299-W22-7		229.85	687.41	457.56
299-W23-1	N	203.87	666.14	462.27
299-W23-11		201.73	664.14	462.41
299-W23-12	N	204.34	666.15	461.81
299-W23-13	N	203.65	666.33	462.68
299-W23-14	N	202.16	664.00	461.84
299-W23-15	N	194.96	655.44	460.48
299-W23-2	N	202.50	663.48	460.98
299-W23-3	N	203.63	663.56	459.93
299-W23-4		199.46	662.63	463.17
299-W23-6		207.25	666.98	459.73
299-W23-7	N	202.33	663.67	461.34
299-W23-8	N	201.96	663.95	461.99
299-W26-10	N	213.07	670.89	457.82
299-W26-8	N	207.84	666.57	458.73
299-W26-9	N	196.01	654.42	458.41
299-W6-1		246.56	702.53	455.97
299-W6-2		234.71	692.45	457.74
299-W6-3	N	242.19	699.83	457.64
299-W6-4	N	243.04	701.25	458.21
299-W6-6	N	255.27	709.99	454.72
299-W6-7	N	255.59	710.28	454.69
299-W6-8	N	238.65	694.73	456.08
299-W7-1		232.15	690.71	458.56
299-W7-10	N	232.52	686.66	454.14
299-W7-11	N	223.18	681.45	458.27
299-W7-12	N	229.37	687.93	458.56
299-W7-2	N	218.13	675.59	457.46
299-W7-3		219.77	676.14	456.37
299-W7-4		212.47	671.69	459.22
299-W7-5		216.11	673.05	456.94
299-W7-6		221.79	678.64	456.85
299-W7-7		217.92	674.94	457.02
299-W7-8		231.74	687.35	455.61
299-W7-9		233.07	692.09	459.02

Appendix A: December 1992 Water Level Measurement Data
(Sheet 13 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
299-W8-1		242.31	701.33	459.02
299-W9-1		276.17	737.73	461.56
3099-47-18B		31.81	374.95	343.14
399-1-1		33.46	376.73	343.27
399-1-10A		30.34	373.65	343.31
399-1-11		34.49	377.79	343.30
399-1-12		41.43	384.45	343.02
399-1-13		45.54	388.62	343.08
399-1-14		39.86	383.23	343.37
399-1-15		36.13	379.59	343.46
399-1-16A		38.62	381.51	342.89
399-1-16B		38.12	381.14	343.02
399-1-16C		29.55	382.29	352.74
399-1-17A		34.52	377.47	342.95
399-1-17B		34.79	377.87	343.08
399-1-17C		1.55	378.13	376.58
399-1-18A		46.95	390.83	343.88
399-1-18B		45.81	389.94	344.13
399-1-18C		43.45	388.05	344.60
399-1-2		44.07	387.02	342.95
399-1-3		41.83	384.73	342.90
399-1-4		37.30	381.11	343.81
399-1-5		36.82	379.82	343.00
399-1-6		30.35	373.81	343.46
399-1-7		42.76	385.63	342.87
399-1-8		42.02	384.91	342.89
399-1-9		26.19	384.80	358.61
399-2-1		32.54	375.30	342.76
399-2-3		32.65	375.44	342.79
399-3-1		41.86	384.43	342.57
399-3-10		42.72	385.40	342.68
399-3-12		45.43	388.10	342.67
399-3-6		50.07	392.85	342.78
399-3-7		51.43	394.22	342.79
399-3-9		45.38	388.17	342.79

