GROUND-WATER MONITORING AND PERFORMANCE REVIEW FOR HOMESTAKE'S GRANTS PROJECT

NRC LICENSE SUA-1471 AND DISCHARGE PLAN DP-200, 2002

FOR:

HOMESTAKE MINING COMPANY OF CALIFORNIA

BY:

HYDRO-ENGINEERING, LLC
MARCH, 2003

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FIGURES

1.0 EXECUTIVE SUMMARY AND INTRODUCTION

1.1 EXECUTIVE SUMMARY

Homestake Mining Company manages a groundwater restoration program as defined by Nuclear Regulatory Commission (NRC) License SUA-1471, and New Mexico Environmental Division (ED), DP-200 permit. The current operating program is a dynamic on-going strategy based on a restoration plan, which began in 1977, and is scheduled to be completed in 2011.

Homestake's long-term goal is to restore the ground-water aquifer to levels as close as practicable with respect to the up-stream background levels. A ground-water collection area (see shaded area on Figure 2.1-1B, Page 2.1-11) has been established and bounded by a downgradient perimeter of injection wells. Ground-water flow that enters this area from the tailings areas is within the collection area. All ground water in the alluvial aquifer that is within the collection area is moving to the collection well system and will eventually be collected. Once restoration within the zone is complete and approved by the agencies, the site is to be transferred to the Department of Energy who has the responsibility for long term care and maintenance.

The data reported within this document represents the results of the monitoring program for 2002. This is a yearly reporting requirement. A similar report has been submitted to the agencies for each year since 1983 (see list in Section 1.2).

The restoration program is designed to remove target contaminants from the ground water by flushing the alluvial aquifer with water from fresh water deep wells or water produced from the reverse osmosis (R.O.) plant. A line of upstream collection wells is used to collect the contaminated water, which is pumped to the R.O. plant for treatment or reported to the evaporation ponds.

Historically, the contaminants are found in two different aquifer systems. The primary aquifer is the alluvial system, which averages approximately 100 foot in depth, and extends generally north to south encompassing both the Lobo Creek and San Mateo alluvial aquifers. In addition, the second aquifer system is in the Chinle formation. It is comprised of three separate aquifers, the Upper, Middle and Lower Chinle aquifers. The Upper and Middle Chinle sub-crop to the alluvial system near the project site. Low-level

concentrations have been observed in the Upper and Middle Chinle aquifers near their subcrops with the overlying alluvial system.

The restoration program, as described above, is made up of injection and collection well systems. R.O. product water or fresh water pumped from deep wells is injected in a continuous line across the site. The injection line forms a water barrier that contains the contaminants within the collection area. The contaminated ground water is pumped and collected from a series of wells from within the collection area. The collected aquifer water is pumped to the R.O. plant or to two large lined evaporation ponds for passive and forced (spray) evaporation.

In the years from 1977 to the present, the combination of injection wells and the up-stream collection system has gradually moved the contaminated ground-water plume upgradient leaving the restored portions of the aquifer at or below background levels.

An average of 462 gpm was pumped into the alluvial fresh-water injection systems in 2002. An additional 179 gpm of fresh water was injected into the Upper and Middle Chinle aquifer systems. An average rate of 288 gpm in 2002 of R.O. product water was injected into the alluvial aquifer, in addition to the fresh-water injection program. Significant production of R.O. product water started in July of 1999 with consistent operation during 2000 through 2002 except during equipment repair periods.

In 2002, an average collection rate was maintained at 383 gpm for the alluvial aquifer. An additional 40 gpm was pumped from the aquifer and re-injected within the collection area. The Upper Chinle aquifer collection averaged 30 gpm in 2002, which consisted of pumping well CE2. The upgradient alluvial aquifer collection averaged 45 gpm in 2002, while average rates of 34 and 34 gpm were pumped from the large tailings pile toe drains and tailings pile dewatering, respectively.

The continuing evaluation of the performance of the Grants restoration system, including the 2002 results, show that sulfate, uranium, selenium and molybdenum are still the key parameters at this site. During the restoration of the key parameters, the restoration of other parameters with low levels of concentrations is also completed at the same time. The monitoring program has shown that any low levels of nitrate, radium-226,

radium-228, vanadium and thorium-230 are also reduced when the key parameters are restored in the area.

Sulfate concentrations exceed the background only near the large and small tailings piles in the Grants Project area.

Uranium concentrations exceed the significant level of 0.43 mg/l, within the collection area, near the tailings. There are also six wells in the Felice Acres and one well in the Murray Acres subdivisions that contain concentrations of uranium exceeding background levels. Irrigation is being used to further reduce the low levels of uranium that exceed background levels in a small area southwest of Felice Acres in Section 3.

Selenium concentrations also exceed background levels in the collection area near the large tailing pile and in portions of Section 3 as mentioned above. None of the subdivision wells contained selenium concentrations above background.

Molybdenum concentrations exist in only one subdivision well in central Felice Acres above 0.1 mg/l. All remaining elevated molybdenum concentrations are near the large and small tailings piles. Migration of this constituent has been limited due to natural retardation within the alluvial aquifer.

All radium concentrations in the alluvial aquifer outside of the tailings perimeter were less than the NRC site standard. This shows that this parameter is not now a constituent of concern and should be removed as a site standard for this site.

Vanadium concentrations do not exceed the site standard in any of the wells in 2002. This parameter has been adequately restored to below background levels and should also be removed as a site standard in the near future.

The thorium concentration in all wells were less than the site standard in 2002. The results of this constituent vary significantly at these low levels. The site records for thorium indicate that thorium is a minor parameter at this site and that it should also be removed as a site standard as well.

Observed background concentrations at the Grants site were similar to those in previous years with a maximum selenium concentration of 0.63 mg/l and uranium concentration of 0.21 mg/l. Background sulfate concentrations range up to 1500 mg/l in 2002, similar to previous years. A small molybdenum concentration was observed in a

background well in 2002 but should be given very little significance based on historical values.

Upgradient background concentrations for nitrate varied up to 16.9 mg/l in 2002 showing that natural levels exist upgradient from the site above the State site standard. An area to the northwest of the large tailings pile contains higher nitrate concentrations than overall background levels but these levels are likely natural due to their location. Nitrate concentrations are not important beyond the Homestake Grants Project area. This constituent has been adequately remediated through completed restoration program efforts to date.

Fresh-water injection into Upper Chinle well CW13, east of the East Fault, continued in 2002. This injection has maintained water levels in the Upper Chinle aquifer east of the East Fault for operation of the nearby Upper Chinle collection wells.

Fresh-water injection continued in 2002 in Upper Chinle well CW5 just north of Broadview Acres. This injection has resulted in gradient reversal of the Upper Chinle water back to the north toward the tailings piles from this area. Collection from Upper Chinle well CE2 was initiated in 1999 and continued in 2000 through 2002 and is used in conjunction with the CW5 and CW25 injection to restore this area. Injection into CW25 was started in 2000.

All sulfate concentrations in the Upper Chinle aquifer are below background concentrations and, therefore, no restoration of this constituent is needed in the Upper Chinle aquifer.

Five Upper Chinle well uranium concentrations exceeded the background concentrations in 2002. Restoration of these elevated values should result from the CE2 collection and the CW5 and CW25 injection.

The selenium concentrations in the Upper Chinle aquifer do not exceed the range in background concentrations. One selenium value in 2002 exceeded the NRC standard and equaled the State standard for selenium in the Upper Chinle aquifer near the tailings piles. The site standard for selenium is considered by HMC to be too low since the background values continue to be higher.

The concentrations for molybdenum exceeded the site standard in six wells in the Upper Chinle aquifer during 2002. Restoration for these locations should occur from the CE2 collection and CW5 and CW25 injection.

The nitrate standard for this site is significantly greater than any of the concentrations observed in 2002 in the Upper Chinle aquifer showing that this parameter is not significant in this aquifer.

None of the radium, vanadium or thorium-230 concentrations exceeded the NRC site standards for these parameters in the Upper Chinle aquifer wells in 2002 showing that these parameters are not important in this aquifer. This is expected due to their very limited concentrations in the overlying alluvial aquifer.

The ground-water flow in the Middle Chinle aquifer in 2002 is very similar to that observed previously except due to the changes from CW28 well pumping. Fresh-water injection started in December of 1997 into well CW14. The fresh water is building up a mound of ground water in this area, which will result in reversing the flow of Middle Chinle water back toward the alluvial subcrop. Well CW44 is being used for irrigation supply, which will increase the flow from Broadview Acres in the Middle Chinle aquifer to the south. Well CW28 was added as a supply well for fresh-water injection in 2002.

Water quality in the Middle Chinle aquifer is generally good with all concentrations meeting the background sulfate concentrations. Uranium and selenium concentrations in the western portion of Felice Acres are only slightly above significant levels due to the alluvial recharge to the Middle Chinle aquifer just south of Felice Acres. Irrigation use of this water by Homestake is being used to reduce these slightly elevated concentrations in western Felice Acres. In the Middle Chinle formation both uranium and selenium are naturally occurring elements so it is difficult to evaluate to what extent past tailings pile seepage has had on this aquifer formation.

Molybdenum, nitrate, radium, vanadium and thorium-230 concentrations in the Middle Chinle aquifer all meet the site standards for these constituents and show that only uranium and selenium are the important parameters relative to this aquifer system.

1.2 INTRODUCTION

This report, as required by the New Mexico Environmental Division (ED) discharge plan DP-200 and the Nuclear Regulatory Commission (NRC) License SUA-1471, presents results of the 2002 annual ground-water monitoring program at Homestake's Grants Project. Homestake Mining Company (HMC) conducted uranium milling operations five miles northeast of Milan, New Mexico from 1958 to 1990 (see Figure 1.2-1). Referred to as the Grants Project, HMC deposited uranium tailings from the alkaline (high pH) Grants mills into two unlined piles (large and small tailings) that overlie San Mateo alluvium. The San Mateo alluvium is simply referred to as the alluvium or alluvial aquifer in this report. In 1977, due to concerns about ground-water selenium levels, HMC installed a system of wells and pumps in order to inject fresh water into the alluvium at the property boundary and to withdraw contaminated water from the alluvium near the tailings.

Previous monitoring reports have been published in quarterly, semi-annual and annual reports[1], which were presented to the ED and the NRC.

Four subdivisions, Broadview, Murray and Felice Acres and Pleasant Valley Estates, are adjacent to the HMC site. These subdivisions are shown on the various figures of the Grants Project area.

Monitoring data for the ground water west of the project site was included in the 1995 through 2002 reports (see Appendix A for water levels and Appendix B for water quality). This area has been designated the "West Area" and it is so labeled on the figures of this report.

The annual ALARA audit is presented in Appendix C. The annual ALARA audit is added to the annual report to meet a license condition. Additionally, an annual inspection of the tailings piles and pond dikes are required to be submitted with the annual report. This inspection report is presented in Appendix D. Appendix E provides a land use survey discussion for the immediate Grants site area. This is a new license condition requirement.

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[1] See Hydro-Engineering 1983b, 1983c, 1984a, 1984b, 1984c, 1985a, 1985b, 1985c, 1985d, 1986a, 1986b, 1986c, 1987a, 1987b, 1988a, 1988b, 1990, 1991, 1992, 1993a, 1994, 1995, 1996, 1997, 1998, 1999, 2000a, 2001a and 2002.

A detailed table of contents is presented behind each of the following report section tabs including a list of figures and tables for the section. The "West Area" map figures throughout have been printed on the back of the page to enable the west and project areas to be viewed simultaneously.

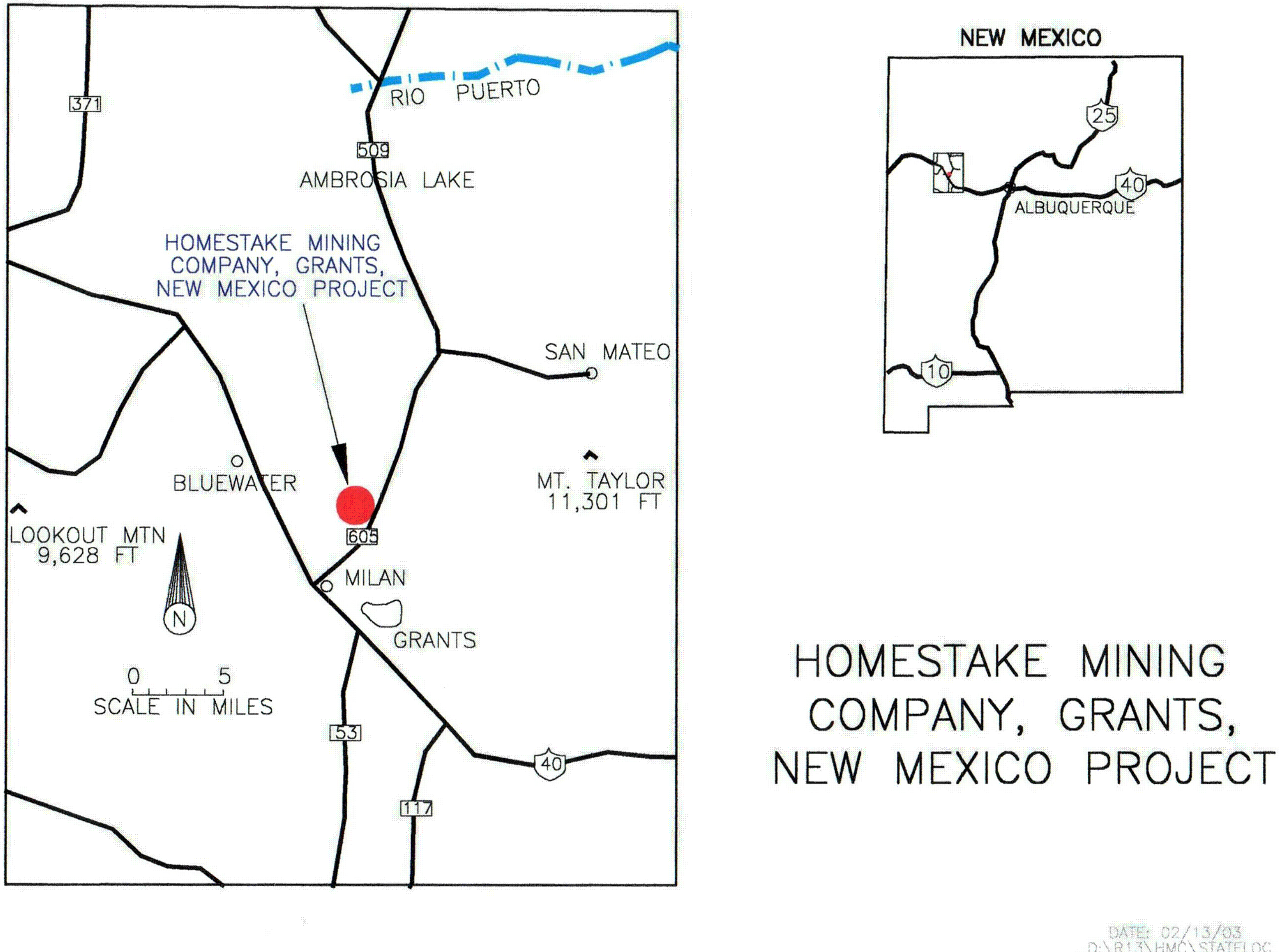

FIGURE 1.2-1. LOCATION OF THE GRANTS PROJECT

SECTION 2

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TABLES

2.0 OPERATIONS

2.1 CURRENT OPERATIONS SUMMARY

The Grants Project ground-water remediation system consists of collection of contaminated ground water near the tailings piles and injection of fresh water and R.O. product water downgradient. These collection and injection systems continued to operate in 2002, along with the reverse osmosis (R.O.) plant, to treat and manage the majority of collection water. The R.O. plant produces an R.O. product that is much better quality than the natural alluvial water and it is used for injection in place of some of the fresh water injection to aid the restoration program. Figures 2.1-1A and 2.1-1B on pages 2.1-10 and 2.1-11 show the location of the present (end of 2002) injection and collection systems along with their starting dates of operation. Figure 2.1-1B also shows the location of the R.O. plant. The pink areas on Figure 2.1-1B show where the tailings piles have been re-contoured to surficially free drain and have interim cover or final reclamation barrier. The red "X" symbols show the location of alluvial collection wells. The green dots depict locations of dewatering wells in the large tailings. The green line around the large tailings indicates the location of the toe drain, which intercepts seepage from the tailings in the uppermost part of the alluvium. The open blue and cyan circles on Figure 2.1-1B show the locations where fresh water or R.O. product is presently being injected, and the solid blue circles show where re-injection is occurring. Collection wells used for re-injection are shown in magenta. The cyan circles indicate fresh-water injection into the Upper (CW5, CW13, CW25 and 944) or Middle (CW14) Chinle aquifers. The three points of compliance (POC) are also shown on this figure as black boxes (wells X, D1 and S4). Water collected from the site is pumped to the R.O. plant or discharged into lined collection ponds or one of two lined evaporation ponds (light blue areas).

The area where the ground-water flow is controlled by the fresh-water injection and collection system is called the "Collection Area" and is shown by the yellow cross-hatched pattern on Figure 2.1-1B. All of the alluvial ground water within the collection area converges to the collection wells.

2.1.1 R.O. PLANT

The R.O. plant consists of a pre-treatment unit, which has a discharge to the evaporation ponds and feeds the two 300 gpm low-pressure R.O. units. The brine from the No. 1 low-pressure unit feeds a 75-gpm high-pressure R.O. unit. The R.O. product water from the two units is discharged to the injection wells. The brine from the R.O. plant is discharged to the evaporation ponds. Some tailings pile collection water was added to the R.O. plant during 2002, which averaged 5.0 gpm based on a yearly average. The R.O. product injection piping has the capability of being discharged to the J and WR injection wells and into the X wells to the south and east of the small tailings pile. Through the end of 2002, R.O. product water was discharged into the X line and injected into wells X1 through X10, X28 through X31 and into wells K2, K6, KA through KE, KM, KN, C4, C13, C5, CW4R, C3R and PM. The R.O. restoration results continued to show that the R.O. product water is much more effective in reducing the uranium and molybdenum concentrations than the fresh water.

2.1.2 COLLECTION

The alluvial aquifer collection rate increased in 2002 because the second R.O. unit was added in 2002. Upgradient collection continues north of County Road 53, collecting background alluvial aquifer water (yellow triangle symbols) for transfer to the drainage system further west (triangle symbols on Figure 2.1-1B). This collection reduces the amount of alluvial water flow into the tailings area. Upper Chinle collection continued from well CE2 (located south of the collection ponds) as injection water for some of the tailings flushing.

2.1.2.1 ALLUVIAL

The red X's on Figure 2.1-1B show the location of five lines of collection wells. The S and D-lines are adjacent to the large tailings, and the K and C-lines are adjacent to the small tailings. New wells B6, B7, B9, DA3, DA4 and SUR were added to the collection

system in 2002. The L-line south of the small tailings continued to operate in 2002 with wells 521, 522 and 639 added to this collection in June of 2002. Alluvial water is pumped from these lines of collection wells to the R.O. plant or it is pumped to the re-injection wells. Figure 2.1-2 on page 2.1-12 graphically presents collection rates for the last six years at the Grants Project. The alluvial collection system rates are shown on this figure as red squares, which increased approximately 100 gpm in 2002 as compared to 2001. Alluvial collection averaged 383 gpm in 2002. An additional average rate of 40 gpm was also pumped from the alluvium for re-injection in 2002 (magenta star).

2.1.2.2 UPGRADIENT

Collection of alluvial water upgradient of the tailings piles started in January of 1993 and continued through 2002. Wells P2 and P4 were pumped in 2002 (yellow triangle symbols in Figure 2.1-1B). This upgradient water was transferred to the next drainage channel to the west. The transfer of this upgradient water is intended to prevent this alluvial water from entering the Grants Project area at the north side of the large tailings. The upgradient collection rate for this effort averaged 45 gpm during 2002 (see green triangle symbols on Figure 2.1-2). Monthly rates were not collected for the upgradient wells and therefore only the yearly average is presented for 2001 and 2002 on Figure 2.1-2.

2.1.2.3 UPPER CHINLE

Figure 2.1-2 also shows the collection rate for Upper Chinle collection well CE2 (see Figure 5.1-1B for location), which is on the south side of the collection ponds. Upper Chinle collection was started in well CE2 in 1999 and is expected to continue for several years. Well CE2 was used to supply water to the large tailings pile for the tailings flushing program during 2002. The yearly average collection rate from the Upper Chinle was 29.8 gpm.

2.1.2.4 QUANTITY OF CONSTITUENTS COLLECTED FROM THE ALLUVIAL AQUIFER

Table 2.1-1 (page 2.1-16) presents the quantities of chemical constituents collected from the ground-water system, the tailings and the toe drains. The ground-water collection system has produced an average pumping rate of 254 gpm between 1978 and 2002. The collection rate that has been re-injected into the alluvial aquifer is not included in the values in Table 2.1-1. The quantity of constituents removed in 2002 was computed by multiplying the average concentration of a particular constituent for each collection well by the volume of water pumped from each well for that year. The average concentration was computed by dividing the total gallons of water pumped from the collection system in the year into the total number of pounds and converting to mg/l.

2.1.3 INJECTION

The fresh-water and R.O. injection system, which aids in the reversal of the piezometric surface back toward the collection wells, consists of a line of injection wells which is oriented generally west-northwest from the south side of the small tailings to the north side of Murray Acres and continuation of this line to the northwest and north to the north side of Section 27 (Figure 2.1-1B). This injection line also extends on the southeast and east sides of the small tailings and is called the X-line in the small tailings area and consists of wells X1 through X10 and wells X28 through X31. The R.O. product water was injected into the X-line during 2002. The R.O. product water has been injected in the X-line wells starting at well X28 and continuing to the northeast through well X10. R.O. product water was also injected into K line in 2002 into wells KA through KE, KM, KN, K, K2, K6 and Y.

2.1.3.1 BROADVIEW AND MURRAY ACRES

The Broadview Acres injection system started in 1977 with the G line on the north side of this subdivision. Injection into the majority of the G-line was discontinued in mid-April in 2000 in order to supply more water to injection wells near the collection area.

The J-line, wells X1 through X10, and wells X28 through X31 are also considered part of the Broadview Acres injection system. Wells X13 through X27 and 1A and 1E were injected with fresh water in 2002. Alluvial fresh-water injection wells 523 and 524 were added to the Broadview injection system in 2002. The M line of the Murray Acres injection system was initially used in 1983. All wells adjacent to the northeast corner and to the north and west of Murray Acres are included in the Murray Acres injection system. This system includes all of the M and WR injection wells. Injection into the M-line west of well WR1R was discontinued at the end of September of 2000 and injection into the WR-line, north of WR10, began. Figure 2.1-3 (page 2.1-13) presents the combined Broadview and Murray Acres fresh water injection rates for the last six years (blue circle symbols), which averaged 462 gpm during 2002 or a total of 243 million gallons.

2.1.3.2 R.O. PRODUCT

Figure 2.1-3 also shows the rates of R.O. product water injection (see magenta stars). The R.O. product injection averaged 288 gpm in 2002 for a total of 151 million gallons.

2.1.3.3 UPPER CHINLE

From 1984 through early 1995 the Upper Chinle injection system consisted of injecting fresh water into Upper Chinle well CW5 located on the north side of Broadview Acres. This effort restored most of the area in the Upper Chinle aquifer between the two faults. Injection into well CW5 was resumed in April of 1997 and continues at present to complete the restoration of this aquifer.

Restoration of the Upper Chinle east of the East Fault started in 1996 by developing a head in the Upper Chinle aquifer that was greater than the alluvial head. Injection of fresh water into well CW13, an Upper Chinle well, started in June, 1996. Injection in Upper Chinle well CW25, located on the western edge of the Upper Chinle outcrop east of Murray Acres, began in 2000. Injection into CW25 will develop a head in the Upper Chinle aquifer that forces flow in the Upper Chinle back to collection well CE2.

Injection into Upper Chinle well 944 started in June of 2002. The red squares on Figure 2.1-3 present the monthly average injection rates for 2002 into Upper Chinle wells 944, CW5, CW13 and CW25, which averaged 179 gpm on an annual basis.

2.1.3.4 MIDDLE CHINLE

Injection of fresh water into Middle Chinle well CW14 was started in December of 1997. This injection was started to prevent northward movement of alluvial water that recharges the Middle Chinle on the south side of Felice Acres from moving north of Broadview Acres. The injection rate averaged 25 gpm in 2002. This injection has prevented the movement of constituents further to the north and allows upgradient collection from CW44.

2.1.3.5 SECTIONS 28 AND 29

A test of fresh-water injection was initiated in late 1999 and conducted through January of 2000 by pumping San Andres well 951, which is located in Section 20, (see Figure 8.0-1A for location of supply well 951) and subsequent injection of water into alluvial wells 682, 656 and 894 (see Figure 2.1-1A for well location). This fresh-water injection in Sections 28 and 29 was started in March of 2002 to block low contaminant concentrations movement in Section 28 until ongoing irrigation water extraction can reduce these low concentrations. This injection is typically 400 gpm and averaged 297 gpm for 2002 with a total injection of 156 million gallons. Figure 2.1-3 presents the monthly injection rates in the Section 28 and 29 wells (cyan X symbols).

2.1.3.6 SECTION 35

Fresh-water injection in the southwestern quarter of Section 35 was initiated in late 2002 by the production of Upper Chinle well CW18 and Middle Chinle well CW28. This fresh water was injected into alluvial wells 641, 642, 848 and 868. Figure 2.1-3 presents the monthly injection rates for the Section 35 fresh-water injection wells. This fresh-water injection is associated with the ground-water restoration of the Section 3 area. Collection

of water in Section 3 is used for the irrigation program. The yearly average injection rate in Section 35 was 21 gpm for 2002.

2.1.4 RE-INJECTION

Alluvial water containing low concentrations of contaminants is being collected and is then re-injected into higher concentration alluvial areas in the collection area in order to enhance restoration of those areas. This lower concentration water will be as effective (see sulfate, uranium, selenium and molybdenum concentrations in plots for wells T and TA) as fresh water during the initial stages of restoration and, therefore, is a beneficial use of this slightly contaminated ground water. Water collected from the L-line to the south of the small tailings and wells 521, 522 and 639 were used in 2002 for collection for re-injection. Re-injection into alluvial wells X11, X12, D2 through D4, DAA, DAB, DL, DW, DY, DF, DG, DQ and DX in 2002 and averaged 40 gpm. Injection into wells DF, DG, DQ and DX was started in April of 2002. The monthly rates for the re-injection are not presented on Figure 2.1-3 but are given on Figure 2.1-2 as the collection rates for re-injection.

2.1.5 TAILINGS CONDITIONS

Tailings wells have been installed in the large tailings pile from 1994 through early 2002. Data collected from these wells has been used to determine the amount of water in the re-contoured, stabilized tailings that is drainable. The tailings wells have also been useful in the evaluation of the tailings dewatering program. No dewatering of the tailings occurred in 1998 and 1999 due to limited capacity in the evaporation ponds except for a small rate in late 1999 for some testing. The complete dewatering program was restarted in 2000 and operated all of 2001 and into mid-April 2002 when operations through the remainder of the year were reduced due to storage availability in the evaporation ponds.

Figure 2.1-4 presents the locations of tailings wells that were pumped in 2002. The cumulative volume of tailings water pumped from 1995 through 2002 is presented on

Figure 2.1-5. A total volume of 98 million gallons of water had been removed from the tailings via dewatering wells by the end of 2002. A total of 18 million gallons was pumped from the tailings in 2002. The yearly average collection rate, including down periods, from the tailings was 34 gpm in 2002.

Wells CE2, CW1, CW2, CW3, 929 and 934 have been used to supply water for flushing the large tailings in 2002. A total of 159 million gallons were injected into the tailings in 2002, which is an average rate of 302 gpm. This program is enabling a larger rate to be produced from the tailings dewatering wells and enhancing the reduction of contaminant concentrations in the tailings.

Tables B.1-1 and B.1-2 of Appendix B present chemical analyses of tailings well water for 2002.

2.1.6 TOE DRAIN CONDITIONS

A series of toe drains have been installed around the large tailings pile to intercept perched ground water seeping from the tailings into the alluvium. The locations of the toe drains and their associated sumps are also shown on Figure 2.1-4. Nine sumps are located around the perimeter of the large tailings pile with two of these sumps tied to the old tailings decant towers (East and West reclaim sumps) that are utilized for collection of toe seepage. Seven of these sumps are connected to the toe drain systems, which are situated around the perimeter of the tailings.

Figure 2.1-5 shows that greater than 145 million gallons of water has been pumped from the toe drains. Approximately 34 gpm of water was collected in 2002 from the toe drains, which is a 16 gpm increase from the 2002 value. This increase is due to the flushing program used on the large tailings pile.

Table 2.1-1 also presents the 2002 quantity of constituents collected from the toe drains. Water quality sample results from the toe drains for 2002 are presented in Tables B.2-1 and B.2-2 of Appendix B.

2.1.7 LINED EVAPORATION PONDS

The use of lined evaporation collection ponds began in October of 1986 when the two were constructed. The large evaporation pond, No. 1, on the small tailings began receiving water in November of 1990. The usage of the second large evaporation pond (No. 2) began in March of 1996.

The majority of the water from the collection system, and some water from the tailings dewatering wells and toe drains is pumped to the R.O. plant as feed water. The majority of the removed tailings water is reported directly to the collection ponds. Excess water is transferred from the East Collection pond to the No. 2 evaporation pond. When necessary, water is transferred from the No. 2 evaporation pond to the No. 1 evaporation pond. Both ponds use spray systems to enhance evaporation.

A few water samples have been collected from the No. 1 and No. 2 large evaporation ponds, the East Collection pond (E COLL POND), and the West Collection pond (W COLL POND). The results of these samples are presented in Tables B.3-1 and B.3-2 of Appendix B.

2.1.8 IRRIGATION

Three irrigation systems were operated in 2002 with the addition of a 60-acre center pivot in Section 28. The 150-acre center pivot in the southwest quarter of Section 33 and 120 acres of flood irrigation in the eastern half of Section 34 were used for the third full irrigation season. Figures 4.1-1A and 4.1-1B show the supply wells for these three irrigation areas. Wells 631, 632, 862, 863, 869, 648, 649, 647, 496, 653, 657, 658 and CW44 were used for the irrigation supply of the Sections 33 and 34 areas in 2002. These supply wells are piped together and are used on only one irrigation area at a time. Wells 634, 659, 881 and 890 are the supply wells for the Section 28 pivot irrigation. These three areas were successfully irrigated during the entire 2002 growing season with 1, 3 and 4 hay cuttings produced from the Sections 28, 33 and 34 areas, respectively. A total of 995 AC-FT of water was applied to the three irrigation areas in 2002.

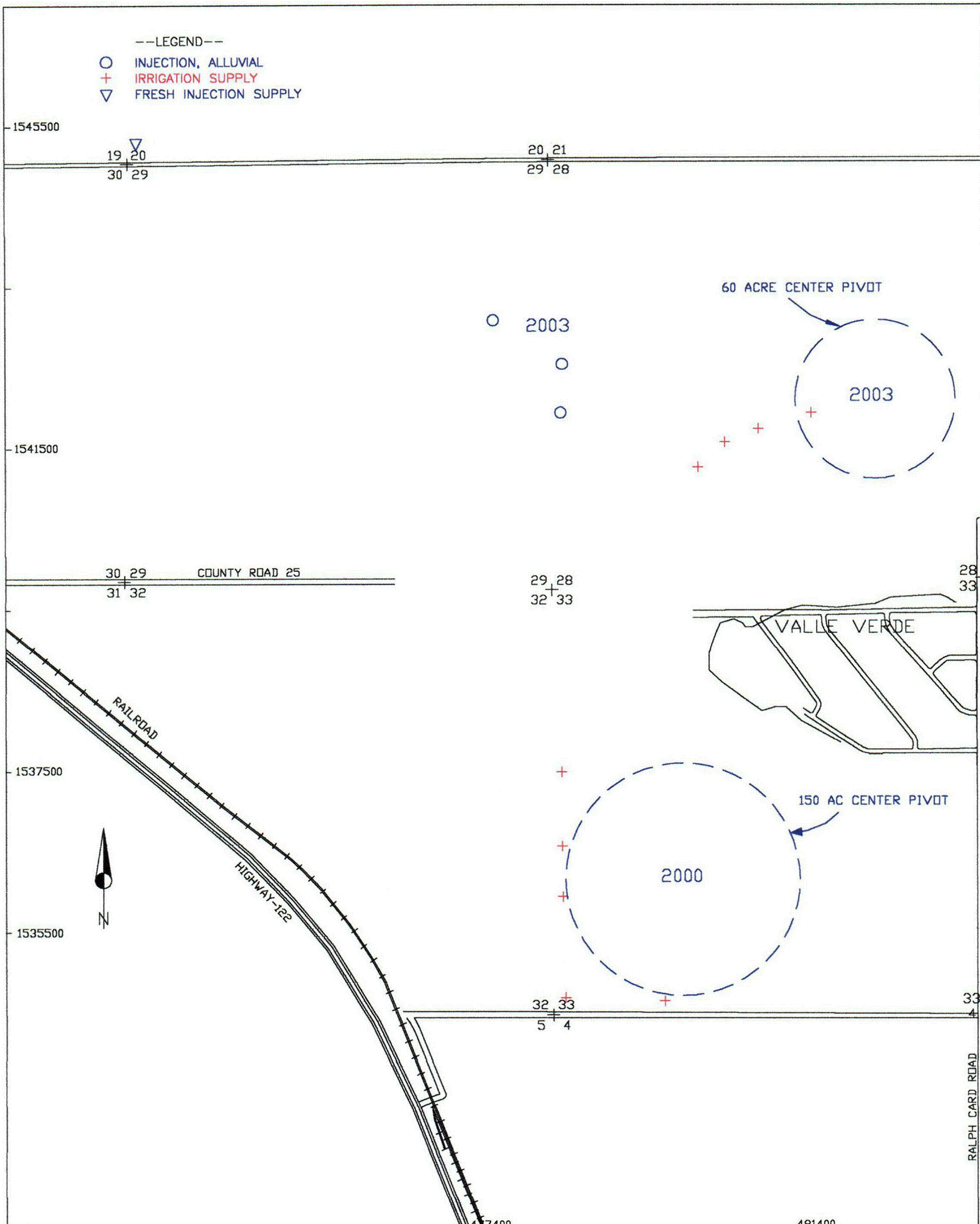

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FIGURE 2.1-1A.	LOCATIONS OF PRESENT INJECTION AND COLLECTION SYSTEMS WITH START OF OPERATION DATES (WEST AREA)	D:\R13\HMC\ 01WQAL lh
		page 2.1-10

