2004 ANNUAL MONITORING REPORT / PERFORMANCE REVIEW
FOR
HOMESTAKE'S GRANTS PROJECT
PURSUANT TO
NRC LICENSE SUA-1471 AND DISCHARGE PLAN DP-200

FOR:

U.S. NUCLEAR REGULATORY COMMISSION
AND
NEW MEXICO ENVIRONMENT DEPARTMENT

BY:

HOMESTAKE MINING COMPANY
GRANTS, NEW MEXICO

AND

HYDRO-ENGINEERING, LLC
CASPER, WYOMING

MARCH, 2005

____

GEORGE L. HOFFMAN, P.E.
5831 N.M. HYDROLOGIST

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

Page Number

APPENDICES

NOTE: TABLE OF CONTENTS IS PRESENTED AFTER THE TAB FOR EACH SECTION

SECTION 1

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

Page Number

FIGURES

1.0 EXECUTIVE SUMMARY AND INTRODUCTION

1.1 EXECUTIVE SUMMARY

Homestake Mining Company manages a ground water restoration program as defined by Nuclear Regulatory Commission (NRC) License SUA-1471, and New Mexico Environment Department (NMED), DP-200 permit. The restoration 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 to the up-gradient background levels. A ground water collection area (see shaded area on Figure 2.1-1, Page 2.1-11) has been established and is bounded by a down-gradient perimeter of injection wells. Alluvial ground water that flows beneath the tailings enters this collection area. All ground water in the alluvial aquifer that is within the collection area is eventually captured by the collection well system. Once ground water quality restoration within the zone is complete and approved by the agencies, the site is to be transferred to the U.S. Department of Energy, which will have the responsibility for long-term site care and maintenance.

The data reported within this document represent the results of the monitoring program during 2004. This is a yearly reporting requirement. A similar report has been submitted to the agencies 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 deep-well supplied fresh water or water produced from the reverse osmosis (R.O.) plant. A series of collection wells is used to collect the contaminated water, which is pumped to the R.O. plant for treatment or, alternatively, reported to the evaporation ponds.

Historically, the contaminants are found in two different aquifer systems. The aquifer system of primary concern is the alluvial system, which averages approximately 100 feet in depth, and extends generally north to south encompassing both the Lobo Creek and San Mateo alluvial aquifers. In addition, a second aquifer system is found within the Chinle formation. It is comprised of three separate aquifers designated as the Upper, Middle and Lower Chinle aquifers. Hydro-Engineering 2003b should be reviewed for details of the geologic setting and aquifer conditions on the site. The Upper and Middle Chinle aquifers subcrop beneath the alluvial system near the project site. Slight to

moderately elevated concentrations of constituents of concern have been observed in the Upper, Middle and Lower 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 series of wells arranged to form a continuous injection line across the site. The injection line creates a hydraulic barrier that results in containment of the contaminants within the collection area. The contaminated ground water is pumped and collected from a series of wells 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-gradient collection system has gradually drawn the contaminated ground water plume up-gradient of the current hydraulic barrier leaving the restored portions of the aquifer with ground water concentrations at or below background levels.

An average of 501 gallons per minute (gpm) was pumped into the alluvial fresh-water injection systems in 2004. An additional 129 gpm of fresh water was injected into the Upper and Middle Chinle aquifer systems. An average rate of 249 gpm of R.O. product water was injected into the alluvial aquifer in 2004, in addition to the fresh-water injection program. Production of significant quantities of R.O. product water started in July of 1999 with consistent operation during 2000 through 2004 except during equipment repair periods.

In 2004, the average collection rate for the alluvial aquifer was maintained at 293 gpm. An additional 39 gpm was pumped from the alluvial aquifer and re-injected within the collection area. The Upper Chinle aquifer collection program consisted of pumping well CE2 at an average rate of 27 gpm in 2004. The up-gradient alluvial aquifer collection system averaged 46 gpm in 2004, while average rates of 51 and 85 gpm were pumped from the Large Tailings Pile toe drains and in situ tailings pile dewatering, respectively.

The continuing evaluation of the performance of the Grants restoration system, including the 2004 results, shows that sulfate, TDS, chloride, uranium, selenium and molybdenum are still the key constituents of interest at this site. Successful restoration of ground water quality with respect to these key constituents will also accomplish restoration for other constituents. 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 constituents are restored in the area.

Data relating to key constituents currently being restored at the site have been reviewed and statistically evaluated to determine upgradient background water quality. These proposed background water quality levels have been submitted to NRC, EPA and NMED for review and concurrence. It should be noted that these proposed standards are utilized throughout this report for comparison purposes in discussing restoration progress.

The only area where sulfate, TDS and chloride concentrations exceed the proposed alluvial background concentrations is in close proximity to the Large and Small Tailings Piles in the Grants Project area.

Uranium concentrations exceed the proposed alluvial background level of 0.15 mg/l within the collection area near the tailings. There are also seven wells in Felice Acres and two wells in Murray Acres subdivision that contain concentrations of uranium exceeding proposed background levels. Ground water withdrawal for irrigation is being used to further reduce uranium levels that exceed background levels in a small area southwest of Felice Acres in Section 3 and in the western half of Section 27 and Section 28.

Selenium concentrations also exceed proposed background levels in the collection area near the Large Tailings Pile and one small area in Section 3. None of the subdivision wells contained selenium concentrations above background.

Molybdenum concentrations slightly above the proposed background level of 0.05 mg/l are present in two subdivision wells in central Felice Acres. The remaining wells exhibiting elevated molybdenum concentrations are all located near the Large and Small Tailings Piles. Migration of this constituent has been limited due to natural retardation within the alluvial aquifer.

Up-gradient background concentrations of nitrate ranged up to 17.2 mg/l in 2004, which illustrates that significant natural levels are present up-gradient of the site. An area to the west of the Large Tailings Pile contains higher nitrate concentrations close to the proposed upper background level, but these levels are likely natural given their location. Nitrate concentrations beyond the immediate Homestake Grants Project area are not at levels of concern. Water quality with respect to

this constituent has been adequately remediated through completed restoration program efforts to date.

All radium activities in the alluvial aquifer outside of the tailings perimeter were less than the NRC site standard. This demonstrates that radium is only a constituent of concern under the Large Tailings Pile.

Vanadium concentrations exceeded the site standard in wells under the Large Tailings Pile in 2004. Concentrations of this constituent have been adequately restored to below background levels except for levels under the Large Tailings Pile.

The thorium concentration in all wells was less than or equal to the site standard in 2004 except levels in the alluvium under the Large Tailings Pile and for three slightly higher values outside of the tailings area. However, the analytical results for this constituent vary significantly at the low observed levels that are approaching laboratory detection limits. The monitoring records for thorium indicate that it is a minor constituent of concern at the Grants site.

Observed alluvial background concentrations of key constituents at the Grants site were similar to those in previous years with a maximum selenium concentration of 0.61 mg/l and a maximum uranium concentration of 0.21 mg/l. Background sulfate concentrations ranged up to 1600 mg/l in 2004, similar to previous years. All molybdenum concentrations were less than 0.03 mg/l in the alluvial background wells during 2004.

Fresh-water injection into Upper Chinle well CW13, east of the East Fault, continued in 2004. This injection has supported higher water levels in the Upper Chinle aquifer east of the East Fault which in turn has allowed continued operation of the nearby Upper Chinle collection wells.

Fresh-water injection continued in 2004 in Upper Chinle well CW5 just north of Broadview Acres and also in Upper Chinle well CW4R. This injection has resulted in gradient reversal within the Upper Chinle, thereby forcing ground water from this area back to the north toward the tailings piles. Collection from Upper Chinle well CE2 was initiated in 1999 and continued through 2004. It is used in conjunction with injection wells CW4R, CW5 and CW25 to restore ground water quality in this area. Injection into well CW25 was started in 2000 and continued through 2004.

All sulfate and TDS concentrations in the Upper Chinle aquifer are below background concentrations except for samples from well CW3, where the concentration is slightly higher than the non-mixing zone Chinle level. Therefore, the Upper Chinle aquifer only requires restoration with respect to TDS and sulfate in a localized area near the Large Tailings Pile.

Uranium concentrations in six Upper Chinle wells exceeded the proposed Upper Chinle background concentrations in 2004. Restoration of these elevated values should result from CE2 well collection and the CW4R, CW5 and CW25 well injection efforts.

Selenium concentrations in the Upper Chinle aquifer exceed the background concentrations in one well in the non-mixing zone. The proposed site standards for selenium for the Upper Chinle mixing zone and the Upper Chinle non-mixing zone are 0.14 and 0.06 mg/l, respectively.

The concentrations of molybdenum exceeded the proposed site standard in five wells near the tailings in the Upper Chinle aquifer during 2004. Restoration for these locations should occur from continued CE2 well collection and CW4R, CW5 and CW25 well injection activities.

The proposed nitrate background levels for the Upper Chinle zones are greater than any of the concentrations observed in 2004. This indicates that nitrate is not a constituent of concern in this aquifer.

None of the Upper Chinle wells contain a radium-226 plus radium-228 value above the Upper Chinle background value of 4 pCi/l. Only one of the vanadium concentrations (well CW3) in the Upper Chinle aquifer exceeds the proposed background level of 0.02 mg/l. None of the measured thorium-230 concentrations exceeded the proposed background levels for this constituent in the Upper Chinle aquifer wells during 2004. With the exception of a slightly elevated vanadium concentration in well CW3, these constituents are not present in the Upper Chinle aquifer at levels of concern. This is consistent with the low observed concentrations in the overlying alluvial aquifer.

The direction and rate of ground water flow in the Middle Chinle aquifer in 2004 is very similar to that of past years. Fresh-water injection into well CW14 started in December of 1997. Fresh-water injection into wells CW30 and CW46 also occurred in 2004. The fresh water is building up a mound of ground water in this area, which will result in a reversal of the flow of Middle Chinle water back toward the alluvial subcrop. Wells 498 and CW44 are being used for irrigation supply,

which will increase the flow in the Middle Chinle aquifer from Broadview Acres to the south. Additionally, well CW28 was added as a supply well for fresh-water injection in 2002.

Water quality in the Middle Chinle aquifer is generally good. All sulfate concentrations are less than the proposed background concentration except for a natural exceedance of the mixing zone background in wells CW17 and WR25. All TDS and chloride concentrations in the Middle Chinle aquifer are less than the background values except for a TDS value in Felice Acres and a TDS value in Murray Acres that are slightly above the non-mixing zone background value and three natural TDS values in wells west of the West Fault. Uranium and selenium concentrations in the western portion of Felice Acres are above proposed background levels due to the alluvial recharge to the Middle Chinle aquifer just south of Felice Acres. Continued irrigation use of this water by Homestake will reduce these elevated concentrations in western Felice Acres. The uranium background is also exceeded in Broadview Acres in well 434 and wells CW35 and WR25 west of the West Fault. The non-mixing zone background selenium concentration is slightly exceeded in well CW28 which is located east of the East Fault and well 493 in Felice Acres. Selenium concentration in mixing zone well CW27 also exceeds the proposed standard. Uranium site standards of 0.18 and 0.07 mg/l, respectively, are proposed for the mixing and non-mixing zones in the Middle Chinle aquifer, while proposed selenium site standards are 0.14 and 0.07 mg/l. Molybdenum concentration in well 434 is slightly above the proposed non-mixing zone standard of 0.05 mg/l.

Nitrate, radium, vanadium and thorium-230 concentrations in the Middle Chinle aquifer all are less than the proposed Middle Chinle background levels. Hence, only uranium and selenium are considered important constituents relative to the Middle Chinle aquifer system.

Concentrations of major constituents in the Lower Chinle aquifer generally increase in the down-gradient direction due to the slow movement of water in the fractured shale. All sulfate, TDS and chloride concentrations are less than the background levels except in far-down-gradient areas, where natural concentrations exceed the non-mixing zone background level. These exceedances result because there is only limited background data for the far-down-gradient areas of the Lower Chinle aquifer, and there is a naturally occurring deterioration of water quality in the down-gradient direction. Background uranium concentrations in the Lower Chinle aquifer are exceeded in six wells. The three wells where concentrations significantly exceed the background mixing zone concentration

of 0.18 mg/l are located near the subcrop of the Lower Chinle aquifer with the alluvial aquifer. Concentrations in three non-mixing zone wells slightly exceed the very low background level of 0.02 mg/l. Concentration of selenium also exceeds the mixing zone standard in two wells near the subcrop area. All molybdenum concentrations in the Lower Chinle aquifer are less than the background level. Two of the Lower Chinle nitrate concentrations slightly exceed the non-mixing zone background of 3.0 mg/l but are well below 10 mg/l. All radium, vanadium and thorium-230 concentrations in the Lower Chinle aquifer meet the proposed background for these constituents.

1.2 INTRODUCTION

This report, as required by the New Mexico Environment Department (NMED) discharge plan DP-200 and the Nuclear Regulatory Commission (NRC) License SUA-1471, presents results of the 2004 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 or Grants site, HMC deposited uranium tailings from the alkaline (high pH) Grants mills into two unlined piles (Large and Small Tailings Piles) 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 NMED and the NRC.

Four subdivisions, Broadview Acres, Murray Acres, 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 ground water west of the project site is included in the 1995 through 2004 reports (see Appendix A for water levels and Appendix B for water quality). This area has been designated the "West Area" and was so labeled on the figures in the annual reports prior to 2003. The 2003 and 2004 annual reports combine the project site and West Area figures on one 11 x 17 inch figure.

The annual ALARA audit, required as an NRC license condition, is presented in Appendix C. Additionally, a report of an annual inspection of the tailings piles and pond dikes must be submitted per license condition and is presented in Appendix D. Appendix E provides an annual land-use survey discussion for the immediate Grants site area; this was an added license condition

[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, 2002, 2003a and 2004.

beginning in 2002.

A detailed table of contents is included for each report section including a list of associated figures and tables.

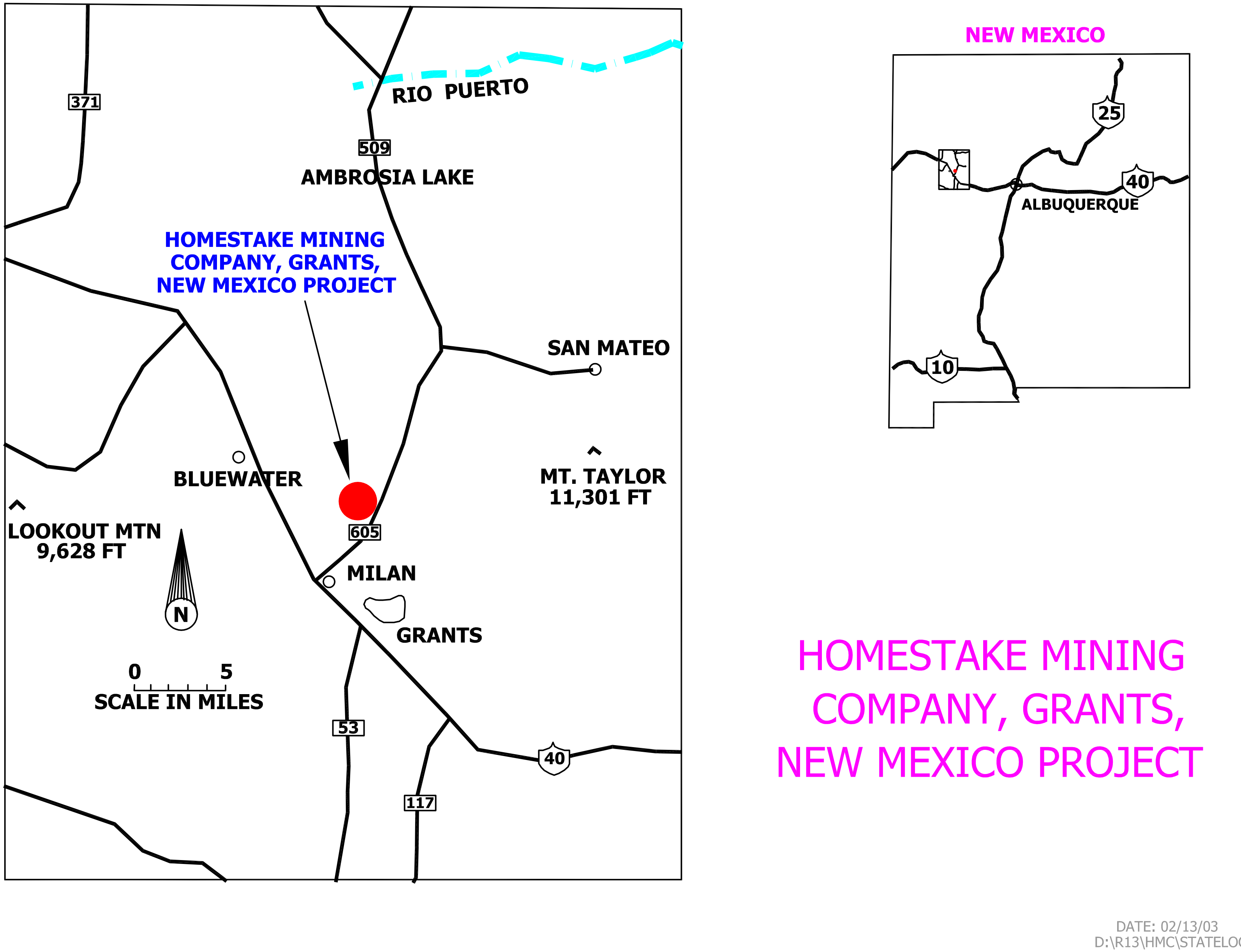


FIGURE 1.2-1. LOCATION OF THE GRANTS PROJECT

SECTION 2

TABLE OF CONTENTS

GROUND WATER MONITORING FOR HOMESTAKE'S GRANTS PROJECT

Page Number

FIGURES

SECTION 2
TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT
(continued)

Page Number

FIGURES
(continued)

TABLES

2.0 OPERATIONS

2.1 CURRENT OPERATIONS SUMMARY

The annual precipitation of 11.2 inches on site in 2004 was slightly above the average normal precipitation for Grants, New Mexico. This near normal condition following an extended drought has resulted in a continuing natural decline in water levels regionally and at the Grants site.

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 down-gradient. These collection and injection systems continued to operate in 2004, along with the reverse osmosis (R.O.) plant, which is used to treat and manage the majority of collected ground water. The R.O. plant produces product water that is of much better quality than the natural alluvial water, and it is used as injection water in some areas of the Grants Project restoration program. Figure 2.1-1 on page 2.1-11 shows the location of the present (end of 2004) injection and collection systems along with their starting dates of operation. 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 ground water flow is controlled by the fresh-water injection and collection systems is called the "Collection Area" and is shown by the yellow cross-hatched pattern on Figure 2.1-1. 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 utilizes a lime/caustic pre-treatment and clarification unit. Blowdown (sludge) from the pre-treatment unit discharges to the West Collection Pond with the treated water feeding 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 a series of injection wells. The brine from the R.O. plant is discharged to the evaporation ponds. Other miscellaneous flows and blowdown from the R.O. plant are pumped to the West Collection Pond for recycle to the R.O. plant.

The R.O. plant inputs and output of R.O. product water for injection are listed in the following tabulation:

R.O. Plant Performance (GPM) (2000 – 2004)				
Year	*Input*		*Output*	
	Collection Wells	Tailings Collection	R.O. Injection	Brine and Blowdown
2000	274	0	204	70
2001	276	5	222	59
2002	383	5	288	100
2003	338	4	266	76
2004	293	12.2	249	64

Aquifer restoration results continue to show that the R.O. product water injection is much more effective than the fresh water in reducing the uranium and molybdenum concentrations within the alluvial aquifer.

2.1.2 COLLECTION

The 2004 alluvial aquifer collection rate was slightly less than that in 2003, and both R.O. units were operated during portions of the year. Up-gradient alluvial aquifer collection continues north of County Road 63. Well P2 was used to collect background alluvial aquifer water (brown triangle symbol on Figure 2.1-1) for transfer to the drainage system farther west. This collection well reduces the quantity of alluvial water flowing into the tailings area. Upper Chinle aquifer collection continued from well CE2 (gold X symbol located south of the collection ponds), and this water was used as injection supply water for the tailings pile flushing program.

2.1.2.1 ALLUVIAL AQUIFER

Figure 2.1-1 shows the locations of five lines of alluvial aquifer collection wells (red x symbols). The S and D-lines are adjacent to the Large Tailings Pile, and the K and C-lines are adjacent to the Small Tailings Pile. Replacement well S5R and well T2 were added to the collection

system in 2004. The L-line south of the Small Tailings Pile continued to operate in 2004 and includes collection wells 521, 522 and 639 which are located on the east side of Highway 605. Alluvial water is pumped from these lines of collection wells to the R.O. plant or it is pumped to re-injection wells. Figure 2.1-2 on page 2.1-12 graphically presents collection rates for the last eight years at the Grants Project. The alluvial collection system operated at an average rate of 293 gpm in 2004. Additionally, an average of 39.4 gpm was extracted from the alluvium for re-injection in 2004.

2.1.2.2 UP-GRADIENT ALLUVIAL WATER

Collection of alluvial water up-gradient of the tailings piles started in January of 1993 and continued through 2004. Well P2 was the main well pumped in 2004 (see Figure 2.1-1). This up-gradient water was transferred to the next drainage channel to the west. The transfer of this up-gradient water prevents some of the alluvial water from entering the Grants Project area at the north side of the Large Tailings Pile and helps maintain the gradient reversal. The collection rate for this effort averaged 46 gpm during 2004 (see Figure 2.1-2). Monthly rates were not measured for the up-gradient wells, and therefore only the yearly average is presented for 2001 through 2004 on Figure 2.1-2.

2.1.2.3 UPPER CHINLE AQUIFER

Figure 2.1-2 shows the collection rate for Upper Chinle collection well CE2, which is located on the south side of the collection ponds. Collection from Upper Chinle well CE2 started in 1999 and is expected to continue for several years. This well was used to supply water to the Large Tailings Pile for the tailings flushing program during 2004. The yearly average collection rate from the Upper Chinle was 27.3 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 extracted from the ground water system, the tailings piles and the toe drains. The ground water collection system

has produced an average pumping rate of 259 gpm for the entire period between 1978 and 2004. The portion of the collection water 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 2004 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.

2.1.3 INJECTION

The fresh-water and R.O. injection systems, which aid in the reversal of the ground water gradients back toward the collection wells, consist of lines of injection wells which are oriented generally along the east, south and west perimeter of the two tailings piles and evaporation pond complex (see green and blue circles on Figure 2.1-1).

In 2003, approximately 2100 feet of four-inch corrugated slotted polyethylene pipe was installed at a depth of approximately 6 feet below land surface west of the Large Tailings Pile to serve as a horizontal injection line (see green line on Figure 2.1-1). A filter sock was placed over the pipe thus negating the need for a sandpack. Water is currently being injected into this injection line at three locations. The 2004 injection rate for this horizontal injection line is included in the Broadview and Murray Acres injection rates, and was approximately 200 gpm for the year.

In 2004, two 250 foot sections of injection lines were added in July south of collection well 522 east of Highway 605. The average injection rate for these lines rate is estimated at 23 gpm and is included in the Broadview and Murray Acres injection rate.

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 wells was discontinued in mid-April of 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. Fresh water was injected into wells X13 through X27, 1A and 1E in 2004. Alluvial fresh-water injection wells 523 and 524 were added to the Broadview Acres injection system in 2002.

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 series injection wells. The M line of the Murray Acres injection system was initially used in 1983. 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 at this time. The horizontal injection line, west of the Large Tailings Pile, was added to this system on August 25, 2003.

Figure 2.1-3 (page 2.1-13) presents fresh-water injection rates for the last eight years. An average of 501 gpm, or a total of 264 million gallons, was injected during 2004.

2.1.3.2 R.O. PRODUCT

The R.O. product water injection system supplies water to the X wells to the south and east of the Small Tailings Pile. Through the end of 2004, 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. Figure 2.1-3 shows the rates of R.O. product water injection which averaged 249 gpm in 2004 for a total of 131 million gallons.

2.1.3.3 UPPER CHINLE AQUIFER

Hydro-Engineering 2003b should be reviewed for a detail discussion of the geologic setting for the Chinle aquifers. 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.

In order to maintain head in the Upper Chinle aquifer east of the East Fault, injection of fresh water into well CW13, an Upper Chinle well, was begun in June, 1996. Injection into 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 increase the head in the Upper Chinle aquifer and force flow in the Upper Chinle back toward collection well CE2. Injection into Upper Chinle well 944 started in June of 2002, and injection into well CW4R started in 2003. The red squares on Figure

2.1-3 present monthly average injection rates into Upper Chinle wells 944, CW4R, CW5, CW13 and CW25, with an overall 2004 average of 106 gpm.

2.1.3.4 MIDDLE CHINLE AQUIFER

Injection of San Andres fresh water into Middle Chinle well CW14 was started in December of 1997. This injection was initiated to prevent northward movement of alluvial water that recharges the Middle Chinle on the south side of Felice Acres. The injection rate averaged 22.8 gpm in 2004 (see Figure 2.1-3). This injection has prevented the movement of constituents further to the north and allows up-gradient collection from well CW44.

2.1.3.5 SECTIONS 28 AND 29

A test of fresh-water injection was initiated in late 1999 and continued through January of 2000 by pumping San Andres well 951, which is located in Section 20, (see Figure 2.1-1 for location of supply well 951). This water was subsequently injected into alluvial wells 682, 656, 894, 633 and 655. This fresh-water injection in Sections 28 and 29 was resumed in March of 2002 to impede movement of ground water with modest contaminant concentrations in Section 28 until ongoing irrigation water extraction can reduce these low concentrations. This injection rate averaged 383 gpm for 2004 with a total injected volume of 202 million gallons.

2.1.3.6 SECTIONS 35 AND 3

Fresh-water injection in the southwestern quarter of Section 35 was initiated in late 2002 utilizing production from Upper Chinle well CW18 and Middle Chinle well CW28. This water was injected into alluvial wells 641, 642, 848 and 868. Figure 2.1-3 presents the monthly injection rates in the wells located in Sections 28 and 29.

Fresh-water injection into alluvial wells 643, 863, 865 and 866, located in the northeast portion of Section 3 was initiated in 2003. Injection into Middle Chinle wells CW30 and CW46 was added to this program in 2004. Seven injection lines in Section 3 and two injection lines in Felice Acres were also added in 2004. These injection wells and lines were supplied by Lower Chinle well CW29 and San Andres well 943 in 2004.

Figure 2.1-3 presents the combined monthly injection rates for Section 35 and Section 3 fresh-water injection wells (see brown diamond symbols on Figure 2.1-3). This injection effort is associated with the ground water restoration of the Section 3 area. Water collected from wells in Section 3 is used for the irrigation program. During 2004, the yearly average injection rate in Sections 35 and 3 was 223 gpm.

2.1.4 RE-INJECTION

Alluvial water containing relatively low concentrations of contaminants is collected and is then injected into areas of the alluvial aquifer with higher concentrations of contaminants in order to enhance restoration of those areas. This aspect of the restoration plan at the Grants sites is referred to as the collection for re-injection program. The 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, re-injection is a beneficial use of this slightly contaminated ground water. Water collected from the L-line to the south of the Small Tailings Pile and wells 521, 522 and 639 was used for re-injection in 2004. The total re-injection rate into alluvial wells X11, X12, D2 through D4, DAA, DAB, DL, DW, DY, DF, DG, and DX in 2004 averaged 39.4 gpm. The monthly re-injection rates are presented on Figure 2.1-2 as the collection rates for re-injection use (COL/RE-INJ). Some of the collection for re-injection water was re-injected into Large Tailings Pile wells in the second half of 2004. Approximately ten percent of the yearly average is estimated to have been injected into the tailings.

2.1.5 TAILINGS CONDITIONS

Tailings wells were installed in the Large Tailings Pile beginning in 1994, and wells have periodically been added through early 2002. Data collected from these wells has been used to estimate the amount of drainable water in the re-contoured, stabilized tailings. The tailings wells are also a primary component of the tailings dewatering program. With the exception of some testing of dewatering options in 1999, no dewatering of the tailings occurred in 1998 and 1999 due to limited available capacity in the evaporation ponds. The complete dewatering program was restarted in 2000 and operated through mid-April 2002. Dewatering rates were reduced through the remainder

of 2002 and 2003 due to limited available storage in the evaporation ponds. The dewatering wells were operated near capacity starting in April of 2004.

Figure 2.1-4 shows the locations of tailings wells that were pumped in 2004. The cumulative volume of tailings water pumped from 1995 through 2004 is presented on Figure 2.1-5. A total volume of 162 million gallons of water had been removed from the tailings via dewatering wells by the end of 2004. A total of 44.7 million gallons was pumped from the tailings in 2004. The yearly average collection rate from the tailings was 84.9 gpm in 2004.

Wells CE2, CW1, CW2, CW3, 929 and 934 have been used to supply water for flushing the Large Tailings Pile in 2004. A total of 147 million gallons were injected into the tailings in 2004, which is an average rate of 280 gpm. This injection for tailings flushing allows larger extraction rates from the tailings dewatering wells and reduces contaminant concentrations in the tailings.

Table 2.1-1 presents the quantity of constituents collected from the tailings wells since dewatering began in 1995. Tables B.1-1 and B.1-2 of Appendix B present chemical analyses of tailings well water during 2004.

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 that are utilized for collection of toe seepage. Two of these sumps are tied to the old tailings decant towers (East and West reclaim sumps).

Figure 2.1-5 shows that 200 million gallons of water has been pumped from the toe drains. Approximately 50.7 gpm of water was collected from the toe drains in 2004, which is a 3 gpm decrease from the 2003 rate. This decrease is due to the increase in pumping from tailings collection wells on the Large Tailings Pile.

Table 2.1-1 also presents the 2004 quantity of constituents collected from the toe drains (see Tables B.2-1 and B.2-2 of Appendix B for water-quality results for 2004).

2.1.7 LINED EVAPORATION PONDS

The use of lined evaporation collection ponds (East Collection Pond and West Collection Pond) began in October of 1986 when the two ponds were constructed. The No. 1 Large Evaporation Pond located on the Small Tailings Pile, began receiving water in November of 1990. Usage of the No. 2 Large Evaporation Pond began in March of 1996.