Appendix A: December 1992 Water Level Measurement Data
(Sheet 14 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
399-4-1		53.03	395.68	342.65
399-4-10		35.94	377.59	341.65
399-4-11		61.84	404.53	342.69
399-4-7		36.03	378.64	342.61
399-4-9		39.51	382.24	342.73
399-5-1		52.80	395.60	342.80
399-6-1		45.87	388.84	342.97
399-8-1		53.19	396.20	343.01
399-8-2		54.74	398.09	343.35
399-8-3		51.57	394.82	343.25
699-101-48B		11.84	390.15	378.31
699-20-20	N	105.34	505.58	400.24
699-20-39	N	138.11	539.98	401.87
699-20-41P	N	134.02	532.00	397.98
699-20-41Q	N	135.59	532.00	396.41
699-20-41R	N	135.60	532.00	396.40
699-23-34		131.14	532.84	401.70
699-24-33		122.61	524.27	401.66
699-24-34A		132.17	533.88	401.71
699-24-34B		131.77	533.50	401.73
699-24-34C		130.87	532.59	401.72
699-24-35		137.07	538.81	401.74
699-25-33A		127.29	528.97	401.68
699-25-34A		128.61	530.31	401.70
699-25-34B		127.67	529.40	401.73
699-25-34C		133.75	535.46	401.71
699-25-55		264.07	676.55	412.48
699-25-70		182.55	629.56	447.01
699-26-33		134.04	535.76	401.72
699-26-34		126.67	528.40	401.73
699-26-35A		130.91	532.66	401.75
699-26-35C	N	130.94	532.68	401.74
699-26-83BP	P	233.42	636.00	402.58
699-26-83BQ	P	233.18	636.00	402.82
699-26-83BR	P	237.00	636.00	399.00

Appendix A: December 1992 Water Level Measurement Data
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Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
699-28-40		157.51	559.44	401.93
699-28-52A		280.98	684.67	403.69
699-29-70AP	P	190.80	629.75	438.95
699-29-70AQ		183.83	630.15	446.32
699-29-70CP	P	229.95	630.94	400.99
699-29-70CQ	P	232.69	630.99	398.30
699-29-70CR	P	230.65	631.15	400.50
699-29-70CS	P	233.49	631.31	397.82
699-29-70CT	P	234.32	631.48	397.16
699-29-70CU	P	235.42	631.64	396.22
699-29-70DP	P	208.16	629.23	421.07
699-29-78		185.90	647.05	461.15
699-31-31		127.73	529.32	401.59
699-31-65		243.66	683.09	439.43
699-31-84B	N	204.48	625.12	420.64
699-32-43		114.45	516.62	402.17
699-32-62		279.31	707.09	427.78
699-32-70B		216.72	666.61	449.89
699-32-72		216.23	668.16	451.93
699-32-77		194.55	653.74	459.19
699-33-42		113.75	516.00	402.25
699-33-56		313.96	717.03	403.07
699-34-39A		135.02	537.07	402.05
699-34-41B		168.74	570.89	402.15
699-34-42		137.98	540.20	402.22
699-34-51		334.37	736.76	402.39
699-35-66		287.19	725.65	438.46
699-35-70		243.07	693.72	450.65
699-35-78A		196.98	660.65	463.67
699-36-61A		340.98	748.11	407.13
699-37-43		286.92	690.58	403.66
699-37-82A		171.16	636.75	465.59
699-38-65		324.48	753.33	428.85
699-38-70		259.44	710.67	451.23
699-39-39		125.04	536.65	411.61

