

ANNUAL REPORT ON RESULTS OF MAMMOTH COMMUNITY
WATER DISTRICT GROUNDWATER MONITORING PROGRAM
FOR OCTOBER 1998-SEPTEMBER 1999

Prepared for
Mammoth Community Water District
Mammoth Lakes, California

by
Kenneth D. Schmidt and Associates
Groundwater Quality Consultants
Fresno, California

December 9, 1999

KENNETH D. SCHMIDT AND ASSOCIATES

GROUNDWATER QUALITY CONSULTANTS

600 WEST SHAW, SUITE 250

FRESNO, CALIFORNIA 93704

TELEPHONE (559) 224-4412

December 9, 1999

Mr. Dennis Erdman, General Manager
Mammoth Community Water District
P.O. Box 597
Mammoth Lakes, CA 93546

Re: Annual Report on Groundwater Monitoring

Dear Dennis:

Submitted herewith is our annual report on the results of the District groundwater monitoring program for the period October 1998-September 1999. I appreciate the cooperation of District personnel in conducting this monitoring and providing data tabulations.

Sincerely yours,


Kenneth D. Schmidt

KDS/ts

cc: Steve Kronick

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INTRODUCTION

In Summer 1992, the Mammoth County Water District contracted for the drilling of five new test wells in Mammoth Lakes. One of these wells (No. 15) was converted to a supply well and pumping began on an emergency basis in Summer 1992. In December 1992, the California Department of Fish and Game filed an action against the District in Superior Court. Concerns were expressed by the Department about the potential impact of pumping of these wells on wildlife, vegetation, and fishery resources of Mammoth Creek and the Hot Creek headsprings, which is located downstream of the District wells. Kenneth D. Schmidt and Associates completed a hydrogeologic evaluation (July 6, 1993) on behalf of the District, to respond to these concerns. In August 1993, a settlement agreement was made between the Department and the District. As part of this agreement, the District was to:

1. Conduct routine monitoring in all District supply and monitor wells.
2. Install a new monitor well tapping consolidated rock at a location south of the District office.
3. Conduct monitoring in the new monitor well.
4. Prepare an annual interpretive report on the results of groundwater monitoring for the water year.

Data available to the District from Wells SC-1 and SC-2 (part of the Long Valley hydrologic monitoring program) were to be included in this evaluation. This report comprises the seventh annual report pursuant to the settlement agreement. The Mammoth County Water District is now the Mammoth Community Water District.

SUMMARY AND CONCLUSIONS

The District pumped 1,037 acre-feet of water from seven of the eight supply wells during the 1999 water year. This was 19 percent more than during the previous water year, and close to the amount pumped in the 1997 water year. A comprehensive water-level monitoring program was conducted for District supply wells and monitor wells. In addition, water-level measurements were available for two other monitor wells east of the District wells, and flow measurements were available for a spring at the University of California Valentine Reserve.

Water levels in most shallow wells tapping the uppermost glacial till strata were relatively constant and shallow during 1999. Groundwater is generally present in the uppermost strata only in the westerly part of the area, in the meadow and near Mammoth Creek. Water levels in most of the monitor wells tapping the consolidated rock rose during the 1999 water year. A water-level elevation contour map was prepared for September 1999. This map and other information indicate that the extent of the cone of

depression due to pumping of District wells was limited in size, and did not extend east of the easterly District monitor well (No. 24).

The results of water quality monitoring indicate no significant changes during the water year, compared to previously.

The results of the 1998-99 monitoring indicate that District pumping did not influence Mammoth Creek streamflow or the spring at the Valentine Reserve. In addition, water-level declines due to pumping did not extend beyond the vicinity of the well field. Thus there was no influence on the Hot Creek headsprings, which are much more distant from the District water supply wells than the monitor wells utilized for the District monitoring program.

WELL CONSTRUCTION DATA

Figure 1 shows locations of District wells, a private supply well, a subsurface geologic cross section, two other monitor wells to the east (SC-1 and SC-2), and the spring area at the Valentine Reserve. Table 1 summarizes construction data for the District supply wells. All of these wells tap consolidated rock, primarily basalt and scoria layers, and some also tap interbedded glacial till and conglomerate. Well No. 1 has been in service since the 1970's and Wells No. 6 and 10 have been in service since 1988. These three wells are termed the "earlier" District supply wells in this report. Well No. 15 was first put in service in July 1992 on an emergency basis. Well No. 18 was put in service in September

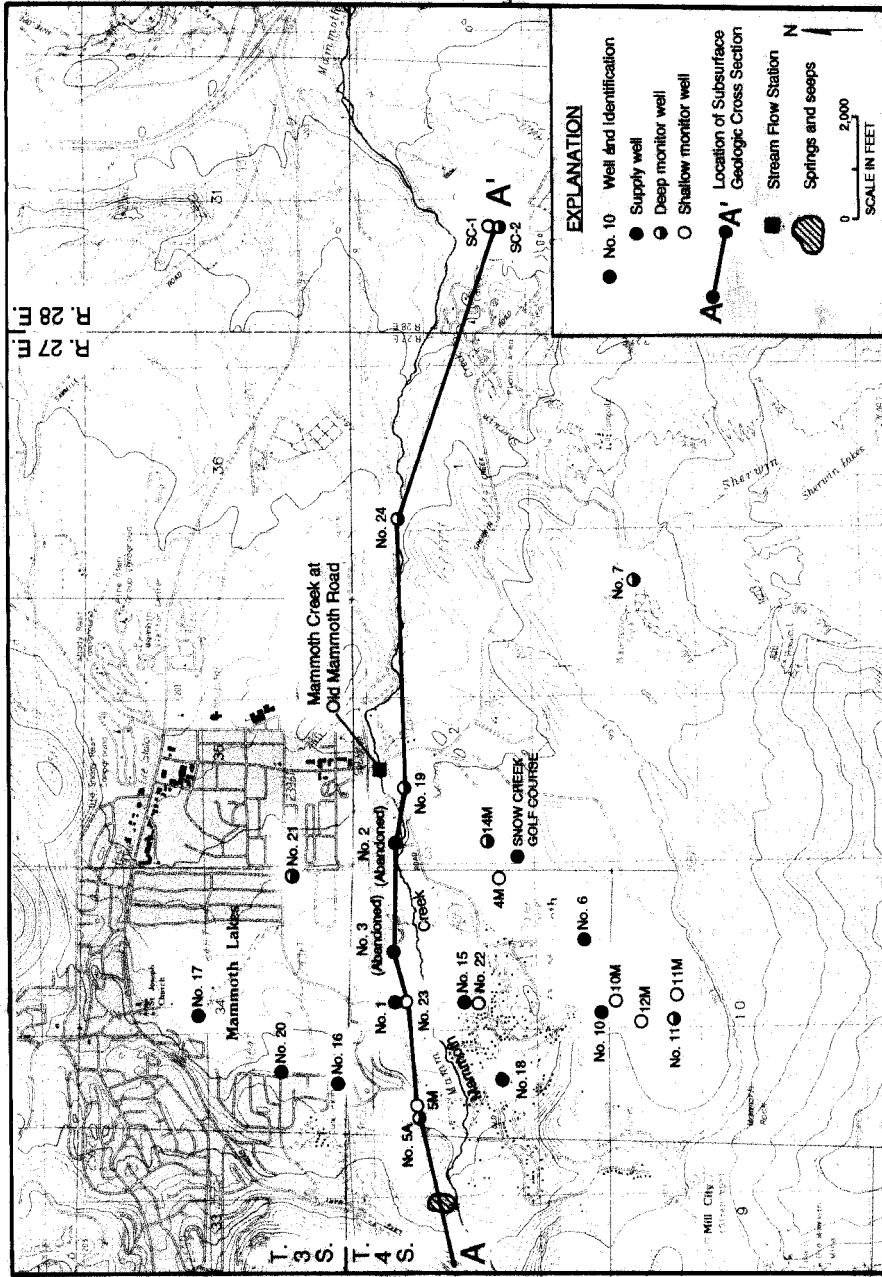


FIGURE 1 - LOCATION OF WELLS AND SUBSURFACE GEOLOGIC CROSS SECTION A-A'

TABLE 1 - CONSTRUCTION DATA FOR DISTRICT SUPPLY WELLS

Well No.	Date Drilled	Drilled Depth (feet)	Cased Depth (feet)	Perforated or Open Interval (feet)	Annular Seal (feet)
1	1976	382	370	200-370	0-90
6	11/87	670	670	146-670	0-52
10	10/87	700	700	136-700	0-52
15	8/92	720	407	407-720	0-135
16	8/92	710	715	420-470 500-680	0-60
17	7/92	710	513	400-710	0-60
18	8/92	710	480	90-150 240-470	0-60
20	9/92	710	420	420-710	0-60

Wells No. 16, 17, 18, and 20 were modified in June 1994 in preparation for being put into service. The test wells that were drilled in 1992 and subsequently converted to production wells are termed herein the "new District supply wells".

1994. Wells No. 16 and 20 were put in service in March 1995; and Well No. 17 was put in service in June 1995. Wells put in service in 1992-95 are termed the "newer" District supply wells in this report. Wells No. 2, 3, 4, 5, and 7 (shown in Figure 1) were not put in service by the District because of low well yields. A small amount of water was pumped from Well No. 7 in Summer 1999 for use at the boys camp. Wells No. 2 and 3 were subsequently destroyed, whereas the other wells were converted to monitor wells.

Table 2 summarizes construction data for District monitor wells. Five of these wells (No. 5A, 14M, 19, 21, and 24) are deep and primarily tap water in fractured volcanic rock. Well No. 7 is a deep well located south of the basalt flow and taps water in a glacial moraine near Sherwin Creek. Well No. 11 is a deep well located south of the basalt flow and taps water in glacial till and granitic rocks. An annular seal was placed in Well No. 21 in July 1997, to preclude surface water and shallow groundwater from entering the well. Well No. 5M taps water in the shallow fractured volcanic rock, just beneath the glacial till. The remaining monitor wells are shallow and tap groundwater in the uppermost glacial till.

SUBSURFACE GEOLOGIC SECTION A-A'

Cross Section A-A' was developed during a previous evaluation, and was updated (Figure 2) by adding more recent water-level data. The locations of wells used for this section are shown in Figure 1.

TABLE 2 - CONSTRUCTION DATA FOR DISTRICT MONITOR WELLS

Well No.	Date Drilled	Drilled Depth (feet)	Cased Depth (feet)	Perforated or Open Interval (feet)	Annular Seal (feet)
4M	1984	89	89	69-89	0-50
5A	7/82(8/93)	357	357	112-357	0-112
5M	8/93	80	80	20-75	0-20
7	8/87	480	480	290-480	0-50
10M	6/88	27	27	7-27	0-5
11	7/88	600	600	170-360	0-50
11M	6/88	43	43	5-43	0-5
12M	9/88	27	27	7-27	0-5
14M	9/88	520	501	100-310	0-100
19	8/92	700	344	200-700	0-140
21	10/92(7/97)	640	145(157)	145-640(157-640)	(70-157)
22	9/92	85	85	55-85	0-25
23	9/92	65	65	30-65	0-25
24	8/93	450	430	300-450	0-20

Well No. 5 was modified in August 1993, so as to be sealed off opposite the glacial till and be perforated only opposite the volcanic rock, and re-designated Well No. 5A. An annular seal was placed in No. 19 in July 1997, and the values in parentheses are for after this work was completed.

FIGURE 2
SUBSURFACE GEOLOGIC CROSS SECTION A-A'
(In Pocket)

Cross Section A-A' shows that the uppermost till layer and volcanic rocks are continuous along the section. Groundwater has been found in the uppermost glacial till layer only in the vicinity of District Wells No. 1, 4, 6, 10, 11, 12, and 15. Most of these wells are either in the meadow or near Mammoth Creek. Water production in the District supply wells is from highly fractured rock, often scoria layers, and sometimes from interbedded glacial till. The intervening less fractured rock probably acts as local confining layers. At Well No. 24, water was not found in the upper part of the basalt or in either of the till layers. Water in this well is in a fractured scoria layer. A lost circulation zone present in this well may influence the water level. In September 1999, there was a fairly uniform water-level slope (about 250 feet per mile) from Well No. 1 to No. 19 to No. 24. The part of the section east of Well No. 24 is oriented almost perpendicular to the direction of groundwater flow (shown later).

PRECIPITATION

Precipitation (inches of water) is routinely measured at the Lake Mary Store, and is an indication of the potential recharge to groundwater. During water years 1991-94, annual precipitation ranged from about 20 to 29 inches and averaged about 22.5 inches. During water years 1995-98, annual precipitation ranged from about 38 to 46 inches and averaged about 43 inches. During water year 1999, the annual precipitation was about 30 inches. These trends

in precipitation are useful when evaluating water-level changes in wells that are measured as part of this program.

DISTRICT PUMPAGE

Pumpage records for District supply wells are provided in Appendix A. Table 3 shows monthly pumpage from District wells during the 1999 water year. The total pumpage was 1,037 acre-feet, or 19 percent greater than that for the previous water year. Of this, 408 acre-feet were from Well No. 15, 243 acre-feet were from Well No. 20, 126 acre-feet were from Well No. 10, and 101 acre-feet were from Well No. 16. The remaining District pumpage (159 acre-feet) was from Wells No. 1, 17, and 18. Well No. 6 was not used during this water year. About 71 acre-feet of water were pumped during the 1999 water year from the Snow Creek Golf Course Well (in the general vicinity of Well No. 14M). This well is owned by Dempsey Construction. From June to August, 1999, an estimated total of about 90,000 gallons was pumped from Well No. 7 for use at the boys' camp.

WATER LEVELS

District Supply Wells

Water-level measurements (static and pumping) for District supply wells are provided in Appendix A. Water-level hydrographs for the earlier wells (No. 1, 6, and 10) are provided in Appendix B.

TABLE 3 - PUMPAGE FROM DISTRICT WELLS (ACRE-FEET)

<u>MONTH</u>	<u>NO. 1</u>	<u>NO. 5</u>	<u>NO. 10</u>	<u>NO. 15</u>	<u>NO. 16</u>	<u>NO. 17</u>	<u>NO. 18</u>	<u>NO. 20</u>	<u>TOTAL</u>
Oct-98	0.000	0.000	7.067	26.209	11.460	0.000	0.000	0.000	44.736
Nov-98	0.010	0.000	6.871	8.049	1.583	0.000	0.890	0.049	17.452
Dec-98	0.000	0.000	15.509	16.245	3.926	0.000	3.334	0.000	39.014
Jan-99	0.000	0.000	17.276	13.644	0.736	0.000	2.893	3.374	37.923
Feb-99	0.015	0.000	1.963	1.423	0.000	0.000	0.178	13.399	16.978
Mar-99	0.000	0.000	0.196	0.245	0.000	0.000	0.000	17.178	17.619
Apr-99	0.196	0.000	1.755	2.110	0.552	0.000	0.000	13.571	18.184
May-99	0.807	0.000	10.405	8.393	15.988	0.000	0.304	19.877	55.774
Jun-99	11.617	0.000	35.926	53.104	9.853	0.000	0.353	39.755	150.608
Jul-99	38.331	0.000	29.055	98.012	0.000	7.706	4.951	71.387	249.442
Aug-99	18.742	0.000	0.000	100.368	22.822	29.080	3.945	58.798	233.755
Sep-99	0.813	0.000	0.196	80.294	34.319	30.896	3.485	5.202	155.205
Total	70.534	0.000	126.221	408.098	101.239	67.681	20.328	242.589	1036.690

New Wells

Figure 3 is a water-level and pumpage hydrograph for Well No. 15, extending back to when it was initially put in service in July 1992. The static water level fell about 80 feet after several months of pumping, and normally ranged from about 260 to 280 feet during periods when the well was being significantly used through early 1995. During periods when the well had not been used much for supply (i.e., May 1995-June 1998), the water level rose substantially. In June 1998, the depth to water in Well No. 15 was 156 feet, or the shallowest of record. In May 1999, the depth to water was 160 feet. Depth to water in Well No. 15 appears to be influenced primarily by the previous pumping history of the well and recharge.

Figure 4 is a water-level and pumpage hydrograph for Well No. 16. The water level in this well changed substantially after the casing was installed (July 1994) and after the pump was installed (February 1995). After the casing was installed and prior to the pump installation, an access tube was not in the well, and the measurements during that period were apparently affected by cascading water. The measurements for July 1994-early February 1995 are thus not considered representative. Measurements for April-May, 1998 also appear to not be representative. During heavy pumping periods of Well No. 20, the static level in Well No. 16 has been about 12 feet lower than during periods of lower pumping of Well No. 20. Overall, static levels in Well No. 16 have been

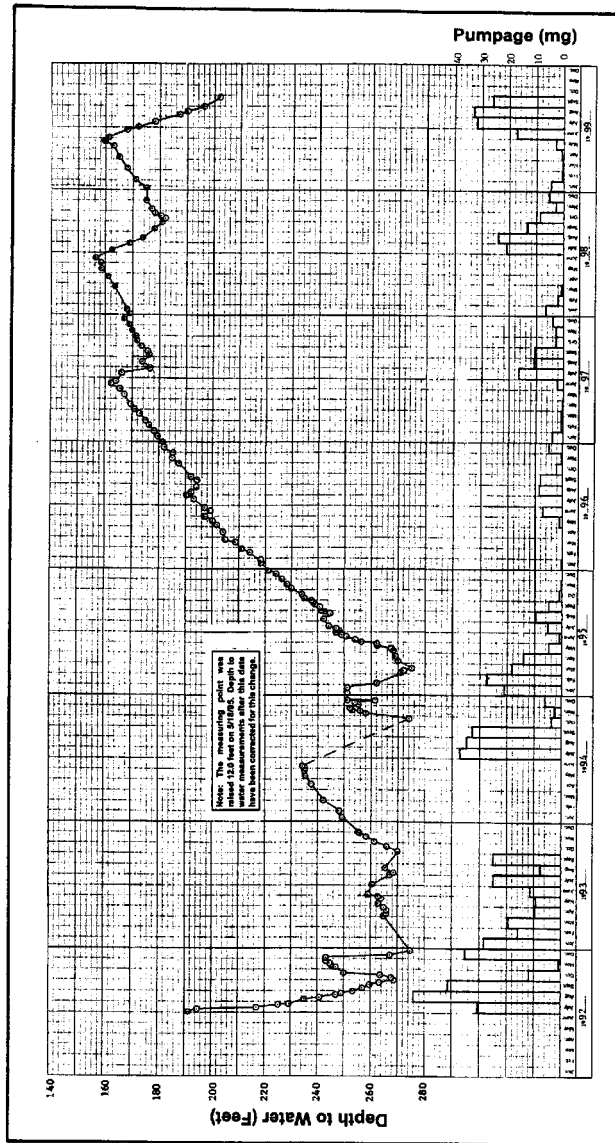


FIGURE 3 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 15

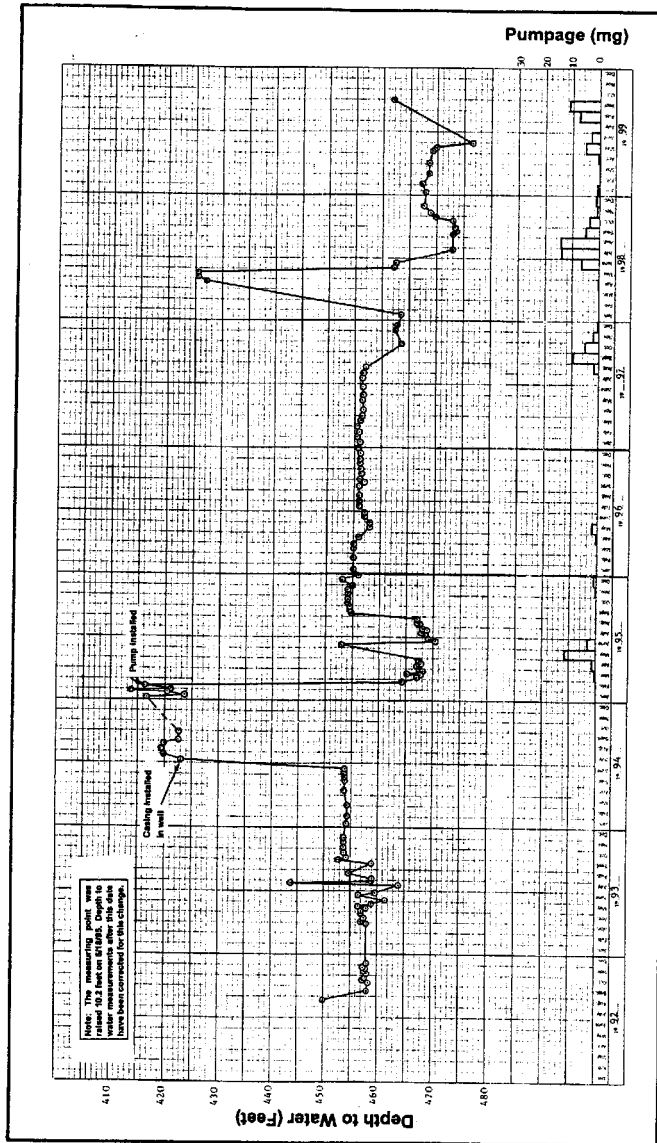


FIGURE 4 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 16

relatively stable since 1992, however there was a slight decline after early 1997.

Figure 5 is a water-level and pumpage hydrograph for Well No. 17. Measurements in early 1995 indicated that the water level apparently rose about eight feet, probably due to recharge. The water level in Well No. 17 appears to be influenced by pumpage of Well No. 20. During operational periods of both of these wells, the static level in Well No. 17 has been about four feet lower than during periods of little pumpage. The water level in Well No. 17 gradually rose during November 1995-August 1999, except during some pumping periods. The shallowest depth to water yet measured in this well was in July 1999.

Figure 6 shows water levels and pumpage for Well No. 18. The overall trend for this well during non-operational periods was a slight water-level rise through 1997. The water level was relatively constant during 1998-99. During pumping periods, the static level averaged about ten feet lower than during non-pumping periods. In early June 1998, the water level in Well No. 18 was 30 feet deep, the shallowest yet measured. The water-level decline of about ten feet in this well during July 1998 appears to have been due to pumping of Wells No. 10 and 15. Depth to water in Well No. 18 was 36 feet in May 1999.

Figure 7 is a water-level and pumpage hydrograph for Well No. 20. From 1994-98, the overall trend was a rising water level. The water-level decline in this well in Summer 1999 was mainly due to

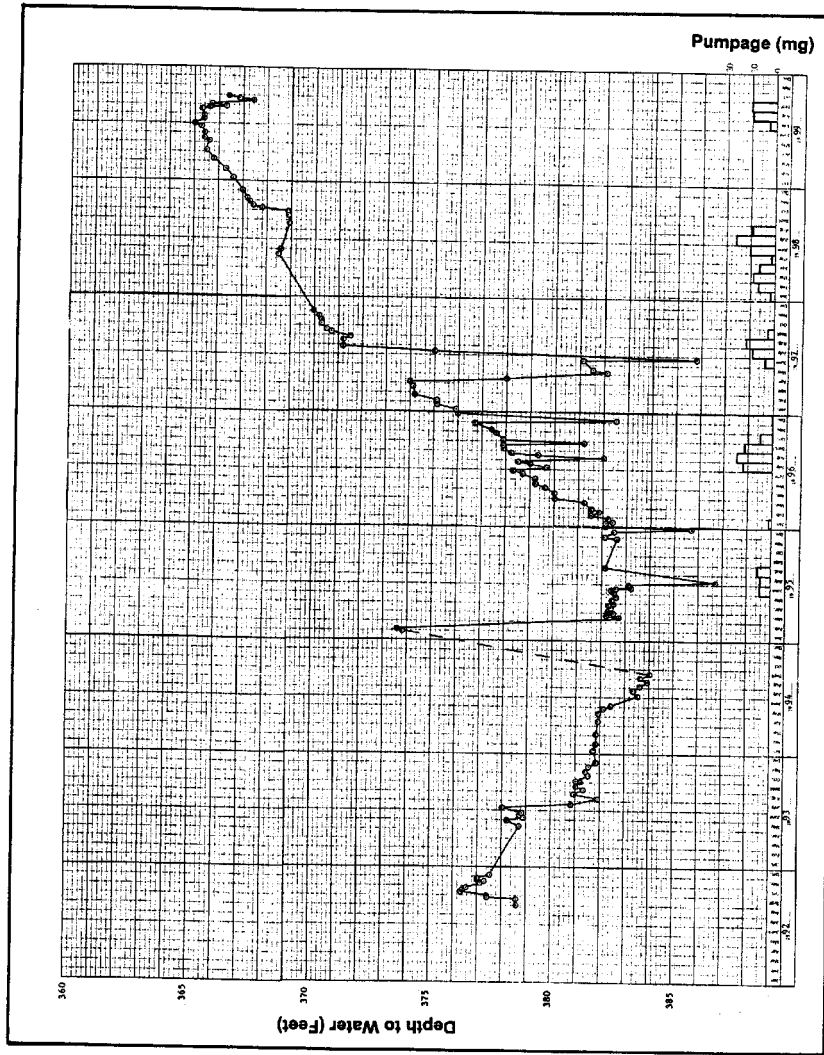


FIGURE 5 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 17

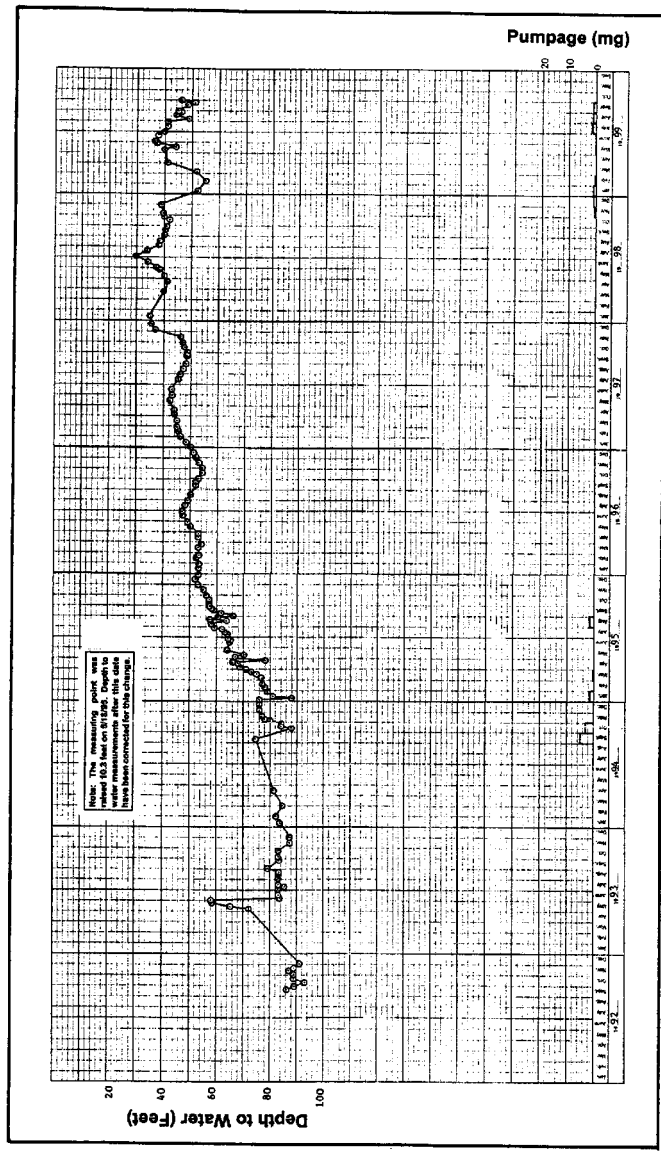


FIGURE 6 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 18

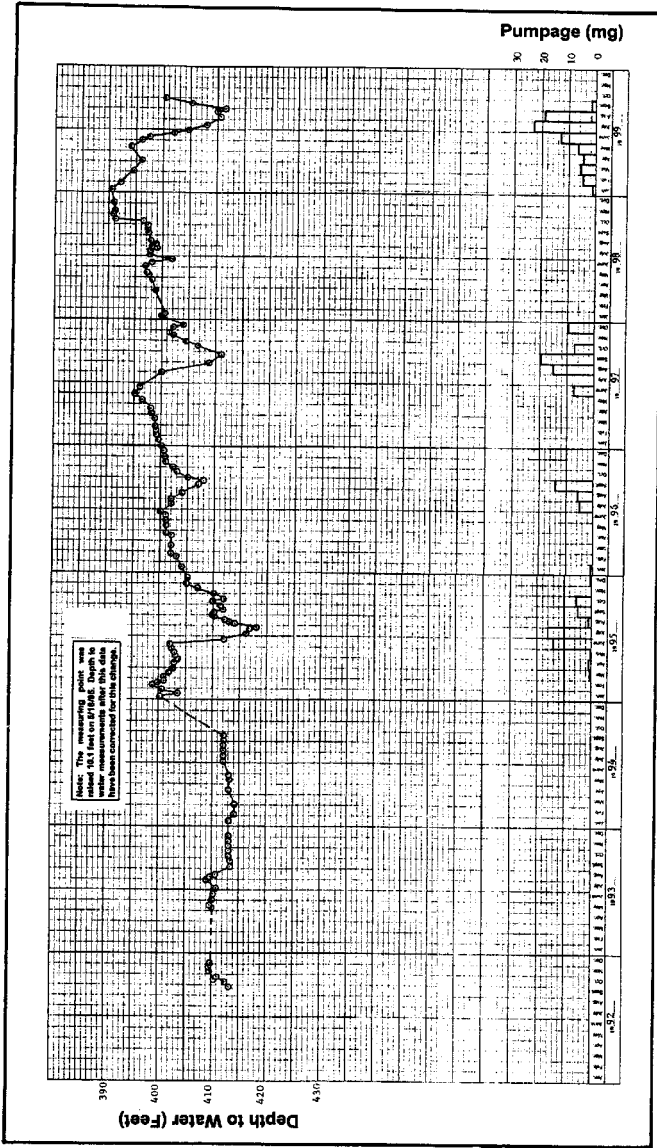


FIGURE 7 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 20

pumping of the well itself. The water level in this well may be somewhat affected by pumpage of Well No. 17. The shallowest levels in Well No. 20 to date were in late 1998 and early 1999.

Earlier Wells

Water-level and pumpage hydrographs for Wells No. 1, 6, and 10 are provided in Appendix B. The static water level in Well No. 1 has ranged from about 160 to 200 feet during low pumping periods to an average of about 270 feet during heavy pumping periods (i.e., August 1994). Overall, the water level in this well rose between 1992 and 1997, and was relatively constant during 1998-99. In June 1998, depth to water in this well was 160 feet, or the shallowest measured since 1990. Depth to water in this well was 163 feet in May 1999. The static water level in Well No. 6 has ranged from less than 30 feet during low pumping periods (after September 1995) to more than 160 feet during heavy pumping periods (August-September, 1994). During May-September, 1996 and in part of 1997, the static level in this well was at or above the land surface. Depth to water was less than 15 feet during the past three water years. The static water level in Well No. 10 has ranged from less than 30 feet during low pumping periods (July 1995) to more than 160 feet during heavy pumping periods (Summer 1993). During the past three water years, depth to water has usually been less than

30 feet, except during pumping in 1998. Depth to water in Well No. 10 was near 13 feet in December 1998, the shallowest measured since 1992.

Deep Monitor Wells

Water-level measurements for monitor wells are provided in Appendix C, and supplementary water-level hydrographs are provided in Appendix D. Transducers were installed in four of the deep monitor wells (No. 14M, No. 19, No. 21, and No. 24), and continuous water-level measurements commenced in December 1995. Well No. 5A is located between Well No. 1 and the Valentine Reserve North Spring (Figure 1). Measurements for Well No. 5A indicate that depth to water has ranged from near the land surface to about 6 feet. During the past five years, the annual shallowest level has been near the land surface, and overall the water level has risen. Well No. 7 is located in the Sherwin Creek campground, about one and a third miles east of Well No. 6. Measurements for Well No. 7 indicate that depth to water has ranged from 241 to 288 feet. The water level in this well appears to be primarily influenced by recharge from Sherwin Creek. The influence of recharge during 1995 is apparent. The shallowest water level of record in this well was measured in September 1997.

Well No. 11 is located in the meadow area, about one quarter mile south of Well No. 10. The water-level measurements for Well No. 11 indicate the deepest level (51 feet) in May 1993, and the

shallowest levels (near the land surface) during most of the period after July 1995. The water level in this well is influenced by pumping of Wells No. 6 and 10, and surface flow, particularly in the Bodle Ditch, which passes through the meadow area. The water levels were deepest during drought conditions and heavy pumping of Wells No. 6 and 10. The shallowest water levels occurred during wet years and less pumping of Wells No. 6 and 10. Well No. 14M is located about two-thirds mile east of Well No. 15. The manual water-level measurements for Well No. 14M indicate that the depth to water normally ranged from about 350 to 360 prior to June 1995. Since May 1995, the water level in this well has generally risen. The rise has primarily been associated with recharge and the reduction in pumping of Wells No. 6 and 10. In August 1998, depth to water was 236 feet, or the shallowest of record. The water level in this well shows the influence of recharge and pumping patterns of Wells No. 6 and 10, and the Snow Creek Golf Course well. Transducer measurements that are considered reliable are available for Well No. 14M for November 1, 1996-September 30, 1999, except for October 1997 and June 1998. These measurements (Appendix D) indicate no significant drawdown due to pumpage of District wells in 1998.

Well No. 19 is located about four-fifths of a mile east of Well No. 1. Based on manual measurements (Figure 8), the water level in Well No. 19 has ranged from about 312 to 345 feet deep. The water level generally rose from 1995-98. However, in 1999, the

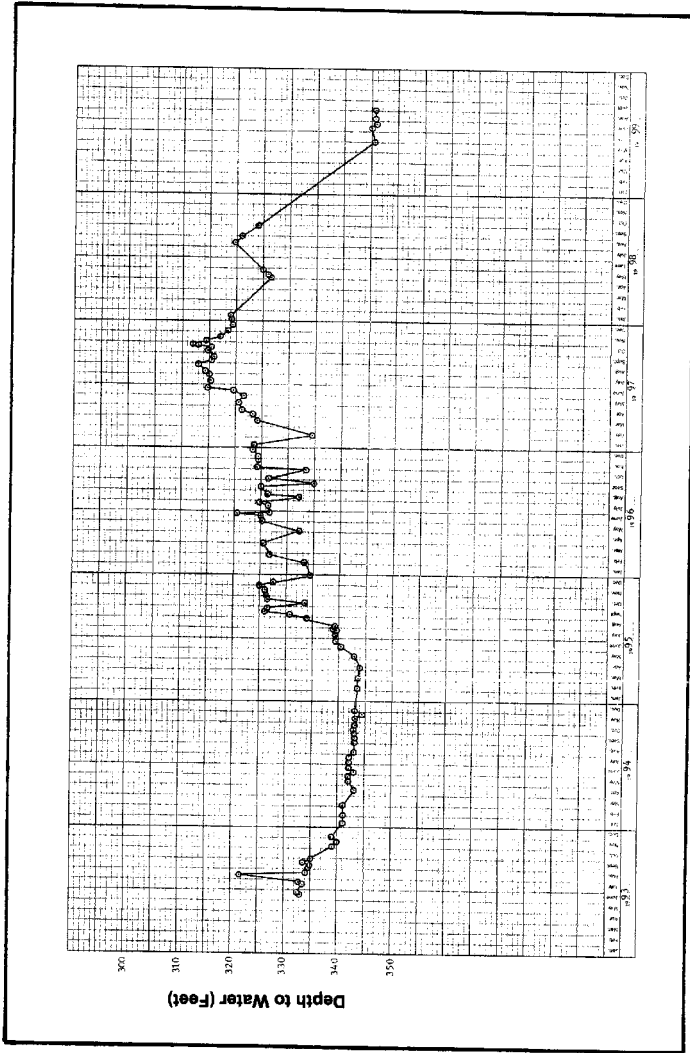


FIGURE 8 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 19

water level fell about 20 feet, to near the levels in 1994 and early 1995. This decline is attributed to less recharge during Winter 1998-99. Because of falling water in this well, the 1999 measurements were made using the transducer instead of the electric sounder. Depth to water was measured once with an electric sounder, and there was a 6-foot difference. The values plotted on Figure 8 for 1999 were thus corrected by deducting six feet. In October 1997, depth to water was 312 feet, or the shallowest yet measured. During the 1999 water year, depth to water in this well was about 346 feet. Transducer readings that are considered fairly reliable are available for this well from November 1, 1996-September 10, 1997, from November 1, 1997-September 30, 1998, except for June 1998, and from May 4-September 30, 1998 (Appendix D).