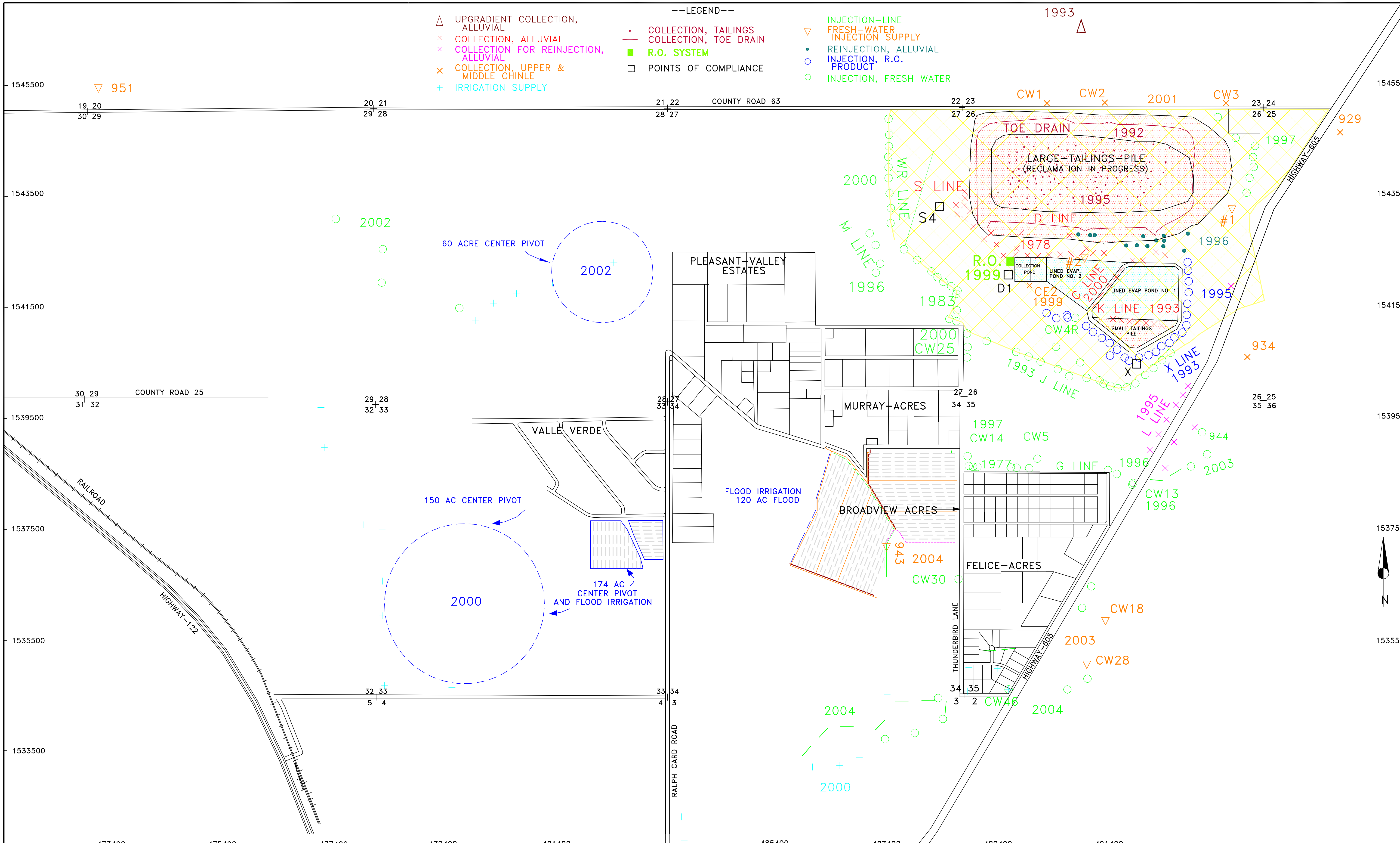
The water from the well collection system and some water from the tailings dewatering wells and toe drains is pumped to the R.O. plant as feed water. The majority of the extracted tailings water is reported directly to the East Collection Pond for subsequent evaporation. Excess water is transferred from 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 total of 99 million gallons (average rate of 188 gpm) of water was delivered to the evaporation pond system in 2004.

Water quality samples results 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) are presented in Tables B.3-1 and B.3-2 of Appendix B.

2.1.8 IRRIGATION

Four irrigation systems were operated in 2004 (see Figure 2.1-1 for locations). 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 fifth full irrigation season; the 60 acre center pivot in Section 28 was operated for the third irrigation season and the 24 acre flood irrigation in the eastern portion of Section 33 was operated for the second year. Figure 4.1-1 shows the supply wells for these irrigated areas. In 2004, wells 496, 498, 538, 541, 631, 632, 647, 648, 649, 653, 657, 658, 687, 862, 869, 996, CW44 and CW45 were used for the irrigation supply to the areas in Sections 33 and 34. Discharge from these supply wells is collected into a common piping system and is used on only one irrigation area at a time. Wells 634, 659, 881, 886 and 890 were used to supply the Section 28 pivot irrigation. These three areas were successfully irrigated during the entire 2004 growing season with 3 hay cuttings produced from the center pivot irrigation within Sections 28 and 33. Only 2 hay cuttings were produced from Section 34 flood while no hay cuttings were done on the Section 33

flood area. A total of 1028 Ac-Ft of water was applied to the four irrigation areas in 2004. The average uranium and selenium concentrations applied to the Section 33/34 fields were 0.26 and 0.09 mg/l for uranium and selenium respectively in 2004 while the average values for Section 28 were 0.27 and 0.07 mg/l.



SCALE: 1"=1600'

C:\PROJECTS\2004-06\04COLL-INJ

DATE: 03/21/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

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

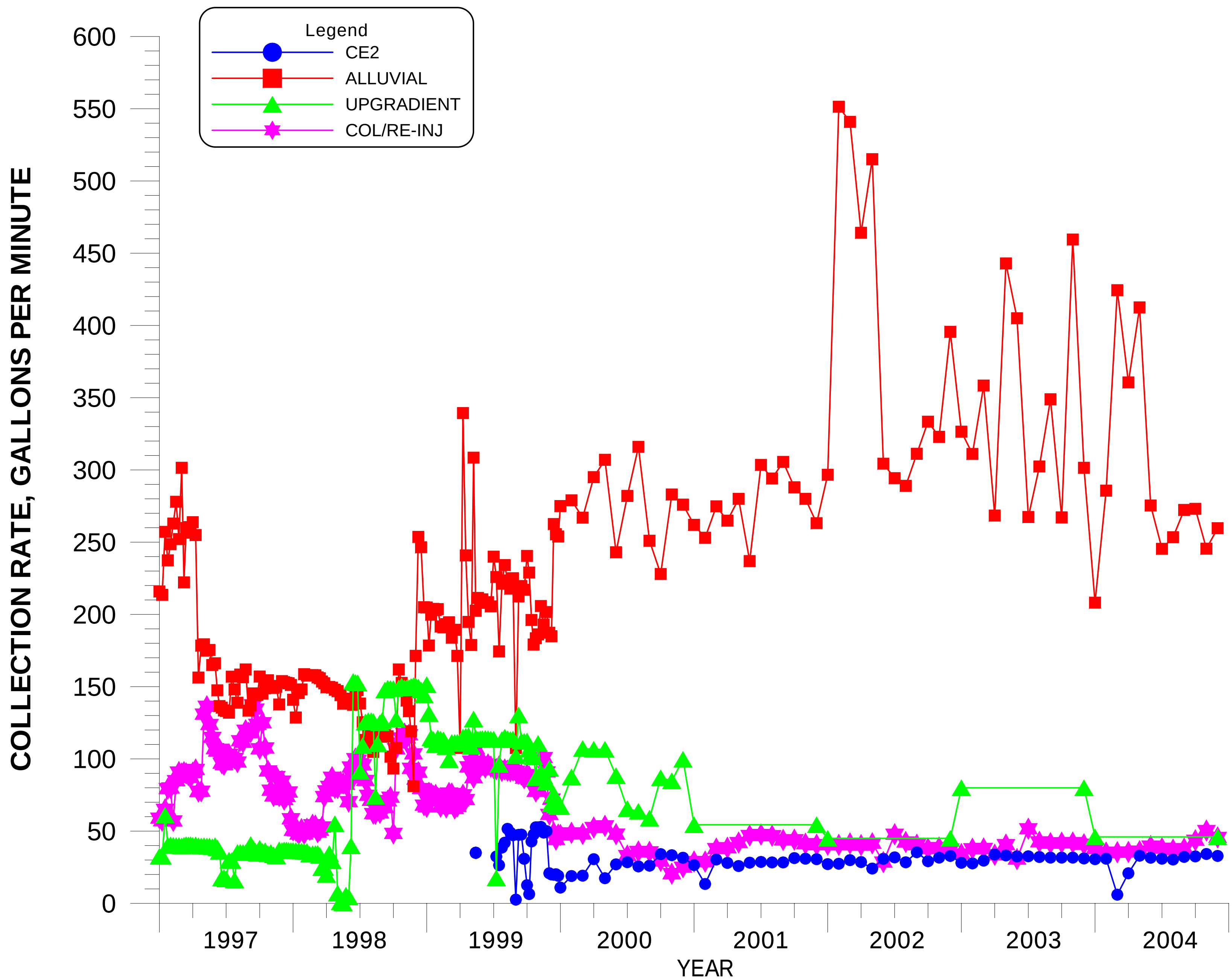


FIGURE 2.1-2. AVERAGE MONTHLY COLLECTION RATES FOR THE ALLUVIAL AND UPPER CHINLE AQUIFERS.

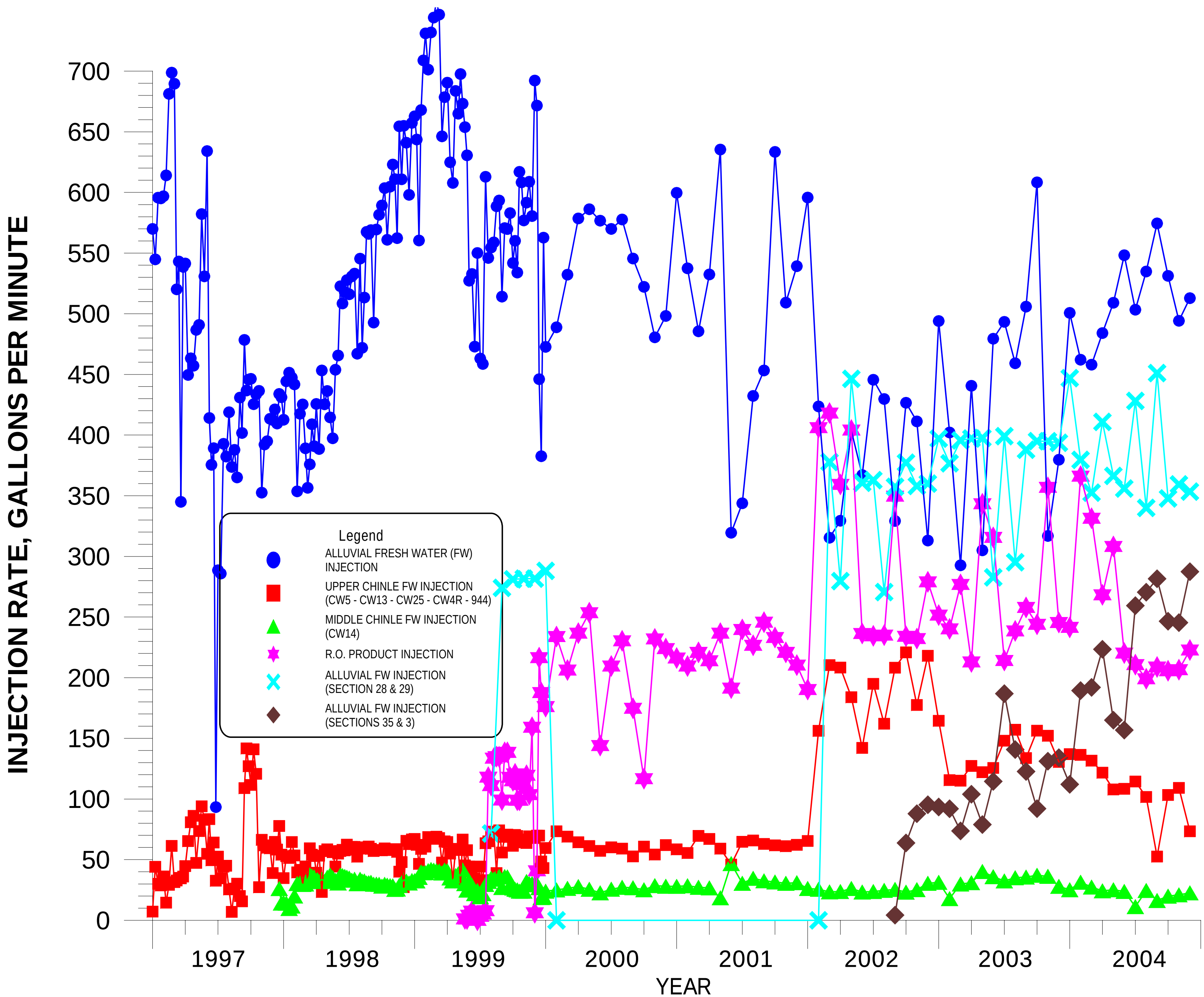


FIGURE 2.1-3. AVERAGE MONTHLY INJECTION RATES FOR THE ALLUVIAL UPPER CHINLE AND MIDDLE CHINLE AQUIFERS.

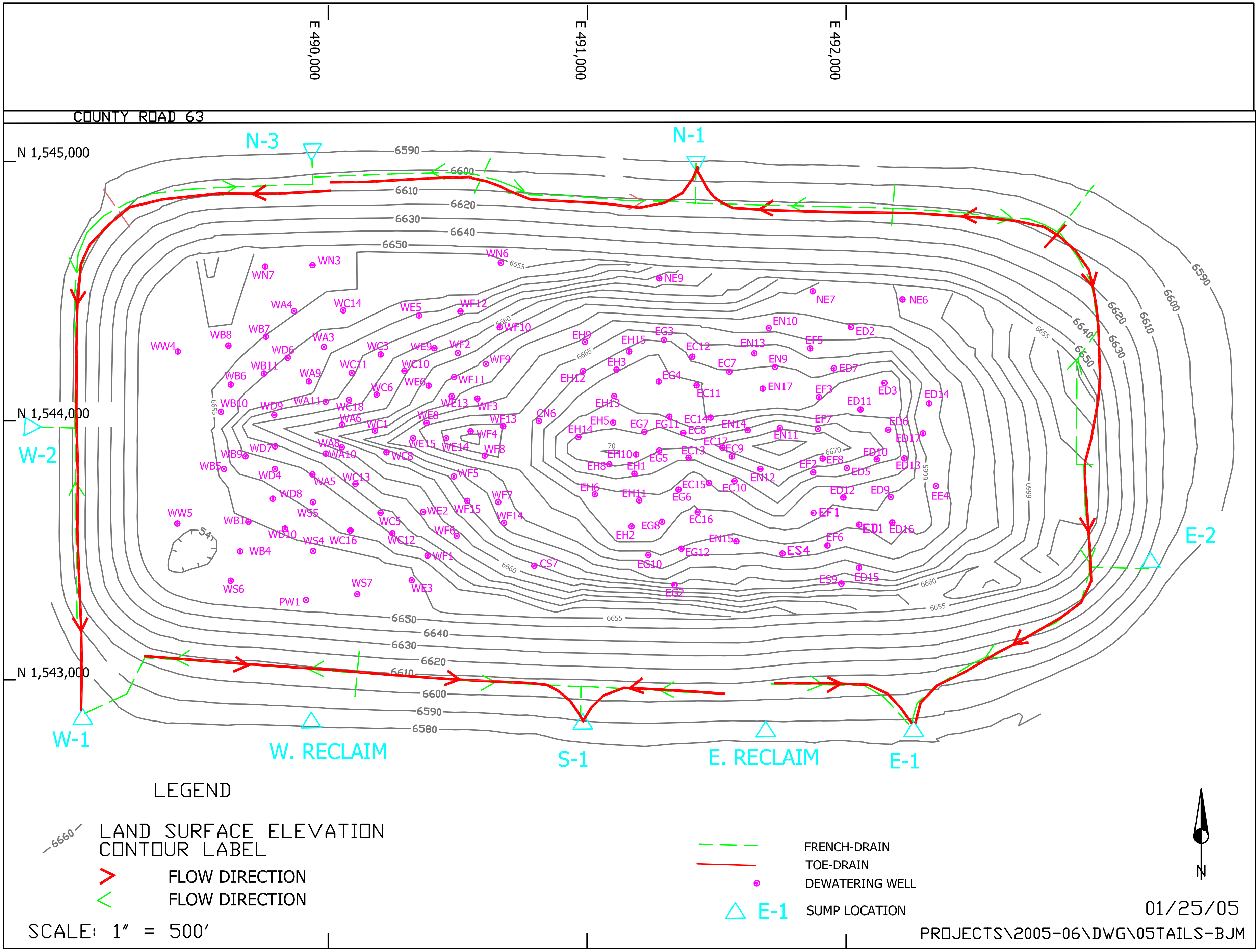


FIGURE 2.1-4. LOCATIONS OF TAILINGS DEWATERING WELLS, TOE DRAINS AND SUMPS

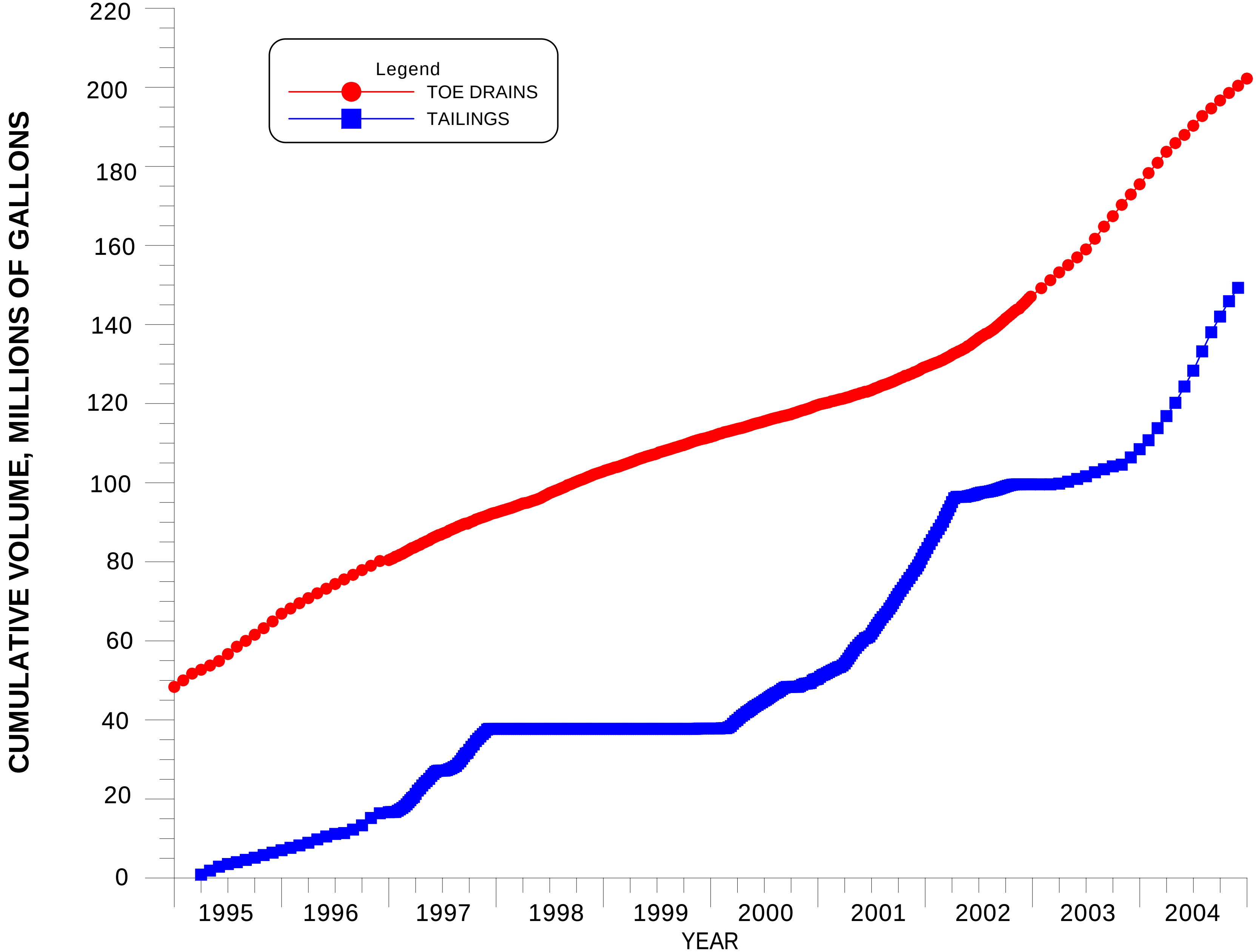


FIGURE 2.1-5. CUMULATIVE VOLUME OF COLLECTION WATER FROM TAILINGS DEWATERING WELLS AND TOE DRAINS.

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
2003	G.W.	177727419	2417	3585168	13.8	20470	15.5	22991	0.73	1083
2003	TOE	28418871	9457	2243048	35.6	8444	78.9	18714	4.35	1032
2003	TAILS	8890076	9800	727126	28.0	2078	92.0	6826	0.30	22
2004	G.W.	154422720	2272	2931913	11.3	14633	16.6	21386	0.79	1017
2004	TOE	26720928	8007	1787722	31.9	7115	67.6	15102	2.78	622
2004	TAILS	44745696	6360	2377848	23.1	8637	60.9	22769	0.20	75
SUM G.W.		3,672,144,259		135,792,784		856,105		998,254		55,084
SUM TOE		200,298,739		17,414,951		70,154		156,413		3,181
SUM TAILS		151,866,372		10,498,665		40,257		101,468		242
COMBINED SUM		4,024,309,370		163,706,399		966,516		1,256,136		58,507

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

Ground water quality restoration in 2005 will continue as a combination of fresh-water and R.O. product injection to maintain the overall piezometric gradient reversal between the lines of injection (M Line, WR Line, J Line and X Line) and contaminated water collection near the tailings piles. The reverse osmosis (R.O.) plant can be operated at a rate of up to 600 gpm but is projected to operate at an average rate of approximately 400 gpm in 2005. When the plant is operated at full capacity, approximately 440 gpm of R.O. product is produced for injection into the alluvium and approximately 160 gpm of brine reject and blowdown is discharged to the evaporation ponds. A larger collection rate and use of the very good quality R.O. product for injection will continue to enhance 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 collected and used for re-injection in the initial phase of restoration of some areas. This re-injection will occur in the alluvium where concentrations are greater than those of the injected water until such time as injection with San Andres fresh water or R.O. product water will better complete the restoration. Use of the low-concentration re-injection water will be limited to areas up-gradient of the J, WR and X 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 and a few tailings wells. Additional wells in this area will be included in the re-injection program in 2005.

Collection from Upper Chinle well CE2 will continue to intercept contaminants in this aquifer. Injection into Upper Chinle wells 944, CW4R, CW5, CW13 and CW25 is planned to continue to control the direction of flow in these areas of the Upper Chinle aquifer.

Injection into well CW14 will be continued in order to build the head in this area of the Middle Chinle aquifer. This will prevent alluvial water from flowing into this portion of the Middle Chinle aquifer.

Irrigation with water from Sections 3, 28, 32, 33 and 35 is planned for the entire growing season in 2005. Full irrigation of the 24 acres of flood in Section 33 is expected for 2005 and the 60 acre center pivot is expected to be expanded to 100 acres in 2005. Fresh-water well injection lines in Sections 27 and 28 will be commissioned and utilized in 2005 to restore these areas of low level aquifer contamination. Fresh-water injection will be continued in Sections 35 and 3 in 2005, and

additional injection wells or injection lines are planned to be added in Section 35 in 2005 to aid restoration and to complement the use of water for irrigation. Additional irrigation wells and injection lines in Sections 27 and 28 are planned to be added to the Section 28 irrigation system to aid restoration in this area.

SECTION 3

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

Page Number

FIGURES

TABLES

3.0 SITE STANDARDS AND BACKGROUND CONDITIONS

3.1 ALLUVIAL SITE STANDARDS

Six water-quality site standards (U, Se, Mo, Ra226 + Ra228, Th230 and V) were previously set for the alluvial aquifer at the Homestake site by the United States Nuclear Regulatory Commission (NRC). These established site standards are presently exceeded by the full range in alluvial aquifer background values for many of the constituents. Accordingly, naturally occurring concentrations of these elements up-gradient of the Grants site have and will continue to prevent successful ground water restoration to meet those existing standards.

Adjustment of the site standards to account for the full range in natural background concentrations is presently under federal and state review by NRC and NMED. Both agencies have accepted the full range of background values for the alluvial aquifer as presented in Hydro-Engineering 2001c. The new (Proposed NRC Site Standards) agreed upon standards are shown in Table 3.1-1 and will be incorporated in the renewal of the NMED DP-200 permit and the amendment of site license SUA-1471 by NRC.

Site standards for the Grants Project are applicable at three points of compliance; the Point of Compliance (POC) wells are S4, D1, X and (see Figure 2.1-1 for locations).

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

Constituents	Homestake Standards		
	Existing NRC License Site Standards	**Proposed NRC License Site Standards*** **	**Existing New Mexico Site Standards***
Uranium	0.04	0.15	0.15
Selenium	0.1	0.27	0.27
Molybdenum	0.03	0.05	1.0@
Vanadium	0.02	0.02	-----
RA-226 + Ra-228	5	5	30
Thorium-230	0.3	0.3	-----
Sulfate	-----	1870	1870
Chloride	-----	250	250
TDS	-----	3060	3060
Nitrate	-----	23	23

NOTE: All concentrations are in mg/l except: Ra-226 + Ra-228 and Th-230, which are in pCi/l.
@ = Irrigation Standard
* = Pending NMED issuance of DP-200
*** = Pending NRC license amendment

3.2 ALLUVIAL BACKGROUND WATER QUALITY

Background alluvial aquifer water-quality conditions at the Grants site are those found up-gradient or north of the Large Tailings Pile. These conditions in the San Mateo alluvium 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 occurs only after extreme precipitation events and then generally only within some reaches of the channels.

Hydrographs of up-gradient 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 Pile, have been used for monitoring alluvial background water quality and are called the near up-gradient wells.

Additional alluvial background wells located farther north were sampled in 2004 (wells 914, 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 up-gradient alluvial aquifer, and these wells are referred to as the far up-gradient wells.

Figure 3.2-1 presents the latest 2004 water-quality data for the near and far-up-gradient alluvial background wells for six parameters: sulfate, uranium, selenium, chloride, TDS and nitrate. Molybdenum concentrations in all up-gradient wells were less than 0.03 mg/l. Sulfate concentrations for the wells varied from 398 to 1600 mg/l in 2004. Uranium concentrations also varied over a large range, from 0.0008 to 0.21 mg/l. Selenium concentrations also varied over a large range, from less than 0.005 to 0.61 mg/l.

Chloride concentrations in water sampled from the up-gradient wells ranged from a low of 38 mg/l to a high of 124 mg/l. The TDS concentrations varied from 1080 to 2740 mg/l. Nitrate concentrations also vary naturally over a large range in the alluvial aquifer, and ranged from less than 0.1 to 17.2 mg/l in 2004. Concentration versus time plots for up-gradient wells DD, ND, P, P3, Q and R are presented in Section 4.3 of this report.

The 95th percentile of the historical background alluvial aquifer water-quality data for the Grants site was defined by ERG (1999a and 1999b). These documents, along with a hydrologic support document (Hydro-Engineering 2001c), were submitted to the NRC in 2001 with a request to

adjust some of the site standards based on the full range of natural background conditions. The 95^{th} percentile is being used to define the upper limit of background. The present NRC standards used average background concentrations for establishing the standards. The 95^{th} percentile is a more appropriate value for use in background discussions, because it better defines the natural full upper limit of background. A tabulation of the 95^{th} percentile background levels for the Grants Project area constituents is included in Figure 3.2-1.

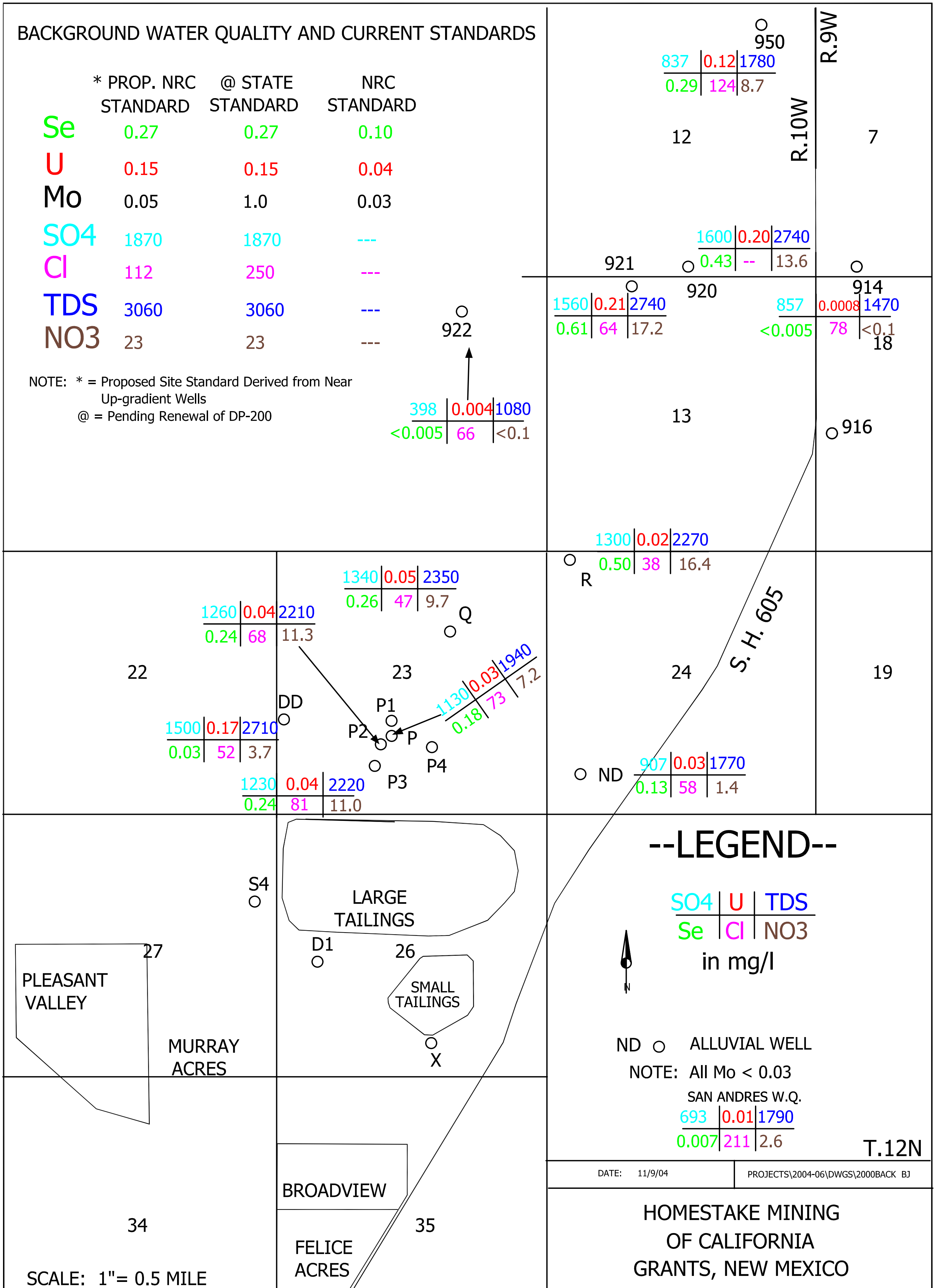


FIGURE 3.2-1. ALLUVIAL BACKGROUND GROUND WATER QUALITY, 2004

3.3 COMPARISON OF ALLUVIAL SITE STANDARDS TO BACKGROUND

The range in concentrations (see Section 3.2) in the alluvial up-gradient wells during 2004 was such that 9 out of 12 selenium concentrations in background well[1] samples were equal to, or exceeded, the present NRC site standard. Additionally, 7 out of 12 uranium values were equal to, or exceeded, the present NRC site standard. The original site standards were set based on an average of concentrations in three samples[2] collected in December 1988, January 1989 and February 1989 from up-gradient well P. As shown by the present data, there is a large natural areal variability in the background water quality. Therefore, the cumulative database for all of the background wells more adequately defines background concentrations, and this expanded database, based on near-up-gradient wells, was utilized in the two ERG (1999a and 1999b) studies. Naturally occurring background variation is illustrated by the uranium concentrations, where concentrations in 2004 varied from 0.0008 to 0.21 mg/l (see red values on Figure 3.2-1). The higher values are five times greater than the present 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 proposed State and NRC standards. The sulfate, TDS and nitrate 95th percentile levels are equal to the proposed State standards because the State has accepted the upper limit evaluation.

[1]Wells DD, ND, P, P3, 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 ALLUVIAL UPPER LIMIT OF BACKGROUND GROUND WATER QUALITY AND SITE STANDARDS.