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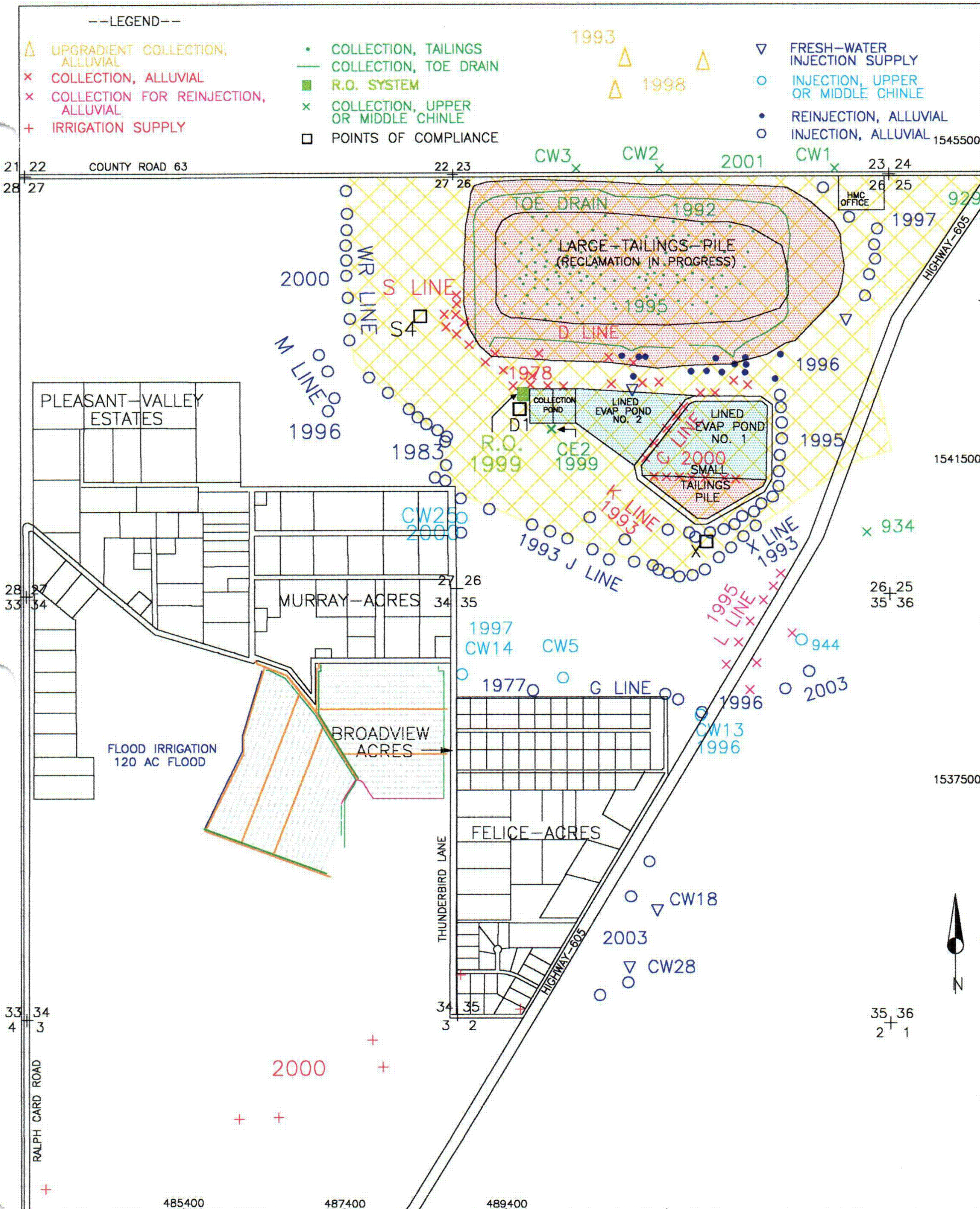

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FIGURE 2.1-1B. LOCATIONS OF PRESENT INJECTION AND COLLECTION SYSTEMS WITH START OF OPERATION DATES

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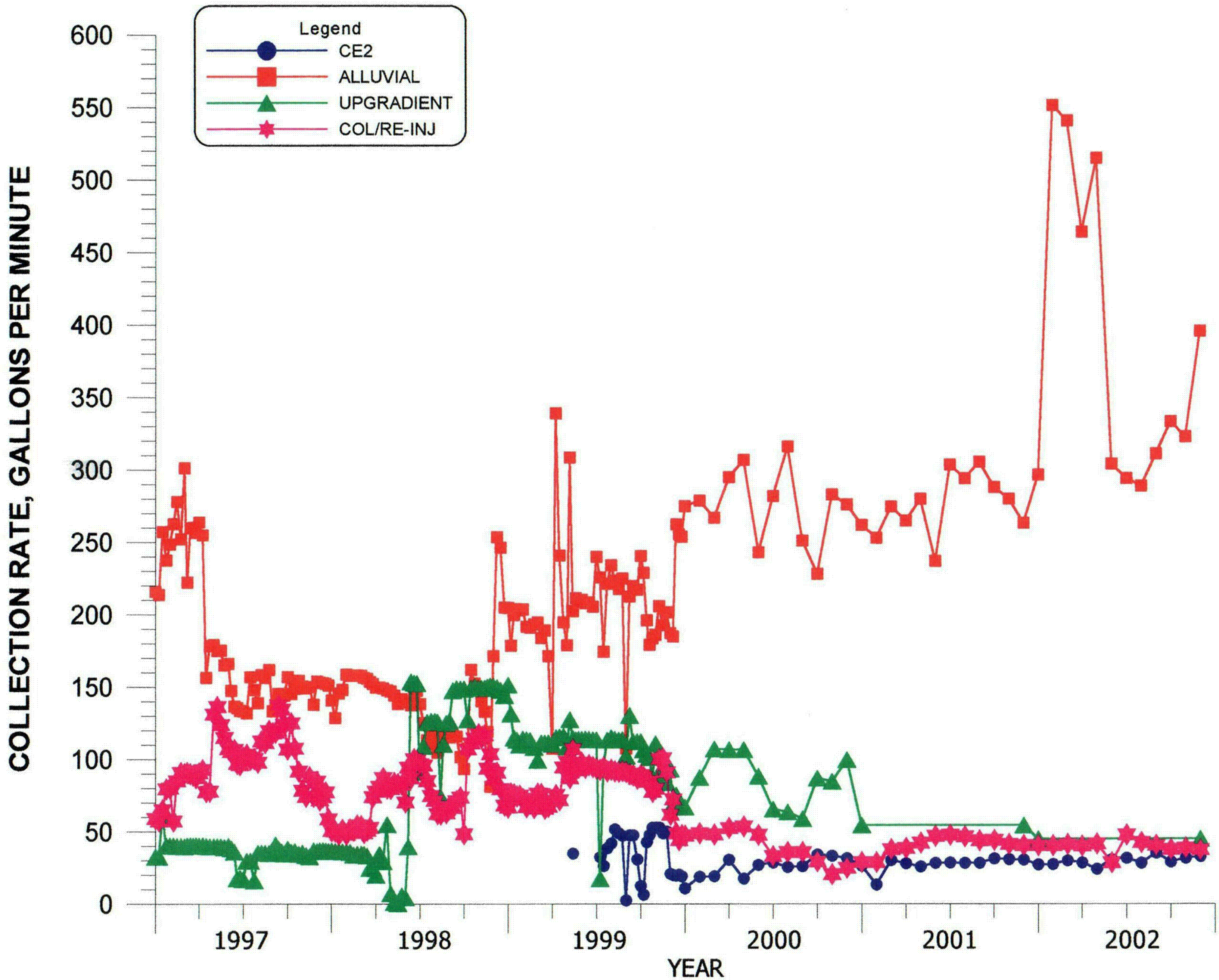

FIGURE 2.1-2. AVERAGE MONTHLY COLLECTION RATES FOR THE ALLUVIAL AND UPPER CHINLE AQUIFERS.

C04

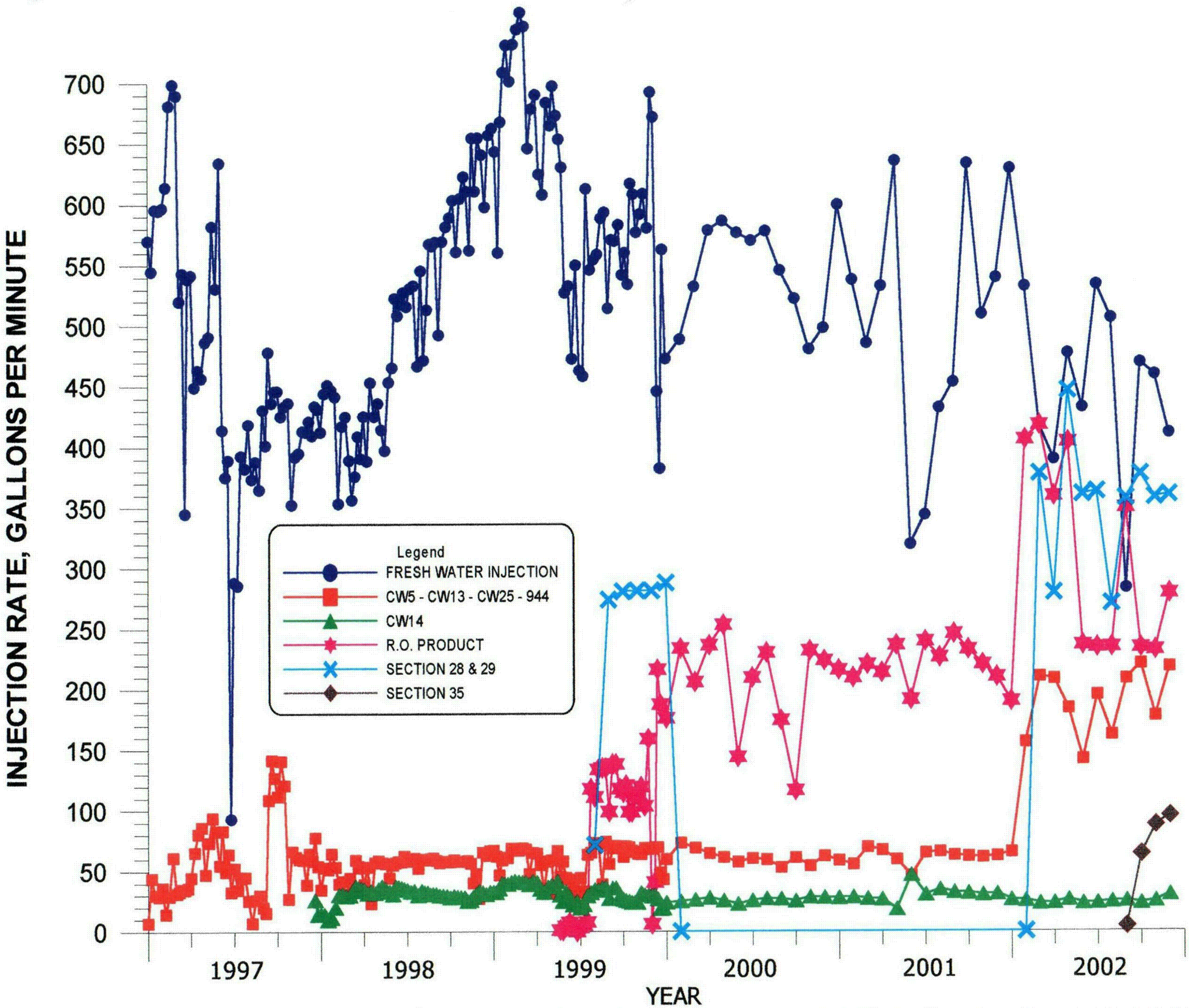

FIGURE 2.1-3. AVERAGE MONTHLY INJECTION RATES FOR THE ALLUVIAL AND UPPER CHINLE AQUIFERS.

C05

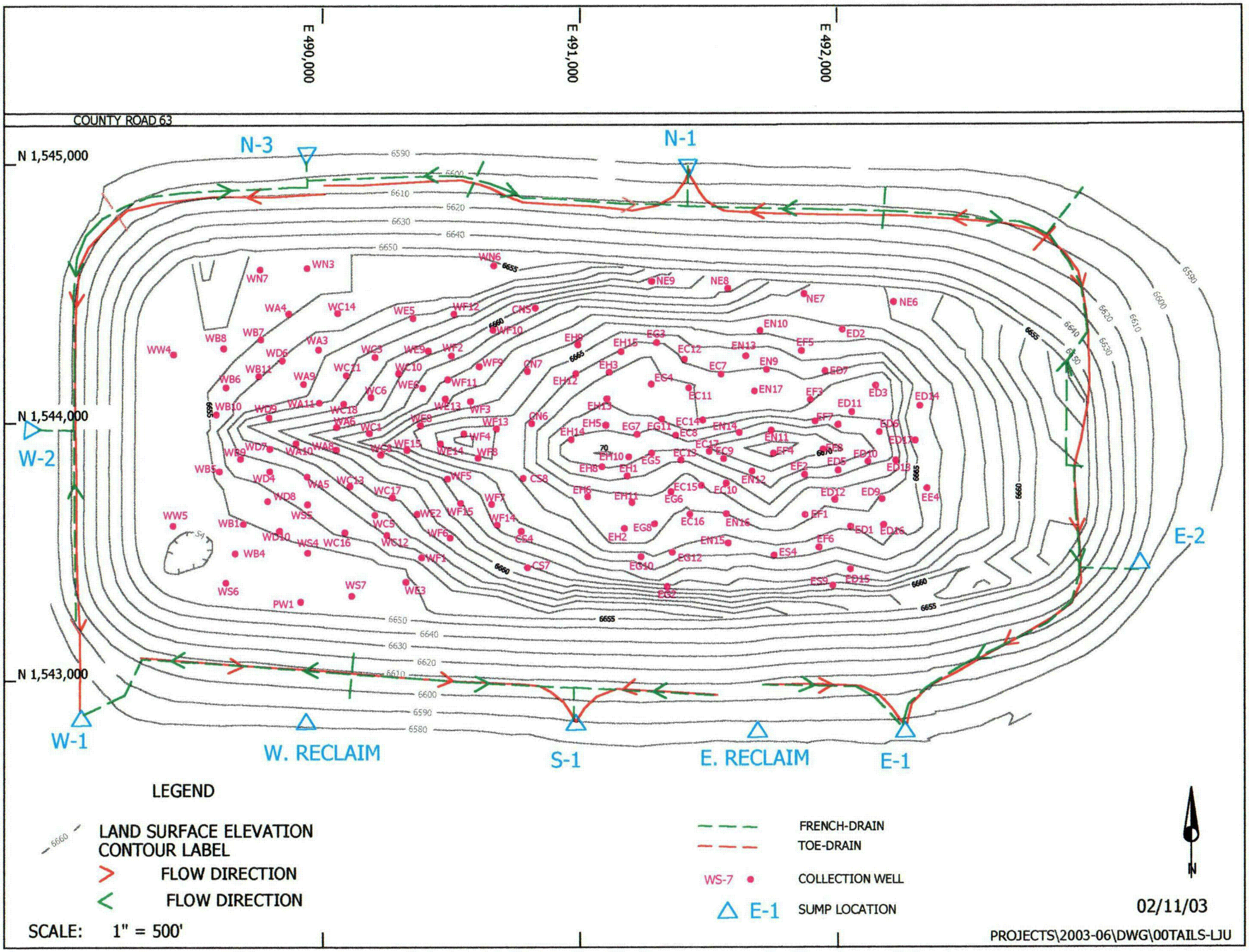

FIGURE 2.1-4. LOCATIONS OF TAILINGS DEWATERING WELLS, TOE DRAINS AND SUMPS

C06

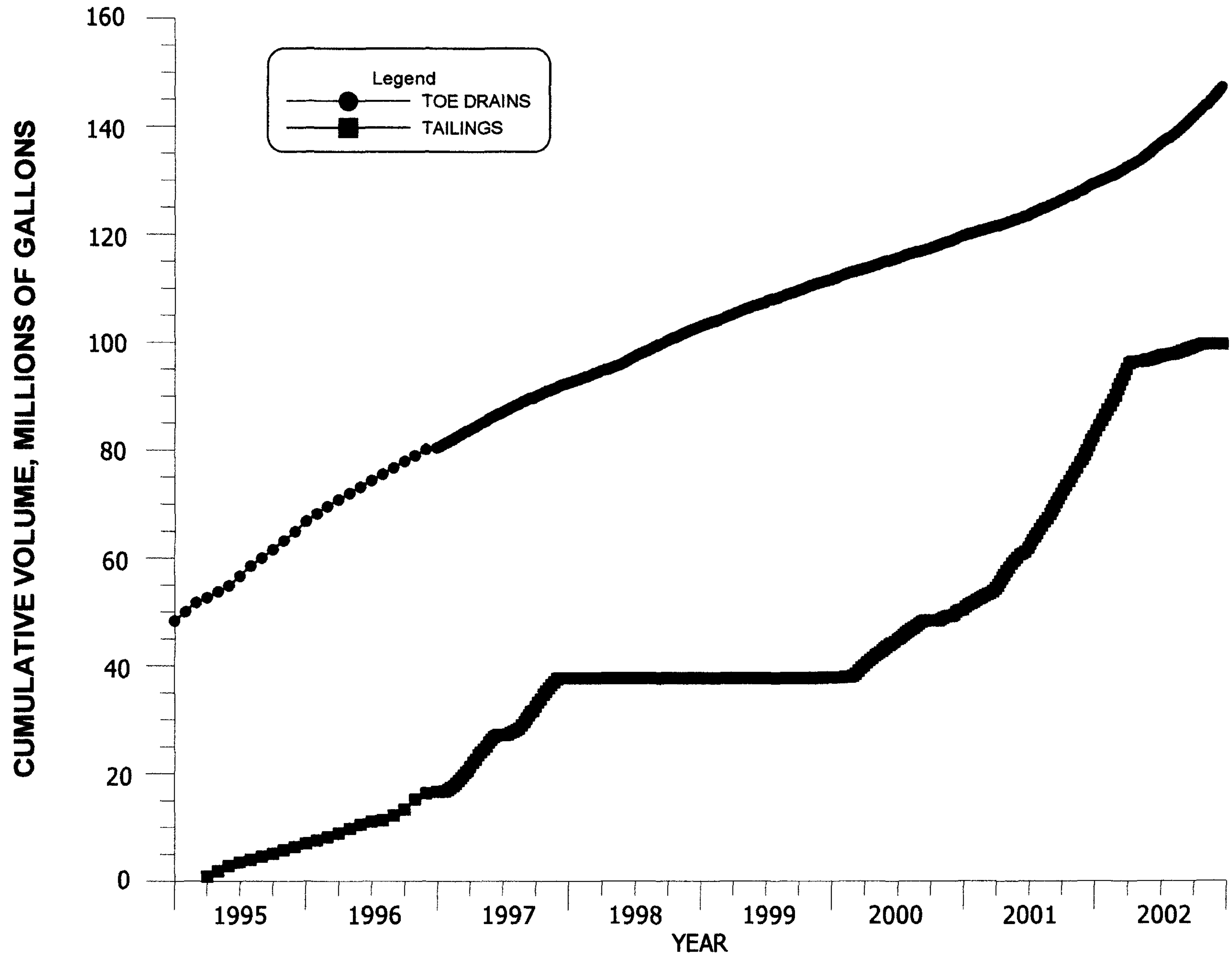

FIGURE 2.1-5. CUMULATIVE VOLUME OF COLLECTION FROM TAILINGS DEWATERING WELLS AND TOE DRAINS.

TABLE 2.1-1. QUANTITIES OF CONSTITUENTS COLLECTED.

YEAR	SOURCE	TOTAL VOLUME PUMPED (GAL)	SULFATE (SO4) CONC. (MG/L)	SULFATE (SO4) AMT. (LB)	URANIUM (U) CONC. (MG/L)	URANIUM (U) AMT. (LB)	MOLYBDENUM (MO) CONC. (MG/L)	MOLYBDENUM (MO) AMT. (LB)	SELENIUM (SE) CONC. (MG/L)	SELENIUM (SE) AMT. (LB)
1978	G.W.	27670033	5200	1200620	35	8081	40	9236	2	462
1979	G.W.	46371629	5200	2012095	35	13543	40	15478	2	774
1980	G.W.	39385860	5200	1708978	35	11503	40	13146	2	657
1981	G.W.	91613183	5200	3975155	35	26756	40	30578	2	1529
1982	G.W.	159848025	5200	6935910	35	46684	40	53353	2	2668
1983	G.W.	167018540	5200	7247043	35	48778	40	55746	2	2787
1984	G.W.	203258522	5200	8819519	35	59362	40	67842	2	3392
1985	G.W.	194074421	5200	8421015	35	56680	40	64777	2	3239
1986	G.W.	199326030	5200	8648886	35	58214	40	66530	2	3326
1987	G.W.	180881740	5200	7848576	35	52827	40	60374	2	3019
1988	G.W.	166460826	5200	7222843	35	48615	40	55560	2	2778
1989	G.W.	175780800	5200	7627243	35	51337	40	58671	2	2934
1990	G.W.	164378919	5200	7132508	35	48007	40	54865	2	2743
1991	G.W.	171497720	5200	7441397	35	50086	40	57242	2	2862
1992	G.W.	128398849	4925	5276234	27.2	29134	35.9	38419	1.60	1718
1992	TOE	8544670	12117	864006	53.2	3793	106.5	7595	1.73	123
1993	G.W.	115795020	5011	4841203	28.1	27130	45.4	43885	1.47	1425
1993	TOE	18357680	12117	1856262	53.2	8150	106.5	16315	1.73	265
1994	G.W.	98294087	4423	3624762	26.0	21146	27.3	22349	1.42	1162
1994	TOE	18337680	12117	1854240	53.2	8141	106.5	16299	1.73	264
1995	G.W.	108306398	3256	2942827	16.1	14553	19.2	17355	1.65	1491
1995	TOE	17711370	11370	1680500	54.6	8069	94.4	13952	2.25	332
1995	TAILS	5905740	8191	403680	36.1	1778	89.7	4420	0.15	7
1996	G.W.	122064160	3899	3967919	20.9	21225	26.8	27259	1.92	1950
1996	TOE	15431810	11537	1484295	46.4	5970	105.0	13509	1.29	166
1996	TAILS	9181390	9434	722129	40.2	3077	108.0	8236	0.18	14
1997	G.W.	94465562	4955	3836678	26.9	20892	33.4	25887	3.17	2456
1997	TOE	12029390	11094	1113808	41.8	419	100.0	10040	0.81	81
1997	TAILS	21292900	10284	1827575	45.8	8139	92.4	16420	0.14	25
1998	G.W.	74459130	5088	3161866	29.6	18385	34.8	21625	1.85	1151
1998	TOE	10321780	9870	850257	42.5	3665	95.2	8203	0.73	63
1999	G.W.	117752408	3363	3305027	16.6	16314	14.8	14545	2.06	2024
1999	TOE	8809890	11560	849976	54.3	3993	106.0	7794	0.46	34
1999	TAILS	120550	9420	9478	40.9	41	111.5	112	0.19	0
2000	G.W.	146609842	3358	4108868	18.8	23004	20.6	25206	1.94	2374
2000	TOE	8032870	9734	652590	58.6	3929	118.0	7911	0.34	23
2000	TAILS	12446810	9710	1008685	37.8	3927	127.0	13193	0.30	31
2001	G.W.	144925056	2770	3350438	19.6	23707	21.4	25884	1.65	1996
2001	TOE	9606280	9935	796529	43.1	3455	95.7	7673	0.78	63
2001	TAILS	31465370	8688	2281555	34.6	9086	89.2	23425	0.19	50
2002	G.W.	201357360	2748	4618092	14.9	25040	16.7	28065	1.23	2067
2002	TOE	17975520	9210	1381718	33.4	5011	88.7	13307	0.76	114
2002	TAILS	17817840	7670	1140588	23.5	3495	40.8	6067	0.12	18
SUM G.W.		3,339,994,120		129,275,703		821,002		953,877		52,984
SUM TOE		145,158,940		13,384,181		54,595		122,597		1,527
SUM TAILS		98,230,600		7,393,691		29,543		71,873		145
COMBINED SUM		3,583,383,660		150,053,574		905,140		1,148,347		54,657

NOTE: Average concentrations for 1978 to 1991 were used in calculating the quantities of constituents removed.
Concentrations from the collection wells have gradually decreased from 1978 through 1991.
G.W. = Ground water; TOE = Toe drains on edge of tailings; TAILS = Large tailings collection wells

2.2 FUTURE OPERATION

Restoration in 2003 is to continue as a combination of fresh-water and R.O. product injection and contaminated water collection to maintain the overall piezometric gradient reversal between the lines of injection (M Line and J Line) and collection near the tailings piles. The reverse osmosis (R.O.) plant can be operated up to 600 gpm. When the plant is operated at full capacity, approximately 440 gpm of R.O. product for injection into the alluvium is produced and approximately 160 gpm of brine reject is reported to the evaporation ponds. The R.O. plant is planned to be operated at 425 gpm in 2003. A larger collection rate and use of the very good quality R.O. product for injection will continue to increase the progress in restoration.

Water collected from the alluvial and Chinle aquifers, where there are relatively low levels of selenium and uranium, will continue to be used for collection for re-injection in the initial phase of restoration. This re-injection will occur in the alluvium where concentrations are greater than those of the injection water until such time as injection with fresh water or R.O. product water will better complete the restoration. The low concentration re-injection water will be limited to areas within the reversal zone upgradient of the J and M injection lines. For the purpose of this document, the reversal zone is called the collection area. To date, re-injection has occurred in wells X5 through X27, 1A, D2 through D4 and DAA, DAB, DL, DW, DY, DF, DG, DQ and DX.

Collection from Upper Chinle well CE2 will continue to intercept contaminant concentrations in this aquifer. Injection into Upper Chinle wells 944, CW5, CW13 and CW25 is planned to continue to control flow in these areas of the Upper Chinle aquifer. The injection into well CW14 will be continued to build the head in this area of the Middle Chinle aquifer to prevent alluvial water from flowing into this portion of the Middle Chinle aquifer.

Irrigation with water from Sections 3, 28, 33 and 35 (southern Felice Acres) is planned for the entire growing season in 2003. The fresh-water injection into Section 28 and 29 will continue in 2003 to restore these slightly elevated contaminant concentration areas. Fresh-water injection is planned to be continued in Section 35 in 2003 and added to

Section 3 to aid the restoration of these areas in conjunction with the use of water for irrigation.

SECTION 3

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3.0 SITE STANDARDS AND BACKGROUND CONDITIONS

3.1 SITE STANDARDS

Six water-quality site standards (U, Se, Mo, Ra226 + Ra228, Th230 and V) have been set for the Homestake site by the United States Nuclear Regulatory Commission (NRC). These site standards are applicable at three points of compliance. Points of compliance (POC) wells are S4, D1 and X (see Figure 2.1-1 for locations). Table 3.1-1 presents the six site standards (see Table 3.3-1 for comparison with background). The established site standards are presently exceeded by the full range in background values for many of the constituents. Therefore, naturally occurring concentrations for these elements will cause compliance issues at this site. The New Mexico standards for uranium, selenium, molybdenum, radium-226 plus radium-228, sulfate, chloride, TDS and nitrate for this site are also presented in Table 3.1-1. Homestake has recently submitted an updated analysis of the full range of background (see Hydro-Engineering 2001c) to justify several changes in the site standards.

TABLE 3.1-1. GRANTS PROJECT WATER-QUALITY STANDARDS.

Constituents	Homestake Standards	
	NRC	**New Mexico**
Uranium	0.04	5
Selenium	0.1	0.12
Molybdenum	0.03	1.0@
Vanadium	0.02	-----
RA-226 + Ra-228	5	30
Thorium-230	0.3	-----
Sulfate	-----	976
Chloride	-----	250
TDS	-----	1770
Nitrate	-----	12.4

NOTE: All concentrations are in mg/l except: Ra-226 + Ra-228 and Th-230, which are in pCi/l.
@ = Irrigation Standard

3.2 GROUND-WATER BACKGROUND WATER QUALITY

The hydrologic background conditions at the Grants site are those that exist upgradient or north of the large tailings pile. These conditions have been monitored since 1976. Ground-water flow in the San Mateo alluvial system is generally from the northeast to the southwest (see Figure 3.2-1). Lobo Creek joins San Mateo Creek at the Homestake site, although neither creek has a well-defined surface flow channel at the site. Surface-water flow exists only after extreme precipitation and then generally only within some reaches of the channel.

Hydrographs of upgradient wells that have been used to define the background hydrologic conditions of the alluvial aquifer are presented in Section 4 of this report. Wells DD, P, P1, P2, P3, P4, Q, R and ND, located just north of the large tailings on the Homestake property, have been used for monitoring alluvial background water quality.

Additional alluvial background wells located further north were sampled in 2002 (wells 914, 916, 920, 921, 922 and 950, see Figure 3.2-1 for locations). Information gathered from these wells has been used to further define the piezometric surface and water-quality conditions in the upgradient alluvial aquifer.

Figure 3.2-1 presents the latest 2002 water-quality data for background wells for six parameters: sulfate, uranium, selenium, chloride, TDS and nitrate. Molybdenum concentrations in these upgradient wells were less than 0.03 to 0.09 mg/l. The sulfate concentrations for these wells upgradient of the large tailings vary from 55 to 1500 mg/l in 2002. Uranium concentrations also vary over a large range, from 0.001 to 0.21 mg/l. Four natural uranium concentrations are nearly four times the NRC site standard of 0.04 mg/l. Selenium concentrations vary over an even larger range, from 0.007 to 0.63 mg/l. The largest 2002 background observation for selenium is six times the NRC site standard.

Chloride concentrations in water sampled from the upgradient wells ranged from a low of 26 mg/l to a high of 135 mg/l. The TDS concentrations varied from 370 to 2700 mg/l. Nitrate concentrations also vary naturally over a large range in the alluvial aquifer from less than 0.1 to 16.9 mg/l in 2002. Time versus concentration plots for upgradient wells DD, ND, P, P4, Q and R are graphically presented in Section 4.3 of this report.

The 95th percentile of the historical background data for this site was defined by ERG (1999a and 1999b). These documents with a hydrologic support document (Hydro-Engineering 2001c) were submitted in 2001 to the NRC with a request to adjust some of the site standards based on the full range of natural background. The 95th percentile is being used to define the upper limit of background. The average background concentration has been used in the past for establishing the standards and discussion of background values. The 95th percentile is a better value for use in background discussions because it better defines the natural full upper limit of background. Figure 3.2-1 presents the 95th percentile background levels for the Grants constituents.

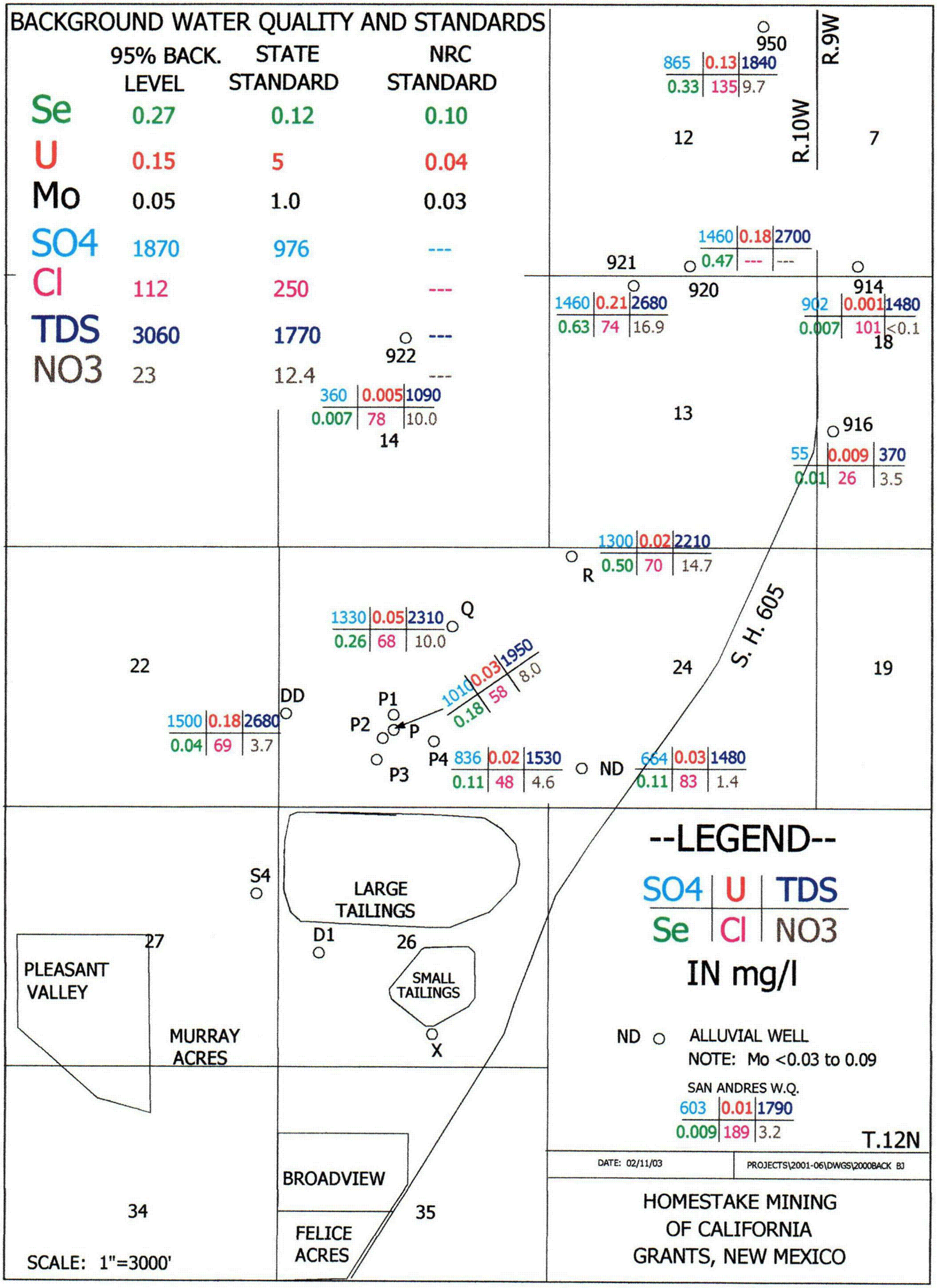

FIGURE 3.2-1. BACKGROUND GROUND-WATER QUALITY

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3.3 COMPARISON OF SITE STANDARDS TO BACKGROUND

The range in concentrations (see Section 3.2) in the upgradient wells during 2002 was such that water in 8 out of 12 selenium concentrations in background wells[1] were equal to, or exceeded, the NRC site standards. Additionally, 5 out of 12 uranium values were equal to, or exceeded, the NRC site standard. These site standards were set based on an average of concentrations in three samples[2] collected from December 1988, January 1989 and February 1989 from upgradient well P. As shown by the present data, there is a large natural areal variability in the background water quality. Therefore, the historical database for all of the background wells more adequately defines background concentrations as used in the two ERG (1999a and 1999b) studies. Naturally occurring background variation is demonstrated by the uranium concentrations, where concentrations in the Fall of 2002 varied from 0.001 to 0.21 mg/l (see red values on Figure 3.2-1). The higher values are four times the site standard of 0.04 mg/l.

Table 3.3-1 presents the 95th percentile of background concentrations (see ERG 1999a and 1999b for computation of the 95th percentile levels) for selenium, uranium, molybdenum, sulfate, chloride, TDS and nitrate along with respective State and NRC standards. The 95th percentile values for selenium and uranium are significantly greater than the NRC standards, while sulfate, TDS and nitrate levels are significantly greater than the State standards.

[1]Wells DD, ND, P, P4, Q, R, 914, 916, 920, 921, 922 and 950.
[2] Average of 3 samples from well P in 1988 and 1989.

TABLE 3.3-1. COMPARISON OF UPPER LIMIT OF BACKGROUND WATER QUALITY AND SITE STANDARDS.

Constituents	95% Background Level	State Standard	NRC Standard
Selenium	0.27	0.12	0.1
Uranium	0.15	5	0.04
Molybdenum	0.05	1.0@	0.03
Sulfate	1870	976	-----
Chloride	112	250	-----
TDS	3060	1770	-----
Nitrate	23	12.4	-----

NOTE: All values are in mg/l
@ = Irrigation Standard

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4.0 ALLUVIAL AQUIFER MONITORING

This section presents 2002 monitoring results for the alluvial aquifer, the most important ground-water system at the Grants site. Well completions are presented first, with the water levels and water-quality results following.

4.1 ALLUVIAL WELL COMPLETIONS

New alluvial wells drilled in 2002 include B12, B13, T4 through T12, T18, T41, 522, 523 and 524. Discussion of the new and previously installed alluvial wells is presented in this section. The new T wells were drilled for additional alluvial collection beneath the large tailings pile with collection planned for 2004. Wells B12 and B13 are planned as future injection locations. Wells 522, 523 and 524 were drilled on the east side of the highway to the southeast of the small tailings pile. These wells are used for collection and fresh-water injection starting in June of 2002. Figures 4.1-1A and 4.1-1B show locations of the alluvial wells west of and near the Homestake Grants Project, respectively. These figures are plotted at a scale of 1" = 1600'. Each of the new wells are located on Figure 4.1-1B.