Appendix A: December 1992 Water Level Measurement Data
(Sheet 16 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
699-39-79		209.20	673.52	464.32
699-40-33A		107.48	518.05	410.57
699-40-39		129.38	541.84	412.46
699-40-40A	N	129.73	541.21	411.48
699-40-40B	N	130.40	542.18	411.78
699-40-62		343.02	747.78	404.76
699-41-40		130.49	545.94	415.45
699-42-39A	N	139.22	558.14	418.92
699-42-39B	N	139.64	558.32	418.68
699-42-40A		123.13	545.43	422.30
699-42-40B		124.43	546.46	422.03
699-42-40C	P	133.30	546.16	412.86
699-42-41	N	146.25	567.30	421.05
699-42-42B		166.18	583.23	417.05
699-43-40	N	122.73	542.20	419.47
699-43-41E		130.19	550.86	420.67
699-43-41F		130.23	551.01	420.78
699-43-41G	N	135.21	551.34	416.13
699-43-42		145.84	564.48	418.64
699-43-42J		162.73	581.68	418.95
699-43-43		164.42	579.37	414.95
699-43-45		194.26	597.68	403.42
699-43-91AP	N	231.11	671.51	440.40
699-43-91AQ	N	231.14	671.94	440.80
699-43-91D	N	261.52	671.99	410.47
699-44-42		158.56	579.22	420.66
699-44-43B		164.74	580.12	415.38
699-44-64		319.77	725.60	405.83
699-44-91P	N	267.96	672.15	404.19
699-44-91Q	N	268.14	672.33	404.19
699-44-91R	N	266.67	672.49	405.82
699-44-91S	N	274.03	672.68	398.65
699-44-91T	N	275.12	672.84	397.72
699-44-91U	N	275.51	673.01	397.50
699-45-42		161.14	577.33	416.19

Appendix A: December 1992 Water Level Measurement Data
(Sheet 17 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
699-45-69		279.47	725.46	445.99
699-47-35A	N	63.04	476.36	413.32
699-47-35B		63.37	476.65	413.28
699-47-46A	N	176.49	580.14	403.65
699-47-50		180.63	584.22	403.59
699-47-60		249.33	651.52	402.19
699-47-80AP	N	271.52	713.03	441.51
699-47-80AQ	N	262.18	713.51	451.33
699-47-80CP	N	307.80	712.58	404.78
699-47-80CQ	N	308.82	712.75	403.93
699-47-80CR	N	308.89	712.92	404.03
699-47-80CS	N	314.43	713.10	398.67
699-47-80CT	N	314.75	713.25	398.50
699-47-80CU	N	314.91	713.43	398.52
699-47-80DP	N	295.95	710.15	414.20
699-48-50	N	170.38	574.06	403.68
699-48-71		243.63	688.15	444.52
699-49-55A		128.75	531.03	402.28
699-49-55B	P	128.78	531.12	402.34
699-49-57A	N	151.36	552.80	401.44
699-49-57B	N	153.77	555.99	402.22
699-49-79		233.88	688.59	454.71
699-50-42		55.94	466.84	410.90
699-50-45	P	43.44	451.41	407.97
699-50-48B		145.00	550.39	405.39
699-50-53A	N	155.25	556.31	401.06
699-50-53B	N	155.14	557.62	402.48
699-50-85		284.52	739.35	454.83
699-51-46	P	38.20	444.63	406.43
699-51-63		167.31	571.84	404.53
699-51-75		192.41	641.51	449.10
699-52-46A	P	47.54	455.61	408.07
699-52-48	P	61.74	466.06	404.32
699-52-54	N	166.46	568.29	401.83
699-52-57	N	160.06	558.46	398.40

Appendix A: December 1992 Water Level Measurement Data
(Sheet 18 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
699-53-35		131.31	530.99	399.68
699-53-47A		32.97	438.28	405.31
699-53-47B		33.26	438.58	405.32
699-53-48A		39.47	442.85	403.38
699-53-48B		38.91	442.71	403.80
699-53-50	P	40.43	444.21	403.78
699-53-55A		174.88	576.56	401.68
699-53-55B		175.41	576.84	401.43
699-53-55C		174.42	576.13	401.71
699-54-42		115.39	511.49	396.10
699-54-45A		96.48	494.29	397.81
699-54-48		56.45	457.02	400.57
699-54-57	P	174.36	576.24	401.88
699-55-40		134.12	543.13	409.01
699-55-50C		42.86	444.43	401.57
699-55-55	N	162.26	563.76	401.50
699-55-57		166.60	568.22	401.62
699-55-70		137.65	569.03	431.38
699-55-76		139.70	583.24	443.54
699-56-43	P	132.33	540.42	408.09
699-56-53	P	32.43	434.34	401.91
699-57-25A	N	50.84	414.57	363.73
699-57-29A	Q	54.06	408.47	354.41
699-57-29B		54.77	416.18	361.41
699-57-83A		145.62	577.96	432.34
699-57-83BP	P	178.88	578.66	399.78
699-57-83BQ	P	179.27	578.66	399.39
699-57-83BR	P	179.31	578.66	399.35
699-57-83C	P	172.95	579.60	406.65
699-58-24	N	57.49	418.80	361.31
699-59-32		62.63	424.29	361.66
699-59-58		96.39	498.02	401.63
699-59-80B		153.79	583.25	429.46
699-60-32		63.80	425.30	361.50
699-60-57	N	67.87	469.57	401.70