Constituents	95% Background Level	Proposed State Standard	Proposed NRC Standard
Selenium	0.27	0.27	0.27
Uranium	0.15	0.15	0.15
Molybdenum	0.05	1.0@	0.05
Sulfate	1870	1870	1870
Chloride	112	250	250
TDS	3060	3060	3060
Nitrate	23	23	23

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

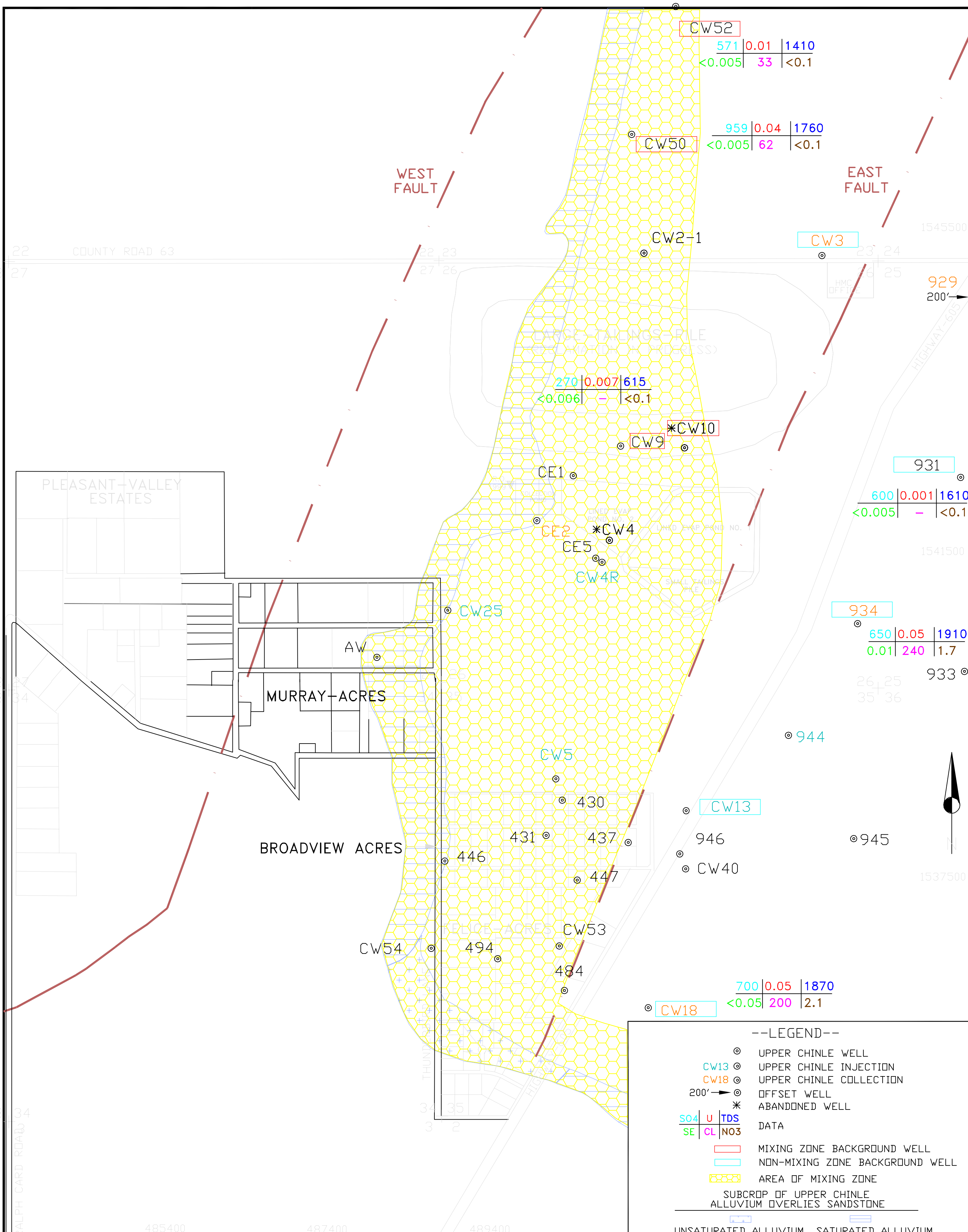
3.4 CHINLE BACKGROUND WATER QUALITY

The Chinle aquifer background water quality has been analyzed and presented to the NRC and NMED in Hydro-Engineering 2003b and ERG 2003. The proposed background concentrations for the mixing zones in the Upper, Middle and Lower Chinle aquifers were grouped together to develop a mixing zone background level. The non-mixing zone water chemistry data for each of the three aquifers were analyzed separately. Table 3.4-1 presents the results from the analysis of the Chinle background data. Figure 3.4-1 presents the location of the Upper Chinle mixing-zone and the wells used in the analysis of background values. The mixing zone is shown with a yellow pattern on Figure 3.4-1. Wells within the mixing zone that were used in the mixing-zone background calculations have a red rectangular box around the well name. Wells used to define the Upper Chinle non-mixing zone are indicated by a light blue rectangular box around their well name. Figure 3.4-1 also presents the 2004 data collected from these background wells for selected parameters of sulfate, uranium, TDS, selenium, chloride and nitrate. This data is presented in a format similar to that used for the alluvial background data. None of the Upper Chinle background concentrations for 2004 exceed the proposed background levels for this aquifer.

The Middle Chinle mixing zone is presented in Figure 3.4-2 with a yellow pattern. Five wells are shown in the Middle Chinle mixing zone, and these wells were included with the Upper Chinle and Lower Chinle mixing-zone wells in establishing the mixing-zone background values. Six wells shown on Figure 3.4-2 were used to establish the Middle Chinle non-mixing zone background levels. This figure also presents the 2004 data collected for these background wells. Two wells, CW17 and WR25, in the mixing zone of the Middle Chinle aquifer exceed the background sulfate concentrations for this aquifer. Both of these wells are west of the West Fault where concentrations in the Middle Chinle aquifer are natural due to natural flow gradient of the aquifer. This indicates that what has previously been considered the range of background sulfate concentrations may not fully define the range of natural concentrations in this aquifer. Likewise, four of the TDS and one of the chloride background concentrations exceeded the proposed background levels for the Middle Chinle aquifer. These exceedances also serve as a reminder that standards established as the 95th percentile will occasionally be exceeded within the range of natural variation. Two of the uranium concentrations west of the West Fault exceeded the proposed mixing zone concentration of 0.18 mg/l, while one of the non-mixing zone selenium concentrations also

exceeded this background level. None of the molybdenum, nitrate, radium, vanadium or thorium-230 values exceeded the background concentrations for the Middle Chinle aquifer for these constituents.

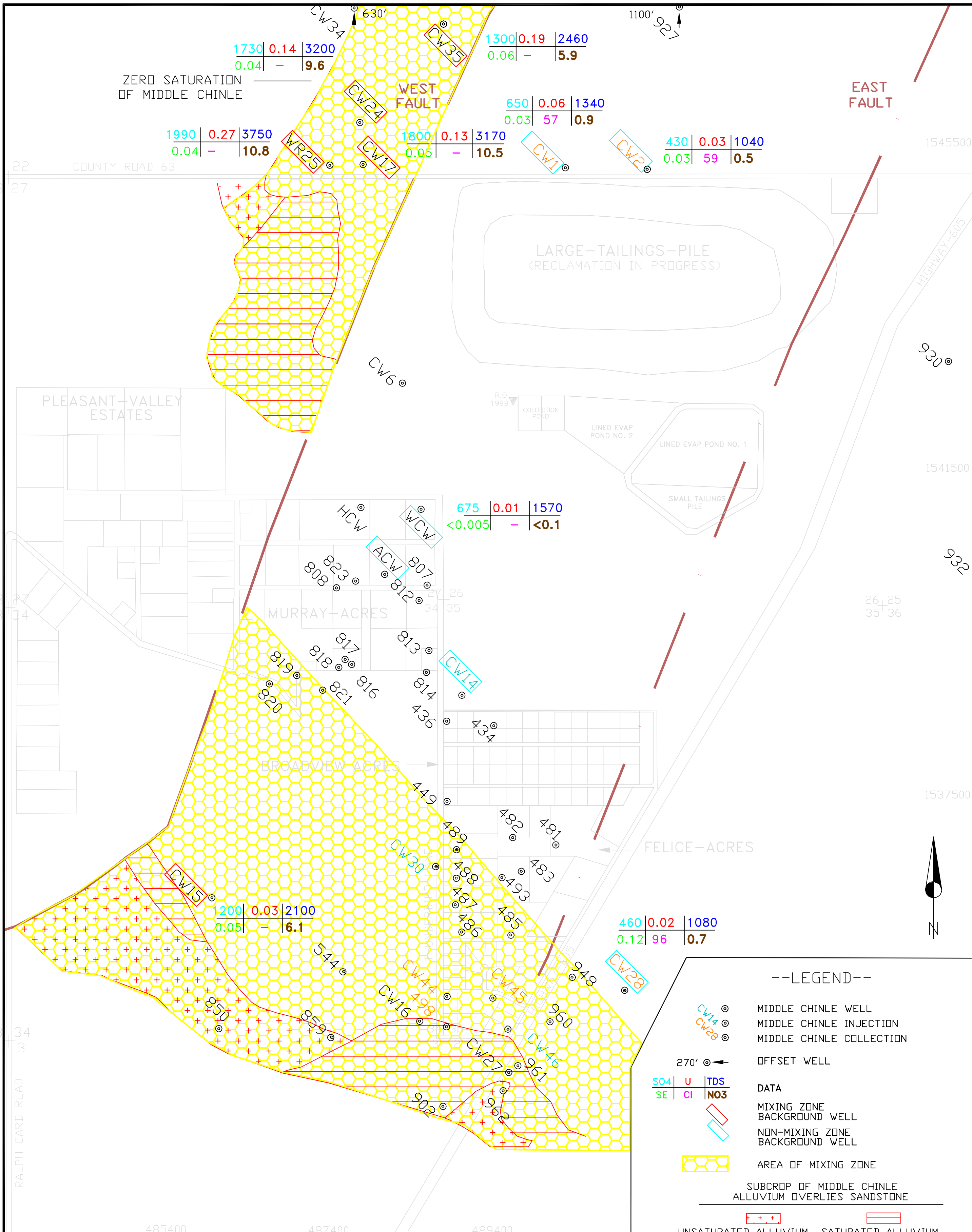
Figure 3.4-3 presents the Lower Chinle mixing zone in a yellow pattern. This figure also shows which wells were used to establish the background concentrations in the mixing and non-mixing zones of the Lower Chinle aquifer. The 2004 data for the Lower Chinle wells previously used to define background concentrations are also presented on Figure 3.4-3. Two of the non-mixing zone sulfate concentrations in the Lower Chinle aquifer slightly exceed this background level. These sulfate values are from the furthest down-gradient wells and indicate that additional data may be needed for some of the farther down-gradient wells. One of the TDS concentrations exceeded the background level in the non-mixing zone. Additional data may be needed to further define the non-mixing zone background concentrations because of the natural deterioration of water in the Lower Chinle aquifer. Two of the non-mixing zone uranium background concentrations exceeded the level of 0.02 mg/l. Pumping of well CW29 may have caused the increase in this well. The nitrate concentration from well CW41 exceeded the non-mixing zone background level. None of the selenium, molybdenum, radium, vanadium or thorium-230 concentrations in the Lower Chinle background wells exceeded their background levels. The Lower Chinle non-mixing zone background levels are somewhat problematic, because the water quality tends to deteriorate naturally as the ground water moves down-gradient. Therefore, the expected natural water quality deterioration is a function of the distance from the Lower Chinle subcrop with the alluvium to a particular point within the aquifer.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 3.4-1. UPPER CHINLE MIXING ZONE AND 2004 GROUND WATER QUALITY

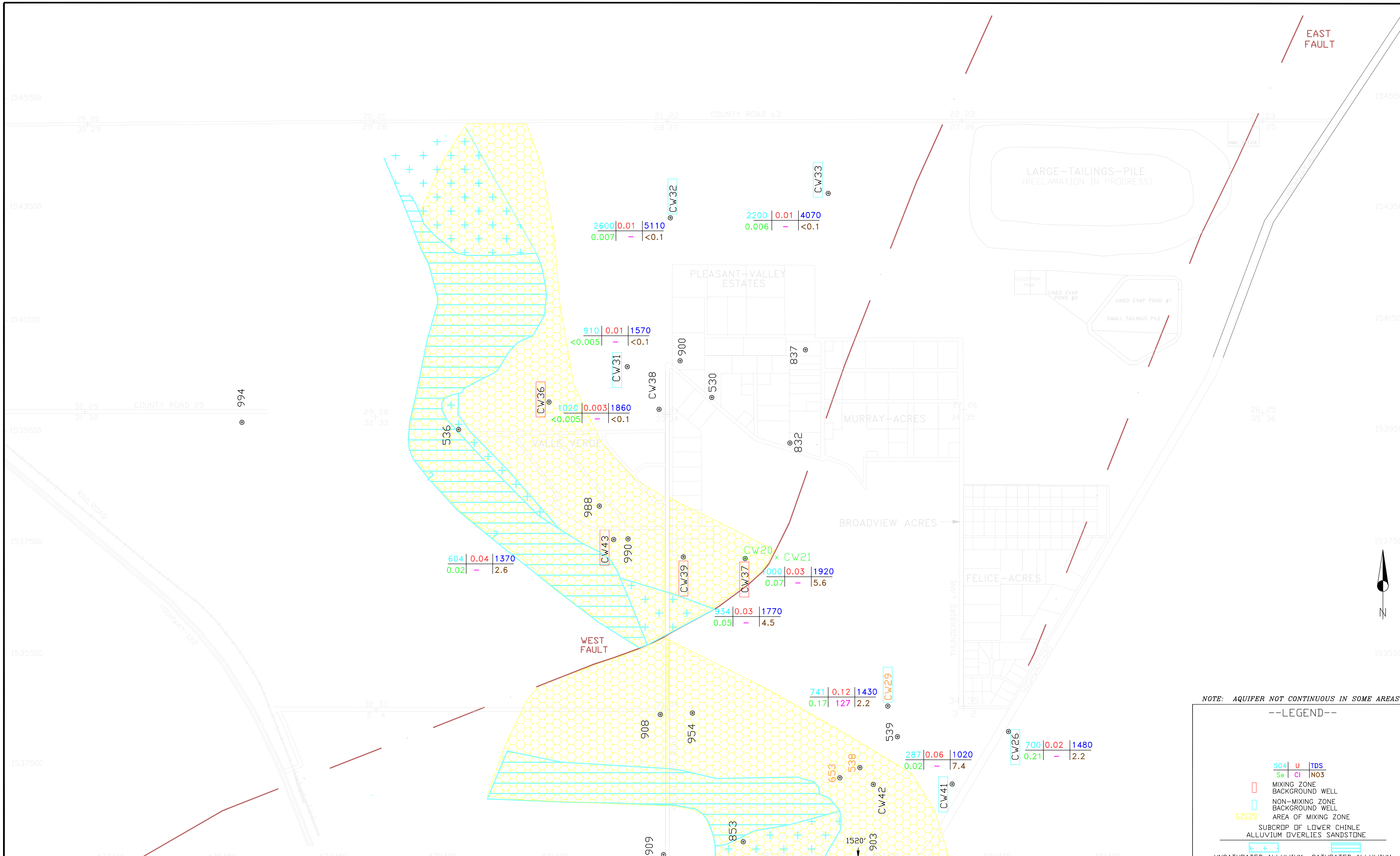
c:\projects\2004-06\UP1600



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 3.4-2. MIDDLE CHINLE MIXING ZONE AND 2004 GROUND WATER QUALITY

c:\projects\2004-06\MID1600



SCALE: 1"=1600'
C:\PROJECTS\2004-06\C-LOW03
DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 3.4-3. LOWER CHINLE MIXING ZONE AND 2004 GROUND WATER QUALITY

TABLE 3.4-1. GRANTS PROJECT- PROPOSED CHINLE BACKGROUND CONCENTRATIONS

Aquifer Zone	CONSTITUENT, concentrations in mg/l except Thorium-230 and Ra226+Ra228 in pCi/l.									
	Selenium	Uranium	Molybdenum	TD	Sulfate	Chloride	Nitrate	Vanadium	Thorium-230	Ra-226 +Ra-228
Chinle Mixing	0.14	0.18	0.10	3140	1750	9	1	0.08	0.97	4
Upper Chinle Non-Mixing	0.06	0.09	0.08	2010	91	41	4.	0.02	0.55	4
Middle Chinle Non-Mixing	0.07	0.07	0.05	1560	85	6	4.	0.02	0.86	4
Lower Chinle Non-Mixing	0.32	0.02	0.03	4140	2000	63	3.	0.01	0.72	4

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

Page Number

FIGURES

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING FOR HOMESTAKE'S GRANTS PROJECT

FIGURES (continued)

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

SECTION 4

TABLE OF CONTENTS

**GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT**

**FIGURES
(continued)**

Page Number

SECTION 4

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

SECTION 4

TABLE OF CONTENTS

**GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT**

TABLES

Page Number

4.0 ALLUVIAL AQUIFER MONITORING

This section presents 2004 monitoring results for the alluvial aquifer. The alluvial aquifer is the upper and most important ground water system at the Grants Project site. The section describing well completions is presented first, and this is followed by sections presenting water-level and water-quality information.

4.1 ALLUVIAL WELL COMPLETIONS

New alluvial wells drilled in 2004 include 541, 801R, M3R, S5R, T17 and T19 through T22 and T40. Additionally, 3000 feet of injection line was installed in Sections 3 and 35 to a depth of approximately 6 feet. Some of the injection lines in Section 35 were installed in Felice Acres while 500 feet were installed east of Highway 605. These injection lines are presently being used in conjunction with the irrigation program and the collection for re-injection east of Highway 605. Operational status and other characteristics of the new and previously installed alluvial wells are discussed in this section. Well 541 was added as an irrigation supply well in Section 32. Well 801R is a replacement well for Murray Acres well 801 which was abandoned. Wells M3R and S5R were drilled as R.O. collection wells. The new alluvial T wells on the pile are future R.O. collection wells. Figure 4.1-1 shows the locations of the alluvial wells near the Homestake Grants Project. This figure is plotted at a scale of 1" = 1600'. This figure also shows the location of the new injection lines.

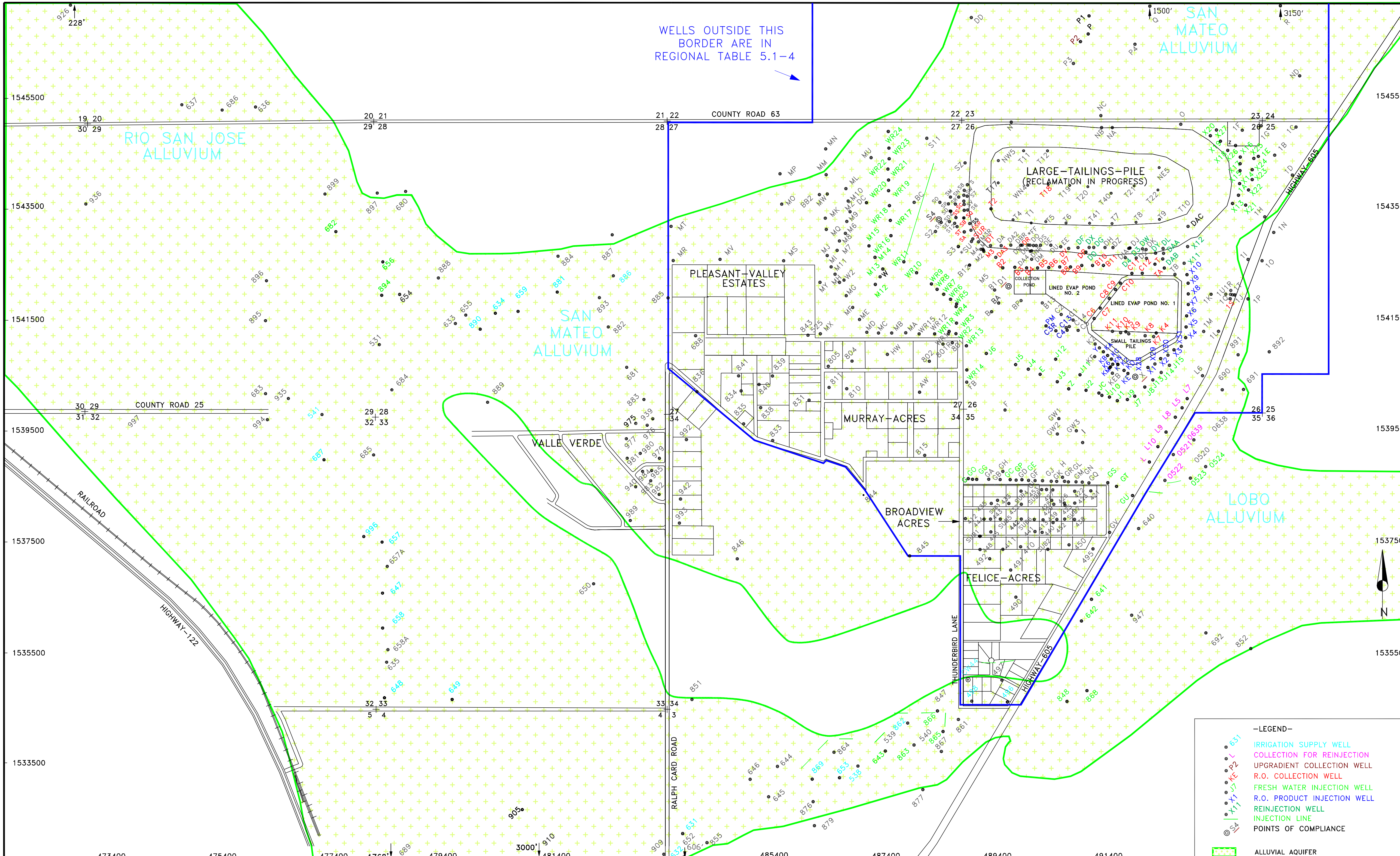
Alluvial wells 914, 920, 921, 922 and 950 are located outside of the area presented on Figure 4.1-1. These upgradient wells are shown on Figure 3.2-1.

The currently active injection and collection wells are labeled with different colors on Figure 4.1-1 so that they can be distinguished from monitoring wells. This figure also shows the wells used for irrigation water supply during the 2004 irrigation season. Table 4.1-1 presents basic well data for alluvial wells located on the Grants Project that have been used to define the alluvial ground water hydrology. Many additional alluvial wells outside of the Grants Project 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 located just south of the

Homestake property. Figure 4.1-1 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). Wells outside the area are delineated with a heavy blue boundary line on Figure 4.1-1 and are considered to be regional wells, and data for these wells are presented in this table. Over 100 alluvial wells are included on the regional table, which brings the total number of alluvial wells used to characterize this site to more than 400. The wells are listed in numerical or alphabetical order based on their well names.



SCALE: 1"=1200'

C:\PROJECTS\ 2004-06\04-CO-IN-IRR

DATE: 02/07/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.1-1. ALLUVIAL WELL LOCATIONS

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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	12/14/2004	34.34	6547.72	2.5	6582.06	55	6524.6 A	25-65	23.2
0691	1540276	493860	66.0	5.0	12/14/2004	42.28	6546.53	2.9	6588.81	55	6530.9 A	26-66	15.6
0891	1540904	493751	54.0	5.0	2/16/2004	29.49	6551.63	2.1	6581.12	50	6529.0 A	24-54	22.6
0892	1540954	494317	50.0	5.0	12/19/2002	41.96	6545.25	2.0	6587.21	42	6543.2 A	30-50	2.0
1A	1543790	493768	61.0	5.0	3/10/2003	39.40	6546.03	2.9	6585.43	47	6535.5 A	39-51	10.5
1B	1544502	494412	51.8	5.0	10/30/2001	38.70	6545.72	1.5	6584.42	50	6532.9 A	20-50	12.8
1C	1545018	494799	52.9	5.0	9/28/2000	43.26	6544.73	2.5	6587.99	43	6542.5 A	34-54	2.2
1D	1544142	494752	42.9	5.0	12/19/2002	29.23	6556.74	2.2	6585.97	40	6543.8 A	22-42	13.0
1E	1544481	494116	51.4	5.0	9/24/2001	2.00	6582.31	2.1	6584.31	43	6539.2 A	34-54	43.1
1F	1544952	493831	61.8	5.0	9/27/2004	44.39	6542.99	1.8	6587.38	54	6531.6 A	30-60	11.4
1G	1545034	494170	57.5	5.0	9/27/2004	42.71	6544.36	2.3	6587.07	48	6536.8 A	35-55	7.6
1H	1543363	494266	55.4	5.0	1/8/2004	55.00	6531.39	1.8	6586.39	43	6541.6 A	25-55	0.0
1I	1542627	493928	49.8	5.0	2/17/2004	36.40	6561.95	1.3	6598.35	35	6562.1 A	27-47	0.0
1J	1541986	493695	50.3	5.0	2/17/2004	34.32	6551.08	1.8	6585.40	40	6543.6 A	30-50	7.5
1K	1541992	493275	55.6	5.0	9/28/2004	34.56	6549.57	1.0	6584.13	47	6536.1 A	30-55	13.4
1L	1541256	493416	53.4	5.0	9/27/2004	25.66	6552.95	3.1	6578.61	40	6535.5 A	35-55	17.4
1M	1541327	493133	43.1	5.0	9/28/2004	22.60	6552.93	1.3	6575.53	33	6541.2 A	25-54	11.7
1N	1543100	494396	45.6	5.0	2/17/2004	33.78	6557.07	2.4	6590.85	25	6563.5 A	15-44	0.0
1O	1542592	494175	44.0	5.0	2/17/2004	43.75	6551.19	0.8	6594.94	29	6565.1 A	14-34	0.0
1P	1541902	493924	52.8	5.0	2/17/2004	34.14	6551.10	2.6	6585.24	35	6547.6 A	20-40	3.5
1Q	1541993	493619	56.0	5.0	5/20/2003	33.82	6549.29	1.8	6583.11	56	6525.3 A	36-56	24.0
1R	1542071	493623	56.0	5.0	5/20/2003	34.92	6551.07	1.5	6585.99	56	6528.5 A	36-56	22.6
1S	1541920	493614	56.0	5.0	11/8/2004	37.90	6544.09	1.8	6581.99	56	6524.2 A	36-56	19.9
1T	1541990	493656	56.0	5.0	5/20/2003	33.80	6551.11	1.8	6584.91	56	6527.1 A	36-56	24.0
1U	1542001	493542	44.2	4.0	5/21/2003	35.10	6551.12	3.2	6586.22	---	--- A	-	---
* A1	1542365	491539	55.6	4.0	1/12/1994	45.29	6527.86	1.1	6573.15	55	6517.1 A	37-57	10.8
* A2	1542356	491539	46.4	4.0	12/23/1991	47.98	6525.42	1.1	6573.40	---	--- A	27-47	---
B	1541684	489311	68.6	4.0	12/27/2004	41.27	6529.63	2.4	6570.90	60	6508.5 A	49-69	21.1
B1	1542071	489370	90.9	5.0	12/9/2004	45.40	6526.25	0.6	6571.65	82	6489.1 A	62-82	37.2
B2	1542475	489515	83.0	5.0	12/5/2000	49.78	6524.47	2.0	6574.25	72	6500.3 A	55-75	24.2
B3	1542480	489731	87.0	5.0	12/5/2000	62.15	6512.14	2.6	6574.29	77	6494.7 A	58-78	17.4
B4	1542471	489942	88.8	5.0	12/5/2000	59.60	6515.06	7.4	6574.66	82	6485.3 A	63-83	29.8
B5	1542474	490141	91.0	5.0	12/5/2000	57.23	6516.23	1.4	6573.46	81	6491.1 A	62-82	25.2
B6	1542478	490341	90.0	5.0	12/5/2000	48.94	6528.75	2.0	6577.69	80	6495.7 A	63-83	33.1
B7	1542488	490540	87.0	5.0	9/22/1995	43.82	6530.58	2.2	6574.40	77	6495.2 A	53-78	35.4
B8	1542488	490734	87.0	5.0	12/5/2000	49.94	6525.81	2.3	6575.75	77	6496.5 A	53-78	29.4
B9	1542514	490935	86.0	5.0	12/5/2000	50.32	6525.85	2.2	6576.17	76	6498.0 A	51-78	27.9
B10	1542517	491133	84.8	5.0	6/26/2002	63.26	6513.51	2.3	6576.77	75	6499.5 A	51-78	14.0

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
B11	1542517	491329	84.9	5.0	9/23/2004	41.28	6536.11	2.2	6577.39	77	6498.2 A	42-80	37.9
B12	1542524	488915	100.0	5.0	12/8/2004	44.20	6528.82	2.2	6573.02	91	6479.8 A	30-100	49.0
B13	1541841	490223	80.0	5.0	12/9/2004	38.99	6531.05	3.1	6570.04	72	6494.9 A	30-80	36.1
BA	1541835	489440	86.0	5.0	12/27/2004	42.60	6528.98	1.7	6571.58	76	6493.9 A	64-78	35.1
BB2	1543791	486213	56.6	4.0	11/15/2002	53.36	6520.44	0.6	6573.80	---	--- A	42-62	---
BC	1543655	487910	82.8	4.0	12/8/2004	44.56	6530.05	2.6	6574.61	75	6497.0 A	63-83	33.0
BP	1541882	489841	85.4	4.0	12/14/2004	44.11	6528.19	3.0	6572.30	75	6494.3 A	40-85	33.9
* C	1541762	490854	79.7	4.0	5/16/1994	41.50	6529.34	0.3	6570.84	75	6495.5 A	59-79	33.8
C1	1541533	490780	76.0	5.0	8/31/2004	34.39	6537.47	0.8	6571.86	67	6504.1 A	41-68	33.4
C2	1541630	490566	76.0	5.0	8/31/2004	30.04	6534.98	0.9	6565.02	66	6498.1 A	42-67	36.9
* C3	1541344	490481	75.0	5.0	6/20/1994	36.20	6532.33	0.9	6568.53	65	6502.6 A	45-67	29.7
C3R	1541338	490472	75.0	5.0	3/7/2002	18.00	6551.29	2.0	6569.29	66	6501.3 A	43-68	50.0
C4	1541348	490675	75.0	5.0	10/2/2000	39.66	6531.18	1.3	6570.84	66	6503.5 A	46-66	27.6
C5	1541344	490869	72.0	5.0	11/9/2004	31.28	6538.57	0.8	6569.85	62	6507.1 A	43-63	31.5
C6	1541533	491142	80.8	5.0	9/21/2004	57.71	6527.18	1.6	6584.89	72	6511.3 A	34-74	15.9
C7	1541734	491280	72.4	5.0	9/21/2004	71.00	6513.44	1.5	6584.44	61	6521.9 A	25-65	0.0
C8	1541906	491415	78.1	5.0	9/21/2004	47.48	6537.01	1.6	6584.49	67	6515.9 A	31-71	21.1
C9	1542075	491545	77.0	5.0	9/21/2004	50.43	6534.12	1.5	6584.55	65	6518.1 A	27-67	16.1
C10	1542182	491629	71.6	5.0	9/21/2004	61.30	6523.96	2.7	6585.26	65	6517.6 A	30-70	6.4
C11	1542376	491844	68.2	5.0	9/21/2004	60.88	6520.50	2.4	6581.38	60	6519.0 A	35-65	1.5
C12	1542375	492029	63.5	5.0	9/21/2004	41.20	6539.35	2.6	6580.55	55	6523.0 A	34-64	16.4
C13	1541394	490655	63.0	5.0	10/29/2001	37.58	6532.43	2.0	6570.01	63	6505.0 A	36-70	27.4
C14	1541413	490713	63.0	5.0	3/7/2002	1.50	6568.19	2.0	6569.69	63	6504.7 A	36-70	63.5
* D	1542127	490118	89.7	4.0	7/28/1986	48.04	6524.85	0.8	6572.89	90	6482.1 A	71-91	42.8
D1	1542140	489615	89.4	4.0	5/24/2004	45.61	6525.29	1.0	6570.90	80	6489.9 A	58-90	35.4
D2	1542641	492107	70.0	5.0	11/29/1999	0.50	6579.67	3.0	6580.17	62	6515.2 A	40-70	64.5
D3	1542646	491917	80.0	5.0	11/29/1999	0.50	6579.63	2.5	6580.13	72	6505.6 A	40-80	74.0
D4	1542652	491724	78.0	5.0	11/29/1999	0.50	6578.93	2.5	6579.43	70	6506.9 A	48-78	72.0
DA	1542864	489488	99.1	5.0	12/4/1997	61.40	6524.15	3.0	6585.55	90	6492.6 A	50-100	31.6
DA2	1542881	489656	82.1	5.0	1/13/1995	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	6/26/2002	76.50	6497.47	1.7	6573.97	71	6501.3 A	31-81	0.0
DAA	1542733	492411	62.7	5.0	12/5/2000	2.00	6578.60	2.2	6580.60	54	6524.4 A	30-60	54.2
DAB	1542633	492399	65.1	5.0	12/5/2000	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	9/8/1998	66.15	6523.33	0.5	6589.48	---	--- A	55-85	---
DBR	1542877	489855	55.6	5.0	1/25/1995	52.19	6536.97	4.8	6589.16	---	--- A	-	---
DC	1543646	487060	64.1	4.0	12/8/2004	42.71	6528.60	2.7	6571.31	---	--- A	45-65	---