Well No. 21 is located about three fourths of a mile east of Well No. 20. Based on manual measurements, the water level in Well No. 21 (Figure 9) has ranged from about 231 to 370 feet in depth. The water level in this well rose significantly between early 1995 and late 1996. There was a water-level decline in this well from December 1996-February 1997, and the water level then rose. Most of the rise is attributed to recharge. An annular seal was placed in this well during July 1997. In August 1997, the water level was the shallowest yet measured. Transducer measurements that are considered reliable are available for Well No. 21 from November 1, 1996-May 31, 1997, November 1, 1997-September 30, 1998, except for

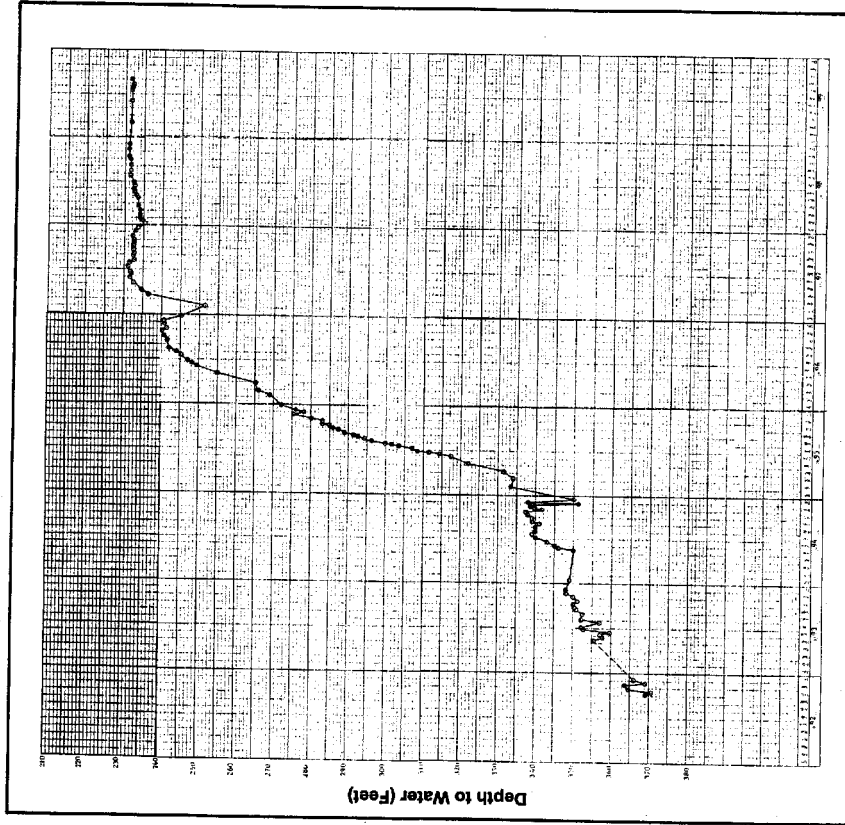


FIGURE 9 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 21

June 1998, and May 4-September 30, 1999 (Appendix D). The manual water-level measurements in this well have indicated no significant response due to pumping of District wells.

Well No. 24 is located about one mile east of Well No. 19. Figure 10 is a water-level hydrograph for Well No. 24, based on manual measurements. Measurements for this well began in Summer 1993, and depth to water has ranged from 352 to 392 feet. The water level rose after early 1995, to the shallowest depth yet measured in December 1998. In 1999, the water level fell about 15 feet, and this is attributed to less recharge due to the relatively low precipitation during Winter 1998-99. Transducer measurements are not available for this well between April 3, 1997 and April 30, 1998, due to equipment failure. Transducer measurements for this well have not always been consistent with manual measurements (Appendix D). The water level in this well obviously responds primarily to recharge, and no influence of District pumping is apparent.

Water levels in Wells No. 19, 21, and 24 rose significantly during water years 1995-1997 and were relatively constant during the 1998 water year. During the 1999 water year, water levels in Wells No. 19 and 24 declined, whereas the level in Well No. 21 stayed relatively constant. Wells No. 19 and 24 are relatively close to Mammoth Creek. The best explanation for the historical water-level variations in these wells is due to the amount of recharge, which is primarily related to climatic patterns. Water levels in these wells rose during and following periods of above

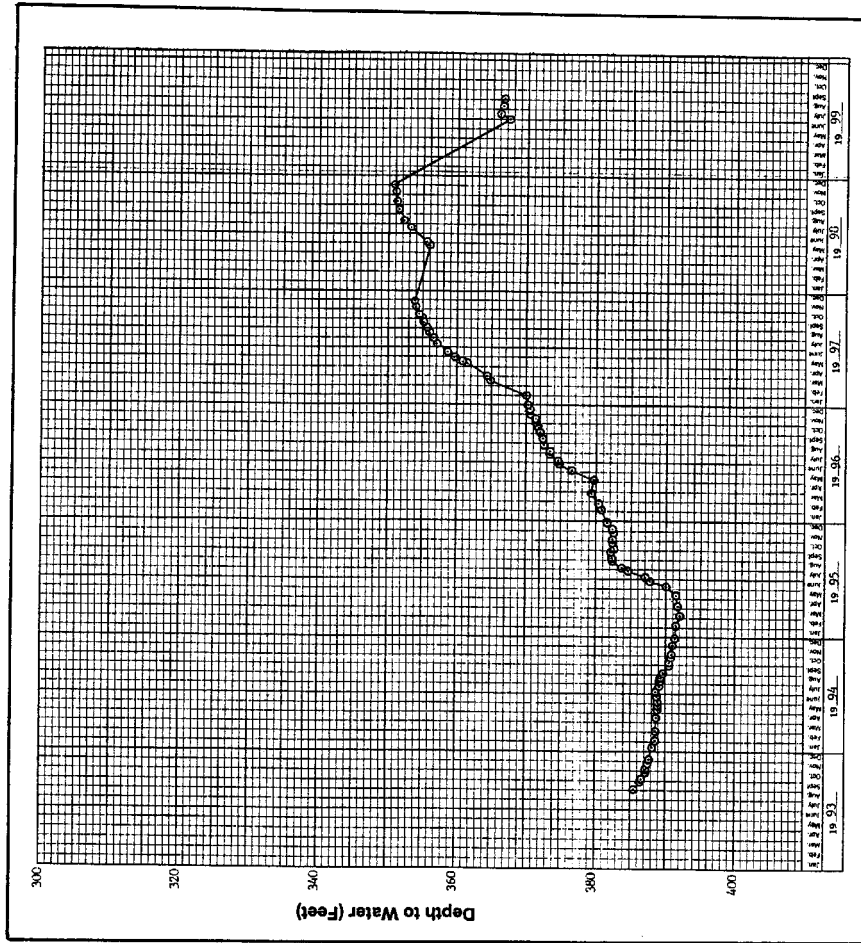


FIGURE 10 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 24

average precipitation. In contrast, water levels in these wells temporarily fell during periods of below normal precipitation.

Figure 11 is a water-level hydrograph for SC-1, which taps groundwater in the upper part of the basalt east of the District wells. The water level in this well generally fell from June 1983 through early 1995. However, some water-level rise occurred during this period due to recharge. Significant recharge was evident during 1995, 1996, and 1998. The shallowest water levels measured in SC-1 were in June 1983 and late July 1995. In July 1998, depth to water in SC-1 was near that in August 1983.

Figure 12 is a water-level hydrograph for SC-2, which taps groundwater in the deeper basalt near SC-1. Comparison of the hydrographs for SC-1 and SC-2 indicates that water levels in the two wells fluctuate similarly. However, the water-level rises are less in the deeper monitor well than in the shallower monitor well, as would be expected if the rises are mainly due to recharge, the source of which is from the land surface. The water level in SC-2 was about 130 feet deep in July 1999, or about the same as in late 1998. The water level in SC-2 generally recovered after 1994, although the rate of recovery decreased in 1998-99. Water-level variations in SC-1 and SC-2 are not indicated to be due to District well pumpage, based on the water-level hydrographs for Wells No. 19, 21, and 24 and other evidence.

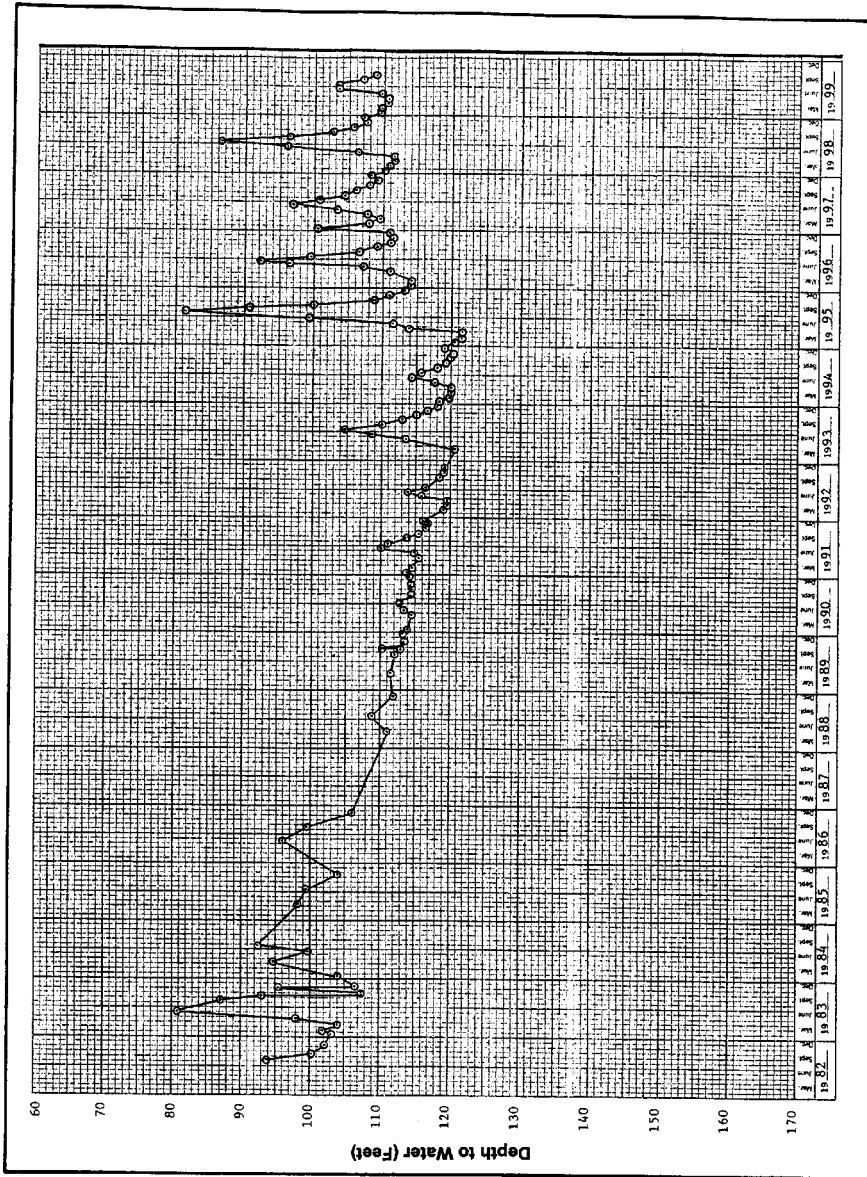


FIGURE 11 - WATER-LEVEL HYDROGRAPH FOR SC-1

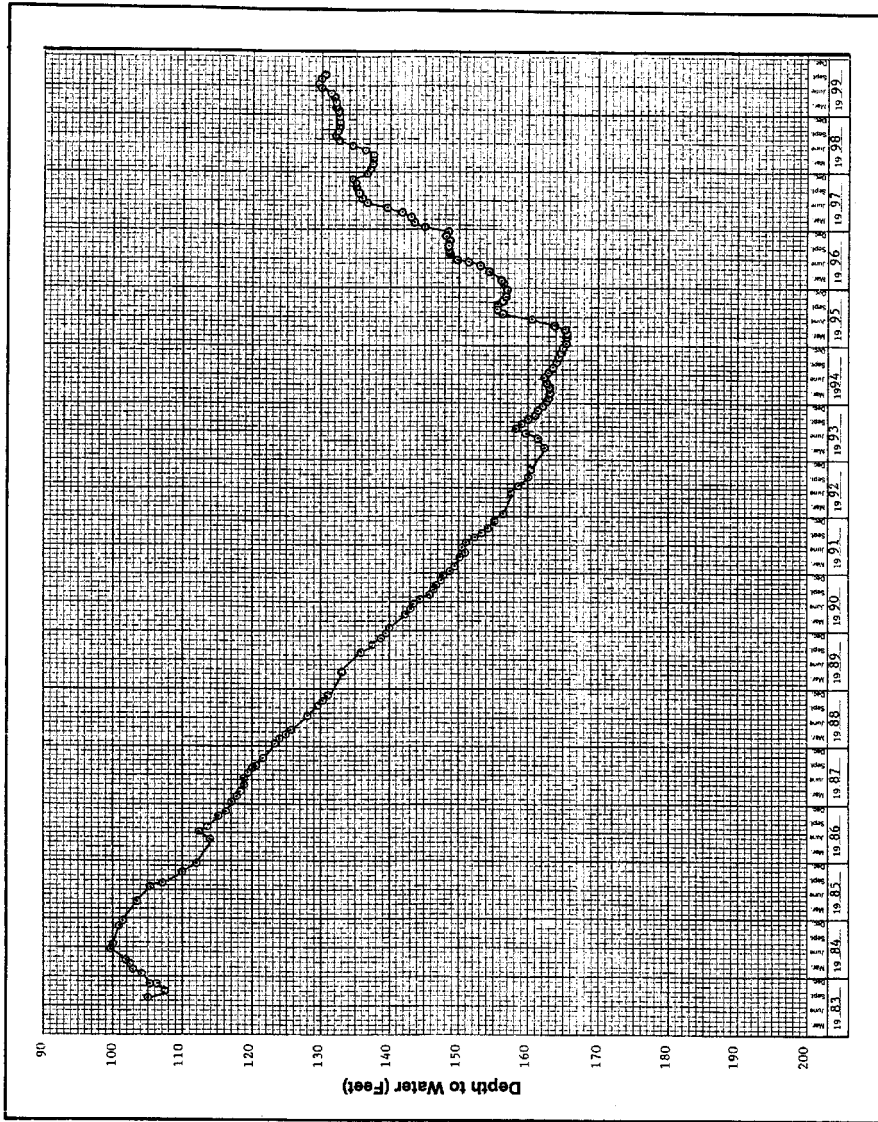


FIGURE 12 - WATER-LEVEL HYDROGRAPH FOR SC-2

Shallow Monitor Wells

A water-level hydrograph for Well No. 22 is provided in Figure 13. Pumpage of nearby Well No. 15 is also plotted on this figure. The water level in Well No. 22 is not related to pumpage of Well No. 15, which taps groundwater in the deeper consolidated rock. The water level in this well responds primarily due to recharge from Mammoth Creek streamflow (Figure 14). Well No. 22 was dry until June 17, 1993 and during 1994-early 1995. There has been water in the well continuously since June 1995. The shallowest water level in Well No. 22 was in August 1995. Depth to water in this well rose about 12 feet during May-July, 1995, due to recharge corresponding to high flows (exceeding 40 cfs) in Mammoth Creek. During 1996-99, the water-level trends in Well No. 22 also followed the pattern of streamflow in Mammoth Creek.

A water-level hydrograph based on manual measurements for Well No. 23 and pumpage for nearby Well No. 1 are shown in Figure 15. Depth to water in Well No. 23 has ranged from about 5 to 16 feet during the period of record. The shallowest water levels were in the spring and early summer of 1993, 1995, and 1996. Depth to water in this well is not influenced by pumpage of Well No. 1, which taps groundwater in the deeper consolidated rock. Well No. 23 is located relatively close to Mammoth Creek and is clearly influenced by recharge from streamflow (Figure 16), and possibly from other local sources of recharge. On August 1, 1996, a float-type continuous water-level recorder was installed in Well No. 23.

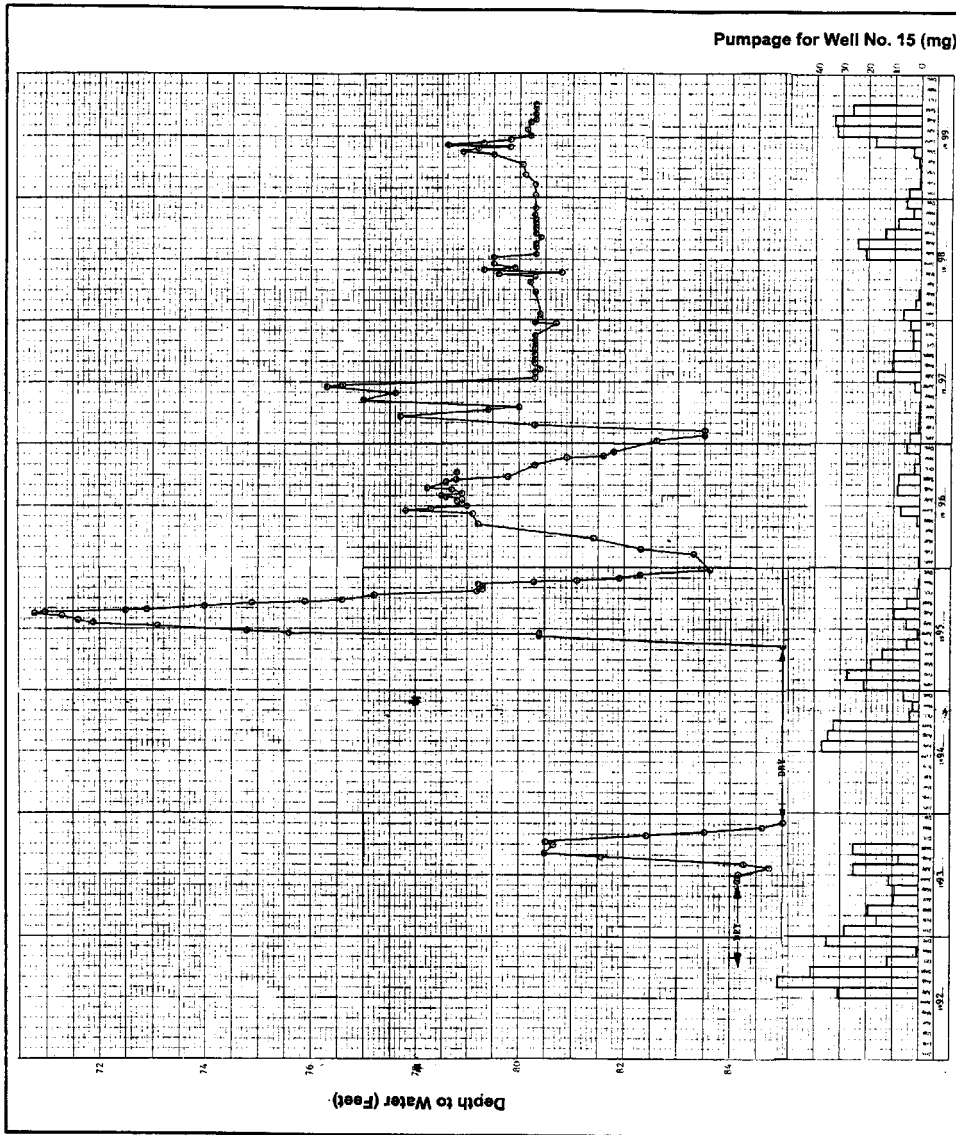


FIGURE 13 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 22 AND PUMPAGE FOR WELL NO.15

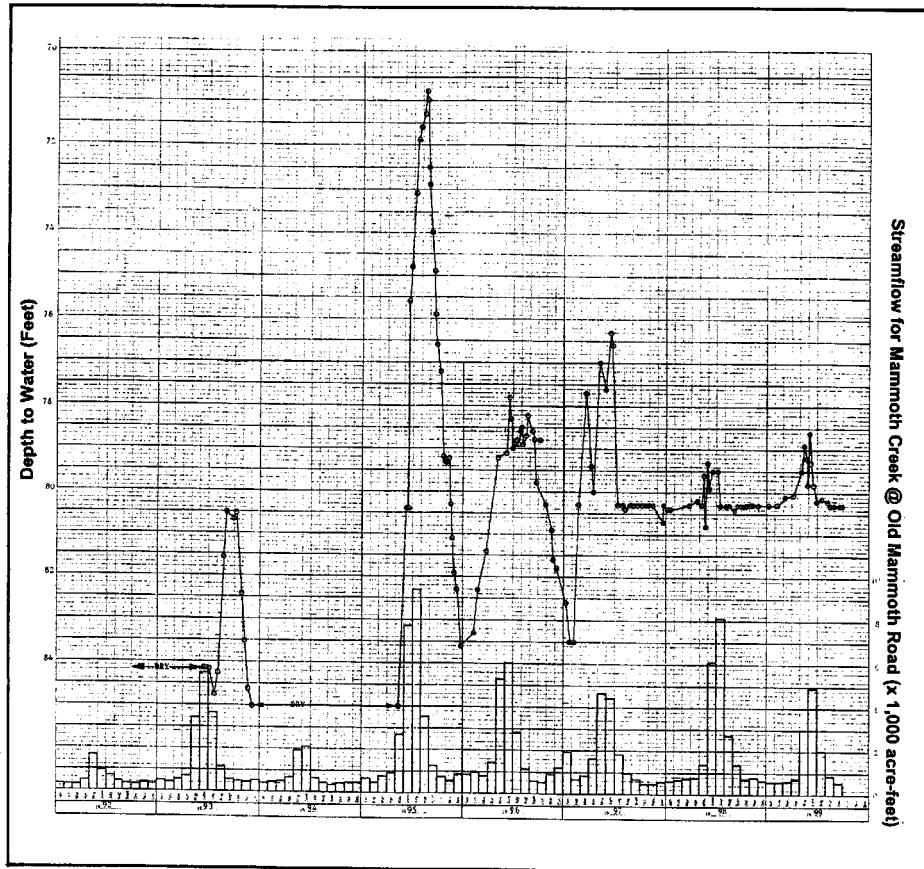


FIGURE 14 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 22 AND MAMMOTH CREEK STREAMFLOW

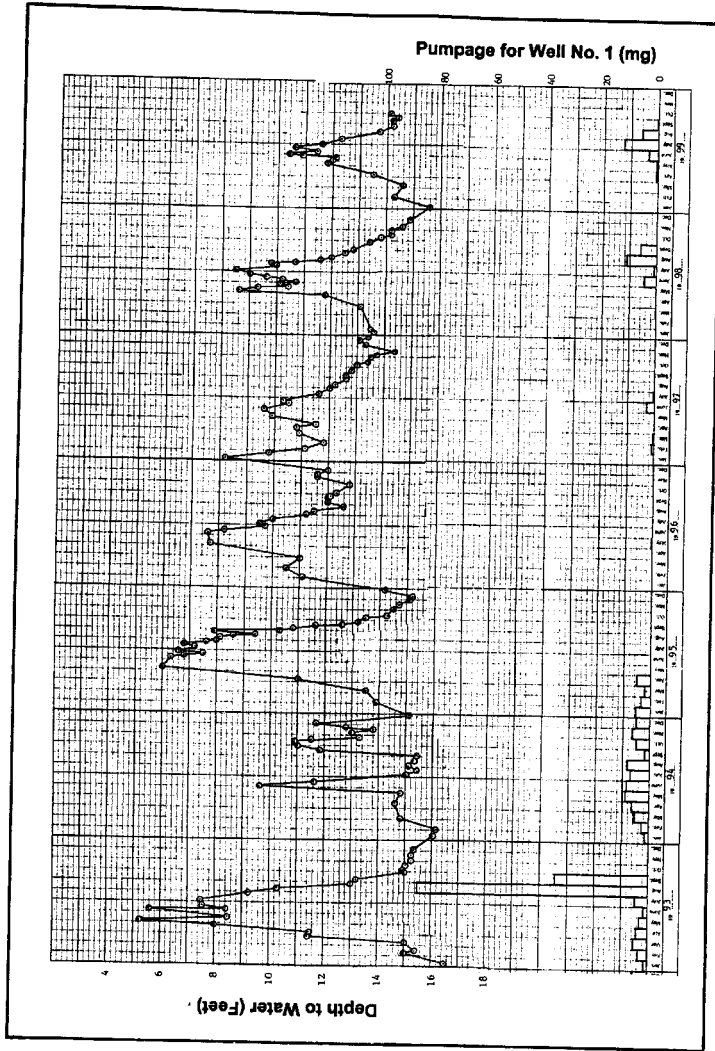


FIGURE 15 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 23 AND PUMPAGE FOR WELL NO. 1

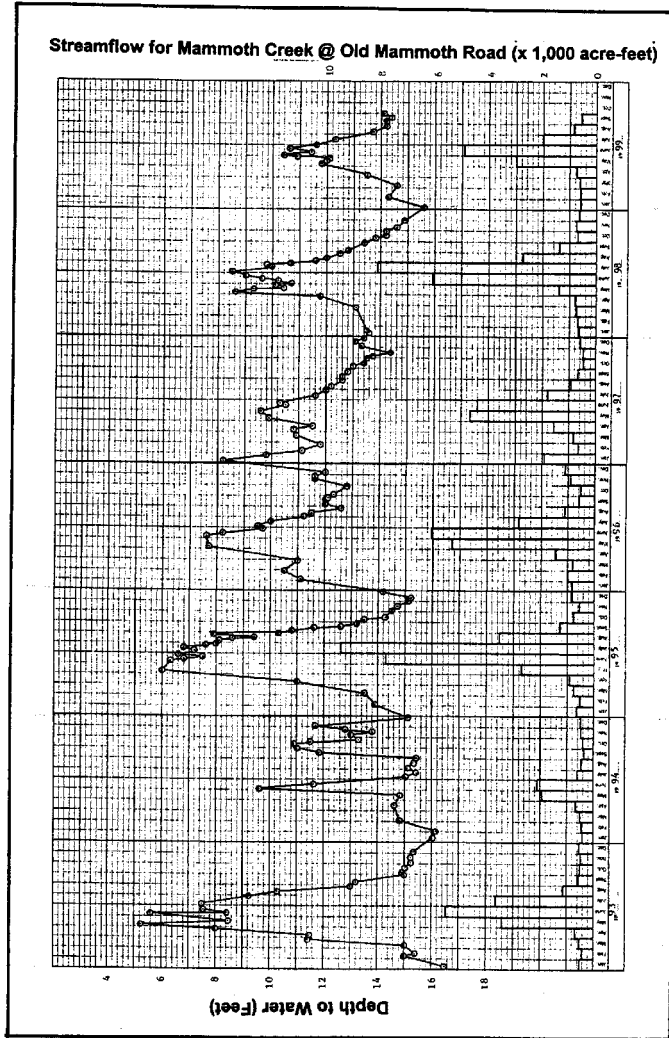


FIGURE 16 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 23 AND MAMMOTH CREEK STREAMFLOW

Some problems were experienced with this recorder, but reliable measurements were obtained during most of 1997-99. A detailed hydrograph for Well No. 23 is provided in Appendix D.

Water-level hydrographs for the remaining shallow monitor wells are provided in Appendix D. Well No. 4M is located in the meadow area east of District Wells No. 6 and 10. The water level in this well rose significantly after early 1995 due to significant surface water flow in the meadow. Depth to water fluctuations in this well have followed patterns of Bodle Ditch flows, rising during periods when flows are present in the ditch. In May 1998, the water levels in this well were the shallowest since 1988.

Well No. 5M taps the shallow volcanic rock, and no water was observed in the overlying glacial till at the time of drilling of this well. Depth to water in Well No. 5M has ranged from about 2.5 to 9 feet. The shallowest levels have been in the spring and early summer, and the deepest in the late summer. The shallowest level each year has ranged from about 2.5 to 3.5 feet.

Well No. 10M was dry from October 1992 through June 10, 1993. Some water appeared in this well during June 17-August 19, 1993, and during June 6-June 20, 1996. The well was otherwise dry from late 1992 through December 4, 1996. In 1998 and 1999, there was water in Well No. 10M most of the time. This well is adjacent to District Well No. 10, and the water level in Well No. 10M is primarily influenced by pumping of this well and also by local recharge.

Well No. 11M is located in the southwest part of the meadow area near the Bodle Ditch. Water levels in this well have seasonal fluctuations, corresponding to flows in the ditch. The shallowest water levels have generally been in June-July. Water levels gradually declined during 1989-92, but rose significantly after 1992. The water level began to rise significantly in April 1996, and the shallowest level yet measured (about four feet deep) was in June 1996. The water level in this well remained relatively shallow through 1999.

Well No. 12M is located in the western part of the meadow area. The water level in this well has responded significantly to a number of recharge events. The water level in this well began to rise significantly in April 1996, and reached the shallowest level of record in June 1996. The water level in this well remained shallow through 1999. The water levels in all of the shallow monitor wells thus respond significantly to recharge, often associated with flow of nearby surface water.

Water-Level Elevation Contours

Figure 17 shows water-level elevation contours for late September 1999. The hydrologic boundary is shown north of Wells No. 1 and 5A and south of Wells No. 16, 17, and 20. This boundary is believed to be present only west of a line connecting Wells No. 14M and 21. A cone of depression was evident due to pumping of District Wells No. 10 and 15. This cone of depression did not

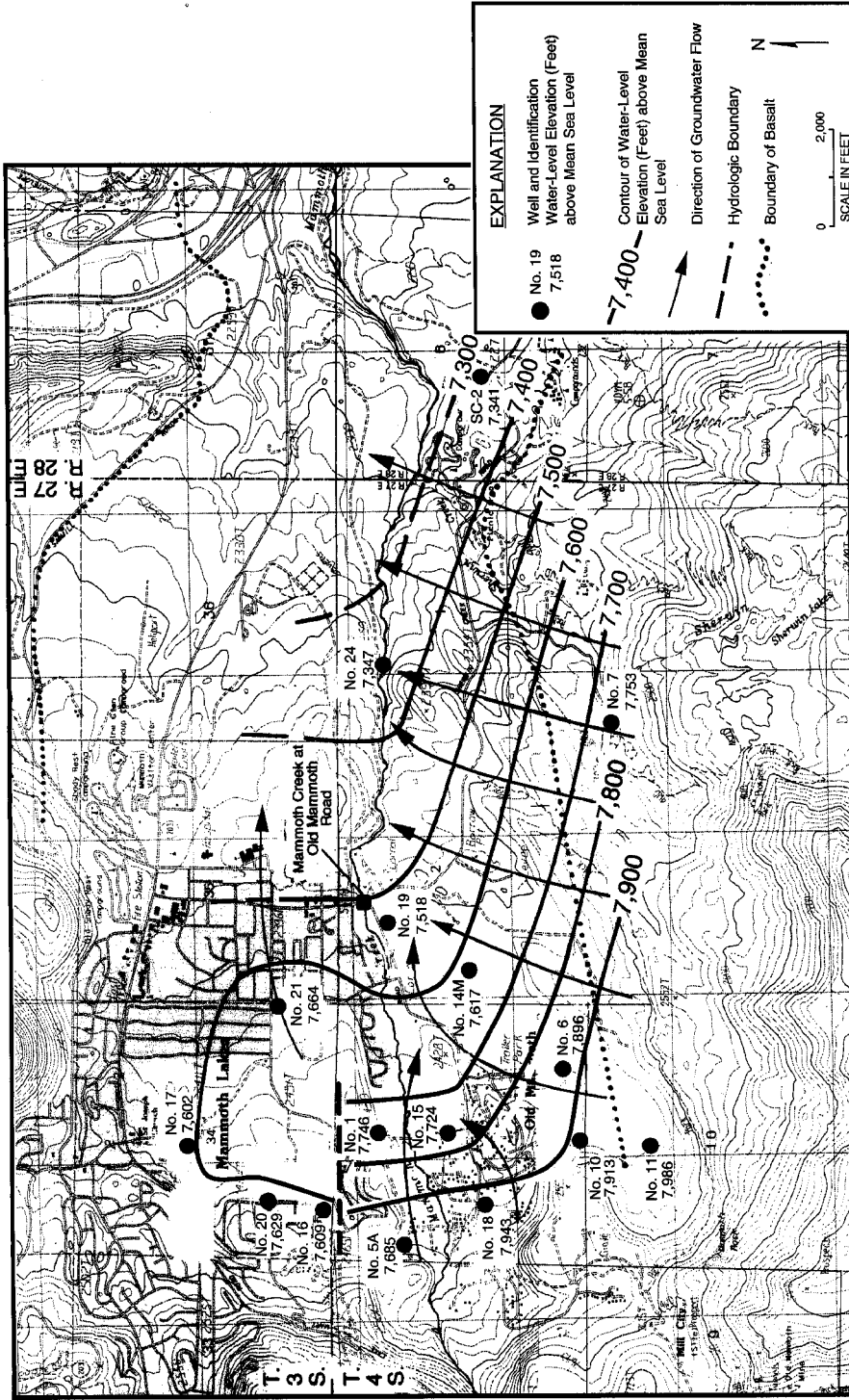


FIGURE 17 - WATER-LEVEL ELEVATIONS IN LATE SEPTEMBER 1999

extend east of Well No. 19. The overall direction of groundwater flow in late September 1999 was similar to that shown in the previous annual reports. This map shows only the horizontal component of groundwater flow in the basalt and interbedded glacial till. Other evidence (i.e., water levels in SC-1 and SC-2) indicates that there is also significant downward flow of groundwater in most of the area.

CHEMICAL QUALITY AND TEMPERATURE OF GROUNDWATER

The results of chemical analyses and temperatures of water for the supply wells and monitor wells during the 1999 water year are provided in Appendix E. Water samples were collected from the supply wells in July and August and from the monitor wells in August 1999. Transducers are installed in most of the deep monitor wells to continuously measure water levels. Because of these transducers, it was not feasible to collect water samples from these wells during 1999. The coldest water (53°F or less) has normally been from shallow monitor wells in the meadow area and in water from the supply wells tapping consolidated rock, south of the hydrologic boundary. In contrast, the warmest water (60°F or greater) normally has been from the wells tapping consolidated rock, north of the hydrologic boundary, closer to the known area of relatively shallow geothermal water in Mammoth Lakes. The lowest electrical conductivity values (less than 200 micromhos per centimeter at 25°C) have normally been for shallow monitor wells

and Well No. 11. The highest values (greater than 430 micromhos) have been for wells tapping the consolidated rock in the western part of the area. There is no evidence of significant changes in chemical quality or temperature of well water during water year 1999, compared to previous information in the earlier annual reports.

MAMMOTH CREEK STREAMFLOW

Records of streamflow at the outlet from Twin Lakes and the Old Mammoth Road crossing during the 1999 water year are provided in Appendix F. The mean monthly flow at the Old Mammoth Road crossing ranged from 9.1 cfs in September 1999 to 82 cfs in June 1999. In 1999, the flow at the Old Mammoth Road crossing began to rise significantly in May, and the highest flows were between May 15 and July 16.

Average daily flows are plotted in Appendix F for both stations for each month during the 1999 water year. A comparison of these daily flows indicates that the streamflow at the Old Mammoth Road crossing normally equaled or exceeded that of the Twin Lakes outflow. During most periods (excluding April-July), the flow was greater at the downstream station, by from about several cfs to up to 10 cfs. This downstream increase in flow is attributed to inflow from ungaged tributaries below the Twin Lakes outlet and possibly some groundwater flow. Such groundwater flow could enter Mammoth Creek locally from unconsolidated deposits.

Historical records indicate that during the summers of drought years, there was little difference in streamflow between the two stations. This information indicates that pumpage of District wells did not influence Mammoth Creek streamflow during the 1999 water year.