Appendix A: December 1992 Water Level Measurement Data
(Sheet 19 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
699-60-59	N	104.55	510.00	405.45
699-60-60		110.67	512.04	401.37
699-61-37		61.34	442.94	381.60
699-61-41		33.12	428.92	395.80
699-61-62		96.16	497.51	401.35
699-61-66		121.61	522.18	400.57
699-62-31		72.69	434.12	361.43
699-62-43A		36.21	432.30	396.09
699-63-25A		33.90	395.15	361.25
699-63-51		25.19	424.54	399.35
699-63-55	N	26.53	426.54	400.01
699-63-58		91.58	491.90	400.32
699-63-90		112.23	509.73	397.50
699-63-92		100.44	484.20	383.76
699-64-27		52.86	414.29	361.43
699-64-62		100.21	500.25	400.04
699-65-22		31.14	391.10	359.96
699-65-50		67.70	467.06	399.36
699-65-59A		106.95	506.96	400.01
699-65-72		142.15	540.28	398.13
699-65-83		88.25	485.63	397.38
699-65-95		55.68	452.26	396.58
699-66-103	P	66.64	463.01	396.37
699-66-23		28.86	389.01	360.15
699-66-38		33.86	436.24	402.38
699-66-39	N	47.21	453.78	406.57
699-66-58		103.37	503.33	399.96
699-66-64		106.52	505.92	399.40
699-66-91		70.17	467.75	397.58
699-67-51		125.15	524.59	399.44
699-67-86		75.50	472.39	396.89
699-67-98		58.67	455.47	396.80
699-68-105		57.12	451.85	394.73
699-69-38		21.71	423.52	401.81
699-69-450		88.34	487.18	398.84

Appendix A: December 1992 Water Level Measurement Data
(Sheet 20 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
699-70-23		29.96	391.71	361.75
699-70-68		127.81	526.21	398.40
699-71-30		30.49	400.68	370.19
699-71-52		124.19	523.04	398.85
699-71-77		76.18	472.28	396.10
699-72-73		86.17	482.57	396.40
699-72-88		38.44	437.37	398.93
699-72-92		53.49	452.22	398.73
699-72-98		54.78	454.19	399.41
699-73-61		132.82	531.53	398.71
699-74-44		48.65	445.18	396.53
699-74-48		89.38	487.18	397.80
699-77-36		36.49	412.28	375.79
699-77-54		83.64	480.59	396.95
699-78-62		74.96	469.88	394.92
699-80-43S		25.01	412.52	387.51
699-81-38		27.34	406.47	379.13
699-81-58		46.33	439.55	393.22
699-82-45A		24.97	413.73	388.76
699-83-36		40.95	418.63	377.68
699-83-47		46.57	435.27	388.70
699-84-35A	Q	7.16	400.28	393.12
699-86-42		25.33	409.92	384.59
699-87-42A		32.62	416.53	383.91
699-87-55		72.33	458.63	386.30
699-88-41		33.85	416.04	382.19
699-89-35		26.68	397.46	370.78
699-90-45		37.52	421.60	384.08
699-91-37		50.01	422.93	372.92
699-91-46	N	33.08	417.06	383.98
699-92-49		48.63	431.94	383.31
699-93-48	N	54.96	437.79	382.83
699-96-43	N	42.62	421.84	379.22
699-96-49		37.58	419.26	381.68
699-97-43		43.02	421.84	378.82