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
DD	1546989	488943	78.5	4.0	5/18/2004	58.52	6534.07	1.9	6592.59	83	6507.7 A	40-80	26.4
DE	1542877	490193	70.2	5.0	10/5/1998	63.70	6527.65	0.8	6591.35	80	6510.6 A	60-90	17.1
DF	1542839	490869	88.5	5.0	5/23/2002	65.06	6525.53	0.6	6590.59	---	--- A	65-95	---
DG	1542839	491157	88.9	5.0	5/23/2002	59.80	6531.98	0.4	6591.78	---	--- A	65-95	---
DH	1542835	491365	61.7	5.0	12/24/1991	52.65	6538.69	4.8	6591.34	---	--- A	65-95	---
DI	1542821	491788	86.1	5.0	12/9/1997	57.87	6531.75	2.3	6589.62	75	6512.3 A	35-85	19.4
DIA	1542821	491793	---	4.0	12/23/1991	50.41	6543.22	1.4	6593.63	---	--- A	-	---
DJ	1542821	491793	85.7	5.0	8/24/1988	46.87	6542.69	0.7	6589.56	75	6513.9 A	35-85	28.8
DK	1542799	492094	65.4	5.0	12/23/1991	43.58	6542.33	0.7	6585.91	55	6530.2 A	35-55	12.1
DL	1542813	492398	64.4	5.0	12/5/2000	2.00	6582.87	2.9	6584.87	55	6527.0 A	35-55	55.9
DM	1542628	490035	62.8	5.0	12/14/2000	52.00	6523.08	3.0	6575.08	---	--- A	-	---
DN	1542776	490020	66.7	4.0	12/14/2000	51.52	6525.14	3.7	6576.66	---	--- A	-	---
DNR	1542779	490031	79.7	4.0	12/5/2000	51.80	6525.26	3.3	6577.06	---	--- A	-	---
DO	1542874	490049	75.8	5.0	12/5/2000	65.20	6525.13	1.6	6590.33	75	6513.7 A	65-75	11.4
DP	1542754	491012	79.8	5.0	6/26/2002	53.46	6526.25	3.5	6579.71	---	--- A	-	---
DQ	1542592	491006	85.3	5.0	7/11/2002	48.10	6528.33	2.2	6576.43	---	--- A	-	---
DR	1542884	489966	87.8	5.0	12/5/2000	66.05	6524.78	2.7	6590.83	85	6503.1 A	65-85	21.6
DS	1542876	490118	---	5.0	8/2/1999	65.22	6523.59	0.9	6588.81	77	6510.9 A	62-77	12.7
DT	1542871	489293	72.3	5.0	12/5/2000	59.80	6524.01	2.7	6583.81	99	6482.1 A	59-99	41.9
DU	1542879	490380	84.6	5.0	7/6/1988	51.56	6539.51	2.9	6591.07	81	6507.2 A	61-81	32.3
DV	1542826	490702	80.0	5.0	6/26/2002	83.45	6502.15	2.9	6585.60	77	6505.7 A	60-80	0.0
DW	1542818	492029	73.4	5.0	12/5/2000	2.50	6586.16	3.6	6588.66	59	6526.1 A	45-60	60.1
DX	1542838	491074	90.0	6.0	8/2/1999	61.80	6530.18	1.0	6591.98	80	6511.0 A	60-90	19.2
DY	1542737	492271	65.7	5.0	12/5/2000	1.50	6579.11	2.3	6580.61	56	6522.3 A	15-65	56.8
DZ	1542834	491501	81.8	5.0	12/27/2004	53.32	6537.21	2.2	6590.53	---	--- A	-	---
E	1540553	490187	61.7	4.0	12/5/2000	2.00	6566.94	1.7	6568.94	60	6507.2 A	44-64	59.7
EE	1542853	490523	91.2	5.0	1/31/1995	45.26	6542.85	0.6	6588.11	80	6507.5 A	50-90	35.3
F	1539908	489554	63.8	4.0	7/7/2004	30.64	6534.18	1.2	6564.82	62	6501.6 A	45-65	32.6
FB	1540417	488857	62.0	4.0	10/13/2004	34.82	6530.84	2.0	6565.66	58	6505.7 A	43-58	25.2
* FF	1542878	490017	---	4.0	6/21/1983	41.08	6535.46	0.2	6576.54	124	6452.3 A	52-132	83.1
G	1538672	488890	78.3	4.0	12/13/2004	4.00	6559.09	2.0	6563.09	75	6486.1 A	50-80	73.0
GA	1538657	489255	---	4.0	12/9/2004	33.00	6529.79	1.8	6562.79	62	6499.0 A	45-65	30.8
GB	1538654	489456	65.2	4.0	4/3/2000	4.00	6558.99	1.9	6562.99	64	6497.1 A	45-65	61.9
GC	1538650	489654	---	4.0	12/11/2003	33.82	6531.35	2.5	6565.17	78	6484.7 A	60-80	46.7
GD	1538646	489855	---	4.0	12/4/1995	0.50	6565.12	1.8	6565.62	72	6491.8 A	55-75	73.3
GE	1538637	489972	117.0	4.0	12/11/2003	34.61	6531.66	2.4	6566.27	65	6498.9 A	50-120	32.8
GF	1538632	490097	119.2	4.0	12/9/2004	34.34	6531.67	1.8	6566.01	67	6497.2 A	50-120	34.5
GG	1538662	489055	58.7	4.0	4/3/2000	4.00	6559.13	1.8	6563.13	57	6504.3 A	48-68	54.8

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
GH	1538807	489509	69.2	4.0	12/9/2004	32.16	6530.60	1.3	6562.76	67	6494.5 A	55-65	36.1
GI	1538631	490218	119.0	4.0	4/3/2000	4.00	6561.85	1.5	6565.85	67	6497.4 A	50-120	64.5
GJ	1538629	490382	119.2	4.0	4/3/2000	4.00	6562.15	2.0	6566.15	65	6499.2 A	50-120	63.0
GK	1538622	490482	115.7	4.0	12/9/2004	33.67	6533.09	2.4	6566.76	67	6497.4 A	50-120	35.7
GL	1538614	490701	119.3	4.0	4/3/2000	4.00	6563.15	2.1	6567.15	71	6494.1 A	50-120	69.1
GM	1538605	490824	118.2	4.0	4/3/2000	4.00	6563.65	2.1	6567.65	69	6496.6 A	50-120	67.1
GN	1538602	490944	116.5	4.0	4/3/2000	4.00	6563.97	1.8	6567.97	70	6496.2 A	50-120	67.8
GO	1538663	488973	122.3	4.0	4/3/2000	4.00	6559.00	1.6	6563.00	75	6486.4 A	50-120	72.6
GP	1538649	489752	121.4	4.0	12/5/2000	5.00	6559.87	2.1	6564.87	68	6494.8 A	50-120	65.1
GQ	1538599	491067	70.0	4.0	12/5/2002	1.77	6566.39	0.9	6568.16	71	6496.3 A	50-70	70.1
GR	1538619	490619	---	4.0	12/23/1991	36.55	6528.66	1.0	6565.21	75	6489.2 A	50-85	39.5
GS	1538597	491408	86.4	5.0	12/5/2000	33.00	6541.31	2.0	6574.31	80	6492.3 A	50-85	49.0
GT	1538534	491565	84.0	5.0	12/5/2000	8.30	6567.87	2.1	6576.17	76	6498.1 A	60-84	69.8
GU	1538367	491854	80.0	5.0	3/7/2002	15.00	6560.65	2.0	6575.65	73	6500.7 A	60-80	60.0
GV	1537701	491428	83.0	5.0	12/9/2004	48.73	6528.65	2.5	6577.38	74	6500.9 A	62-82	27.8
GW1	1539755	490530	73.0	5.0	12/9/2004	30.75	6534.52	1.0	6565.27	65	6499.3 A	48-73	35.3
GW2	1539471	490497	75.0	5.0	12/9/2004	31.81	6534.27	1.0	6566.08	68	6497.1 A	47-75	37.2
GW3	1539532	490835	72.0	5.0	5/4/1993	34.42	6531.86	1.0	6566.28	62	6503.3 A	45-72	28.6
H	1538703	490582	69.3	4.0	12/23/1991	37.93	6528.65	1.8	6566.58	69	6495.8 A	50-70	32.9
I	1539319	490954	70.0	4.0	5/25/2004	30.80	6536.40	1.6	6567.20	68	6497.6 A	52-72	38.8
J	1540174	491302	65.6	4.0	12/5/2000	6.00	6564.19	3.4	6570.19	56	6510.8 A	46-68	53.4
J1	1540082	491585	57.0	6.0	12/5/2000	18.80	6553.05	3.8	6571.85	55	6513.1 A	50-57	40.0
J2	1540271	491013	58.0	6.0	12/5/2000	26.00	6544.19	2.9	6570.19	55	6512.3 A	50-58	31.9
J3	1540414	490499	70.0	6.0	12/5/2000	27.40	6541.74	2.6	6569.14	66	6500.5 A	43-70	41.2
J4	1540643	489974	80.0	6.0	12/5/2000	18.00	6551.52	3.9	6569.52	68	6497.6 A	40-70	53.9
J5	1540728	489747	65.0	6.0	12/5/2000	10.55	6559.24	2.8	6569.79	61	6506.0 A	50-65	53.2
J6	1540919	489221	67.0	6.0	12/5/2000	7.10	6563.00	3.7	6570.10	65	6501.4 A	48-67	61.6
J7	1540168	491892	61.9	5.0	12/5/2000	19.50	6550.88	2.1	6570.38	53	6515.3 A	40-60	35.6
J8	1540318	492064	63.2	5.0	12/5/2000	23.30	6547.49	2.4	6570.79	52	6516.4 A	35-61	31.1
J9	1540101	491759	68.0	5.0	12/5/2000	24.60	6546.60	2.0	6571.20	58	6511.2 A	36-68	35.4
J10	1540138	491436	66.0	5.0	12/5/2000	18.00	6552.91	3.5	6570.91	36	6531.4 A	66-	21.5
J11	1540545	490909	66.0	5.0	12/5/2000	12.00	6557.86	2.0	6569.86	55	6512.9 A	36-66	45.0
J12	1540827	490466	70.0	5.0	12/5/2000	18.44	6551.86	3.0	6570.30	60	6507.3 A	40-70	44.6
J13	1540451	492218	55.0	5.0	2/5/2002	4.00	6564.40	1.8	6568.40	46	6520.6 A	15-55	43.8
J14	1540585	492367	55.0	5.0	2/5/2002	12.90	6556.08	1.7	6568.98	44	6523.3 A	15-55	32.8
J15	1540719	492521	55.0	4.0	2/5/2002	3.10	6566.53	2.2	6569.63	46	6521.4 A	15-55	45.1
JC	1540215	491240	60.0	5.0	12/5/2000	22.10	6546.34	1.8	6568.44	50	6516.6 A	35-55	29.7
K	1540730	491590	61.7	4.0	8/12/2002	2.00	6571.51	3.8	6573.51	60	6509.7 A	44-64	61.8

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
K2	1540736	491587	58.9	4.0	8/12/2002	14.90	6557.31	2.5	6572.21	58	6511.7 A	46-56	45.6
K3	1540744	491571	56.7	2.0	10/31/1997	43.44	6527.23	1.3	6570.67	---	--- A	53-58	---
K4	1541211	492371	86.2	5.0	10/11/2004	65.30	6536.72	2.5	6602.02	80	6519.5 A	65-85	17.2
K5	1541269	491935	86.4	5.0	10/11/2004	59.71	6542.02	2.8	6601.73	80	6518.9 A	55-85	23.1
K6	1540689	491459	58.0	5.0	3/6/2002	13.00	6557.07	2.0	6570.07	---	--- A	33-58	---
K7	1541232	492237	86.0	5.0	10/11/2004	57.18	6544.35	2.0	6601.53	79	6520.5 A	56-86	23.8
K8	1541250	492081	86.0	1.0	10/11/2004	54.48	6546.01	2.0	6600.49	78	6520.5 A	66-86	25.5
K9	1541287	491787	86.0	5.0	10/11/2004	62.38	6537.96	2.0	6600.34	79	6519.3 A	56-86	18.6
K10	1541305	491638	87.0	5.0	10/11/2004	67.98	6532.83	2.0	6600.81	81	6517.8 A	47-87	15.0
K11	1541325	491490	84.0	5.0	10/11/2004	68.45	6532.16	2.0	6600.61	78	6520.6 A	64-84	11.6
KA	1540959	491331	67.8	5.0	8/12/2002	13.00	6559.19	1.9	6572.19	65	6505.3 A	42-72	53.9
KB	1540893	491406	61.8	5.0	8/12/2002	0.60	6571.05	0.8	6571.65	60	6510.9 A	40-70	60.2
KC	1540826	491477	68.6	5.0	8/12/2002	0.50	6569.81	0.7	6570.31	59	6510.6 A	42-72	59.2
KD	1540627	491701	62.1	5.0	8/12/2002	1.10	6569.12	0.6	6570.22	---	--- A	40-70	---
KE	1540566	491776	60.8	5.0	8/12/2002	9.10	6563.18	2.5	6572.28	---	--- A	40-70	---
KEB	1540570	491487	59.9	5.0	7/12/2004	19.70	6550.03	1.5	6569.73	50	6518.2 A	40-60	31.8
KF	1540870	491169	63.5	5.0	7/13/2004	24.80	6545.41	2.2	6570.21	50	6518.0 A	30-60	27.4
KM	1540671	491444	52.4	5.0	3/6/2002	12.20	6557.57	2.2	6569.77	---	--- A	-	---
KN	1540734	491492	50.1	5.0	10/11/2002	8.36	6561.23	2.3	6569.59	---	--- A	-	---
KZ	1541100	491183	58.4	5.0	12/27/2004	28.56	6543.16	1.2	6571.72	---	--- A	-	---
L	1538970	492150	67.0	4.0	10/14/2004	46.88	6528.09	0.8	6574.97	59	6515.2 A	46-66	12.9
L5	1539946	492730	60.2	5.0	10/14/2004	38.30	6537.77	1.3	6576.07	50	6524.8 A	25-55	13.0
L6	1540526	493110	51.1	5.0	10/14/2004	23.36	6551.28	2.1	6574.64	50	6522.5 A	25-55	28.7
L7	1540113	492842	67.8	5.0	10/14/2004	40.56	6536.05	2.3	6576.61	62	6512.3 A	36-66	23.7
L8	1539773	492621	73.9	5.0	10/14/2004	46.30	6530.19	2.1	6576.49	65	6509.4 A	32-72	20.8
L9	1539509	492463	74.9	5.0	10/14/2004	46.44	6530.79	2.2	6577.23	64	6511.0 A	43-73	19.8
L10	1539250	492310	74.2	5.0	10/14/2004	47.70	6529.13	2.0	6576.83	63	6511.8 A	53-73	17.3
M1	1542797	489157	103.4	4.0	1/3/1989	79.80	6505.17	1.5	6584.97	120	6463.5 A	66-106	41.7
M2	1542785	489159	40.4	4.0	1/20/1995	34.85	6541.41	1.4	6576.26	---	--- A	-	---
M3	1542805	489151	105.3	4.0	6/26/2002	65.80	6510.30	1.0	6576.10	---	--- A	79-99	---
M3R	1542926	489078	115.0	5.0	12/15/2004	50.70	6529.56	2.1	6580.26	108	6470.2 A	55-115	59.4
M4	1542804	489134	81.8	5.0	10/31/2000	56.72	6521.54	3.7	6578.26	---	--- A	78-82	---
M5	1542360	489080	92.3	5.0	12/9/2004	46.78	6528.56	3.2	6575.34	84	6488.1 A	60-90	40.4
M6	1543097	486674	110.0	5.0	12/8/2004	64.83	6510.21	2.2	6575.04	65	6507.9 A	60-110	2.3
M7	1542790	486523	83.0	5.0	12/8/2004	59.94	6512.91	2.4	6572.85	71	6499.4 A	63-83	13.5
M8	1542960	486567	83.0	5.0	9/5/2000	33.71	6541.52	2.4	6575.23	57	6515.8 A	53-83	25.7
M9	1543310	486699	103.0	5.0	12/8/2004	64.80	6512.01	3.5	6576.81	78	6495.3 A	63-103	16.7
M10	1543677	486723	88.0	5.0	12/8/2004	55.43	6517.93	2.3	6573.36	86	6485.1 A	58-88	32.9

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
M11	1542358	486486	118.0	5.0	12/8/2003	53.98	6519.24	3.2	6573.22	109	6461.0 A	58-118	58.2
M12	1542174	487209	124.0	5.0	12/5/2000	3.87	6569.64	2.5	6573.51	118	6453.0 A	57-124	116.7
M13	1542450	487336	117.0	5.0	12/5/2000	29.81	6546.35	3.0	6576.16	108	6465.2 A	57-117	81.2
M14	1542661	487216	117.0	5.0	12/5/2000	29.42	6547.75	2.7	6577.17	109	6465.5 A	57-117	82.3
M15	1542872	487094	102.0	5.0	12/5/2000	3.71	6575.37	3.5	6579.08	93	6482.6 A	52-102	92.7
MA	1541290	487767	85.0	4.0	12/8/2004	45.63	6526.59	1.0	6572.22	85	6486.2 A	70-85	40.4
MB	1541296	487512	90.0	4.0	9/5/2000	2.05	6570.01	1.0	6572.06	85	6486.1 A	60-90	84.0
MC	1541304	487264	100.0	4.0	12/8/2004	46.06	6526.00	1.0	6572.06	95	6476.1 A	70-100	49.9
MD	1541311	487050	105.0	4.0	9/5/2000	2.00	6569.46	1.0	6571.46	105	6465.5 A	75-105	104.0
ME	1541537	486934	105.0	4.0	9/5/2000	1.61	6569.31	1.0	6570.92	105	6464.9 A	75-105	104.4
MF	1541757	486808	110.0	4.0	12/8/2004	50.71	6521.57	1.0	6572.28	110	6461.3 A	90-110	60.3
MG	1541972	486694	110.0	4.0	9/5/2000	1.72	6571.36	1.0	6573.08	110	6462.1 A	90-110	109.3
MH	1542208	486569	110.0	4.0	12/8/2004	54.92	6519.00	1.0	6573.92	110	6462.9 A	90-110	56.1
MI	1542486	486413	110.0	4.0	9/5/2000	2.24	6574.03	1.0	6576.27	110	6465.3 A	90-110	108.8
MJ	1542682	486350	60.0	4.0	12/8/2004	54.16	6518.78	1.8	6572.94	60	6511.1 A	40-60	7.6
MK	1543373	486324	57.0	4.5	12/8/2004	60.05	6513.74	1.5	6573.79	92	6480.3 A	-	33.5
ML	1543902	486691	76.0	5.0	12/8/2004	49.34	6523.36	2.3	6572.70	80	6490.4 A	56-76	33.0
MM	1544154	486324	63.0	5.0	9/5/2000	3.46	6573.99	2.4	6577.45	50	6525.1 A	33-63	48.9
MN	1544613	486325	63.0	5.0	12/18/1996	64.15	6513.41	1.9	6577.56	42	6533.7 A	23-63	0.0
MO	1543620	485518	88.0	4.5	10/13/2004	66.31	6506.58	2.0	6572.89	80	6490.9 A	45-85	15.7
MP	1544164	485492	80.0	5.0	12/18/1996	62.66	6511.82	2.1	6574.48	50	6522.4 A	33-63	0.0
MQ	1543173	486326	98.0	5.0	12/8/2004	66.51	6507.79	1.6	6574.30	88	6484.7 A	58-98	23.1
MR	1542609	483574	100.0	5.0	11/10/2004	71.40	6494.86	1.8	6566.26	100	6464.5 A	54-94	30.4
MS	1542607	485570	82.0	5.0	11/10/2004	63.68	6506.99	1.5	6570.67	89	6480.2 A	52-82	26.8
MT	1543221	483531	98.0	4.5	11/10/2004	71.09	6496.34	2.3	6567.43	87	6478.1 A	34-94	18.2
MU	1544461	487143	80.0	5.0	12/8/2004	43.44	6530.75	1.5	6574.19	72	6500.7 A	50-80	30.1
MV	1542618	484418	105.0	4.5	10/22/1998	65.97	6503.81	1.3	6569.78	95	6473.5 A	75-105	30.3
MW	1543802	486346	85.0	5.0	12/8/2004	64.36	6510.55	1.9	6574.91	83	6490.0 A	35-85	20.5
MX	1541287	486244	103.0	5.0	12/13/2004	53.72	6514.89	1.7	6568.61	94	6472.9 A	63-103	42.0
MY	1542200	486213	112.0	5.0	12/13/2004	59.18	6514.38	3.0	6573.56	102	6468.6 A	72-112	45.8
MZ	1543485	486757	92.0	5.0	12/8/2004	67.90	6508.74	3.0	6576.64	84	6489.6 A	60-92	19.1
N	1545101	489665	92.0	4.0	8/31/2004	51.10	6532.87	0.9	6583.97	80	6503.1 A	54-94	29.8
NA	1545000	491488	91.4	5.0	8/31/2004	54.93	6536.05	1.1	6590.98	80	6509.9 A	50-90	26.2
NB	1545000	491296	96.4	5.0	8/31/2004	50.14	6543.16	3.5	6593.30	80	6509.8 A	50-90	33.4
NC	1545220	491282	95.0	4.0	8/17/2004	50.91	6534.92	0.8	6585.83	85	6500.0 A	65-95	34.9
ND	1545927	494872	70.0	4.0	5/18/2004	47.48	6545.41	1.1	6592.89	65	6526.8 A	50-70	18.6
NE5	1544279	492332	156.8	5.0	3/1/2004	51.64	6615.36	3.2	6667.00		--- T	50-110	---
										150	6513.8 A	135-155	101.6

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
NW5	1544408	489433	149.8	5.0	3/2/2004	62.32	6595.26	2.7	6657.58		--- T	39-79	---
										155	6499.9 A	119-159	95.4
O	1545060	492725	69.9	4.0	8/31/2004	47.31	6540.52	1.3	6587.83	77	6509.5 A	40-70	31.0
P	1546691	491058	109.1	4.0	7/7/2004	55.00	6532.26	1.7	6587.26	107	6478.6 A	82-112	53.7
P1	1547017	491060	105.0	6.0	11/28/2000	55.75	6536.72	0.8	6592.47	105	6486.7 A	60-105	50.1
P2	1546555	490912	105.0	6.0	2/16/2004	66.00	6523.79	0.9	6589.79	105	6483.9 A	60-105	39.9
P3	1546159	490785	95.0	5.0	12/21/2004	49.31	6540.64	2.2	6589.95	85	6502.8 A	55-95	37.9
P4	1546504	491899	92.0	5.0	12/21/2004	49.60	6539.92	3.6	6589.52	84	6501.9 A	52-92	38.0
PM	1541426	490292	81.9	4.0	1/12/2004	12.33	6555.09	1.8	6567.42	---	--- A	-	---
Q	1548693	492153	98.3	4.0	5/18/2004	49.59	6544.23	2.3	6593.82	100	6491.5 A	72-102	52.7
R	1550372	494514	85.0	4.0	5/18/2004	42.91	6561.12	0.3	6604.03	95	6508.7 A	60-90	52.4
S	1543871	488816	72.2	4.0	12/8/2004	50.03	6531.14	2.0	6581.17	75	6504.2 A	52-72	27.0
S1	1543288	488401	85.0	2.0	12/27/2004	45.16	6530.03	5.3	6575.19	85	6484.9 A	60-85	45.1
S2	1543127	488299	100.0	3.0	12/27/2004	44.02	6529.70	2.0	6573.72	100	6471.7 A	90-100	58.0
S3	1542857	488714	122.6	5.0	12/8/2004	45.76	6529.02	6.2	6574.78	116	6452.6 A	80-120	76.4
S4	1543344	488359	112.4	5.0	12/8/2004	45.40	6529.89	2.3	6575.29	108	6465.0 A	50-110	64.9
S5	1543269	488923	115.0	5.0	12/27/2004	49.68	6525.01	1.0	6574.69	105	6468.7 A	54-106	56.3
S5R	1543150	488938	115.0	5.0	12/15/2004	50.31	6530.18	1.9	6580.49	109	6469.6 A	55-115	60.6
S6	1543515	488874	113.2	5.0	1/3/2000	55.85	6524.22	1.3	6580.07	105	6473.8 A	55-105	50.5
S7	1543763	488874	97.0	5.0	1/4/1999	57.38	6522.51	1.0	6579.89	82	6496.9 A	40-84	25.6
S8	1543968	488879	43.8	5.0	8/22/1995	43.28	6537.06	1.0	6580.34	40	6539.3 A	12-42	0.0
S11	1544793	488150	76.2	5.0	12/13/2004	38.68	6539.71	1.9	6578.39	70	6506.5 A	48-78	33.2
S12	1543297	488628	93.0	5.0	12/8/2004	50.21	6528.64	2.1	6578.85	80	6496.7 A	53-93	31.9
SA	1543122	488811	123.7	5.0	12/5/2000	67.24	6513.07	1.0	6580.31	115	6464.3 A	100-130	48.8
SB	1543371	488811	125.0	5.0	12/5/2000	57.43	6523.66	0.9	6581.09	115	6465.2 A	100-130	58.5
SC	1543617	488815	105.4	5.0	12/5/2000	57.11	6521.69	1.2	6578.80	103	6474.6 A	55-105	47.1
SD	1543490	488564	90.1	5.0	12/23/1991	63.14	6515.17	0.6	6578.31	107	6470.7 A	50-110	44.5
SD4	1543497	488556	95.0	5.0	6/1/1993	61.44	6517.33	1.1	6578.77	95	6482.7 A	45-95	34.7
SE	1543301	488550	111.8	5.0	3/19/2001	55.38	6522.61	0.5	6577.99	88	6489.5 A	50-90	33.1
SE4	1543308	488560	105.3	2.0	3/19/2001	53.71	6524.29	---	6578.00	---	--- A	-	---
SM	1543748	488566	86.0	5.0	12/8/2004	46.42	6532.32	0.7	6578.74	---	--- A	-	---
SN	1543752	488716	67.5	4.0	12/8/2004	48.07	6531.19	1.1	6579.26	---	--- A	-	---
SO	1543652	488381	92.3	5.0	12/27/2004	47.39	6531.40	0.6	6578.79	---	--- A	-	---
SP	1543630	488531	94.4	4.0	12/27/2004	47.25	6531.41	2.0	6578.66	---	--- A	-	---
SQ	1543507	488814	95.0	5.0	6/26/2002	58.18	6521.02	0.9	6579.20	95	6483.3 A	55-95	37.7
SR	1543611	488669	95.0	5.0	11/2/1998	58.25	6520.94	0.8	6579.19	95	6483.4 A	50-90	37.6
SS	1543374	488666	101.0	5.0	6/26/2002	63.87	6514.51	1.2	6578.38	90	6487.2 A	51-101	27.3
ST	1543215	488688	97.0	5.0	6/26/2002	59.31	6520.00	2.2	6579.31	96	6481.1 A	55-97	38.9

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
* SU	1542946	488953	110.0	5.0	9/5/1995	35.60	6542.50	0.7	6578.10	110	6467.4 A	50-110	75.1
SUR	1542991	488968	115.0	5.0	6/26/2002	62.86	6517.86	2.6	6580.72	106	6472.1 A	35-115	45.7
SV	1543676	488813	78.2	6.0	6/26/2002	64.60	6514.65	1.7	6579.25	100	6477.6 A	55-105	37.1
SW	1543783	488812	81.9	6.0	5/19/2004	56.44	6524.85	2.9	6581.29	75	6503.4 A	35-80	21.5
SX	1544510	489025	45.0	5.0	---	---	---	1.0	6581.49	40	6540.5 A	20-40	---
SZ	1544367	488833	62.6	5.0	12/8/2004	42.10	6539.37	0.4	6581.47	60	6521.1 A	40-70	18.3
T	1542536	492260	70.2	4.0	2/16/2004	35.90	6543.33	2.4	6579.23	68	6508.8 A	61-71	34.5
T1	1543285	490027	---	5.0	12/6/2002	102.40	6561.51	1.0	6663.91	161	6501.9 A	121-171	59.6
T2	1543538	489303	186.0	5.0	12/9/2004	128.48	6536.34	1.6	6664.82	180	6483.2 A	100-186	53.1
T4	1543340	489699	205.0	5.0	12/9/2004	98.13	6559.61	2.9	6657.74	175	6479.8 A	145-205	79.8
T5	1543307	490289	182.0	5.0	12/9/2004	123.99	6533.34	3.1	6657.33	151	6503.2 A	122-182	30.1
T6	1543282	490655	160.0	5.0	12/9/2004	124.15	6534.62	3.3	6658.77	156	6499.5 A	130-160	35.1
T7	1543272	491484	160.0	5.0	12/9/2004	123.00	6536.67	2.4	6659.67	142	6515.3 A	130-160	21.4
T8	1543296	491914	162.0	5.0	12/9/2004	124.00	6537.61	2.6	6661.61	158	6501.0 A	132-162	36.6
T9	1543347	492337	141.0	5.0	12/9/2004	98.36	6565.59	3.3	6663.95	138	6522.7 A	121-141	42.9
T10	1543434	492791	148.0	5.0	12/9/2004	109.75	6550.21	2.4	6659.96	142	6515.6 A	108-148	34.7
T11	1544585	489887	193.0	5.0	12/9/2004	124.87	6531.94	2.8	6656.81	160	6494.0 A	113-193	37.9
T12	1544583	490317	200.0	5.0	12/9/2004	96.50	6560.73	2.8	6657.23	170	6484.4 A	120-200	76.3
T17	1544008	489430	183.0	5.0	12/9/2004	125.79	6531.12	3.0	6656.91	170	6483.9 A	143-183	47.2
T18	1543977	490333	195.0	5.0	12/9/2004	145.12	6520.04	2.9	6665.16	162	6500.3 A	115-195	19.8
T19	1543958	490722	167.0	5.0	12/9/2004	133.84	6533.92	2.6	6667.76	162	6503.2 A	137-167	30.8
T20	1543935	491048	170.0	5.0	12/9/2004	135.30	6535.39	1.4	6670.69	162	6507.3 A	140-170	28.1
T21	1543951	491882	170.0	5.0	12/9/2004	131.89	6538.11	1.6	6670.00	163	6505.4 A	140-170	32.7
T22	1543876	492311	165.0	5.0	12/9/2004	64.18	6603.01	2.1	6667.19	160	6505.1 A	120-165	97.9
T40	1543819	491466	170.0	5.0	12/9/2004	133.17	6537.10	2.4	6670.27	165	6502.9 A	140-170	34.2
T41	1543278	491079	160.0	5.0	12/9/2004	124.68	6535.28	3.2	6659.96	155	6501.8 A	130-160	33.5
TA	1542471	492426	62.4	5.0	9/22/2004	35.07	6545.23	2.4	6580.30	55	6522.9 A	35-65	22.3
TB	1542351	492616	64.4	5.0	9/23/2004	37.28	6546.29	1.9	6583.57	55	6526.7 A	35-65	19.6
W	1542302	487297	99.3	4.0	12/8/2004	47.75	6524.39	0.3	6572.14	117	6454.8 A	58-118	69.6
W2	1542251	486654	79.1	4.0	3/2/1998	56.21	6515.29	0.9	6571.50	---	--- A	-	---
WN4	1543958	489961	142.4	5.0	3/2/2004	58.10	6604.68	3.0	6662.78		--- T	40-100	---
										165	6494.8 A	50-190	109.9
WR1	1541280	488529	---	5.0	6/27/1989	46.54	6521.86	0.8	6568.40	---	--- A	-	---
WR1R	1541302	488536	85.0	5.0	12/5/2000	28.62	6539.85	0.0	6568.47	85	6483.5 A	-	56.4
WR2	1541290	488678	94.1	5.0	12/5/2000	2.52	6566.07	0.9	6568.59	85	6482.7 A	65-95	83.4
WR3	1541490	488671	82.3	5.0	12/5/2000	32.96	6536.58	2.7	6569.54	83	6483.8 A	63-93	52.7
WR4	1541788	488678	62.0	5.0	12/5/2000	1.92	6570.89	0.0	6572.81	---	--- A	-	---
WR5	1541813	488683	72.4	5.0	12/5/2000	38.69	6532.54	0.6	6571.23	80	6490.6 A	60-80	41.9