VALENTINE RESERVE SPRINGFLOW

Rates of flow of the main spring at the University of California Eastern Sierra Valentine Reserve are provided in Appendix G. Figure 18 shows the variations in springflow during May-September, 1999. Records for late May, June, and much of July are not available due to equipment malfunction. In May, flow ranged from about 70 to 116 gpm, and decreased after early May. For most of the period of springflow in late July-September, the flow ranged from about 46 to 55 gpm. Pumpage from the closest District Wells (No. 15, 16, 18, and 20) that were pumped during this period is also shown in this figure. Well No. 15 was pumped primarily during July-September, Well No. 16 was pumped primarily during late May, June, and in late August and September. Well No. 18 was pumped only for relatively short periods. Well No. 20 was pumped primarily from May until early September. Careful examination of Figure 18 indicates that the variation in total pumpage does not correlate with the springflow. In late September, springflow increased about 10 gpm, and total pumpage decreased by about 3.5 million gallons per week. However, consideration of

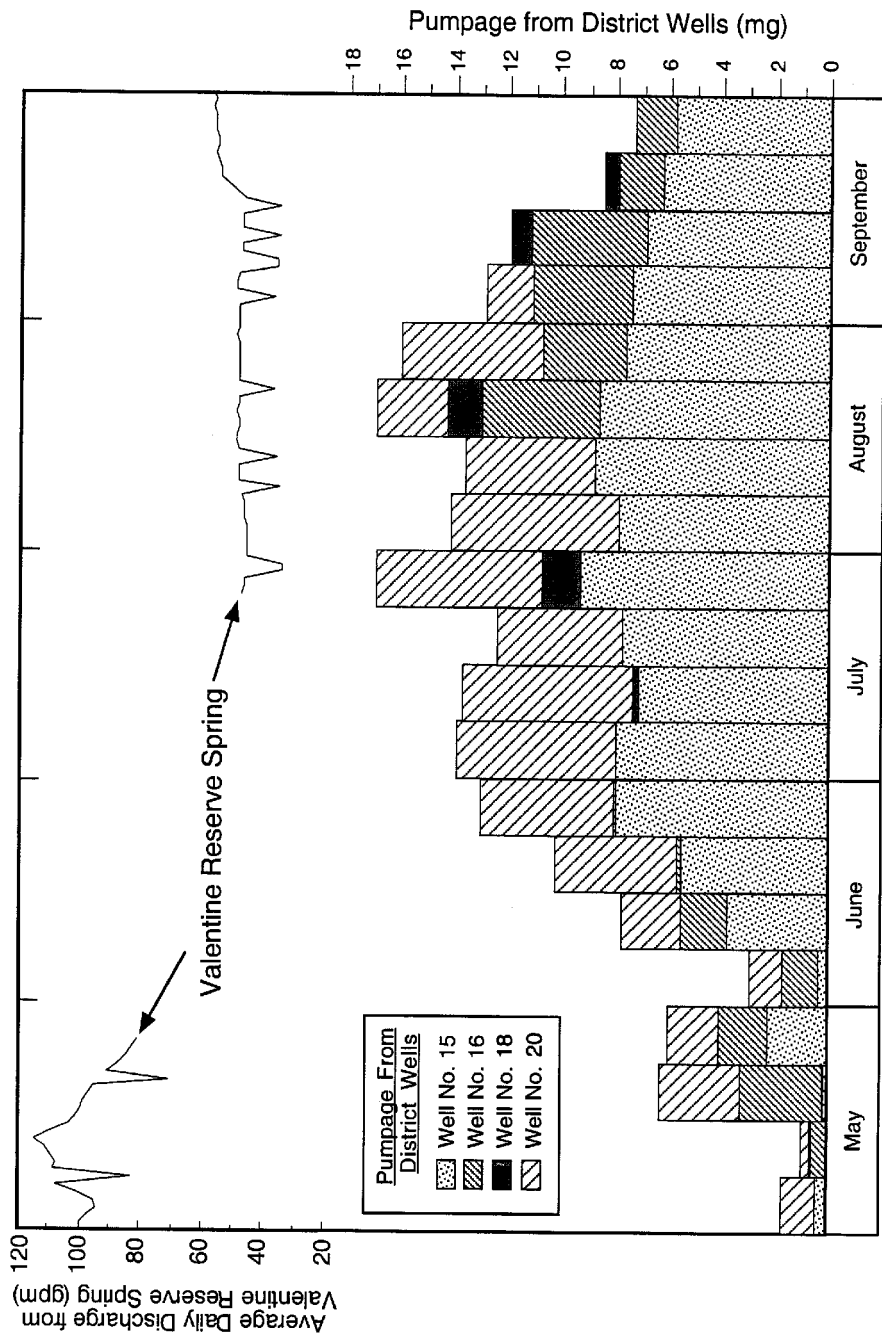


FIGURE 18 - FLOW FROM VALENTINE RESERVE SPRING AND DISTRICT WELL PUMPAGE (1999)

pumpage for individual wells indicates that pumping patterns of District wells was not the causative factor for the observed rise. That is, pumpage of the individual wells does not correlate with springflow.

Springflow measurements for the seven-year period of record (Figure 19) indicate that the pattern of springflow is related to runoff. For most years, springflow was lowest in July or August, and then increased near the end of the water year. This could have been due to lower air temperatures, which would result in decreased evapotranspiration of water by plants in the area. Another possible factor is increased runoff from higher land on Mammoth Mountain. There was no noticeable impact of District pumping during the 1999 water year on springflow at the Valentine Reserve. This is consistent with monitoring results during the previous years.

DATA EVALUATION AND INTERPRETATION

Water-level hydrographs for most of the monitor wells tapping the uppermost glacial till strata and consolidated rock in and near the District well field indicate relatively constant water levels during the 1999 water year. Substantial recharge was indicated during the 1995-98 water years, coincident with substantial runoff in the Mammoth Creek watershed. Water-level hydrographs for Wells No. 7, 21, 24, and SC-1, east of the District well field, also indicate substantial rises during that period. Recharge was

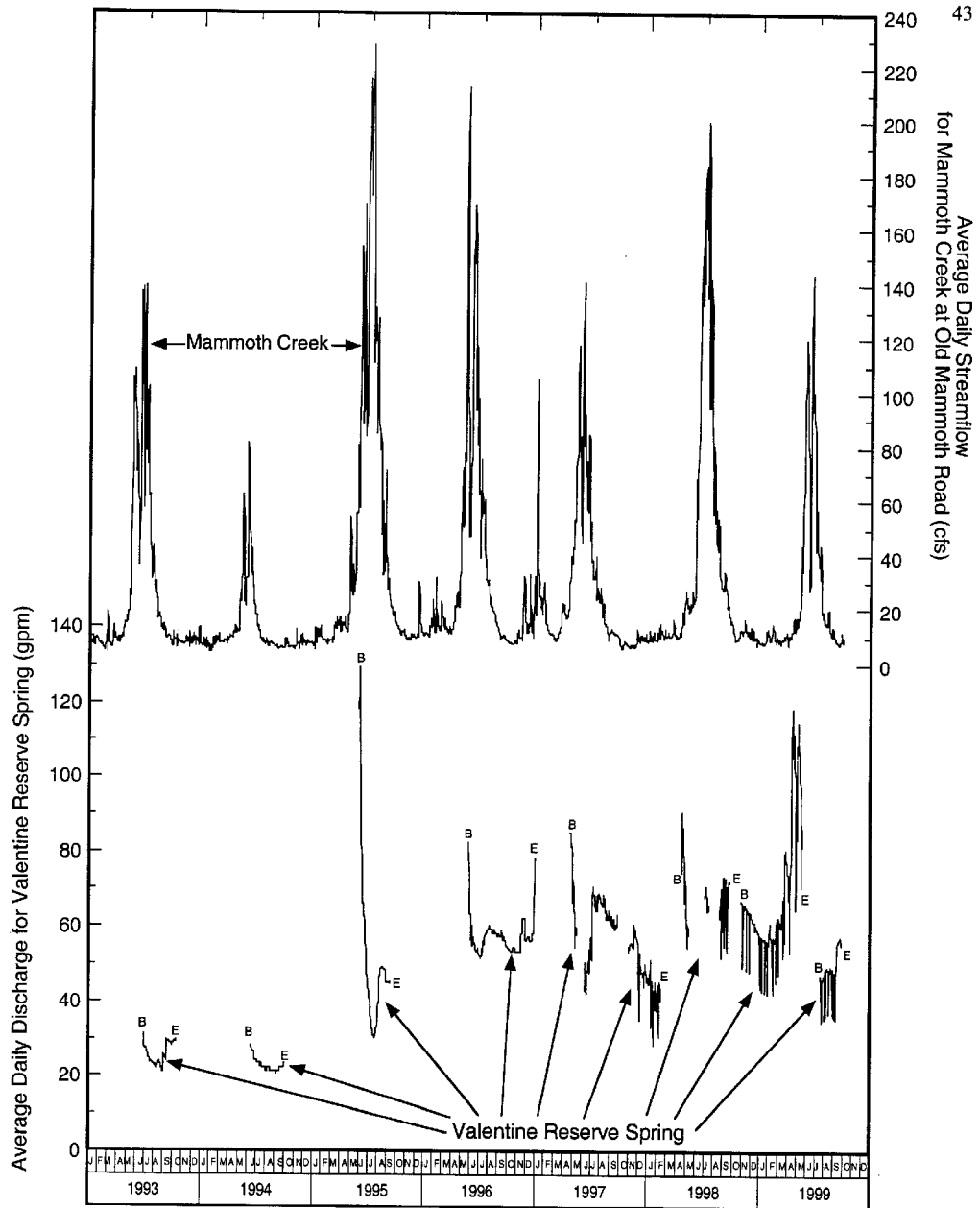


FIGURE 19 - FLOW FOR VALENTINE SPRING AND MAMMOTH CREEK STREAMFLOW (1993-1999)

indicated to be the primary factor influencing water-level trends, except for some active District supply wells. Significant water-level declines due to pumping have only been observed in or near the pumped wells themselves.

The water-level elevation contour map for September 1999 confirms that the cone of depression due to pumping of District wells is localized, and does not extend east past Well No. 24. Because the water levels in the consolidated rock in the well field are well below the channel of Mammoth Creek, there is no apparent impact of District pumping on streamflow. This was confirmed by the Mammoth Creek streamflow measurements upstream and downstream of the well field. Water levels in the most westerly deep wells (No. 5A, 16, 18, and 20) that are closest to the Valentine Reserve were relatively stable or rose during the 1998 water year. There has been no impact on flow of the springs at the Valentine Reserve or on the flow of the Hot Creek headsprings due to pumping of the District supply wells.

REFERENCES

Kenneth D. Schmidt and Associates, "Results of Summer 1993 Aquifer Test, Mammoth County Water District Well No. 15", November 9, 1993, 22 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth County Water District Groundwater Monitoring Program for October 1992-September 1993", December 13, 1993, 30 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1993-September 1994, December 14, 1994, 34 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1994-September 1995, December 11, 1995, 41 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1995-September 1996, December 12, 1996, 43 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1996-September 1997, December 8, 1997, 45 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1997-September 1998, December 9, 1998, 43 p.

APPENDIX A
PUMPAGE AND WATER-LEVEL DATA
FOR DISTRICT SUPPLY WELLS

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 1 PUMPAGE
(MILLION GALLONS)**

DAY	1998		1999											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.688	0.272	0.200	
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.558	0.182	0.058	
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.234	0.304	0.000	
4	0.000	0.003	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.502	0.270	0.000	
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.578	0.186	0.000	
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.384	0.138	0.000	
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.276	0.042	0.000	
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.402	0.000	0.000	
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.486	0.000	0.000	
10	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.524	0.000	0.007	
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.496	0.000	0.000	
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.330	0.000	0.000	
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.384	0.240	0.000	
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.144	0.083	0.310	0.414	0.000	0.000	
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.128	0.000	0.406	0.000	0.000	
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.292	0.332	0.000	0.000	
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.526	0.340	0.000	0.000	
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.197	0.346	0.288	0.000	0.000	
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.055	0.185	0.402	0.170	0.000	0.000	
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.488	0.306	0.000	0.000	
21	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.000	0.186	0.400	0.244	0.000	0.000	
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.177	0.356	0.344	0.000	0.000	
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147	0.356	0.210	0.000	0.000	
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.161	0.356	0.204	0.000	0.000	
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.244	0.356	0.276	0.000	0.000	
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.323	0.356	0.164	0.000	0.000	
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.133	0.578	0.078	0.000	0.000	
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.222	0.452	0.120	0.000	0.000	
29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.383	0.390	0.172	0.000	0.000	
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.745	0.960	0.174	0.000	0.000	
31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350	0.234	0.000	0.000	
TOTAL	0.000	0.004	0.000	0.000	0.005	0.000	0.064	0.263	3.787	12.496	6.110	0.265	0.000	
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.008	0.126	0.403	0.197	0.009	0.000	
MAX	0.000	0.003	0.000	0.000	0.005	0.000	0.064	0.144	0.745	0.688	0.414	0.200	0.000	
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
AC-FT	0.000	0.012	0.000	0.000	0.015	0.000	0.196	0.807	11.617	38.331	18.742	0.813	0.000	
TOTAL AC-FT OCT THRU SEP:			70.534	TOTAL AC-FT JAN THRU DEC:			70.521							

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 6 PUMPAGE
(MILLION GALLONS)**

DAY	1988			1899			MAR	APR	MAY	JUN	JUL	AUG	SEP	
	OCT	NOV	DEC	JAN	FEB									
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
MAX	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
AC-FT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
TOTAL AC-FT OCT THRU SEP:	0.000												TOTAL AC-FT JAN THRU DEC:	0.000

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 10 PUMPAGE
(MILLION GALLONS)**

DAY	1988		1989		FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
	OCT	NOV	DEC	JAN									
1	0.064	0.070	0.000	0.578	0.000	0.000	0.064	0.000	0.384	0.512	0.000	0.000	
2	0.128	0.056	0.000	0.640	0.000	0.000	0.000	0.512	0.128	0.512	0.000	0.000	
3	0.000	0.192	0.000	0.448	0.000	0.000	0.000	0.192	0.000	0.576	0.000	0.000	
4	0.000	0.000	0.000	0.576	0.000	0.000	0.000	0.000	0.000	0.576	0.000	0.000	
5	0.000	0.000	0.000	0.192	0.000	0.000	0.000	0.000	0.000	0.576	0.000	0.000	
6	0.000	0.064	0.000	0.064	0.128	0.000	0.000	0.000	0.000	0.320	0.000	0.000	
7	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.384	0.000	0.000	
8	0.000	0.064	0.000	0.512	0.000	0.000	0.000	0.000	0.256	0.000	0.000	0.000	
9	0.000	0.064	0.000	0.576	0.000	0.000	0.000	0.000	0.512	0.320	0.000	0.000	
10	0.000	0.064	0.000	0.064	0.000	0.000	0.000	0.000	0.512	0.320	0.000	0.000	
11	0.000	0.064	0.000	0.064	0.000	0.000	0.000	0.000	0.448	0.192	0.000	0.000	
12	0.320	0.064	0.064	0.064	0.000	0.000	0.000	0.000	0.576	0.576	0.000	0.000	
13	0.064	0.000	0.064	0.000	0.192	0.000	0.000	0.000	0.576	0.256	0.000	0.000	
14	0.064	0.000	0.192	0.064	0.000	0.000	0.000	0.000	0.576	0.448	0.000	0.000	
15	0.128	0.000	0.064	0.448	0.000	0.000	0.000	0.000	0.512	0.640	0.000	0.000	
16	0.064	0.128	0.000	0.128	0.000	0.000	0.000	0.000	0.448	0.256	0.000	0.000	
17	0.128	0.000	0.128	0.256	0.000	0.000	0.000	0.000	0.448	0.448	0.000	0.000	
18	0.128	0.000	0.128	0.256	0.000	0.000	0.000	0.128	0.448	0.576	0.000	0.000	
19	0.064	0.000	0.064	0.064	0.000	0.000	0.000	0.000	0.448	0.576	0.000	0.000	
20	0.064	0.000	0.128	0.000	0.000	0.000	0.060	0.000	0.640	0.448	0.000	0.000	
21	0.128	0.128	0.512	0.064	0.000	0.000	0.000	0.000	0.576	0.448	0.000	0.000	
22	0.064	0.136	0.128	0.000	0.000	0.000	0.000	0.000	0.448	0.448	0.000	0.000	
23	0.192	0.056	0.000	0.128	0.000	0.000	0.000	0.000	0.512	0.000	0.000	0.000	
24	0.128	0.192	0.256	0.320	0.000	0.000	0.000	0.000	0.448	0.000	0.000	0.000	
25	0.064	0.128	0.000	0.000	0.000	0.000	0.000	0.000	0.512	0.000	0.000	0.000	
26	0.000	0.128	0.576	0.000	0.000	0.000	0.000	0.256	0.512	0.000	0.000	0.000	
27	0.128	0.128	0.576	0.000	0.000	0.000	0.064	0.128	0.256	0.128	0.000	0.000	
28	0.128	0.320	0.512	0.000	0.000	0.000	0.320	0.000	0.512	0.000	0.000	0.000	
29	0.064	0.128	0.576	0.000	0.000	0.000	0.064	0.384	0.448	0.000	0.000	0.000	
30	0.128	0.000	0.576	0.192	0.000	0.000	0.000	0.640	0.576	0.000	0.000	0.000	
31	0.064	0.000	0.640	0.064	0.000	0.000	0.000	0.640	0.512	0.000	0.000	0.000	
TOTAL	2.304	2.240	5.056	5.632	0.640	0.064	0.572	3.392	11.712	9.472	0.000	0.064	
MEAN	0.074	0.075	0.163	0.182	0.023	0.002	0.019	0.109	0.390	0.306	0.000	0.002	
MAX	0.320	0.320	0.640	0.640	0.256	0.064	0.320	0.640	0.640	0.640	0.000	0.064	
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
AC-FT	7.067	6.871	15.509	17.276	1.963	0.196	1.755	10.405	35.926	29.055	0.000	0.196	
TOTAL AC-FT OCT THRU SEP:	126.221											TOTAL AC-FT JAN THRU DEC:	96.773

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 15 PUMPAGE
(MILLION GALLONS)**

DAY	1998		1999		MAY	JUN	JUL	AUG	SEP
	OCT	NOV	DEC	JAN					
1	0.112	0.144	0.000	0.592	0.000	0.208	0.848	1.264	0.880
2	0.400	0.080	0.000	0.624	0.016	0.352	1.360	1.040	0.976
3	0.624	0.160	0.000	0.592	0.000	0.048	1.200	1.088	1.008
4	1.120	0.000	0.000	0.208	0.000	0.000	1.184	0.928	1.200
5	1.136	0.000	0.000	0.240	0.000	0.000	1.104	1.104	1.216
6	0.176	0.128	0.000	0.080	0.144	0.000	1.120	1.056	1.152
7	0.224	0.144	0.000	0.368	0.000	0.000	1.056	1.344	0.944
8	0.256	0.080	0.000	0.368	0.080	0.000	1.248	1.328	0.928
9	0.192	0.144	0.000	0.368	0.000	0.000	1.200	1.008	0.960
10	0.240	0.128	0.000	0.128	0.000	0.000	1.344	1.008	0.896
11	0.808	0.080	0.000	0.000	0.000	0.000	0.816	0.800	1.120
12	0.624	0.144	0.080	0.096	0.000	0.400	0.720	0.448	1.184
13	0.128	0.000	0.080	0.000	0.000	0.000	0.608	0.672	0.912
14	0.320	0.000	0.000	0.080	0.000	0.032	0.672	1.152	0.912
15	0.240	0.000	0.000	0.144	0.240	0.000	0.624	1.280	0.816
16	0.176	0.000	0.000	0.240	0.000	0.000	0.560	0.752	0.912
17	0.096	0.000	0.000	0.272	0.000	0.000	0.736	1.328	0.912
18	0.096	0.000	0.000	0.090	0.000	0.096	0.496	1.040	0.800
19	0.096	0.016	0.000	0.096	0.000	0.000	0.736	1.040	0.800
20	0.208	0.080	0.496	0.096	0.000	0.000	0.768	1.024	0.768
21	0.080	0.080	0.496	0.000	0.000	0.064	0.864	1.008	0.752
22	0.096	0.080	0.128	0.096	0.000	0.000	0.864	1.024	0.736
23	0.224	0.096	0.112	0.000	0.000	0.000	0.688	1.222	1.152
24	0.160	0.144	0.432	0.000	0.000	0.000	0.688	1.222	1.152
25	0.000	0.112	0.000	0.032	0.000	0.000	0.752	1.222	0.944
26	0.160	0.096	0.624	0.000	0.000	0.000	0.704	1.222	1.040
27	0.192	0.208	0.624	0.000	0.000	0.000	0.704	1.222	0.992
28	0.176	0.400	0.640	0.000	0.000	0.048	1.296	0.992	0.800
29	0.096	0.080	0.544	0.000	0.000	0.128	0.664	0.800	0.912
30	0.128	0.000	0.448	0.000	0.000	0.000	0.664	0.800	0.752
31	0.160	0.000	0.560	0.000	0.000	0.000	1.110	1.098	0.800
TOTAL	8.544	2.624	5.296	4.448	0.688	2.736	17.312	31.952	26.176
MEAN	0.276	0.087	0.171	0.143	0.023	0.088	0.577	1.031	0.873
MAX	1.136	0.400	0.656	0.624	0.400	0.576	1.514	1.360	1.344
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.448	0.800
AC-FT	26.209	8.049	16.245	13.644	2.110	8.393	53.104	98.012	80.294
TOTAL AC-FT OCT THRU SEP:			408.098		TOTAL AC-FT JAN THRU DEC:		357.595		

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 16 PUMPAGE
(MILLION GALLONS)**

DAY	1998		1999											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	0.176	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.316	0.000	0.000	0.212		
2	0.208	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.316	0.000	0.000	0.580		
3	0.196	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.212	0.000	0.000	0.488		
4	0.232	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.772		
5	0.188	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.000	0.000	0.760		
6	0.212	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.168	0.000	0.000	0.600		
7	0.228	0.000	0.092	0.024	0.000	0.000	0.000	0.000	0.280	0.000	0.000	0.296		
8	0.188	0.000	0.120	0.000	0.000	0.000	0.000	0.000	0.288	0.000	0.000	0.672		
9	0.376	0.000	0.060	0.000	0.000	0.000	0.000	0.000	0.268	0.000	0.000	0.544		
10	0.256	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.208	0.000	0.000	0.236		
11	0.376	0.000	0.076	0.000	0.000	0.000	0.000	0.036	0.232	0.000	0.000	0.748		
12	0.228	0.024	0.136	0.000	0.000	0.000	0.000	0.000	0.204	0.000	0.000	0.752		
13	0.160	0.036	0.148	0.100	0.000	0.000	0.000	0.000	0.308	0.000	0.000	0.752		
14	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.284	0.000	0.000	0.644		
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.292	0.068	0.000	0.500		
16	0.000	0.000	0.380	0.000	0.000	0.000	0.000	0.304	0.000	0.000	0.000	0.228		
17	0.084	0.000	0.000	0.000	0.000	0.000	0.000	0.320	0.000	0.000	0.000	0.212		
18	0.164	0.000	0.204	0.000	0.000	0.000	0.000	0.348	0.000	0.000	0.608	0.000		
19	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.392	0.000	0.000	0.752	0.004		
20	0.024	0.000	0.000	0.108	0.000	0.000	0.000	0.332	0.000	0.000	0.740	0.420		
21	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.388	0.000	0.000	0.768	0.308		
22	0.180	0.000	0.000	0.008	0.000	0.000	0.008	0.388	0.000	0.000	0.756	0.000		
23	0.108	0.324	0.016	0.000	0.000	0.000	0.048	0.380	0.000	0.000	0.752	0.000		
24	0.012	0.000	0.032	0.000	0.000	0.000	0.048	0.396	0.000	0.000	0.760	0.000		
25	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.000	0.000	0.000	0.752	0.156		
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.228	0.308		
27	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.204	0.000	0.000	0.000	0.288		
28	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.336	0.000	0.000	0.000	0.208		
29	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.304	0.000	0.000	0.000	0.264		
30	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.328	0.000	0.000	0.572	0.236		
31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.316	0.000	0.000	0.752	0.000		
TOTAL	3.736	0.516	1.280	0.240	0.000	0.000	0.180	5.212	3.212	0.000	7.440	11.188		
MEAN	0.121	0.017	0.041	0.008	0.000	0.000	0.006	0.168	0.107	0.000	0.240	0.373		
MAX	0.376	0.324	0.380	0.108	0.000	0.000	0.060	0.392	0.316	0.000	0.768	0.772		
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
AC-FT	11.460	1.583	3.926	0.736	0.000	0.000	0.552	15.988	9.853	0.000	22.822	34.319		
TOTAL AC-FT OCT THRU SEP:			101.239	TOTAL AC-FT JAN THRU DEC:			84.270							

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 17 PUMPAGE
(MILLION GALLONS)**

DAY	1998		1999		FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	OCT	NOV	DEC	JAN								
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.344	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.456	0.016
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.496	0.728
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.432	0.888
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.504	0.888
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.496	0.904
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.440	0.816
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.552	0.744
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.264	0.660
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.832
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.904
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.888
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.752
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.392	0.760
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.344	0.280
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.704	0.000
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.240	0.000
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.224	0.000
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.496	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.176	0.000
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.816	0.000
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.888	0.000
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.712	0.000
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.624	0.000
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.000
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.672	0.000
29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.888	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.424	0.000
31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.528	0.000	0.000
TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.512	9.480	10.072
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.081	0.306	0.336
MAX	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.888	0.816	0.904
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AC-FT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.706	29.080	30.896
TOTAL AC-FT OCT THRU SEP.	67.681											
TOTAL AC-FT JAN THRU DEC.	67.681											

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 18 PUMPAGE
(MILLION GALLONS)**

DAY	1988												TOTAL AC-FT OCT THRU SEP:	
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	0.000	0.000	0.000	0.117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.098	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	0.000	0.000	0.000	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.171
12	0.000	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.120	0.180	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	0.000	0.100	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.494
17	0.000	0.056	0.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.471
18	0.000	0.000	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19	0.000	0.082	0.075	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.116	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21	0.000	0.000	0.074	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	0.000	0.000	0.017	0.133	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24	0.000	0.000	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27	0.000	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28	0.000	0.000	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29	0.000	0.000	0.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.155	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.000	0.000	0.071	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	0.288	1.087	0.943	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.136
MEAN	0.000	0.010	0.035	0.030	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038
MAX	0.000	0.100	0.120	0.180	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.494
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AC-FT	0.000	0.887	3.334	2.893	0.178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.485
TOTAL AC-FT OCT THRU SEP:													16.107	
TOTAL AC-FT JAN THRU DEC:	20.328													

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 20 PUMPAGE
(MILLION GALLONS)**

DAY	1988												1989											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.000	0.000	0.000	0.000	0.000	0.152	0.264	0.160	0.144	0.648	1.008	0.728												
2	0.000	0.000	0.000	0.000	0.000	0.128	0.144	0.120	0.072	0.984	0.920	0.776												
3	0.000	0.000	0.000	0.000	0.000	0.120	0.136	0.000	0.056	0.848	0.888	0.128												
4	0.000	0.000	0.000	0.064	0.144	0.264	0.144	0.232	0.152	0.936	0.736	0.016												
5	0.000	0.000	0.000	0.000	0.000	0.136	0.152	0.320	0.136	1.248	0.824	0.000												
6	0.000	0.016	0.000	0.000	0.152	0.396	0.128	0.352	0.240	0.648	0.760	0.000												
7	0.000	0.000	0.000	0.000	0.128	0.280	0.280	0.120	0.408	0.728	1.192	0.032												
8	0.000	0.000	0.000	0.000	0.136	0.064	0.152	0.064	0.352	1.080	1.048	0.000												
9	0.000	0.000	0.000	0.000	0.128	0.136	0.272	0.104	0.736	1.112	0.880	0.000												
10	0.000	0.000	0.000	0.000	0.128	0.136	0.144	0.000	0.664	1.288	0.864	0.000												
11	0.000	0.000	0.000	0.000	0.128	0.120	0.152	0.000	0.424	0.632	0.000	0.000												
12	0.000	0.000	0.000	0.000	0.152	0.296	0.136	0.000	0.000	0.640	0.000	0.000												
13	0.000	0.000	0.000	0.000	0.304	0.288	0.128	0.136	0.000	0.684	0.488	0.000												
14	0.000	0.000	0.000	0.000	0.360	0.280	0.000	0.000	0.000	0.344	0.944	0.000												
15	0.000	0.000	0.000	0.000	0.152	0.128	0.128	0.000	0.376	0.592	0.860	0.000												
16	0.000	0.000	0.000	0.000	0.144	0.136	0.128	0.000	0.456	0.368	0.912	0.016												
17	0.000	0.000	0.000	0.000	0.048	0.128	0.136	0.000	0.568	0.792	0.200	0.000												
18	0.000	0.000	0.000	0.000	0.136	0.144	0.152	0.456	0.392	0.880	0.640	0.000												
19	0.000	0.000	0.000	0.000	0.288	0.136	0.128	0.496	0.800	0.536	0.256	0.000												
20	0.000	0.000	0.000	0.004	0.312	0.320	0.000	0.504	0.280	0.528	0.600	0.000												
21	0.000	0.000	0.000	0.000	0.296	0.272	0.080	0.640	1.256	0.408	0.016	0.000												
22	0.000	0.000	0.000	0.100	0.144	0.136	0.000	0.440	0.624	0.571	0.008	0.000												
23	0.000	0.000	0.000	0.128	0.144	0.144	0.208	0.424	0.504	0.571	0.000	0.000												
24	0.000	0.000	0.000	0.132	0.128	0.136	0.200	0.296	0.608	0.571	0.000	0.000												
25	0.000	0.000	0.000	0.172	0.280	0.120	0.216	0.168	0.624	0.571	0.624	0.000												
26	0.000	0.000	0.000	0.000	0.144	0.152	0.000	0.168	0.816	0.572	0.680	0.000												
27	0.000	0.000	0.000	0.124	0.312	0.280	0.160	0.344	0.608	1.088	0.696	0.000												
28	0.000	0.000	0.000	0.048	0.288	0.272	0.128	0.360	0.620	1.008	0.768	0.000												
29	0.000	0.000	0.000	0.120	0.000	0.200	0.136	0.152	0.316	0.488	0.920	0.000												
30	0.000	0.000	0.000	0.272	0.000	0.136	0.272	0.272	0.928	0.952	0.944	0.000												
31	0.000	0.000	0.000	0.000	0.144	0.144	0.000	0.152	0.976	0.672	0.000	0.000												
TOTAL	0.000	0.016	0.000	1.100	4.368	5.600	4.424	6.480	12.960	23.272	19.168	1.696												
MEAN	0.000	0.001	0.000	0.035	0.156	0.181	0.147	0.209	0.432	0.751	0.618	0.057												
MAX	0.000	0.016	0.000	0.272	0.360	0.336	0.280	0.640	1.256	1.288	1.192	0.776												
MIN	0.000	0.000	0.000	0.000	0.000	0.064	0.000	0.000	0.000	0.344	0.000	0.000												
AC-FT	0.000	0.048	0.000	3.374	13.399	17.178	13.571	19.877	39.755	71.387	58.798	5.202												
TOTAL AC-FT OCT THRU SEP:	242,589												242,540											

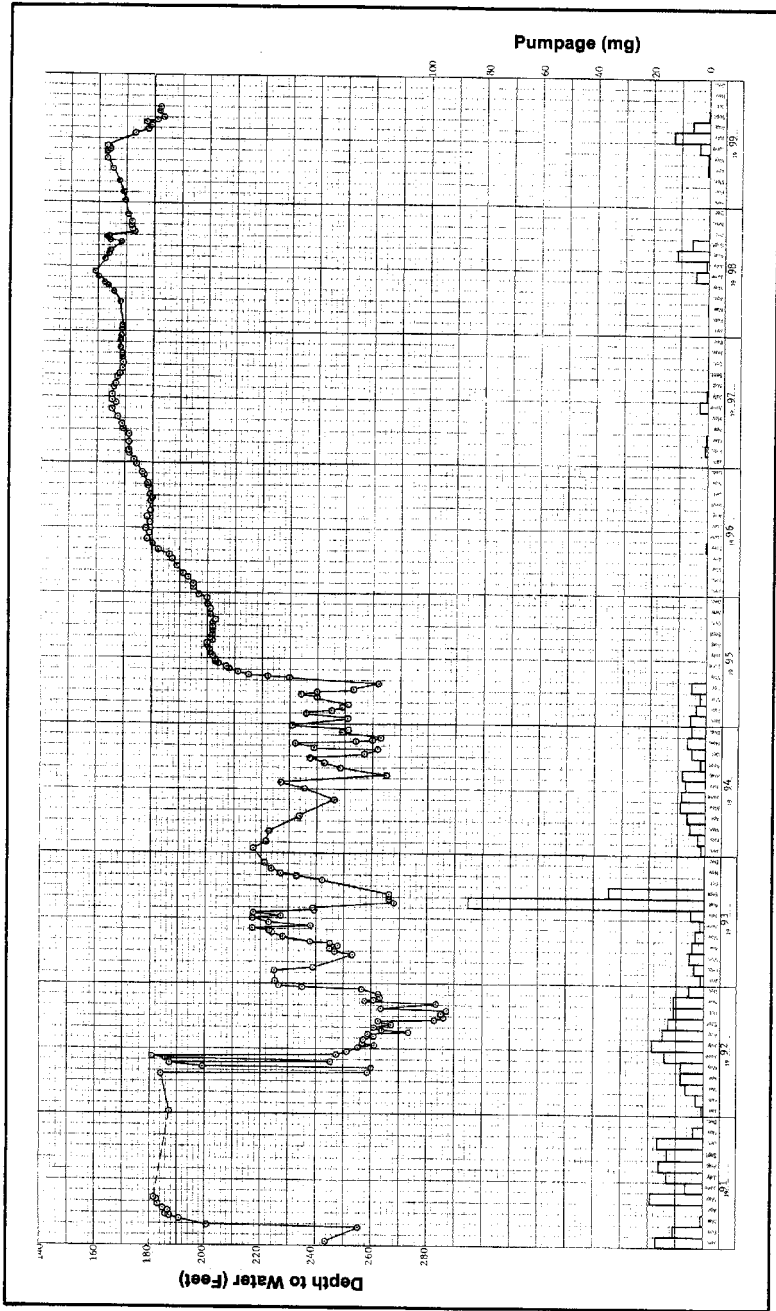
**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL WATER LEVEL DATA
OCTOBER 1998 - SEPTEMBER 1999**

WELL NO. 1				WELL NO. 6			
Date	Static	Date	Pumping	Date	Static	Date	Pumping
10/07/98	-173.21	05/05/99	-194.47	10/7/98	-7.36		
10/15/98	-172.79	06/03/99	-191.90	10/15/98	-7.89		
10/22/98	-172.63	06/21/99	-191.33	10/22/98	-7.72		
10/29/98	-172.11	07/01/99	-197.87	10/29/98	-7.19		
11/06/98	-171.96	07/09/99	-200.13	11/6/98	-7.02		
12/01/98	-170.58	08/23/99	-211.42	12/1/98	-5.78		
01/05/99	-169.53			1/5/99	-2.09		
02/02/99	-168.78			2/2/99	-4.91		
03/02/99	-167.46			3/2/99	-5.25		
04/02/99	-165.12			4/2/99	-1.23		
05/12/99	-163.21			5/5/99	-0.89		
05/19/99	-163.19			5/12/99	-0.53		
05/27/99	-162.96			5/19/99	-1.75		
06/01/99	-164.22			5/27/99	-1.22		
06/08/99	-163.27			6/1/99	-1.22		
07/13/99	-173.53			6/8/99	-2.09		
07/26/99	-177.83			6/21/99	-0.89		
08/04/99	-178.88			7/1/99	-2.12		
08/12/99	-176.89			7/9/99	-1.77		
08/19/99	-181.02			7/13/99	-1.94		
09/01/99	-183.61			7/26/99	-1.42		
09/07/99	-181.48			8/4/99	-1.77		
09/14/99	-181.84			8/12/99	-2.12		
09/20/99	-181.26			8/19/99	-1.94		
09/28/99	-181.96			8/23/99	-2.12		
				9/1/99	-8.01		
				9/7/99	-8		
				9/14/99	-5.6		
				9/20/99	n/a		
				9/28/99	0		
Mean	-173.83		-197.85		-3.39		#DIV/0!
Max	-183.61		-211.42		-8.01		0.00
Min	-162.96		-191.33		0.00		0.00
Historical							
Mean	-197.70		-252.81		-45.85		-147.24
Max	-268.10		-295.00		-160.00		-200.00
Min	-149.75		-191.33		0.00		-77.43