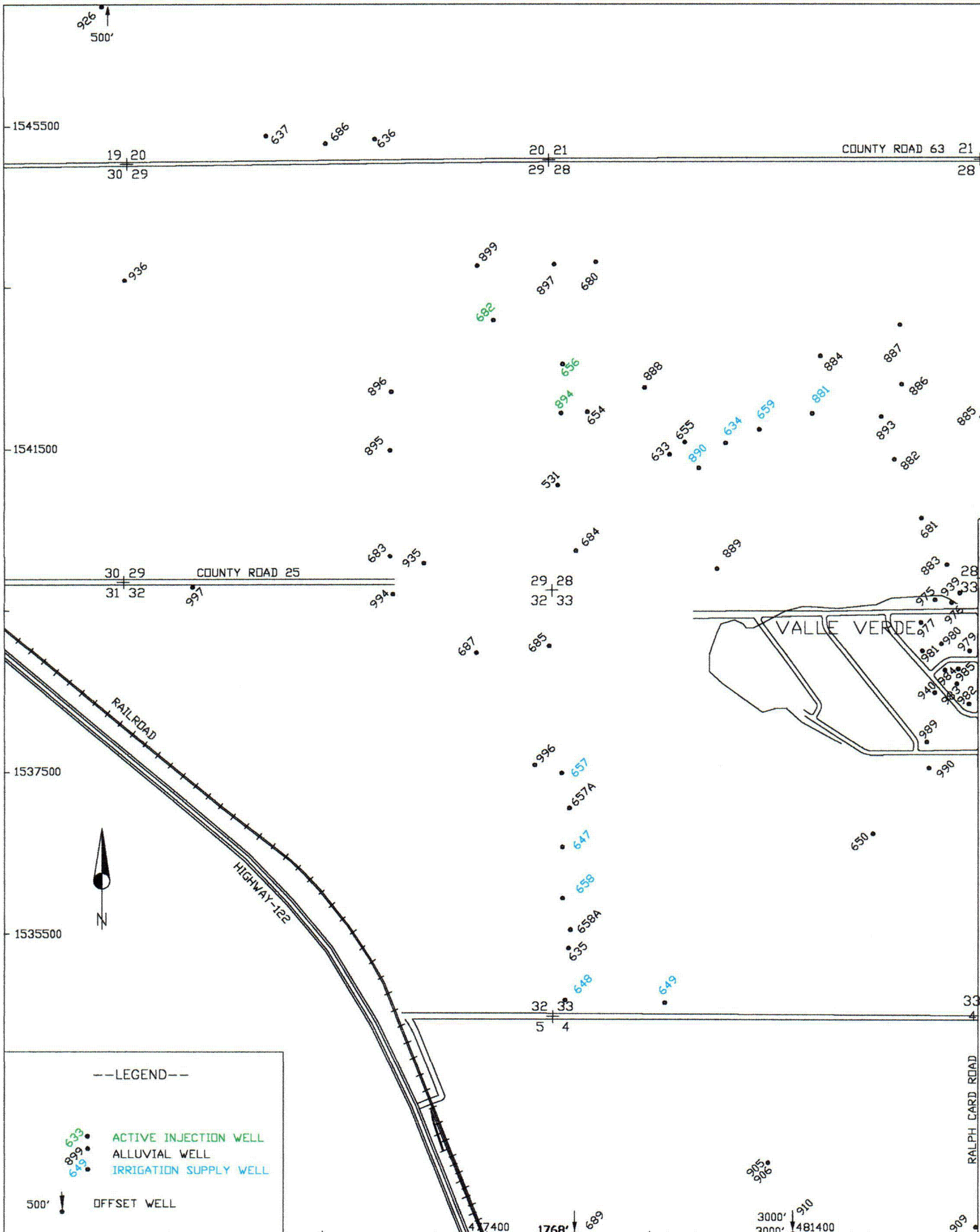
Alluvial wells 532, 914, 916, 920, 921, 922, 950 and 999 contain data but exist outside of Figures 4.1-1A and 4.1-1B. Drawing 1.1-1 of Hydro-Engineering, 1996 shows the wells that exist outside of the figures included in this report.

The currently active injection and collection wells are labeled with different colors on Figures 4.1-1A and 4.1-1B so that they can be distinguished from monitoring wells. These figures also show the wells used for irrigation water supply during the 2002 irrigation season. Table 4.1-1 presents basic well data for alluvial wells located on the Homestake property that have been used to define the alluvial ground-water hydrology. Many additional alluvial wells outside of the Homestake property have also been used for that purpose. The basic well data table presents the location, well depth, casing diameter, water-level information, depth to the base of the alluvium and casing perforation intervals for each well.

Table 4.1-2 presents the same type of basic well data for alluvial wells in the Broadview and Felice Acres subdivisions. These two subdivisions are just south of the Homestake property. Figure 4.1-1B also shows the locations of the subdivision wells.

Table 4.1-3 presents similar basic data for alluvial wells located in Murray Acres and Pleasant Valley Estates subdivisions.

Table 4.1-4 presents data for regional wells located outside of the subdivisions and the immediate Homestake property around the tailings sites (Grants Project). The limits of the Grants Project site boundary are delineated with a heavy line on Figure 4.1-1B. Wells outside this area are considered to be regional, and data for them are included in the regional water-quality and basic well data tables. The project site boundary includes Broadview, Felice and Murray Acres and Pleasant Valley Estates subdivisions. Slightly greater than 100 alluvial wells have been included on the regional table, which brings the total number of alluvial wells used to characterize this site to greater than 400. The wells are listed in numerical or alphabetic order based on their well names.



SCALE: 1"=1800'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 02/11/03

FIGURE 4.1-1A. ALLUVIAL WELL LOCATIONS (WEST AREA)

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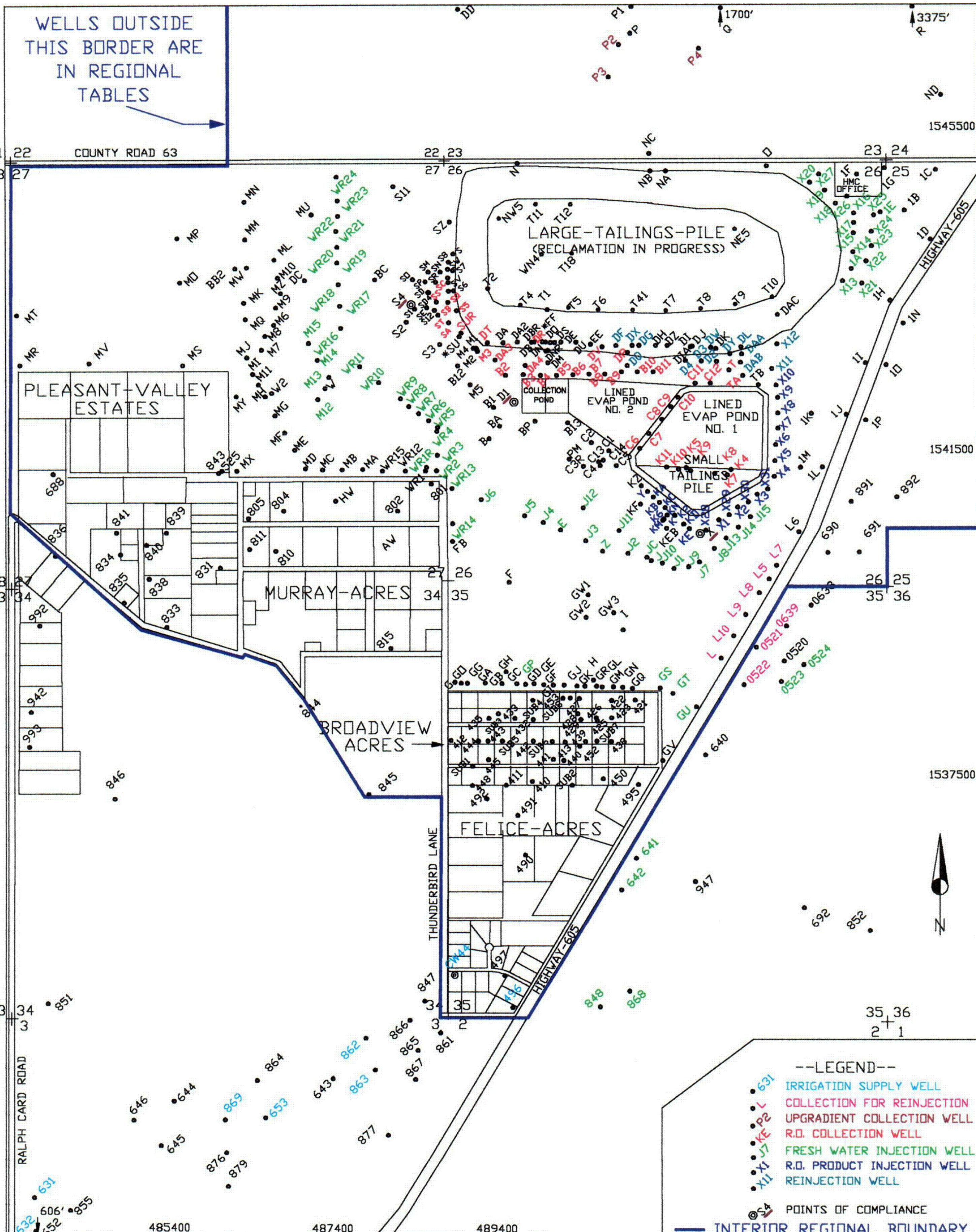

SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 02/26/03

FIGURE 4.1-1B. ALLUVIAL WELL LOCATIONS

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TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
0690	1540279	493465	65.0	5.0	12/5/02	36.83	6545.23	2.5	6582.06	55	6524.6 A	25-65	20.7
0691	1540276	493860	66.0	5.0	12/5/02	48.03	6540.78	2.9	6588.81	55	6530.9 A	26-66	9.9
0891	1540904	493751	54.0	5.0	12/19/02	30.51	6550.61	2.1	6581.12	50	6529.0 A	24-54	21.6
0892	1540954	494317	50.0	5.0	12/19/02	41.96	6545.25	2.0	6587.21	42	6543.2 A	30-50	2.0
1A	1543790	493768	61.0	5.0	10/15/02	14.30	6571.13	2.9	6585.43	47	6535.5 A	39-51	35.6
1B	1544502	494412	51.8	5.0	10/30/01	38.70	6545.72	1.5	6584.42	50	6532.9 A	20-50	12.8
1C	1545018	494799	52.9	5.0	9/28/00	43.26	6544.73	2.5	6587.99	43	6542.5 A	34-54	2.2
1D	1544142	494752	42.9	5.0	12/19/02	29.23	6556.74	2.2	6585.97	40	6543.8 A	22-42	13.0
1E	1544481	494116	51.4	5.0	9/24/01	2.00	6582.31	2.1	6584.31	43	6539.2 A	34-54	43.1
1F	1544952	493831	61.8	5.0	10/9/02	44.60	6542.78	1.8	6587.38	54	6531.6 A	30-60	11.2
1G	1545034	494170	57.5	5.0	10/9/02	42.81	6544.26	2.3	6587.07	48	6536.8 A	35-55	7.5
1H	1543363	494266	55.4	5.0	10/11/02	34.82	6551.57	1.8	6586.39	43	6541.6 A	25-55	10.0
1I	1542627	493928	49.8	5.0	12/19/02	34.08	6564.27	1.3	6598.35	35	6562.1 A	27-47	2.2
1J	1541986	493695	50.3	5.0	10/11/02	34.01	6551.39	2.0	6585.40	40	6543.4 A	30-50	8.0
1K	1541992	493275	55.6	5.0	10/11/02	32.49	6551.64	1.8	6584.13	47	6535.3 A	30-55	16.3
1L	1541256	493416	53.4	5.0	10/14/02	25.84	6552.77	3.1	6578.61	40	6535.5 A	35-55	17.3
1M	1541327	493133	43.1	5.0	10/14/02	20.36	6555.17	1.3	6575.53	33	6541.2 A	25-54	13.9
1N	1543100	494396	45.6	5.0	10/3/00	29.60	6561.25	2.4	6590.85	25	6563.5 A	15-44	0.0
1O	1542592	494175	44.0	5.0	12/19/02	43.82	6551.12	0.8	6594.94	29	6565.1 A	14-34	0.0
1P	1541902	493924	52.8	5.0	12/19/02	34.34	6550.90	2.6	6585.24	35	6547.6 A	20-40	3.3
* A1	1542365	491539	55.6	4.0	1/12/94	45.29	6527.86	1.1	6573.15	55	6517.1 A	37-57	10.8
* A2	1542356	491539	46.4	4.0	12/23/91	47.98	6525.42	1.1	6573.40	—	— A	27-47	—
B	1541684	489311	68.6	4.0	1/27/03	42.57	6528.33	2.4	6570.90	60	6508.5 A	49-69	19.8
B1	1542071	489370	90.9	5.0	7/13/00	45.11	6526.54	0.6	6571.65	82	6489.1 A	62-82	37.5
B2	1542475	489515	83.0	5.0	12/5/00	49.78	6524.47	2.0	6574.25	72	6500.3 A	55-75	24.2
B3	1542480	489731	87.0	5.0	12/5/00	62.15	6512.14	2.6	6574.29	77	6494.7 A	58-78	17.4
B4	1542471	489942	88.8	5.0	12/5/00	59.60	6515.06	7.4	6574.66	82	6485.3 A	63-83	29.8
B5	1542474	490141	91.0	5.0	12/5/00	57.23	6516.23	1.4	6573.46	81	6491.1 A	62-82	25.2
B6	1542478	490341	90.0	5.0	12/5/00	48.94	6528.75	2.0	6577.69	80	6495.7 A	63-83	33.1
B7	1542488	490540	87.0	5.0	9/22/95	43.82	6530.58	2.2	6574.40	77	6495.2 A	53-78	35.4
B8	1542488	490734	87.0	5.0	12/5/00	49.94	6525.81	2.3	6575.75	77	6496.5 A	53-78	29.4
B9	1542514	490935	86.0	5.0	12/5/00	50.32	6525.85	2.2	6576.17	76	6498.0 A	51-78	27.9
B10	1542517	491133	84.8	5.0	6/26/02	63.26	6513.51	2.3	6576.77	75	6499.5 A	51-78	14.0
B11	1542517	491329	84.9	5.0	10/1/02	52.11	6525.28	2.2	6577.39	77	6498.2 A	42-80	27.1
B12	1542600	489000	100.0	5.0	12/5/02	48.29	6524.71	2.2	6573.00	91	6479.8 A	30-100	44.9
B13	1541870	490200	80.0	5.0	12/5/02	40.44	6527.56	3.1	6568.00	72	6492.9 A	30-80	34.7

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
BA	1541835	489440	86.0	5.0	1/27/03	44.11	6527.47	1.7	6571.58	76	6493.9 A	64-78	33.6
BB2	1543791	486213	56.6	4.0	11/15/02	53.36	6520.44	0.6	6573.80	—	— A	42-62	—
BC	1543655	487910	82.8	4.0	12/5/02	48.52	6526.09	2.6	6574.61	75	6497.0 A	63-83	29.1
BP	1541882	489841	85.4	4.0	7/16/02	45.44	6526.86	3.0	6572.30	75	6494.3 A	40-85	32.6
* C	1541762	490854	79.7	4.0	5/16/94	41.50	6529.34	0.3	6570.84	75	6495.5 A	59-79	33.8
C1	1541533	490780	76.0	5.0	8/21/02	37.28	6534.58	0.8	6571.86	67	6504.1 A	41-68	30.5
C2	1541630	490566	76.0	5.0	8/21/02	33.24	6531.78	0.9	6565.02	66	6498.1 A	42-67	33.7
* C3	1541344	490481	75.0	5.0	6/20/94	36.20	6532.33	0.9	6568.53	65	6502.6 A	45-67	29.7
C3R	1541338	490472	75.0	5.0	3/7/02	18.00	6551.29	2.0	6569.29	66	6501.3 A	43-68	50.0
C4	1541348	490675	75.0	5.0	10/2/00	39.66	6531.18	1.3	6570.84	66	6503.5 A	46-66	27.6
C5	1541344	490869	72.0	5.0	10/21/02	33.06	6536.79	0.8	6569.85	62	6507.1 A	43-63	29.7
C6	1541533	491142	80.8	5.0	10/14/02	60.58	6524.31	1.6	6584.89	72	6511.3 A	34-74	13.0
C7	1541734	491280	72.4	5.0	10/14/02	59.44	6525.00	1.5	6584.44	61	6521.9 A	25-65	3.1
C8	1541906	491415	78.1	5.0	10/14/02	68.90	6515.59	1.6	6584.49	67	6515.9 A	31-71	0.0
C9	1542075	491545	77.0	5.0	10/14/02	65.50	6519.05	1.5	6584.55	65	6518.1 A	27-67	1.0
C10	1542182	491629	71.6	5.0	10/14/02	63.43	6521.83	2.7	6585.26	65	6517.6 A	30-70	4.3
C11	1542376	491844	68.2	5.0	10/1/02	63.90	6517.48	2.4	6581.38	60	6519.0 A	35-65	0.0
C12	1542375	492029	63.5	5.0	10/14/02	37.48	6543.07	2.6	6580.55	55	6523.0 A	34-64	20.1
C13	1541394	490655	63.0	5.0	10/29/01	37.58	6532.43	2.0	6570.01	63	6505.0 A	36-70	27.4
C14	1541413	490713	63.0	5.0	3/7/02	1.50	6568.19	2.0	6569.69	63	6504.7 A	36-70	63.5
* D	1542127	490118	89.7	4.0	7/28/86	48.04	6524.85	0.8	6572.89	90	6482.1 A	71-91	42.8
D1	1542140	489615	89.4	4.0	6/10/02	46.89	6524.01	1.0	6570.90	80	6489.9 A	58-90	34.1
D2	1542641	492107	70.0	5.0	11/29/99	0.50	6579.67	3.0	6580.17	62	6515.2 A	40-70	64.5
D3	1542646	491917	80.0	5.0	11/29/99	0.50	6579.63	2.5	6580.13	72	6505.6 A	40-80	74.0
D4	1542652	491724	78.0	5.0	11/29/99	0.50	6578.93	2.5	6579.43	70	6506.9 A	48-78	72.0
DA	1542864	489488	99.1	5.0	12/4/97	61.40	6524.15	3.0	6585.55	90	6492.6 A	50-100	31.6
DA2	1542881	489656	82.1	5.0	1/13/95	51.11	6536.18	2.8	6587.29	83	6501.5 A	64-74	34.7
DA3	1542664	489390	81.0	5.0	—	—	—	2.6	6574.36	72	6499.8 A	30-81	—
DA4	1542598	489756	81.0	5.0	6/26/02	76.50	6497.47	1.7	6573.97	71	6501.3 A	31-81	0.0
DAA	1542733	492411	62.7	5.0	12/5/00	2.00	6578.60	2.2	6580.60	54	6524.4 A	30-60	54.2
DAB	1542633	492399	65.1	5.0	12/5/00	0.50	6579.38	2.3	6579.88	56	6521.6 A	30-60	57.8
DAC	1543218	492851	67.7	5.0	—	—	—	4.1	6620.36	45	6571.3 A	20-30	—
DB	1542874	489842	73.2	5.0	9/8/98	66.15	6523.33	0.5	6589.48	—	— A	55-85	—
DBR	1542877	489855	55.6	5.0	1/25/95	52.19	6536.97	4.8	6589.16	—	— A	-	—
DC	1543646	487060	64.1	4.0	11/15/02	43.46	6527.85	2.7	6571.31	—	— A	45-65	—
DD	1546989	488943	78.5	4.0	5/14/02	58.20	6534.39	1.9	6592.59	83	6507.7 A	40-80	26.7

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS

(cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
DE	1542877	490193	70.2	5.0	10/5/98	63.70	6527.65	0.8	6591.35	80	6510.6 A	60-90	17.1
DF	1542839	490869	88.5	5.0	5/23/02	65.06	6525.53	0.6	6590.59	—	— A	65-95	—
DG	1542839	491157	88.9	5.0	5/23/02	59.80	6531.98	0.4	6591.78	—	— A	65-95	—
DH	1542835	491365	61.7	5.0	12/24/91	52.65	6538.69	4.8	6591.34	—	— A	65-95	—
DI	1542821	491788	86.1	5.0	12/9/97	57.87	6531.75	2.3	6589.62	75	6512.3 A	35-85	19.4
DIA	1542821	491793	—	4.0	12/23/91	50.41	6543.22	1.4	6593.63	—	— A	-	—
DJ	1542821	491793	85.7	5.0	8/24/88	46.87	6542.69	0.7	6589.56	75	6513.9 A	35-85	28.8
DK	1542799	492094	65.4	5.0	12/23/91	43.58	6542.33	0.7	6585.91	55	6530.2 A	35-55	12.1
DL	1542813	492398	64.4	5.0	12/5/00	2.00	6582.87	2.9	6584.87	55	6527.0 A	35-55	55.9
DM	1542628	490035	62.8	5.0	12/14/00	52.00	6523.08	3.0	6575.08	—	— A	-	—
DN	1542776	490020	66.7	4.0	12/14/00	51.52	6525.14	3.7	6576.66	—	— A	-	—
DNR	1542779	490031	79.7	4.0	12/5/00	51.80	6525.26	3.3	6577.06	—	— A	-	—
DO	1542874	490049	75.8	5.0	12/5/00	65.20	6525.13	1.6	6590.33	75	6513.7 A	65-75	11.4
DP	1542754	491012	79.8	5.0	6/26/02	53.46	6526.25	3.5	6579.71	—	— A	-	—
DQ	1542592	491006	85.3	5.0	7/11/02	48.10	6528.33	2.2	6576.43	—	— A	-	—
DR	1542884	489966	87.8	5.0	12/5/00	66.05	6524.78	2.7	6590.83	85	6503.1 A	65-85	21.6
DS	1542876	490118	—	5.0	8/2/99	65.22	6523.59	0.9	6588.81	77	6510.9 A	62-77	12.7
DT	1542871	489293	72.3	5.0	12/5/00	59.80	6524.01	2.7	6583.81	99	6482.1 A	59-99	41.9
DU	1542879	490380	84.6	5.0	7/6/88	51.56	6539.51	1.8	6591.07	81	6508.3 A	61-81	31.2
DV	1542826	490702	80.0	5.0	6/26/02	83.45	6502.15	2.9	6585.60	77	6505.7 A	60-80	0.0
DW	1542818	492029	73.4	5.0	12/5/00	2.50	6586.16	3.6	6588.66	59	6526.1 A	45-60	60.1
DX	1542838	491074	90.0	6.0	8/2/99	61.80	6530.18	1.0	6591.98	80	6511.0 A	60-90	19.2
DY	1542737	492271	65.7	5.0	12/5/00	1.50	6579.11	2.3	6580.61	56	6522.3 A	15-65	56.8
DZ	1542834	491501	81.8	5.0	1/27/03	55.94	6534.59	2.2	6590.53	—	— A	-	—
E	1540553	490187	61.7	4.0	12/5/00	2.00	6566.94	1.7	6568.94	60	6507.2 A	44-64	59.7
EE	1542853	490523	91.2	5.0	1/31/95	45.26	6542.85	0.6	6588.11	80	6507.5 A	50-90	35.3
F	1539908	489554	63.8	4.0	7/17/02	31.34	6533.48	1.2	6564.82	62	6501.6 A	45-65	31.9
FB	1540417	488857	62.0	4.0	1/22/03	35.20	6530.46	2.0	6565.66	58	6505.7 A	43-58	24.8
* FF	1542878	490017	—	4.0	6/21/83	41.08	6535.46	0.2	6576.54	124	6452.3 A	52-132	83.1
G	1538672	488890	78.3	4.0	12/5/02	34.94	6528.15	2.0	6563.09	75	6486.1 A	50-80	42.1
GA	1538657	489255	—	4.0	12/5/02	33.62	6529.17	1.8	6562.79	62	6499.0 A	45-65	30.2
GB	1538654	489456	65.2	4.0	4/3/00	4.00	6558.99	1.9	6562.99	64	6497.1 A	45-65	61.9
GC	1538650	489654	—	4.0	12/5/02	34.41	6530.76	2.5	6565.17	78	6484.7 A	60-80	46.1
GD	1538646	489855	—	4.0	12/4/95	0.50	6565.12	1.8	6565.62	72	6491.8 A	55-75	73.3
GE	1538637	489972	117.0	4.0	12/5/02	35.35	6530.92	2.4	6566.27	65	6498.9 A	50-120	32.1
GF	1538632	490097	119.2	4.0	4/3/00	4.00	6562.01	1.8	6566.01	67	6497.2 A	50-120	64.8

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
GG	1538662	489055	58.7	4.0	4/3/00	4.00	6559.13	1.8	6563.13	57	6504.3 A	48-68	54.8
GH	1538807	489509	69.2	4.0	3/20/02	32.83	6529.93	1.3	6562.76	67	6494.5 A	55-65	35.5
GI	1538631	490218	119.0	4.0	4/3/00	4.00	6561.85	1.5	6565.85	67	6497.4 A	50-120	64.5
GJ	1538629	490382	119.2	4.0	4/3/00	4.00	6562.15	2.0	6566.15	65	6499.2 A	50-120	63.0
GK	1538622	490482	115.7	4.0	12/5/02	35.03	6531.73	2.4	6566.76	67	6497.4 A	50-120	34.4
GL	1538614	490701	119.3	4.0	4/3/00	4.00	6563.15	2.1	6567.15	71	6494.1 A	50-120	69.1
GM	1538605	490824	118.2	4.0	4/3/00	4.00	6563.65	2.1	6567.65	69	6496.6 A	50-120	67.1
GN	1538602	490944	116.5	4.0	4/3/00	4.00	6563.97	1.8	6567.97	70	6496.2 A	50-120	67.8
GO	1538663	488973	122.3	4.0	4/3/00	4.00	6559.00	1.6	6563.00	75	6486.4 A	50-120	72.6
GP	1538649	489752	121.4	4.0	12/5/00	5.00	6559.87	2.1	6564.87	68	6494.8 A	50-120	65.1
GQ	1538599	491067	70.0	4.0	12/5/02	1.77	6566.39	0.9	6568.16	71	6496.3 A	50-70	70.1
GR	1538619	490619	—	4.0	12/23/91	36.55	6528.66	1.0	6565.21	75	6489.2 A	50-85	39.5
GS	1538597	491408	86.4	5.0	12/5/00	33.00	6541.31	2.0	6574.31	80	6492.3 A	50-85	49.0
GT	1538534	491565	84.0	5.0	12/5/00	8.30	6567.87	2.1	6576.17	76	6498.1 A	60-84	69.8
GU	1538367	491854	80.0	5.0	3/7/02	15.00	6560.65	2.0	6575.65	73	6500.7 A	60-80	60.0
GV	1537701	491428	83.0	5.0	10/14/02	49.52	6527.86	2.5	6577.38	74	6500.9 A	62-82	27.0
GW1	1539755	490530	73.0	5.0	12/5/02	30.19	6535.08	1.0	6565.27	65	6499.3 A	48-73	35.8
GW2	1539471	490497	75.0	5.0	12/5/02	31.54	6534.54	1.0	6566.08	68	6497.1 A	47-75	37.5
GW3	1539532	490835	72.0	5.0	5/4/93	34.42	6531.86	1.0	6566.28	62	6503.3 A	45-72	28.6
H	1538703	490582	69.3	4.0	12/23/91	37.93	6528.65	1.8	6566.58	69	6495.8 A	50-70	32.9
I	1539319	490954	70.0	4.0	6/18/02	31.64	6535.56	1.6	6567.20	68	6497.6 A	52-72	38.0
J	1540174	491302	65.6	4.0	12/5/00	6.00	6564.19	3.4	6570.19	56	6510.8 A	46-68	53.4
J1	1540082	491585	57.0	6.0	12/5/00	18.80	6553.05	3.8	6571.85	55	6513.1 A	50-57	40.0
J2	1540271	491013	58.0	6.0	12/5/00	26.00	6544.19	2.9	6570.19	55	6512.3 A	50-58	31.9
J3	1540414	490499	70.0	6.0	12/5/00	27.40	6541.74	2.6	6569.14	66	6500.5 A	43-70	41.2
J4	1540643	489974	80.0	6.0	12/5/00	18.00	6551.52	3.9	6569.52	68	6497.6 A	40-70	53.9
J5	1540728	489747	65.0	6.0	12/5/00	10.55	6559.24	2.8	6569.79	61	6506.0 A	50-65	53.2
J6	1540919	489221	67.0	6.0	12/5/00	7.10	6563.00	3.7	6570.10	65	6501.4 A	48-67	61.6
J7	1540168	491892	61.9	5.0	12/5/00	19.50	6550.88	2.1	6570.38	53	6515.3 A	40-60	35.6
J8	1540318	492064	63.2	5.0	12/5/00	23.30	6547.49	2.4	6570.79	52	6516.4 A	35-61	31.1
J9	1540101	491759	68.0	5.0	12/5/00	24.60	6546.60	2.0	6571.20	58	6511.2 A	36-68	35.4
J10	1540138	491436	66.0	5.0	12/5/00	18.00	6552.91	3.5	6570.91	36	6531.4 A	66-	21.5
J11	1540545	490909	66.0	5.0	12/5/00	12.00	6557.86	2.0	6569.86	55	6512.9 A	36-66	45.0
J12	1540827	490466	70.0	5.0	12/5/00	18.44	6551.86	3.0	6570.30	60	6507.3 A	40-70	44.6
J13	1540451	492218	55.0	5.0	2/5/02	4.00	6564.40	1.8	6568.40	46	6520.6 A	15-55	43.8
J14	1540585	492367	55.0	5.0	2/5/02	12.90	6556.08	1.7	6568.98	44	6523.3 A	15-55	32.8

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
J15	1540719	492521	55.0	4.0	2/5/02	3.10	6566.53	2.2	6569.63	46	6521.4 A	15-55	45.1
JC	1540215	491240	60.0	5.0	12/5/00	22.10	6546.34	1.8	6568.44	50	6516.6 A	35-55	29.7
K	1540730	491590	61.7	4.0	8/12/02	2.00	6571.51	3.8	6573.51	60	6509.7 A	44-64	61.8
K2	1540736	491587	58.9	4.0	8/12/02	14.90	6557.31	2.5	6572.21	58	6511.7 A	46-56	45.6
K3	1540744	491571	56.7	2.0	10/31/97	43.44	6527.23	1.3	6570.67	—	— A	53-58	—
K4	1541211	492371	86.2	5.0	10/21/02	61.90	6540.12	2.5	6602.02	80	6519.5 A	65-85	20.6
K5	1541269	491935	86.4	5.0	10/21/02	65.68	6536.05	2.8	6601.73	80	6518.9 A	55-85	17.1
K6	1540689	491459	58.0	5.0	3/6/02	13.00	6557.07	2.0	6570.07	—	— A	33-58	—
K7	1541232	492237	86.0	5.0	10/21/02	53.80	6547.73	2.0	6601.53	79	6520.5 A	56-86	27.2
K8	1541250	492081	86.0	1.0	10/21/02	81.60	6518.89	2.0	6600.49	78	6520.5 A	66-86	0.0
K9	1541287	491787	86.0	5.0	10/21/02	64.45	6535.89	2.0	6600.34	79	6519.3 A	56-86	16.6
K10	1541305	491638	87.0	5.0	10/21/02	69.50	6531.31	2.0	6600.81	81	6517.8 A	47-87	13.5
K11	1541325	491490	84.0	5.0	10/21/02	65.30	6535.31	2.0	6600.61	78	6520.6 A	64-84	14.7
KA	1540959	491331	67.8	5.0	8/12/02	13.00	6559.19	1.9	6572.19	65	6505.3 A	42-72	53.9
KB	1540893	491406	61.8	5.0	8/12/02	0.60	6571.05	0.8	6571.65	60	6510.9 A	40-70	60.2
KC	1540826	491477	68.6	5.0	8/12/02	0.50	6569.81	0.7	6570.31	59	6510.6 A	42-72	59.2
KD	1540627	491701	62.1	5.0	8/12/02	1.10	6569.12	0.6	6570.22	—	— A	40-70	—
KE	1540566	491776	60.8	5.0	8/12/02	9.10	6563.18	2.5	6572.28	—	— A	40-70	—
KEB	1540570	491487	59.9	5.0	11/22/02	17.28	6552.45	1.5	6569.73	50	6518.2 A	40-60	34.2
KF	1540870	491169	63.5	5.0	1/27/03	23.95	6546.26	2.2	6570.21	50	6518.0 A	30-60	28.2
KM	1540671	491444	52.4	5.0	3/6/02	12.20	6557.57	2.2	6569.77	—	— A	-	—
KN	1540734	491492	50.1	5.0	10/11/02	8.36	6561.23	2.3	6569.59	—	— A	-	—
KZ	1541100	491183	58.4	5.0	1/27/03	27.24	6544.48	1.2	6571.72	—	— A	-	—
L	1538970	492150	67.0	4.0	7/22/02	51.63	6523.34	0.8	6574.97	59	6515.2 A	46-66	8.2
L5	1539946	492730	60.2	5.0	11/11/02	41.60	6534.47	1.3	6576.07	50	6524.8 A	25-55	9.7
L6	1540526	493110	51.1	5.0	11/11/02	22.38	6552.26	2.1	6574.64	50	6522.5 A	25-55	29.7
L7	1540113	492842	67.8	5.0	11/11/02	49.24	6527.37	2.3	6576.61	62	6512.3 A	36-66	15.1
L8	1539773	492621	73.9	5.0	11/11/02	47.14	6529.35	2.1	6576.49	65	6509.4 A	32-72	20.0
L9	1539509	492463	74.9	5.0	11/11/02	43.75	6533.48	2.2	6577.23	64	6511.0 A	43-73	22.5
L10	1539250	492310	74.2	5.0	11/11/02	41.51	6535.32	2.0	6576.83	63	6511.8 A	53-73	23.5
M1	1542797	489157	103.4	4.0	1/3/89	79.80	6505.17	1.5	6584.97	120	6463.5 A	66-106	41.7
M2	1542785	489159	40.4	4.0	1/20/95	34.85	6541.41	1.4	6576.26	—	— A	-	—
M3	1542805	489151	105.3	4.0	6/26/02	65.80	6510.30	1.0	6576.10	—	— A	79-99	—
M4	1542804	489134	81.8	5.0	10/31/00	56.72	6521.54	3.7	6578.26	—	— A	78-82	—
M5	1542360	489080	92.3	5.0	8/12/02	49.85	6525.49	3.2	6575.34	84	6488.1 A	60-90	37.4
M6	1543097	486674	110.0	5.0	12/5/02	65.03	6510.01	2.2	6575.04	65	6507.9 A	60-110	2.1