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
WR6	1541902	488566	96.8	5.0	12/5/2000	3.04	6569.99	1.3	6573.03	84	6487.7 A	55-85	82.3
WR7	1541997	488456	97.3	5.0	12/5/2000	38.91	6534.82	2.0	6573.73	84	6487.8 A	55-85	47.0
WR8	1542095	488328	110.2	5.0	12/5/2000	38.72	6533.88	0.4	6572.60	100	6472.2 A	50-100	61.7
WR9	1542185	488217	111.3	5.0	12/5/2000	46.82	6526.23	0.8	6573.05	100	6472.3 A	50-100	54.0
WR10	1542389	487961	120.6	5.0	1/29/2003	14.84	6558.35	0.7	6573.19	110	6462.5 A	60-110	95.9
WR11	1542586	487728	120.5	5.0	1/29/2003	14.88	6559.61	0.3	6574.49	110	6464.2 A	60-110	95.4
WR12	1541280	488277	96.7	4.0	12/8/2004	1.00	6567.19	1.1	6568.19	85	6482.1 A	55-85	85.1
WR13	1541068	488861	70.0	5.0	12/5/2000	18.98	6550.19	3.2	6569.17	60	6506.0 A	50-60	44.2
WR14	1540638	488863	70.0	5.0	5/28/2003	15.50	6551.41	2.3	6566.91	61	6503.6 A	50-60	47.8
WR15	1541280	488016	70.0	4.0	5/28/2003	10.90	6560.29	0.0	6571.19	75	6496.2 A	60-75	64.1
WR16	1543051	487495	122.3	5.0	1/29/2003	6.54	6566.24	1.9	6572.78	100	6470.9 A	40-120	95.4
WR17	1543328	487485	124.4	5.0	1/29/2003	2.45	6570.64	2.2	6573.09	75	6495.9 A	40-120	74.7
WR18	1543597	487465	73.6	5.0	1/29/2003	2.97	6569.94	2.2	6572.91	70	6500.7 A	20-70	69.2
WR19	1543873	487458	87.8	5.0	1/29/2003	3.31	6571.62	2.2	6574.93	74	6498.7 A	25-85	72.9
WR20	1544059	487449	102.3	5.0	1/29/2003	3.98	6570.49	2.1	6574.47	80	6492.4 A	42-102	78.1
WR21	1544241	487449	88.9	5.0	1/29/2003	6.28	6569.77	2.1	6576.05	77	6497.0 A	28-88	72.8
WR22	1544434	487462	91.5	5.0	1/29/2003	3.44	6574.45	2.4	6577.89	86	6489.5 A	30-90	85.0
WR23	1544632	487445	94.3	5.0	1/29/2003	1.72	6574.75	2.2	6576.47	77	6497.3 A	32-92	77.5
WR24	1544938	487438	89.2	5.0	1/29/2003	2.04	6586.63	3.0	6588.67	82	6503.7 A	50-90	83.0
X	1540512	491892	50.7	4.0	11/29/2004	20.88	6550.73	1.7	6571.61	---	--- A	-	---
X1	1540671	492129	54.0	5.0	8/12/2002	7.50	6566.04	3.9	6573.54	47	6522.6 A	37-47	43.4
X2	1540836	492363	53.0	6.0	8/12/2002	2.50	6569.43	1.9	6571.93	45	6525.0 A	40-45	44.4
X3	1540992	492599	52.0	5.0	8/12/2002	2.50	6570.78	2.0	6573.28	42	6529.3 A	32-42	41.5
X4	1541210	492814	54.0	5.0	8/12/2002	13.10	6563.84	3.2	6576.94	45	6528.7 A	37-45	35.1
X5	1541408	492821	44.0	6.0	8/12/2002	7.80	6569.81	3.6	6577.61	35	6539.0 A	24-36	30.8
X6	1541609	492828	46.0	6.0	8/12/2002	8.00	6570.72	3.5	6578.72	35	6540.2 A	22-37	30.5
X7	1541808	492851	56.0	6.0	12/5/2000	8.60	6571.83	3.4	6580.43	45	6532.0 A	32-46	39.8
X8	1542007	492852	61.0	5.0	12/5/2000	13.00	6568.76	3.4	6581.76	51	6527.4 A	32-52	41.4
X9	1542194	492852	61.0	5.0	12/5/2000	27.00	6555.92	3.6	6582.92	51	6528.3 A	24-52	27.6
X10	1542352	492835	61.0	5.0	8/12/2002	4.00	6578.43	3.6	6582.43	53	6525.8 A	30-55	52.6
X11	1542553	492782	57.0	5.0	12/5/2000	0.50	6581.50	3.0	6582.00	53	6526.0 A	17-57	55.5
X12	1542861	492852	57.0	5.0	12/5/2000	0.50	6582.83	3.0	6583.33	53	6527.3 A	17-57	55.5
X13	1543640	493665	56.0	5.0	4/9/2002	40.76	6546.18	2.5	6586.94	51	6533.4 A	16-56	12.7
X14	1544002	493777	56.0	5.0	4/9/2002	39.80	6546.40	2.1	6586.20	49	6535.1 A	16-56	11.3
X15	1544222	493800	57.0	5.0	4/9/2002	40.54	6542.37	2.3	6582.91	51	6529.6 A	17-57	12.8
X16	1544473	493795	47.0	5.0	4/9/2002	40.64	6544.15	2.3	6584.79	47	6535.5 A	22-47	8.7
X17	1544356	493793	55.0	5.0	4/9/2002	41.06	6544.78	3.3	6585.84	48	6534.6 A	35-55	10.2
X18	1544593	493569	57.0	5.0	4/9/2002	29.06	6557.02	3.8	6586.08	49	6533.3 A	37-57	23.8

TABLE 4.1-1. WELL DATA FOR THE HOMESTAKE ALLUVIAL 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
X19	1544753	493437	63.0	5.0	4/9/2002	45.56	6539.64	4.5	6585.20	56	6524.8 A	33-63	14.9
X20	1544855	493256	71.0	5.0	4/9/2002	47.00	6538.73	3.5	6585.73	64	6518.2 A	31-71	20.5
X21	1543606	493894	55.0	5.0	12/5/2000	38.99	6547.34	2.7	6586.33	51	6532.6 A	35-55	14.7
X22	1543874	493946	56.0	5.0	12/5/2000	39.21	6546.49	2.6	6585.70	50	6533.1 A	36-56	13.4
X23	1544064	494012	56.0	5.0	12/5/2000	38.96	6546.98	2.8	6585.94	47	6536.1 A	36-56	10.8
X24	1544244	494011	56.0	5.0	12/5/2000	39.94	6545.78	2.6	6585.72	46	6537.1 A	36-56	8.7
X25	1544445	494042	53.0	5.0	12/5/2000	39.41	6546.22	2.8	6585.63	46	6536.9 A	33-53	9.3
X26	1544693	493702	53.0	5.0	12/5/2000	35.34	6552.30	2.8	6587.64	43	6541.8 A	33-53	10.5
X27	1544953	493374	71.0	5.0	12/5/2000	46.27	6539.03	5.1	6585.30	64	6516.2 A	31-71	22.8
X28	1540545	491971	56.0	5.0	8/12/2002	8.30	6561.66	2.0	6569.96	48	6520.0 A	16-56	41.7
X29	1540735	492256	51.0	5.0	8/12/2002	4.00	6566.03	2.0	6570.03	43	6525.0 A	11-51	41.0
X30	1540897	492493	51.0	5.0	8/12/2002	3.00	6569.53	2.0	6572.53	43	6527.5 A	11-51	42.0
X31	1541052	492731	51.0	5.0	8/12/2002	8.00	6566.13	2.0	6574.13	44	6528.1 A	11-51	38.0
Y	1541025	491256	60.8	4.0	10/15/2002	15.20	6557.68	2.4	6572.88	57	6513.5 A	54-59	44.2
Z	1540290	490701	73.9	4.0	12/5/2000	5.00	6564.22	0.6	6569.22	68	6500.6 A	60-70	63.6

Note: A = Alluvial Aquifer, Base
T = Tailings Aquifer
* = Well Abandoned
MP = Measuring Point
LSD = Land Surface Datum
IN = Inches
FT = Feet
MSL = Mean Sea Level

TABLE 4.1-2. 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	8/26/2003	36.60	6523.06	0.0	6559.66	75	6484.7 A	90-105	38.4
0411	1537400	489510	70.0	6.0	8/7/1996	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	---	---	4/27/1994	35.25	6530.75	0.0	6566.00	---	--- A	-	---
0421	1538450	491100	88.0	5.0	1/30/1996	37.58	6534.42	0.9	6572.00	92	6479.1 A	72-102	55.3
0422	1538440	490810	80.0	4.0	4/6/1994	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	4/7/1994	32.42	6534.58	0.0	6567.00	71	6496.0 A	50-90	38.6
0426	1538230	490620	100.0	---	11/10/1981	30.65	6534.35	0.0	6565.00	80	6485.0 A	80-100	49.4
0427	1538450	490410	121.0	6.0	4/12/1994	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	9/1/1995	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	72	6496.0 A	-	---
											6433.0 U	-	---
0431	1538045	490090	130.0	6.0	4/12/1994	35.00	6533.00	0.0	6568.00	60	6508.0 A	125-130	25.0
											6450.0 U	125-130	
0432	1538210	489840	---	---	---	---	---	0.0	6565.00	---	--- A	-	---
0433	1538220	489620	90.0	4.0	5/2/1997	36.05	6527.95	1.5	6564.00	75	6487.5 A	58-84	40.5
0435	1538220	489300	85.0	6.0	3/25/2003	34.48	6526.52	1.3	6561.00	85	6474.7 A	-	51.8
0438	1537940	490810	120.0	4.0	---	---	---	0.0	6571.00	105	6466.0 A	70-100	---
0439	1537940	490490	97.0	4.0	8/7/1996	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	1/30/1995	35.19	6530.81	0.0	6566.00	78	6488.0 A	106-116	42.8
0442	1537940	489840	100.0	4.0	8/7/1996	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	---	5/18/1994	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	9/8/1983	41.28	6518.72	0.0	6560.00	60	6500.0 A	60-95	18.7
											6500.0 U	60-95	
0447	1537490	490480	142.0	6.0	4/11/1985	41.18	6526.82	0.0	6568.00	80	6488.0 A	120-142	38.8
											6430.0 U	120-142	
0448	1537400	489100	---	---	---	---	---	0.0	6561.00	---	--- A	-	---
0450	1537480	490710	---	6.0	1/25/1995	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	8/7/1996	41.20	6525.80	0.8	6567.00	85	6481.2 A	40-100	44.6
0453	1538375	490300	110.0	4.0	7/1/2002	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	12/20/2004	33.58	6527.42	0.0	6561.00	---	--- A	-	---

TABLE 4.1-2. 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
SUB2	1537395	490320	---	4.0	5/4/2004	40.10	6527.47	0.0	6567.57	---	--- A	-	---
SUB3	1538280	489420	84.0	6.0	12/20/2004	28.40	6528.67	0.0	6557.07	72	6485.1 A	56-72	43.6
SUB4	1538440	489840	100.0	4.0	9/21/1978	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	12/12/2003	40.00	6522.66	0.0	6562.66	80	6482.7 A	220-260	40.0
											6352.7 M	220-260	
0483	1536586	489753	280.0	5.0	7/24/1996	36.93	6525.73	0.0	6562.66	40	6522.7 A	-	3.1
											6497.7 U	-	
											6326.7 M	270-300	
0490	1536540	489756	63.0	4.0	12/20/2004	36.35	6526.07	0.0	6562.42	75	6487.4 A	20-80	38.7
0491	1537025	489662	63.0	4.0	8/23/2004	38.30	6524.32	0.0	6562.62	40	6522.6 A	30-63	1.7
0492	1537220	489280	60.0	4.0	5/20/2004	34.10	6526.58	1.2	6560.68	55	6504.5 A	40-60	22.1
0495	1537400	497100	---	---	---	---	---	0.0	6571.00	---	--- A	-	---
0496	1534650	489603	94.4	5.0	12/20/2004	54.58	6507.94	1.6	6562.52	86	6474.9 A	53-93	33.0
0497	1535039	489503	94.0	5.0	12/20/2004	54.27	6508.35	2.0	6562.62	89	6471.6 A	64-94	36.7
0498	1534661	488953	150.0	6.0	12/10/2004	58.28	6502.31	2.0	6560.59	80	6478.6 A	70-110	
											6478.6 M	130-150	
CW44	1535048	488891	208.0	6.0	12/14/2004	60.20	6500.54	2.5	6560.74	94	6464.2 A	-	36.3
											6428.2 M	69-208	

Note: A = Alluvial Aquifer, Base
U = Upper Chinle Aquifer, Top
M = Middle Chinle Aquifer, Top
* = Well Abandoned
MP = Measuring Point
LSD = Land Surface Datum
IN = Inches
FT = Feet
MSL = Mean Sea Level

TABLE 4.1-3. 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			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
					DATE	DEPTH (FT-MP)	ELEV. (FT-MSL)						
Murray													
* 0801	1541020	488600	100.0	4.0	7/15/2004	39.20	6528.53	0.0	6567.73	85	6482.7 A	80-100	45.8
0801R	1541096	488431	93.2	5.0	11/4/2004	41.01	6528.04	3.0	6569.05	82	6484.1 A	60-90	44.0
0802	1540790	488190	98.0	6.0	5/22/1997	40.20	6522.52	0.0	6562.72	81	6481.7 A	75-81	40.8
0803	1540800	487430	---	6.0	9/19/1983	84.86	6476.14	0.0	6561.00		--- C	85-180	---
										85	6476.0 A	85-180	0.1
0804	1540790	486790	137.0	6.0	5/7/2002	46.60	6515.40	0.0	6562.00	85	6477.0 A	125-136	38.4
0805	1540695	486373	140.0	5.0	10/6/1994	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	5/22/1991	29.14	6526.12	0.0	6555.26	---	--- A	-	---
0844	1538376	487002	75.0	4.0	12/20/2004	34.60	6521.53	1.2	6556.13	70	6484.9 A	35-75	36.6
0845	1537280	487833	65.0	4.0	8/17/2004	34.66	6522.39	1.7	6557.05	55	6500.4 A	45-65	22.0
AW	1540235	488015	156.0	6.0	6/29/2004	36.50	6526.93	0.1	6563.43	63	6500.3 A	-	26.6
											6463.3 U	66-155	
HW	1540900	487430	115.0	6.0	11/9/1994	40.00	6517.00	0.0	6557.00	95	6462.0 A	60-94	55.0
Pleasant Valley													
0525	1541270	486020	---	4.5	7/12/2002	55.36	6514.64	---	6570.00	---	--- A	-	---
0688	1541257	483955	105.0	5.0	12/20/2004	62.83	6499.79	2.9	6562.62	95	6464.7 A	65-105	35.1
0831	1540090	486030	---	---	9/6/1983	54.95	6506.05	0.0	6561.00	---	--- A	-	---
0833	1539250	485350	110.0	6.0	12/10/1996	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	5/2/2000	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	---	7/22/1995	49.03	6513.97	0.0	6563.00	---	--- A	-	---
0839	1541120	485465	100.0	5.0	12/19/1994	50.00	6510.00	0.0	6560.00	94	6466.0 A	80-96	44.0
0840	1540440	485360	98.0	6.0	9/8/1983	47.32	6513.68	0.0	6561.00	94	6467.0 A	73-94	46.7
0841	1540835	485020	100.0	---	7/22/1995	54.66	6506.34	0.0	6561.00	---	--- A	-	---
0843	1541265	485995	120.0	4.0	6/27/1989	52.40	6517.60	0.0	6570.00	112	6458.0 A	100-110	59.6

Note: A = Alluvial Aquifer, Base
U = Upper Chinle Aquifer, Top
C = Chinle Shale
* = Well Abandoned
MP = Measuring Point
LSD = Land Surface Datum
IN = Inches
FT = Feet
MSL = Mean Sea Level

TABLE 4.1-4. 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	12/14/2004	53.26	6532.76	0.3	6586.02	68	6517.7 A	35-75	15.0
0521	1539104	492588	75.0	5.0	10/7/2004	59.88	6524.56	2.5	6584.44	65	6516.9 A	35-75	7.6
0522	1538640	492437	77.0	5.0	10/7/2004	52.64	6527.89	2.8	6580.53	68	6509.7 A	37-77	18.2
0523	1538680	492896	74.0	5.0	9/10/2002	2.00	6584.79	3.0	6586.79	62	6521.8 A	34-74	63.0
0524	1538889	493173	78.0	5.0	1/28/2003	3.47	6586.88	3.0	6590.35	70	6517.4 A	33-78	69.5
0531	1541086	478262	---	---	10/30/1996	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	-	---
0538	1533486	486899	170.0	6.0	12/10/2004	81.98	6466.96	2.2	6548.94	95	6451.7 A	50-90	15.2
											6413.7 L	130-170	
0539	1534014	487596	210.0	6.0	12/10/2004	75.60	6479.72	2.0	6555.32	100	6453.3 A	50-70	26.4
										100	A	80-100	
											6378.3 L	170-210	101.4
0540	1534125	488091	90.0	5.0	12/10/2004	66.28	6489.63	2.7	6555.91	80	6473.2 A	30-90	16.4
0541	1539831	477236	118.0	5.0	12/10/2004	88.71	6466.91	2.0	6555.62	112	6441.6 A	78-118	25.3
0631	1532234	483756	118.0	6.0	12/10/2004	90.61	6450.49	2.2	6541.10	109	6429.9 A	58-118	20.6
0632	1531850	483767	110.0	6.0	12/10/2004	90.05	6451.25	3.0	6541.30	102	6436.3 A	70-110	14.9
0633	1541467	479642	83.0	8.0	12/10/2004	75.00	6482.56	0.0	6557.56	95	6462.6 A	11-83	20.0
0634	1541652	480362	103.0	4.5	12/10/2004	72.75	6487.32	2.8	6560.07	95	6462.3 A	80-100	25.1
0635	1535363	478401	63.0	12.0	---	---	---	---	6546.25	---	--- A	4-63	---
0636	1545374	476038	123.0	4.5	9/15/2004	100.38	6473.06	2.3	6573.44	119	6452.1 A	103-123	20.9
0637	1545409	474710	124.0	4.5	9/15/2004	106.48	6468.72	2.5	6575.20	118	6454.7 A	104-124	14.0
0638	1539628	493265	75.0	5.0	12/14/2004	49.45	6536.11	0.0	6585.56	65	6520.6 A	35-75	15.5
0639	1539370	492961	80.0	5.0	10/7/2004	63.00	6524.88	2.5	6587.88	71	6514.4 A	35-80	10.5
0640	1537790	491961	84.0	5.0	12/14/2004	51.25	6528.72	2.2	6579.97	77	6500.8 A	64-84	28.0
0641	1536494	491110	95.0	5.0	1/29/2003	2.23	6571.13	2.5	6573.36	87	6483.9 A	65-95	87.3
0642	1536104	490932	95.0	5.0	1/29/2003	1.69	6570.19	2.4	6571.88	89	6480.5 A	65-95	89.7
0643	1533760	487386	108.0	5.0	10/16/2002	75.89	6475.44	1.5	6551.33	93	6456.8 A	58-108	18.6
0644	1533481	485450	110.0	5.0	12/10/2004	83.83	6460.07	2.2	6543.90	102	6439.7 A	55-110	20.4
0645	1532924	485282	80.0	5.0	10/19/1998	66.48	6477.31	2.5	6543.79	70	6471.3 A	60-80	6.0
0646	1533246	484953	100.0	5.0	1/7/2004	82.49	6460.86	1.5	6543.35	91	6450.9 A	60-100	10.0
0647	1536623	478308	140.0	4.5	12/10/2004	100.20	6451.71	1.4	6551.91	132	6418.5 A	80-140	33.2
0648	1534730	478343	120.0	4.5	12/10/2004	105.50	6442.29	0.5	6547.79	120	6427.3 A	80-120	15.0
0649	1534730	479798	124.0	4.5	12/10/2004	98.10	6445.19	0.3	6543.29	115	6428.0 A	84-124	17.2
0650	1536779	482135	109.0	4.5	12/14/2004	80.14	6466.97	2.2	6547.11	103	6441.9 A	89-109	25.1
0652	1531170	483779	88.0	5.0	12/20/2004	85.66	6452.49	1.5	6538.15	79	6457.7 A	60-88	0.0

TABLE 4.1-4. 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
0653	1533283	486570	206.0	6.0	12/10/2004	79.76	6465.21	1.3	6544.97	97	6446.7 A	69-206	18.5
											6408.7 L	-	
0654	1541994	478636	120.0	4.5	12/10/2004	73.80	6476.70	1.4	6550.50	106	6443.1 A	60-120	33.6
0655	1541620	479830	96.0	8.0	5/2/2000	75.15	6483.03	---	6558.18	88	--- A	21-84	---
0656	1542578	478333	88.0	8.0	5/2/2000	77.32	6476.75	---	6554.07	88	--- A	6-88	---
0657	1537497	478392	128.0	6.0	12/10/2004	96.80	6455.01	2.2	6551.81	120	6429.6 A	87-128	25.4
0657A	1537083	478412	35.0	12.0	4/13/1999	37.00	6512.00	---	6549.00	---	--- A	17-35	---
0658	1535922	478436	130.0	6.0	12/10/2004	101.92	6448.26	0.4	6550.18	129	6420.8 A	89-130	27.5
0658A	1535589	478423	30.6	---	---	---	---	---	6546.10	---	--- A	14-31	---
0659	1541689	480772	101.0	4.5	12/10/2004	72.72	6487.45	2.0	6560.17	97	6461.2 A	61-101	26.3
0680	1543850	478746	80.0	4.5	10/25/1996	77.39	6481.48	2.0	6558.87	75	6481.9 A	50-80	0.0
0681	1540676	482734	117.0	6.0	9/24/1998	64.18	6496.34	2.1	6560.52	111	6447.4 A	67-117	48.9
0682	1543125	477489	94.0	4.0	4/3/2001	80.80	6473.17	2.8	6553.97	102	6449.2 A	54-94	24.0
0683	1540198	476217	120.0	6.0	12/21/2004	87.76	6468.28	2.0	6556.04	140	6414.0 A	80-120	54.2
0684	1540273	478499	143.0	6.0	10/5/2004	84.79	6468.49	2.0	6553.28	118	6433.3 A	83-143	35.2
0685	1539098	478170	100.0	4.5	12/10/2004	93.48	6463.09	1.7	6556.57	116	6438.9 A	60-100	24.2
0686	1545319	475438	115.0	4.5	9/15/2004	108.63	6470.17	1.8	6578.80	136	6441.0 A	75-115	29.2
0687	1539011	477276	102.0	6.0	12/10/2004	92.55	6463.41	2.2	6555.96	120	6433.8 A	62-102	29.6
0689	1530024	478478	80.0	4.5	7/27/2004	73.51	6468.51	2.6	6542.02	75	6464.4 A	60-80	4.1
0692	1535892	493175	90.0	5.0	7/28/2004	65.57	6519.25	2.5	6584.82	80	6502.3 A	58-90	16.9
0846	1537219	484730	75.0	4.0	12/20/2004	44.58	6504.34	1.1	6548.92	65	6482.8 A	40-65	21.5
0847	1534736	488508	92.0	5.0	11/22/1996	53.88	6504.39	2.6	6558.27	80	6475.7 A	52-92	28.7
0848	1534634	490660	92.0	5.0	1/29/2003	13.22	6559.27	2.7	6572.49	91	6478.8 A	52-92	80.4
0851	1534692	483909	91.0	5.0	8/19/2004	79.98	6466.46	3.3	6546.44	80	6463.1 A	41-91	3.3
0852	1535610	493989	74.0	5.0	11/22/1996	73.26	6516.88	2.5	6590.14	70	6517.7 A	54-74	0.0
0855	1532111	484184	105.0	5.0	9/13/2004	92.33	6448.78	2.1	6541.11	97	6442.0 A	70-105	6.8
0861	1534332	488702	100.0	5.0	8/30/2004	72.84	6487.01	2.3	6559.85	65	6492.6 A	50-100	0.0
0862	1534265	487800	110.0	5.0	12/10/2004	62.75	6493.43	3.3	6556.18	97	6455.9 A	63-103	37.5
0863	1533867	487912	110.0	5.0	8/21/2003	8.00	6548.56	2.5	6556.56	94	6460.1 A	63-103	88.5
0864	1533735	486464	95.0	5.0	11/17/2004	79.20	6467.52	1.9	6546.72	78	6466.9 A	44-84	0.7
0865	1534123	488429	97.0	5.0	12/11/2002	71.98	6484.80	2.2	6556.78	88	6466.6 A	37-97	18.2
0866	1534494	488340	120.0	5.0	8/21/2003	2.60	6555.52	1.8	6558.12	80	6476.3 A	33-113	79.2
0867	1533762	488409	88.0	5.0	12/10/2004	68.45	6487.45	2.0	6555.90	86	6467.9 A	48-88	19.6
0868	1534848	491033	103.0	5.0	1/29/2003	5.38	6569.36	2.2	6574.74	94	6478.5 A	53-103	90.8
0869	1533251	486073	94.0	5.0	12/10/2004	82.86	6461.63	2.0	6544.49	99	6443.5 A	44-94	18.1
* 0870	1532680	484906	93.0	5.0	1/11/1996	68.56	6475.60	1.9	6544.16	95	6447.3 A	69-89	28.3

TABLE 4.1-4. 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
0871	1533603	485400	100.0	5.0	1/11/1996	66.86	6477.85	2.4	6544.71	93	6449.3 A	60-100	28.5
* 0872	1533092	485407	100.0	5.0	1/11/1996	65.80	6477.51	1.8	6543.31	96	6445.5 A	55-100	32.0
* 0873	1533286	484505	100.0	5.0	1/11/1996	67.55	6475.46	1.9	6543.01	96	6445.1 A	60-100	30.3
* 0874	1533968	484925	105.0	5.0	1/11/1996	68.68	6476.66	2.2	6545.34	110	6433.1 A	55-105	43.5
* 0875	1532785	483634	125.0	5.0	1/11/1996	69.85	6472.99	1.7	6542.84	116	6425.1 A	65-125	47.9
0876	1532853	486088	95.0	5.0	12/10/2004	83.71	6460.55	1.9	6544.26	85	6457.4 A	58-88	3.2
0877	1533068	488067	70.0	5.0	8/18/1998	63.58	6489.50	1.9	6553.08	65	6486.2 A	58-68	3.3
0879	1532401	486104	70.0	5.0	12/10/2004	69.18	6475.37	2.2	6544.55	62	6480.4 A	48-68	0.0
0881	1542034	481478	96.0	4.5	12/10/2004	77.00	6488.04	2.0	6565.04	103	6460.0 A	76-96	28.0
0882	1541404	482396	110.0	4.5	10/4/2004	70.64	6490.52	2.0	6561.16	98	6461.2 A	70-110	29.3
0883	1540097	483039	100.0	5.0	12/21/2004	62.16	6494.97	1.9	6557.13	96	6459.3 A	60-90	35.7
0884	1542677	481498	90.0	5.0	10/4/2004	82.36	6483.74	1.0	6566.10	85	6480.2 A	58-88	3.6
0885	1541919	483474	100.0	5.0	12/10/2004	69.38	6495.26	1.5	6564.64	95	6468.1 A	70-100	27.1
0886	1542327	482487	90.0	5.0	12/10/2004	73.25	6491.30	1.5	6564.55	87	6476.1 A	60-90	15.3
0887	1543063	482469	67.0	5.0	3/12/1998	69.21	6498.52	1.5	6567.73	60	6506.2 A	42-67	0.0
0888	1542285	479335	105.0	5.0	12/10/2004	78.00	6479.33	1.1	6557.33	90	6466.2 A	75-105	13.1
0889	1540047	480222	65.0	5.0	10/24/1996	63.31	6486.32	1.5	6549.63	60	6488.2 A	35-65	0.0
0890	1541365	480088	101.0	5.0	12/10/2004	74.70	6483.73	1.7	6558.43	93	6463.7 A	81-101	20.0
0893	1541934	482244	98.0	4.5	12/10/2004	72.92	6491.05	2.1	6563.97	93	6468.9 A	78-98	22.2
0894	1541976	478317	78.0	4.5	10/2/2002	77.12	6477.17	3.0	6554.29	97	6454.3 A	58-78	22.9
0895	1541521	476222	104.0	5.0	10/4/2004	82.59	6471.25	2.4	6553.84	116	6435.4 A	61-101	35.8
0896	1542246	476237	113.0	5.0	10/4/2004	83.55	6472.06	2.0	6555.61	117	6436.6 A	73-113	35.4
0897	1543819	478237	93.0	4.0	9/27/1998	83.28	6478.97	2.0	6562.25	70	6490.3 A	63-93	0.0
0899	1543801	477288	110.0	4.0	10/4/2004	97.46	6473.38	2.0	6570.84	120	6448.8 A	70-110	24.5
0905	1532700	480850	120.0	5.0	---	---	---	0.0	6545.00	120	6425.0 A	100-120	---
0906	1532900	480450	---	---	8/29/1995	74.65	6462.75	0.0	6537.40	---	--- A	-	---
0909	1531900	483400	140.0	4.0	11/19/1982	77.45	6461.45	0.0	6538.90	112	6426.9 L	80-135	34.6
											6426.9 A	80-135	
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	1/24/1996	38.40	6604.60	0.3	6643.00	---	--- A	-	---
0914	1555500	500850	93.0	6.0	5/17/2004	40.86	6601.14	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	4/26/1994	40.00	6585.00	0.0	6625.00	---	--- A	45-70	---
0917	1542200	514600	---	---	---	---	---	0.0	6800.00	---	--- A	-	---
0920	1555800	496900	---	7.0	5/11/1994	33.40	6594.20	0.7	6627.60	---	--- A	-	---

TABLE 4.1-4. 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
0921	1555400	495800	73.0	5.0	5/17/2004	38.02	6585.98	1.9	6624.00	---	---	A	-	---
0922	1555200	492500	96.0	6.0	5/17/2004	51.74	6569.96	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	10/5/2004	90.11	6468.01	2.6	6558.12	125	6430.5	A	95-132	37.5
0936	1543621	472978	160.0	5.0	---	---	---	0.0	6573.38	160	6413.4	A	100-160	---
0939	1539750	483200	97.0	8.0	7/25/1996	59.31	6497.69	2.3	6557.00	---	---	A	-	---
0940	1537750	482850	70.0	---	7/24/1996	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	7/27/1994	54.63	6520.55	0.0	6575.18	95	6480.2	A	70-100	40.4
0950	1560400	498300	81.0	5.0	7/12/2000	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	---	---	12/9/1995	61.47	6495.53	1.0	6557.00	---	---	A	-	---
0979	1539010	483280	105.0	5.0	7/10/2002	57.56	6593.44	0.0	6651.00	100	6551.0	A	90-100	42.4
0980	1539040	483080	---	---	11/8/1995	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	7/18/1996	58.75	6592.25	0.0	6651.00	102	6549.0	A	90-110	43.3
0989	1537890	482760	---	---	11/2/1995	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	10/20/2004	92.27	6462.73	0.0	6555.00	---	---	L	95-110	---
										---	---	A	95-110	---
0996	1537621	477989	138.0	5.0	12/10/2004	98.10	6454.42	1.7	6552.52	136	6414.8	A	126-136	39.6
0997	1539821	473807	---	---	3/12/1996	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	-	---

TABLE 4.1-4. 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
1020	---	---	---	5.0	1/18/1996	15.17		0.0	0.00	---	--- A	-	---
1021	---	---	---	---	1/18/1996	18.00		0.0	0.00	---	--- A	-	---

Note: A = Alluvial Aquifer, Base
L =Lower Chinle Aquifer, Top
* = Well Abandoned
MP = Measuring Point
LSD = Land Surface Datum
IN = Inches
FT = Feet
MSL = Mean Sea Level

4.2 ALLUVIAL WATER LEVELS

4.2.1 WATER-LEVEL ELEVATION - ALLUVIAL

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

Figure 4.2-1 presents the Fall of 2004 alluvial aquifer water-level elevation contours for the Grants Project area near Homestake's tailings. The alluvial aquifer limits were defined based on the 2002 water-level elevation map and base of the alluvium map. There were no recent adjustments in the alluvial aquifer limits, because water-level changes between 2002 and 2004 have been minor. Locations of the alluvial wells, with their respective well names listed adjacent to the well symbol, are plotted on Figure 4.1-1. The 2004 ground water flow patterns in the alluvial aquifer are very similar to those observed in the Fall of 2003 However, in 2004 there exists a ridge in the piezometric surface west of the Large Tailings Pile which is attributable to injection of water into the injection line (see Figure 4.1-1 for location of the injection line). The hydraulic ridge on the southeast side of the Small Tailings Pile was similar in 2004 to that which was observed in 2003. The water-level elevations and flow directions indicate the extent of the area of the alluvial aquifer from which ground water is drawn by the collection system. The area of collection is between the fresh-water injection area and the collection wells, where ground 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 elevations in Section 3 decreased from 2003 to 2004 as a result of pumping irrigation supply water from seven wells in this section (see Figure 4.2-1). Water-level changes are even more pronounced in Section 33 (see the western half of Figure 4.2-1), because eight irrigation supply wells are located in this area, and because natural recharge was below normal in 2004. The water levels in Section 28 were fairly similar to the 2003 levels even though irrigation supply wells were pumped in this area. The injection of water in the western portion of Section 28 probably supported these steady water levels.