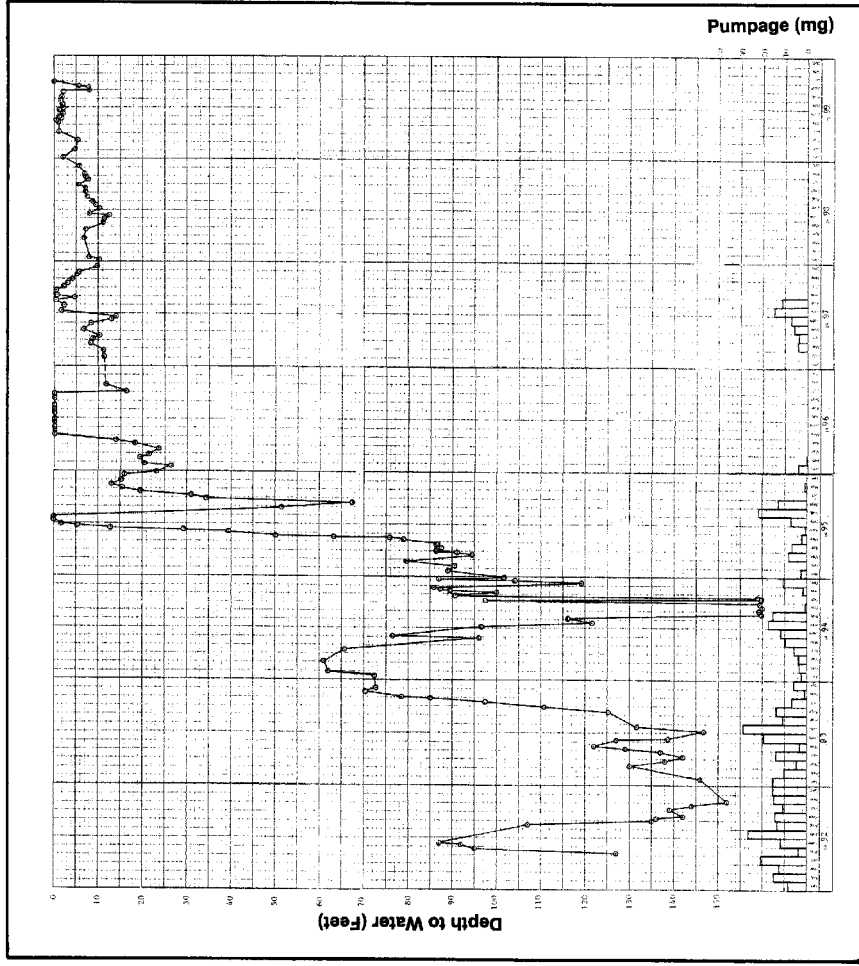
prodwell

APPENDIX B

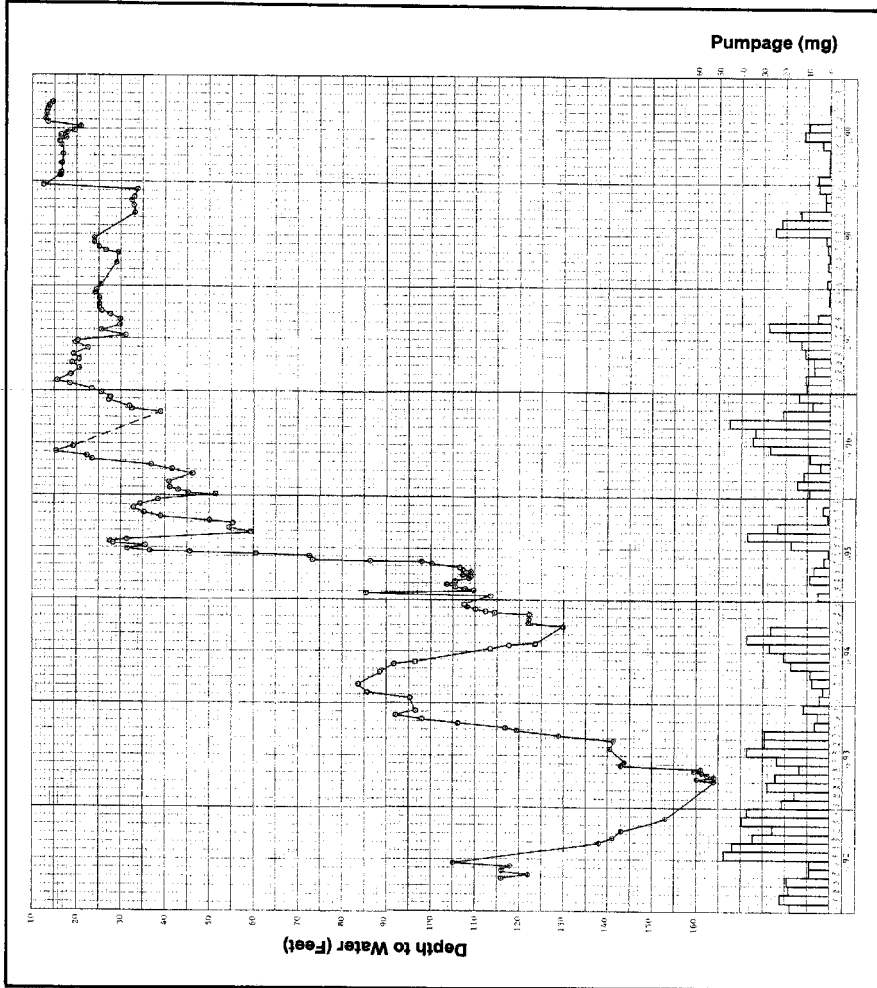
PUMPAGE AND WATER-LEVEL HYDROGRAPHS
FOR EARLIER SUPPLY WELLS



WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 1



WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 6



WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 10

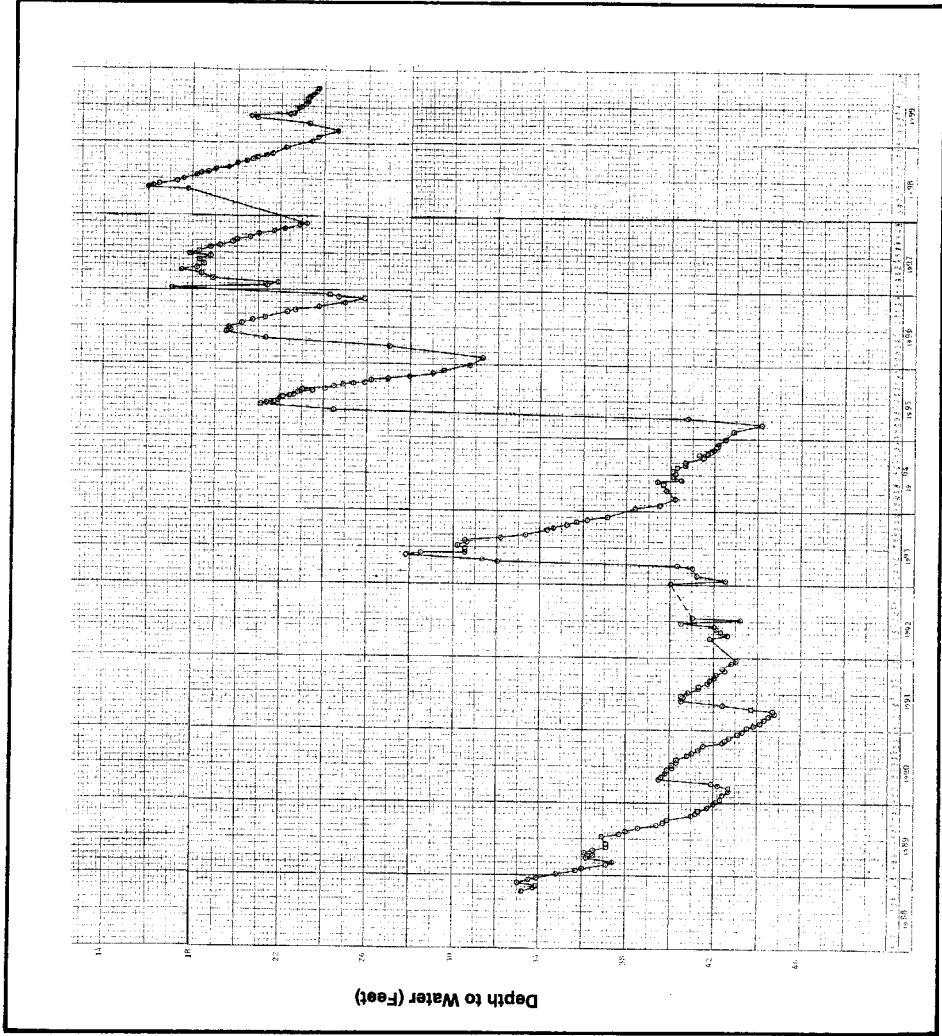
APPENDIX C
WATER-LEVEL MEASUREMENTS
FOR MONITOR WELLS

MAMMOTH COMMUNITY WATER DISTRICT
MONITOR WELL LEVEL DATA (OCT/1998-SEP/1999)

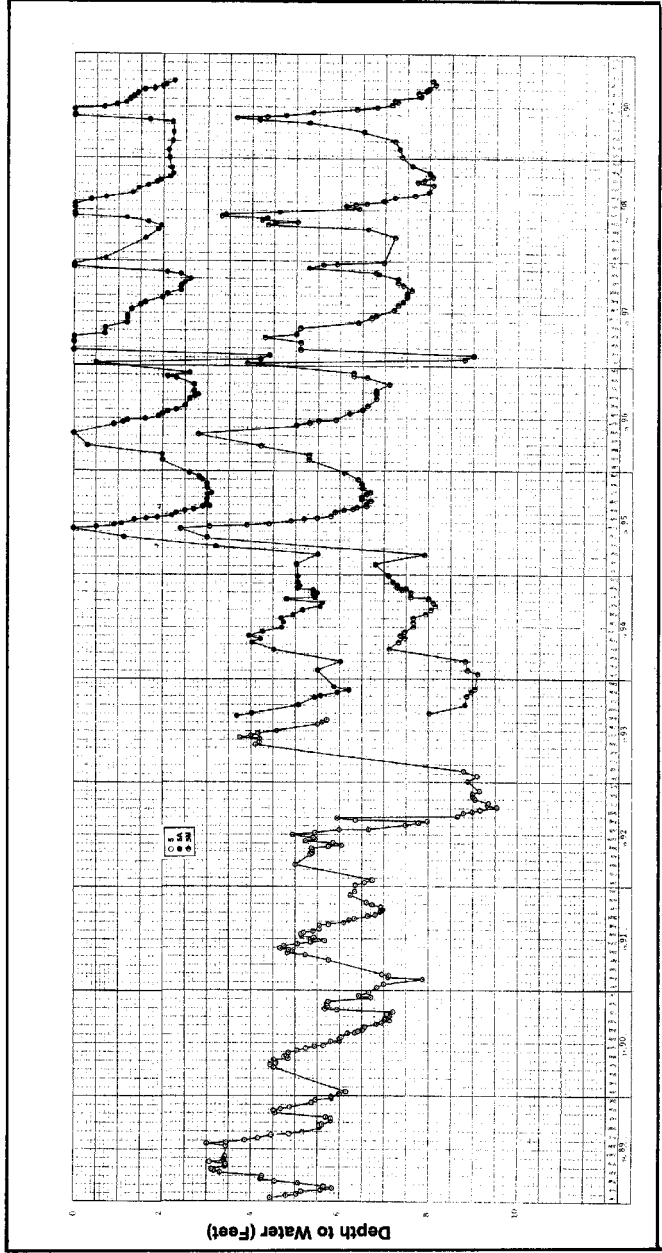
Date	Well 4M	Well 5A	Well 5M	Well 7	Well 10M	Well 11	Well 11M	Well 12M	Well 14M	Well 19	Well 21	Well 22	Well 23	Well 24
10/07/98	-20.67	-1.87	-7.71	-242.22	-16.26	0.00	-13.06	-10.47	-239.17		-230.98	-80.33	-13.81	-351.31
10/15/98	-20.88	-1.93	-7.86	-242.02	-15.92	0.00	-12.94	-9.92				-80.31	-14.17	
10/22/98	-21.03	-2.03	-8.06	-242.19	-15.59	0.00	-16.51	-10.06				-80.36	-14.32	
10/29/98	-21.34	-2.14	-7.97	-241.89	-15.43	0.00	-17.09	-10.37				-80.29	-14.24	
11/06/98	-21.58	-2.19	-7.98	-241.98	-15.38	0.00	-17.52	-10.64	-239.27		-231.04	-80.29	-14.62	-351.04
12/07/98	-22.23	-2.18	-7.62	-242.37	-15.64	0.00	-19.08	-12.47	-238.86		-231.23	-80.33	-14.85	-350.87
01/05/99	-23.36	-2.13	-7.37	-243.36	-21.37	0.00	-20.47	-15.69				-80.29	-15.58	
02/01/99	-23.69	-2.11	-7.33	-244.13	-17.76	0.00	-21.23	-16.88				-80.28	-14.26	
03/02/99	-24.58	-2.21	-7.19	-244.62	-16.84	0.00	-21.56	-16.88	-252.76		-231.59	-80.11	-14.58	
04/02/99	-23.27	-2.13	-6.49		-16.08	0.00	-21.72	-16.84				-80.05	-13.52	
05/05/99	-20.93	-2.01	-5.27	-247.04	-14.83	0.00	-19.59	-14.03				-79.49	-11.84	
05/12/99	-20.59	-1.89	-4.66	-247.08	-14.12	0.00	-18.49	-13.11				-78.89	-11.96	
05/19/99	-22.44	0.00	-3.64	-247.14	-14.06	0.00	-17.76	-12.08				-79.21	-12.07	
05/27/99	-22.56	0.00	-4.33	-247.19	-14.09	0.00	-12.84	-10.21				-79.78	-10.91	
06/01/99	-22.47	0.00	-4.76	-247.19	-16.17	0.00	-11.82	-9.27	-273.68	-351.56	-231.69	-78.58	-10.40	-367.31
06/08/99	-22.46	0.00	-5.36		-15.15	0.00	-13.96	-8.87				-79.34	-11.36	
06/21/99	-22.82	0.00	-6.36	-247.27	-18.36	0.00	-14.97	-10.69				-79.76	-10.56	
07/01/99	-22.89	-0.89	-6.81	-247.29	-18.97	0.00	-16.19	-11.54				-80.21	-11.58	
07/09/99	-23.07	-0.96	-7.17	-247.34	-19.03	0.00	-16.07	-12.22				-80.24	-12.18	
07/13/99	-23.12	-1.16	-7.27	-247.19	-18.89	0.00	-16.54	-12.39	-256.12	-351.06	-231.68	-80.16	-12.29	-365.93
07/26/99	-23.19	-1.26	-7.22	-248.17	-17.09	0.00	-17.54	-14.16	-254.25	-351.75	-231.81	-80.27	-13.28	-366.01
08/04/99	-23.24	-1.32	-7.78	-247.51	-16.44	0.00	-17.03	-13.14	-252.19	-351.56	-232.01	-80.24	-13.66	-366.25
08/12/99	-23.34	-1.43	-7.74	-247.86	-16.39	0.00	-18.57	-13.57				-80.27	-13.59	
08/19/99	-23.34	-1.53	-7.86	-247.72	-16.47	0.00	-19.21	-14.04				-80.28	-14.21	
08/23/99	-23.41	-1.68	-7.92	-247.63	-16.54	0.00	-19.55	-14.47				-80.28	-14.12	
09/01/99	-23.45	-1.81	-7.97	-248.09	-16.73	0.00	-20.11	-15.22	-260.88	-351.56	-231.42	-80.28	-14.15	-366.62
09/07/99	-23.57	-1.98	-8.06	-247.81	-16.98	0.00	-20.47	-15.49				-80.31	-14.51	
09/14/99	-23.62	-2.04	-8.12	-247.81	-17.17	0.00	-20.79	-16.13				-80.31	-14.39	
09/20/99	-23.69	-2.22	-8.08	-247.86	-17.24	0.00	-20.76	-16.31				-80.28	-14.36	
09/28/99	-23.73	-2.23	-8.06	-248.04	-17.42	0.00	-20.82	-16.49				-80.29	-14.06	
Mean	-22.69	-1.50	-7.00	-246.00	-16.61	0.00	-17.81	-13.12	-251.91	-351.50	-231.49	-80.04	-13.31	-360.67
Max	-24.58	-2.23	-8.12	-248.17	-21.37	0.00	-21.72	-16.88	-273.68	-351.75	-232.01	-80.36	-15.58	-367.31
Min	-20.59	0.00	-3.64	-241.89	-14.06	0.00	-11.82	-8.87	-238.86	-351.06	-231.04	-78.58	-10.40	-350.87

APPENDIX D

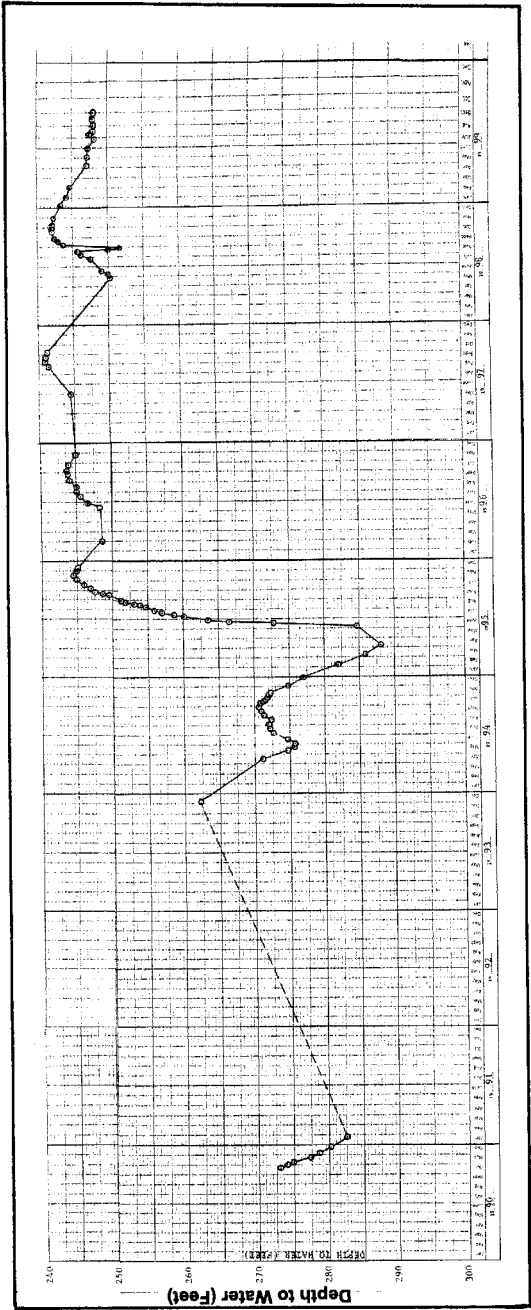
SUPPLEMENTARY WATER-LEVEL
HYDROGRAPHS FOR MONITOR WELLS



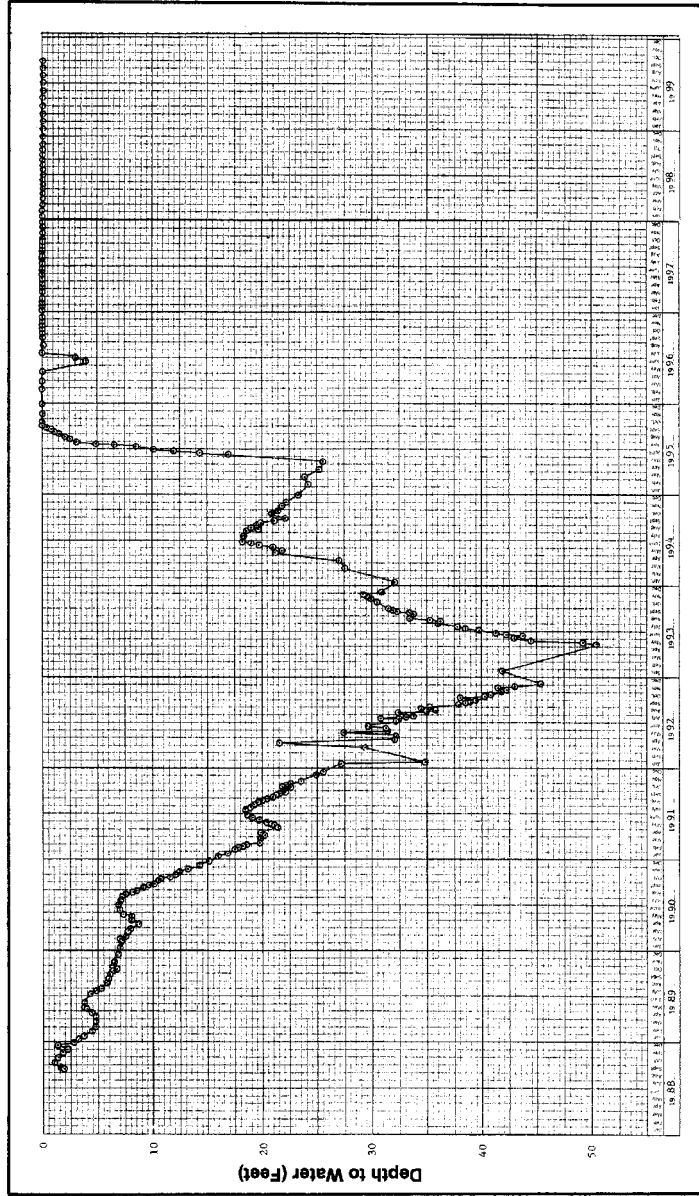
WATER-LEVEL HYDROGRAPH FOR WELL NO. 4M



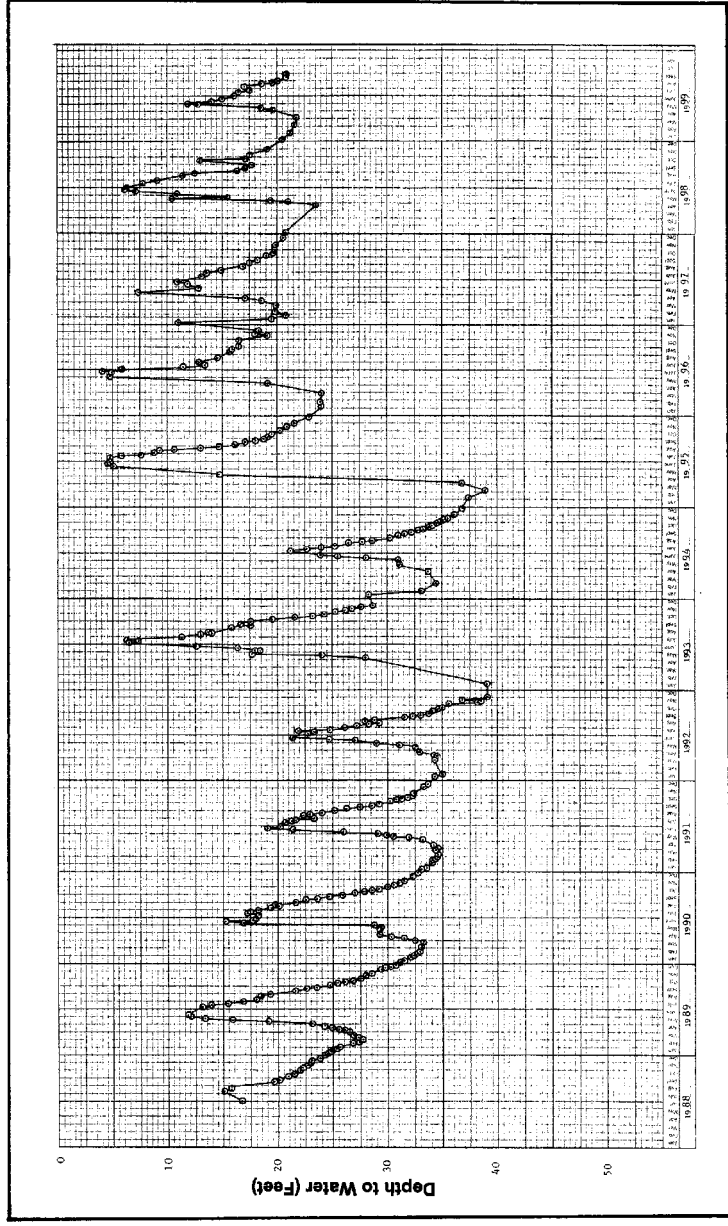
WATER-LEVEL HYDROGRAPH FOR WELL NO. 5, No. 5A, AND NO. 5M



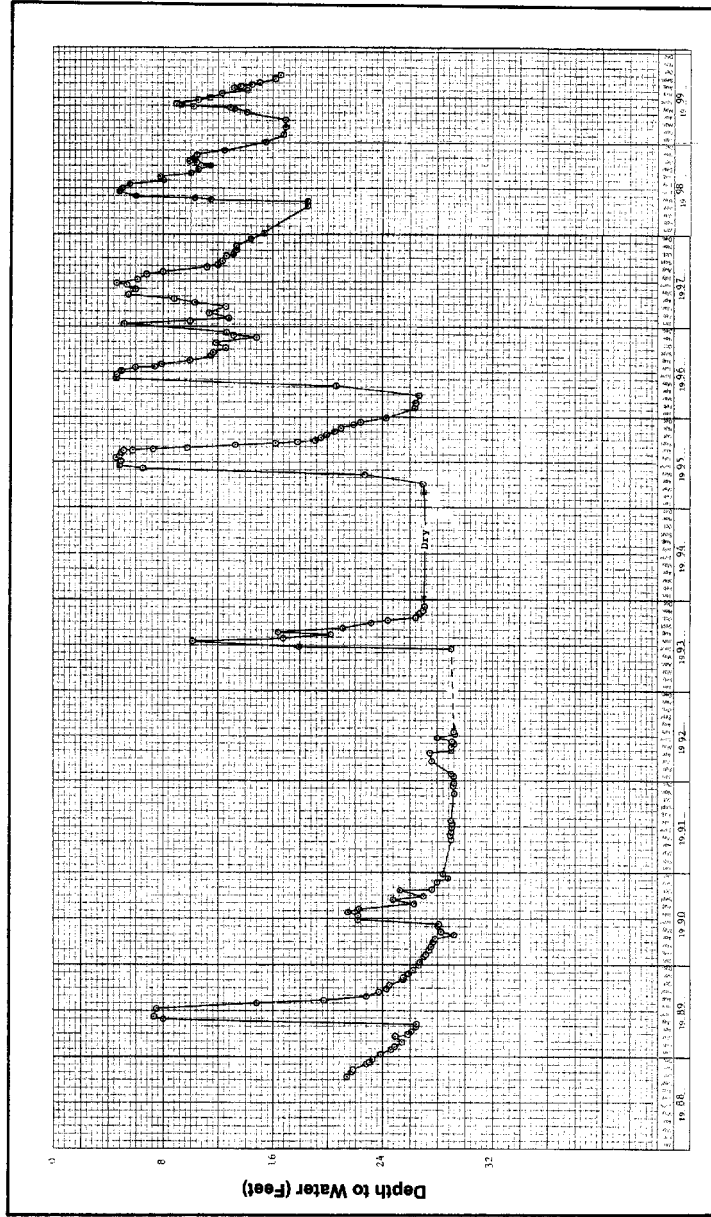
WATER-LEVEL HYDROGRAPH FOR WELL NO. 7



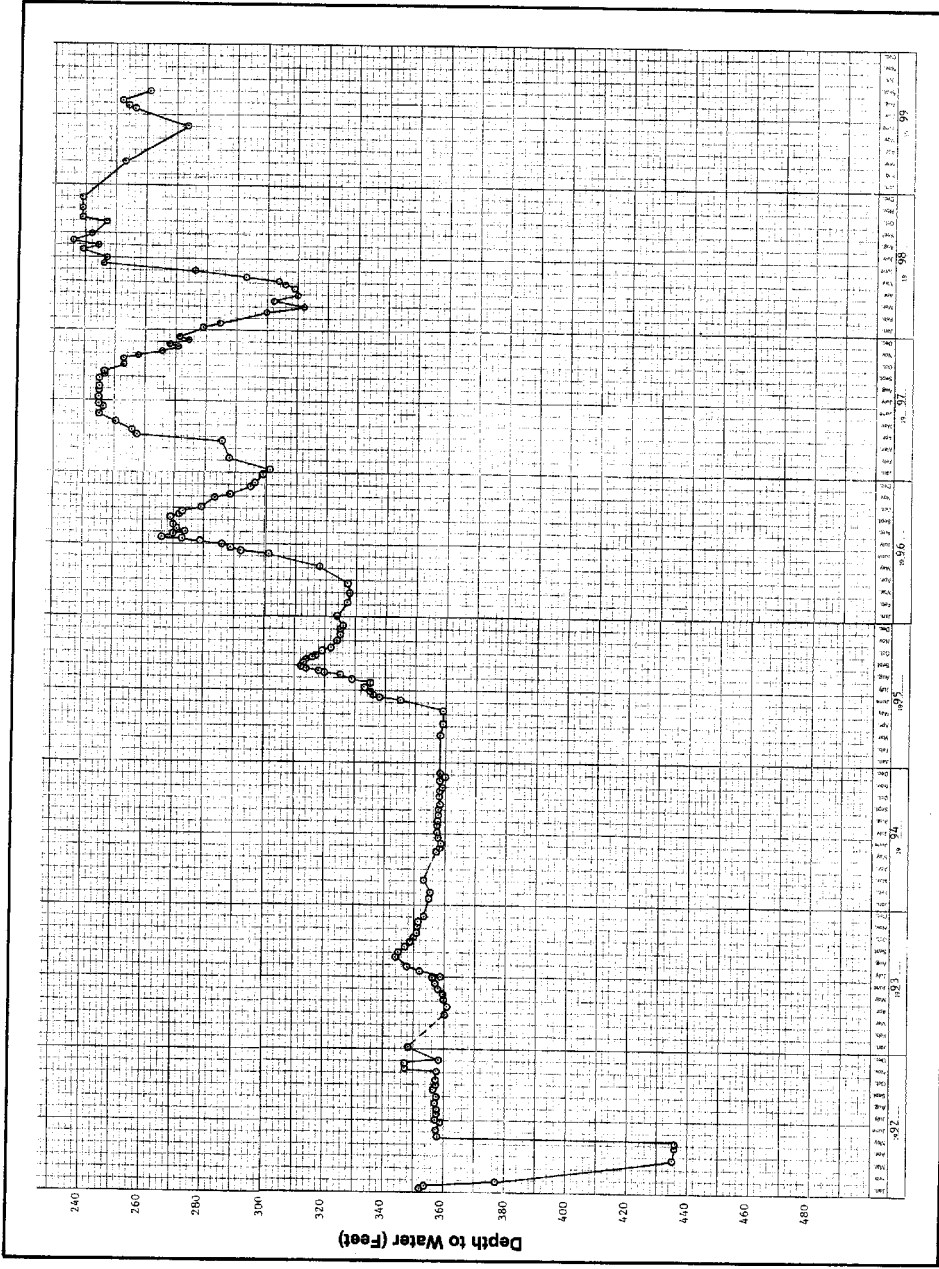
WATER-LEVEL HYDROGRAPH FOR WELL NO. 11



WATER-LEVEL HYDROGRAPH FOR WELL NO. 11M



WATER-LEVEL HYDROGRAPH FOR WELL NO. 12M

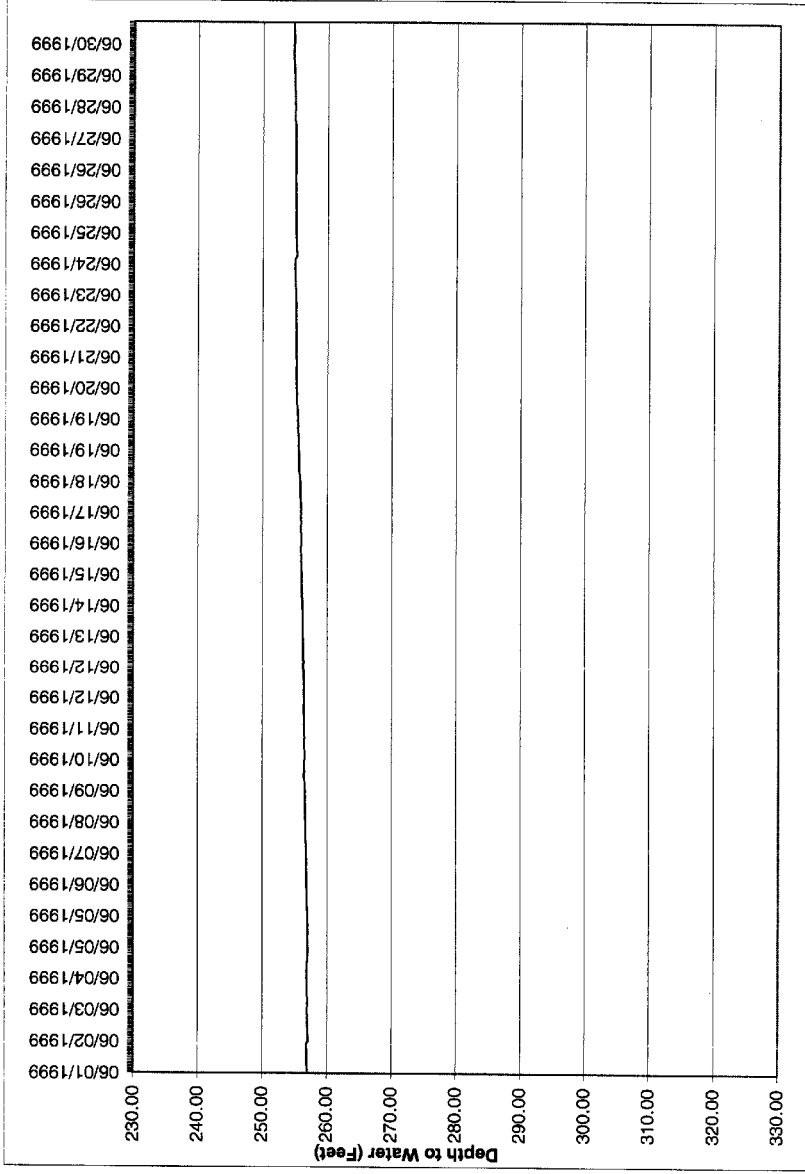


WATER-LEVEL HYDROGRAPH FOR WELL NO. 14M

**Water-Level Hydrographs from Transducer
Measurements for Well No. 14M**

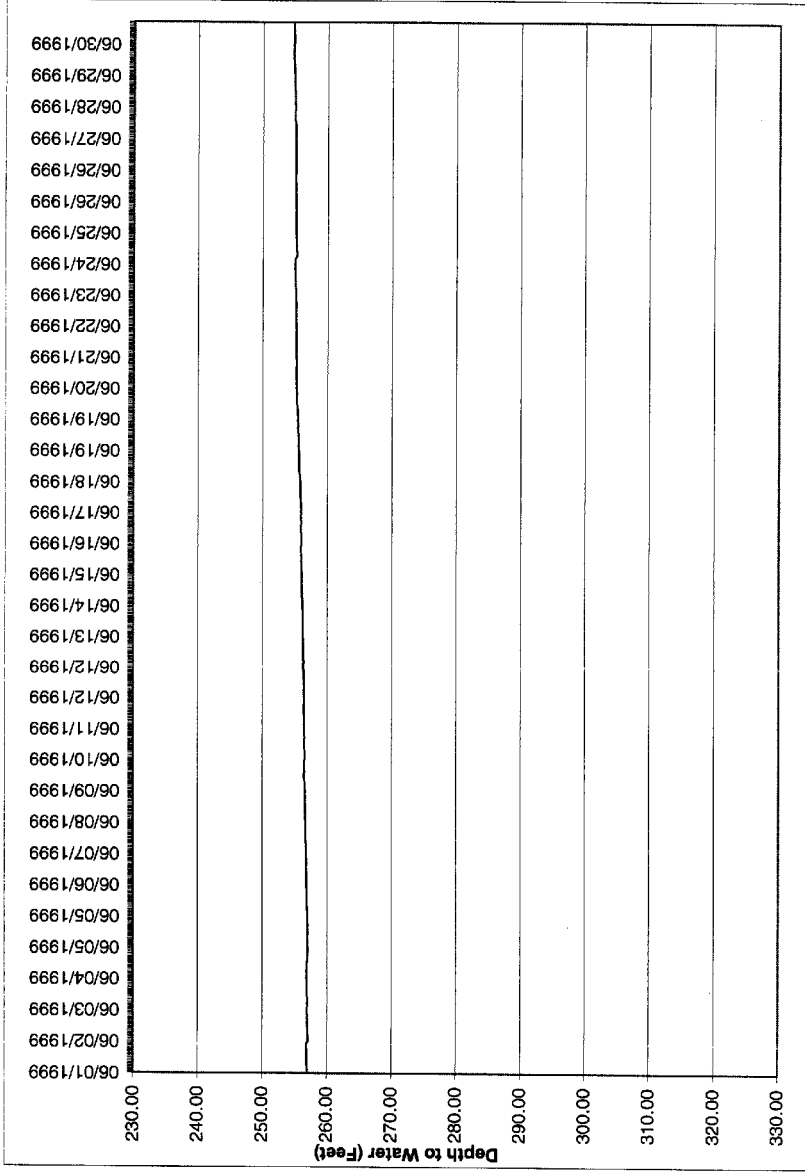
**Note: Solid triangle and adjoining depth to water
on graph are for measurement with an electric sounder.**