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
M7	1542790	486523	83.0	5.0	12/5/02	60.48	6512.37	2.4	6572.85	71	6499.4 A	63-83	12.9
M8	1542960	486567	83.0	5.0	9/5/00	33.71	6541.52	2.4	6575.23	57	6515.8 A	53-83	25.7
M9	1543310	486699	103.0	5.0	12/5/02	67.96	6508.85	3.2	6576.81	78	6495.6 A	63-103	13.3
M10	1543677	486723	88.0	5.0	11/15/02	55.70	6517.66	2.4	6573.36	86	6485.0 A	58-88	32.7
M11	1542358	486486	118.0	5.0	9/5/00	48.72	6524.50	3.0	6573.22	109	6461.2 A	58-118	63.3
M12	1542174	487209	124.0	5.0	12/5/00	3.87	6569.64	2.5	6573.51	118	6453.0 A	57-124	116.7
M13	1542450	487336	117.0	5.0	12/5/00	29.81	6546.35	3.0	6576.16	108	6465.2 A	57-117	81.2
M14	1542661	487216	117.0	5.0	12/5/00	29.42	6547.75	2.7	6577.17	109	6465.5 A	57-117	82.3
M15	1542872	487094	102.0	5.0	12/5/00	3.71	6575.37	3.5	6579.08	93	6482.6 A	52-102	92.7
MA	1541290	487767	85.0	4.0	12/5/02	46.05	6526.17	1.0	6572.22	85	6486.2 A	70-85	40.0
MB	1541296	487512	90.0	4.0	9/5/00	2.05	6570.01	1.0	6572.06	85	6486.1 A	60-90	84.0
MC	1541304	487264	100.0	4.0	12/5/02	45.80	6526.26	1.0	6572.06	95	6476.1 A	70-100	50.2
MD	1541311	487050	105.0	4.0	9/5/00	2.00	6569.46	1.0	6571.46	105	6465.5 A	75-105	104.0
ME	1541537	486934	105.0	4.0	9/5/00	1.61	6569.31	1.0	6570.92	105	6464.9 A	75-105	104.4
MF	1541757	486808	110.0	4.0	12/5/02	51.18	6521.10	1.0	6572.28	110	6461.3 A	90-110	59.8
MG	1541972	486694	110.0	4.0	9/5/00	1.72	6571.36	1.0	6573.08	110	6462.1 A	90-110	109.3
MH	1542208	486569	110.0	4.0	12/5/02	55.41	6518.51	1.0	6573.92	110	6462.9 A	90-110	55.6
MI	1542486	486413	110.0	4.0	9/5/00	2.24	6574.03	1.0	6576.27	110	6465.3 A	90-110	108.8
MJ	1542682	486350	60.0	4.0	12/5/02	54.23	6518.71	1.8	6572.94	60	6511.1 A	40-60	7.6
MK	1543373	486324	57.0	4.5	12/5/02	60.10	6513.69	1.5	6573.79	92	6480.3 A	-	33.4
ML	1543902	486691	76.0	5.0	12/5/02	49.24	6523.46	2.3	6572.70	80	6490.4 A	56-76	33.1
MM	1544154	486324	63.0	5.0	9/5/00	3.46	6573.99	2.4	6577.45	50	6525.1 A	33-63	48.9
MN	1544613	486325	63.0	5.0	12/18/96	64.15	6513.41	1.9	6577.56	42	6533.7 A	23-63	0.0
MO	1543620	485518	88.0	4.5	11/15/02	65.63	6507.26	2.0	6572.89	80	6490.9 A	45-85	16.4
MP	1544164	485492	80.0	5.0	12/18/96	62.66	6511.82	2.1	6574.48	50	6522.4 A	33-63	0.0
MQ	1543173	486326	98.0	5.0	12/5/02	66.26	6508.04	1.6	6574.30	88	6484.7 A	58-98	23.3
MR	1542609	483574	100.0	5.0	11/11/02	70.03	6496.23	1.8	6566.26	100	6464.5 A	54-94	31.8
MS	1542607	485570	82.0	5.0	11/11/02	63.20	6507.47	1.5	6570.67	89	6480.2 A	52-82	27.3
MT	1543221	483531	98.0	4.5	11/13/02	69.68	6497.75	2.3	6567.43	87	6478.1 A	34-94	19.6
MU	1544461	487143	80.0	5.0	12/5/02	43.22	6530.97	1.5	6574.19	72	6500.7 A	50-80	30.3
MV	1542618	484418	105.0	4.5	10/22/98	65.97	6503.81	1.3	6569.78	95	6473.5 A	75-105	30.3
MW	1543802	486346	85.0	5.0	11/15/02	63.35	6511.56	1.9	6574.91	83	6490.0 A	35-85	21.6
MX	1541287	486244	103.0	5.0	11/12/02	53.22	6515.39	1.7	6568.61	94	6472.9 A	63-103	42.5
MY	1542200	486213	112.0	5.0	11/12/02	59.23	6514.33	3.0	6573.56	102	6468.6 A	72-112	45.8
MZ	1543485	486757	92.0	5.0	9/5/00	22.61	6554.03	0.0	6576.64	84	6492.6 A	60-92	61.4
N	1545101	489665	92.0	4.0	9/5/02	52.98	6530.99	0.9	6583.97	80	6503.1 A	54-94	27.9

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
NA	1545000	491488	91.4	5.0	9/5/02	57.00	6533.98	1.1	6590.98	80	6509.9 A	50-90	24.1
NB	1545000	491296	96.4	5.0	9/5/02	49.53	6543.77	3.5	6593.30	80	6509.8 A	50-90	34.0
NC	1545220	491282	95.0	4.0	9/5/02	52.93	6532.90	0.8	6585.83	85	6500.0 A	65-95	32.9
ND	1545927	494872	70.0	4.0	5/14/02	47.63	6545.26	1.1	6592.89	65	6526.8 A	50-70	18.5
NE5	1544279	492332	156.8	5.0	2/28/02	64.81	6602.19	3.2	6667.00	150	— T	50-110	—
										150	6513.8 A	135-155	88.4
NW5	1544408	489433	149.8	5.0	2/28/02	114.58	6543.00	2.7	6657.58	155	— T	39-79	—
										155	6499.9 A	119-159	43.1
O	1545060	492725	69.9	4.0	9/5/02	49.07	6538.76	1.3	6587.83	77	6509.5 A	40-70	29.2
P	1546691	491058	109.1	4.0	7/15/02	57.39	6529.87	1.7	6587.26	107	6478.6 A	82-112	51.3
P1	1547017	491060	105.0	6.0	11/28/00	55.75	6536.72	0.8	6592.47	105	6486.7 A	60-105	50.1
P2	1546555	490912	105.0	6.0	12/4/00	61.41	6528.38	0.9	6589.79	105	6483.9 A	60-105	44.5
P3	1546159	490785	95.0	5.0	4/4/02	54.80	6535.15	2.2	6589.95	85	6502.8 A	55-95	32.4
P4	1546504	491899	92.0	5.0	4/4/02	60.83	6528.69	3.6	6589.52	84	6501.9 A	52-92	26.8
PM	1541426	490292	81.9	4.0	8/13/02	34.93	6532.49	1.8	6567.42	—	— A	-	—
Q	1548693	492153	98.3	4.0	5/14/02	50.32	6543.50	2.3	6593.82	100	6491.5 A	72-102	52.0
R	1550372	494514	85.0	4.0	5/14/02	43.24	6560.79	0.3	6604.03	95	6508.7 A	60-90	52.1
S	1543871	488816	72.2	4.0	5/14/02	56.05	6525.12	2.0	6581.17	75	6504.2 A	52-72	21.0
S1	1543288	488401	85.0	2.0	1/27/03	52.05	6523.14	5.3	6575.19	85	6484.9 A	60-85	38.3
S2	1543127	488299	100.0	3.0	1/27/03	49.84	6523.88	2.0	6573.72	100	6471.7 A	90-100	52.2
S3	1542857	488714	122.6	5.0	7/16/02	51.36	6523.42	6.2	6574.78	116	6452.6 A	80-120	70.8
S4	1543344	488359	112.4	5.0	7/16/02	51.70	6523.59	2.3	6575.29	108	6465.0 A	50-110	58.6
S5	1543269	488923	115.0	5.0	6/26/02	62.50	6512.19	1.0	6574.69	105	6468.7 A	54-106	43.5
S6	1543515	488874	113.2	5.0	1/3/00	55.85	6524.22	1.3	6580.07	105	6473.8 A	55-105	50.5
S7	1543763	488874	97.0	5.0	1/4/99	57.38	6522.51	1.0	6579.89	82	6496.9 A	40-84	25.6
S8	1543968	488879	43.8	5.0	8/22/95	43.28	6537.06	1.0	6580.34	40	6539.3 A	12-42	0.0
S11	1544793	488150	76.2	5.0	11/11/02	49.98	6528.41	1.9	6578.39	70	6506.5 A	48-78	21.9
S12	1543297	488628	93.0	5.0	12/5/02	57.10	6521.75	2.1	6578.85	80	6496.7 A	53-93	25.0
SA	1543122	488811	123.7	5.0	12/5/00	67.24	6513.07	1.0	6580.31	115	6464.3 A	100-130	48.8
SB	1543371	488811	125.0	5.0	12/5/00	57.43	6523.66	0.9	6581.09	115	6465.2 A	100-130	58.5
SC	1543617	488815	105.4	5.0	12/5/00	57.11	6521.69	1.2	6578.80	103	6474.6 A	55-105	47.1
SD	1543490	488564	90.1	5.0	12/23/91	63.14	6515.17	0.6	6578.31	107	6470.7 A	50-110	44.5
SD4	1543497	488556	95.0	5.0	6/1/93	61.44	6517.33	1.1	6578.77	95	6482.7 A	45-95	34.7
SE	1543301	488550	111.8	5.0	3/19/01	55.38	6522.61	0.5	6577.99	88	6489.5 A	50-90	33.1
SE4	1543308	488560	105.3	2.0	3/19/01	53.71	6524.29	—	6578.00	—	— A	-	—
SM	1543748	488566	86.0	5.0	12/5/00	55.21	6523.53	0.7	6578.74	—	— A	-	—

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
SN	1543752	488716	67.5	4.0	12/5/00	55.48	6523.78	1.1	6579.26	—	—A	-	—
SO	1543652	488381	92.3	5.0	1/27/03	55.02	6523.77	0.6	6578.79	—	—A	-	—
SP	1543630	488531	94.4	4.0	1/27/03	55.14	6523.52	2.0	6578.66	—	—A	-	—
SQ	1543507	488814	95.0	5.0	6/26/02	58.18	6521.02	0.9	6579.20	95	6483.3A	55-95	37.7
SR	1543611	488669	95.0	5.0	11/2/98	58.25	6520.94	0.8	6579.19	95	6483.4A	50-90	37.6
SS	1543374	488666	101.0	5.0	6/26/02	63.87	6514.51	1.2	6578.38	90	6487.2A	51-101	27.3
ST	1543215	488688	97.0	5.0	6/26/02	59.31	6520.00	2.2	6579.31	96	6481.1A	55-97	38.9
* SU	1542946	488953	110.0	5.0	9/5/95	35.60	6542.50	0.7	6578.10	110	6467.4A	50-110	75.1
SUR	1542991	488968	115.0	5.0	6/26/02	62.86	6517.86	2.6	6580.72	106	6472.1A	35-115	45.7
SV	1543676	488813	78.2	6.0	6/26/02	64.60	6514.65	1.7	6579.25	100	6477.6A	55-105	37.1
SW	1543783	488812	81.9	6.0	7/3/94	60.70	6520.59	2.9	6581.29	75	6503.4A	35-80	17.2
SX	1544510	489025	45.0	5.0	—	—	—	1.0	6581.49	40	6540.5A	20-40	—
SZ	1544367	488833	62.6	5.0	12/5/00	49.63	6531.84	0.4	6581.47	60	6521.1A	40-70	10.8
T	1542536	492260	70.2	4.0	10/1/02	36.78	6542.45	2.4	6579.23	68	6508.8A	61-71	33.6
T1	1543285	490027	—	5.0	12/6/02	102.40	6561.51	1.0	6663.91	161	6501.9A	121-171	59.6
T2	1543538	489303	186.0	5.0	12/6/02	134.68	6530.14	5.0	6664.82	180	6479.8A	100-186	50.3
T4	1543340	489699	205.0	5.0	12/6/02	131.21	6526.53	2.9	6657.74	175	—T	-	—
										175	6479.8A	145-205	46.7
T5	1543307	490289	182.0	5.0	12/6/02	122.21	6535.12	3.1	6657.33	151	—T	-	—
										151	6503.2A	122-182	31.9
T6	1543282	490655	160.0	5.0	12/6/02	76.62	6582.15	3.3	6658.77	156	—T	-	—
										156	6499.5A	130-160	82.7
T7	1543272	491484	160.0	5.0	12/6/02	125.01	6534.66	2.4	6659.67	142	—T	-	—
										142	6515.3A	130-160	19.4
T8	1543296	491914	162.0	5.0	12/6/02	123.36	6538.25	2.6	6661.61	158	—T	-	—
										158	6501.0A	132-162	37.2
T9	1543347	492337	141.0	5.0	12/6/02	94.96	6568.99	3.3	6663.95	138	—T	-	—
										138	6522.7A	121-141	46.3
T10	1543434	492791	148.0	5.0	12/6/02	109.83	6550.13	2.4	6659.96	142	—T	-	—
										142	6515.6A	108-148	34.6
T11	1544585	489887	193.0	5.0	12/6/02	125.87	6530.94	2.8	6656.81	160	—T	-	—
										160	6494.0A	113-193	36.9
T12	1544583	490317	200.0	5.0	12/6/02	123.51	6533.72	2.8	6657.23	170	—T	-	—
										170	6484.4A	120-200	49.3
T18	1543977	490333	195.0	5.0	12/6/02	133.68	6531.48	3.0	6665.16	162	—T	-	—
										162	6500.2A	115-195	31.3
T41	1543278	491079	160.0	5.0	12/6/02	126.21	6533.75	3.2	6659.96	155	—T	-	—
										155	6501.8A	130-160	32.0

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS
(cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
TA	1542471	492426	62.4	5.0	10/1/02	46.30	6534.00	2.4	6580.30	55	6522.9 A	35-65	11.1
TB	1542351	492616	64.4	5.0	10/1/02	39.58	6543.99	1.9	6583.57	55	6526.7 A	35-65	17.3
W	1542302	487297	99.3	4.0	12/5/02	49.18	6522.96	0.3	6572.14	117	6454.8 A	58-118	68.1
W2	1542251	486654	79.1	4.0	3/2/98	56.21	6515.29	0.9	6571.50	—	— A	-	—
WN4	1543958	489961	142.4	5.0	3/21/02	94.96	6567.82	3.0	6662.78	165	— T	40-100	—
										165	6494.8 A	50-190	73.0
WR1	1541280	488529	—	5.0	6/27/89	46.54	6521.86	0.8	6568.40	—	— A	-	—
WR1R	1541302	488536	85.0	5.0	12/5/00	28.62	6539.85	0.0	6568.47	85	6483.5 A	-	56.4
WR2	1541290	488678	94.1	5.0	12/5/00	2.52	6566.07	0.9	6568.59	85	6482.7 A	65-95	83.4
WR3	1541490	488671	82.3	5.0	12/5/00	32.96	6536.58	2.7	6569.54	83	6483.8 A	63-93	52.7
WR4	1541788	488678	62.0	5.0	12/5/00	1.92	6570.89	0.0	6572.81	—	— A	-	—
WR5	1541813	488683	72.4	5.0	12/5/00	38.69	6532.54	0.6	6571.23	80	6490.6 A	60-80	41.9
WR6	1541902	488566	96.8	5.0	12/5/00	3.04	6569.99	1.3	6573.03	84	6487.7 A	55-85	82.3
WR7	1541997	488456	97.3	5.0	12/5/00	38.91	6534.82	2.0	6573.73	84	6487.8 A	55-85	47.0
WR8	1542095	488328	110.2	5.0	12/5/00	38.72	6533.88	0.4	6572.60	100	6472.2 A	50-100	61.7
WR9	1542185	488217	111.3	5.0	12/5/00	46.82	6526.23	0.8	6573.05	100	6472.3 A	50-100	54.0
WR10	1542389	487961	120.6	5.0	12/5/00	48.52	6524.67	0.7	6573.19	110	6462.5 A	60-110	62.2
WR11	1542586	487728	120.5	5.0	12/5/00	48.29	6526.20	0.3	6574.49	110	6464.2 A	60-110	62.0
WR12	1541280	488277	96.7	4.0	12/5/02	42.64	6525.55	1.1	6568.19	85	6482.1 A	55-85	43.5
WR13	1541068	488861	70.0	5.0	12/5/00	18.98	6550.19	3.2	6569.17	60	6506.0 A	50-60	44.2
WR14	1540638	488863	70.0	5.0	12/5/00	17.75	6549.16	2.3	6566.91	61	6503.6 A	50-60	45.6
WR15	1541280	488016	70.0	4.0	10/2/00	2.20	6568.99	0.0	6571.19	75	6496.2 A	60-75	72.8
WR16	1543051	487495	122.3	5.0	12/5/00	44.22	6528.56	1.9	6572.78	100	6470.9 A	40-120	57.7
WR17	1543328	487485	124.4	5.0	12/5/00	4.71	6568.38	2.2	6573.09	75	6495.9 A	40-120	72.5
WR18	1543597	487465	73.6	5.0	12/5/00	2.43	6570.48	2.2	6572.91	70	6500.7 A	20-70	69.8
WR19	1543873	487458	87.8	5.0	12/5/00	3.91	6571.02	2.2	6574.93	74	6498.7 A	25-85	72.3
WR20	1544059	487449	102.3	5.0	12/5/00	8.26	6566.21	2.1	6574.47	80	6492.4 A	42-102	73.8
WR21	1544241	487449	88.9	5.0	12/5/00	24.00	6552.05	2.1	6576.05	77	6497.0 A	28-88	55.1
WR22	1544434	487462	91.5	5.0	12/5/00	35.65	6542.24	2.4	6577.89	86	6489.5 A	30-90	52.7
WR23	1544632	487445	94.3	5.0	12/5/00	3.30	6573.17	2.2	6576.47	77	6497.3 A	32-92	75.9
WR24	1544938	487438	89.2	5.0	12/5/00	32.00	6556.67	3.0	6588.67	82	6503.7 A	50-90	53.0
X	1540512	491892	50.7	4.0	12/30/02	14.84	6556.77	1.7	6571.61	—	— A	-	—
X1	1540671	492129	54.0	5.0	8/12/02	7.50	6566.04	3.9	6573.54	47	6522.6 A	37-47	43.4
X2	1540836	492363	53.0	6.0	8/12/02	2.50	6569.43	1.9	6571.93	45	6525.0 A	40-45	44.4
X3	1540992	492599	52.0	5.0	8/12/02	2.50	6570.78	2.0	6573.28	42	6529.3 A	32-42	41.5
X4	1541210	492814	54.0	5.0	8/12/02	13.10	6563.84	3.2	6576.94	45	6528.7 A	37-45	35.1

TABLE 4.1-1 BASIC WELL DATA FOR THE ALLUVIAL HOMESTAKE WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
X5	1541408	492821	44.0	6.0	8/12/02	7.80	6569.81	3.6	6577.61	35	6539.0 A	24-36	30.8
X6	1541609	492828	46.0	6.0	8/12/02	8.00	6570.72	3.5	6578.72	35	6540.2 A	22-37	30.5
X7	1541808	492851	56.0	6.0	12/5/00	8.60	6571.83	3.4	6580.43	45	6532.0 A	32-46	39.8
X8	1542007	492852	61.0	5.0	12/5/00	13.00	6568.76	3.4	6581.76	51	6527.4 A	32-52	41.4
X9	1542194	492852	61.0	5.0	12/5/00	27.00	6555.92	3.6	6582.92	51	6528.3 A	24-52	27.6
X10	1542352	492835	61.0	5.0	8/12/02	4.00	6578.43	3.6	6582.43	53	6525.8 A	30-55	52.6
X11	1542553	492782	57.0	5.0	12/5/00	0.50	6581.50	3.0	6582.00	53	6526.0 A	17-57	55.5
X12	1542861	492852	57.0	5.0	12/5/00	0.50	6582.83	3.0	6583.33	53	6527.3 A	17-57	55.5
X13	1543640	493665	56.0	5.0	4/9/02	40.76	6546.18	2.5	6586.94	51	6533.4 A	16-56	12.7
X14	1544002	493777	56.0	5.0	4/9/02	39.80	6546.40	2.1	6586.20	49	6535.1 A	16-56	11.3
X15	1544222	493800	57.0	5.0	4/9/02	40.54	6542.37	2.3	6582.91	51	6529.6 A	17-57	12.8
X16	1544473	493795	47.0	5.0	4/9/02	40.64	6544.15	2.3	6584.79	47	6535.5 A	22-47	8.7
X17	1544356	493793	55.0	5.0	4/9/02	41.06	6544.78	3.3	6585.84	48	6534.6 A	35-55	10.2
X18	1544593	493569	57.0	5.0	4/9/02	29.06	6557.02	3.8	6586.08	49	6533.3 A	37-57	23.8
X19	1544753	493437	63.0	5.0	4/9/02	45.56	6539.64	4.5	6585.20	56	6524.8 A	33-63	14.9
X20	1544855	493256	71.0	5.0	4/9/02	47.00	6538.73	3.5	6585.73	64	6518.2 A	31-71	20.5
X21	1543606	493894	55.0	5.0	12/5/00	38.99	6547.34	2.7	6586.33	51	6532.6 A	35-55	14.7
X22	1543874	493946	56.0	5.0	12/5/00	39.21	6546.49	2.6	6585.70	50	6533.1 A	36-56	13.4
X23	1544064	494012	56.0	5.0	12/5/00	38.96	6546.98	2.8	6585.94	47	6536.1 A	36-56	10.8
X24	1544244	494011	56.0	5.0	12/5/00	39.94	6545.78	2.6	6585.72	46	6537.1 A	36-56	8.7
X25	1544445	494042	53.0	5.0	12/5/00	39.41	6546.22	2.8	6585.63	46	6536.9 A	33-53	9.3
X26	1544693	493702	53.0	5.0	12/5/00	35.34	6552.30	2.8	6587.64	43	6541.8 A	33-53	10.5
X27	1544953	493374	71.0	5.0	12/5/00	46.27	6539.03	5.1	6585.30	64	6516.2 A	31-71	22.8
X28	1540545	491971	56.0	5.0	8/12/02	8.30	6561.66	2.0	6569.96	48	6520.0 A	16-56	41.7
X29	1540735	492256	51.0	5.0	8/12/02	4.00	6566.03	2.0	6570.03	43	6525.0 A	11-51	41.0
X30	1540897	492493	51.0	5.0	8/12/02	3.00	6569.53	2.0	6572.53	43	6527.5 A	11-51	42.0
X31	1541052	492731	51.0	5.0	8/12/02	8.00	6566.13	2.0	6574.13	44	6528.1 A	11-51	38.0
Y	1541025	491256	60.8	4.0	10/15/02	15.20	6557.68	2.4	6572.88	57	6513.5 A	54-59	44.2
Z	1540290	490701	73.9	4.0	12/5/00	5.00	6564.22	0.6	6569.22	68	6500.6 A	60-70	63.6

Note: A = Alluvial Aquifer
M = Middle Chinle Aquifer
T = Tailings Aquifer
* = Well Abandoned
? = Uncertain Identity

TABLE 4.1-2 BASIC WELL DATA FOR THE ALLUVIAL AQUIFER BROADVIEW AND FELICE ACRES WELLS

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
						Broadview							
0410	1537440	489840	105.0	6.0	12/6/94	33.36	6526.30	0.0	6559.66	75	6484.7 A	90-105	41.6
0411	1537400	489510	70.0	6.0	8/7/96	35.10	6524.90	0.0	6560.00	70	6490.0 A	65-70	34.9
0412	1537940	488830	—	6.0	—	—	—	0.0	6561.00	—	—A	-	—
0413	1537900	490100	—	—	4/27/94	35.25	6530.75	0.0	6566.00	—	—A	-	—
0421	1538450	491100	88.0	5.0	1/30/96	37.58	6534.42	0.9	6572.00	92	6479.1 A	72-102	55.3
0422	1538440	490810	80.0	4.0	4/6/94	32.82	6537.18	0.0	6570.00	75	6495.0 A	60-80	42.2
0423	1538230	490800	—	—	—	—	—	0.0	6570.00	—	—A	-	—
0425	1538430	490630	90.0	6.0	4/7/94	32.42	6534.58	0.0	6567.00	71	6496.0 A	50-90	38.6
0426	1538230	490620	100.0	—	11/10/81	30.65	6534.35	0.0	6565.00	80	6485.0 A	80-100	49.4
0427	1538450	490410	121.0	6.0	4/12/94	35.00	6535.00	0.0	6570.00	81	6489.0 A	62-120	46.0
0428	1538280	490390	110.0	4.0	—	—	—	0.0	6570.00	66	6504.0 A	83-104	—
0429	1538210	490430	100.0	6.0	9/1/95	37.21	6532.79	0.0	6570.00	74	6496.0 A	58-75	36.8
0430	1538469	490300	145.0	—	—	—	—	0.0	6568.00	—	—A	-	—
										114	6454.0 U	-	—
0431	1538045	490090	130.0	6.0	4/12/94	35.00	6533.00	0.0	6568.00	60	6508.0 A	125-130	25.0
										60	6450.0 U	125-130	83.0
0432	1538210	489840	—	—	—	—	—	0.0	6565.00	—	—A	-	—
0433	1538220	489620	90.0	4.0	5/2/97	36.05	6527.95	1.5	6564.00	75	6487.5 A	58-84	40.5
0435	1538220	489300	85.0	6.0	8/7/96	34.75	6526.25	1.3	6561.00	85	6474.7 A	-	51.6
0438	1537940	490810	120.0	4.0	—	—	—	0.0	6571.00	105	6466.0 A	70-100	—
0439	1537940	490490	97.0	4.0	8/7/96	39.80	6527.20	0.0	6567.00	75	6492.0 A	77-97	35.2
0440	1537700	490230	—	—	—	—	—	0.0	6566.00	—	—A	-	—
0441	1537720	490090	116.0	6.0	1/30/95	35.19	6530.81	0.0	6566.00	78	6488.0 A	106-116	42.8
0442	1537940	489840	100.0	4.0	8/7/96	37.15	6527.85	0.0	6565.00	80	6485.0 A	70-100	42.8
0443	1537940	489280	—	4.0	—	—	—	0.0	6561.00	75	6486.0 A	60-80	—
0444	1537940	489180	80.0	—	5/18/94	28.84	6532.16	0.0	6561.00	—	—A	-	—
0445	1537720	489300	108.0	6.0	—	—	—	0.0	6561.00	79	6482.0 A	75-105	—
0446	1537720	488850	110.0	6.0	9/8/83	41.28	6518.72	0.0	6560.00	60	6500.0 A	60-95	18.7
										60	6500.0 U	60-95	18.7
0447	1537490	490480	142.0	6.0	4/11/85	41.18	6526.82	0.0	6568.00	—	—A	120-142	—
										80	6488.0 U	120-142	38.8
0448	1537400	489100	—	—	—	—	—	0.0	6561.00	—	—A	-	—
0450	1537480	490710	—	6.0	1/25/95	42.29	6528.71	0.0	6571.00	85	6486.0 A	70-105	42.7
* 0451	1537700	490600	—	—	—	—	—	0.0	0.00	—	—A	-	—
0452	1537880	490420	100.0	4.0	8/7/96	41.20	6525.80	0.8	6567.00	85	6481.2 A	40-100	44.6

TABLE 4.1-2 BASIC WELL DATA FOR THE ALLUVIAL AQUIFER BROADVIEW AND FELICE ACRES WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
0453	1538375	490300	110.0	4.0	7/1/02	34.93	6533.07	0.9	6568.00	80	6487.1 A	60-110	46.0
* 0454	1537920	489025	—	4.0	—	—	—	0.0	0.00	—	—A	-	—
SUB1	1537620	489100	—	4.0	4/29/02	34.00	6527.00	0.0	6561.00	—	—A	-	—
SUB2	1537395	490320	—	4.0	7/17/98	40.92	6526.65	0.0	6567.57	—	—A	-	—
SUB3	1538280	489420	84.0	6.0	4/24/02	28.80	6528.27	0.0	6557.07	72	6485.1 A	56-72	43.2
SUB4	1538440	489840	100.0	4.0	9/21/78	49.11	6515.89	0.0	6565.00	78	6487.0 A	60-85	28.9
SUB5	1537940	489470	86.0	4.0	—	—	—	0.0	6562.31	66	6496.3 A	55-80	—
SUB6	1537940	490090	82.0	4.0	—	—	—	0.0	6566.00	80	6486.0 A	52-82	—
SUB7	1537940	490630	98.0	4.0	—	—	—	0.0	6568.00	85	6483.0 A	78-98	—
SUB8	1538450	490210	150.0	5.0	—	—	—	0.0	6568.00	72	6496.0 A	60-90	—
SUB9	—	—	—	—	—	—	—	0.0	0.00	—	—A	-	—
						Felice Acres							
0481	1538350	490180	320.0	4.0	—	—	—	0.0	6568.00	110	6458.0 A	270-310	—
										110	6298.0 M	270-310	—
0482	1536985	489604	260.0	5.0	7/25/02	39.80	6522.86	0.0	6562.66	80	6482.7 A	220-260	40.2
										80	6352.7 M	220-260	170.2
0483	1536586	489753	280.0	—	7/24/96	36.93	6525.73	0.0	6562.66	—	—A	-	—
										—	—M	-	—
0490	1536540	489756	63.0	4.0	6/11/02	37.23	6525.19	0.0	6562.42	75	6487.4 A	20-80	37.8
0491	1537025	489662	63.0	4.0	7/25/02	39.22	6523.40	0.0	6562.62	40	6522.6 A	30-63	0.8
0492	1537220	489280	60.0	4.0	6/10/02	34.70	6525.98	1.2	6560.68	55	6504.5 A	40-60	21.5
0495	1537400	497100	—	—	—	—	—	0.0	6571.00	—	—A	-	—
0496	1534650	489603	94.4	5.0	12/11/02	56.45	6506.07	1.6	6562.52	86	6474.9 A	53-93	31.1
0497	1535039	489503	94.0	5.0	12/11/02	56.30	6506.32	2.0	6562.62	89	6471.6 A	64-94	34.7
CW44	1535048	488891	208.0	6.0	12/12/02	62.48	6498.26	2.5	6560.74	94	6464.2 A	-	34.0
										94	6428.2 M	69-208	70.0

Note: A = Alluvial Aquifer
M = Middle Chinle Aquifer
T = Tailings Aquifer
* = Well Abandoned
? = Uncertain Identity

TABLE 4.1-3 BASIC WELL DATA FOR THE ALLUVIAL AQUIFER MURRAY ACRES AND PLEASANT VALLEY WELLS

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
						Murray							
0801	1541020	488600	100.0	4.0	12/21/94	36.85	6530.88	0.0	6567.73	85	6482.7 A	80-100	48.2
0802	1540790	488190	98.0	6.0	5/22/97	40.20	6522.52	0.0	6562.72	81	6481.7 A	75-81	40.8
0803	1540800	487430	—	6.0	9/19/83	84.86	6476.14	0.0	6561.00	85	— C	85-180	—
										85	6476.0 A	85-180	0.1
0804	1540790	486790	137.0	6.0	5/7/02	46.60	6515.40	0.0	6562.00	85	6477.0 A	125-136	38.4
0805	1540695	486373	140.0	5.0	10/6/94	59.34	6507.66	0.0	6567.00	110	6457.0 A	100-140	50.7
0810	1540290	486700	105.0	6.0	—	—	—	0.0	6562.00	81	6481.0 A	75-101	—
0811	1540320	486373	140.0	4.0	—	—	—	0.0	6563.00	110	6453.0 A	100-140	—
0815	1539090	488100	255.0	4.0	5/22/91	29.14	6526.12	0.0	6555.26	—	— A	-	—
0844	1538376	487002	75.0	4.0	7/17/02	34.28	6521.85	1.2	6556.13	70	6484.9 A	35-75	36.9
0845	1537280	487833	65.0	4.0	7/24/02	34.90	6522.15	1.7	6557.05	55	6500.4 A	45-65	21.8
AW	1540235	488015	156.0	6.0	1/5/98	15.00	6548.43	0.1	6563.43	63	6500.3 A	-	48.1
										63	6463.3 U	66-155	85.1
HW	1540900	487430	115.0	6.0	11/9/94	40.00	6517.00	0.0	6557.00	95	6462.0 A	60-94	55.0
						Pleasant Valley							
0525	1541270	486020	0.0	4.5	7/12/02	55.36	6514.64	—	6570.00	—	— A	-	—
0688	1541257	483955	105.0	5.0	6/10/02	61.61	6501.01	2.9	6562.62	95	6464.7 A	65-105	36.3
0831	1540090	486030	—	—	9/6/83	54.95	6506.05	0.0	6561.00	—	— A	-	—
0833	1539250	485350	110.0	6.0	12/10/96	46.61	6511.39	0.0	6558.00	103	6455.0 A	60-90	56.4
0834	1540260	484800	100.0	4.0	—	—	—	0.0	6560.00	80	6480.0 A	60-80	—
0835	1539610	484795	98.0	5.0	5/2/00	49.74	6509.26	0.0	6559.00	94	6465.0 A	73-94	44.3
0836	1540250	484010	90.0	4.0	—	—	—	0.0	6558.00	80	6478.0 A	65-80	—
0838	1540600	485640	100.0	—	7/22/95	49.03	6513.97	0.0	6563.00	—	— A	-	—
0839	1541120	485465	100.0	5.0	12/19/94	50.00	6510.00	0.0	6560.00	94	6466.0 A	80-96	44.0
0840	1540440	485360	98.0	6.0	9/8/83	47.32	6513.68	0.0	6561.00	94	6467.0 A	73-94	46.7
0841	1540835	485020	100.0	—	7/22/95	54.66	6506.34	0.0	6561.00	—	— A	-	—
0843	1541265	485995	120.0	4.0	6/27/89	52.40	6517.60	0.0	6570.00	112	6458.0 A	100-110	59.6

Note: A = Alluvial Aquifer
M = Middle Chinle Aquifer
T = Tailings Aquifer
* = Well Abandoned
? = Uncertain Identity

TABLE 4.1-4 BASIC WELL DATA FOR THE ALLUVIAL AQUIFER REGIONAL WELLS

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
0520	1538934	492935	75.0	5.0	11/13/02	56.01	6530.01	0.3	6586.02	[illegible]	6517.7 A	35-75	12.3
0521	1539104	492588	75.0	5.0	11/13/02	64.12	6520.32	2.5	6584.44	[illegible]	6516.9 A	35-75	3.4
0522	1538640	492437	77.0	5.0	11/13/02	54.75	6525.78	2.8	6580.53	[illegible]	6509.7 A	37-77	16.1
0523	1538680	492896	74.0	5.0	9/10/02	2.00	6584.79	3.0	6586.79	62	6521.6 A	34-74	63.0
0524	1538889	493173	78.0	5.0	11/13/02	3.35	6587.00	3.0	6590.35	70	6517.4 A	33-78	69.7
0531	1541086	478262	—	—	10/30/96	79.24	6474.55	2.0	6553.79	—	—A	-	—
0532	1518700	482400	214.0	—	—	—	—	0.0	6515.00	—	—A	-	—
0533	—	—	195.0	—	—	—	—	0.0	6520.00	—	—A	-	—
0631	1532234	483756	118.0	6.0	12/11/02	84.47	6456.63	2.2	6541.10	109	6429.9 A	58-118	26.7
0632	1531850	483767	110.0	6.0	12/11/02	84.13	6457.17	3.0	6541.30	102	6438.3 A	70-110	20.9
0633	1541467	479642	83.0	8.0	12/5/02	76.40	6481.16	0.0	6557.56	95	6462.6 A	11-83	18.6
0634	1541652	480362	103.0	4.5	12/5/02	72.01	6488.06	2.8	6560.07	95	6462.3 A	80-100	25.8
0635	1535363	478401	63.0	12.0	—	—	—	—	6546.25	—	—A	4-63	—
0636	1545374	476038	123.0	4.5	10/3/02	98.12	6475.32	2.3	6573.44	119	6452.1 A	103-123	23.2
0637	1545409	474710	124.0	4.5	10/3/02	103.31	6471.89	2.5	6575.20	118	6454.7 A	104-124	17.2
0638	1539628	493265	75.0	5.0	12/5/02	57.85	6527.71	0.0	6585.56	65	6520.6 A	35-75	7.2
0639	1539370	492961	80.0	5.0	11/13/02	63.35	6524.53	2.5	6587.88	71	6514.4 A	35-80	10.2
0640	1537790	491961	84.0	5.0	7/23/02	52.69	6527.28	2.2	6579.97	77	6500.8 A	64-84	26.5
0641	1536494	491110	95.0	5.0	11/12/02	8.08	6565.28	2.5	6573.36	87	6483.9 A	65-95	81.4
0642	1536104	490932	95.0	5.0	11/13/02	6.62	6565.26	2.4	6571.88	89	6480.5 A	65-95	84.8
0643	1533760	487386	108.0	5.0	10/16/02	75.89	6475.44	1.5	6551.33	93	6456.8 A	58-108	18.6
0644	1533481	485450	110.0	5.0	10/16/02	75.80	6468.10	2.2	6543.90	102	6438.7 A	55-110	28.4
0645	1532924	485282	80.0	5.0	10/19/98	66.48	6477.31	2.5	6543.79	70	6471.3 A	60-80	6.0
0646	1533246	484953	100.0	5.0	10/16/02	77.60	6465.75	1.5	6543.35	91	6450.9 A	60-100	14.9
0647	1536623	478308	140.0	4.5	12/11/02	93.03	6458.88	1.4	6551.91	132	6418.5 A	80-140	40.4
0648	1534730	478343	120.0	4.5	12/11/02	97.48	6450.31	0.5	6547.79	120	6427.3 A	80-120	23.0
0649	1534730	479798	124.0	4.5	12/11/02	90.93	6452.36	0.3	6543.29	115	6428.0 A	84-124	24.4
0650	1536779	482135	109.0	4.5	4/14/98	71.10	6476.01	2.2	6547.11	103	6441.9 A	89-109	34.1
0652	1531170	483779	88.0	5.0	10/16/02	84.61	6453.54	1.5	6538.15	79	6457.7 A	80-88	0.0
0653	1533283	486570	206.0	6.0	12/11/02	73.98	6470.99	1.3	6544.97	97	6446.7 A	69-206	24.3
										97	6408.7 L	-	62.3
0654	1541994	478636	120.0	4.5	12/5/02	72.69	6477.81	1.4	6550.50	106	6443.1 A	60-120	34.7
0655	1541620	479830	96.0	8.0	5/2/00	75.15	6483.03	—	6558.18	88	—A	21-84	—
0656	1542578	478333	88.0	8.0	5/2/00	77.32	6476.75	—	6554.07	88	—A	6-88	—
0657	1537497	478392	128.0	6.0	12/11/02	89.51	6462.30	2.2	6551.81	120	6429.6 A	87-128	32.7
0657A	1537083	478412	35.0	12.0	4/13/99	37.00	6512.00	—	6549.00	—	—A	17-35	—