Several wells were drilled in the area of the zero saturation boundaries to better define the limits of the alluvial aquifer. However, there are occurrences of limited saturation 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 boundary of the alluvium occurs and the water levels in these wells may not be representative of the alluvial aquifer.

Flow in the San Mateo alluvium is naturally diverted either west through the western portion of Section 28 or south/southwest through Section 35 around the area where the base of the alluvium is elevated. There is no alluvial saturation where the elevation of the base of the alluvium is above the water table. The San Mateo alluvial water then mixes with the Rio San Jose alluvial water flowing from the northwest. The combined flow continues to flow in a southerly direction. The gradient of the alluvial water surface has been increased somewhat due to irrigation water withdrawal, but it is still relatively 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 4.2-1) joins the Rio San Jose ground water system in the eastern portion of Section 4.

Water-level data for the alluvial wells are presented in Appendix A as Table A.1-1 (HMC alluvial wells), Table A.1-2 (Murray Acres, Broadview Acres, Felice Acres, and Pleasant Valley Estates alluvial wells) and Table A.1-3 (regional alluvial wells).

4.2.2 WATER-LEVEL CHANGE - ALLUVIAL

Figure 4.2-2 presents well locations and indicates the grouping of wells for presentation 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 Figure 4.2-2 correspond with those used on the water-level elevation plots. Time plots (Figures 4.2-3 through 4.2-18) present the last nine years of data to illustrate the recent 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 up-gradient wells DD, ND, NC, P, Q and R. A very slight increasing trend was observed in up-gradient wells during 2004 except for a small decline in water levels in wells DD and P.

Water-level elevation data are presented for two sets of wells monitored for the purpose of detection of a reversal of water-surface gradient near the S line of the collection system. These wells (SP and SO) are located just northeast of the majority of the S line of collection wells. Figure 4.2-4 graphically illustrates that the alluvial hydraulic gradient is reversed between wells SO and SP. Water-level rises were observed in these two wells in 2003 and 2004 due to injection of fresh water into the injection line. However, an adequate gradient reversal was maintained during this rise.

Wells S1 and S2 are the two reversal wells down-gradient of the S line of collection wells (see Figures 4.1-1 and 4.2-2 for their location). Recent data from these two wells indicate a loss in the reversal of the ground water flow direction due to the rise in water levels caused by the injection line (see Figure 4.2-5). The injection line water caused a larger water level rise in well S1 than in well S2. Water levels from well S5 have been added to demonstrate the reversal between wells S2 and S5. This data shows that a strong reversal has been maintained.

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 each of these wells increased in 2004 due to the injection into the injection line. The rise in water levels in wells BC, S, S4 and S11 has been greater than three feet in the last year.

The alluvial water levels north of Murray Acres were fairly steady in 2004 in wells MO, MQ, MS and MY. Water levels increased in well W in 2004 (see Figure 4.2-7).

Wells B and BA are monitored in order to define the reversal in the ground water 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 and indicates a continued ground water reversal. Water levels in this area generally rose more than one foot over the last year.

Figure 4.2-9 presents water-level elevation plots for alluvial wells BP, B13, D1, M5 and S3, which are located near the lined collection ponds and to the northwest of these ponds. This plot shows that the water levels increased in each of these wells during 2004 with a larger increase in the wells located northwest of the collection ponds and closer to the injection line.

Water-level elevations in the alluvial aquifer near the Small Tailings collection system are presented on Figure 4.2-10 for reversal wells DZ and KZ. Well DZ is near the D collection line and well KZ is close to the K injection line and, therefore, is naturally down-

gradient of well DZ. This plot shows that, during 2004, a strong reversal of the ground water gradient was maintained between the line of injection and line of collection. This pair of reversal wells is adequate to define the ground water gradient between this major zone of injection and the collection system.

Figure 4.2-11 presents water-level elevation data for wells B11, C12, L6 and TA. This data reflects the changes in water levels near the north and east sides of the Small Tailings Pile. The variation in water levels in well B11 is due to fluctuations in the collection rate from this well. Injection of R.O. product and fresh water has caused the higher water-level elevations observed in well L6. A rise in the water level at well TA occurred in 2004.

Figure 4.2-12 shows the water-level elevation plots for wells I, KEB, KF and X. Water levels were fairly steady in these wells in 2004 due to consistent injection with the exception of a gradual decline observed in well X.

Water-level elevations in the alluvial aquifer south of the Broadview Acres injection system were fairly steady during 2004 (see water levels for wells 490, 497, GH and SUB1 on Figure 4.2-13). The seasonal water level changes in well 497 are due to the irrigation program.

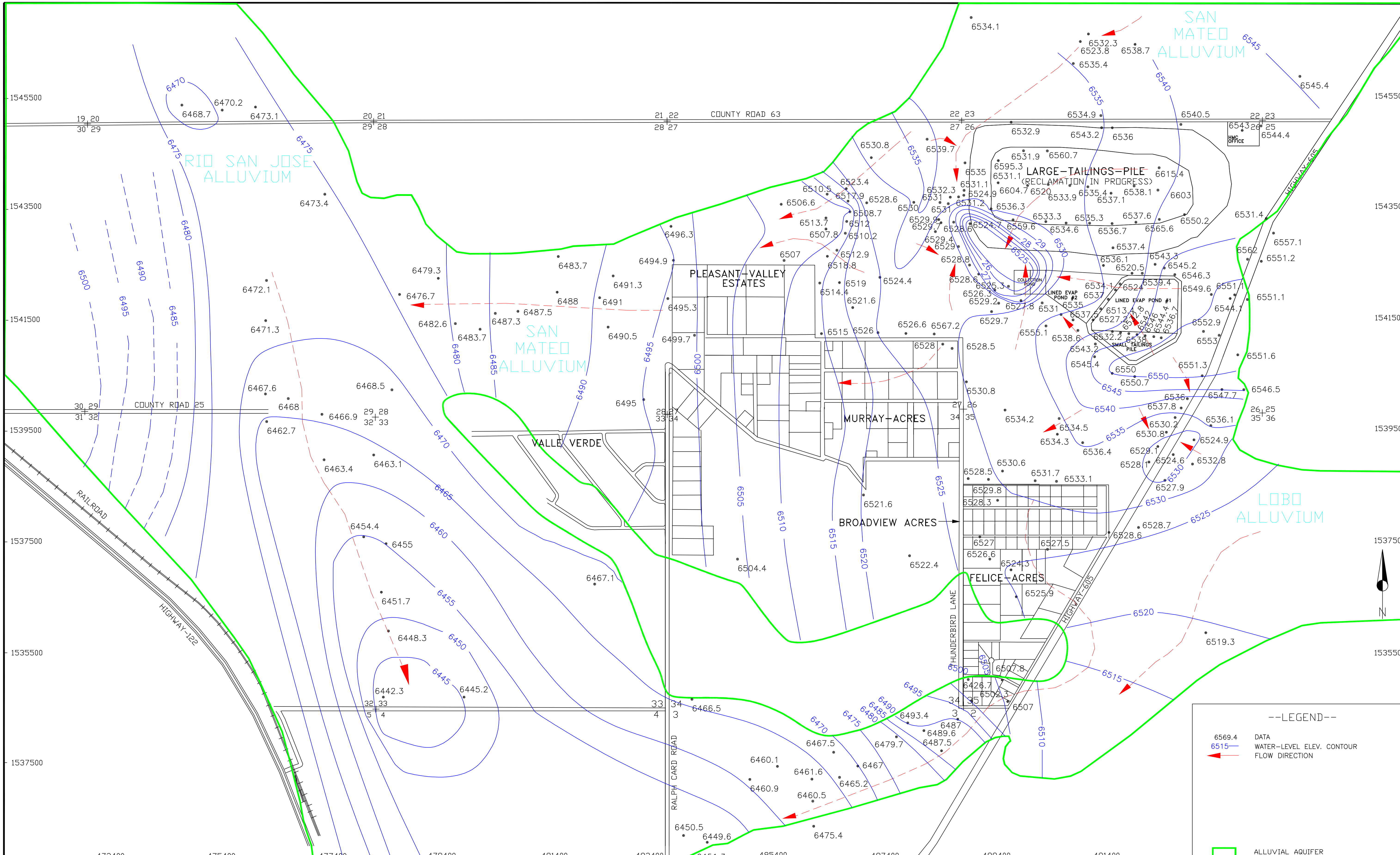
Water levels in the Murray Acres area were also fairly steady in alluvial wells 688, 844, 846, FB and MX during 2004 except for a continued gradual decrease in the water level in well 688 (see Figure 4.2-14).

Figure 4.2-15 presents water-level hydrographs for six wells in Section 3. Wells 653, 855, 862 and 869 are irrigation supply wells, and therefore the dramatic changes in water level reflect periods of pumping. Water levels in alluvial well 652 have gradually declined over the last five years due to the production of irrigation water and continuing drought conditions.

Water-level hydrographs for six wells in the Section 28 area are presented on Figure 4.2-16. Wells 881, 886 and 890 were used as irrigation supply wells. Late season water levels in 2004 were similar to those at a similar time in recent years except for a decline in levels from wells 881 and MR. Figure 4.2-17 presents the water- level time plots for the group of wells west and southwest of the Section 28 irrigation supply wells. Some decline in water levels in wells 685, 686, 895 and 899 was observed in 2004.

Figure 4.2-18 presents the water-level plots for the Section 33 wells shown on Figure 4.2-2. Wells 648, 649, 657, 658 and 996 are irrigation supply wells, and therefore, their water

levels are influenced by the periodic withdrawal of water from these wells. The observed water levels during December of 2004 are lower than those observed in previous years at this time. The combination of withdrawal for irrigation and the ongoing drought conditions is the likely cause of the overall decline in water levels with time.



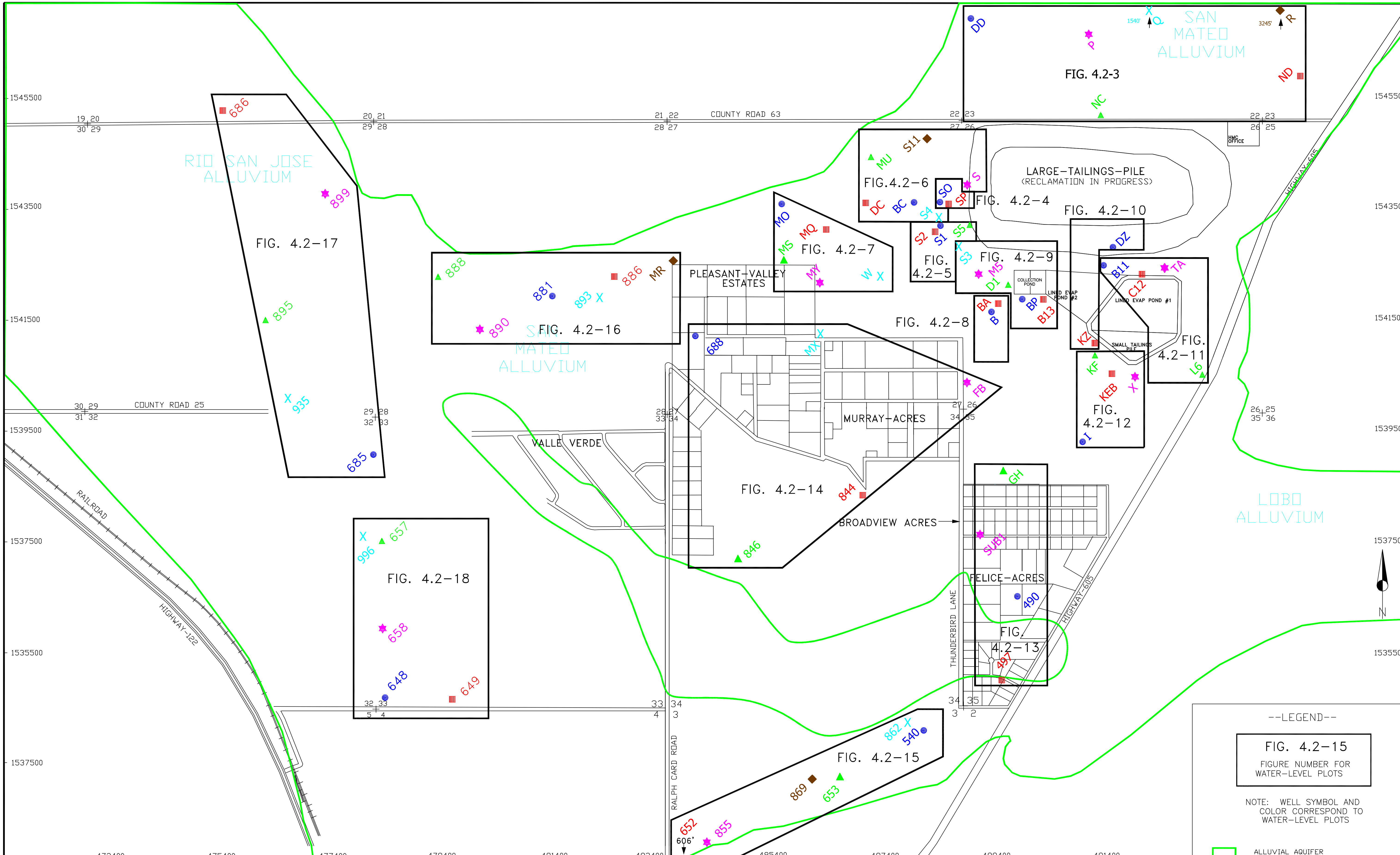
SCALE: 1"=1600'

C:\PROJECTS\ 2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.2-1. WATER-LEVEL ELEVATIONS FOR THE ALLUVIAL AQUIFER, FALL 2004, FT-MSL



SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

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

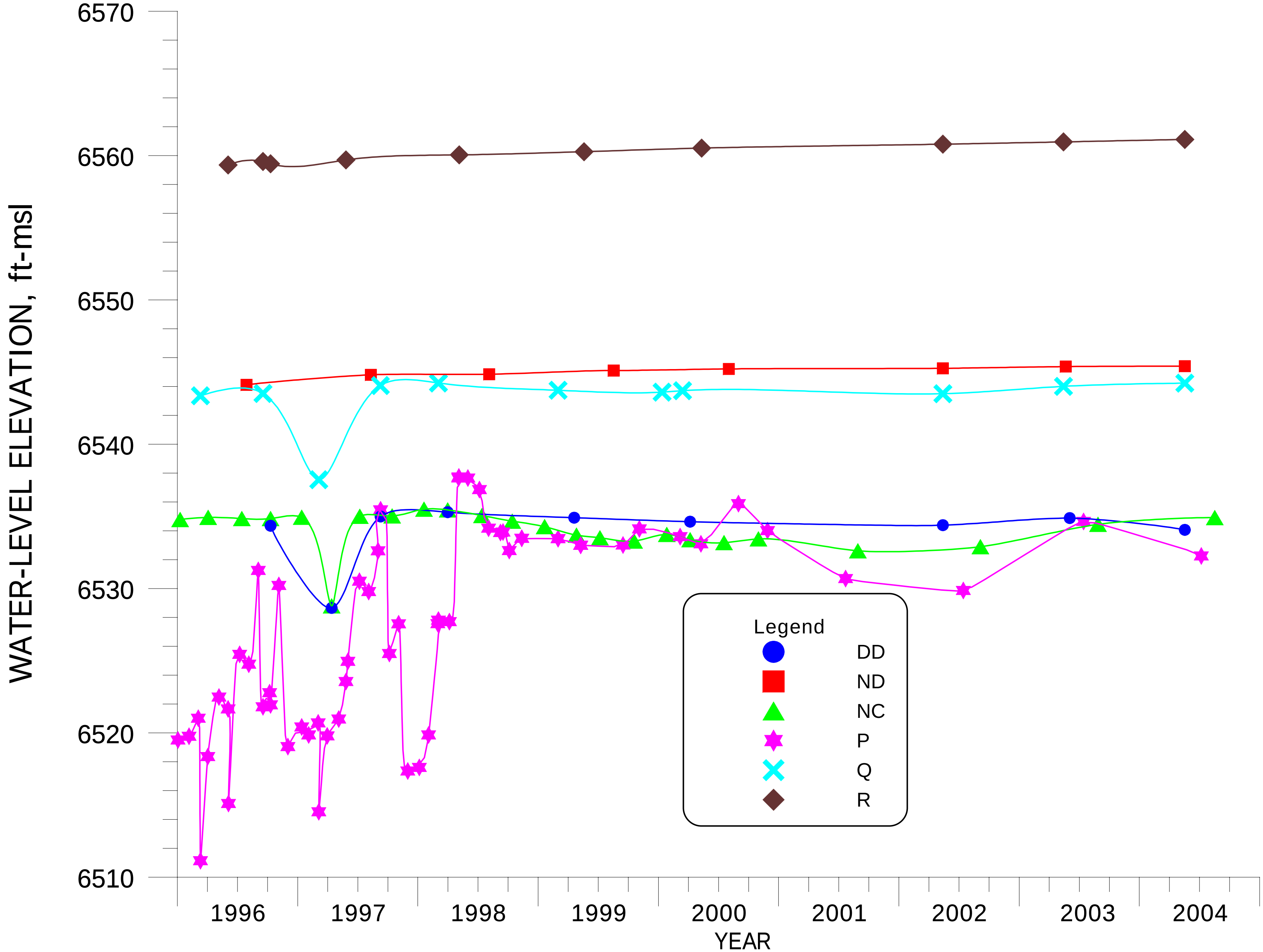


FIGURE 4.2-3. WATER-LEVEL ELEVATION FOR WELLS DD, ND, NC, P, Q AND R.

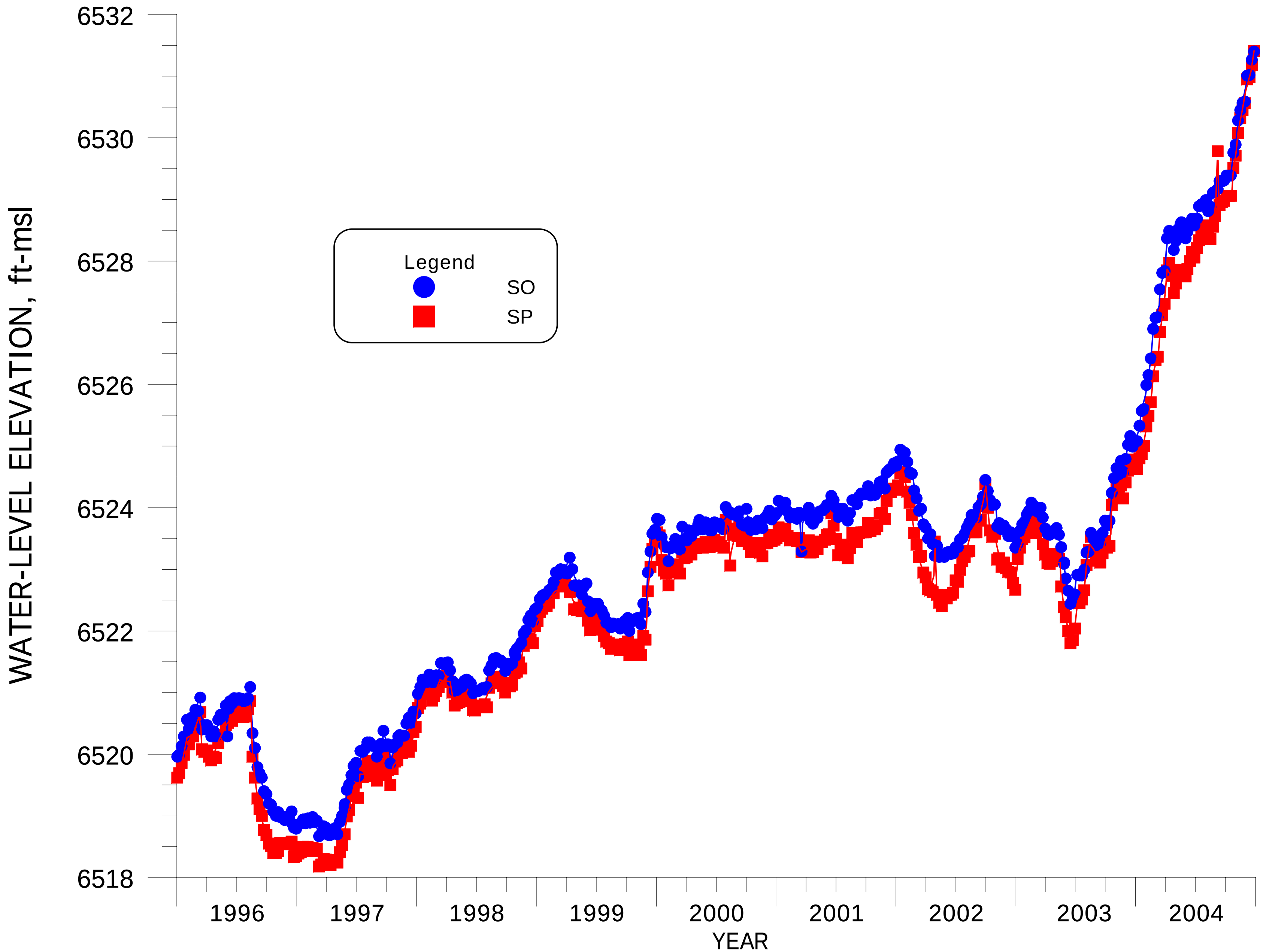


FIGURE 4.2-4. WATER-LEVEL ELEVATION FOR WELLS SO AND SP.

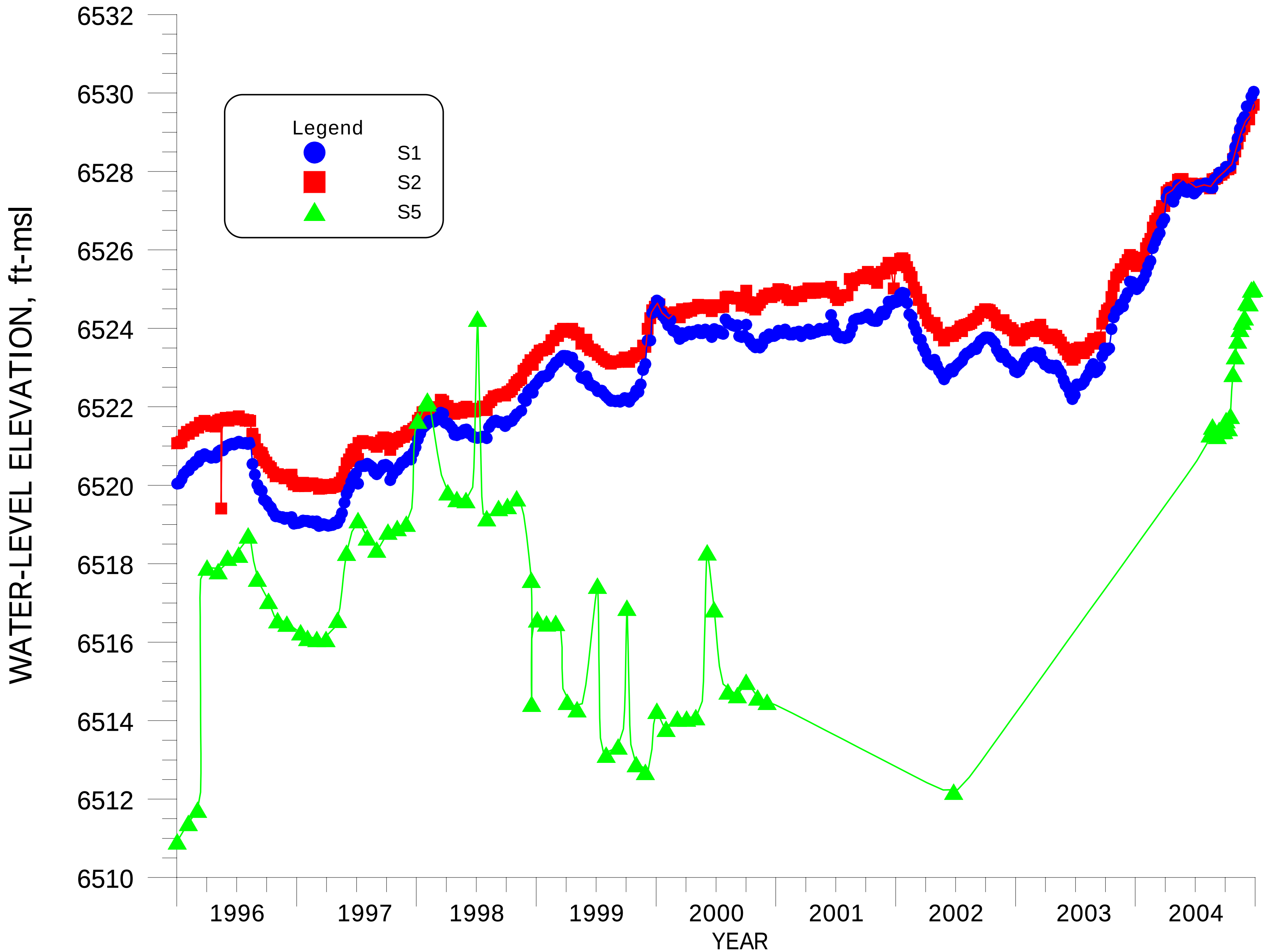


FIGURE 4.2-5. WATER-LEVEL ELEVATION FOR WELLS S1, S2 AND S5.

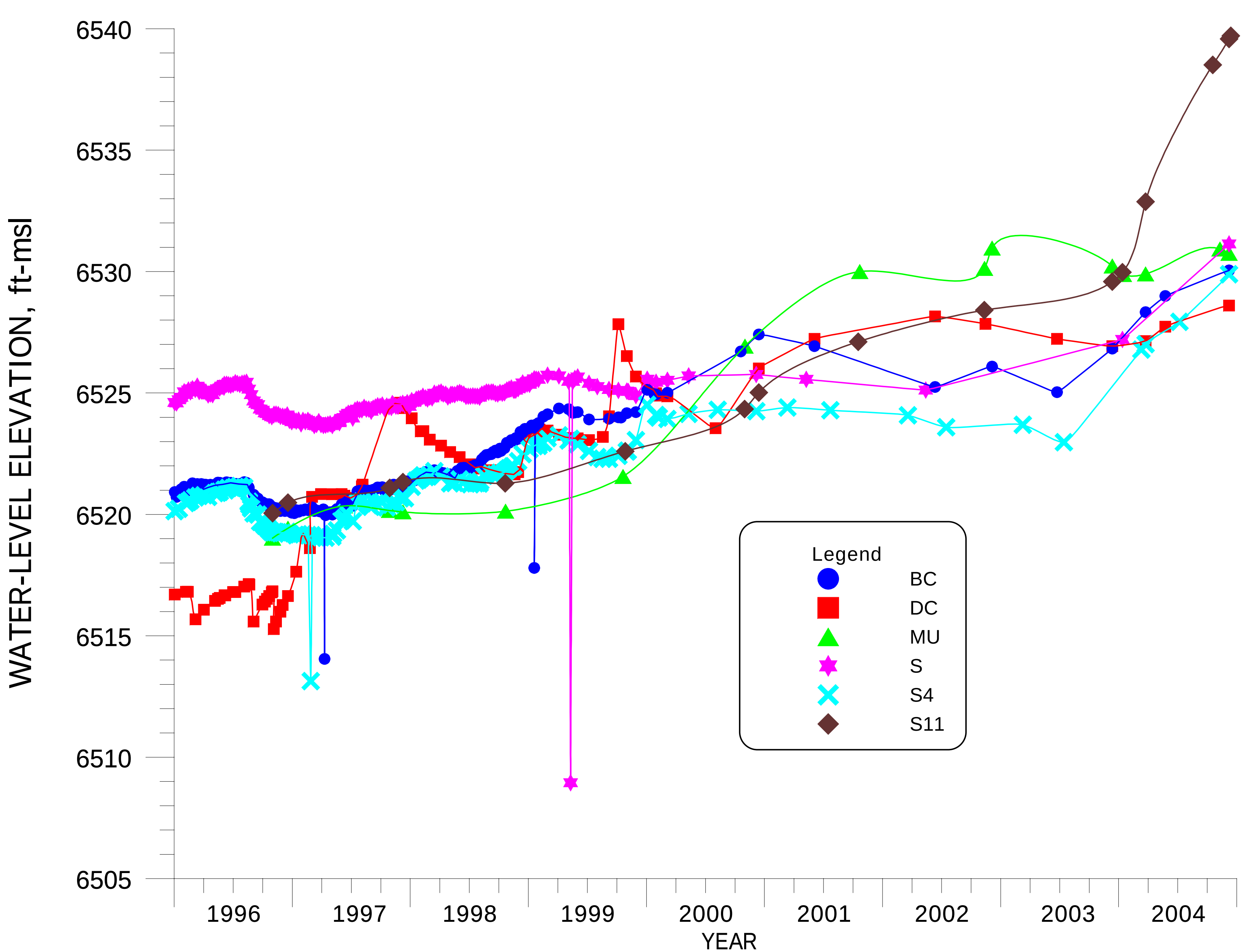


FIGURE 4.2-6. WATER-LEVEL ELEVATION FOR WELLS BC, DC, MU, S, S4 AND S11.