Well # 14M



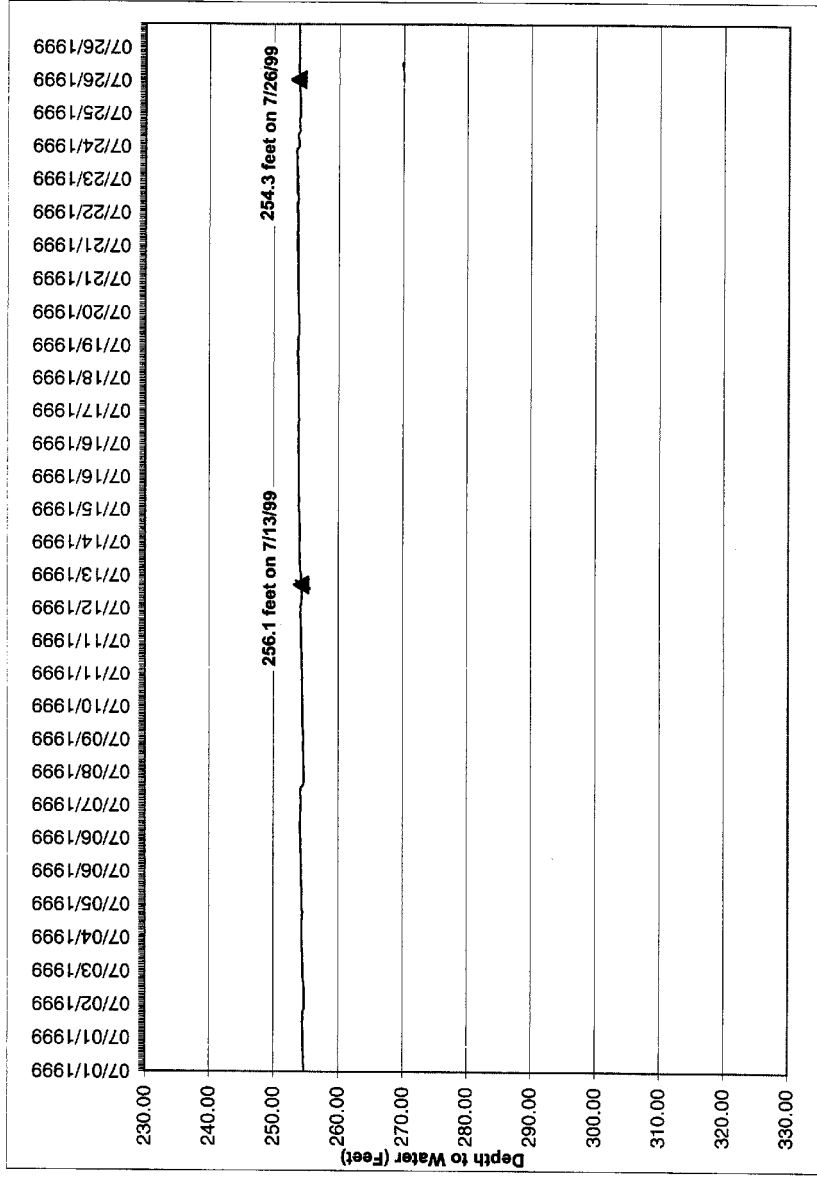
Jun 99 Chart

Well # 14M



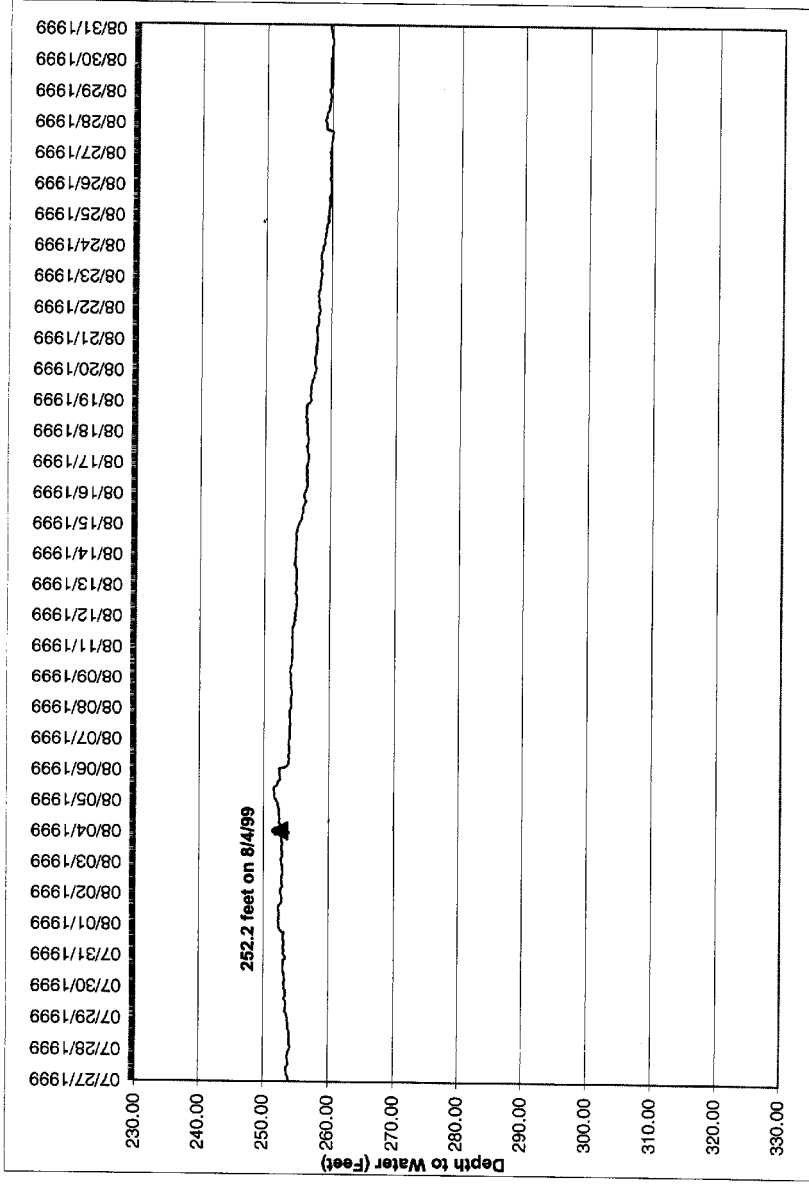
Jun 99 Chart

Well # 14NT



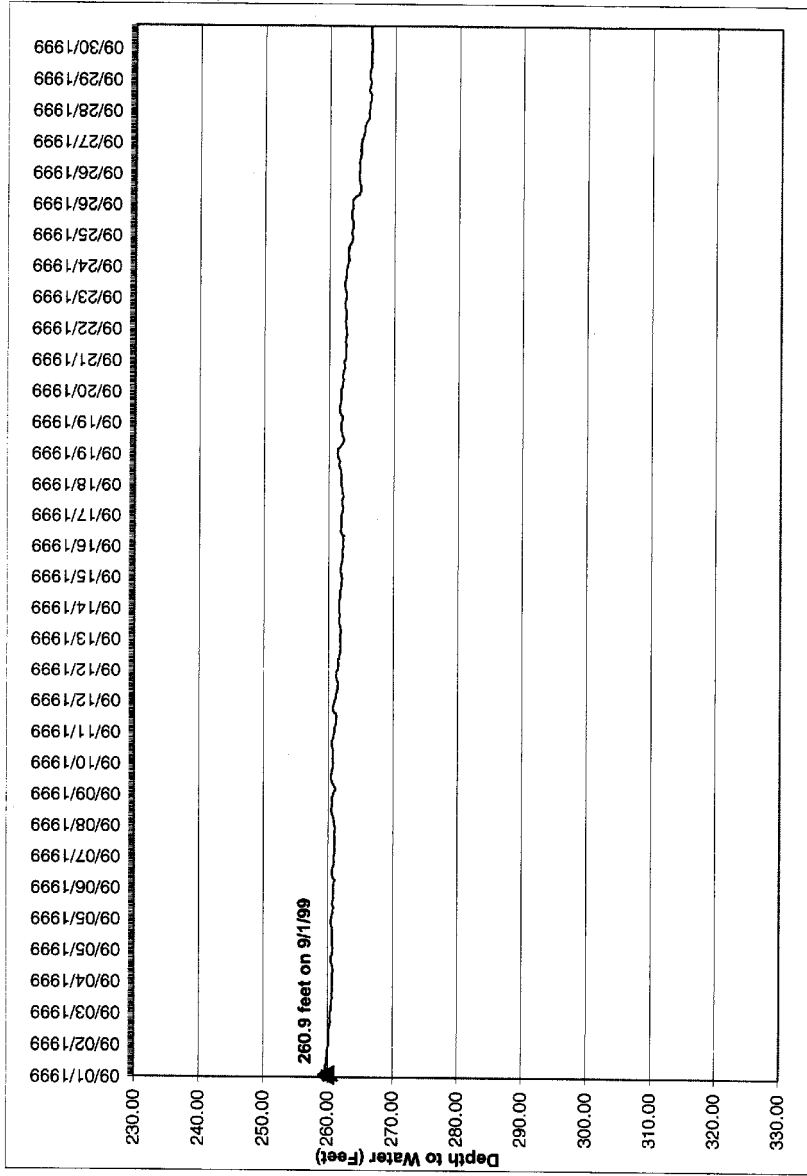
Jul 99 Chart

Well # 14M



Aug 99 Chart

Well # 14M

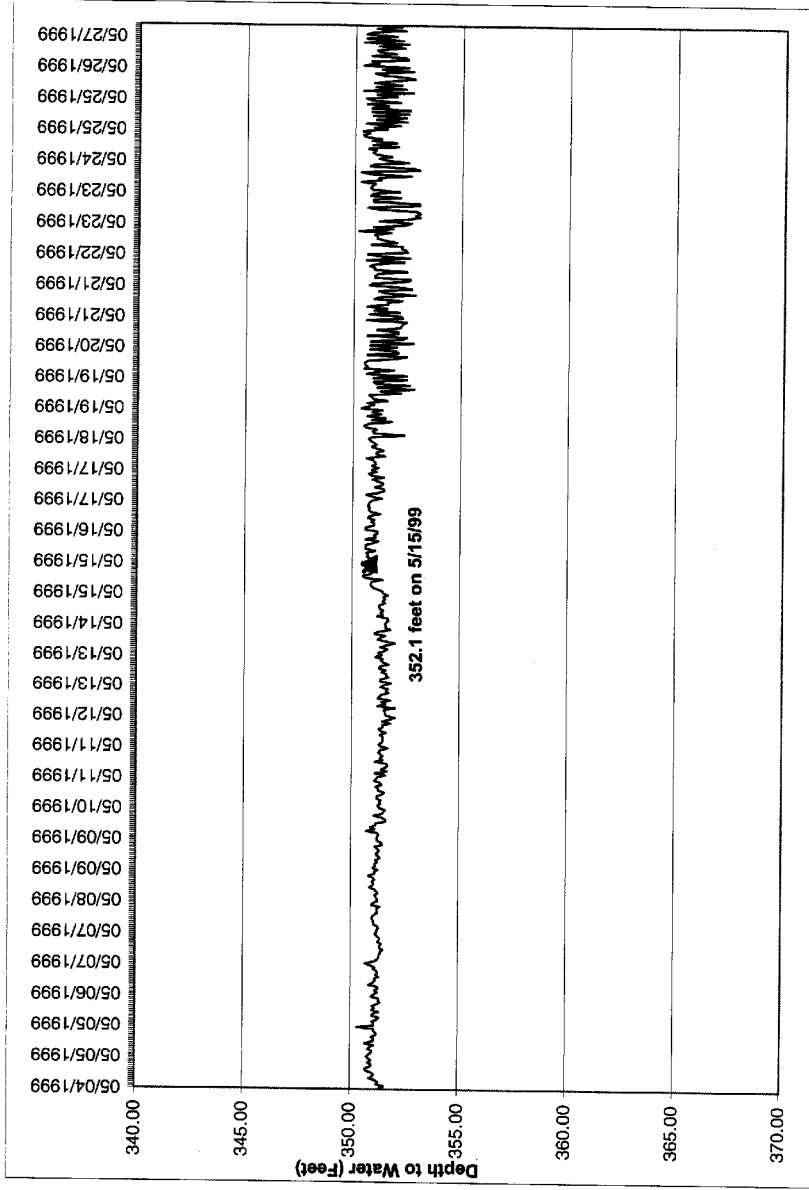


Sep 99 Chart

**Water-Level Hydrographs from Transducer
Measurements for Well No. 19**

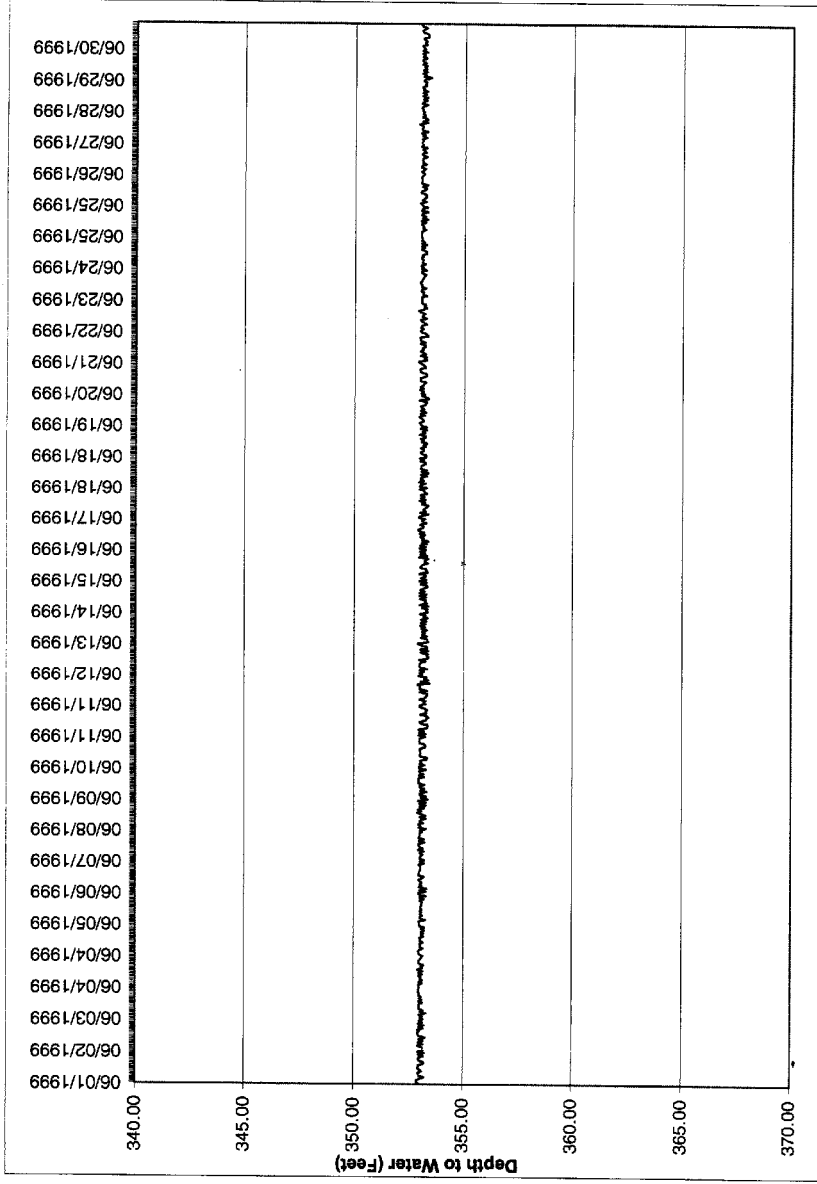
**Note: Solid triangle and adjoining depth to water
on graph are for measurement with an electric sounder.**

Well#19



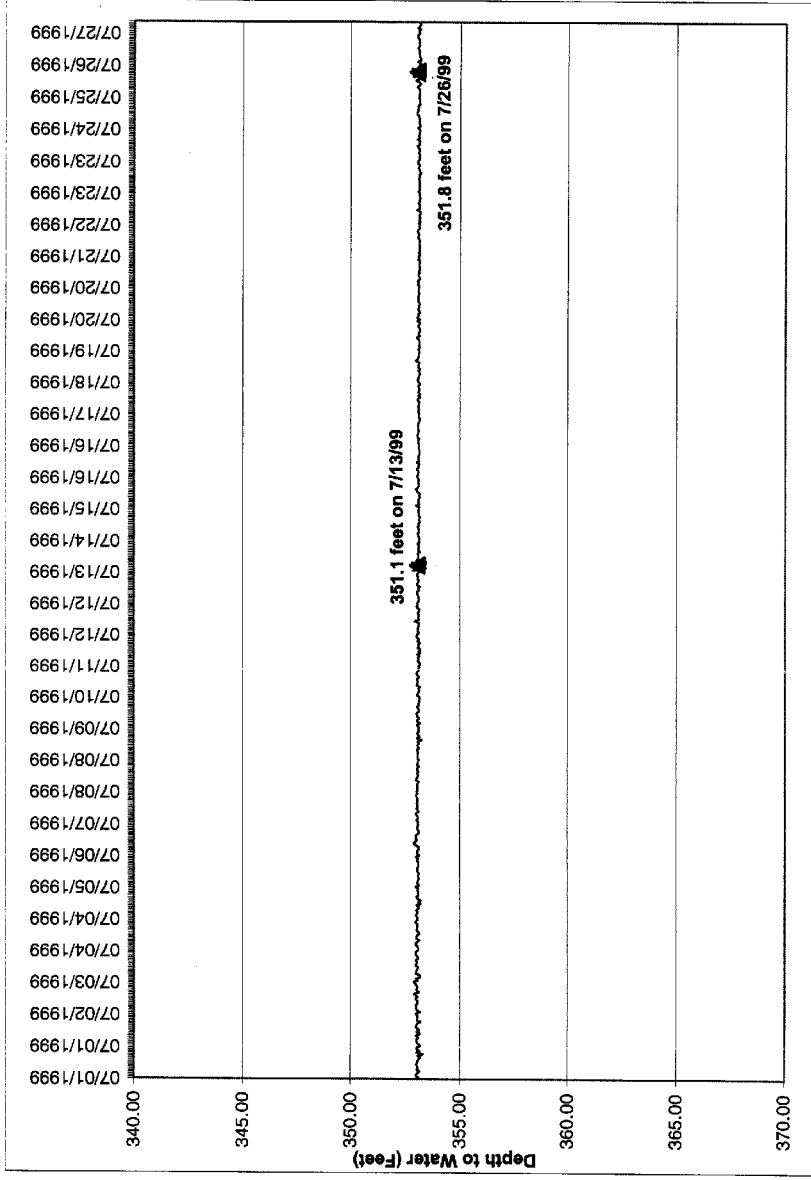
May 99 Chart

Well#19



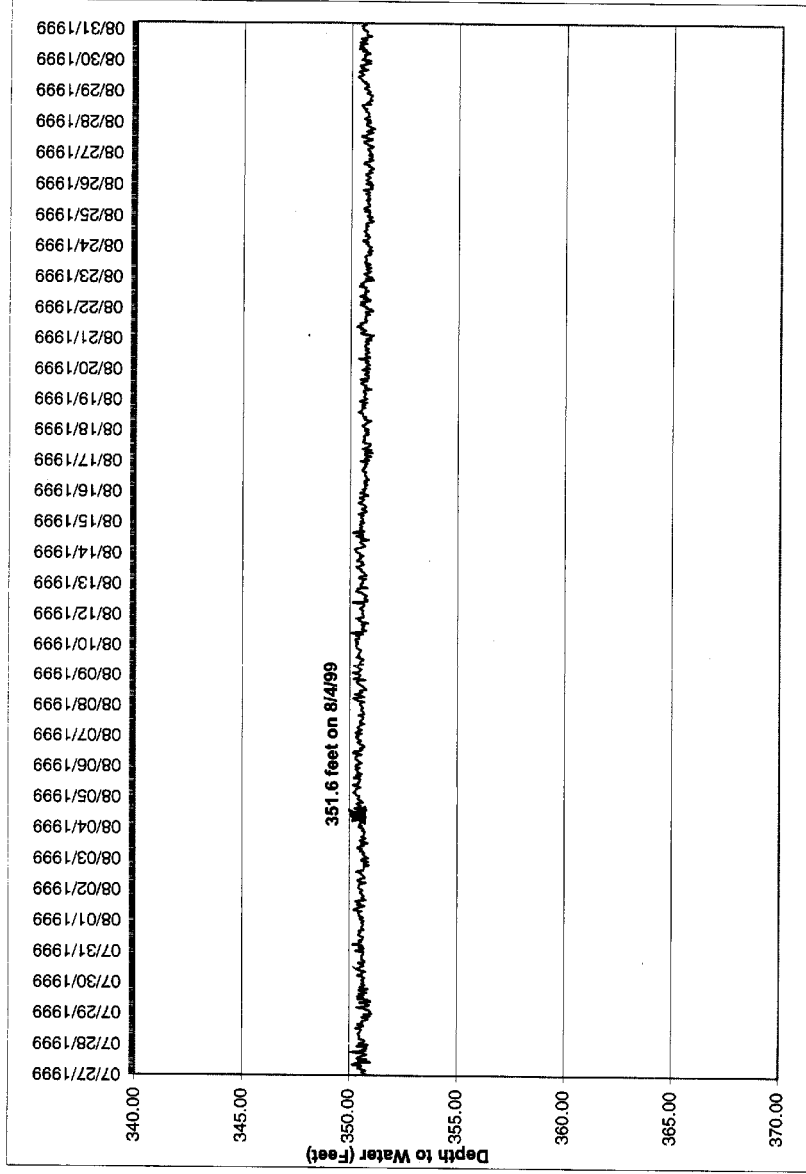
Jun 99 Chart

Well#19



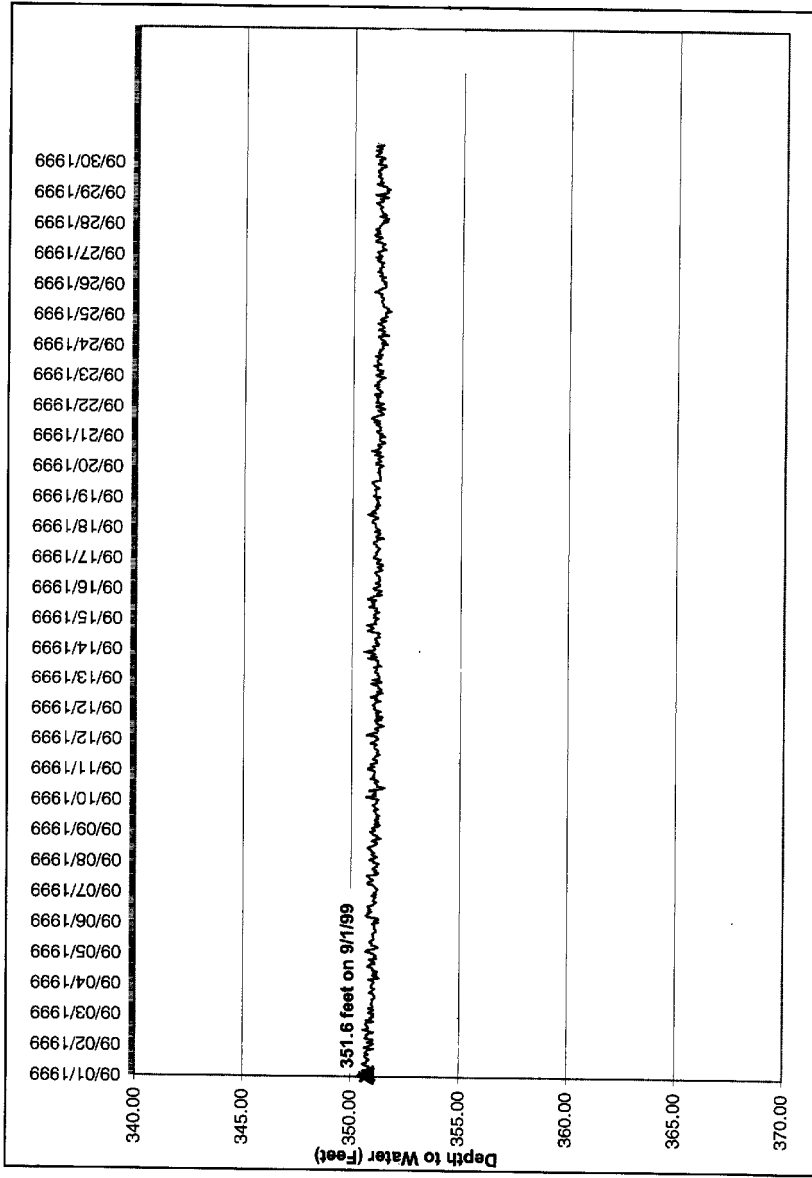
Jul 99 Chart

Well#19



Aug 99 Chart

Well#19

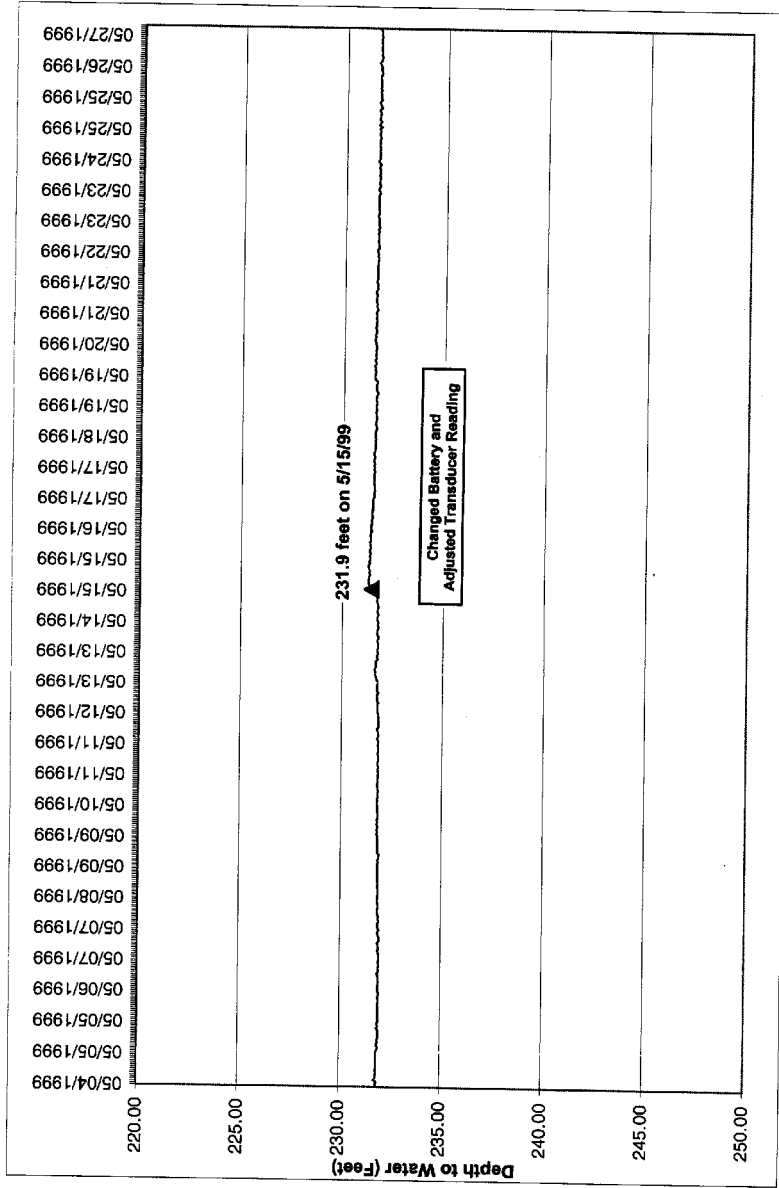


Sep 99 Chart

**Water-Level Hydrographs from Transducer
Measurements for Well No. 21**

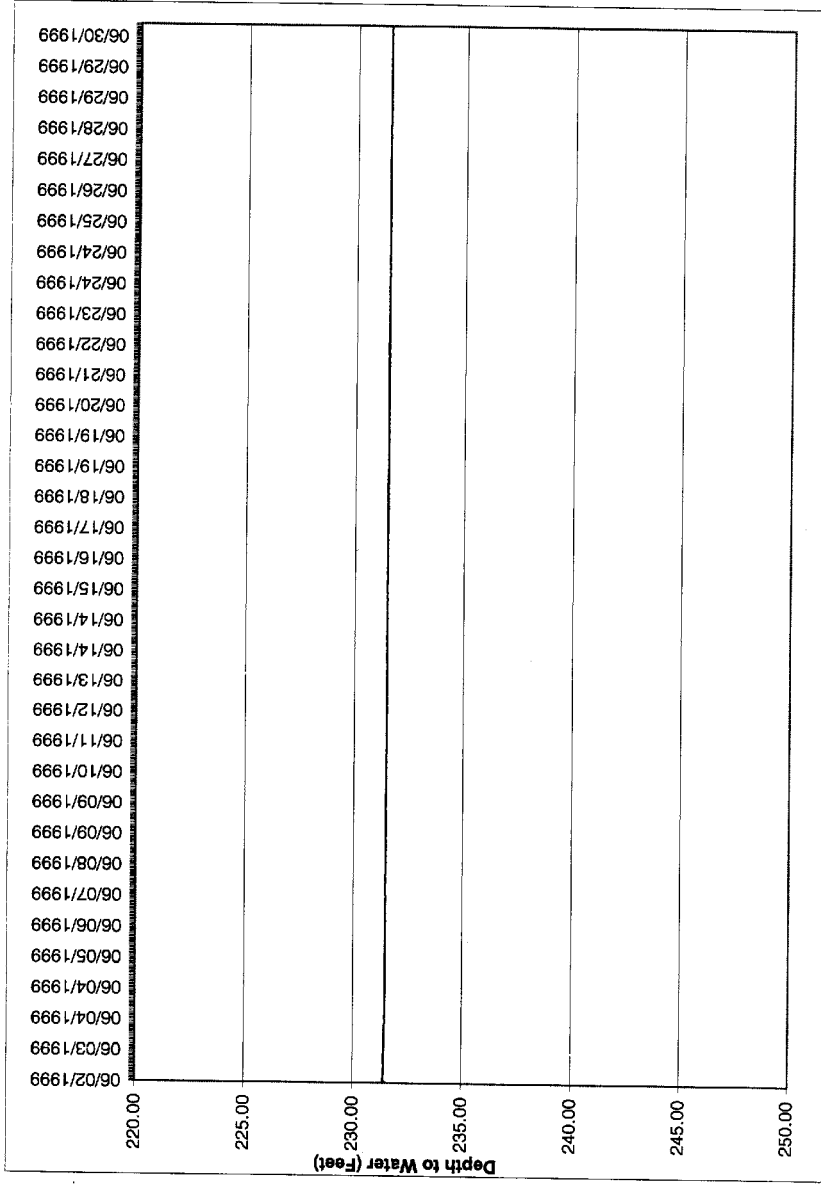
**Note: Solid triangle and adjoining depth to water
on graph are for measurement with an electric sounder.**