TABLE 4.1-4 BASIC WELL DATA FOR THE ALLUVIAL AQUIFER REGIONAL WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
0658	1535922	478436	130.0	6.0	12/11/02	94.65	6455.53	0.4	6550.18	129	6420.8 A	89-130	34.7
0658A	1535589	478423	30.6	—	—	—	—	—	6546.10	—	— A	14-31	—
0659	1541689	480772	101.0	4.5	12/5/02	72.00	6488.17	2.0	6560.17	97	6461.2 A	61-101	27.0
0680	1543850	478746	80.0	4.5	10/25/96	77.39	6481.48	2.0	6558.87	75	6481.9 A	50-80	0.0
0681	1540676	482734	117.0	6.0	9/24/98	64.18	6496.34	2.1	6560.52	111	6447.4 A	67-117	48.9
0682	1543125	477489	94.0	4.0	4/3/01	80.80	6473.17	2.8	6553.97	102	6449.2 A	54-94	24.0
0683	1540198	476217	120.0	6.0	10/11/02	86.32	6469.72	2.0	6556.04	140	6414.0 A	80-120	55.7
0684	1540273	478499	143.0	6.0	10/9/02	83.54	6469.74	2.0	6553.28	118	6433.3 A	83-143	36.5
0685	1539098	478170	100.0	4.5	7/24/02	91.68	6464.89	1.7	6556.57	116	6438.9 A	60-100	26.0
0686	1545319	475438	115.0	4.5	10/3/02	106.00	6472.80	1.8	6578.80	136	6441.0 A	75-115	31.8
0687	1539011	477276	102.0	6.0	7/24/02	90.61	6465.35	2.2	6555.96	120	6433.8 A	62-102	31.5
0689	1530024	478478	80.0	4.5	7/23/02	66.24	6475.78	2.6	6542.02	75	6464.4 A	60-80	11.4
0692	1535892	493175	90.0	5.0	7/23/02	66.36	6518.46	2.5	6584.82	80	6502.3 A	58-90	16.1
0846	1537219	484730	75.0	4.0	7/17/02	44.01	6504.91	1.1	6548.92	65	6482.8 A	40-65	22.1
0847	1534736	488508	92.0	5.0	11/22/96	53.88	6504.39	2.6	6558.27	80	6475.7 A	52-92	28.7
0848	1534634	490660	92.0	5.0	11/13/02	41.00	6531.49	2.7	6572.49	91	6478.8 A	52-92	52.7
0851	1534692	483909	91.0	5.0	8/19/02	75.65	6470.79	3.3	6546.44	80	6463.1 A	41-91	7.6
0852	1535610	493989	74.0	5.0	11/22/96	73.26	6516.88	2.5	6590.14	70	6517.7 A	54-74	0.0
0855	1532111	484184	105.0	5.0	8/19/02	86.38	6454.73	2.1	6541.11	97	6442.0 A	70-105	12.7
0861	1534332	488702	100.0	5.0	8/19/02	73.33	6486.52	2.3	6559.85	65	6492.6 A	50-100	0.0
0862	1534265	487800	110.0	5.0	12/11/02	65.95	6490.23	3.3	6556.18	97	6455.9 A	63-103	34.3
0863	1533867	487912	110.0	5.0	12/11/02	74.30	6482.26	2.5	6556.56	94	6460.1 A	63-103	22.1
0864	1533735	486464	95.0	5.0	8/19/02	73.36	6473.36	1.9	6546.72	78	6466.9 A	44-84	6.5
0865	1534123	488429	97.0	5.0	12/11/02	71.98	6484.80	2.2	6556.78	88	6466.6 A	37-97	18.2
0866	1534494	488340	120.0	5.0	12/11/02	65.25	6492.87	1.8	6558.12	80	6476.3 A	33-113	16.6
0867	1533762	488409	88.0	5.0	12/11/02	72.58	6483.32	2.0	6555.90	86	6467.9 A	48-88	15.4
0868	1534848	491033	103.0	5.0	11/13/02	5.30	6569.44	2.2	6574.74	94	6478.5 A	53-103	90.9
0869	1533251	486073	94.0	5.0	12/11/02	75.00	6469.49	2.0	6544.49	99	6443.5 A	44-94	26.0
* 0870	1532680	484906	93.0	5.0	1/11/96	68.56	6475.60	1.9	6544.16	95	6447.3 A	69-89	28.3
0871	1533603	485400	100.0	5.0	1/11/96	66.86	6477.85	2.4	6544.71	93	6449.3 A	60-100	28.5
* 0872	1533092	485407	100.0	5.0	1/11/96	65.80	6477.51	1.8	6543.31	96	6445.5 A	55-100	32.0
* 0873	1533286	484505	100.0	5.0	1/11/96	67.55	6475.46	1.9	6543.01	96	6445.1 A	60-100	30.3
* 0874	1533968	484925	105.0	5.0	1/11/96	68.68	6476.66	2.2	6545.34	110	6433.1 A	55-105	43.5
* 0875	1532785	483634	125.0	5.0	1/11/96	69.85	6472.99	1.7	6542.84	116	6425.1 A	65-125	47.9
0876	1532853	486088	95.0	5.0	8/19/02	74.59	6469.67	1.9	6544.26	85	6457.4 A	58-88	12.3
0877	1533068	488067	70.0	5.0	8/18/98	63.58	6489.50	1.9	6553.08	65	6486.2 A	58-68	3.3

TABLE 4.1-4 BASIC WELL DATA FOR THE ALLUVIAL AQUIFER REGIONAL WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
0879	1532401	486104	70.0	5.0	8/18/97	64.68	6479.87	2.2	6544.55	62	6480.4 A	48-68	0.0
0881	1542034	481478	96.0	4.5	12/5/02	75.37	6489.67	2.0	6565.04	103	6460.0 A	76-96	29.6
0882	1541404	482396	110.0	4.5	10/3/02	69.26	6491.90	2.0	6561.16	98	6461.2 A	70-110	30.7
0883	1540097	483039	100.0	5.0	10/2/02	60.74	6496.39	1.9	6557.13	96	6459.3 A	60-90	37.1
0884	1542677	481498	90.0	5.0	10/3/02	80.36	6485.74	1.0	6566.10	85	6480.2 A	58-88	5.6
0885	1541919	483474	100.0	5.0	10/3/02	69.38	6495.26	1.5	6564.64	95	6468.1 A	70-100	27.1
0886	1542327	482487	90.0	5.0	10/9/02	73.08	6491.47	1.5	6564.55	87	6476.1 A	60-90	15.4
0887	1543063	482469	67.0	5.0	3/12/98	69.21	6498.52	1.5	6567.73	60	6506.2 A	42-67	0.0
0888	1542285	479335	105.0	5.0	10/10/02	79.30	6478.03	1.1	6557.33	90	6466.2 A	75-105	11.8
0889	1540047	480222	65.0	5.0	10/24/96	63.31	6486.32	1.5	6549.63	60	6488.2 A	35-65	0.0
0890	1541365	480088	101.0	5.0	12/5/02	74.95	6483.48	1.7	6558.43	93	6463.7 A	81-101	19.8
0893	1541934	482244	98.0	4.5	10/3/02	74.92	6489.05	2.1	6563.97	93	6468.9 A	78-98	20.2
0894	1541976	478317	78.0	4.5	10/2/02	77.12	6477.17	3.0	6554.29	97	6454.3 A	58-78	22.9
0895	1541521	476222	104.0	5.0	10/10/02	81.21	6472.63	2.4	6553.84	116	6435.4 A	61-101	37.2
0896	1542246	476237	113.0	5.0	10/10/02	82.24	6473.37	2.0	6555.61	117	6436.6 A	73-113	36.8
0897	1543819	478237	93.0	4.0	9/27/98	83.28	6478.97	2.0	6562.25	70	6490.3 A	63-93	0.0
0899	1543801	477288	110.0	4.0	10/10/02	96.06	6474.78	2.0	6570.84	120	6448.8 A	70-110	25.9
0905	1532700	480850	120.0	5.0	—	—	—	0.0	6545.00	120	6425.0 A	100-120	—
0906	1532900	480450	—	—	8/29/95	74.65	6462.75	0.0	6537.40	—	— A	-	—
0909	1531900	483400	140.0	4.0	11/19/82	77.45	6461.45	0.0	6538.90	112	6426.9 L	80-135	34.6
										112	6426.9 A	80-135	34.6
0910	1528800	481150	138.0	5.0	—	—	—	0.0	6535.00	132	6403.0 A	120-134	—
0912	1471000	478250	—	—	—	—	—	0.0	6530.00	—	— A	-	—
0913	1555800	500950	—	8.0	1/24/96	38.40	6604.60	0.3	6643.00	—	— A	-	—
0914	1555500	500850	—	6.0	5/9/02	40.41	6601.59	1.4	6642.00	—	— A	-	—
0915	1552650	499650	100.0	4.0	—	—	—	0.0	6625.00	70	6555.0 A	55-85	—
0916	1552350	499600	160.0	4.0	4/26/94	40.00	6585.00	0.0	6625.00	—	— A	45-70	—
0917	1542200	514600	—	—	—	—	—	0.0	6800.00	—	— A	-	—
0920	1555800	496900	—	7.0	5/11/94	33.40	6594.20	0.7	6627.60	—	— A	-	—
0921	1555400	495800	—	5.0	5/8/02	38.43	6585.57	1.9	6624.00	—	— A	-	—
0922	1555200	492500	—	6.0	5/8/02	52.28	6569.42	1.7	6621.70	—	— A	-	—
0924	1547500	438900	135.0	4.0	—	—	—	0.0	6592.90	112	6480.9 A	94-114	—
0925	1548600	480800	150.0	4.0	—	—	—	0.0	6601.40	140	6461.4 A	126-141	—
0926	1547500	472700	134.0	4.0	—	—	—	0.0	6596.90	132	6464.9 A	123-132	—
0935	1540115	476629	300.0	16.0	10/9/02	88.08	6470.04	2.6	6558.12	125	6430.5 A	95-132	39.5
0936	1543621	472978	160.0	5.0	—	—	—	0.0	6573.38	160	6413.4 A	100-160	—

TABLE 4.1-4 BASIC WELL DATA FOR THE ALLUVIAL AQUIFER REGIONAL WELLS (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO BASE OF ALLUVIUM (FT-LSD)	ELEV. TO BASE OF ALLUVIUM (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	SATURATED THICKNESS
0939	1539750	483200	97.0	8.0	7/25/96	59.31	6497.69	2.3	6557.00	—	—A	-	—
0940	1537750	482850	70.0	—	7/24/96	57.30	6495.70	8.8	6553.00	—	—A	-	—
0942	1538300	483710	102.0	—	—	—	—	0.0	6550.20	95	6455.2 A	85-95	—
0947	1536206	491841	100.0	4.0	7/27/94	54.63	6520.55	0.0	6575.18	95	6480.2 A	70-100	40.4
0950	1560400	498300	81.0	5.0	7/12/00	25.70	6631.30	0.5	6657.00	—	—A	-	—
0952	1534550	477800	140.0	—	—	—	—	0.0	6550.00	—	—A	-	—
0975	1539640	482880	—	—	—	—	—	0.0	6556.00	—	—A	-	—
0976	1539630	483100	115.0	—	—	—	—	0.0	0.00	—	—A	-	—
0977	1539400	482730	—	—	12/9/95	61.47	6495.53	1.0	6557.00	—	—A	-	—
0979	1539010	483280	105.0	5.0	7/10/02	57.56	6593.44	0.0	6651.00	100	6551.0 A	90-100	42.4
0980	1539040	483080	—	—	11/8/95	57.70	6497.30	0.0	6555.00	—	—A	-	—
0981	1538970	482820	—	—	—	—	—	0.0	6554.00	—	—A	-	—
0982	1538370	483290	110.0	5.0	—	—	—	0.0	6651.00	105	6546.0 A	90-105	—
0983	1538590	483100	—	—	—	—	—	0.0	6552.00	—	—A	-	—
0984	1538750	482950	103.0	5.0	—	—	—	0.0	6651.00	98	6553.0 A	88-98	—
0985	1538820	483180	115.0	5.0	7/18/96	58.75	6592.25	0.0	6651.00	102	6549.0 A	90-110	43.3
0989	1537890	482760	—	—	11/2/95	58.10	6494.90	1.0	6553.00	—	—A	-	—
0992	1539340	483780	100.0	5.0	—	—	—	0.0	6652.00	95	6557.0 A	85-95	—
0993	1537860	483680	102.0	5.0	—	—	—	0.0	6650.00	98	6552.0 A	85-98	—
0994	1539700	476240	144.0	6.0	11/13/02	90.47	6464.53	0.0	6555.00	—	—L	95-110	—
										—	—A	95-110	—
0996	1537621	477989	138.0	5.0	7/24/02	96.26	6456.26	1.7	6552.52	136	6414.8 A	126-136	41.4
0997	1539821	473807	—	—	3/12/96	76.90	6491.40	0.0	6568.30	—	—A	-	—
0999	1524230	480187	185.0	—	—	—	—	0.0	6527.00	—	—A	-	—
1012	—	—	—	6.0	—	—	—	0.0	0.00	—	—A	-	—
1013	—	—	—	4.0	—	—	—	0.0	0.00	—	—A	-	—
1014	—	—	—	9.0	—	—	—	0.0	0.00	—	—A	-	—
1015	—	—	—	6.0	—	—	—	0.0	0.00	—	—A	-	—
1018	—	—	—	5.0	—	—	—	0.0	0.00	—	—A	-	—
1020	—	—	—	5.0	1/18/96	15.17	-15.17	0.0	0.00	—	—A	-	—
1021	—	—	—	—	1/18/96	18.00	-18.00	0.0	0.00	—	—A	-	—

Note: A = Alluvial Aquifer
M = Middle Chinle Aquifer
T = Tailings Aquifer
* = Well Abandoned
? = Uncertain Identity

4.2 ALLUVIAL WATER LEVELS

4.2.1 WATER-LEVEL ELEVATION - ALLUVIAL

This section presents information necessary to define the direction that ground water moves in the alluvial aquifer. Water-level elevations are used to define the gradient of the alluvial water table, which in turn can be used to define the direction of ground-water flow.

Figures 4.2-1A and 4.2-1B present Fall of 2002 alluvial aquifer water-level elevations for what has been termed the west area and the Grants Project area near Homestake's tailings, respectively. Additionally, these figures show, with patterned areas, where the alluvial aquifer is absent due to lack of saturation. These areas were defined based on the 2002 water-level elevation map and base of the alluvium map. Adjustments in the alluvial aquifer limits using 2002 water-level elevation data were made due to changes on the east side of the small tailings pile. These unsaturated areas exist where the elevation of the base of the alluvium is equal to or greater than the water-level elevation. Locations of the alluvial wells, with their respective well names listed adjacent to the well symbol, are plotted on Figures 4.1-1A and 4.1-1B. The 2002 ground-water flow patterns in the alluvial aquifer are very similar to those observed in the Fall of 2001, with a slightly larger depression on the south side of the large tailings due to the collection system (see Figures 4.2-1A and 4.2-1B of Hydro-Engineering, L.L.C., 2001a). The ridge of water on the southeast side of the small tailings was increased in 2002. One-foot water-level elevation contour intervals were drawn near the collection wells where space allowed. Water-level elevations define the area of collection and a pattern outlines this area on Figure 2.1-1. The area of collection is between the fresh-water injection and the collection wells where water is flowing back to the collection wells. The area of the large tailings pile is also within the collection area because alluvial ground water in this area flows to the collection wells.

The water-level contours declined in Section 3 due to the irrigation supply pumping from six wells in this section (see Figure 4.2-1B). The main changes in water levels in Figure 4.2-1A are in Section 33 due to the five irrigation supply wells in this

area and the below normal natural recharge level in 2002. Some decline occurred in the eastern portion of Section 28 due to irrigation supply pumping in this area.

Several wells have been drilled in the area of the zero saturation boundaries to better define the limits of the alluvial aquifer. Water was observed in some of these wells in the Chinle shale below the alluvium, indicating that there may be zones of perched water in the upper part of the Chinle shale. These wells have been used to help define where the zero saturation of the alluvium occurs and their water levels should be used with caution.

Figure 4.2-1A shows the direction of alluvial ground-water flow in the area immediately west of the Grants Project area with red flow arrows. Flow in the San Mateo alluvium is forced to flow through the western portion of Section 28 due to the zero saturation limits to the north and south of this area. The San Mateo alluvial water then mixes with the Rio San Jose alluvial water from the northwest, which continues to flow to the south. The gradient has been increased due to irrigation activity but is still very flat in the Rio San Jose alluvium due to its large transmitting ability. Alluvial ground water that flows through the northern portion of Section 3 (see Figure 4.2-1B) joins the Rio San Jose ground-water system in the eastern portion of Section 4.

Water-level data for the HMC alluvial wells are presented in Table A.1-1 of Appendix A. Table A.1-2 presents alluvial water-level data measured in wells located in Murray Acres, Broadview Acres, Felice Acres, and Pleasant Valley Estates. The water levels from the four subdivisions are presented in numeric and alphabetical order, with wells 453, Sub1 and Sub3 from Broadview Acres and wells 482, 490, 491, 492, 496, 497 and CW44 from Felice Acres. Water levels from wells 804, 844 and 845 are from Murray Acres, while wells 525 and 688 are located in Pleasant Valley. The alluvial water-level data for the regional wells are presented in Table A.1-3 of Appendix A.

4.2.2 WATER-LEVEL CHANGE - ALLUVIAL

Figures 4.2-2A and 4.2-2B present wells that were grouped together on water-level elevation versus time plots. The figure number of the water-level elevation plots for each group of wells is shown by the well groupings. The colors used for the

well name and well symbol on Figures 4.2-2A and 4.2-2B are the same as those used on the water-level elevation plots. Water-level elevation data considered to be inaccurate were removed from the plots for better visual presentation of trends, but the excluded data remains in the Appendix A tabulations. Time plots (Figures 4.2-3 through 4.2-18) present only the last seven years of data to better show the 2002 trends.

Water levels in the alluvial aquifer have been fairly stable during the last year. Figure 4.2-3 presents water-level elevation data for upgradient wells DD, ND, NC, P, Q and R. A very gradual increasing trend has been observed in upgradient wells R and ND in 2002. A decline in well P is likely caused by the upgradient alluvial pumping. The water level in the remainder of the upgradient wells has been fairly stable.

Water-level elevation data are presented for two sets of gradient reversal wells located near the S line of the collection system. Reversal wells SP and SO are located just northeast of the majority of the S line of collection wells. Figure 4.2-4 presents water-level elevation data for these two wells and shows that the alluvial hydraulic gradient is reversed between wells SO and SP. Water levels rose in these two wells in mid-2002 but declined at the end of the year. An adequate reversal was maintained during this rise. Wells S1 and S2 are the two reversal wells downgradient of the S line of collection wells (see Figures 4.1-1B and 4.2-2 for location). Recent data from these two wells show reversal of the ground-water surface downgradient of the S collection wells (see Figure 4.2-5) throughout a water level rise and decline in 2002.

Figure 4.2-6 presents water-level elevation data for a group of wells located west of the S line of collection wells. Water-level elevations in wells DC and MU increased in 2002, while the level dropped in wells BC, MO and S4.

The alluvial water levels north of Murray Acres declined in 2002 in wells MQ, MY and W. Water levels were fairly steady in well S3 in 2002 (see Figure 4.2-7).

The pair of reversal wells B and BA is used to define the gradient between the M and J injection lines and the D collection line. Figure 4.2-8 presents water-level elevation data for wells B and BA. Well B is downgradient of well BA, and a ground-water reversal is demonstrated when its water-level elevation is greater than that in well BA. A ground-water gradient from the south to the north exists in this area and

the gradient reversal was maintained in 2002. Water levels in this area overall were steady in 2002.

Figure 4.2-9 presents water-level elevation plots for alluvial wells BP, D1, M5 and PM, which are located near the lined collection ponds. This plot shows that the water levels gradually increased in 2002 in well PM with a large increase in the early portion of the year due to R.O. injection. Steady to a slight declining trend was observed in the other three wells.

Water-level elevations in the alluvial aquifer near the small tailings collection system, at reversal wells DZ and KZ, are presented on Figure 4.2-10. Well DZ is near the D collection line and well KZ is close to the K injection line and, therefore, naturally downgradient of well DZ. This plot shows that during 2002 a strong reversal of the ground-water gradient was maintained between the line of injection and line of collection. This pair of reversal wells will be adequate to define the ground-water gradient between this major zone of injection and the collection system. Water levels in well KF are also shown with this pair of reversal wells.

Figure 4.2-11 presents water-level elevation data for wells B11, DQ, L6 and TB. This data reflects the changes in water levels near the north and east sides of the small tailings pile. The variable water levels in well B11 are due to the collection from this well. The R.O. and fresh-water injection has caused the higher water-level elevations in the area of well L6. A decline in the water level at well TB occurred in 2002. Figure 4.2-12 shows the water-level elevation plots for wells I, KEB, X and Y. Water levels were increased in wells KEB, X and Y in 2002 due to the R.O. injection.

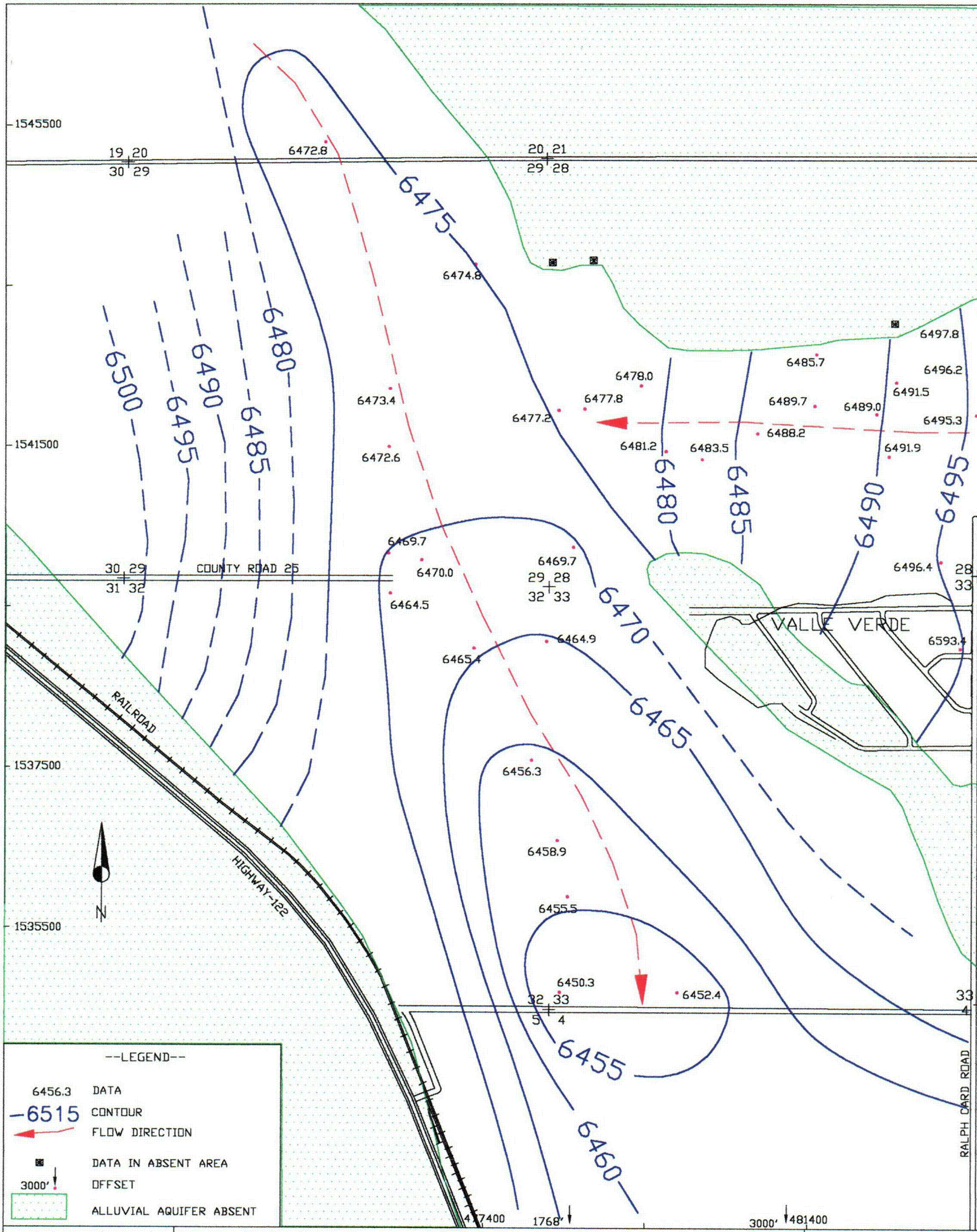
Water-level elevations in the alluvial aquifer south of the Broadview Acres injection system were fairly steady during 2002 except for some decline in well 497 (see water levels for wells Sub1, 453, 490 and 497 on Figure 4.2-13). Water levels were fairly steady in alluvial wells FB, 844, 846, 688 and MX during 2002 except for a gradual decline in wells 688 and MX (see Figure 4.2-14).

Figure 4.2-15 presents the water levels in five wells in Section 3. Wells 653, 862 and 869 are irrigation supply wells and therefore their water levels vary relative to their pumping. Water levels in alluvial wells 652 and 855 have gradually declined over

the last three years due to the production of irrigation water and continuing drought conditions.

Water levels in five wells are presented in Figure 4.2-16 in the Section 28 area. Wells 890 and 881 are irrigation supply wells in this area and initially used in 2002. Water levels were declining in this area prior to the start of the irrigation but have increased their decline in 2002 likely due to the production of irrigation supply water. Figure 4.2-17 presents the water levels in the group of wells downgradient of the Section 28 irrigation supply. Some recovery of water levels in this area have been observed in 2002 due to the fresh-water injection into Section 29. The water level in well 687 did not recover in 2002 but probably would have had a slightly larger decline if the Section 29 injection had not occurred.

Figure 4.2-18 presents the water level plots for the Section 33 wells. Wells 648, 649, 657 and 658 are irrigation supply wells and therefore their water levels are influenced by the production of the water from these wells. The non-pumping water level after the 2002 irrigation season shows that water levels in this area are below those observed in early 2001. Combination of the irrigation supply and drought conditions are causing the water levels to overall decline with time.

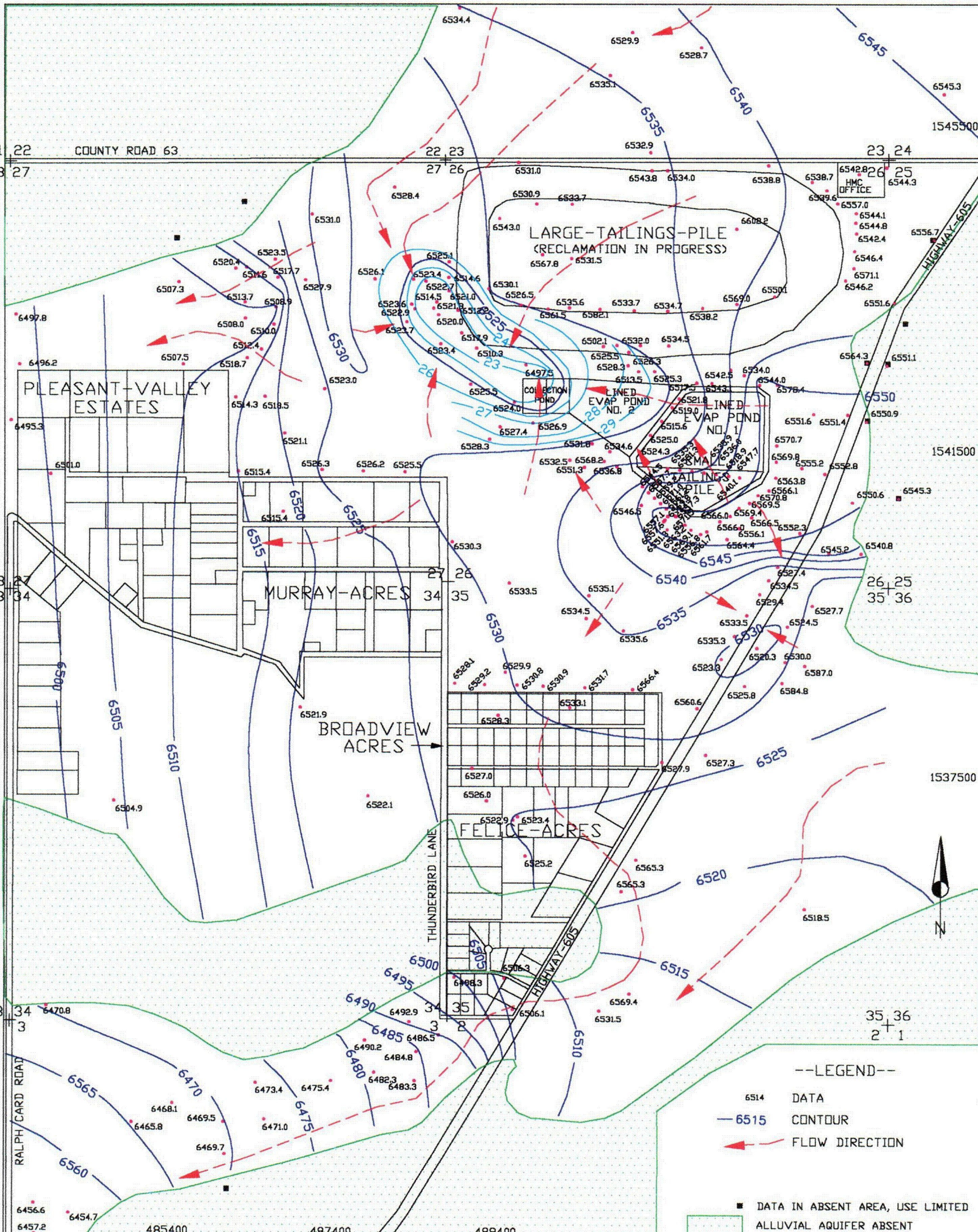


SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 02/11/03

FIGURE 4.2-1A. WATER-LEVEL ELEVATION FOR THE ALLUVIAL AQUIFER (WEST AREA), FALL 2002, FT-MSL

D:\R13\HMC\
01WQAL lh

C10

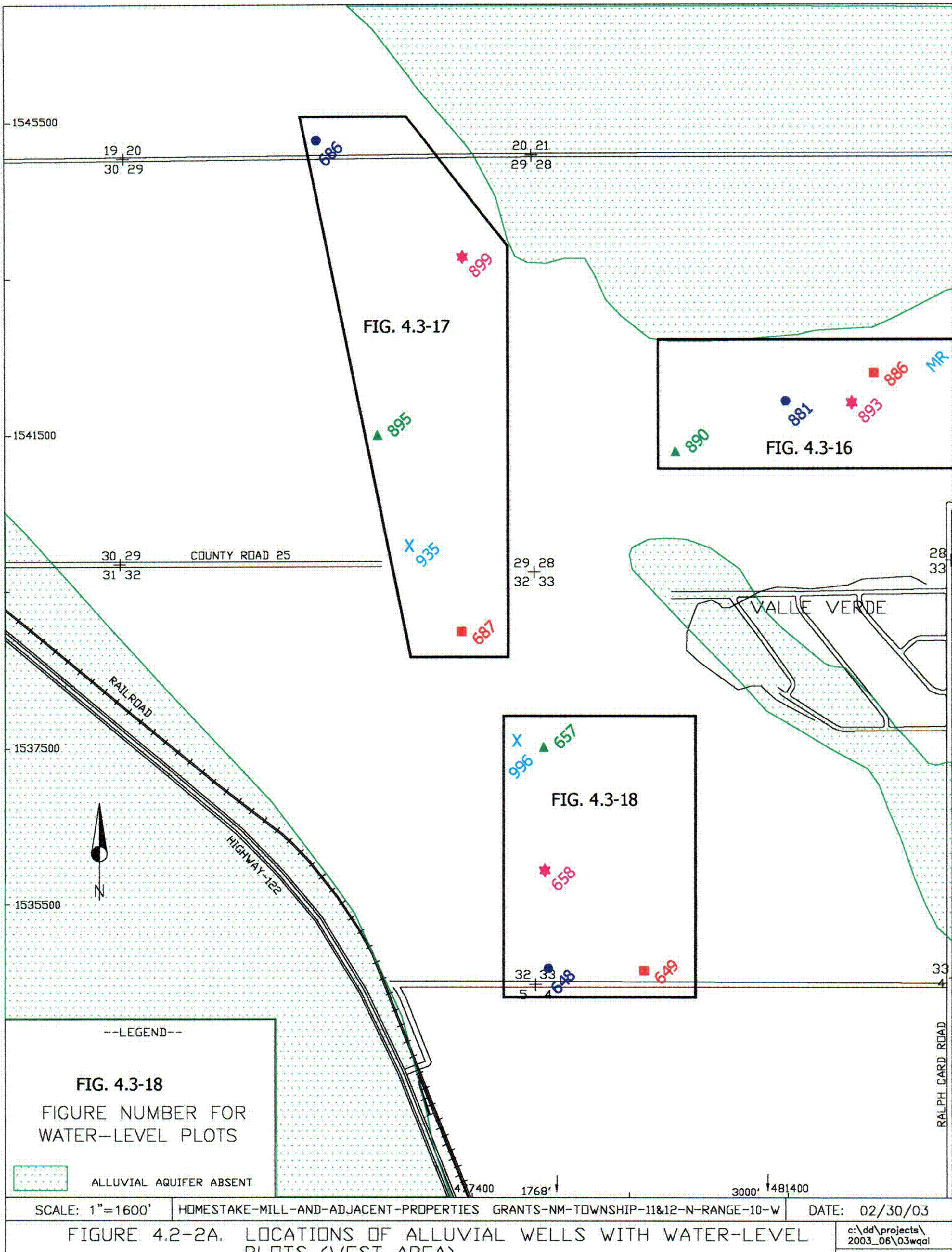


SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 02/11/03

FIGURE 4.2-1B. WATER-LEVEL ELEVATION FOR THE ALLUVIAL AQUIFER, FALL 2002, FT-MSL

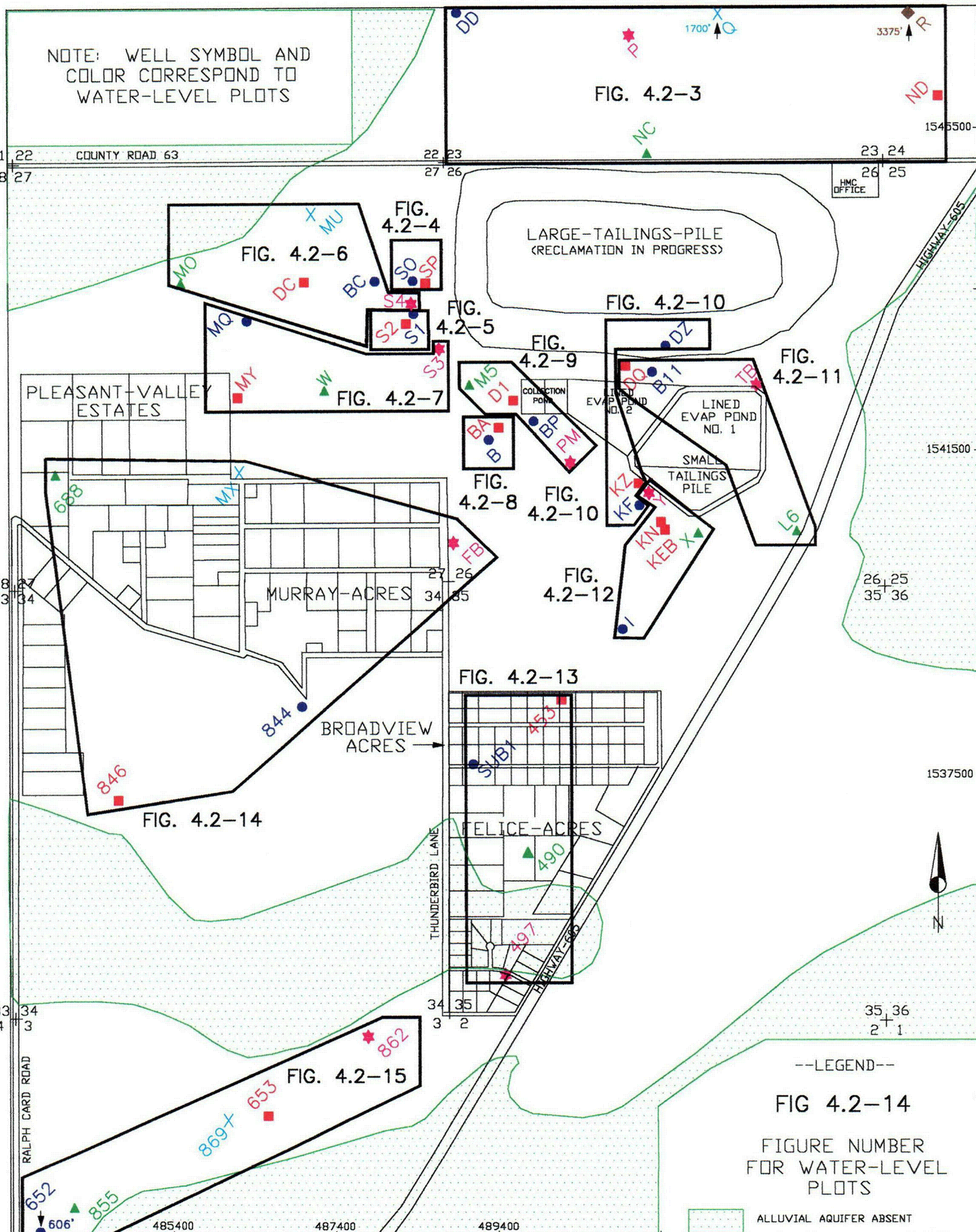
D:\R13\HMC\ 01EQAL lh

C11



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 02/30/03
FIGURE 4.2-2A. LOCATIONS OF ALLUVIAL WELLS WITH WATER-LEVEL PLOTS (WEST AREA)		c:\dd\projects\2003_06\03wqal
		page 4.2-8