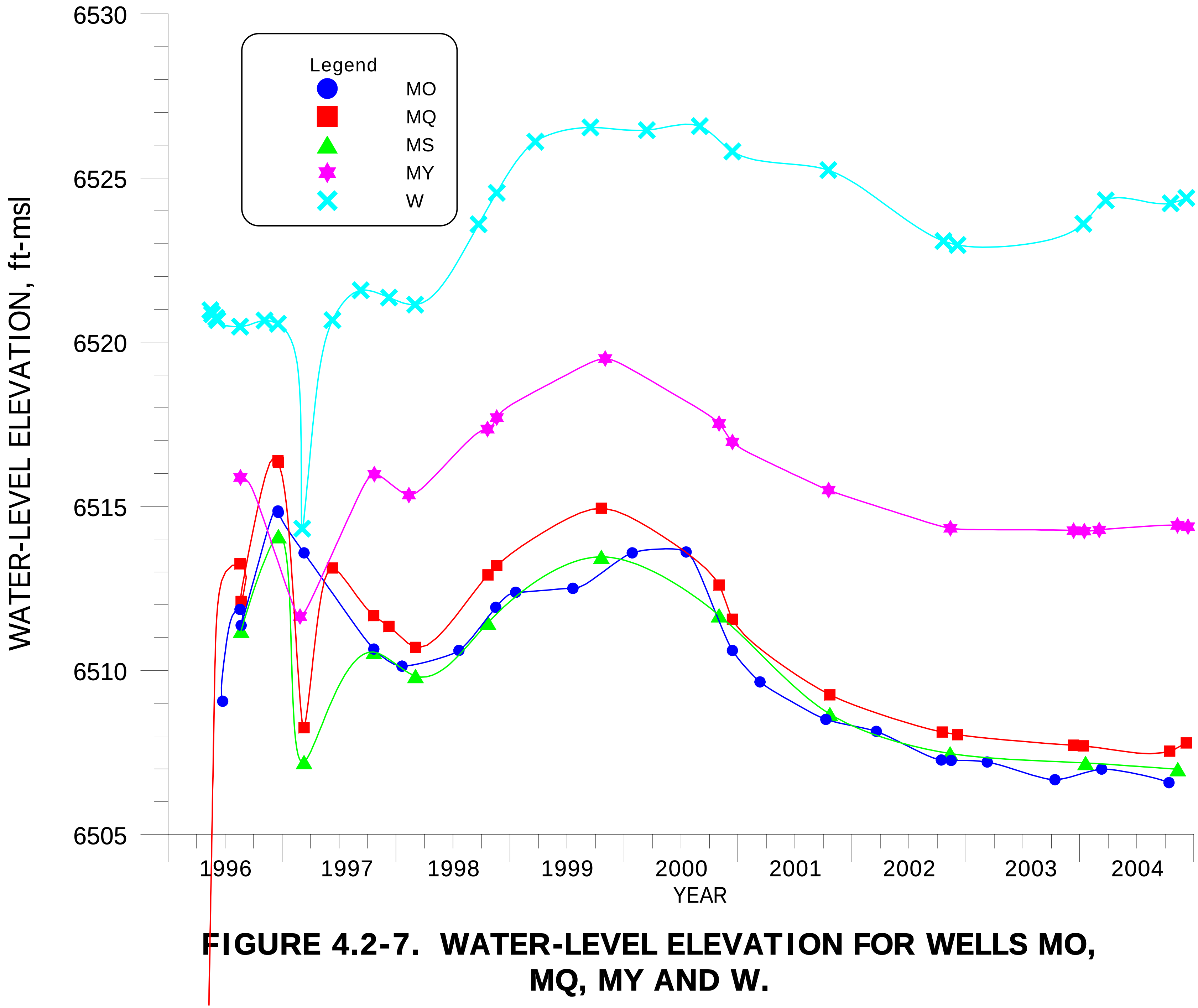


FIGURE 4.2-7. WATER-LEVEL ELEVATION FOR WELLS MO, MQ, MY AND W.

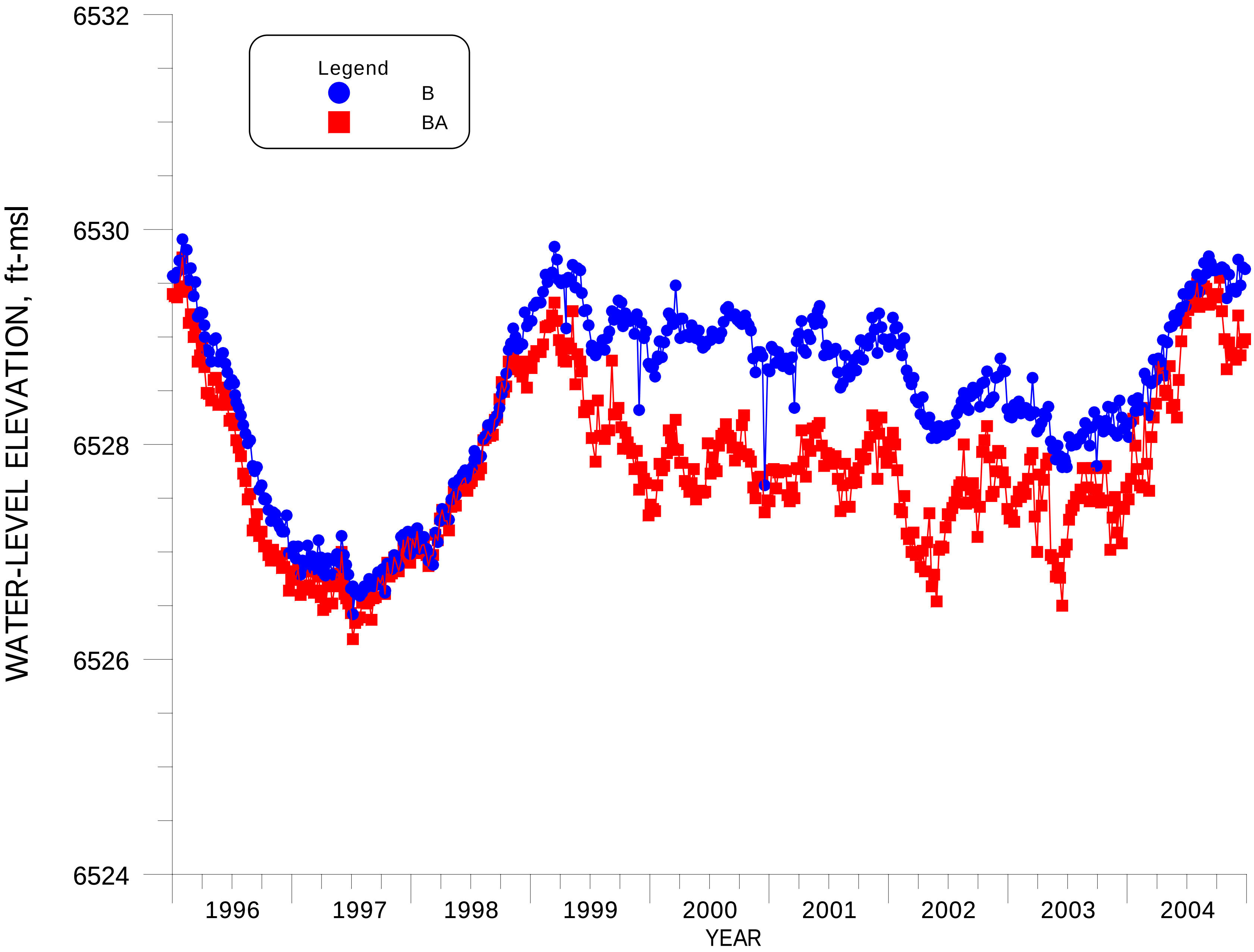


FIGURE 4.2-8. WATER-LEVEL ELEVATION FOR WELLS B AND BA.

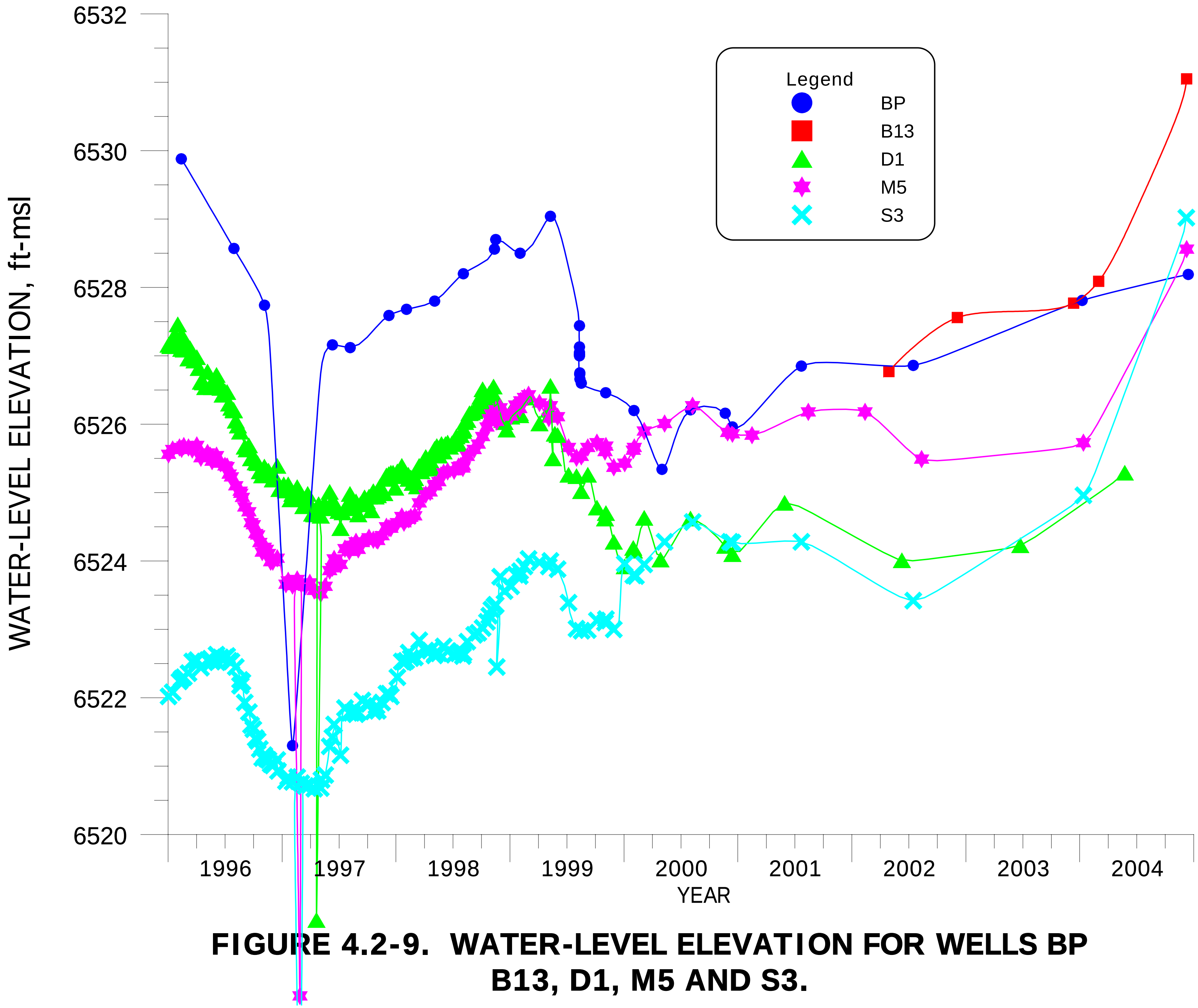


FIGURE 4.2-9. WATER-LEVEL ELEVATION FOR WELLS BP B13, D1, M5 AND S3.

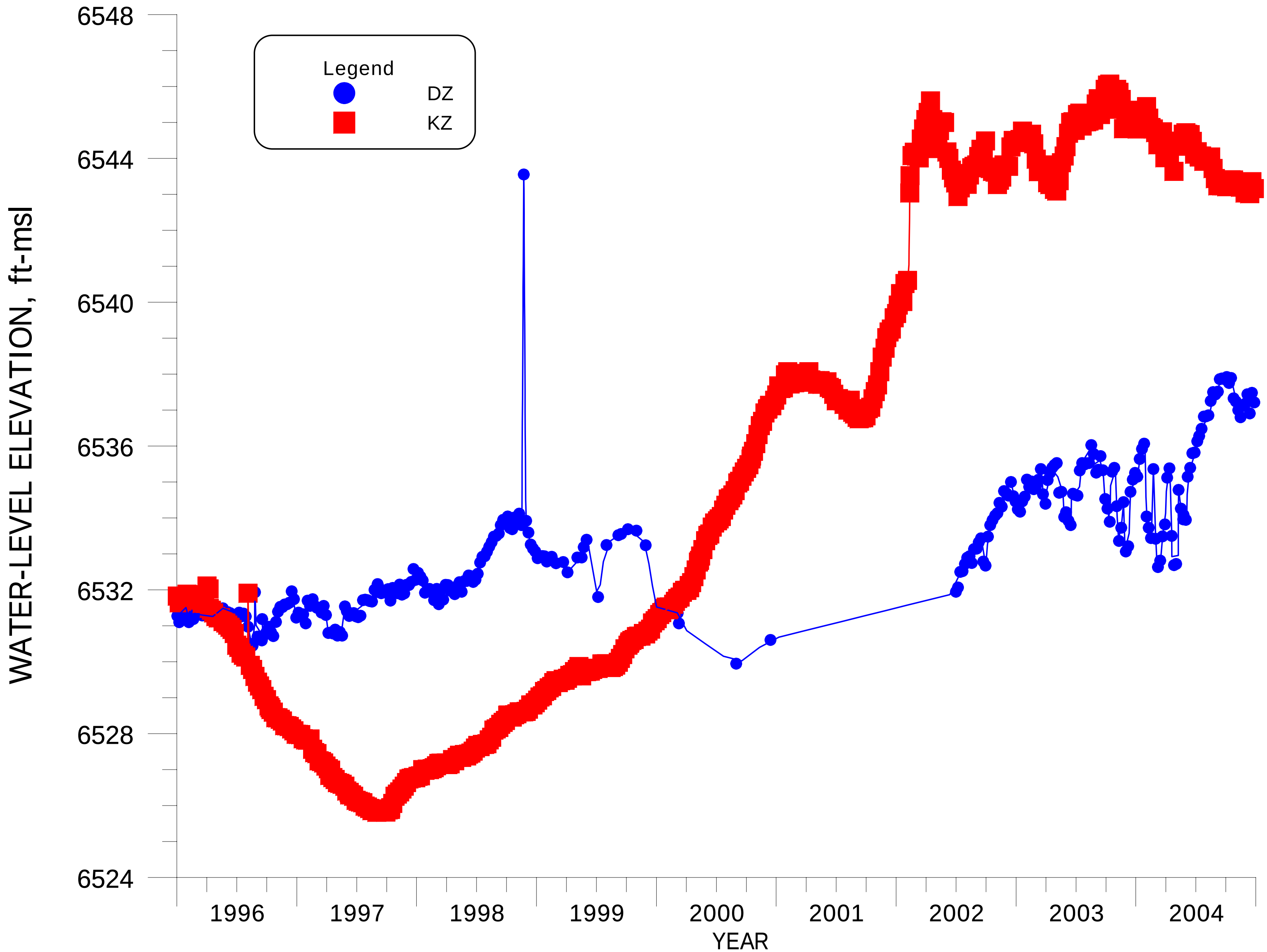


FIGURE 4.2-10. WATER-LEVEL ELEVATION FOR WELLS DZ AND KZ.

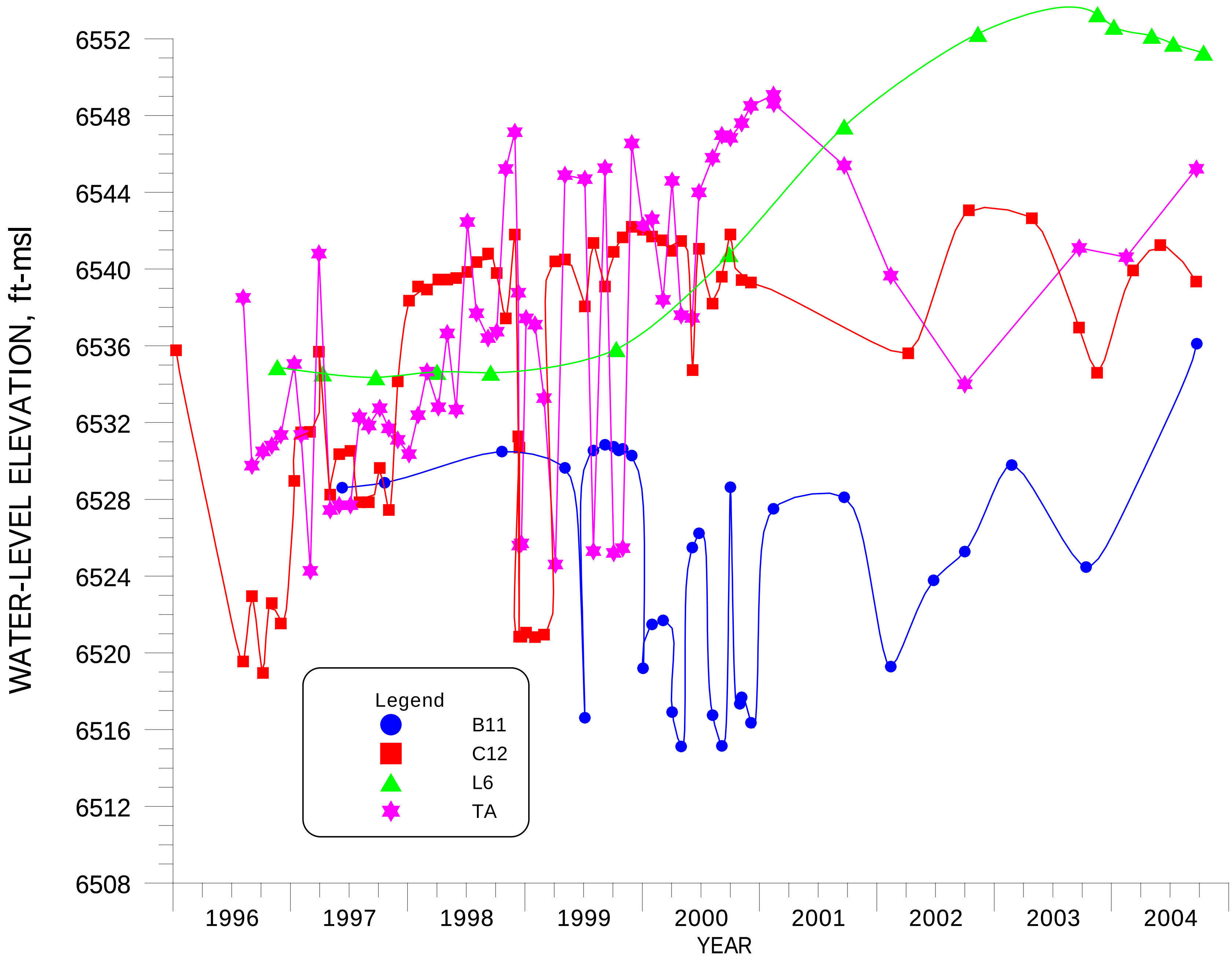


FIGURE 4.2-11. WATER-LEVEL ELEVATION FOR WELLS B11, C12, L6 AND TA.

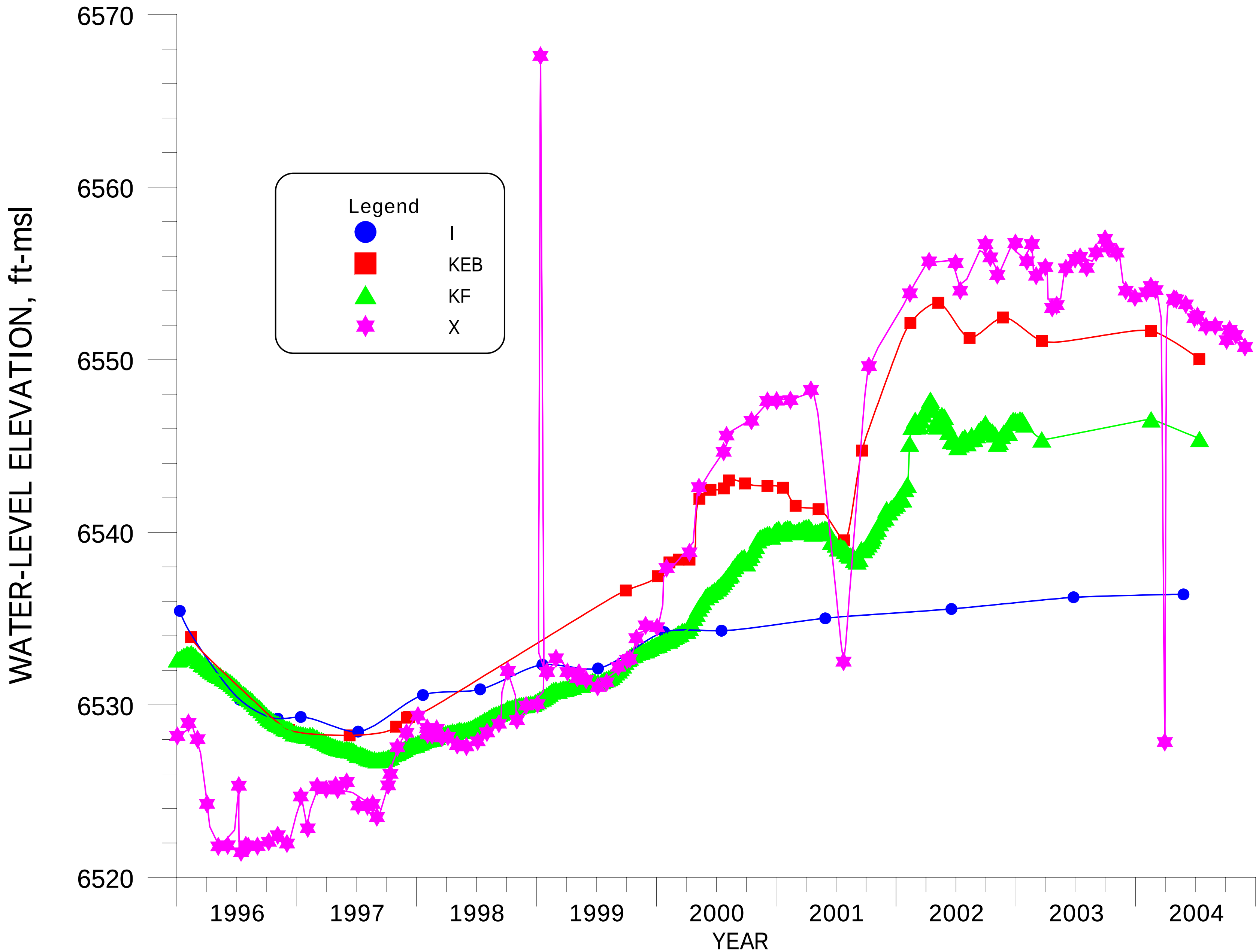


FIGURE 4.2-12. WATER-LEVEL ELEVATION FOR WELLS I, KEB, KF AND X.

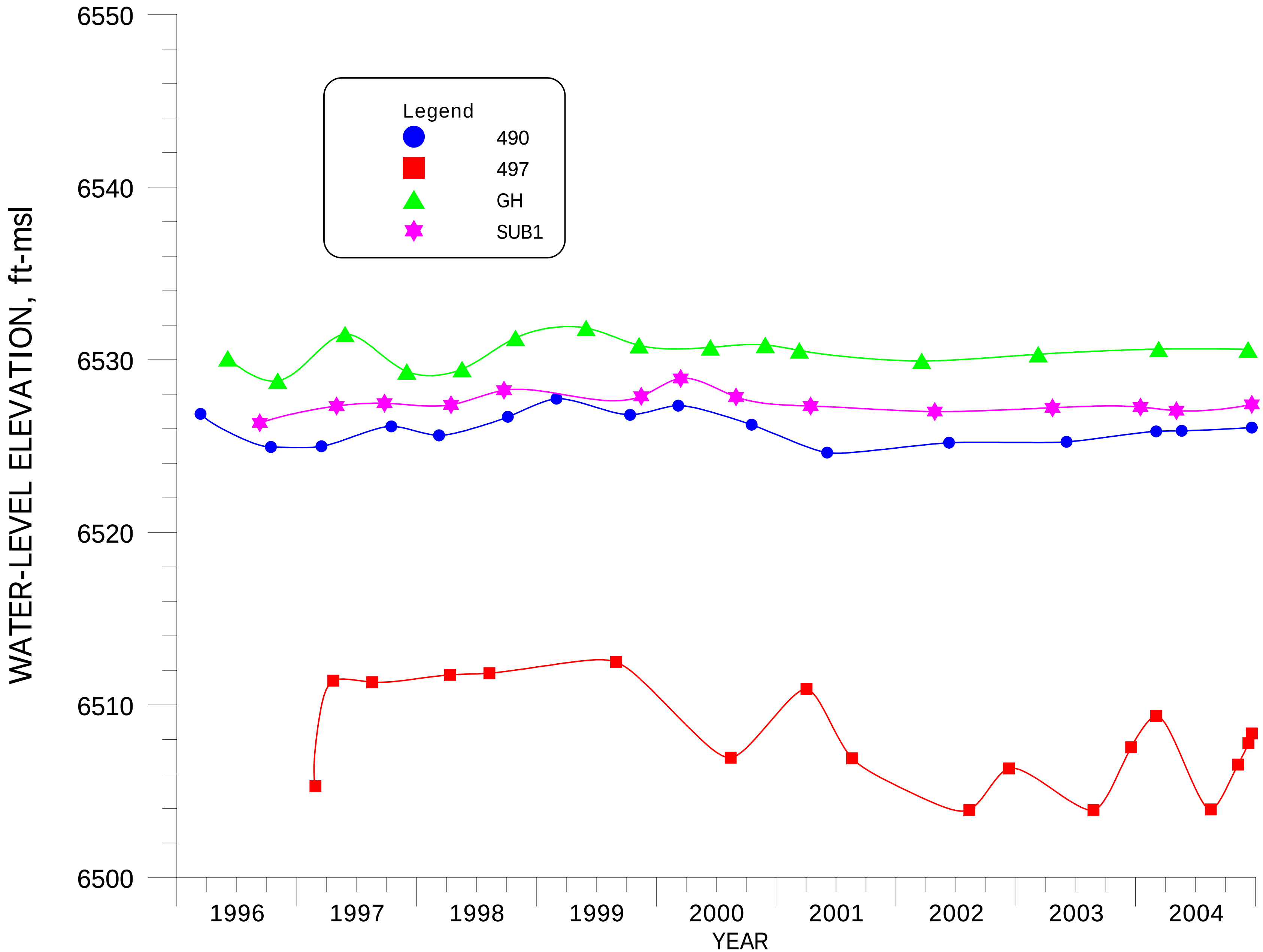


FIGURE 4.2-13. WATER-LEVEL ELEVATION FOR WELLS 490, 497, GH AND SUB1.

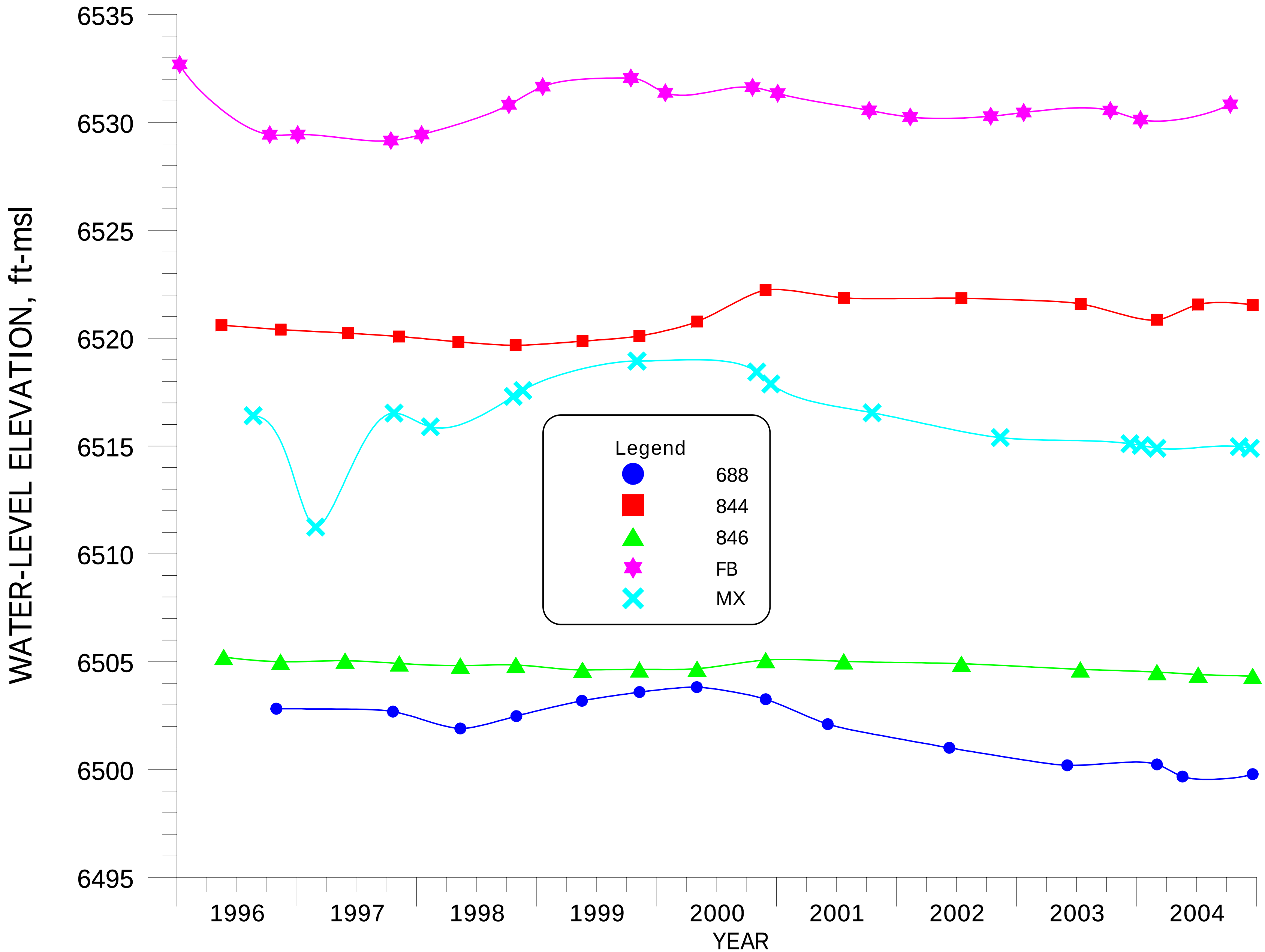


FIGURE 4.2-14. WATER-LEVEL ELEVATION FOR WELLS 688, 844, 846, FB AND MX.

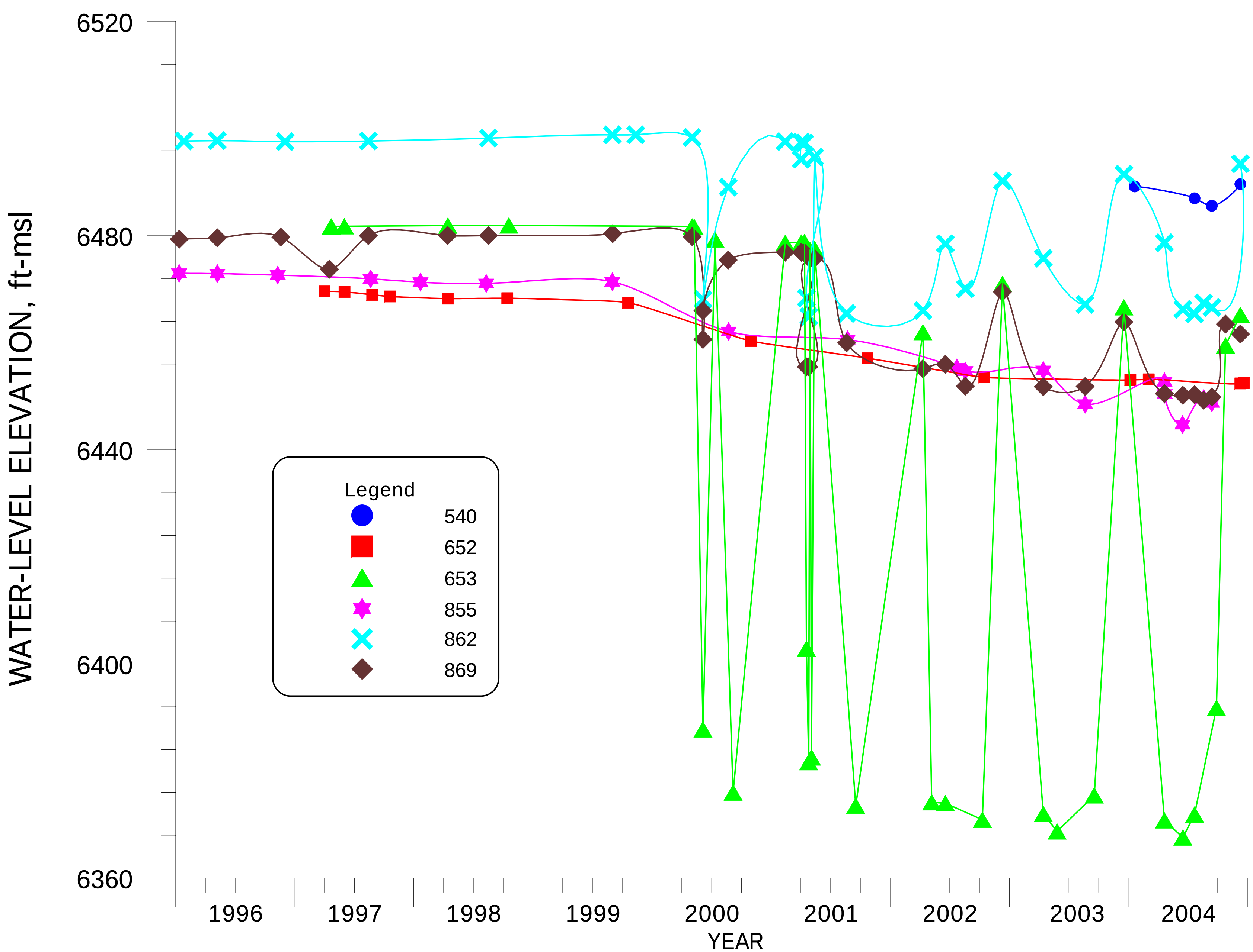


FIGURE 4.2-15. WATER-LEVEL ELEVATION FOR WELLS 540, 652, 653, 855, 862 AND 869.