Appendix A: December 1992 Water Level Measurement Data
(Sheet 21 of 21)

Well	Notes	Depth to Water (ft)	Elevation (ft) above msl	
			Adjusted Casing	Water Level
699-97-51A	N	20.95	402.33	381.38
699-98-49A		20.63	401.80	381.17
699-S18-E2A		75.38	434.85	359.47
699-S19-E13		50.17	394.51	344.34
699-S27-E14		57.20	399.76	342.56
699-S29-E12		42.67	387.96	345.29
699-S30-E10A		43.48	392.29	348.81
699-S30-E10B		42.66	392.07	349.41
699-S30-E15A		57.85	400.14	342.29
699-S31-1		83.48	460.00	376.52
699-S31-E10A		36.23	384.57	348.34
699-S31-E10B		34.56	383.71	349.15
699-S31-E10C		33.86	382.91	349.05
699-S31-E10D		31.66	380.58	348.92
699-S31-E13		48.50	394.06	345.56
699-S31-E8		20.63	374.75	354.12
699-S32-E13A		44.57	390.46	345.89
699-S32-E13B		48.45	394.72	346.27
699-S32-E8		15.42	375.50	360.08
699-S34-E10		28.98	382.37	353.39
699-S34-E15		58.44	404.55	346.11
699-S36-E12B		47.17	399.07	351.90
699-S36-E13A		47.55	399.30	351.75
699-S37-E11		46.83	399.30	352.47
699-S37-E14		56.67	408.28	351.61
699-S38-E11		45.16	398.60	353.44
699-S38-E12A		52.63	404.95	352.32
699-S38-E12B		52.67	405.00	352.33
699-S40-E14		49.65	402.85	353.20
699-S41-E11		47.49	401.36	353.87
699-S41-E12		49.13	401.93	352.80
699-S41-E13A		57.65	410.56	352.91
699-S41-E13B		57.19	410.10	352.91
699-S41-E13C		57.79	410.67	352.88
699-S43-E12		52.35	405.69	353.34

Notes: N = Well not included on map
P = Well in confined aquifer, not included on map
Q = Questionable data, not included on map

APPENDIX B

WATER LEVEL DIFFERENCE, 200 AREAS, DECEMBER 1988 TO DECEMBER 1992

Appendix B: Water Level Difference, 200 Areas, December 1988 to
December 1992 (Sheet 1 of 5)

Well	12/88 Water level	12/92 Water level	Change
299-E13-10	405.85	401.22	-4.63
299-E17-1	405.50	402.07	-3.43
299-E17-10	406.08	402.30	-3.78
299-E17-14	406.83	402.22	-4.61
299-E17-15	397.16	401.37	4.21
299-E17-16	405.87	402.07	-3.80
299-E17-17	404.57	402.12	-2.45
299-E17-18	404.68	402.08	-2.60
299-E17-20	405.74	402.16	-3.58
299-E17-5	404.57	401.88	-2.69
299-E17-6	405.95	402.42	-3.53
299-E17-8	405.30	402.38	-2.92
299-E17-9	405.42	402.18	-3.24
299-E18-1	406.03	402.27	-3.76
299-E18-3	406.02	402.22	-3.80
299-E23-2	405.99	402.65	-3.34
299-E24-16	405.24	402.32	-2.92
299-E24-17	404.80	401.13	-3.67
299-E24-2	405.71	402.16	-3.55
299-E24-7	406.08	402.11	-3.97
299-E25-11	406.23	402.16	-4.07
299-E25-19	406.18	402.12	-4.06
299-E25-26	407.11	402.66	-4.45
299-E25-28	407.28	402.88	-4.40
299-E25-32P	407.53	402.73	-4.80
299-E25-34	407.29	402.74	-4.55
299-E25-35	406.39	402.54	-3.85
299-E25-36	405.77	402.15	-3.62
299-E27-10	406.46	402.66	-3.80
299-E27-8	405.88	402.35	-3.53
299-E27-9	406.01	402.44	-3.57
299-E28-27	405.54	402.05	-3.49
299-E32-1	405.40	402.28	-3.12
299-E32-2	405.29	401.87	-3.42
299-E32-3	405.36	401.78	-3.58