C12



SCALE: 1"=1600' HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W DATE: 02/13/03

FIGURE 4.2-2B. LOCATIONS OF ALLUVIAL WELLS WITH WATER-LEVEL PLOTS

D:\R13\HMC\ 01EQAL lh

C13

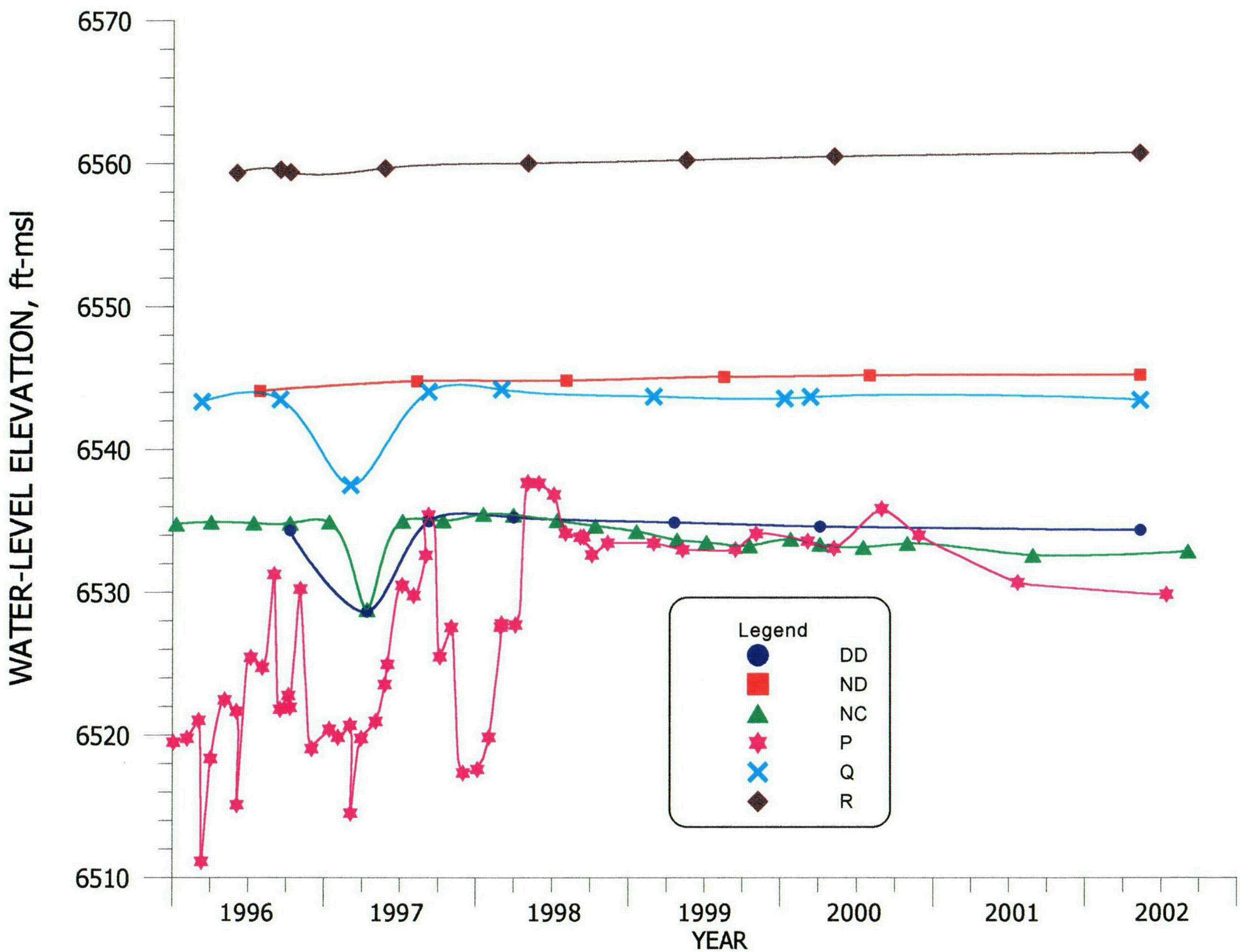


FIGURE 4.2-3. WATER-LEVEL ELEVATION FOR WELLS DD, ND, NC, P, Q AND R.

C14

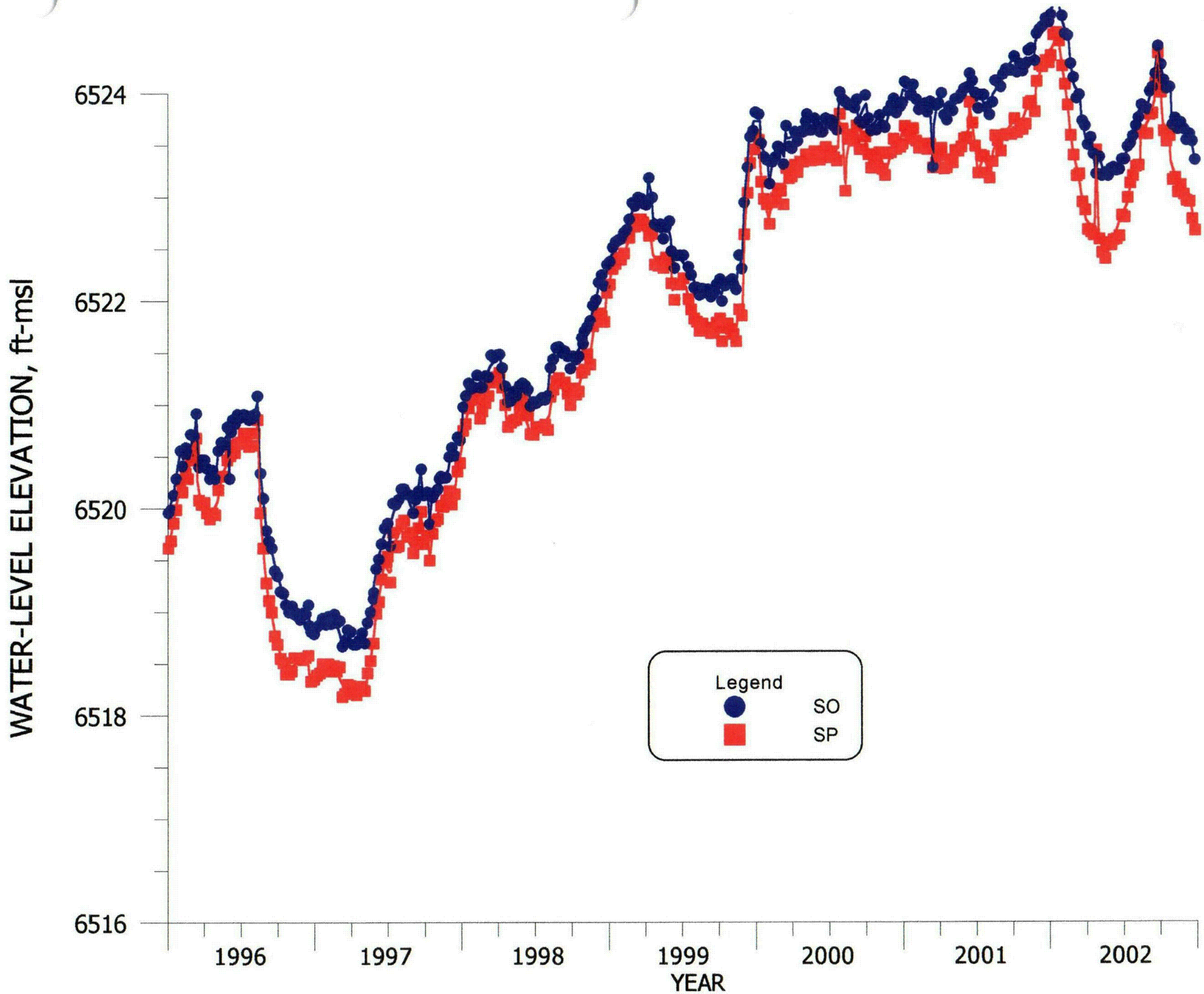


FIGURE 4.2-4. WATER-LEVEL ELEVATION FOR WELLS SO AND SP.

C15

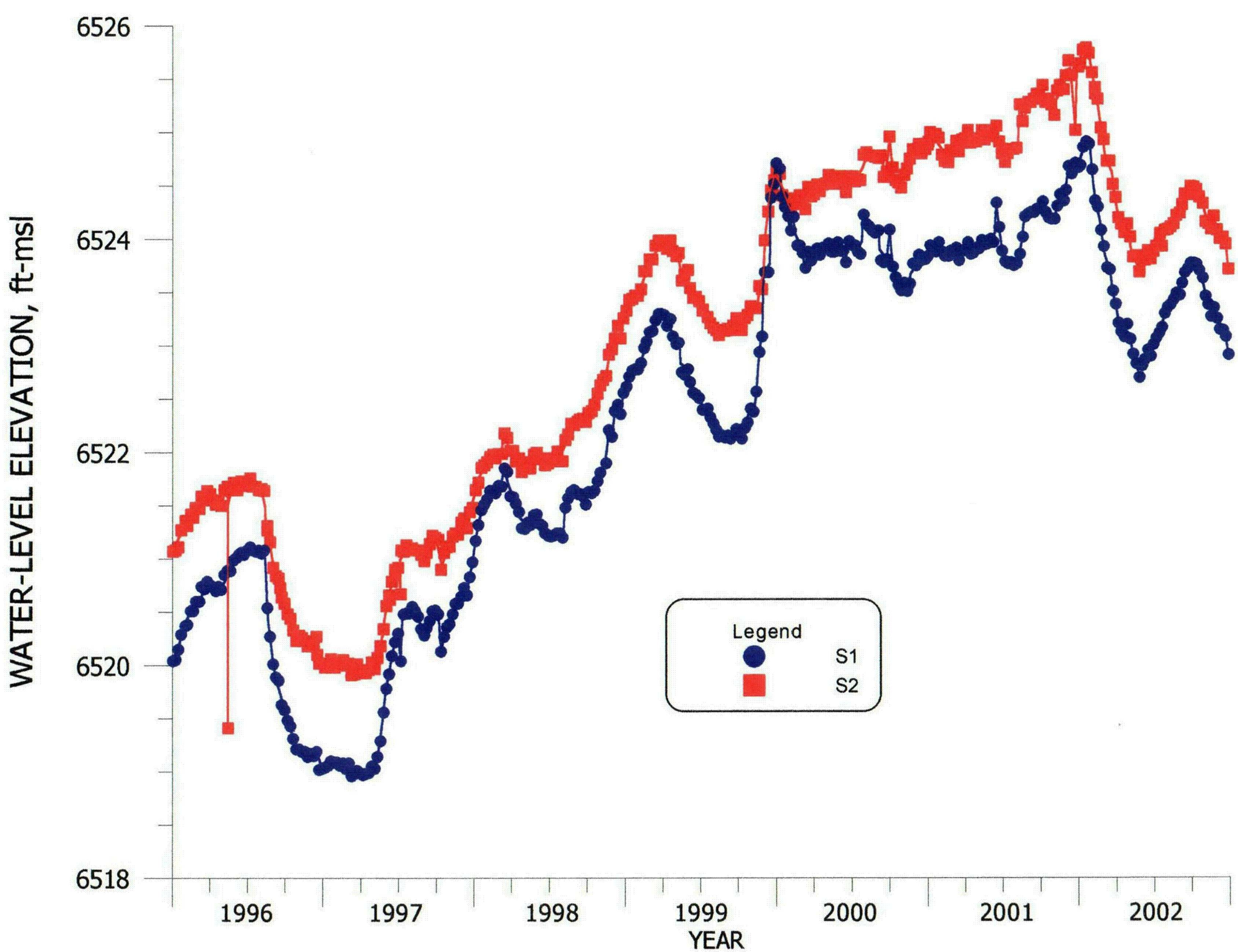


FIGURE 4.2-5. WATER-LEVEL ELEVATION FOR WELLS S1 AND S2.

C16

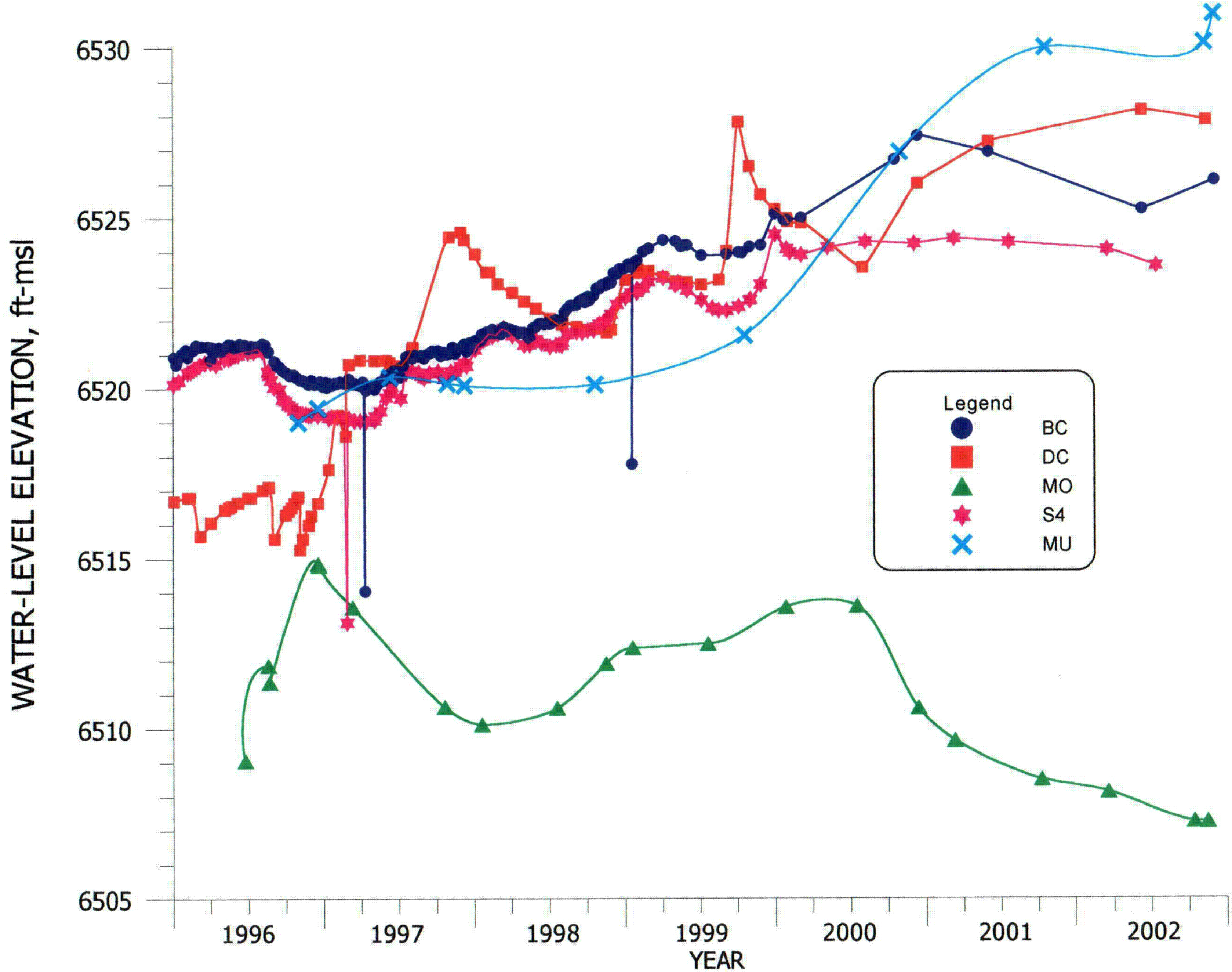


FIGURE 4.2-6. WATER-LEVEL ELEVATION FOR WELLS BC, DC, MO, S4 AND MU.

C17

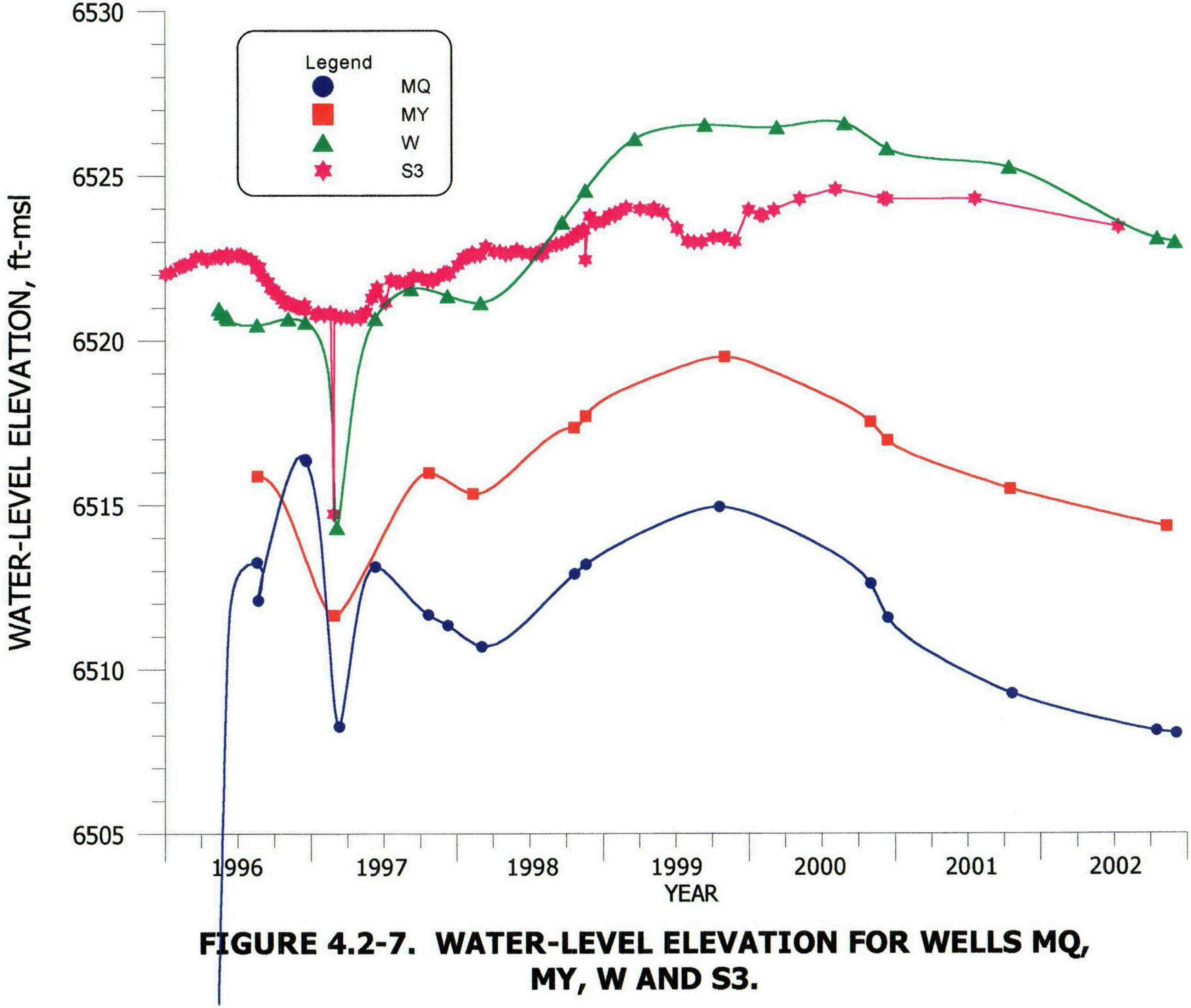


FIGURE 4.2-7. WATER-LEVEL ELEVATION FOR WELLS MQ, MY, W AND S3.

C18

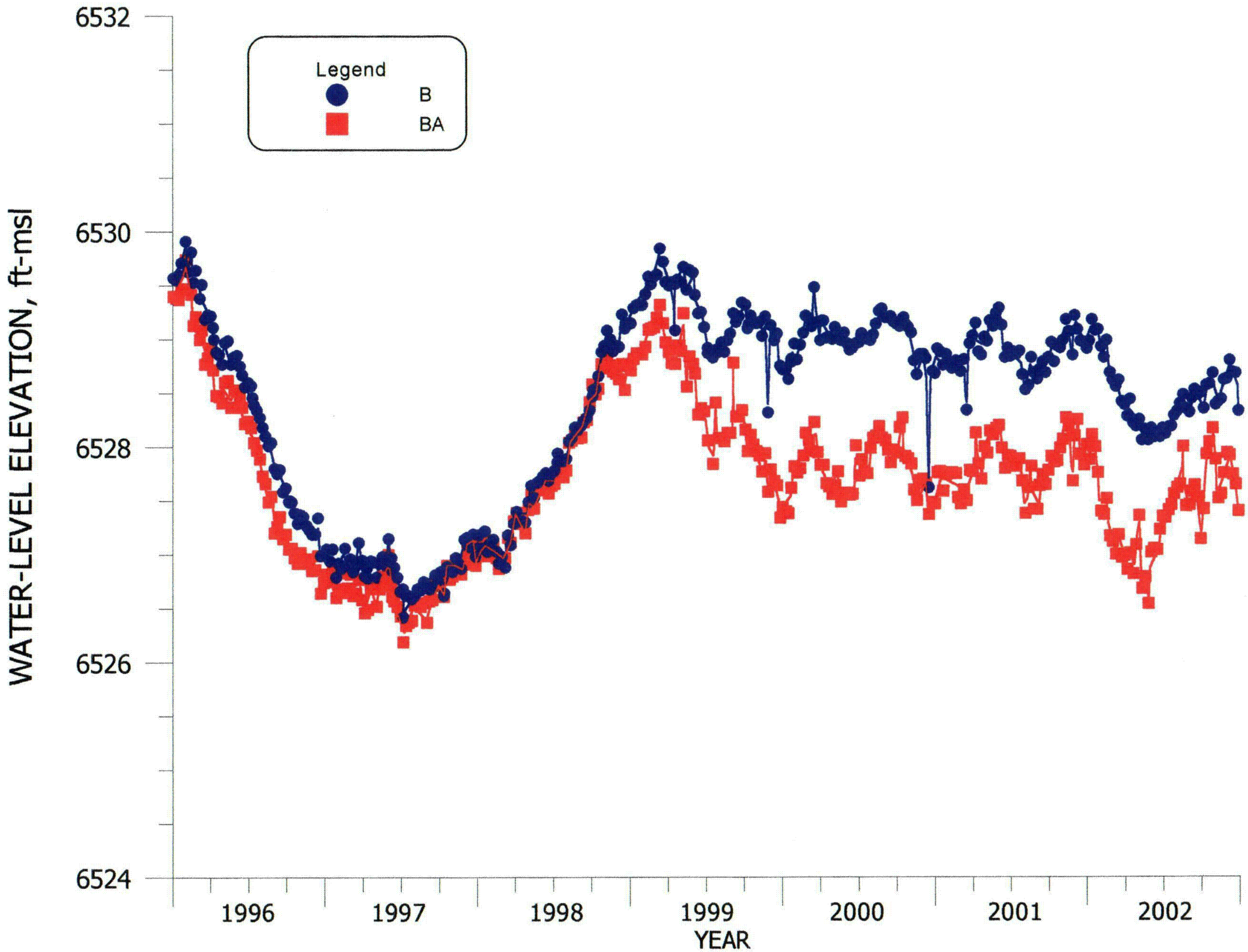


FIGURE 4.2-8. WATER-LEVEL ELEVATION FOR WELLS B AND BA.

C19

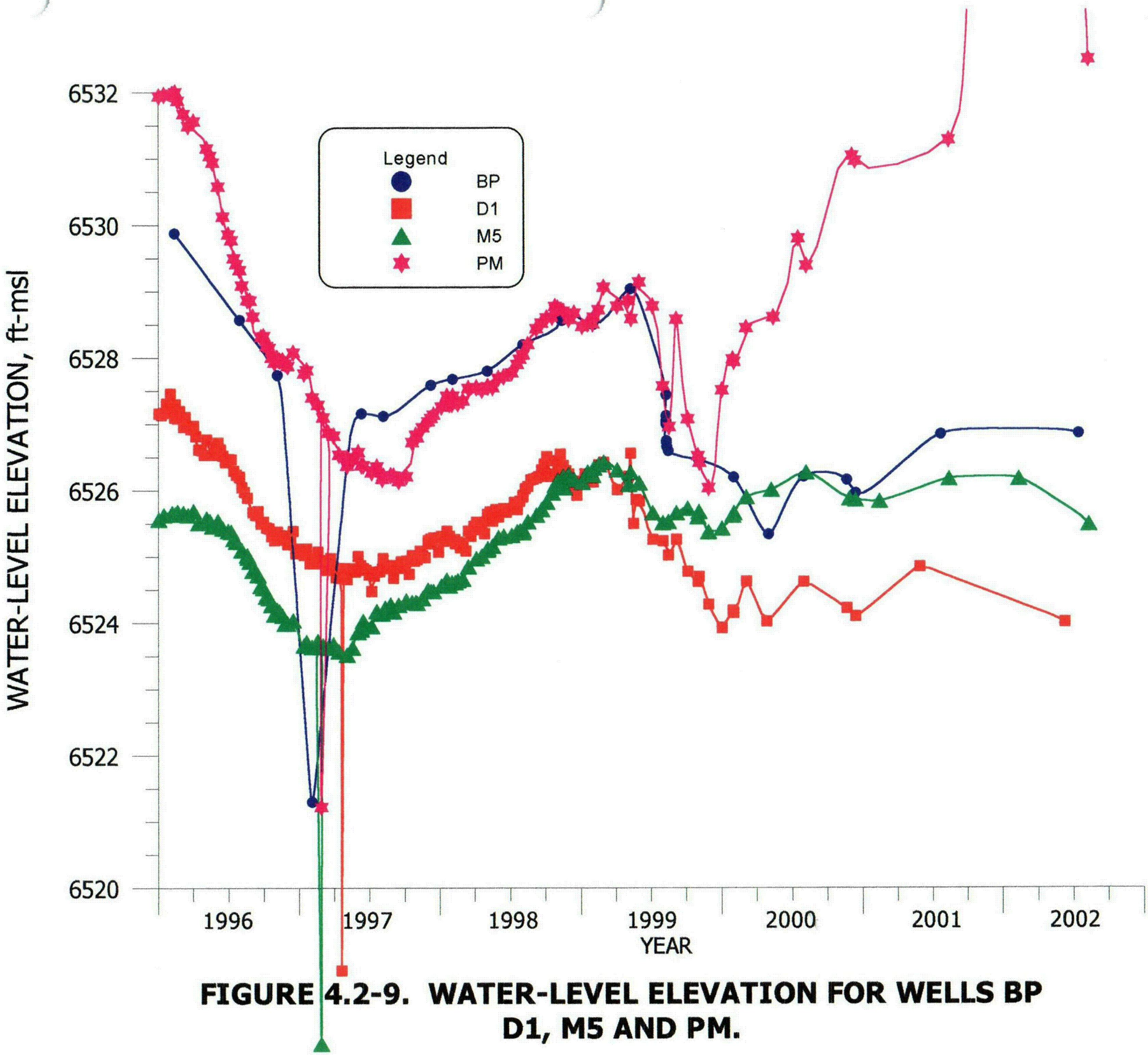


FIGURE 4.2-9. WATER-LEVEL ELEVATION FOR WELLS BP D1, M5 AND PM.

C20

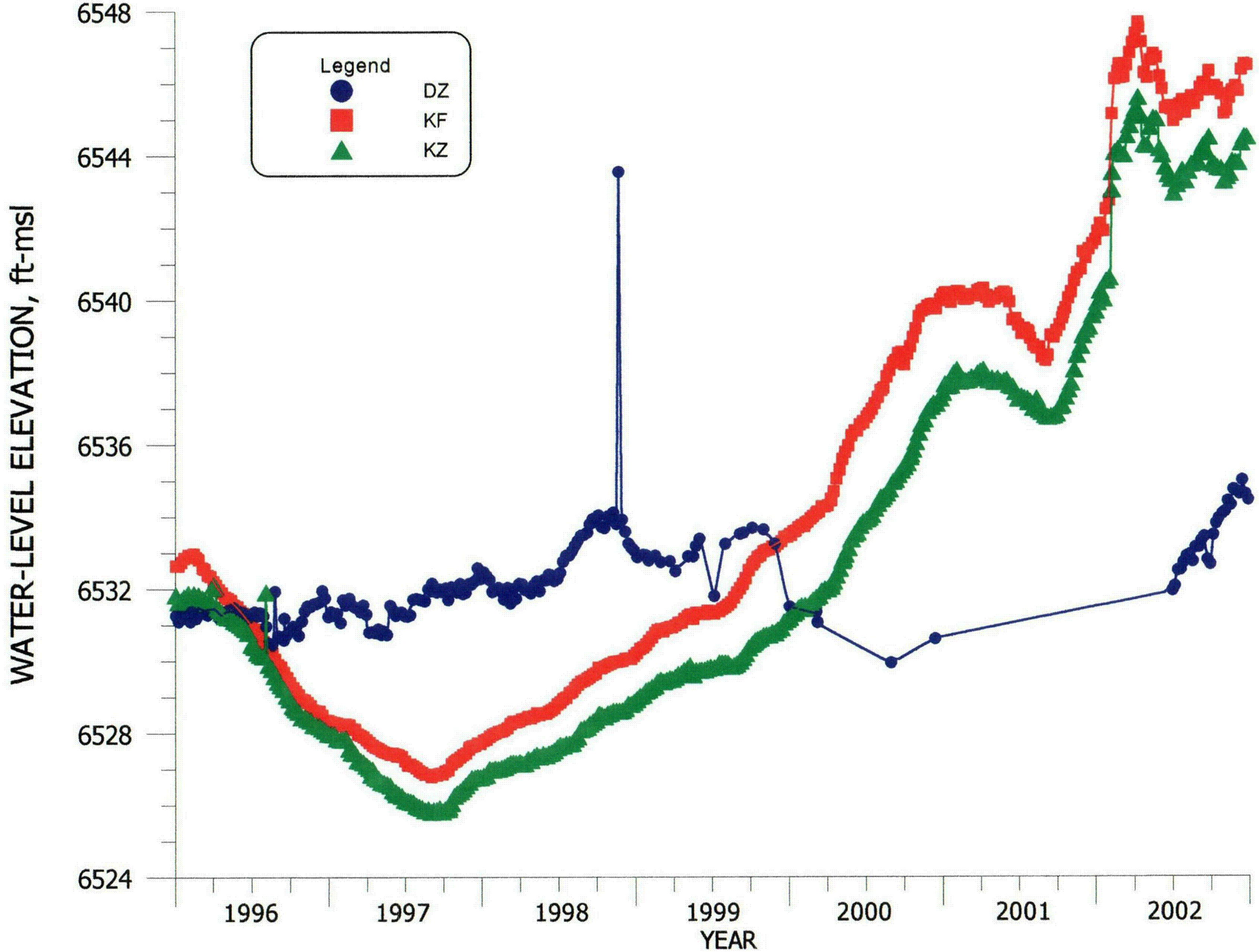
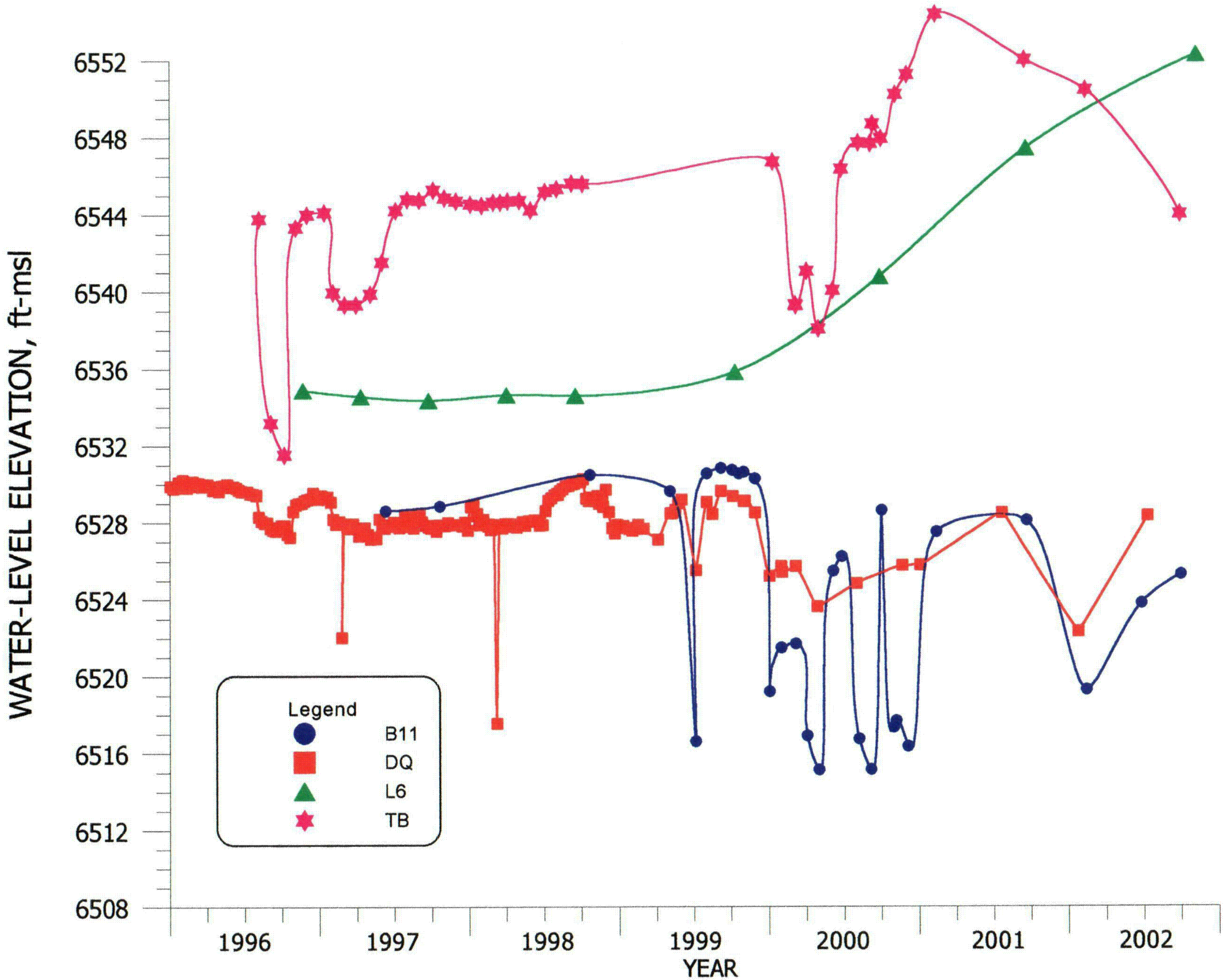


FIGURE 4.2-10. WATER-LEVEL ELEVATION FOR WELLS DZ, KF AND KZ.