Well#21



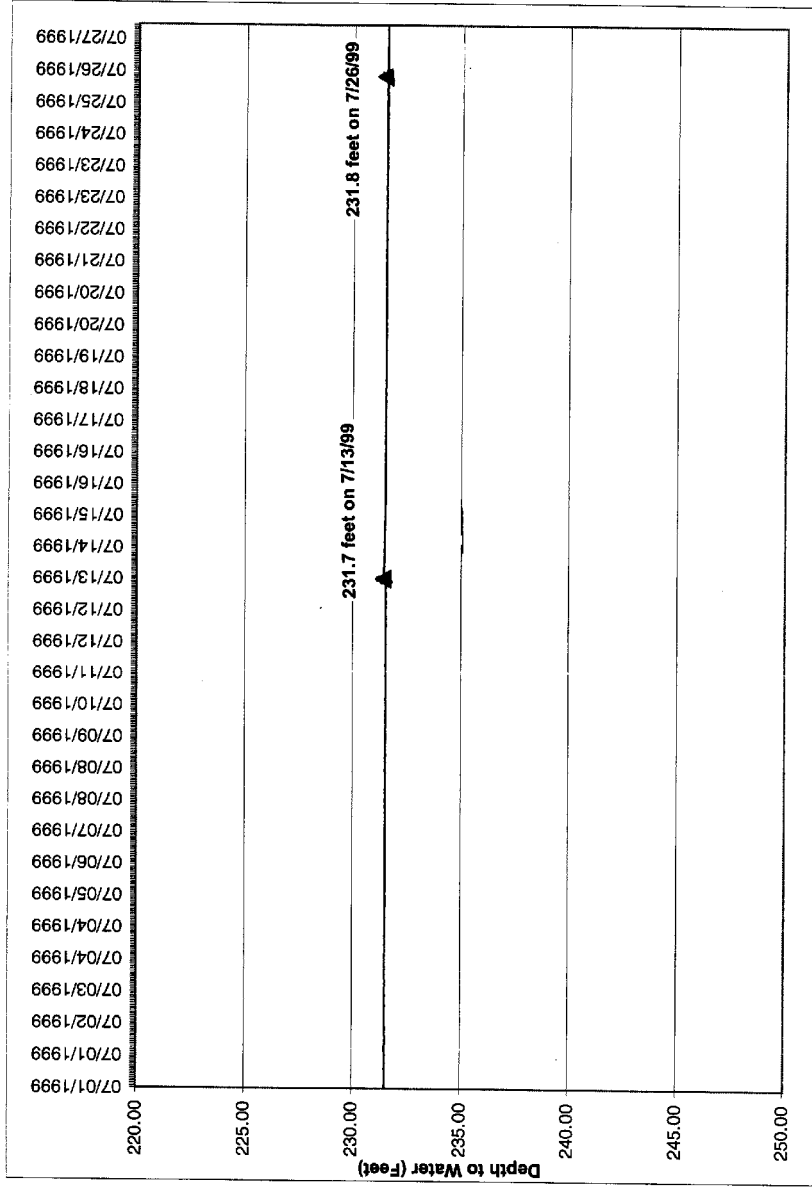
May 99 Chart

Well#21



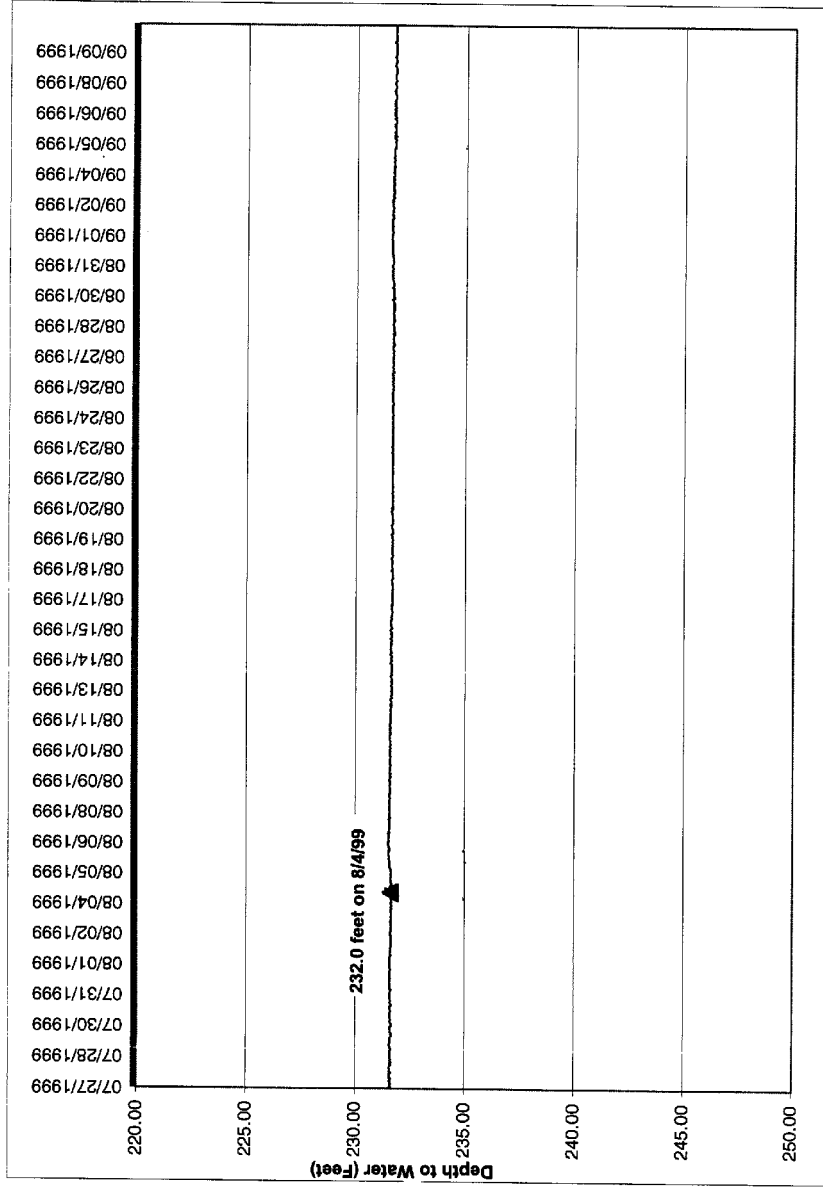
Jun 99 Chart

Well#21



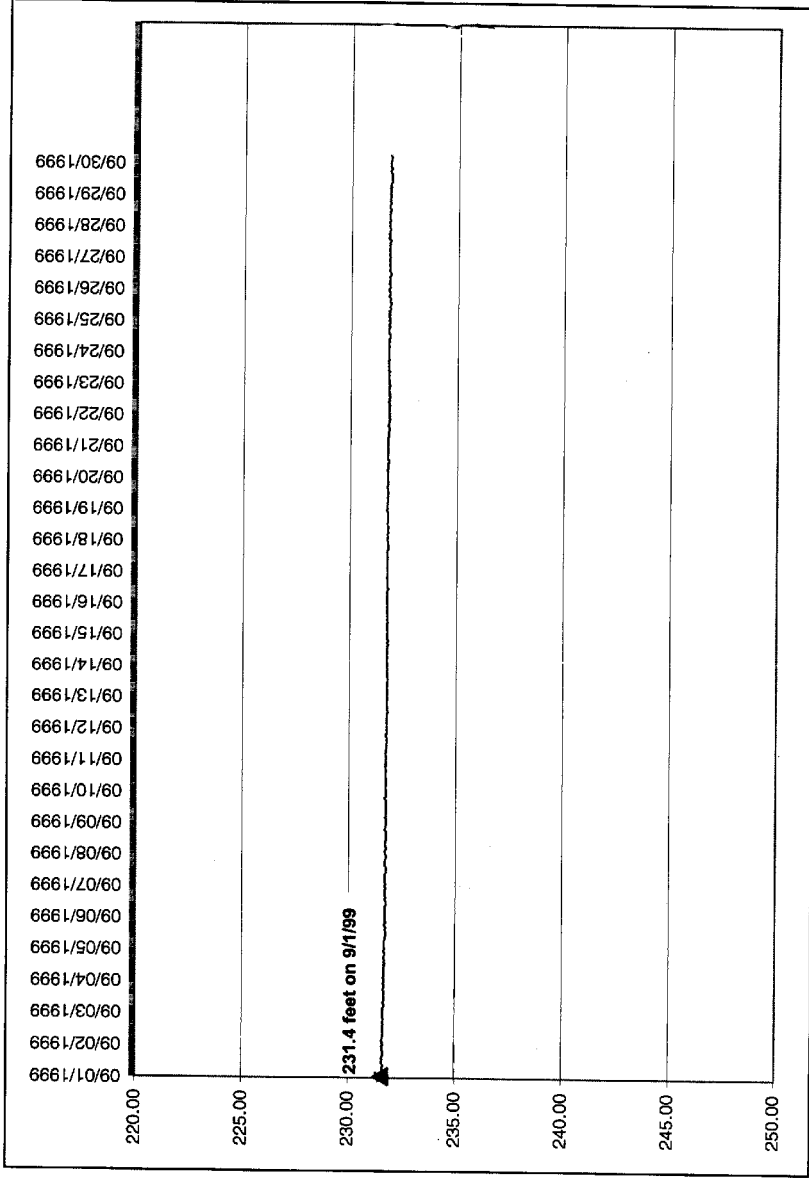
Jul 99 Chart

Well#21



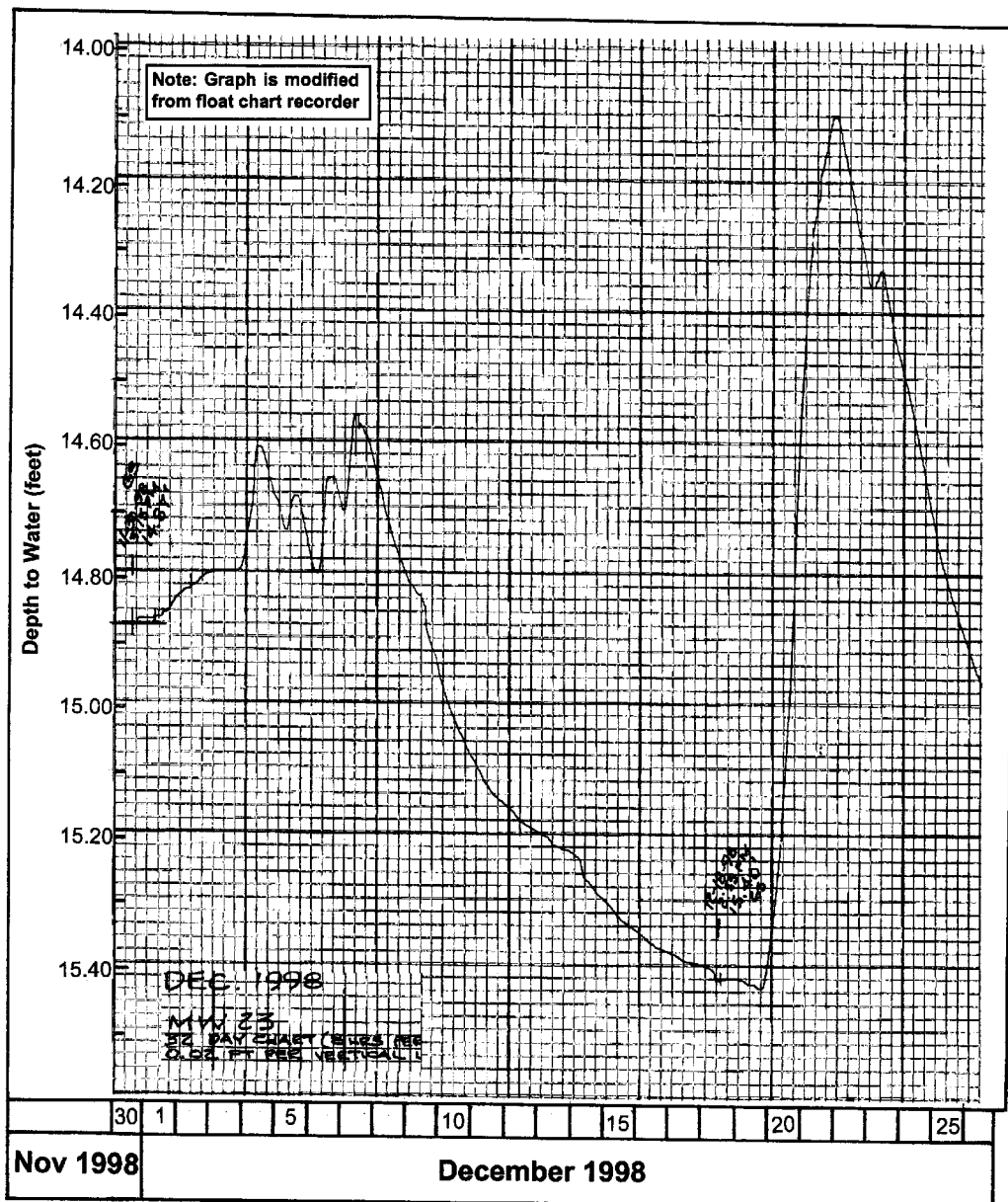
Aug 99 Chart

Well#21

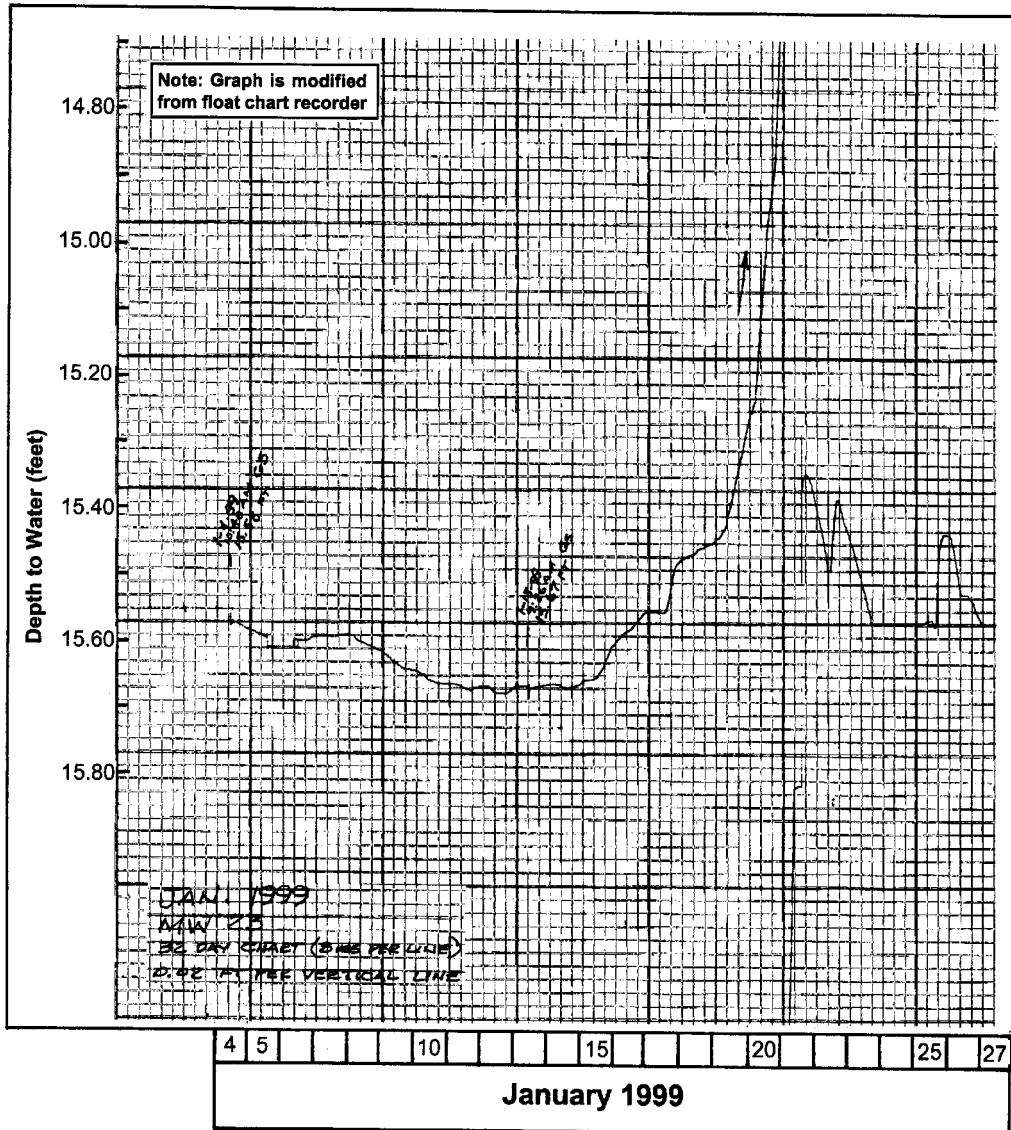


Sep 99 Chart

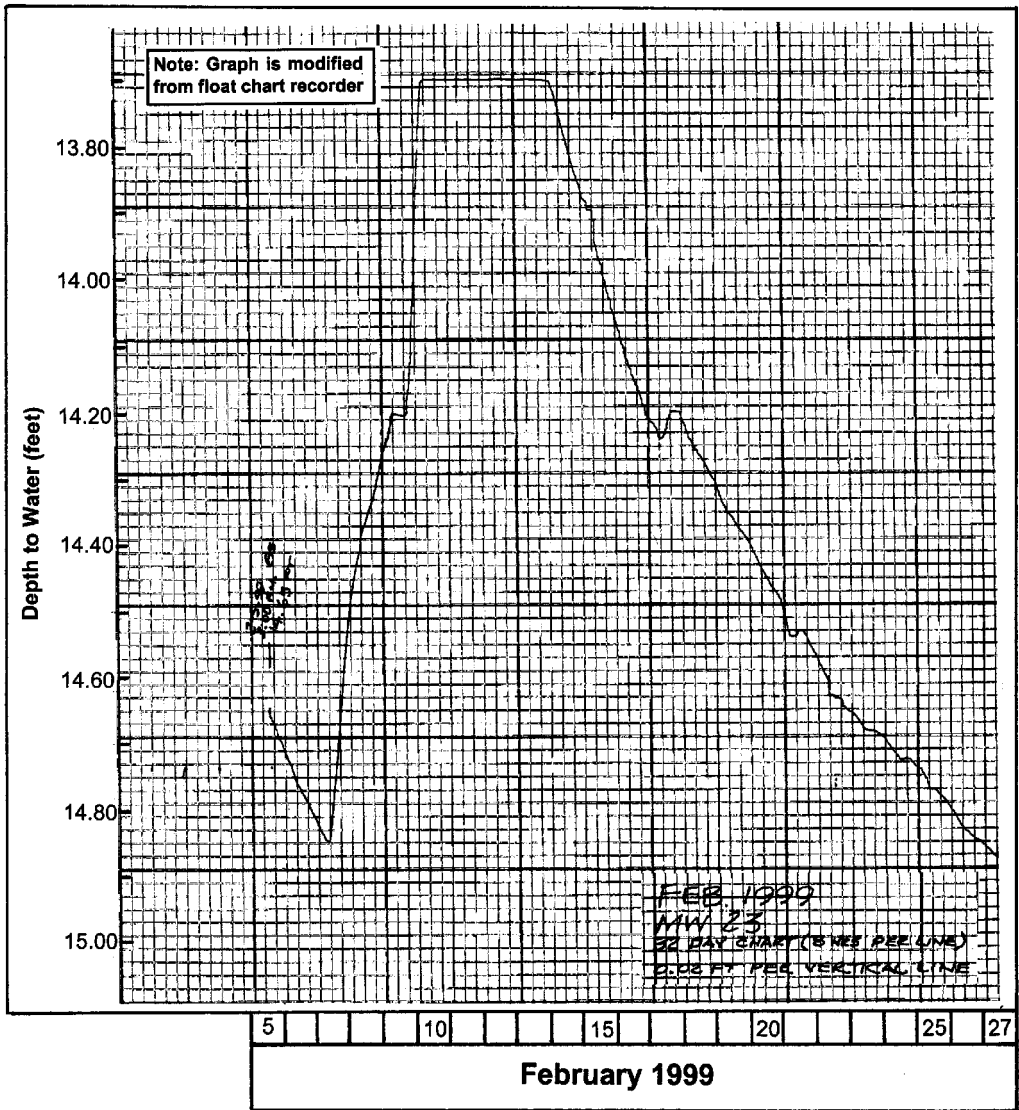
**Water-Level Hydrographs from a
Float Chart Recorder for MW-23**



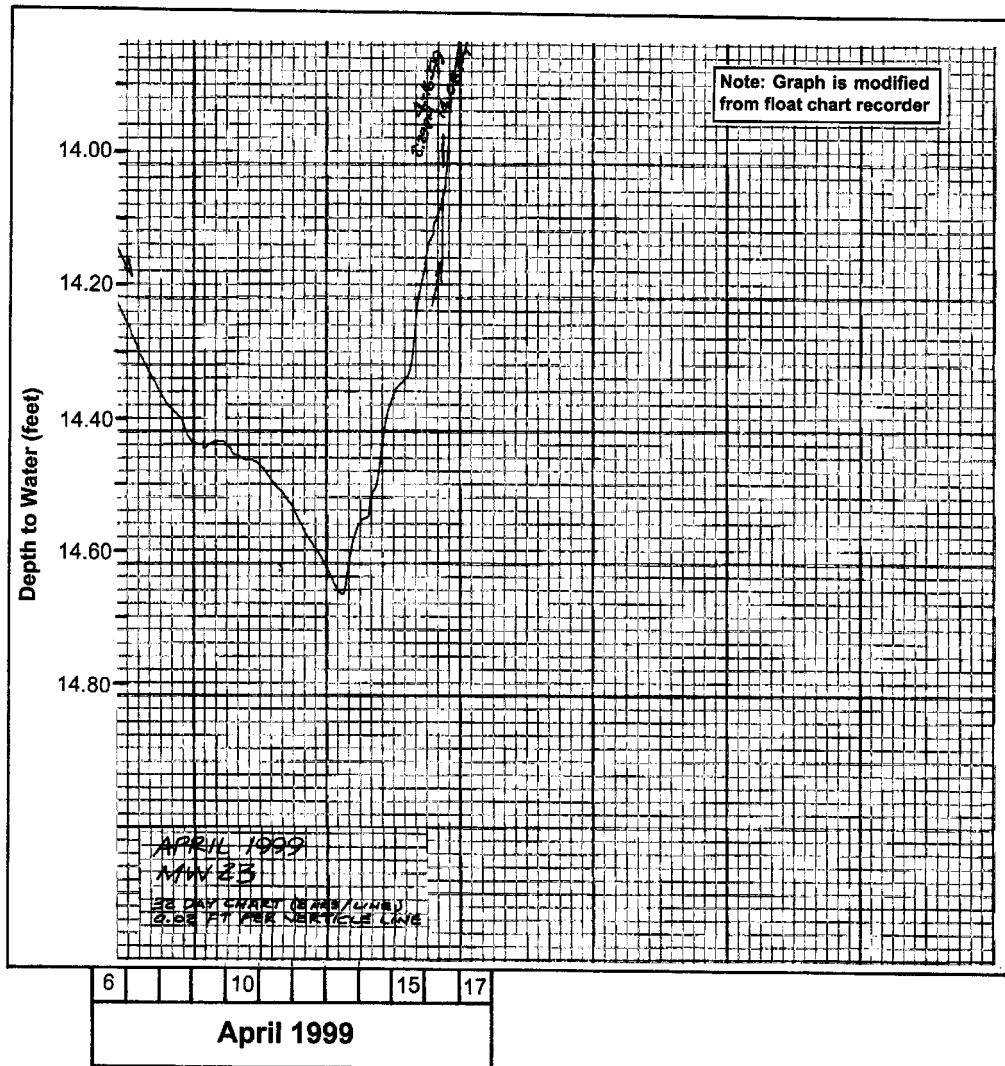
WATER-LEVEL HYDROGRAPH FOR MW-23



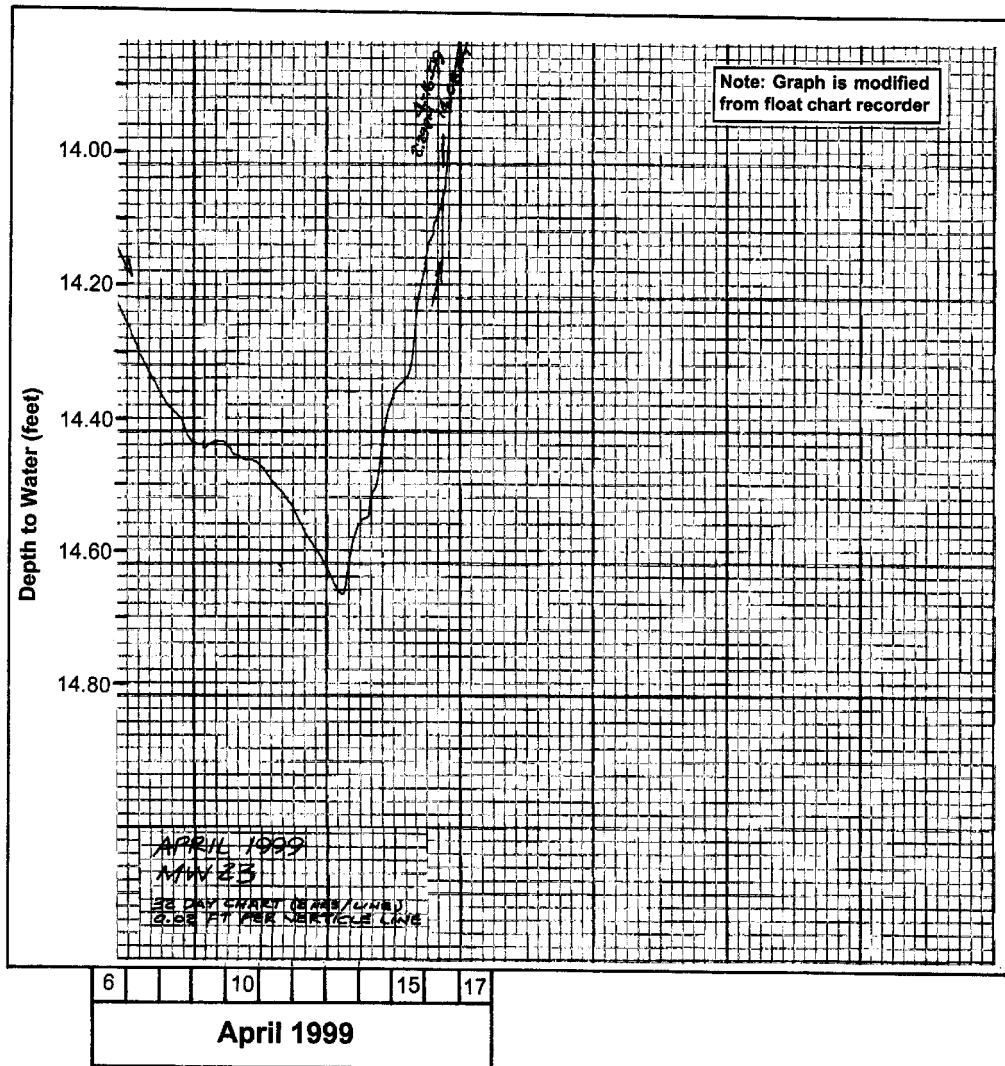
WATER-LEVEL HYDROGRAPH FOR MW-23



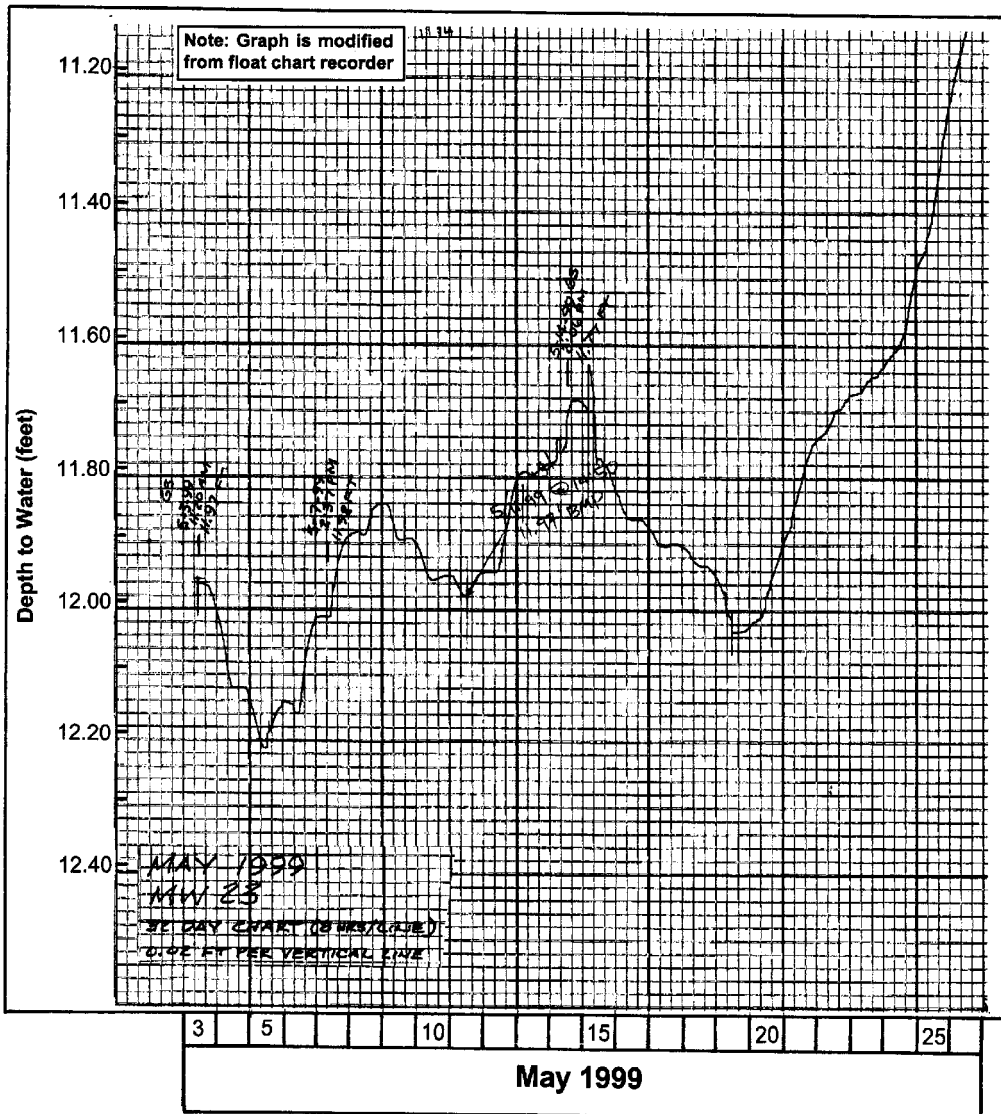
WATER-LEVEL HYDROGRAPH FOR MW-23



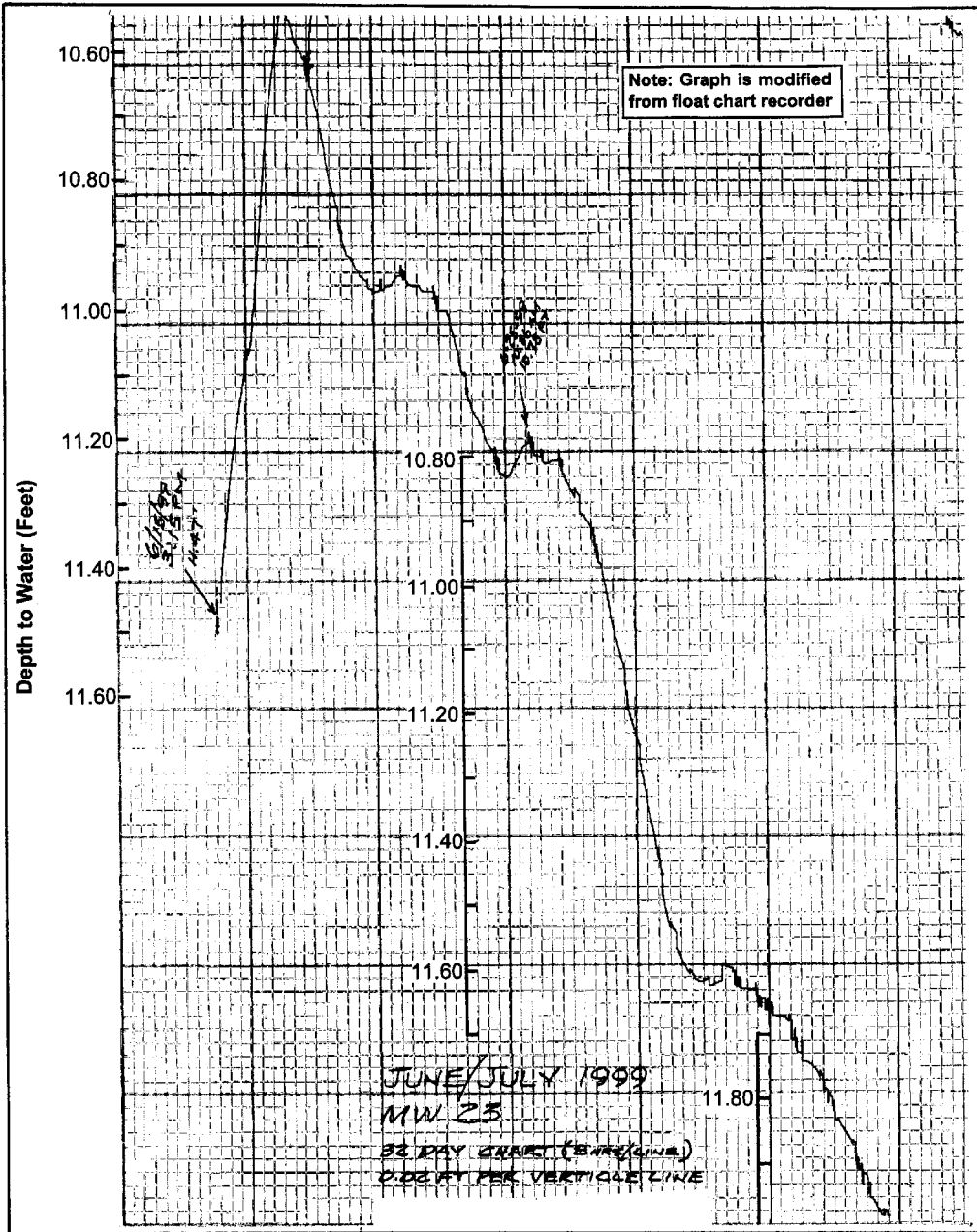
WATER-LEVEL HYDROGRAPH FOR MW-23



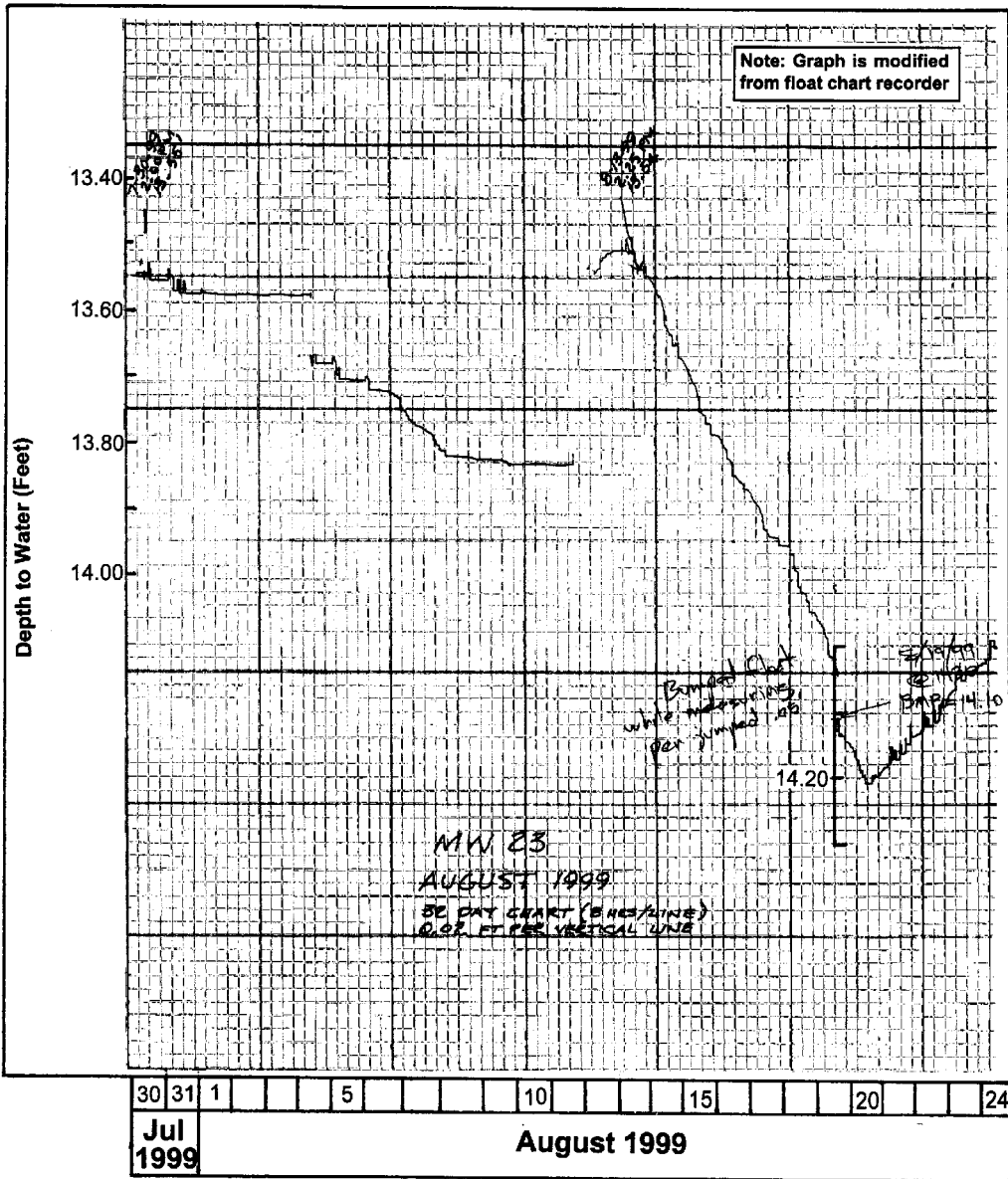
WATER-LEVEL HYDROGRAPH FOR MW-23



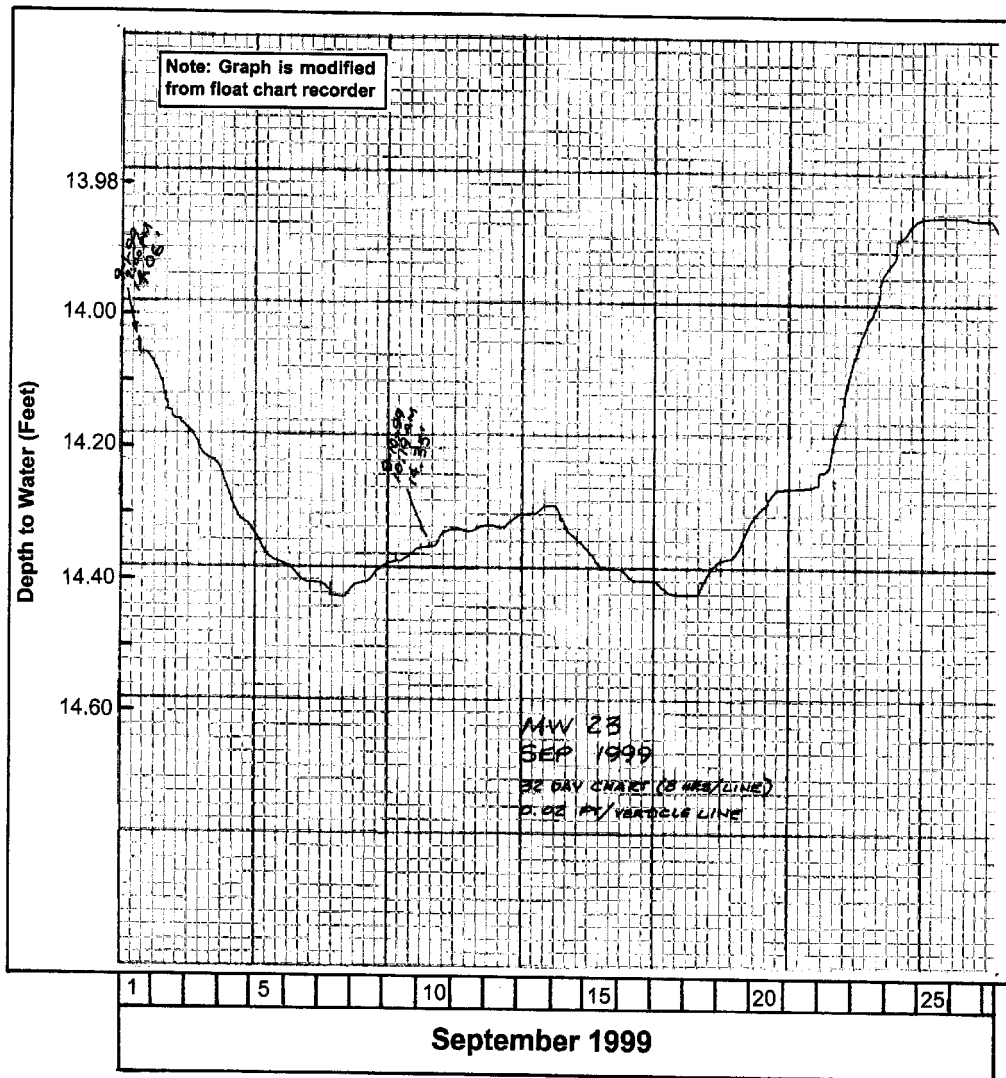
WATER-LEVEL HYDROGRAPH FOR MW-23



WATER-LEVEL HYDROGRAPH FOR MW-23



WATER-LEVEL HYDROGRAPH FOR MW-23

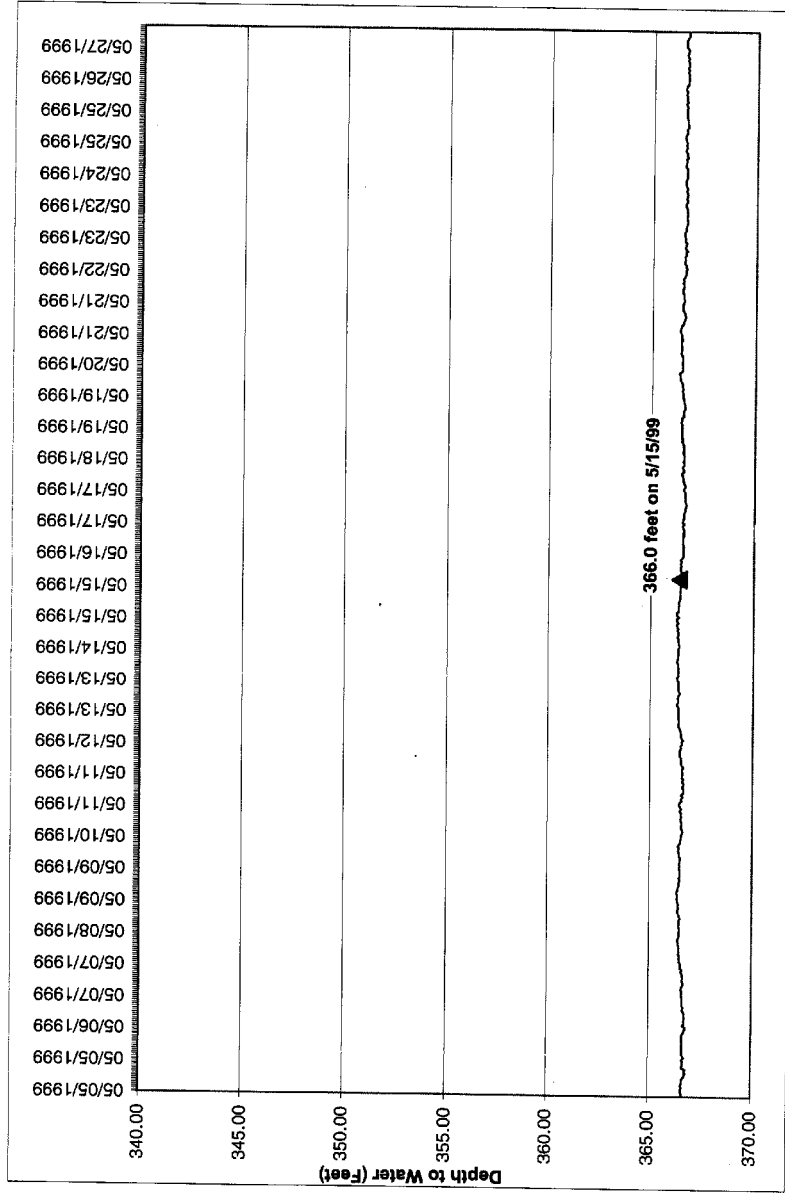


WATER-LEVEL HYDROGRAPH FOR MW-23

**Water-Level Hydrographs from Transducer
Measurements for Well No. 24**

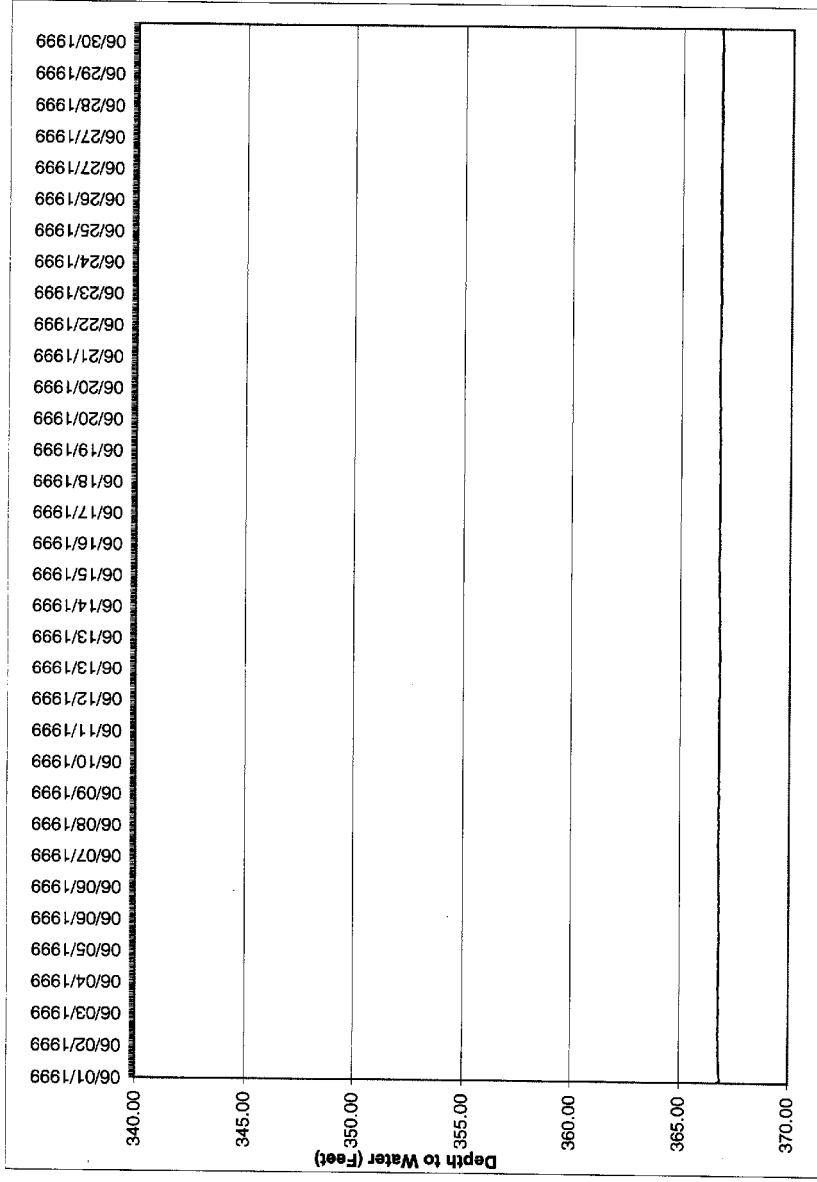
**Note: Solid triangle and adjoining depth to water
on graph are for measurement with an electric sounder.**