Appendix B: Water Level Difference, 200 Areas, December 1988 to
December 1992 (Sheet 2 of 5)

Well	12/88 Water level	12/92 Water level	Change
299-E32-4	405.27	401.83	-3.44
299-E33-28	405.67	402.10	-3.57
299-E33-29	405.79	402.07	-3.72
299-E33-30	405.48	402.06	-3.42
299-E33-5	405.39	402.48	-2.91
299-E34-2	405.87	402.18	-3.69
299-E34-3	406.53	402.64	-3.89
299-E34-5	406.66	403.33	-3.33
299-E34-6	405.84	402.42	-3.42
299-W10-13	466.34	462.50	-3.84
299-W10-14	465.94	462.07	-3.87
299-W10-2	466.76	462.26	-4.42
299-W10-8	465.75	461.95	-3.78
299-W11-10	458.24	454.15	-4.09
299-W11-7	465.01	461.10	-3.91
299-W15-12	468.72	463.70	-5.02
299-W15-18	470.16	465.42	-4.74
299-W18-15	471.31	465.51	-5.80
299-W18-22	468.38	464.14	-4.24
299-W18-23	469.27	464.86	-4.41
299-W19-20	461.53	455.93	-5.60
299-W19-21	471.86	466.03	-5.83
299-W19-24	462.16	457.43	-4.73
299-W22-22	462.33	457.47	-4.86
299-W23-11	467.86	462.41	-5.45
299-W23-4	469.96	463.17	-6.79
299-W6-2	461.62	457.74	-3.88
299-W7-1	461.46	458.56	-2.90
299-W7-2	460.55	457.46	-3.09
299-W7-3	459.30	456.37	-2.93
299-W7-4	462.88	459.22	-3.66
299-W7-5	460.10	456.94	-3.16
299-W8-1	461.80	459.02	-2.78
299-W9-1	464.88	461.56	-3.32
699-24-33	404.94	401.66	-3.28

Appendix B: Water Level Difference, 200 Areas, December 1988 to
December 1992 (Sheet 3 of 5)

Well	12/88 Water level	12/92 Water level	Change
699-24-34A	404.93	401.71	-3.22
699-24-34B	404.95	401.73	-3.22
699-24-35	404.83	401.74	-3.09
699-25-34A	405.00	401.70	-3.30
699-25-34C	405.46	401.71	-3.75
699-25-55	413.50	412.48	-1.02
699-25-70	449.43	447.01	-2.42
699-26-33	405.14	401.72	-3.42
699-26-34	405.18	401.73	-3.45
699-26-35A	405.17	401.75	-3.42
699-28-40	405.53	401.93	-3.60
699-28-52A	406.79	403.69	-3.10
699-29-78	465.14	461.15	-3.99
699-31-31	405.02	401.59	-3.43
699-32-43	405.90	402.17	-3.73
699-32-62	429.41	427.78	-1.63
699-32-70B	452.66	449.89	-2.77
699-32-72	455.08	451.93	-3.15
699-32-77	463.77	459.19	-4.58
699-33-42	406.00	402.25	-3.75
699-33-42	406.00	402.25	-3.75
699-34-39A	405.89	402.05	-3.84
699-34-41B	406.09	402.15	-3.94
699-34-41B	406.09	402.15	-3.94
699-34-42	406.03	402.22	-3.81
699-34-42	406.03	402.22	-3.81
699-34-51	406.45	402.39	-4.06
699-35-66	440.03	438.46	-1.57
699-35-70	452.64	450.65	-1.99
699-35-78A	468.36	463.67	-4.69
699-36-61A	409.62	407.13	-2.49
699-37-82A	468.61	465.59	-3.02
699-38-65	430.88	428.85	-2.03
699-38-70	454.60	451.23	-3.37
699-39-79	469.11	464.32	-4.79