C21



4.2-18

FIGURE 4.2-11. WATER-LEVEL ELEVATION FOR WELLS B11, DQ, L6 AND TB.

C22

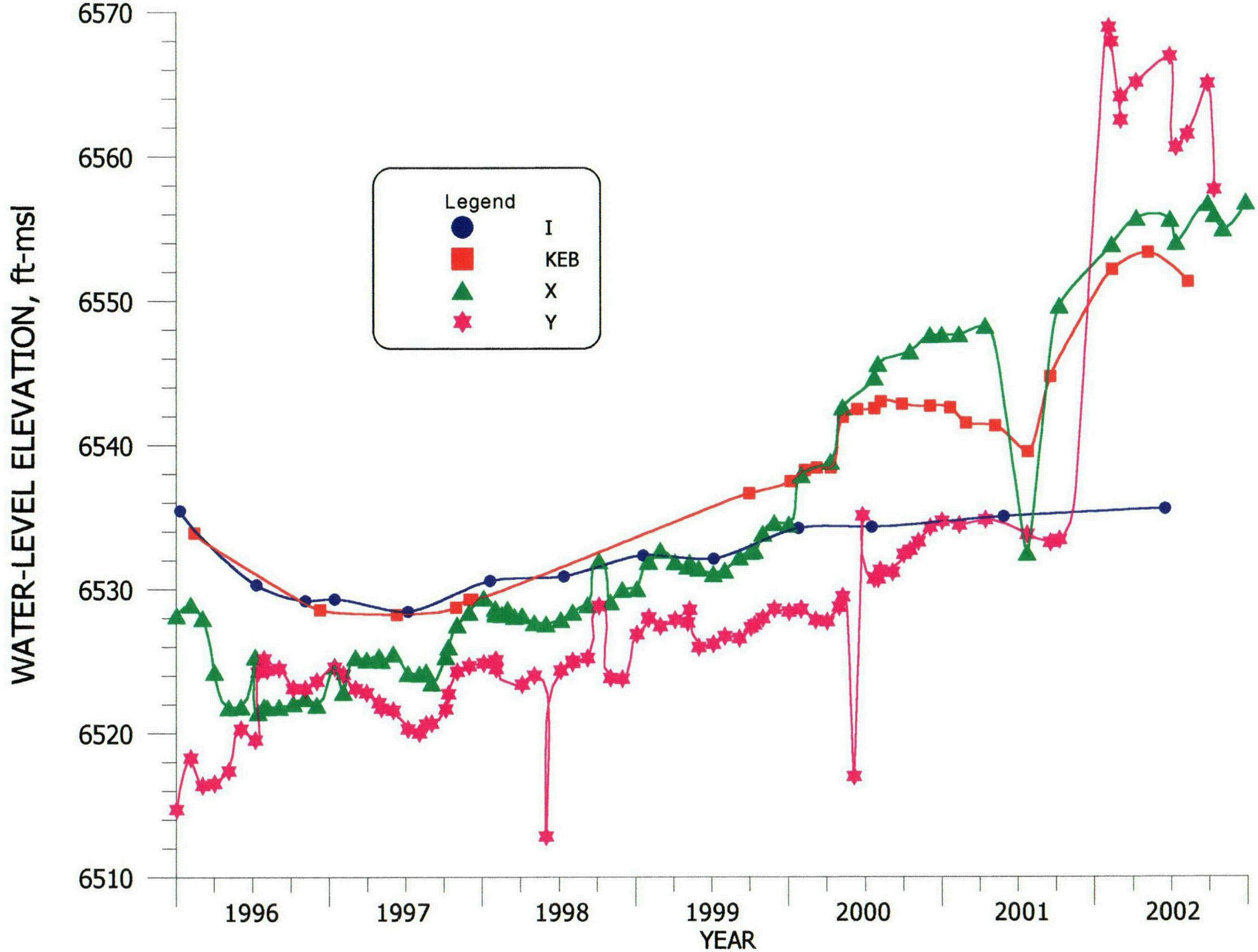


FIGURE 4.2-12. WATER-LEVEL ELEVATION FOR WELLS I, KEB, X AND Y.

c23

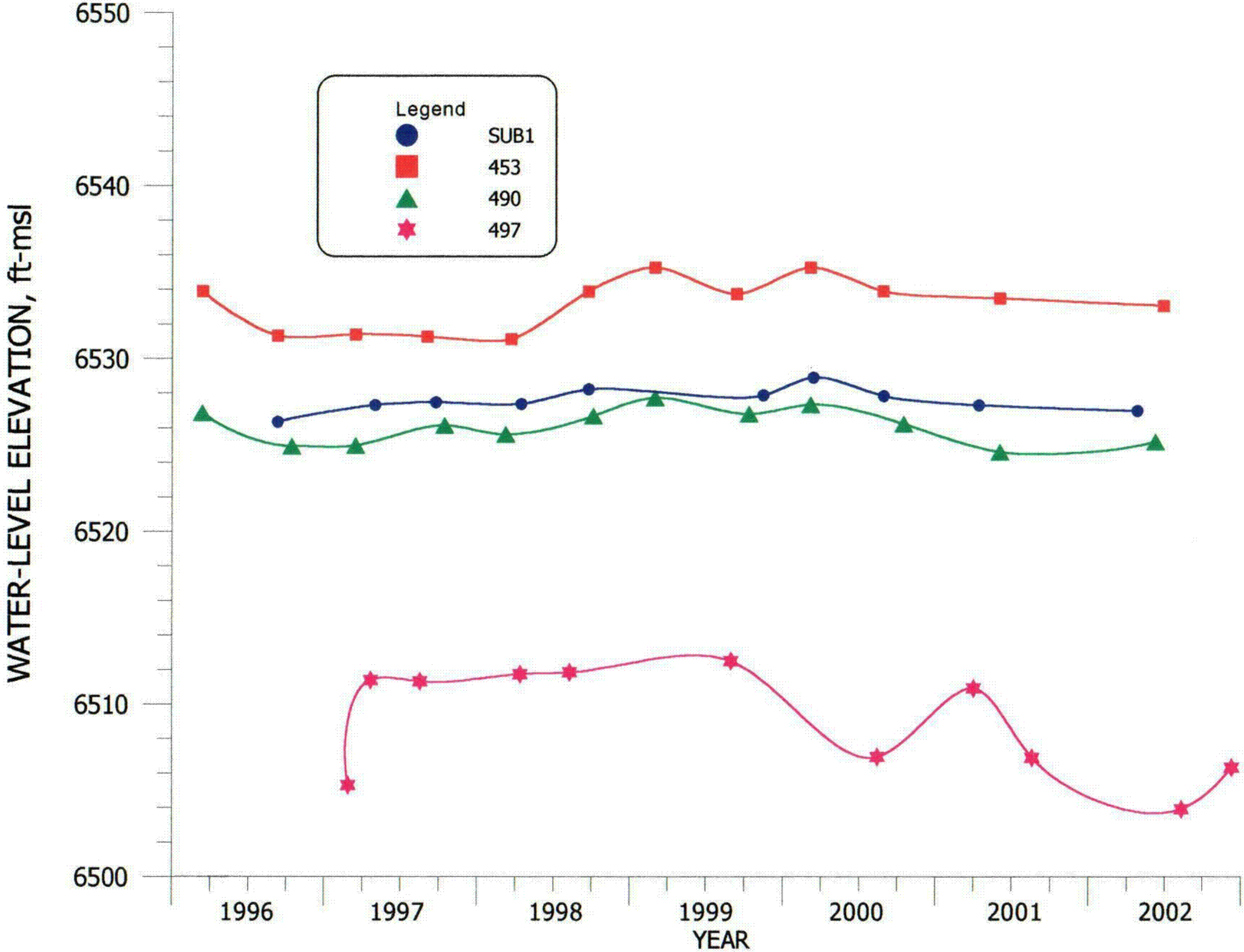


FIGURE 4.2-13. WATER-LEVEL ELEVATION FOR WELLS SUB1, 453, 490 AND 497.

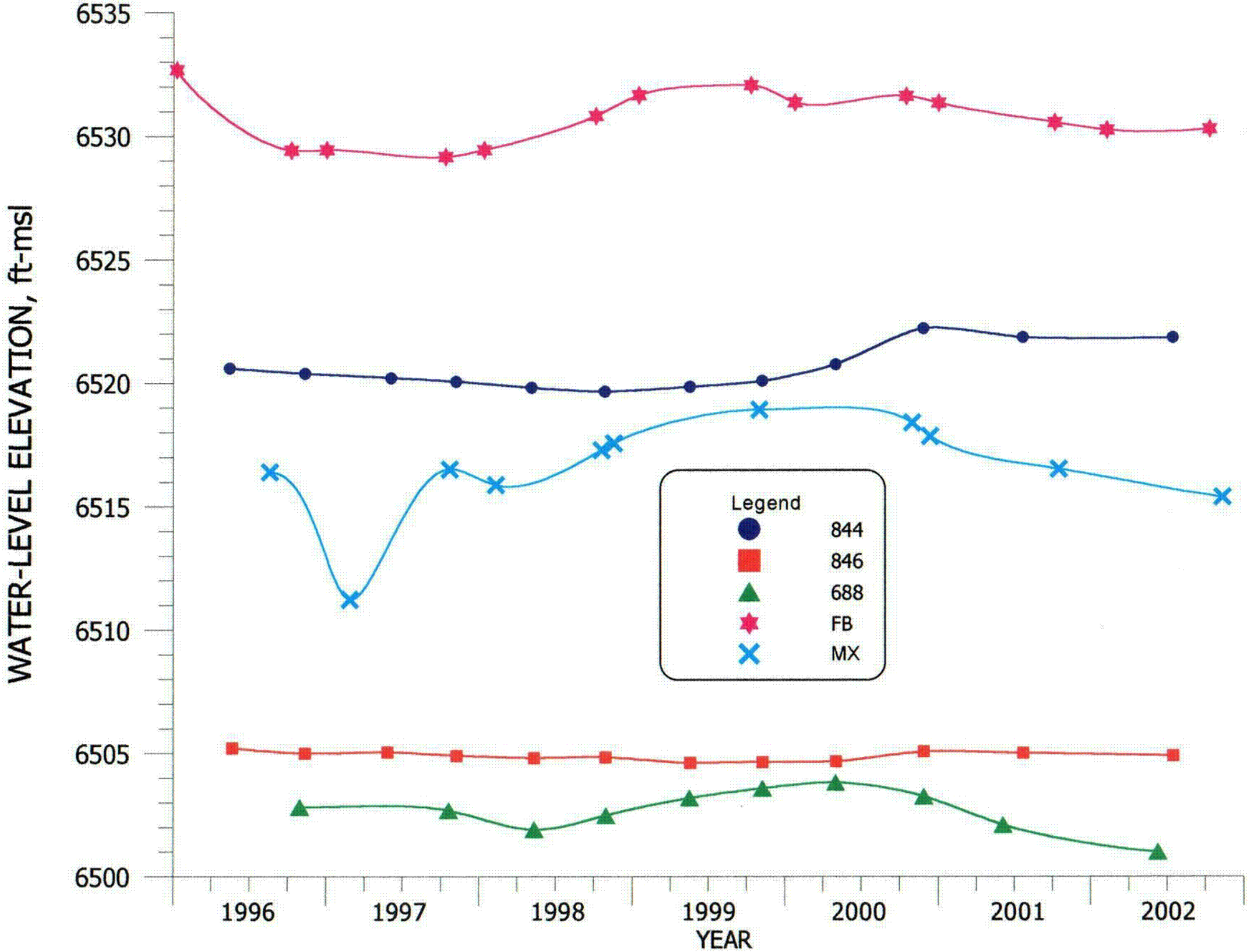


FIGURE 4.2-14. WATER-LEVEL ELEVATION FOR WELLS 844, 846, 688, FB AND MX.

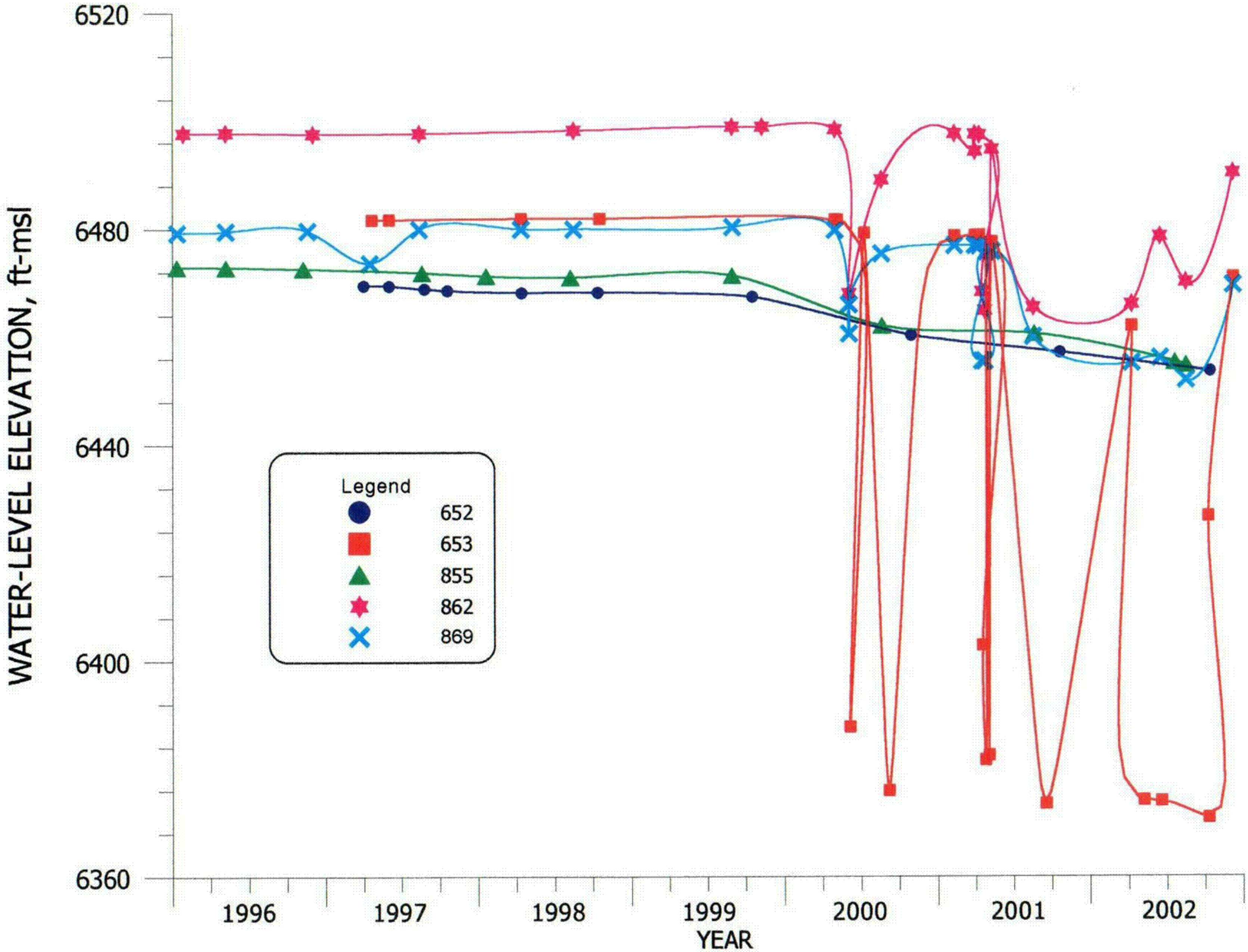


FIGURE 4.2-15. WATER-LEVEL ELEVATION FOR WELLS 652, 653, 855, 862 AND 869.

C24

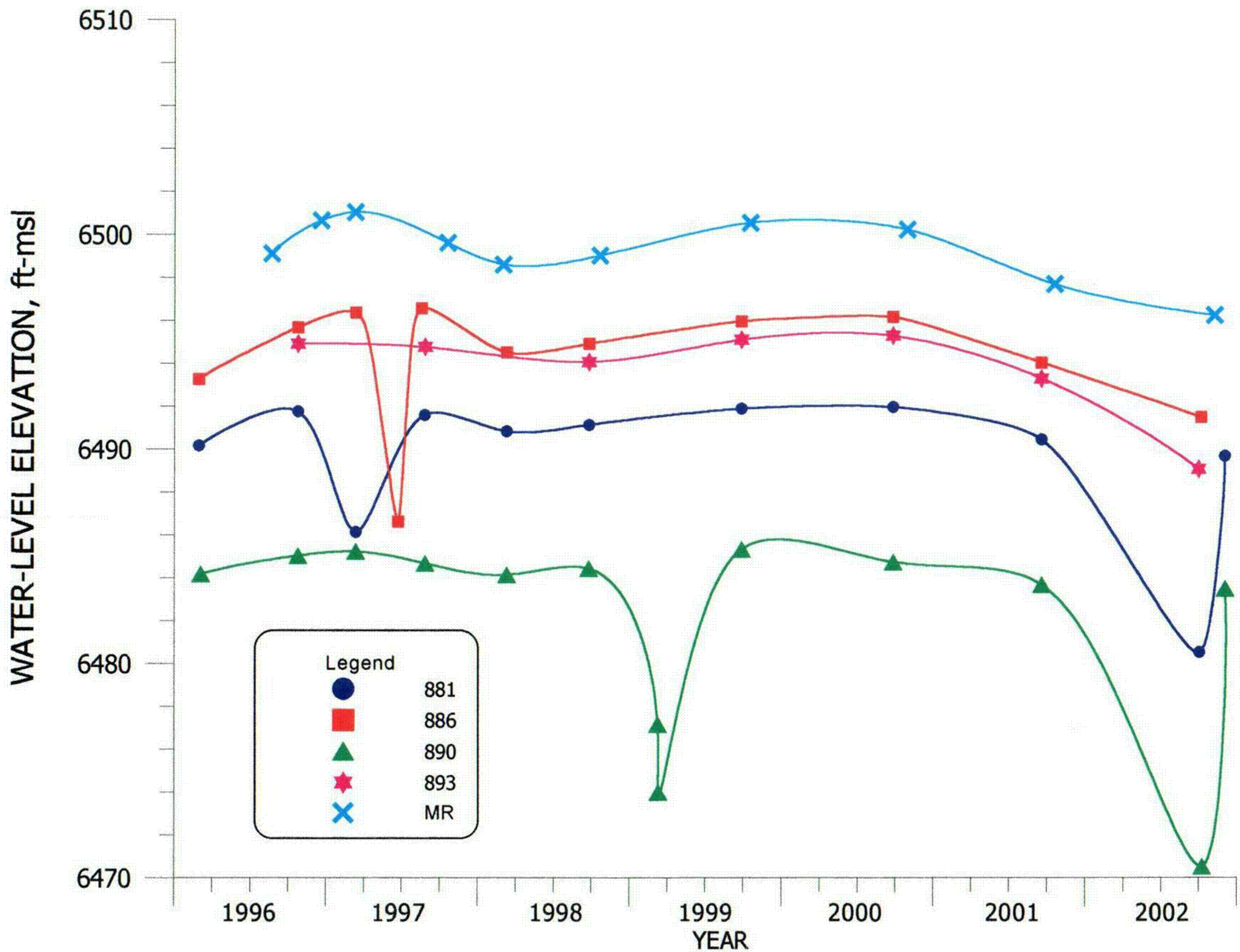


FIGURE 4.2-16. WATER-LEVEL ELEVATION FOR WELLS 881, 886, 890, 893 AND MR.

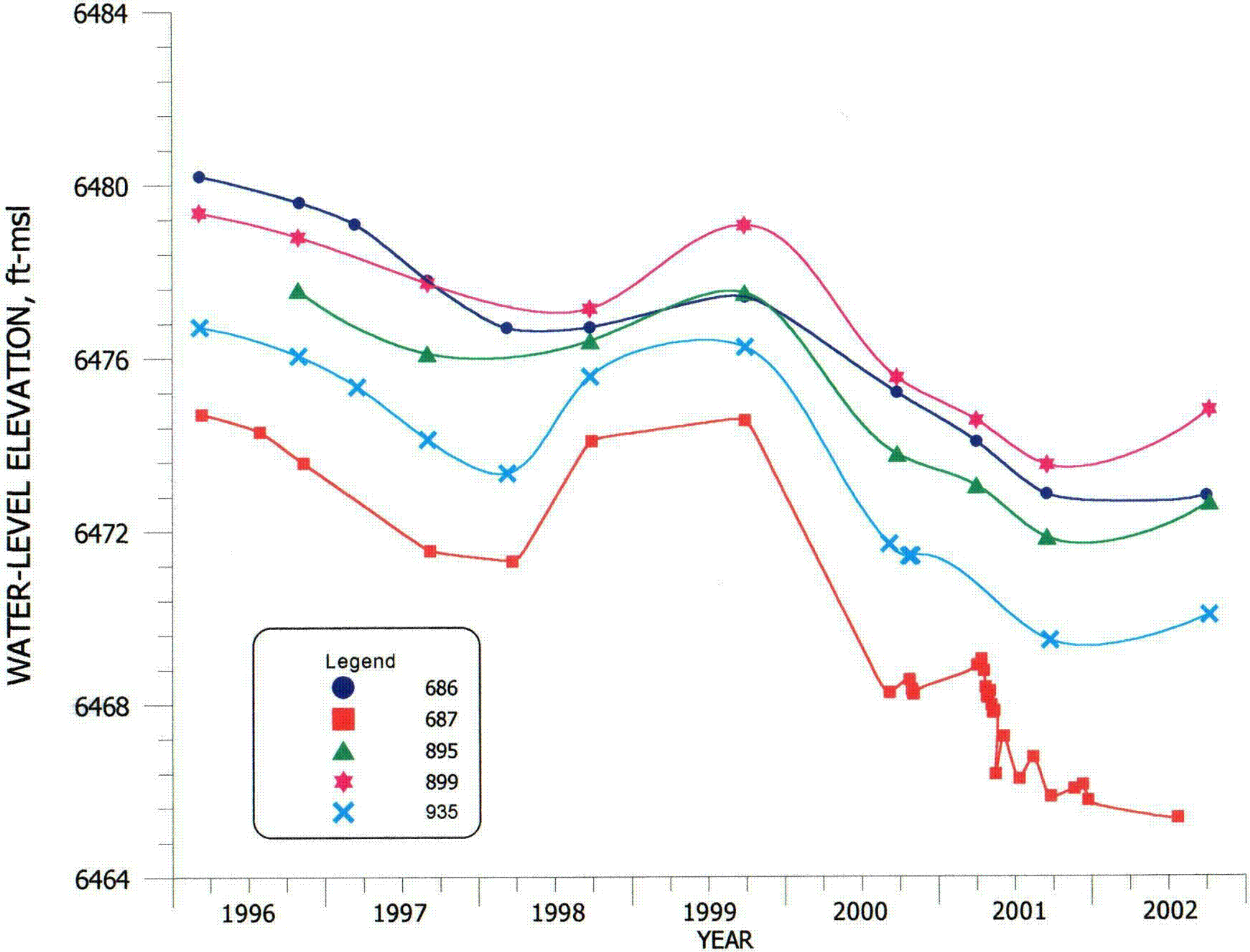


FIGURE 4.2-17. WATER-LEVEL ELEVATION FOR WELLS 686, 687, 895, 899 AND 935.

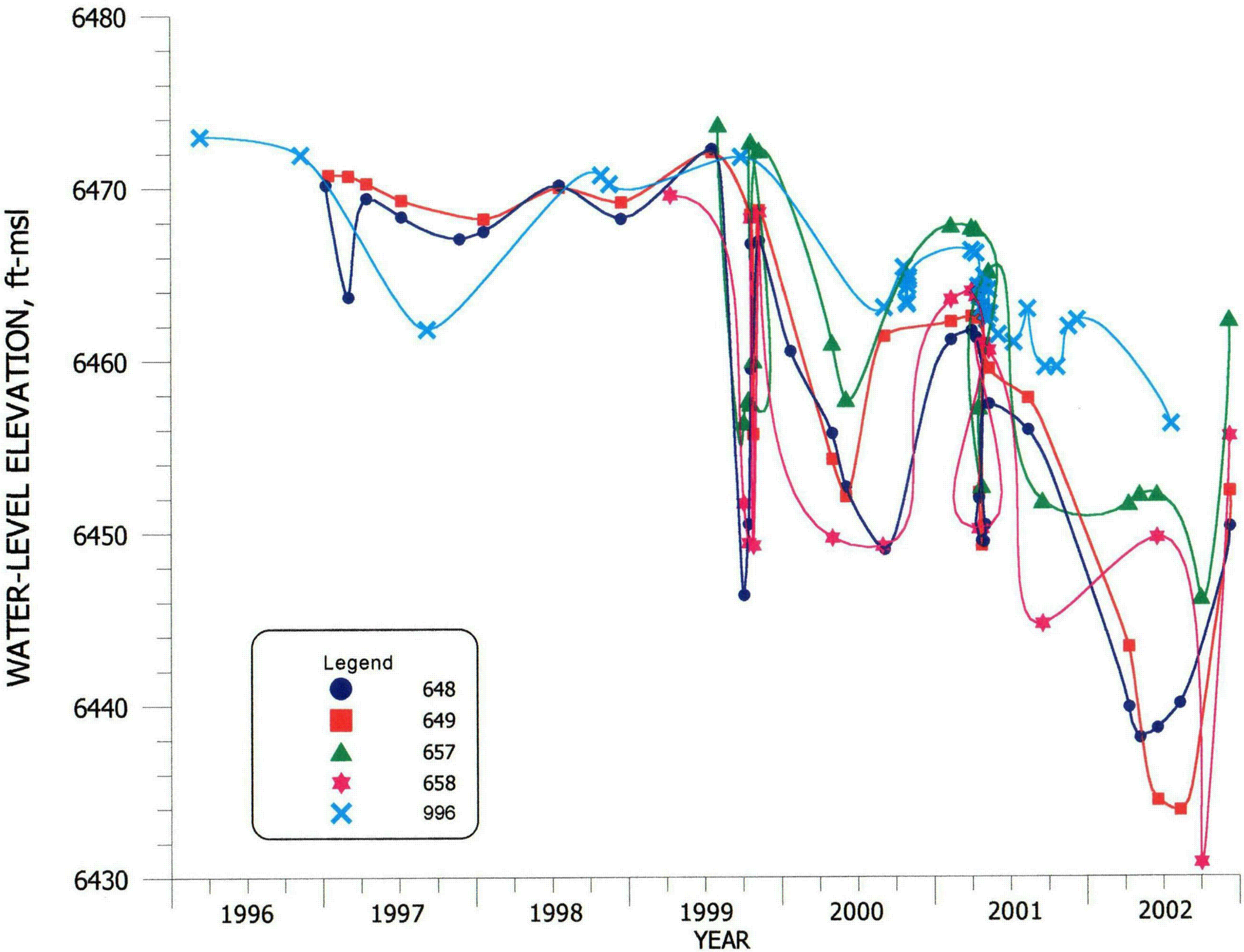


FIGURE 4.2-18. WATER-LEVEL ELEVATION FOR WELLS 648, 649, 657, 658 AND 996.

C25

4.3 ALLUVIAL WATER QUALITY

This section presents the 2002 water-quality data for the alluvial aquifer. The major constituents that are typically measured at this site are sulfate, chloride and TDS, with sulfate concentrations being the most important indication for contaminant remediation. Selenium, uranium and molybdenum are the metal constituents of most concern at this site. Nitrate, radium, chromium, vanadium and thorium are also discussed in the monitoring report but are not very important at this site. Tables B.4-1 through B.4-6 of Appendix B present the 2002 alluvial water-quality data for each well. The most recent value observed during the monitoring in 2002 was used for the concentration contour figures. The basic well completion data tables are presented in Section 4.1 for the alluvial wells.

Colored patterns are used on some of the figures to delineate important concentration limits for each of the constituents. Wells located near the unsaturated portion of the alluvial aquifer are depicted with a square symbol and water-quality data from these sources are potentially unreliable.

4.3.1 SULFATE - ALLUVIAL

Sulfate concentrations have been used as the main indicator constituent for this site because concentrations are large in the tailings solution. Concentrations of sulfate in the alluvial aquifer for the Fall of 2002 are presented on Figures 4.3-1A and 4.3-1B. Background concentrations observed in 2002 range from 55 to 1500 mg/l. The background and standard information is presented in the left upper corner on the east area figure for each parameter. The New Mexico sulfate standard for this site is 976 mg/l. An updated statistical evaluation of the background sulfate concentration with data through 1998 showed that concentrations as great as 1870 mg/l could be naturally occurring at this site. Therefore, this concentration has been used to show a blue pattern where significant sulfate concentrations exist. This information is presented in a box in the upper left side of Figure 4.3-1B for sulfate. No sulfate concentrations in the alluvial aquifer exceed 1870 mg/l on the west map (see Figure 4.3-1A). The areas that exceed this concentration and, therefore, contain the blue shading on Figure 4.3-1B are in the two tailings pile areas. Sulfate concentrations in an area of the large tailings pile still exceed 10,000 mg/l. A significant amount of additional reduction in

sulfate concentration has been achieved along the restoration zone, near the small tailings pile, in 2002. The sulfate concentrations observed in Broadview and Felice Acres were less than 1000 mg/l in 2002, except for a value of 1330 mg/l from well Sub3. Sulfate concentrations were fairly stable in Section 3 in 2002. Sulfate concentrations exceed 1000 mg/l in the southwest portion of Murray and Pleasant Valley. Sulfate concentrations exceed 1000 mg/l adjacent to the zero saturation boundary in the northern portion of Section 27 (see Figure 4.3-1B) and continuing into Section 28 (see Figure 4.3-1A). Downgradient of the Grants Project site, the sulfate concentrations are all within natural range of background and, therefore, no restoration of sulfate is needed beyond the Grants Project area.

Water-quality concentrations versus time have been developed for the alluvial aquifer for sulfate, uranium, selenium and molybdenum. The groupings of wells used for these plots are shown on Figures 4.3-2A and 4.3-2B. These figures show the sulfate concentration figure numbers for each of these groupings. The color and symbol used for each well are the same as those used in the time plots for each constituent. Figure numbers for other water-quality parameters are not shown on this map but the location map should be useful for the other time concentration plots because the color, symbol and well groupings are the same.

Figure 4.3-3 presents the sulfate concentrations plotted versus time for upgradient wells DD, ND, P, P4, Q and R. This plot shows that an overall, gradual increasing trend is occurring in the upgradient wells ND and R. An overall declining trend is occurring in well DD, while an increasing trend may be developing in wells P and Q. The historical values for well P shows similar periods of short term increasing values for the alluvial aquifer. The changes in sulfate concentration in these wells are well within the range observed for sulfate in the upgradient wells. The increases could be due to higher concentrations upgradient of Homestake's background wells flowing into this area.

Sulfate concentrations in alluvial well S3 declined in 2002 with an overall declining trend since 1995 (see Figure 4.3-4). The sulfate concentration for well S2 slightly increased in 2002 after a large decline in 2001. Overall sulfate concentrations declined in well S4 in 2002. Concentrations have been steady to the northwest of the large tailings at well S11 and to the north of the large tailings at well NC.

Figure 4.3-5 presents the sulfate concentrations versus time for alluvial wells BC, DC, MO, MU and W. The sulfate concentrations were fairly steady in alluvial wells BC, MO and MU in 2002, while concentrations decreased in well DC. Concentrations remained low in well W in 2002.

The fourth sulfate concentration plot for the alluvial wells is presented for wells B, BP, D1, M5 and PM (see Figure 4.3-6). This figure shows that the overall sulfate concentrations in each of these wells were fairly steady in 2002 with the exception of a large decline in concentrations in PM.

Figure 4.3-7 presents the sulfate concentrations versus time for wells B11, DQ, S5, T, TA and TB. The sulfate concentrations in collection wells B11 and DQ have decreased during 2002, while sulfate concentrations in well S5 gradually increased. Values in wells T, TA and TB have decreased, showing the influence of the R.O. injection.

Figure 4.3-8 presents the sulfate concentrations versus time for alluvial wells on the west side of the small tailings. This plot shows fairly steady sulfate concentrations in well C9 in 2002, while concentrations in wells C2, C6 and C12 declined in 2002.

Figure 4.3-9 presents the sulfate concentrations versus time for alluvial wells on the south side of the small tailings. This figure shows that the sulfate concentrations in these wells varied with time in 2002 due to variations in the amount of the R.O. product injection flowing to these wells. The R.O. product injection decreased the sulfate concentrations in wells KF and KZ to very low values. Figure 4.3-10 shows the sulfate concentrations for the small tailings collection wells K4, K5, K7 and K10. Some increase in 2002 was observed in well K5, while sulfate concentrations declined in wells K4 and K10. Sulfate concentrations were fairly steady in well K7.

Sulfate concentrations in collection wells to the southeast of the small tailings are presented in Figure 4.3-11. This figure shows a gradual decline in concentrations in 2002 in wells L6 and L9 and fairly steady sulfate concentrations in well L10. The sulfate concentration in well L5 increased in 2002 due to more fresh water and less R.O. product water moving to this well.

Figure 4.3-12 presents the sulfate concentration time plots for Broadview Acres alluvial wells 453, Sub1, Sub2 and Sub3. Small variations were observed in three

of these Broadview wells in 2002 and their concentrations are all near the injection concentration. Concentrations in well Sub3 in 2002 were similar to the 1997, 1998 and 2001 higher values.

Figure 4.3-13 presents sulfate concentrations versus time for Felice Acres alluvial wells 490, 492, 496 and 497. The sulfate concentrations in these four wells were fairly steady in 2002.

Figure 4.3-14 shows sulfate concentrations for Murray Acres and Pleasant Valley alluvial wells 802, 844, 846, 688 and FB. This plot shows that sulfate concentrations for alluvial wells 802, 844 and 846 increased in 2002. Concentrations were fairly steady in alluvial wells 688 and FB in 2002.

Figure 4.3-15 presents the sulfate concentration plots for five wells in Section 3 (see Figure 4.3-2B for the location of these wells). Sulfate concentrations in each of these Section 3 alluvial wells have been fairly steady for the last several years. No significant long-term trends are being observed in the concentrations in these wells.

The sulfate concentrations for five wells near the Section 28 center pivot are presented in Figure 4.3-16. This plot of the sulfate concentrations also shows no significant trend in this constituent with time. Figure 4.3-2A shows the locations of these five wells with well MR being located on the western edge of Section 27.

Five wells are also shown to the west of the Section 28 irrigation. Three of these wells are located in Section 29 while well 686 is located just north of Section 29 in Section 20 and well 687 is located to the south in Section 32 (see Figure 4.3-2A for location of these wells). Sulfate concentrations in well 899 have been gradually declining for the last few years. Sulfate concentrations also declined in well 935 in 2002. The sulfate concentrations in the other three wells were fairly steady in 2002. The decline in sulfate concentrations in well 935 may be due to the fresh water injection to the north of this well. The sulfate concentrations for four wells in Section 33 and a well in the eastern portion of Section 32 are presented in Figure 4.3-18. Sulfate concentrations in each of these wells have been steady in 2002. Figure 4.3-2A shows the location of the Section 33 wells used in this plot.

4.3.2 TOTAL DISSOLVED SOLIDS - ALLUVIAL

Total dissolved solids (TDS) concentration contours for the alluvial aquifer during the Fall of 2002 are presented on Figures 4.3-19A and 4.3-19B. The background

TDS concentrations measured upgradient of the large tailings in the Fall of 2002 varied from 370 to 2700 mg/l. Based on our updated statistical analysis, a TDS concentration of 3060 mg/l or larger is needed to be confident that the concentrations are not naturally occurring. A light blue pattern is shown on Figure 4.3-19B to indicate where the TDS concentrations exist above 3060 mg/l. None of the concentrations in the west area exceed this level. The TDS concentrations near the tailings exceed 3060 mg/l for approximately 800 feet to the west of the large tailings. Some TDS concentrations in the large tailings area exceed 20,000 mg/l. A zone of 2000 mg/l extends to the west of the large tailings to the west side of Section 28 (see Figures 4.3-19A). An additional area of TDS concentrations greater than 2000 mg/l exists in the southern portion of Pleasant Valley and the southwest portion of Murray Acres and to the south of this area. A small area of TDS concentrations above 2000 mg/l extends into the southeast corner of Section 28 and the northeast corner of Section 33. The only other areas of TDS concentrations above 2000 are a small area of TDS concentrations slightly above 2000 mg/l in western Broadview Acres and one well in Felice Acres. Only the areas proximal to the two tailings piles need restoration based on TDS.