Well#24



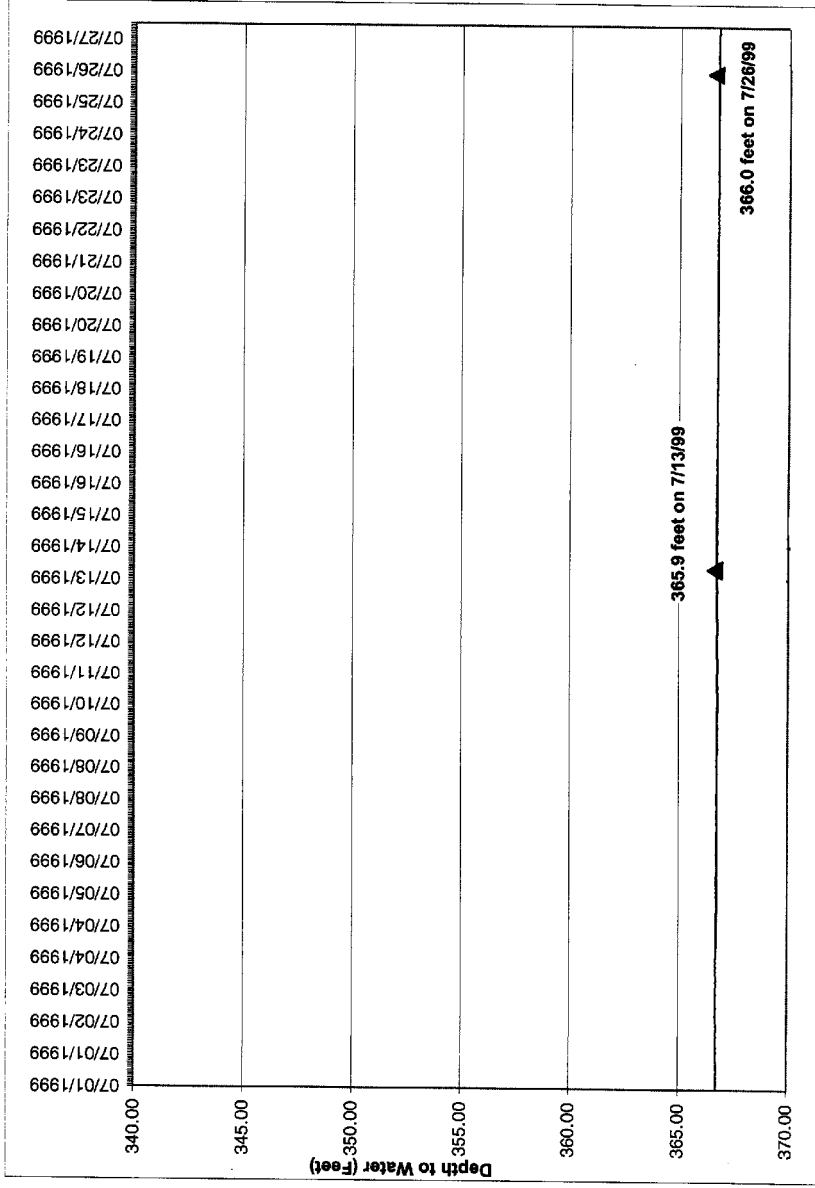
May 99 Chart

Well#24



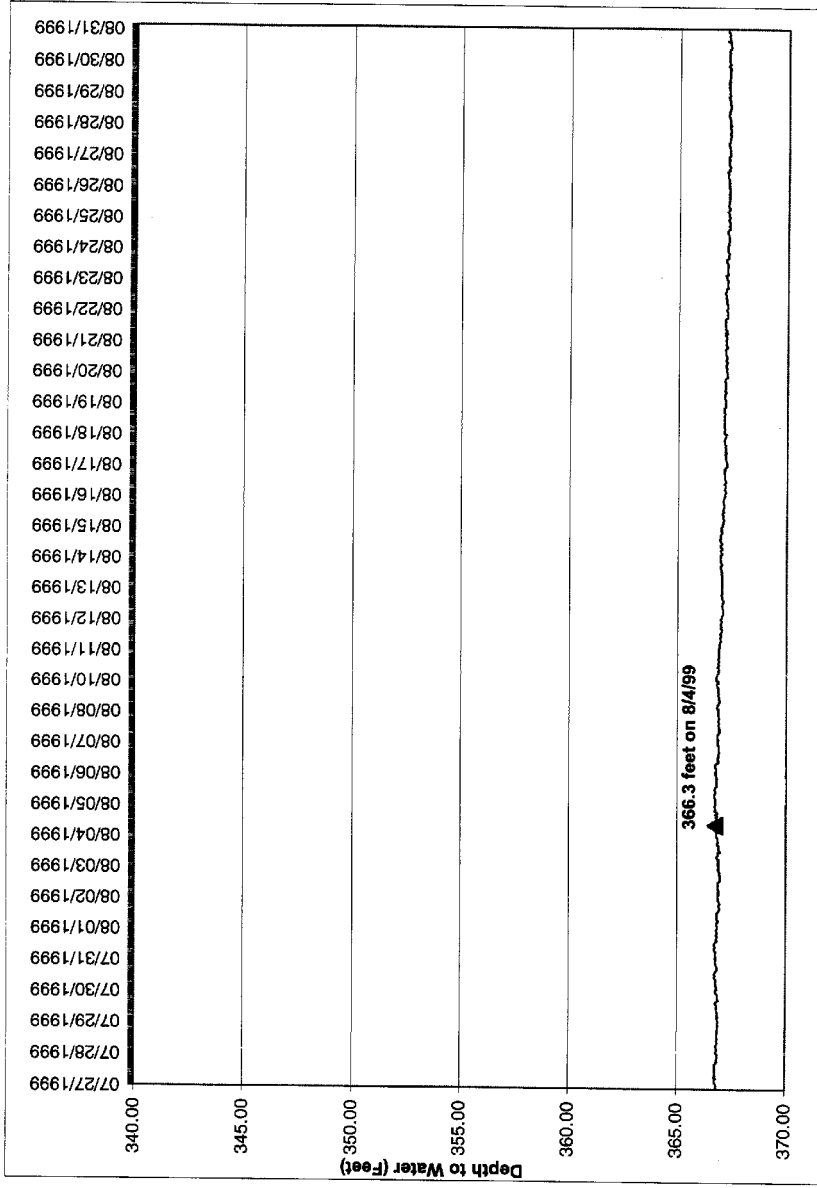
Jun 99 Chart

Well#24



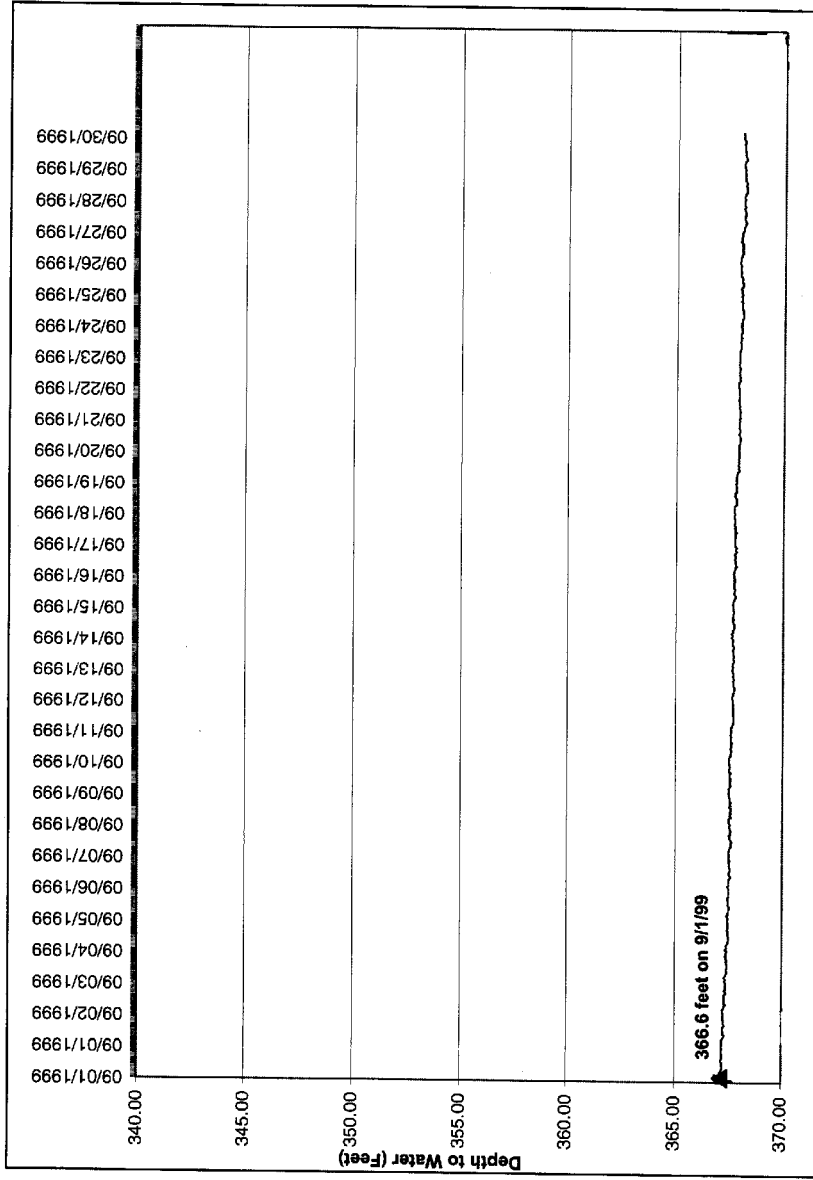
Jul 99 Chart

Well#24



Aug 99 Chart

Well#24



Sep 99 Chart

APPENDIX E
CHEMICAL ANALYSES OF WATER FROM DISTRICT WELLS

**MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL WATER QUALITY**

Production Well Site	Sample Date	Sample Time	Conductivity umho/cm	TDS mg/L	Temp (°F)	pH
1	6/6/96	8:20	240	168	47	7.4
	9/12/97	10:15	190	96	49	7.2
	7/6/98	14:30	210	120	47	7.4
	7/14/99	9:20	208	165	48	7.6
6	6/6/96	9:05	470	283	49	7.5
	9/12/97	9:25	397	198	53	7.1
	7/7/98	8:20	300	160	51	8.2
	7/14/99	8:45	305	172	50	7.6
10	6/6/96	9:20	465	315	50	7.3
	9/12/97	9:14	359	179	55	7.2
	6/30/98	13:25	350	240	49	7.6
	7/14/99	8:30	353	231	49	7.5
15	6/6/96	9:45	240	152	55	7.4
	9/12/97	9:19	288	144	55	7.2
	6/30/98	13:45	360	210	53	7.5
	7/14/99	9:05	355	190	55	7.6
16	7/11/96	9:00	660	432	70	7.5
	9/11/97	10:11	632	317	73	7.1
	7/6/98	14:35	710	500	70	7.1
	8/20/99	10:30	690	480	70	7.2
17	7/11/96	8:45	360	265	65	7.3
	No sample due to motor/pump failure					
	7/6/98	9:15	350	280	60	7.1
	8/20/99	10:10	350	280	61	7.2
18	7/11/96	8:15	540	332	47	7.1
	9/12/97	13:40	500	251	68	7.1
	7/6/98	14:15	490	350	70	6.9
	8/20/99	11:30	510	355	67	7.1
20	7/11/96	9:20	217	164	59	7.1
	9/11/97	9:57	336	168	61	6.9
	No sample due to motor/pump failure					
	8/20/99	11:00	310	210	60	7.1

quality10/25/99

**MAMMOTH COMMUNITY WATER DISTRICT
MONITOR WELL WATER QUALITY**

Monitor Well Site	Sample Date	Sample Time	Conductivity $\mu\text{mho/cm}$	TDS mg/L	Temp ($^{\circ}\text{F}$)	pH
4M	09/09/96	8:05	162	84	47	7.4
	09/24/97	8:03	93	47	45	7.2
	09/04/98	7:45	99	53	45	7.2
	08/26/99	7:40	103	49	44	7.2
5A	09/09/96	8:30	674	339	60	6.7
	09/24/97	8:35	662	331	58	6.8
	09/04/98	8:20	660	332	58	6.8
	08/26/99	8:10	669	330	58	6.9
5M	09/09/96	8:40	430	217	56	6.4
	No sample due to USGS chart recorder					
	09/04/98	8:30	450	226	56	6.5
7	08/26/99	8:15	428	219	55	6.7
	No sample					
	09/02/97	10:15	101	50	49	7.4
10M	09/10/98	9:45	110	51	49	7.2
	08/27/99	8:30	104	53	50	7.2
	No water in well to sample					
11	09/16/97	14:05	358	180	50	7.3
	09/04/98	8:45	349	175	50	7.2
	08/26/99	8:35	333	162	50	7.1
	09/09/96	9:30	96	50	51	7.4
11M	09/16/97	14:20	106	53	53	7.3
	09/04/98	8:20	104	50	50	7.3
	08/26/99	9:00	101	61	51	7.3
	09/09/96	9:40	283	144	52	7.5
11M	09/16/97	14:30	350	175	51	7.5
	09/04/98	9:25	350	175	50	7.3
	08/26/99	9:10	310	162	51	7.3

MAMMOTH COMMUNITY WATER DISTRICT
MONITOR WELL WATER QUALITY

Monitor Well Site	Sample Date	Sample Time	Conductivity umho/cm	TDS mg/L	Temp (°F)	pH
12M	09/09/96	10:05	287	137	52	7.5
	09/16/97	14:02	364	182	50	7.5
14	09/04/98	9:05	359	180	50	7.4
	08/26/99	8:45	370	189	51	7.5
19	09/09/96	No sample due to transducer in well.				
	09/16/97	No sample due to transducer in well.				
	09/04/98	No sample due to transducer in well.				
21	08/26/99	No sample due to transducer in well.				
	09/09/96	No sample due to transducer in well.				
	09/16/97	No sample due to transducer in well.				
22	09/04/98	No sample due to transducer in well.				
	08/26/99	No sample due to transducer in well.				
	09/09/96	No sample due to transducer in well.				
23	09/10/98	8:00	115	57	48	7.1
	08/27/99	9:15	111	61	47	7.1
	09/09/96	10:50	93	47	52	7.3
24	09/16/97	10:05	95	48	50	7.3
	09/04/98	10:00	98	50	50	7.3
	08/27/99	9:45	91	49	50	7.2
	09/09/96	No sample due to transducer in well.				
	09/16/97	No sample due to transducer in well.				
	09/04/98	No sample due to transducer in well.				
	8/27/99	No sample due to transducer in well.				

APPENDIX F
MAMMOTH CREEK STREAMFLOW

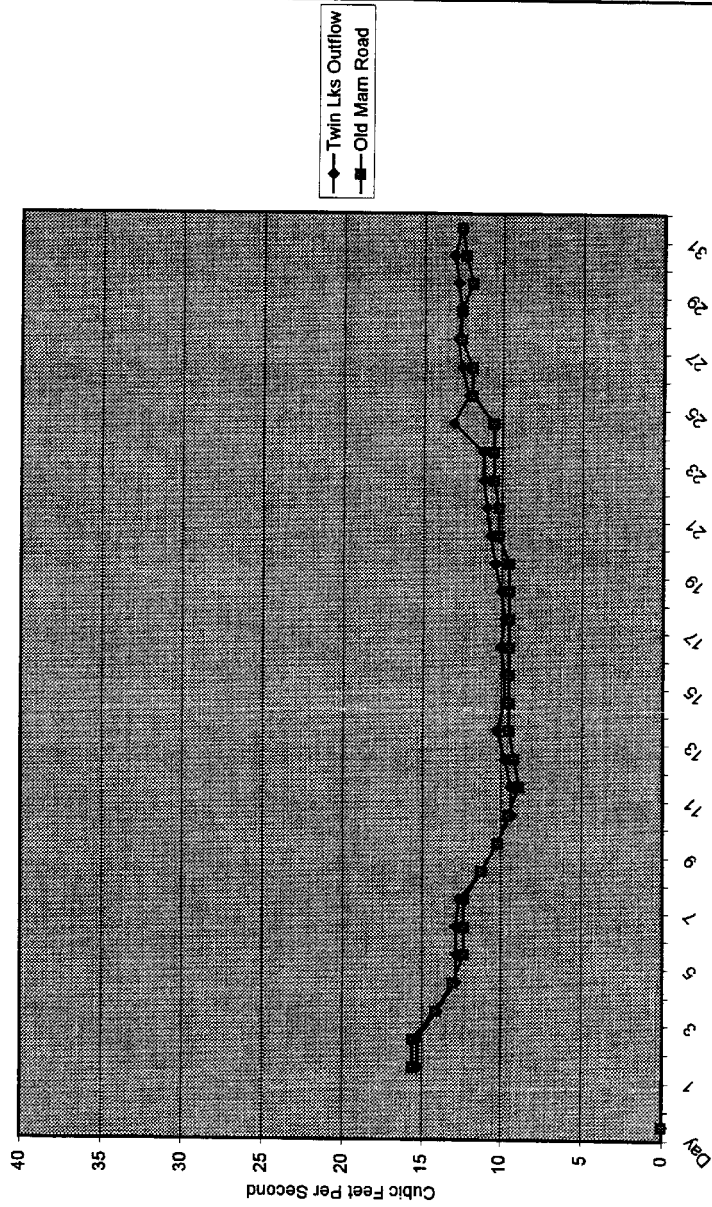
TWIN LAKES OUTFLOW

Day	Daily discharge in cubic feet per second											
	1998			1999			2000			2001		
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.3	12.8	14.8	6.8	9.4	8.5	7.6	11.2	>32.42	>32.42	15.3	10.2
2	15.3	11.6	13.1	6.8	8.5	8.5	7.6	13.0	>32.42	>32.42	15.0	9.8
3	14.0	11.4	12.1	6.8	8.5	9.4	7.6	15.5	>32.42	>32.42	15.0	9.6
4	12.8	11.3	12.5	6.8	8.3	8.1	7.6	13.0	>32.42	>32.42	14.8	9.4
5	12.8	10.9	11.4	6.8	8.3	8.1	7.6	12.3	>32.42	>32.42	13.0	9.4
6	12.8	10.7	11.4	7.2	8.3	8.1	8.5	12.6	>32.42	>32.42	14.5	9.1
7	12.6	11.2	10.9	7.0	8.3	8.1	8.7	13.3	>32.42	>32.42	13.8	8.5
8	11.2	15.5	10.5	6.8	10.2	8.3	8.5	14.0	26.5	32.42	13.8	8.5
9	10.2	15.5	10.2	6.8	12.6	8.9	9.1	14.0	16.1	31.82	13.5	8.5
10	9.4	13.5	9.4	6.6	13.8	8.7	8.7	14.0	16.5	>32.42	14.0	8.5
11	9.4	14.5	9.4	6.6	12.1	8.3	8.5	14.5	24.2	>32.42	17.9	8.1
12	9.8	13.5	8.9	6.6	11.6	8.1	8.5	15.8	>32.42	30.00	18.6	8.3
13	10.2	13.0	8.9	6.8	10.0	8.1	8.5	17.6	>32.42	29.12	17.1	8.7
14	9.8	12.1	8.9	6.8	9.1	8.1	8.5	>32.42	>32.42	29.42	13.0	8.3
15	9.8	11.4	8.9	6.4	9.1	7.9	8.7	31.2	>32.42	>32.42	11.9	7.9
16	10.0	11.4	8.9	7.2	9.1	7.9	8.9	31.8	>32.42	>32.42	12.1	8.1
17	9.8	11.6	8.9	7.6	8.9	8.1	8.9	32.4	>32.42	30.90	11.6	7.9
18	10.0	11.1	8.7	7.4	8.9	8.1	9.4	25.3	>32.42	26.46	10.7	8.9
19	10.4	10.7	8.3	10.7	8.9	8.1	9.4	25.3	>32.42	30.60	11.2	8.3
20	10.7	10.2	8.3	13.8	8.9	8.3	9.6	>32.42	>32.42	26.46	10.7	8.9
21	10.9	10.2	8.3	14.0	8.9	8.3	9.6	>32.42	>32.42	19.10	10.7	8.9
22	11.2	10.2	8.3	12.9	8.9	7.9	9.8	>32.42	>32.42	18.10	10.2	8.9
23	11.2	10.2	8.3	11.6	8.9	7.9	9.4	>32.42	>32.42	19.70	11.9	9.6
24	13.1	10.9	8.1	14.5	8.9	8.1	9.4	>32.42	>32.42	19.18	12.1	12.3
25	12.1	10.5	7.9	14.5	8.9	8.1	8.9	>32.42	>32.42	17.32	11.6	12.3
26	12.6	9.8	7.2	13.0	8.9	7.6	8.7	>32.42	>32.42	17.32	11.2	11.6
27	12.8	9.4	7.2	12.6	8.9	7.6	8.9	>32.42	>32.42	17.59	11.2	11.2
28	12.6	10.9	7.2	10.7	8.7	7.6	10.2	>32.42	>32.42	17.32	13.0	10.9
29	12.8	11.6	7.0	10.2	8.7	7.6	9.4	>32.42	>32.42	17.06	12.6	10.5
30	13.1	12.1	7.2	9.6		7.6	8.9	>32.42	32.42	16.55	12.1	9.8
31	12.6		7.6	9.4		7.6	10.7	>32.42	>32.42	15.52	12.3	9.1
						8.1		>32.42		15.30	10.2	
Mean	11.6	11.7	9.3	9.1	9.4	8.1	8.8				13.1	9.4
Maximum	15.3	15.5	14.8	14.5	13.8	9.4	10.7	>32.42	>32.42	>32.42	18.6	12.3
Minimum	9.4	9.4	7.0	6.4	8.3	7.6	7.6	11.2	16.5	15.3	10.2	7.9

MAMMOTH CREEK FLOW AT OLD MAMMOTH ROAD

Day	Daily discharge in cubic feet per second											
	1998						1999					
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.6	12.3	12.6	8.3	8.6	8.3	11.2	14.5	110.3	56.2	14.9	10.5
2	15.6	11.5	14.1	8.3	9.8	8.3	11.2	17.2	89.7	57.5	14.9	9.8
3	14.1	13.0	13.3	8.3	9.2	9.5	9.5	17.6	89.7	54.9	15.6	9.5
4	13.0	12.3	9.2	8.6	9.2	9.8	9.2	17.2	88.2	53.1	15.6	9.5
5	12.3	12.3	11.5	7.9	8.9	9.8	9.5	16.0	82.3	50.0	15.2	9.2
6	12.3	11.2	12.6	8.3	8.6	9.5	9.8	17.2	73.6	42.9	14.5	8.9
7	12.3	11.9	13.3	8.3	9.8	9.2	10.5	18.9	65.4	39.5	15.6	8.9
8	11.2	13.0	12.6	7.6	14.1	9.2	9.8	20.2	48.8	37.3	14.9	8.3
9	10.2	15.2	9.2	8.3	14.1	7.3	9.8	19.7	31.0	35.7	14.5	8.3
10	9.5	16.8	11.2	7.9	14.1	8.9	11.2	19.3	27.0	36.2	14.9	8.3
11	8.9	15.6	10.2	7.9	15.2	9.5	10.2	19.7	30.0	38.9	19.7	8.3
12	9.2	15.6	10.2	7.9	13.7	9.5	9.8	21.5	58.1	36.2	20.2	7.9
13	9.5	14.9	9.8	7.9	12.6	9.5	9.8	24.6	71.6	31.0	19.3	8.3
14	9.5	14.1	9.8	7.6	10.9	9.8	11.2	31.3	89.9	32.0	16.0	8.3
15	9.5	13.7	10.2	7.6	10.5	9.5	11.9	44.0	98.2	42.9	13.3	7.6
16	9.5	13.0	9.8	7.9	9.5	9.2	12.3	38.4	118.6	44.0	12.6	7.6
17	9.5	12.3	9.8	8.3	9.2	9.5	12.6	40.1	144.0	34.6	12.3	7.6
18	9.5	12.6	9.5	9.2	9.5	10.2	14.1	37.3	130.6	33.0	11.9	7.9
19	9.5	12.3	10.5	10.5	9.5	10.9	14.9	40.1	99.8	31.0	11.5	8.9
20	10.2	11.9	6.8	11.9	8.9	10.2	16.0	40.1	93.6	26.5	11.2	8.9
21	10.2	11.2		10.5	7.9	10.2	17.2	58.1	99.8	19.3	10.9	8.6
22	10.5	12.3	9.8	11.9	9.8	9.5	17.2	64.7	100.6	19.3	10.5	8.6
23	10.5	12.3	9.2	13.0	9.8	10.2	14.5	65.4	100.6	19.7	11.9	12.3
24	10.5	12.3	9.2	11.2	9.5	10.2	13.3	66.1	90.5	18.9	12.3	12.3
25	11.9	13.0	9.8	13.3	10.5	10.9	12.3	82.3	89.7	17.2	11.5	11.5
26	11.9	10.5	9.2	12.6	9.2	10.9	14.1	95.9	91.3	17.2	11.0	10.2
27	12.6	10.2	8.6	12.3	8.9	12.3	17.2	105.4	84.5	17.2	13.7	9.8
28	12.6	9.8	8.6	12.3	9.2	11.5	16.0	103.0	73.6	16.8	13.3	9.2
29	11.9	11.5	8.3	10.5		11.2	13.7	113.6	48.8	16.0	12.3	8.9
30	12.3	13.3	7.9	9.2		10.9	13.7	120.3	41.7	15.6	11.9	7.9
31	12.6		8.3	8.6		7.9		116.9		15.2	11.5	
Mean	11.2	12.7	10.2	9.5	10.4	9.8	12.5	48.5	82.1	32.4	13.9	9.1
Maximum	15.6	16.8	14.1	13.3	15.2	12.3	17.2	120.3	144.0	57.5	20.2	12.3
Minimum	8.9	9.8	6.8	7.6	7.9	7.3	9.2	14.5	27.0	15.2	10.5	7.6