Appendix B: Water Level Difference, 200 Areas, December 1988 to
December 1992 (Sheet 4 of 5)

Well	12/88 Water level	12/92 Water level	Change
699-40-33A	411.37	410.57	-.80
699-40-62	407.68	404.76	-2.92
699-42-40B	423.41	422.03	-1.38
699-43-42J	420.59	418.95	-1.64
699-43-43	416.20	414.95	-1.25
699-44-42	422.07	420.66	-1.41
699-44-64	408.33	405.83	-2.50
699-45-42	419.16	416.19	-2.97
699-47-60	405.06	402.19	-2.87
699-48-71	447.08	444.52	-2.56
699-49-79	457.90	455.32	-2.58
699-50-42	411.59	410.90	-.69
699-50-85	456.43	454.83	-1.60
699-51-63	406.83	404.53	-2.30
699-51-75	450.59	449.10	-1.49
699-53-35	397.71	399.68	1.97
699-53-47B	406.44	405.32	-1.12
699-53-48A	404.62	403.38	-1.24
699-53-55B	404.01	401.43	-2.58
699-54-48	404.17	400.57	-3.60
699-55-40	409.78	409.01	-.77
699-55-50C	404.18	401.57	-2.61
699-55-70	432.73	431.38	-1.35
699-55-76	444.90	443.54	-1.36
699-57-83A	432.95	432.34	-.61
699-59-32	361.87	361.66	-.21
699-59-58	403.37	401.63	-1.74
699-59-80B	427.78	429.46	1.68
699-60-32	361.70	361.50	-.20
699-60-60	403.99	401.37	-2.62
699-61-37	382.15	381.60	-.55
699-61-41	396.40	395.80	-.60
699-61-62	402.90	401.35	-1.55
699-61-66	402.78	400.57	-2.21
699-62-31	361.62	361.43	-.19

Appendix B: Water Level Difference, 200 Areas, December 1988 to
December 1992 (Sheet 5 of 5)

Well	12/88 Water level	12/92 Water level	Change
699-62-43A	396.74	396.09	-.65
699-63-51	400.71	399.35	-1.36
699-63-58	402.28	400.32	-1.96
699-64-62	401.90	400.04	-1.86
699-65-50	400.70	399.36	-1.34
699-65-59A	401.79	400.01	-1.78
699-65-72	399.36	398.13	-1.23

APPENDIX C

300 AREA WATER LEVEL MEASUREMENT DATA FOR JANUARY 4, 1993

Appendix C: 300 Area Water Level Measurement Data for January 4, 1993.

Well #	Steel tape measured water level	Transducer measured water level
399-1-1	342.44	
399-1-2		343.09
399-1-3	342.90	
399-1-4	343.81	
399-1-6	343.46	
399-1-7	342.87	342.89
399-1-8	342.89	342.93
399-1-10A	343.31	
399-1-12	343.02	
399-1-13A	343.08	
399-1-14A	343.37	
399-1-15	343.46	
399-1-16A	342.89	
399-1-17A	342.95	
399-1-18A		343.90
399-2-1		342.72
399-2-2		342.79
399-2-3	342.79	
399-3-1	342.57	
399-3-6	342.78	
399-3-7	342.79	
399-3-9		342.61
399-3-10	342.68	
399-3-12		342.64
399-4-1		342.68
399-4-7		342.50
399-4-9		342.67
399-4-11	342.69	
399-5-1		342.90
399-6-1		342.99
399-8-1		343.09
399-8-5A		343.43
699-S19-E14		344.24
699-S22-E9A		344.83
699-S27-E9A		347.55
699-S28-E12		344.34
699-S29-E16A		342.12

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