4.3.3 CHLORIDE - ALLUVIAL

Chloride concentrations are important in defining tailings seepage due to the conservative nature of this constituent and low concentrations upgradient. The 2002 chloride concentration figure for the alluvial aquifer near the tailings is presented in Figure 4.3-20. Upgradient chloride concentrations in the alluvial aquifer varied from 26 to 135 mg/l in the Fall of 2002. The fresh-water injection systems have used water with chloride concentrations of approximately 200 mg/l while the R.O. product chloride concentration is less than 10 mg/l. A significant portion of the alluvial aquifer around the large and small tailings contained chloride concentrations in excess of the State drinking water standard of 250 mg/l. Chloride concentrations are useful in defining the areas where the R.O. product water has migrated in the alluvial aquifer. A light blue pattern is shown to define where concentrations exceed 250 mg/l. This figure shows that restoration is only needed near the tailings for chloride. No chloride concentrations have existed in the past in the west area above 250 mg/l and therefore chloride concentrations are not typically measured in the west area.

4.3.4 URANIUM - ALLUVIAL

Uranium is also a very important parameter to this site due to the significant levels in the tailings seepage. Uranium data for the Fall of 2002 are presented on Figures 4.3-21A and 4.3-21B. Background uranium concentrations during the Fall of 2002 varied from 0.001 to 0.21 mg/l and the site standard is 0.04 mg/l (see notes in upper left corner of Figure 4.3-21B). A uranium concentration of 0.43 mg/l has been chosen as the significance level of uranium at this site. The light blue pattern on Figures 4.3-21A and 4.3-21B shows where uranium concentrations exceed 0.43 mg/l. Uranium concentrations exceed this level in the area of the large and small tailings pond and extend approximately 1200 feet to the west of the large tailings pile. Uranium concentrations above 0.43 mg/l also extend down to the L collection wells to the south of the small tailings. Uranium concentrations in the L wells were significantly reduced over the last year. Uranium concentrations also exceed 0.43 mg/l in two small areas in the central and western portions of Section 27 and a narrow band through the central portion of Section 28. These uranium concentrations only slightly exceed the 0.43 mg/l value. Lower uranium concentrations extend further to the west, joining the Rio San Jose alluvial system in the eastern portion of Section 29. Uranium concentrations are also contributed to this area from the Rio San Jose alluvial system from Section 20. These lower concentrations have joined together and extend down approximately one-half mile into Section 33.

An additional area of uranium concentrations above 0.43 mg/l exists in the southern portion of Felice Acres and to the southwest into Section 3 (see Figure 4.3-21B). These concentrations extend for approximately one-half mile to the southwest of the southwest corner of Felice Acres and generally were reduced in 2002. A small area also exists in the northern portion of Felice Acres. One small additional area in the northeast portion of Murray Acres at well 802 exceeds the 0.43 mg/l concentration. Some additional restoration is needed in each of these areas based on uranium concentrations.

Uranium versus time plots are presented for this constituent to demonstrate the variations observed with time. Figures 4.3-2A and 4.3-2B show the location of the alluvial wells used for the uranium time plots. The figure numbers shown on Figures

4.3-2A and 4.3-2B correspond to the sulfate time plots. The same grouping of wells was used for the uranium plots and their symbols and colors are the same as the sulfate plots. Figure 4.3-22 presents the uranium concentrations versus time for upgradient wells DD, ND, P, P4, Q and R. The uranium concentrations in these wells have been fairly steady for the last two years except for a gradual rising trend in well DD. The range in background uranium concentration for 2002 and the NRC site standard are shown on Figure 4.3-21B.

A decrease in uranium concentrations was observed in 2002 for wells S3 and S4 (see Figure 4.3-23). Uranium concentrations stayed low in wells NC and S11. Concentrations were steady in 2002 in well S2.

Figure 4.3-24 presents the uranium concentration plots for alluvial wells west of the large tailings pile. This plot shows that uranium concentrations are low and gradually declining in wells BC and MO, while concentrations were low in wells DC, MU and W.

Figure 4.3-25 presents the uranium concentrations for alluvial wells B, BP, D1, M5 and PM. Fairly steady 2002 concentrations have been observed in wells BP and B in 2002. An overall decline was observed in wells D1 and M5. The latest value for well PM shows an increase which is not confirmed by other constituents.

Uranium concentrations versus time for alluvial wells B11, DQ, S5, T, TA and TB are presented in Figure 4.3-26. This figure shows that overall concentrations in collection well B11, T and TA and monitoring wells DQ and TB were declining in 2002. Fairly steady concentrations are observed in 2002 in well S5.

Figure 4.3-27 presents the uranium concentrations for collection wells on the west side of the small tailings. This plot shows that uranium concentrations in collection wells C6, C9 and C12 show a decline in concentration. Uranium concentrations stayed low in well C2.

Figure 4.3-28 presents uranium concentrations for wells on the south side of the small tailings. Uranium concentrations are low in each of these wells, due to the R.O. product injection into this area. The rate of decline in uranium concentrations in wells K5, K7 and K10 decreased in 2002 (see Figure 4.3-29). A decreasing trend was observed again in collection well K4.

Uranium concentrations for alluvial wells L5, L6, L9 and L10 are presented on Figure 4.3-30. This plot shows a decrease in uranium concentrations in 2002 in each of these wells.

Figure 4.3-31 presents uranium concentrations versus time for four Broadview Acres alluvial wells: Sub1, 453, Sub2 and Sub3. Uranium concentrations in wells Sub1 and Sub2 have been similar and gradually declined in 2002. Uranium concentrations to the north in wells 453 and Sub3 have been small for several years.

Figure 4.3-32 presents the uranium concentrations for Felice Acres wells 490, 492, 496 and 497. Uranium concentrations in these four alluvial wells have also been fairly steady for the last few years, except for a small decline in uranium in well 496.

Figure 4.3-33 presents the uranium concentrations for wells in the Murray and Pleasant Valley subdivision areas. Uranium concentrations declined in well 802 in 2002. Uranium concentrations in the remaining alluvial wells in this area are low and concentrations in alluvial well 802 are expected to gradually decrease with time.

The uranium concentrations versus time for five wells in Section 3 are presented in Figure 4.3-34 (see Figure 4.3-2B for location). This plot shows that the uranium concentrations in the two western wells 652 and 855 have always been low. Uranium concentrations are gradually increasing in well 862 but are expected to start to decline due to the maximum concentrations that exist in this area. A gradual decline has been observed in well 653 while the concentrations at the front of the uranium zone in well 869 have varied over the last two years.

Figure 4.3-35 shows the uranium concentrations for four Section 28 wells and one western Section 27 well (see Figure 4.3-2A for locations). A very gradual declining trend is observed in the concentrations over the last three years in these wells.

Uranium concentrations in the eastern area of Section 29 are presented in Figure 4.3-36. The uranium concentrations to the north of Section 29 in well 686 are gradually declining with time. This well is located in Rio San Jose alluvial system upgradient of the confluence with the San Mateo alluvial system. A gradual decline is also being observed in alluvial wells 899 and 935 in Section 29. Concentrations in 2002 were steady in well 895. The concentrations farther south in the northeast portion of Section 33 were also declining in well 687.

Smaller concentrations exist farther south in Sections 32 and 33 and are presented in Figure 4.3-37. This plot shows that concentrations have stayed low with a

gradual decline in concentrations in wells 648, 649 and 996 in 2002. The concentrations in wells 657 and 658 were fairly steady in 2002.

4.3.5 SELENIUM - ALLUVIAL

Selenium is one of the important parameters at the Grants site due to significant levels of this constituent historically in the tailings. Figures 4.3-38A and 4.3-38B present the selenium concentrations for the west and east sides. Although the selenium site standard is 0.1 mg/l, only values equaling or exceeding 0.27 mg/l can be considered non-naturally occurring, based on statistical analysis. The important selenium concentration at this site has been selected to be greater than 0.27 mg/l. A blue pattern on the concentration contour figures is used to show where concentrations exceed 0.27 mg/l. No areas of selenium concentrations above 0.27 exist in the west area (see Figure 4.3-38A). A 0.1 mg/l contour extends approximately one mile into the west area in the central portion of Section 28 and exists just to the east of Section 4 in Section 3.

Concentrations exceeding 0.27 mg/l exist around the large and small tailings piles (see Figure 4.3-38B). The 0.27 mg/l concentrations extend approximately 1000 feet to the west of the large tailings and extends down to the south of the small tailings in the area of the L collection wells. Selenium concentrations were reduced in the L collection area in 2002. An additional two areas of concentrations that exceed 0.27 mg/l exists in Section 3, southwest of Felice Acres. None of the concentrations in the subdivisions exceed 0.1 mg/l. This shows that the area near the tailings and portions of Section 3 need additional restoration based on selenium.

The time concentration plots for selenium are presented to define the variations with time for this constituent in the alluvial aquifer. Figures 4.3-2A and 4.3-2B should be used to determine the location of wells in each of the groups of plots. The symbols and colors used on Figures 4.3-2A and 4.3-2B are the same on each constituent time plot. Figure 4.3-39 presents the selenium concentrations for upgradient wells DD, ND, P, P4, Q and R. This plot shows an increasing trend in upgradient well R which is the farthest upgradient well from the tailings. A small increasing trend is also seen in the 2002 data for wells Q, ND and DD. The average selenium concentration from well P has been higher since well P has not been

continuously pumped as part of the upgradient collection initiated in early 1998. The NRC and State site standards and the 2002 range in selenium values for all upgradient wells are also shown on Figure 4.3-38B.

Figure 4.3-40 shows an overall increasing trend in well S2 in 2002. An overall gradual decreasing trend has been observed in well S3 for the last few years. Steady concentrations have been observed in wells NC, S4 and S11 for the last few years.

Figure 4.3-41 presents the selenium concentrations for wells BC, DC, MO, MU and W. Selenium concentrations have stayed low in these wells.

The selenium concentrations for alluvial wells to the southwest of the large tailings are presented in Figure 4.3-42. This figure shows an overall decrease in selenium concentrations in wells D1, M5 and PM during 2002. Overall steady concentrations were observed in wells B and BP.

Figure 4.3-43 presents the selenium concentrations for wells B11, DQ, S5, T, TA and TB. A decreasing trend in selenium is being observed in well B11, while selenium concentrations in well DQ increased in 2002. A decline in selenium concentrations in wells TA and TB occurred in 2002, while fairly steady concentrations were observed in well S5.

The selenium concentrations versus time for collection wells on the west side of the small tailings pile are presented in Figure 4.3-44. This plot shows that the selenium concentrations in wells C9 and C12 exhibit a general decline the last few years. Fairly steady concentrations are being observed in wells C2 and C6.

Figure 4.3-45 presents selenium concentrations versus time for wells on the south side of the small tailings. This figure presents values for wells KEB, KF, KZ and X. This plot shows small concentrations in 2002 in each of these wells due to the R.O. product injection in this area. Selenium concentrations in wells K4, K5 and K10 declined in 2002 (see Figure 4.3-46). Concentrations in 2002 in collection well K7 were steady after a decline in late 2001 and early 2002.

Figure 4.3-47 presents the selenium concentrations for wells L5, L6, L9 and L10. A large decreasing trend is indicated by the data for well L6. Fairly steady selenium concentrations with time are being observed in collection wells L5, L9 and L10 in 2002.

Figures 4.3-48 and 4.3-49 present the selenium concentrations for the Broadview and Felice Acres alluvial wells. These plots show that the selenium concentrations have been reduced and maintained at low levels for the last several years in these two subdivisions, except for the slightly higher values in southern Felice wells 496 and 497. Selenium concentrations slightly declined in 2002 in well 496 while they gradually increased in well 497. Selenium concentrations are presented for the Murray Acres and Pleasant Valley areas in Figure 4.3-50. This plot shows low selenium concentrations in these monitoring wells in this area of the alluvial aquifer. A very gradual increasing trend within the background range has been observed in wells 844 and 846.

The selenium concentration plots versus time for the five wells in Section 3 are presented in Figure 4.3-51. Wells 652 and 855 are located in the western portion of Section 3. Well 652 shows a gradual declining trend over the last few years while well 855 shows a gradual increasing trend for the last few years. Concentrations in the three wells, which are located in the eastern and central portion of Section 3, have been fairly steady with time.

The selenium concentrations in Section 28 have been fairly steady with time. Figure 4.3-52 presents the plot of the selenium concentrations for the Section 28 wells. A very gradual overall increasing trend has been observed in well 886.

Figure 4.3-53 shows the selenium concentrations in Section 29, just north of Section 29 in well 686 and to the south in well 687. A very gradual increasing trend in selenium concentration has been observed the last few years in well 687. The selenium concentration in well 895 stayed steady in 2002 after an increase in 2001. Selenium concentrations slightly declined in 2002 in well 935.

The Section 33 selenium concentration plot is presented in Figure 4.3-54. This shows a gradual increasing trend in selenium concentrations for the last three years in well 996. Selenium concentrations have been fairly steady in the Section 33 wells for the last few years.

4.3.6 MOLYBDENUM - ALLUVIAL

This section discusses the molybdenum concentrations in the alluvial aquifer at the Grants Project during the Fall of 2002. Figure 4.3-55 presents the concentration

contours. Molybdenum concentrations in the west area have been less than 0.03 mg/l and therefore are not routinely measured. Therefore, no molybdenum figure for the west area was developed for 2002. The extent of movement of molybdenum is significantly less than that of selenium and uranium. Molybdenum concentrations exceed 100 mg/l near the large tailings and a 10 mg/l contour extends around most of the large tailings and the western portion of the small tailings. Significant molybdenum concentrations extend approximately 800 feet west of the large tailings pile and also to the southeast of the small tailings pile to the L collection wells. Significant reduction in molybdenum concentrations occurred in 2002 in the small tailings area. One alluvial well in Felice Acres slightly exceeds 0.1 mg/l of molybdenum.

The light blue patterned area on Figure 4.3-55 shows the area where molybdenum concentrations exceed 0.73 mg/l. This concentration has been chosen as the significant level of this constituent at this site. This shows that molybdenum concentrations need to be restored only adjacent to the tailings and near the L collection line.

Molybdenum concentrations versus time plots have been developed for the alluvial aquifer because this parameter is significant to this aquifer. Figure 4.3-56 presents the molybdenum concentrations for the upgradient wells DD, ND, P, P4, Q and R. This plot shows that the concentrations have remained low in these six wells. The color and symbol used on the molybdenum plots are shown on Figure 4.3-2B.

A decreasing trend with time is being observed in well S3 in 2002, while the molybdenum concentrations in well S4 were variable in 2002 (see Figure 4.3-57). Molybdenum concentrations in 2002 increased in well S2 after a decline in 2001. Molybdenum concentrations in well NC were small in 2002.

Figure 4.3-58 presents the molybdenum concentrations for wells BC, DC, MO, MU and W. Molybdenum concentrations in each of these wells are low and steady.

Figure 4.3-59 presents the molybdenum concentrations for wells B, BP, D1, M5 and PM. Molybdenum concentrations in well M5 were fairly steady in 2002 after significantly declining prior to 2000. A fairly steady concentration with time is being observed in wells B, BP, D1 and PM.

Figure 4.3-60 presents the molybdenum concentrations for wells B11, DQ, S5, T, TA and TB. A sharp decline in the molybdenum concentration in well DQ was

observed in 2002. Molybdenum concentrations in well S5 increased in 2002. Molybdenum concentrations in wells B11, T, TA and TB gradually declined in 2002.

Molybdenum concentrations for wells on the west side of the small tailings are presented in Figure 4.3-61. This figure shows large molybdenum concentrations in wells C6, C9 and C12 with each declining in 2002. Small concentrations were maintained in well C2.

Figure 4.3-62 presents the molybdenum concentrations for the wells on the south side of the small tailings. This plot shows small molybdenum concentrations in wells KEB, KF, KZ and X during the last year. Figure 4.3-63 shows a decline in concentrations in wells K4 and K10 and gradual declines in wells K5 and K7.

Figure 4.3-64 presents molybdenum concentrations further to the southeast in wells L5, L6, L9 and L10. A significant decreasing trend was observed in wells L5, L6 and L9 during 2002. A gradual decline in molybdenum concentrations in well L10 were observed.

Molybdenum concentrations for alluvial wells in Broadview and Felice Acres are presented in Figures 4.3-65 and 4.3-66 respectively. The molybdenum concentrations in Broadview wells Sub1, Sub2, 453 and Sub3 have been low for the last several years. A slightly higher molybdenum concentration exists in well 490 in Felice Acres with a small declining trend with time during the last few years.

Figure 4.3-67 shows the molybdenum concentration in wells in the Murray Acres and Pleasant Valley area. This plot shows that molybdenum concentrations have remained low in these alluvial wells except for an outlier in the first value in 2001 for well FB. Molybdenum is not monitored on the west area wells because historical measurements show that this constituent did not migrate to the west area.

4.3.7 NITRATE - ALLUVIAL

Some of the nitrate concentrations upgradient of the Grants site generally exceed the State drinking water standard of 12.4 mg/l of nitrate (see Table 3.1-1). A statistical analysis of the upgradient data through 1998 shows that a nitrate concentration of 23 mg/l is needed to be 95% confident that it is not from natural upgradient levels. Figures 4.3-68A and 4.3-68B present the nitrate concentrations during the Fall of 2002 for the alluvial aquifer. The nitrate concentrations north and

upgradient of the tailings at this site have affected the nitrate concentrations downgradient of the large tailings in the northern portion of Sections 27 and 28. It is difficult to determine whether the tailings has affected the nitrate concentrations in this area due to the naturally higher concentrations upgradient. The nitrate concentrations in the northeast portion of Section 27 that exceed 23 mg/l are likely natural levels due to the ground-water flow in this area. Figure 4.3-68A shows that higher nitrate concentrations exist in Section 20 and extend down into Section 29. These higher nitrate concentrations in the Rio San Jose alluvial system are also upgradient and enter the combined San Mateo and Rio San Jose system upgradient of where the Homestake site alluvial water meets the Rio San Jose. Therefore, none of these nitrate concentrations can be attributed to the Homestake tailings seepage.

Nitrate concentrations exceed 10 mg/l in an area between the large and small tailings but none of these values exceed 23 mg/l. This parameter has been adequately restored. Time plots for nitrate concentrations in the alluvial aquifer have not been developed because this parameter is not very important to this site.

4.3.8 RADIUM-226 AND RADIUM-228 - ALLUVIAL

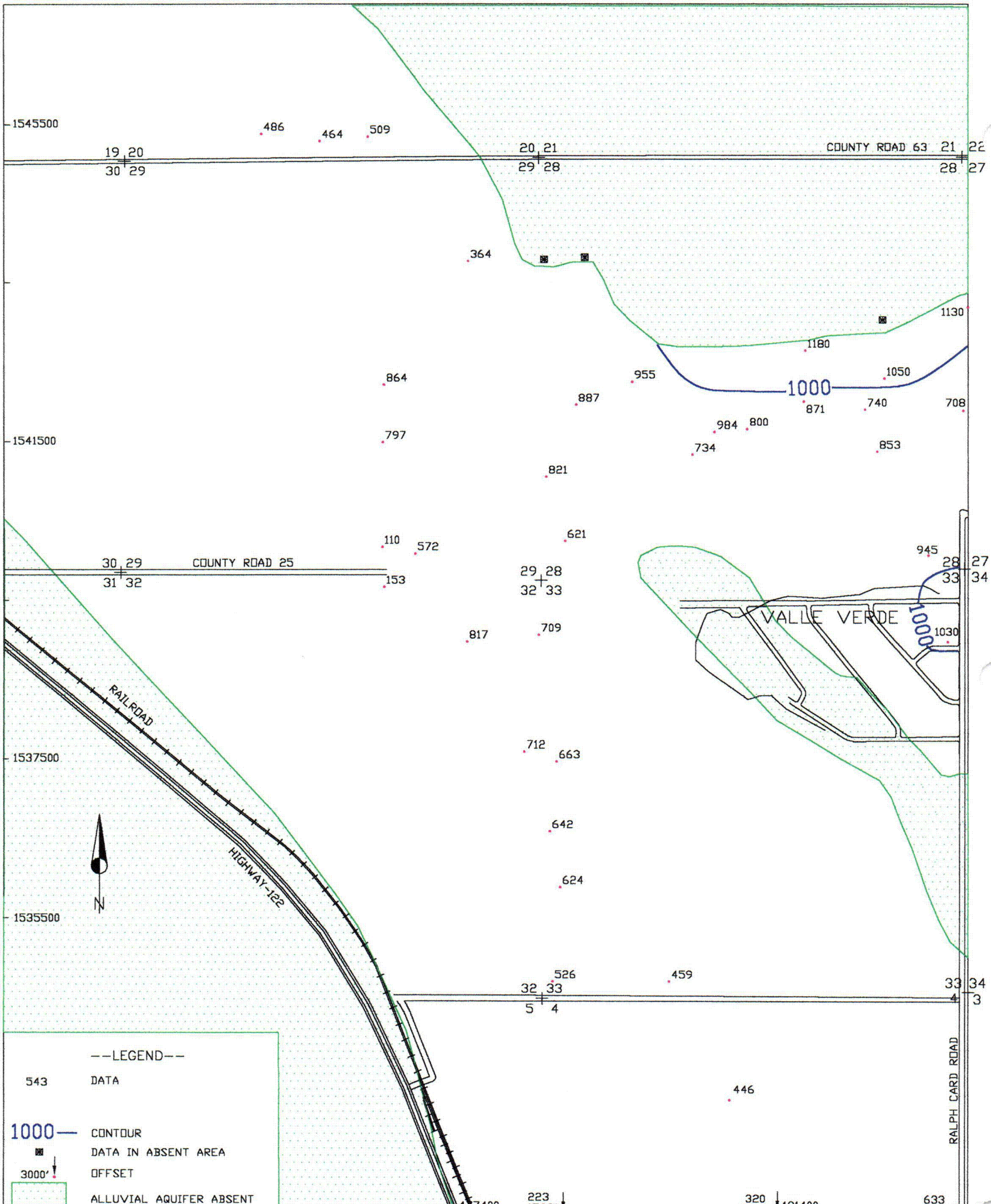
Figure 4.3-69 presents radium concentrations in the Grants Project area. The radium concentrations are very small in the alluvial aquifer. A figure for radium for the west area was not developed. Monitoring of radium concentrations have been reduced due to the insignificant concentrations in the alluvial aquifer. The radium-226 concentrations are presented horizontally, while the radium-228 values are shown at a 45° angle and in a magenta color. The State standard for radium-226 plus radium-228 is 30 pCi/l, while the NRC site standard is 5 pCi/l (see upper left corner of Figure 4.3-69 for this information). Three radium-226 concentrations in the three vertical drains in the large tailings exceeded the site standard in 2002. No radium concentrations outside of the tailings exceeded the standard. Past data has shown that radium is not mobile at this site in the alluvial aquifer. Radium concentrations at the Grants Site are, therefore, not significant, and these parameters should be considered for removal as a site standard. Radium-226 should be monitored annually at the three POC wells to demonstrate that concentrations remain at non-significant levels.

4.3.9 VANADIUM - ALLUVIAL

Vanadium concentrations are shown on Figure 4.3-70 for 2002. None of the vanadium concentrations in the POC wells exceeded the site standard of 0.02 mg/l. POC well X with the last 2002 value of 0.01 mg/l was the only POC well that routinely contained a vanadium concentration above the site standard prior to restoration of the area. Therefore, none of the POC wells are expected to contain vanadium concentrations above the site standard of 0.02 mg/l in the future. The R.O. product injection has effectively restored the area near well X. This parameter has been adequately restored.

4.3.10 THORIUM-230 - ALLUVIAL

Figure 4.3-71 presents the 2002 thorium concentrations for the alluvial aquifer. Thorium concentrations are low at this site. The very low site standard of 0.3 pCi/l is due to the low background concentrations and no drinking water standard has been established for this constituent. The maximum thorium-230 concentration in 2002 from a POC well was less than 0.2 pCi/l. Thorium-230 should be considered for removal as a site standard and only monitored at the three POC wells annually.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 02/11/03
FIGURE 4.3-1A. SULFATE CONCENTRATIONS FOR THE ALLUVIAL AQUIFER (WEST AREA), FALL 2002, mg/l		D:\R13\HMC\ 01WQAL lh
		page 4.3-16

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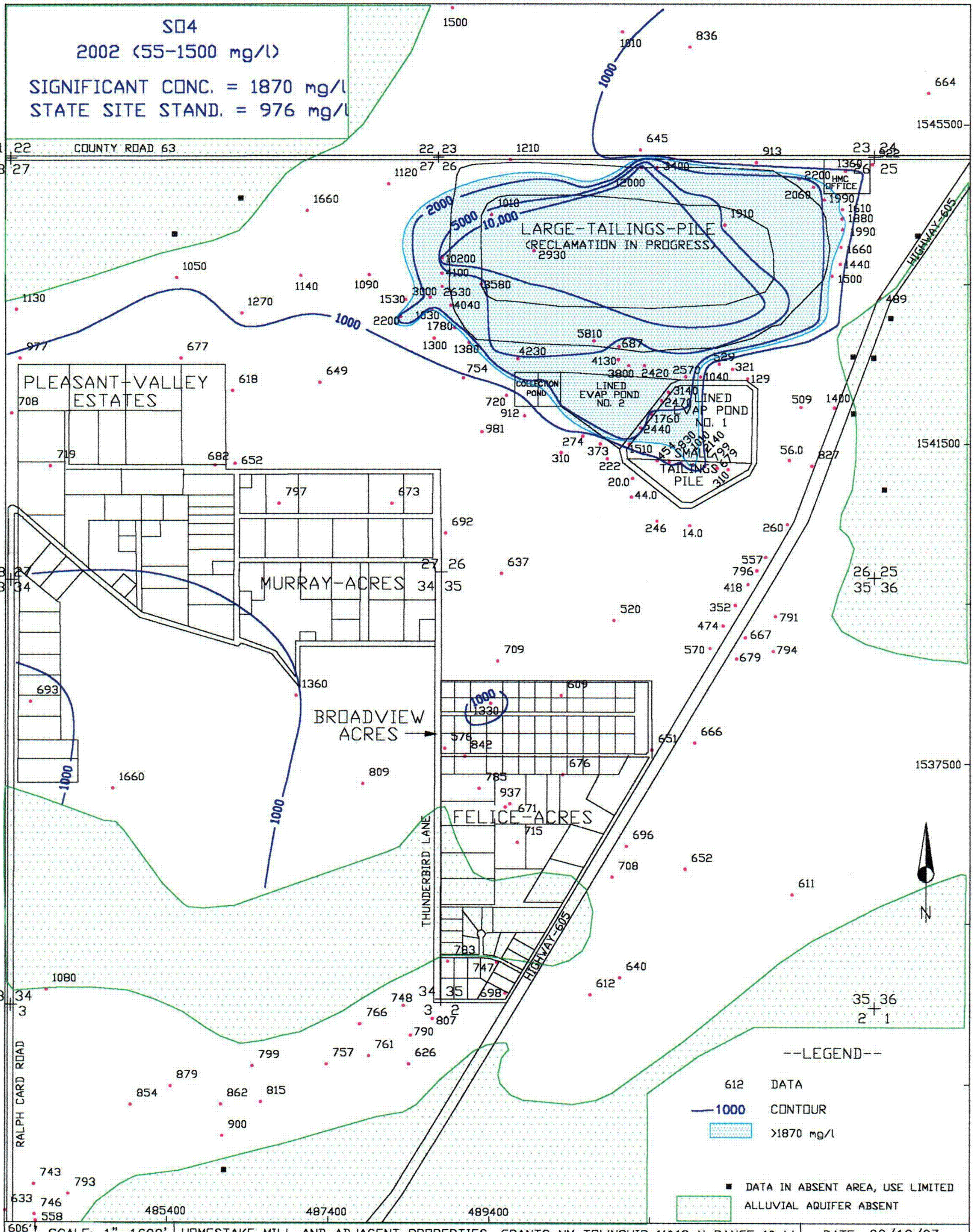

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FIGURE 4.3-1B. SULFATE CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 2002, mg/l

D:\R13\HMC\ 01EQAL lh

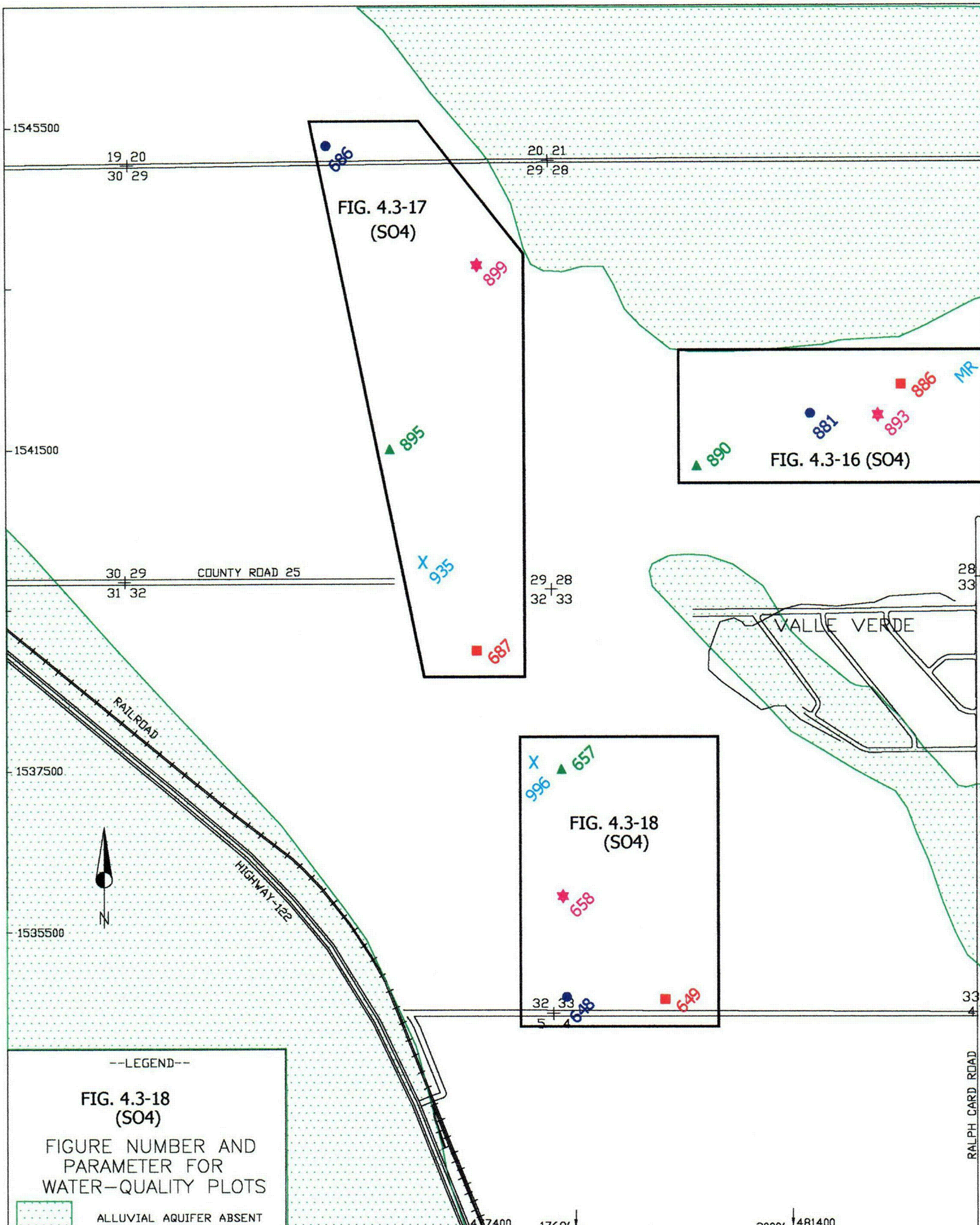

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FIGURE 4.3-2A. LOCATION OF ALLUVIAL WELLS WITH WATER-QUALITY PLOTS (WEST AREA)

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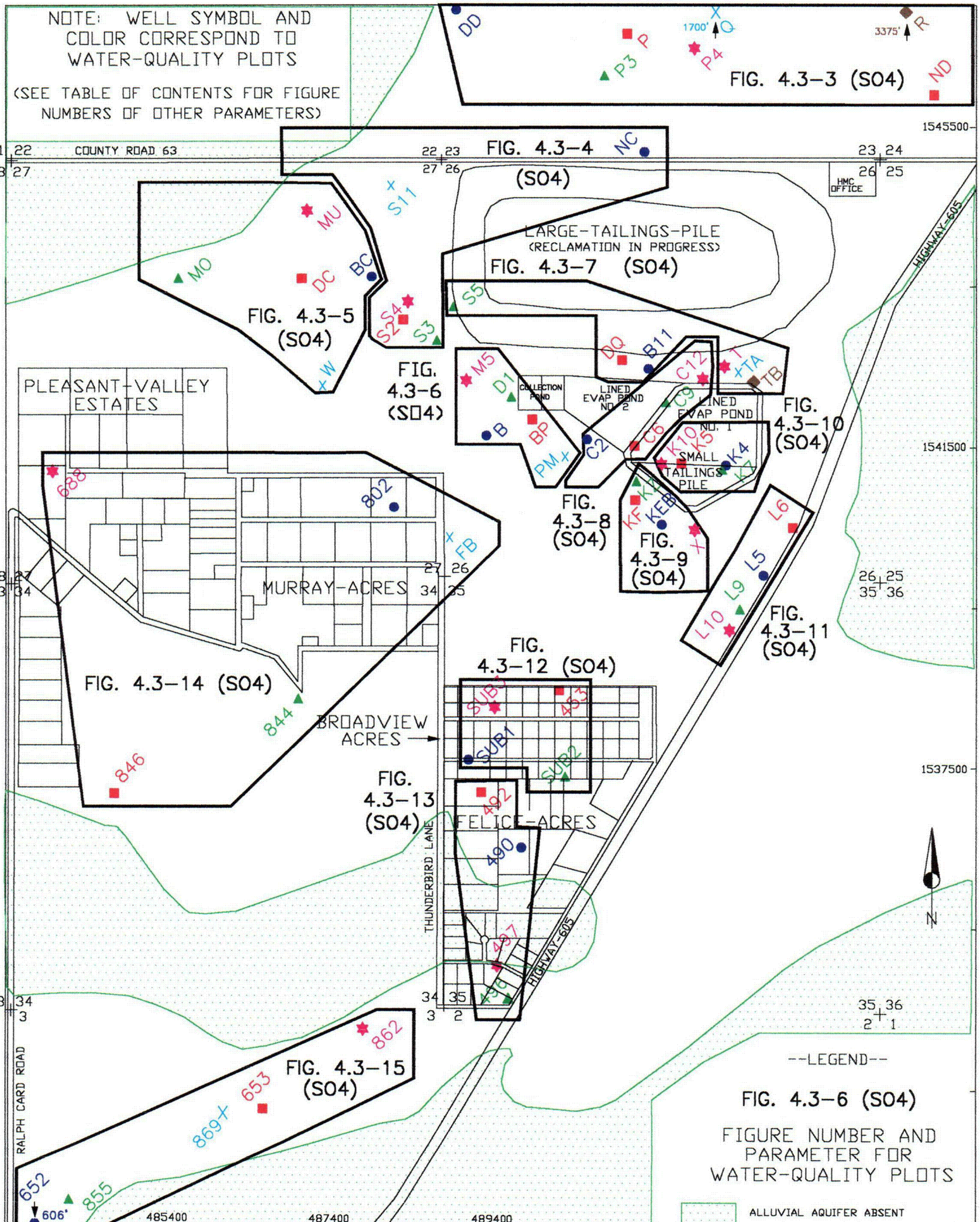
C28



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 02/13/03

FIGURE 4.3-2B. LOCATION OF ALLUVIAL WELLS WITH WATER-QUALITY PLOTS

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