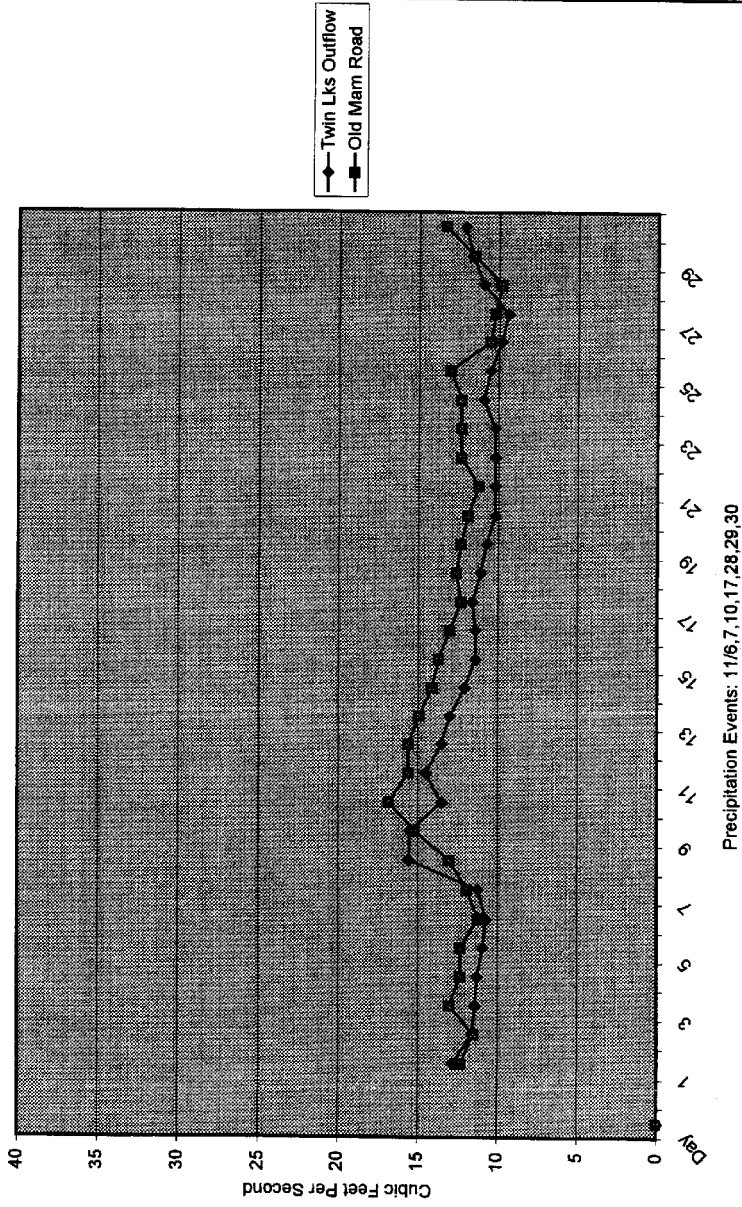
MAMMOTH CREEK STREAMFLOW COMPARISON



Precipitation Events: 10/24,25,29

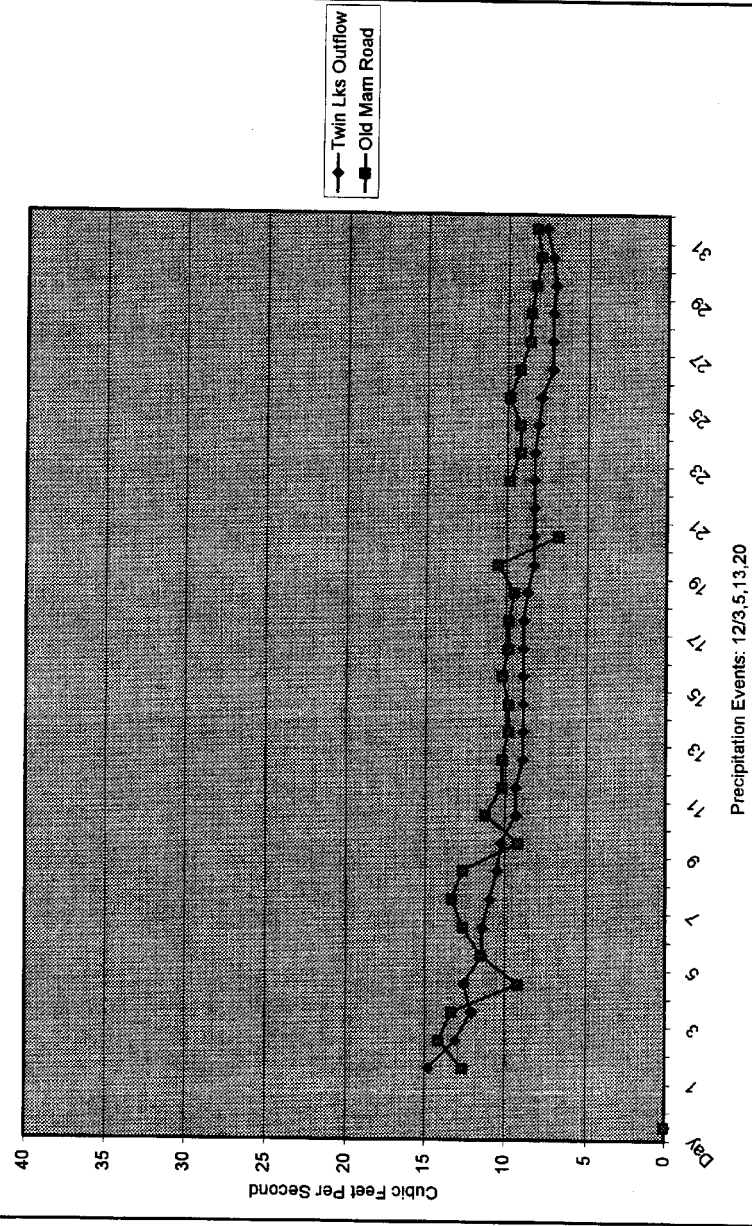
October 1998

MAMMOTH CREEK STREAMFLOW COMPARISON



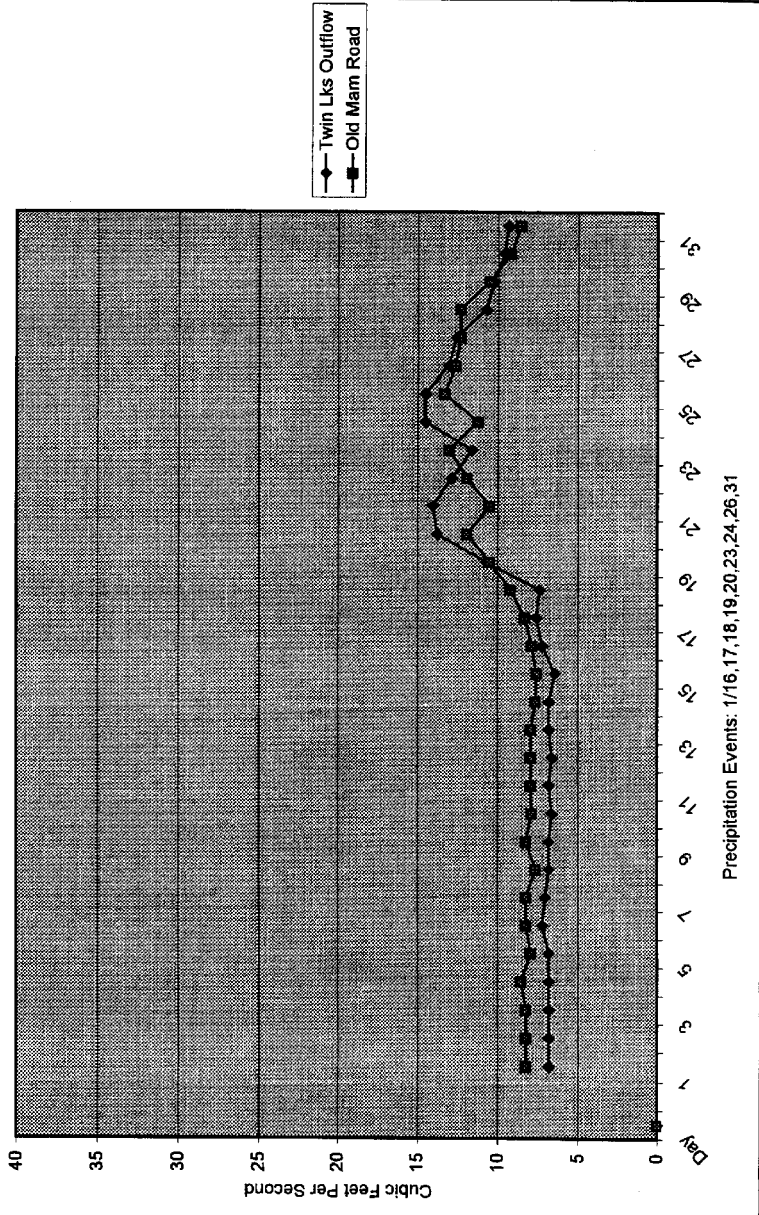
November 1998

MAMMOTH CREEK STREAMFLOW COMPARISON



December 1998

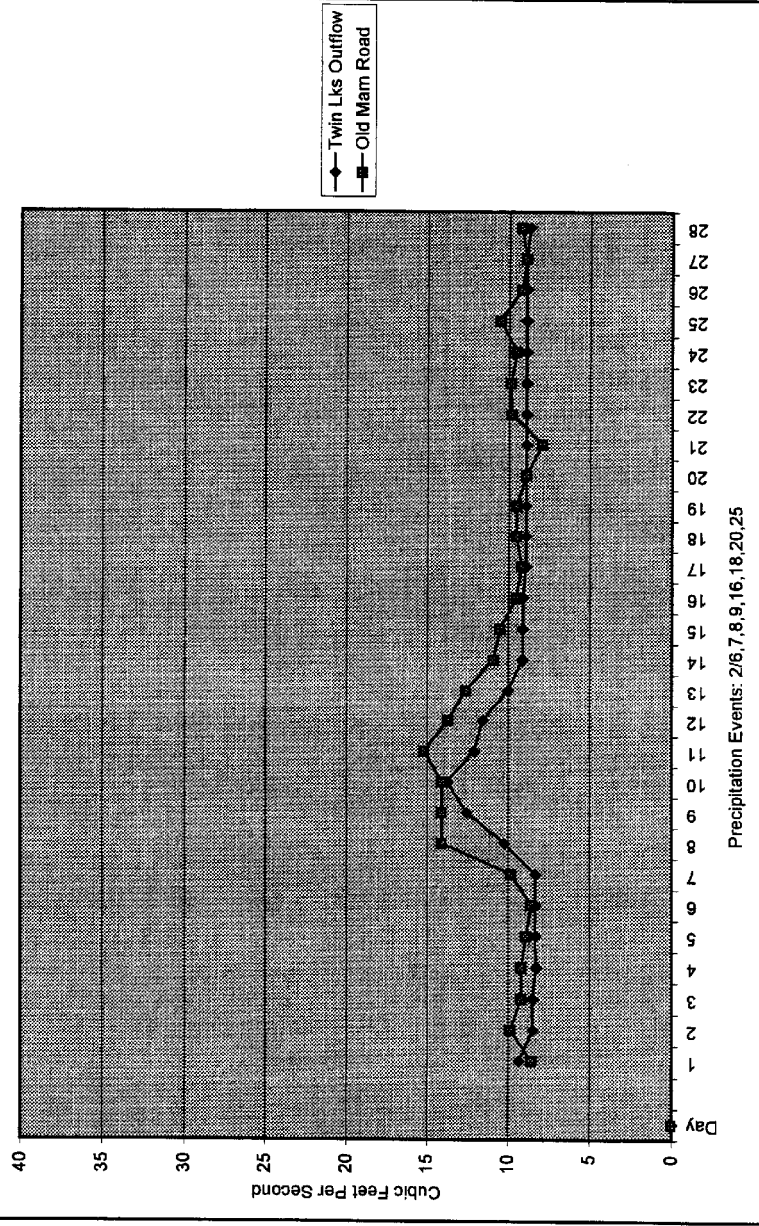
MAMMOTH CREEK STREAMFLOW COMPARISON



Precipitation Events: 1/16, 17, 18, 19, 20, 23, 24, 26, 31

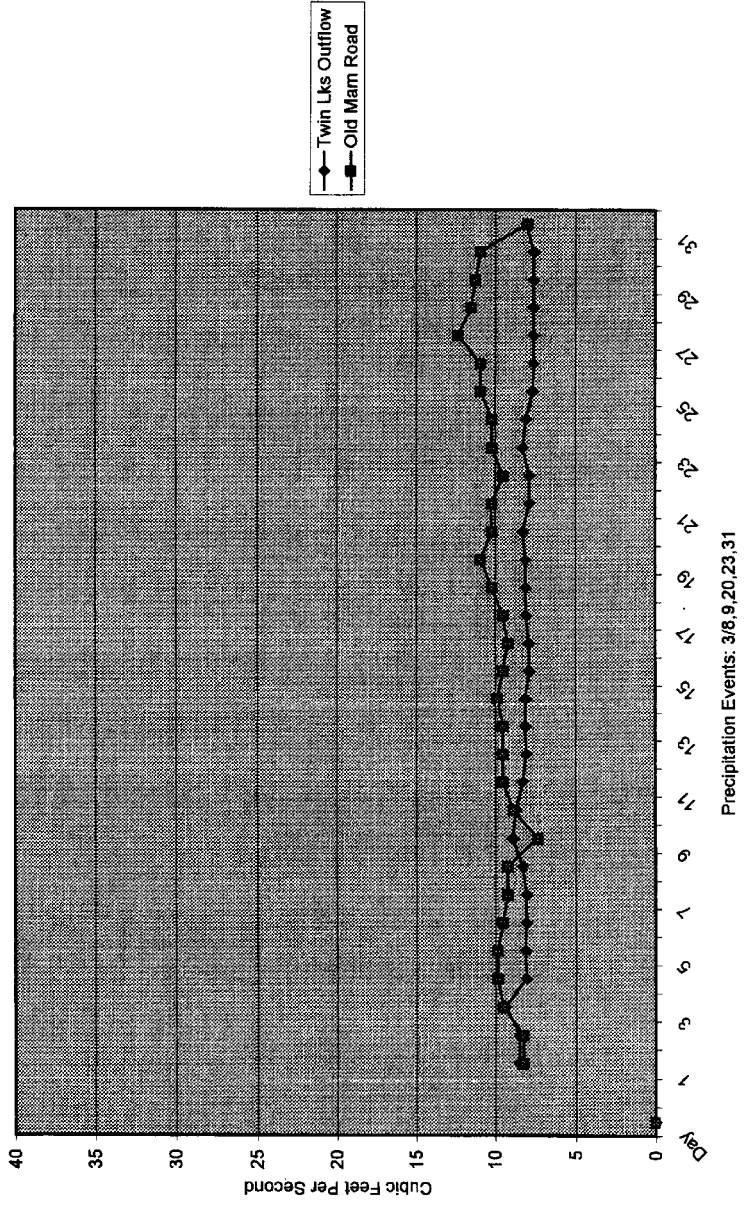
January 1999

MAMMOTH CREEK STREAMFLOW COMPARISON



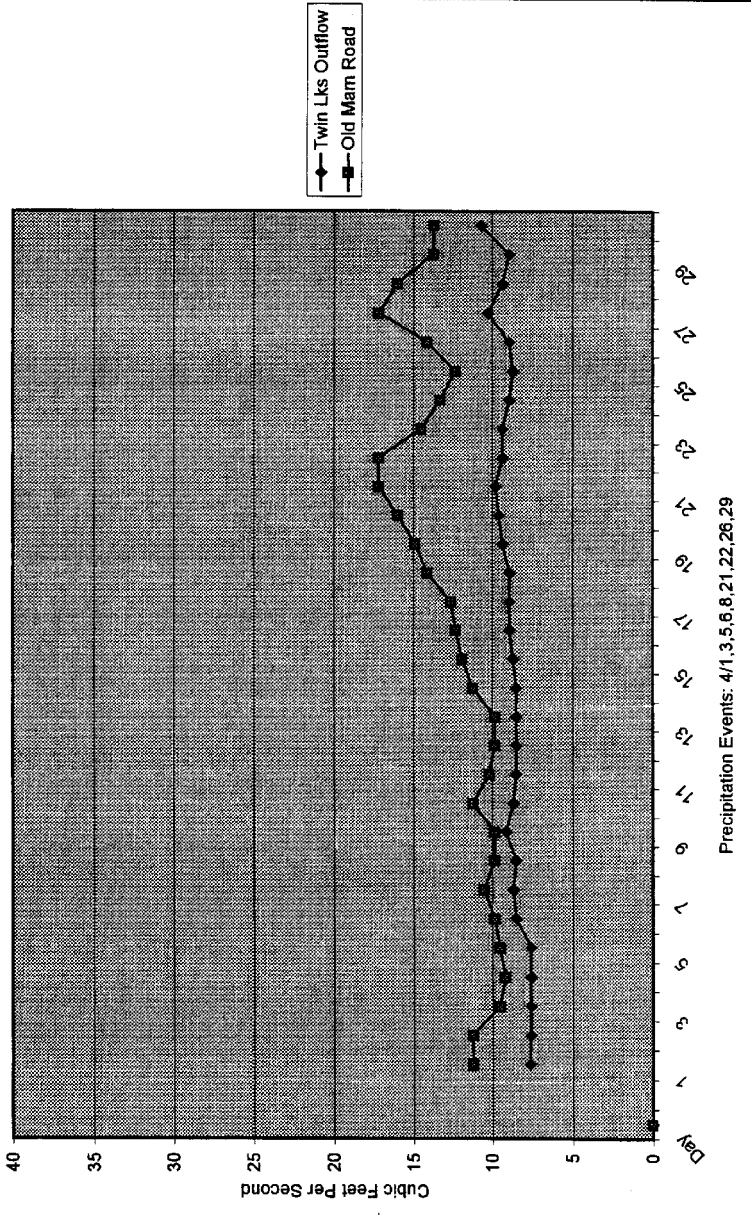
February 1999

MAMMOTH CREEK STREAMFLOW COMPARISON



March 1999

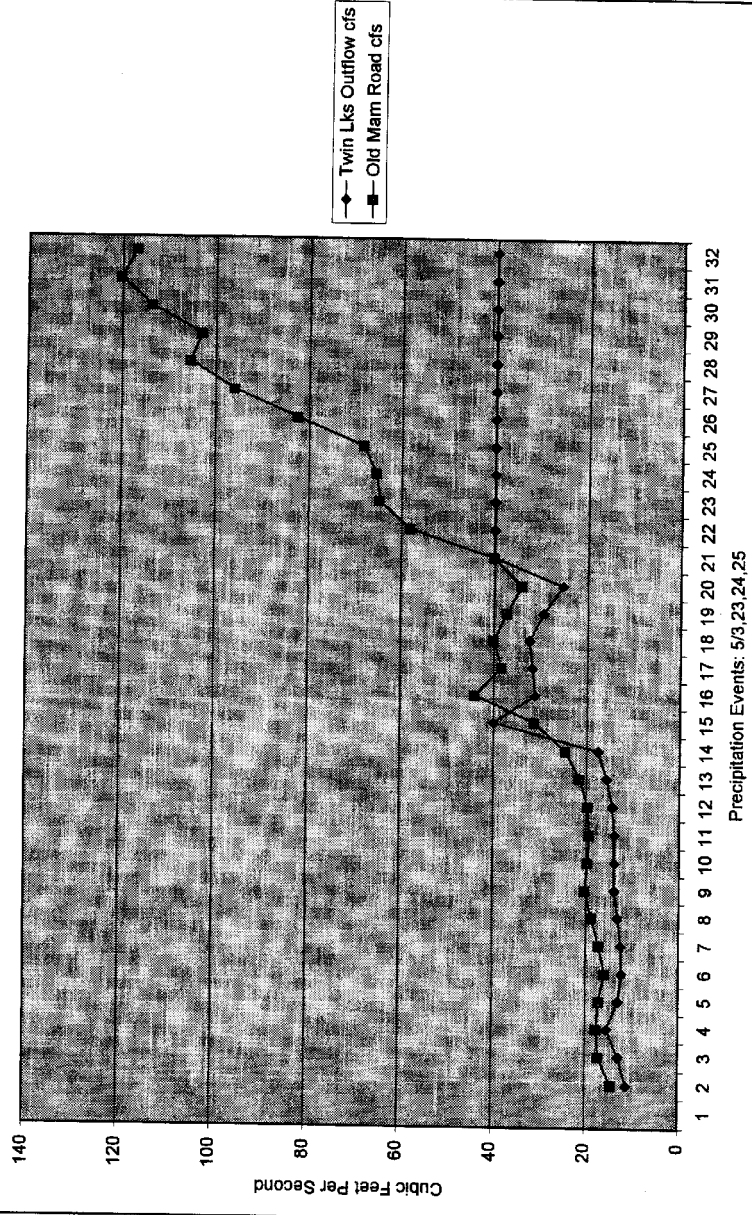
MAMMOTH CREEK STREAMFLOW COMPARISON



April 1999

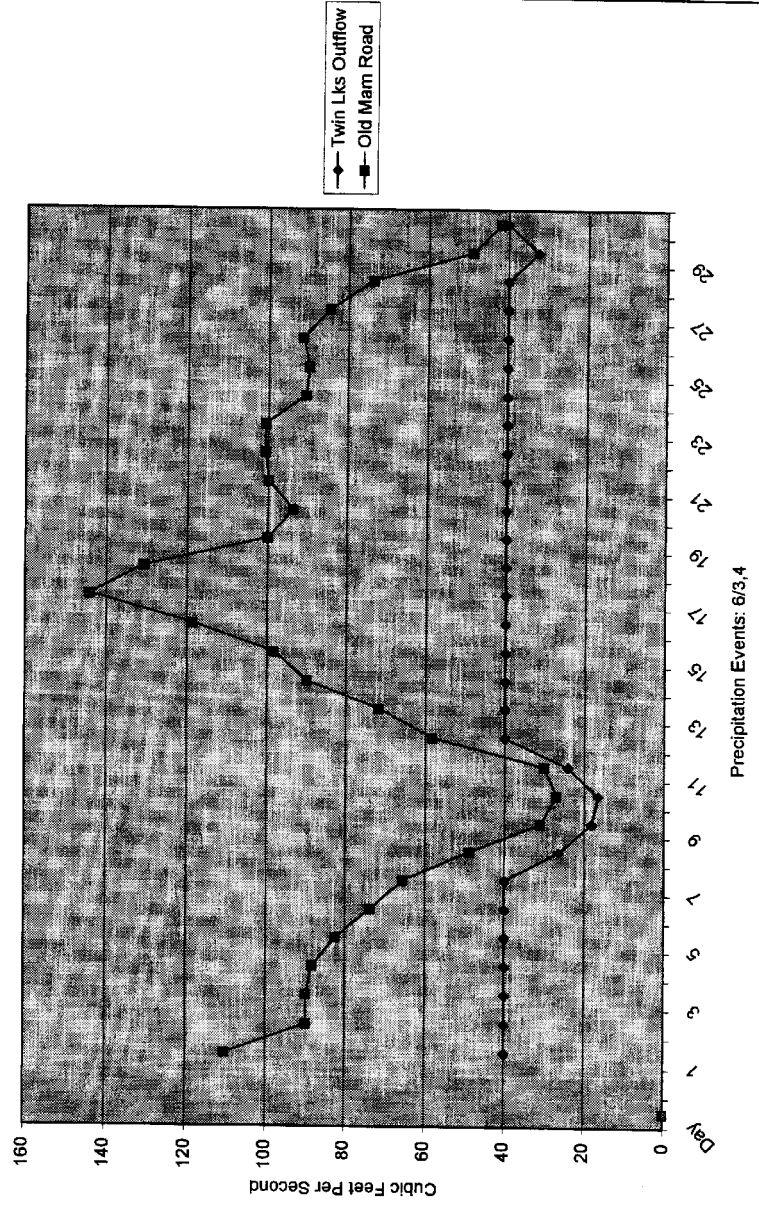


MAMMOTH CREEK STREAMFLOW COMPARISON



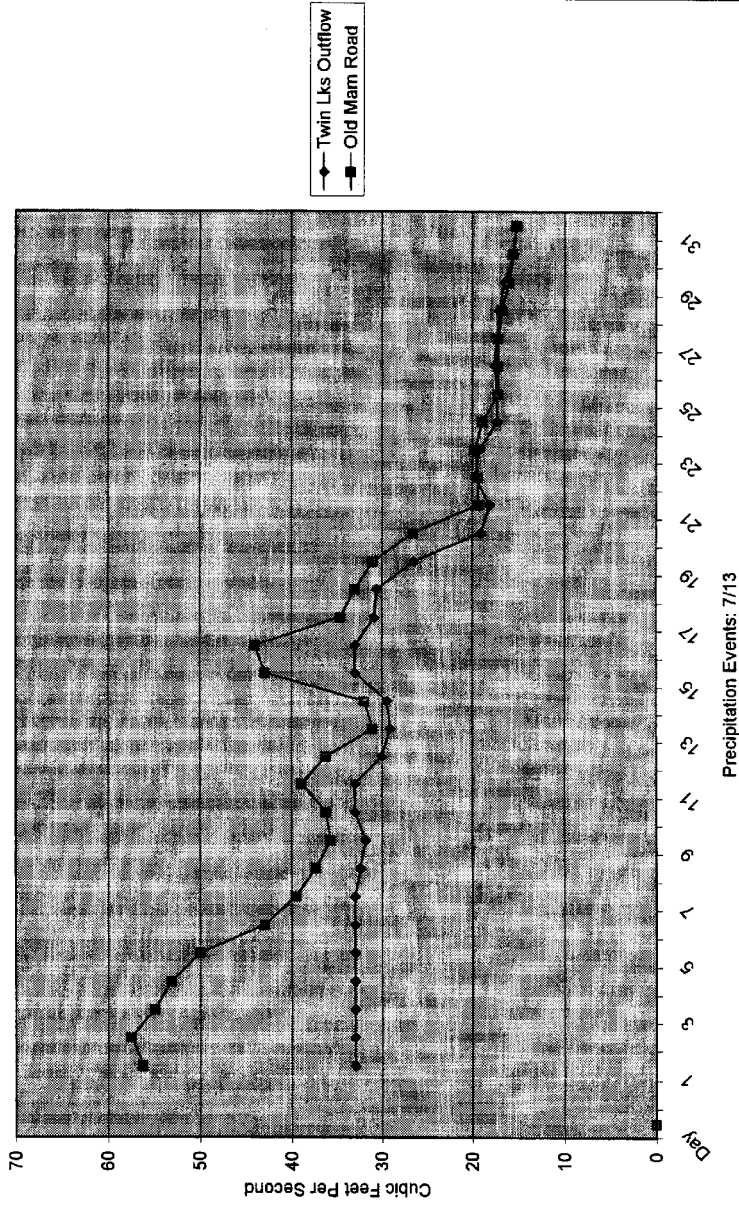
May 1999
(Twin Lakes weir capacity 32.42 cfs)

MAMMOTH CREEK STREAMFLOW COMPARISON



June 1999
 (Twin Lakes weir capacity 32.42 cfs)

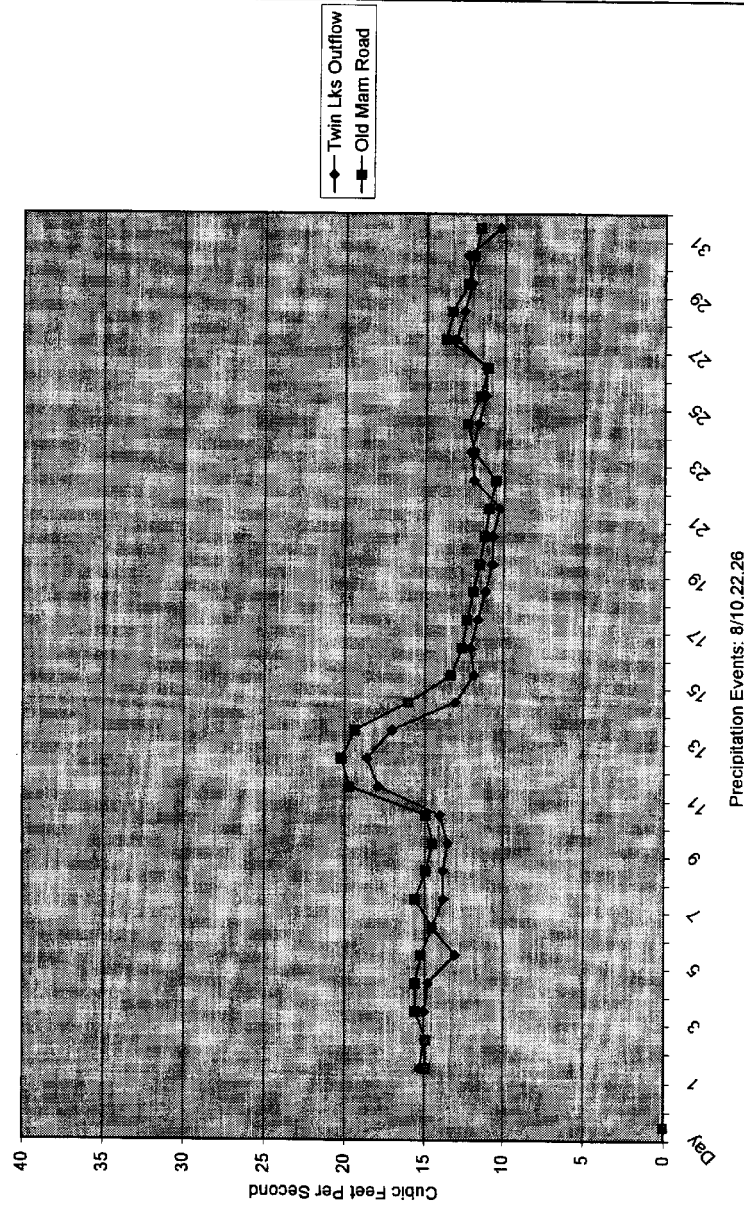
MAMMOTH CREEK STREAMFLOW COMPARISON



Precipitation Events: 7/13

July 1999
(Twin Lakes weir capacity at 32.42 cfs)

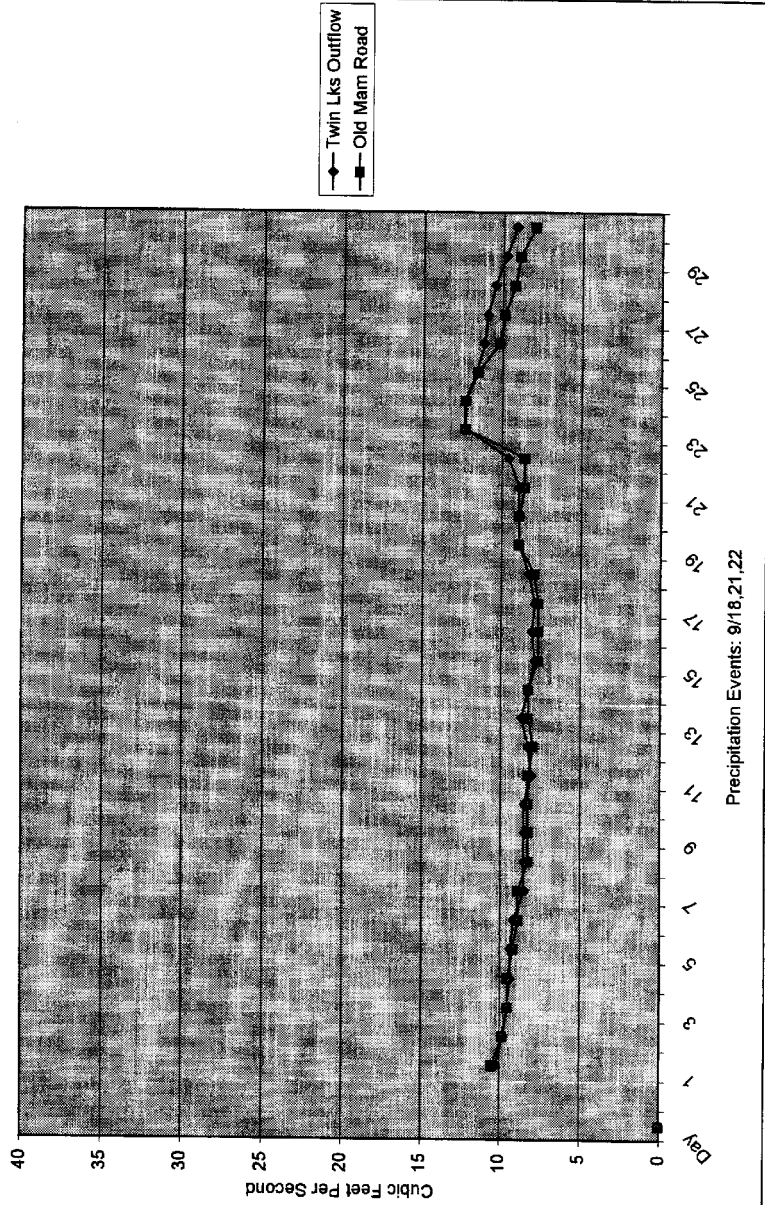
MAMMOTH CREEK STREAMFLOW COMPARISON



Precipitation Events: 8/10, 22, 26

August 1999

MAMMOTH CREEK STREAMFLOW COMPARISON



September 1999

APPENDIX G

VALENTINE RESERVE SPRINGFLOW

**Valentine Reserve Spring Discharge
1998-99**

<u>Date</u>	<u>Time</u>	<u>24 Av. Flow (gpm)</u>	<u>Date</u>	<u>Time</u>	<u>24 Av. Flow (gpm)</u>
5-Nov1998	17:00	66.8	24-Dec	16:59	59.9
6-Nov	17:00	66.6	25-Dec	16:59	59.5
7-Nov	17:00	66.4	26-Dec	16:59	59.3
8-Nov	17:00	66.2	27-Dec	16:59	59.3
9-Nov	17:00	65.9	28-Dec	16:59	58.8
10-Nov	17:00	65.7	29-Dec	16:59	58.8
11-Nov	17:00	65.4	30-Dec	16:59	58.6
12-Nov	17:00	48.9	31-Dec1998	16:59	58.7
13-Nov	17:00	65.5	1-Jan1999	16:59	58.4
14-Nov	17:00	65.6	2-Jan	16:59	58.4
15-Nov	17:00	65.7	3-Jan	16:59	58.4
16-Nov	17:00	65.3	4-Jan	16:59	58.2
17-Nov	17:00	65.6	5-Jan	16:59	57.9
18-Nov	17:00	65.2	6-Jan	16:59	57.7
19-Nov	17:00	64.6	7-Jan	16:59	43.3
20-Nov	17:00	64.6	8-Jan	16:59	43.3
21-Nov	17:00	64.6	9-Jan	16:59	57.4
22-Nov	17:00	64.9	10-Jan	16:59	57.3
23-Nov	17:00	64.7			
			12-Jan	16:59	57.0
25-Nov	16:59	48.2	13-Jan	16:59	56.8
26-Nov	16:59	64.4	14-Jan	16:59	42.4
27-Nov	16:59	64.2	15-Jan	16:59	56.3
28-Nov	16:59	63.8	16-Jan	16:59	56.2
29-Nov	16:59	63.7	17-Jan	16:59	56.2
30-Nov	16:59	63.6	18-Jan	16:59	56.4
1-Dec1998	16:59	63.4	19-Jan	16:59	56.3
2-Dec	16:59	63.3	20-Jan	16:59	56.8
3-Dec	16:59	63.7	21-Jan	16:59	56.7
4-Dec	16:59	47.8	22-Jan	16:59	42.4
5-Dec	16:59	63.4	23-Jan	16:59	56.4
6-Dec	16:59	63.4	24-Jan	16:59	42.3
7-Dec	16:59	63.2	25-Jan	16:59	56.3
8-Dec	16:59	62.8	26-Jan	16:59	56.3
9-Dec	16:59	62.2	27-Jan	16:59	56.2
10-Dec	16:59	62.0	28-Jan	16:59	55.9
11-Dec	16:59	61.7	29-Jan	16:59	55.7
12-Dec	16:59	61.5	30-Jan	16:59	55.9
13-Dec	16:59	61.2	31-Jan	16:59	41.8
14-Dec	16:59	61.3	1-Feb1999	16:59	55.5
15-Dec	16:59	60.8	2-Feb	16:59	55.4
16-Dec	16:59	61.0	3-Feb	16:59	55.2
17-Dec	16:59	60.8	4-Feb	16:59	55.5
18-Dec	16:59	60.7	5-Feb	16:59	55.5
19-Dec	16:59	60.9	6-Feb	16:59	55.0
20-Dec	16:59	61.1	7-Feb	16:59	57.3
21-Dec	16:59	60.6	8-Feb	16:59	61.0
22-Dec	16:59	60.4	9-Feb	16:59	58.9
23-Dec	16:59	60.0	10-Feb	16:59	57.8

**Valentine Reserve Spring Discharge
1998-99**

<u>Date</u>	<u>Time</u>	<u>24 Av. Flow (gpm)</u>	<u>Date</u>	<u>Time</u>	<u>24 Av. Flow (gpm)</u>
11-Feb1999	16:59	57.0	1-Apr	16:59	80.0
12-Feb	16:59	56.4	2-Apr	16:59	79.0
13-Feb	16:59	55.9	3-Apr	16:59	77.7
14-Feb	16:59	55.8	4-Apr	16:59	76.3
15-Feb	16:59	55.5	5-Apr	16:59	75.3
16-Feb	16:59	55.5	6-Apr	16:59	74.7
17-Feb	16:59	41.7	7-Apr	16:59	74.1
18-Feb	16:59	57.1	8-Apr	16:59	73.6
19-Feb	16:59	57.3	9-Apr	16:59	72.5
20-Feb	16:59	56.6	10-Apr	16:59	70.9
21-Feb	16:59	56.4	11-Apr	16:59	69.1
22-Feb	16:59	56.0	12-Apr	16:59	67.3
23-Feb	16:59	55.7	13-Apr	16:59	65.9
24-Feb	16:59	56.2	14-Apr	16:59	67.5
25-Feb	16:59	56.9	15-Apr	16:59	53.1
26-Feb	16:59	56.8	16-Apr	16:59	73.5
27-Feb	16:59	57.0	17-Apr	16:59	76.8
28-Feb	16:59	59.6	18-Apr	16:59	80.1
1-Mar	16:59	44.9	19-Apr	16:59	88.3
2-Mar	16:59	60.4	20-Apr	16:59	98.2
3-Mar	16:59	61.5	21-Apr	16:59	109.0
4-Mar	16:59	61.9	22-Apr	16:59	118.2
5-Mar	16:59	62.2	23-Apr	16:59	117.4
6-Mar	16:59	62.0	24-Apr	16:59	111.2
7-Mar	16:59	46.9	25-Apr	16:59	105.2
8-Mar	16:59	62.4	26-Apr	16:59	105.4
9-Mar	16:59	62.5	27-Apr	16:59	111.0
10-Mar	16:59	62.2	28-Apr	16:59	111.5
11-Mar	16:59	61.7	29-Apr	16:59	107.1
12-Mar	16:59	61.0	30-Apr	16:59	102.6
13-Mar	16:59	60.5	1-May	16:59	99.5
14-Mar	16:59	60.3	2-May	16:59	99.9
15-Mar	16:59	59.7	3-May	16:59	97.0
16-Mar	16:59	59.4	4-May	16:59	94.2
17-Mar	16:59	59.3	5-May	16:59	94.8
18-Mar	16:59	60.1	6-May	16:59	100.8
19-Mar	16:59	62.0	7-May	16:59	107.3
20-Mar	16:59	63.2	8-May	16:59	82.8
21-Mar	16:59	64.0	9-May	16:59	108.6
22-Mar	16:59	65.6	10-May	16:59	107.6
23-Mar	16:59	67.1			
24-Mar	16:59	51.7	12-May	11:00	111.0
25-Mar	16:59	71.3	13-May	11:00	114.6
26-Mar	16:59	71.4	14-May	11:00	109.2
27-Mar	16:59	55.6	15-May	11:00	103.2
28-Mar	16:59	76.7	16-May	11:00	101.8
29-Mar	16:59	79.3	17-May	11:00	99.6
30-Mar	16:59	79.8	18-May	11:00	98.9
31-Mar	16:59	80.4	19-May	11:00	97.1

**Valentine Reserve Spring Discharge
1998-99**

<u>Date</u>	<u>Time</u>	<u>24 Av. Flow (gpm)</u>	<u>Date</u>	<u>Time</u>	<u>24 Av. Flow (gpm)</u>
20-May 1999	11:00	95.4	2-Sep	16:00	48.9
21-May	11:00	70.1	3-Sep	16:00	48.8
22-May	11:00	90.9	4-Sep	16:00	48.6
23-May	11:00	87.6	5-Sep	16:00	36.2
24-May	11:00	84.9	6-Sep	16:00	36.0
25-May	11:00	83.2	7-Sep	16:00	47.8
26-May	11:00	80.9	8-Sep	16:00	47.4
			9-Sep	16:00	35.4
			10-Sep	16:00	47.2
24-Jul	16:00	47.2	11-Sep	16:00	47.2
25-Jul	16:00	46.7	12-Sep	16:00	47.1
26-Jul	16:00	46.2	13-Sep	16:00	35.2
27-Jul	16:00	34.4	14-Sep	16:00	46.8
28-Jul	16:00	34.3			
29-Jul	16:00	45.9	17-Sep	14:00	54.6
30-Jul	16:00	45.7	18-Sep	14:00	54.9
31-Jul	16:00	46.0	19-Sep	14:00	55.4
1-Aug	16:00	46.0	20-Sep	14:00	56.5
2-Aug	16:00	46.1	21-Sep	14:00	55.5
3-Aug	16:00	46.9	22-Sep	14:00	55.7
4-Aug	16:00	46.5	23-Sep	14:00	56.5
5-Aug	16:00	46.3	24-Sep	14:00	56.2
6-Aug	16:00	47.3	25-Sep	14:00	56.5
7-Aug	16:00	35.2	26-Sep	14:00	56.8
8-Aug	16:00	48.1	27-Sep	14:00	56.6
9-Aug	16:00	48.2	28-Sep	14:00	57.0
10-Aug	16:00	48.4	29-Sep	14:00	55.9
11-Aug	16:00	35.8	30-Sep 1999	14:00	55.0
12-Aug	16:00	48.5			
13-Aug	16:00	48.8			
14-Aug	16:00	48.9			
15-Aug	16:00	48.5			
16-Aug	16:00	48.6			
17-Aug	16:00	49.3			
18-Aug	16:00	48.7			
19-Aug	16:00	48.4			
20-Aug	16:00	36.4			
21-Aug	16:00	48.4			
22-Aug	16:00	48.4			
23-Aug	16:00	48.6			
24-Aug	16:00	47.9			
25-Aug	16:00	48.0			
26-Aug	16:00	48.2			
27-Aug	16:00	49.4			
28-Aug	16:00	48.6			
29-Aug	16:00	48.6			
30-Aug	16:00	48.4			
31-Aug	16:00	48.7			
1-Sep	16:00	36.7			

Valentine Reserve Spring Discharge
1998-99 Daily Average