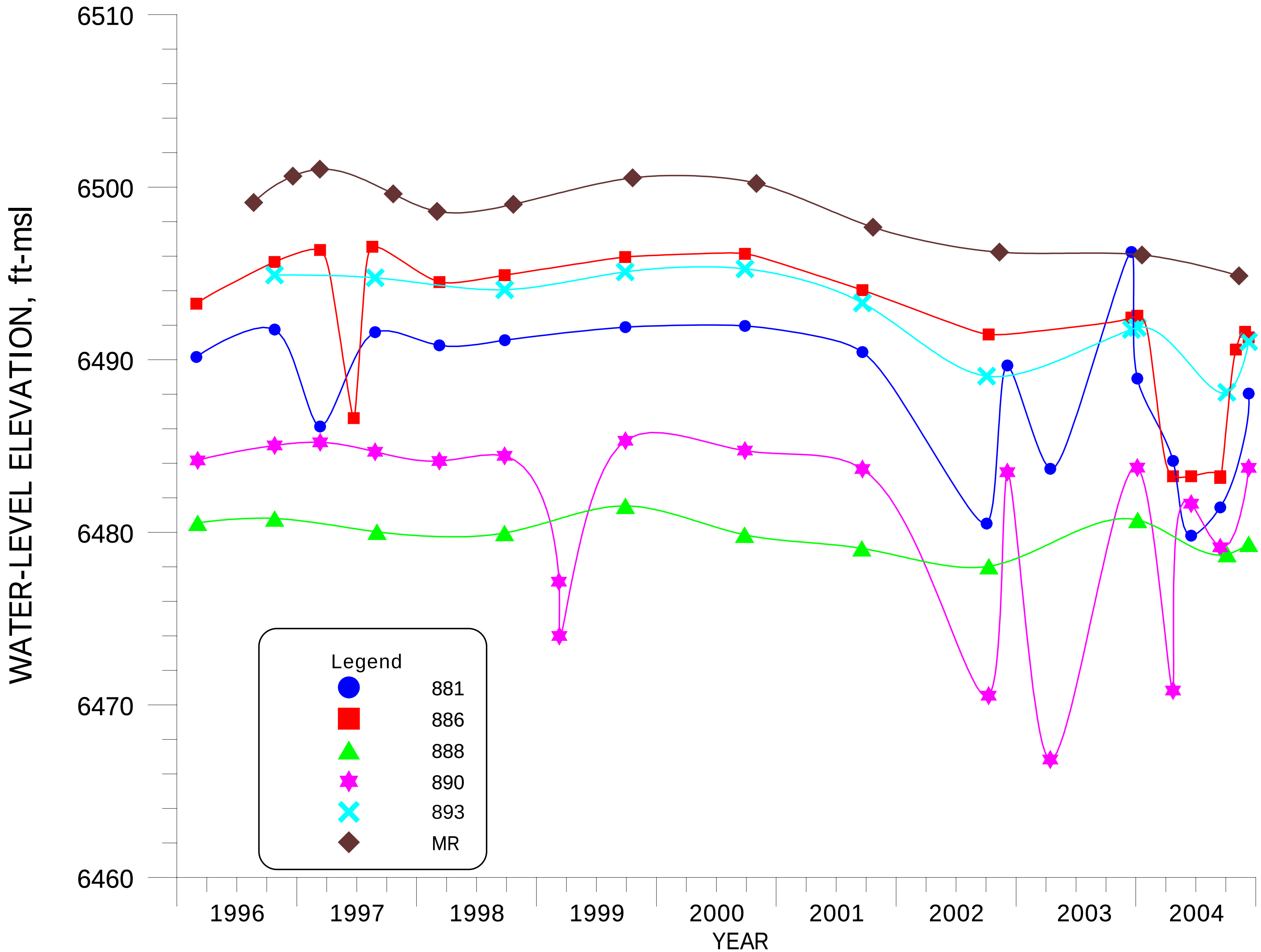


FIGURE 4.2-16. WATER-LEVEL ELEVATION FOR WELLS 881, 886, 888, 890, 893 AND MR.

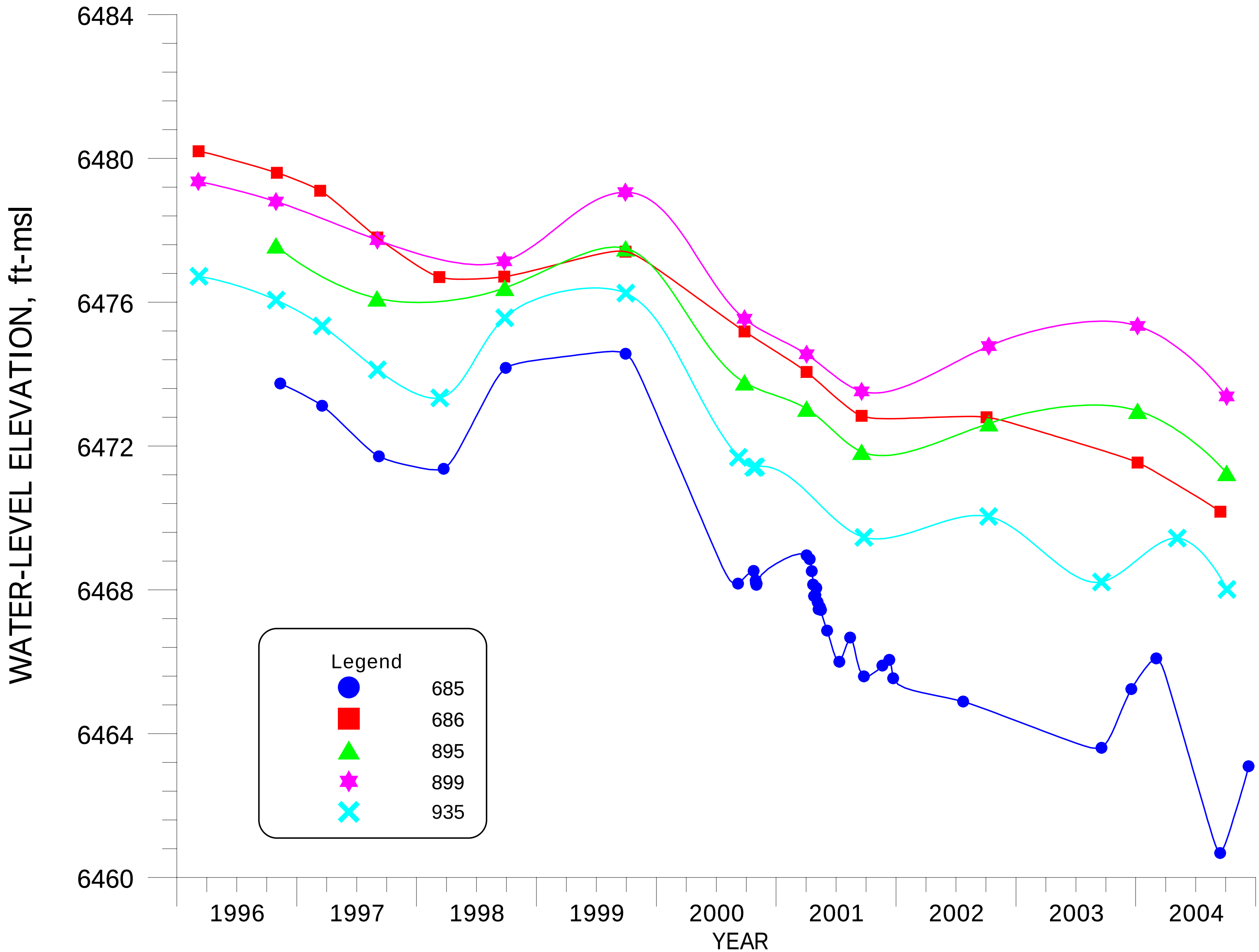


FIGURE 4.2-17. WATER-LEVEL ELEVATION FOR WELLS 685, 686, 895, 899 AND 935.

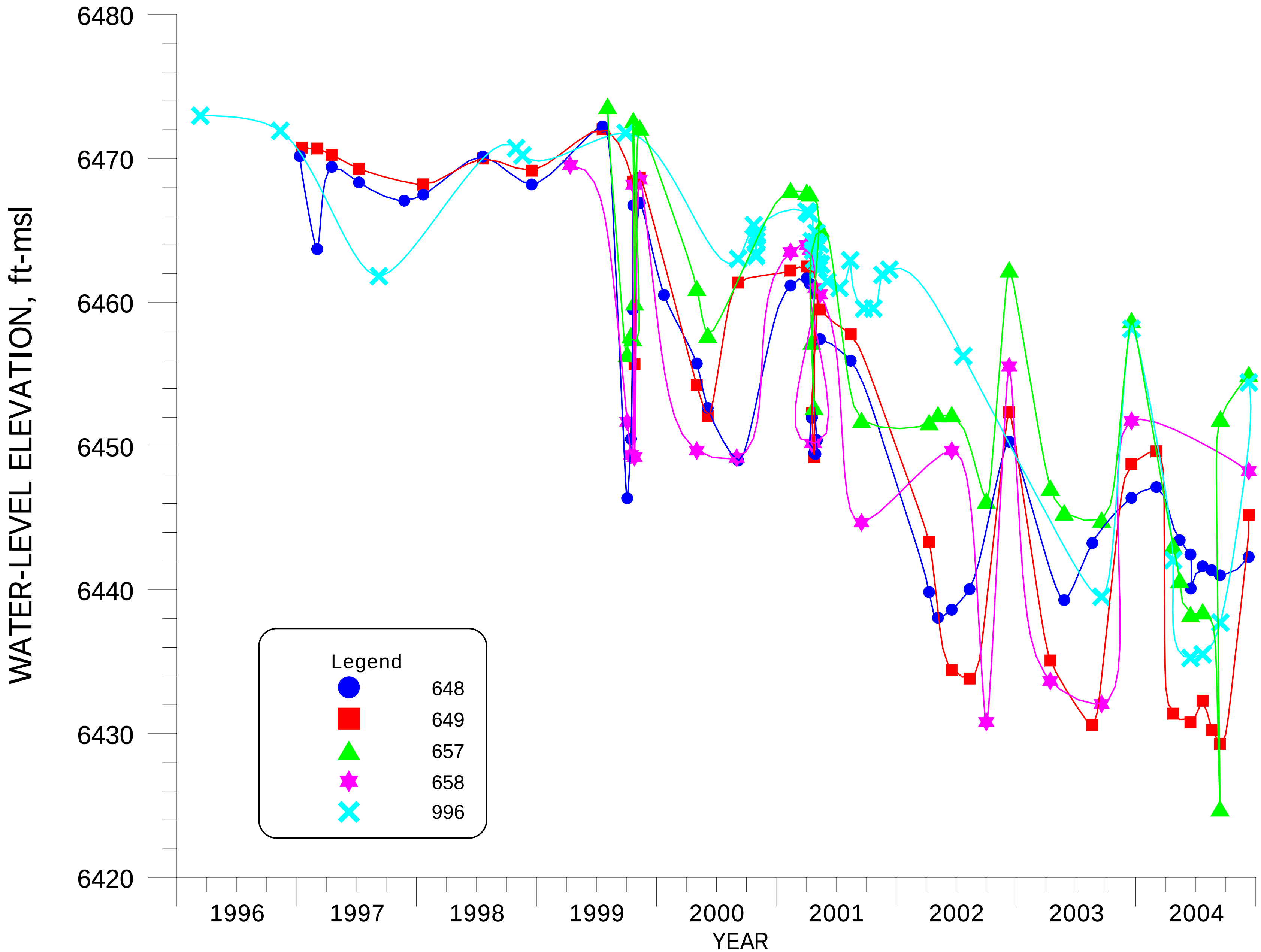


FIGURE 4.2-18. WATER-LEVEL ELEVATION FOR WELLS 648, 649, 657, 658 AND 996.

4.3 ALLUVIAL WATER QUALITY

This section presents the 2004 water-quality data for the alluvial aquifer. The major constituents that are typically measured at this site are sulfate, chloride and TDS. Sulfate concentrations are used as the primary indicator of contaminant remediation. Selenium, uranium and molybdenum are the metals of concern at this site. Nitrate, radium, chromium, vanadium and thorium are also discussed in the monitoring report, but these constituents are of only minor concern at the Grants site. Tables B.4-1 through B.4-6 in Appendix B present the 2004 alluvial water-quality data for each well. The most recent monitoring values were used for the concentration contour figures presented in this section.

Colored patterns are used on the figures to delineate where concentration limits exceed the proposed full range of background water quality for each of the constituents.

4.3.1 SULFATE - ALLUVIAL

Sulfate has been used as the primary indicator constituent for this site, because concentrations are large in the tailings solution. Concentrations of sulfate in the alluvial aquifer for 2004 are presented on Figure 4.3-1. Background concentrations observed in 2004 ranged from 398 to 1600 mg/l. The proposed standard is presented in the legend of the respective figure for each parameter. A greater than sign was added in front of the numeric value to note that the pattern shows where the standard is exceeded. An updated statistical evaluation of the background sulfate concentration with data through 1998 showed that concentrations as great as 1870 mg/l could occur naturally at this site and is, therefore, the proposed site standard. Areas where sulfate concentrations exceed 1870 mg/l are shown with a green pattern. Areas where the upper background concentration of 1870 mg/l is exceeded are near the two tailings piles and are indicated by the green shading on Figure 4.3-1. Sulfate concentrations in these small areas underlying the Large Tailings Pile still locally exceed 10,000 mg/l. A significant reduction in sulfate concentration was achieved along the restoration zone, near the Small Tailings Pile, in 2004. The observed sulfate concentrations in Broadview Acres and Felice Acres were less than 1000 mg/l in 2004, except for a value of 1530 mg/l measured in a water sample collected from well SUB3. Sulfate concentrations were fairly stable in Section 3 in 2004. Sulfate concentrations exceeded 1000 mg/l in the southwest portion of Murray Acres and southern Pleasant Valley Estates. Sulfate concentrations also exceeded 1000 mg/l adjacent to the zero

saturation boundary in the northern portion of Section 27 and extending into Section 28 (see Figure 4.3-1). Down-gradient of the Grants Project site, the sulfate concentrations are all within the natural range of background and, therefore, no water-quality restoration with respect to sulfate is necessary beyond the immediate Grants Project area proximal and underlying the tailings piles.

Plots of constituent concentrations versus time have been prepared for the alluvial aquifer for sulfate, TDS, chloride, uranium, selenium, molybdenum and nitrate. The groupings of wells used for these plots are shown on Figure 4.3-2. The figure numbers for each of the well groupings that correspond with the sulfate concentration versus time plots are indicated. The color and symbol used for each well are the same as those used in the time plots for each constituent. Figure numbers for the time plots of other constituents are not shown on this map; however, it is useful for the other time-concentration plots because the color, symbol and well groupings are consistent.

Figure 4.3-3 presents sulfate concentrations plotted versus time for up-gradient wells DD, ND, P, P3, Q and R. A gradually increasing trend is occurring in the up-gradient wells ND, P, P3 and R. An overall declining trend in sulfate concentration has been observed in well DD during the last few years. The historical values for well P show similar periods of short term increasing values in the alluvial aquifer with the recent increase extending to a higher level. The changes in sulfate concentration in these wells are well within the range previously observed for sulfate in the up-gradient wells. The increases could be due to the influx of ground water with higher sulfate concentrations into this area up-gradient of Homestake's background wells.

Sulfate concentrations in alluvial well S3 were steady in 2004 (see Figure 4.3-4). The sulfate concentrations for well S2 decreased in 2004 after a period of relative stability was observed in 2002 and early 2003. Sulfate concentrations generally increased in wells S4 and S11 in 2004. Concentrations to the north of the Large Tailings Pile at well NC were steady in 2004.

Figure 4.3-5 presents sulfate concentrations plotted versus time for alluvial wells BC, DC, MO, MU and W situated west of the Large Tailings Pile. Sulfate concentrations were fairly stable in alluvial wells BC, MO and MU in 2004, while concentrations increased in well DC after a decline during the previous two years. Concentrations remained low in well W in 2004.

Figure 4.3-6 presents sulfate concentration versus time plots for alluvial wells B, BP, D1 and M5. Overall, sulfate concentrations in each of these wells were fairly steady in 2004 except for an increase in values from well D1 samples.

Figure 4.3-7 presents time plots of sulfate concentrations for wells B11, DZ, SQ, T and TA. The sulfate concentrations in collection wells B11 and SQ have shown an overall decrease during 2004. Sulfate concentrations in well DZ were fairly steady in 2004. Concentrations in wells T and TA have decreased to low levels, which indicates the influence of the R.O. product injection.

Figure 4.3-8 presents plots of sulfate concentration versus time for alluvial wells on the west side of the Small Tailings Pile. Sulfate concentrations were relatively stable in wells C2, C9 and C12 in 2004, while concentrations in well C6 decreased.

Figure 4.3-9 presents sulfate concentrations versus time for alluvial wells on the south side of the Small Tailings Pile. Sulfate concentrations in these wells were all small in 2004 as a result of injected R.O. product water flowing toward these wells. R.O. product water injection has reduced sulfate concentrations in wells KF, KZ and X to very low levels over the last 4 years.

Figure 4.3-10 shows the sulfate concentrations for the Small Tailings Pile collection wells K4, K5, K7 and K10. Some increase was observed in well K7 during 2003 with fairly steady 2004 values. The sulfate concentrations declined in well K5 in 2004. Sulfate concentrations were generally steady in wells K4 and K10 following significant declines in previous years.

Time plots of sulfate concentrations in collection wells located southeast of the Small Tailings Pile are presented on Figure 4.3-11. This figure shows a reasonably steady sulfate concentration in 2004 in wells L5, L6, L7, L8, L9 and L10.

Figure 4.3-12 presents sulfate concentration time plots for Broadview Acres alluvial wells GH, SUB1, SUB2 and SUB3. Small variations were observed in wells SUB1, SUB2, SUB3 in 2004, and the observed concentrations are similar to the injection water utilized in the G-Line injection system. Slightly higher values were observed in well SUB3 during the year.

Figure 4.3-13 presents sulfate concentrations versus time for Felice Acres alluvial wells 490, 491, 496 and 497. The sulfate concentrations in these wells were fairly steady in 2004.

Figure 4.3-14 contains time plots of sulfate concentrations for Murray Acres and Pleasant Valley Estates alluvial wells 688, 802, 844, 846 and FB. This plot shows that sulfate concentrations in water taken from alluvial well 846 were steady in 2004 after an increase in 2003. Concentrations were fairly steady in alluvial wells 688, 802 and 844 during 2004.

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

The sulfate concentrations in water from five wells near the Section 28 center pivot irrigation system are presented on Figure 4.3-16. There are no significant trends for sulfate concentration in this area.

Figure 4.3-17 presents sulfate concentrations with time for five wells located to the west of the Section 28 irrigation area. The sulfate concentrations in these wells remained fairly stable during 2004 except for a small decline in well 935. Some of the small changes in sulfate concentrations may be due to the injection of fresh water in wells situated in Sections 28 and 29.

The time variations of sulfate concentrations in water sampled from four irrigation supply wells in Section 33 and a well in the eastern portion of Section 33 are plotted on Figure 4.3-18. Sulfate concentrations in each of these wells were fairly steady in 2004, with a slight decrease noted in well 657.

4.3.2 TOTAL DISSOLVED SOLIDS - ALLUVIAL

Total dissolved solids (TDS) concentration contours for the alluvial aquifer during 2004 are presented on Figure 4.3-19. The alluvial background TDS concentrations measured up-gradient of the Large Tailings Pile in 2004 varied from 1080 to 2740 mg/l. Based on an updated statistical analysis, TDS concentration must exceed 3060 mg/l before it is considered elevated beyond the naturally occurring range. A light green pattern is shown on Figure 4.3-19 to indicate where the TDS concentrations exceed 3060 mg/l. None of the observed concentrations in the west half of this figure exceed this level. The TDS concentrations near the tailings exceed 3060 mg/l for a distance of approximately 800 feet to the west of the Large Tailings Pile. Some TDS concentrations underlying the Large Tailings area exceed 20,000 mg/l. A zone of 2000 mg/l or greater TDS concentration extends to the west of the Large Tailings Pile to the west side of

Section 28 (see Figure 4.3-19) and in the western portion of the alluvial aquifer up-gradient of the site. An additional area of TDS concentrations greater than 2000 mg/l exists in the southern portion of Pleasant Valley Estates and the southwest portion of Murray Acres and to the south and southwest of this area. The only other area of TDS concentrations above 2000 mg/l are small areas in western Broadview Acres and southern Felice Acres. Only the areas closely proximal to the two tailings piles and small areas northeast and south of Pleasant Valley Estates require ground water quality restoration with respect to TDS.

TDS-time concentration plots were developed for the same grouping of wells as those prepared for sulfate (see Figure 4.3-2 for groupings of wells with TDS plots). Figure 4.3-20 presents the TDS concentrations versus time for the up-gradient wells. TDS concentrations have gradually increased in wells ND, P, P3, Q and R over the last few years. A gradual overall decrease in TDS concentrations was previously observed in well DD, and the levels remained fairly steady in 2004.

Figure 4.3-21 presents TDS concentrations plotted versus time for wells NC, S2, S3, S4 and S11. This plot shows steady concentrations in 2004 for well NC. Declines in TDS concentrations are noted in wells S2 and S3 while an overall increase was observed in wells S4 and S11.

TDS concentrations were relatively stable in water collected from wells BC and W during 2004 (see Figure 4.3-22). Increasing concentrations have been observed in 2004 in wells DC and MO, while a decline in concentration occurred in well MU.

TDS concentrations in water sampled from wells B, BP, D1 and M5 are presented in Figure 4.3-23. TDS concentrations were relatively unchanged in 2004 in each of these wells.

Figure 4.3-24 presents TDS concentrations for wells B11, DZ, SQ, T and TA. Low and steady concentrations were observed in wells T and TA in 2004, while decreases were observed in wells B11, DZ and SQ.

Figure 4.3-25 presents time concentration plots for the wells on the west side of the Small Tailings Pile. The concentrations in wells C6 and C12 declined in 2004, while concentrations were mostly unchanged in wells C2 and C9.

TDS concentrations versus time for four wells just south of the Small Tailings Pile are presented in Figure 4.3-26. This figure shows low and steady recent concentrations for wells

KF and KEB. A small increase in TDS concentration was observed in wells KZ and X in 2004 due to fresh water injection reaching these wells.

Figure 4.3-27 presents plots of TDS concentrations for four wells on the south side of the No. 1 Evaporation Pond on top of the Small Tailings Pile. Samples from these alluvial wells have shown reduced TDS concentrations in recent years, except for wells K7 and K10, in which an overall increase was noted in 2004. The TDS concentrations were steady in wells K4 and K5 in 2004.

TDS concentrations in water taken from the L line of wells are presented in Figure 4.3-28. TDS concentrations are gradually decreasing with time in each of the wells.

Figure 4.3-29 presents the TDS concentrations versus time for the Broadview Acres wells. This plot shows fairly steady TDS concentrations in 2004.

The TDS concentrations in the Felice Acres alluvial wells also were steady in 2004 (see Figure 4.3-30). A small decline was observed in well 496.

TDS concentrations for the Murray Acres and Pleasant Valley Estates alluvial wells are presented in Figure 4.3-31. A gradual increasing trend in concentrations has been observed in well 846. The TDS concentration in water sampled from well 844 was fairly steady in 2004 after a period of increasing concentration in 2002. The TDS concentrations in the other three wells have remained relatively unchanged.

Figure 4.3-32 presents time plots of TDS concentrations for five wells located in Section 3. Overall, TDS concentrations have been relatively steady over the last few years. The TDS concentrations for the Section 28 irrigation supply and monitoring wells were also stable in 2004 (see Figure 4.3-33).

TDS concentrations in alluvial wells in Section 29 and adjacent areas are presented on Figure 4.3-34. TDS concentrations in these wells in 2004 were fairly steady. Figure 4.3-35 presents TDS concentrations in the Section 33 alluvial wells. This plot shows fairly steady concentrations in the Section 33 wells in 2004.

4.3.3 CHLORIDE - ALLUVIAL

Chloride concentration is another important indicator of tailings seepage because of the conservative nature of this constituent and the fact that up-gradient concentrations are low. Chloride concentrations measured during 2004 in the alluvial aquifer near the tailings are presented on Figure 4.3-36. Up-gradient chloride concentrations in the alluvial aquifer varied from 38 to 124 mg/l in 2004. The fresh-water injection systems have used water with chloride concentrations of approximately 200 mg/l, whereas the R.O. product chloride concentration is less than 10 mg/l. The alluvial aquifer around and underlying the Large and Small Tailings Piles contains chloride concentrations in excess of the State drinking water standard of 250 mg/l. Measurement of chloride concentration in ground water is useful in defining areas where the R.O. product water has migrated in the alluvial aquifer. A light green pattern on Figure 4.3-36 is used to illustrate where concentrations exceed 250 mg/l. The limited areal extent of the green pattern on this figure shows that the need for ground water-quality restoration with respect to chloride is limited to the immediate area of the tailings. Chloride concentrations in the alluvial water in the western half of Figure 4.3-36 have never exceeded 250 mg/l and, therefore, chloride concentrations are not typically measured in all of the wells in the west area. However, chloride concentrations were measured in samples collected from most of these wells in 2004.

Figure 4.3-37 presents chloride concentrations versus time for the six up-gradient wells. Analysis of the data on this figure shows a decline in chloride concentrations in 2004 in wells DD, ND, R and Q. A small increase in the chloride concentration was observed in well P and P3 in 2004.

Figure 4.3-38 presents time plots of chloride concentration for wells NC, S2, S3, S4 and S11. A fairly steady chloride level was measured in well S3 in 2004. The 2004 chloride concentrations in wells S4 and S11 were greater than 2003 values.

Chloride concentrations in well BC remained low in 2004, while a gradual increase in chloride concentrations was observed in wells MU and W (see Figure 4.3-39).

Plots of chloride concentration for wells B, BP, D1 and M5 are presented on Figure 4.3-40. The chloride concentration in each of these wells is similar to the fresh water injection concentration.

Chloride concentrations in wells B11, DZ, SQ, T and TA are presented on Figure 4.3-41. Chloride concentrations in wells B11, DZ and SQ have exhibited significant variation but

have generally declined over the last few years. Chloride concentrations in samples from wells T and TA were small in 2004.

Chloride concentrations in alluvial wells on the west side of the Small Tailings Pile are presented on Figure 4.3-42. This figure shows stable chloride concentrations in well C6, while a small reduction is noted in wells C9 and C12.

All of the chloride concentrations on the south side of the Small Tailings Pile remained very low in 2004 except for a temporary fluctuation in well X. This reflects the changes from fresh water to R.O. product water injection in this area (see Figure 4.3-43). The chloride concentrations in water from the K wells (see Figure 4.3-44) have been steady and low in 2004.

The chloride concentrations in water collected from the L line wells are presented in Figure 4.3-45. Since the 2003 measurements, chloride concentrations have generally decreased in these wells. With respect to chloride concentration, the quality of water has been restored in the vicinity of the L wells, and measured concentrations reflect a mixture of the R.O. product and fresh water injection.

Figure 4.3-46 presents time plots of chloride concentrations in the Broadview Acres wells with the concentrations very similar to the fresh water chloride concentration.

Figure 4.3-47 presents the chloride concentration-time plots for the four Felice Acres wells. The 2004 chloride concentrations are fairly similar to previous chloride concentrations.

Chloride concentration plots for the Murray Acres and Pleasant Valley Estates wells are presented on Figure 4.3-48. Chloride concentrations are very similar to the fresh water injection concentration with an attendant increase in concentration for well 846.

The plots of chloride concentration versus time in Section 3 wells are presented on Figure 4.3-49. Chloride concentrations were slightly higher in 2004 in wells 862 and 869.

Figure 4.3-50 presents plots of the variation of chloride concentrations with time in Section 28 wells. A small decline in chloride concentration was observed in wells 890, 893 and MR in 2004.

Chloride concentrations in the Section 29 monitoring wells are presented on Figure 4.3-51. It is anticipated that chloride concentrations in samples from these wells will decrease with time because of the nearby injection of fresh water with a lower chloride concentration.

The water in injection supply well 951 typically has a chloride concentration of approximately 50 mg/l.

Figure 4.3-52 presents time plots of chloride concentrations in the Section 33 wells. The 2004 chloride concentrations for these wells are fairly similar to those measured prior to 2004.

4.3.4 URANIUM - ALLUVIAL

Uranium is considered an important ground water constituent at this site due to the significant levels in the tailings seepage. Uranium data and contours for 2004 are presented on Figure 4.3-53. Background uranium concentrations during 2004 varied from 0.0008 to 0.21 mg/l, and the proposed NRC alluvial site standard is 0.15 mg/l. The light green pattern on Figure 4.3-53 shows where uranium concentrations exceed 0.15 mg/l, the statistical upper range of background from previous statistical analysis through 1998 data.

Uranium concentrations exceed background in the area of the Large and Small Tailings Piles, and to the west extending to the western portion of Section 28. Uranium concentrations in Sections 28 and 29 also reflect a contribution from the Rio San Jose alluvial system in Section 20, but these levels have decreased to less than 0.15 mg/l. The zones of moderately elevated concentrations join together and the combined area extends down-gradient approximately one-half mile into Section 33. Uranium concentrations greater than 0.15 mg/l are also present near the L collection wells south of the Small Tailings Pile. Uranium concentrations in the L wells were significantly reduced over those observed last year.

An additional area where uranium concentrations in the alluvium are greater than 0.15 mg/l exists in Felice Acres and to the southwest into Section 3 (see Figure 4.3-53). The area of elevated concentrations extends for approximately one-half mile to the southwest of the southwest corner of Felice Acres. Uranium concentrations in this area were generally reduced in 2004. The uranium concentrations in another small area in the northeast portion of Murray Acres at wells 802 and AW exceed 0.15 mg/l. Additional restoration is needed in each of these areas with respect to uranium concentrations.

Uranium concentration plots were prepared in order to illustrate changes that result from the corrective action program and other factors. Figure 4.3-2 shows the grouping and location of the alluvial wells used for the uranium-time plots. The figure numbers shown on

Figure 4.3-2 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 those used on the sulfate plots.

Figure 4.3-54 presents uranium concentrations plotted versus time for up-gradient wells DD, ND, P, P3, Q and R. The uranium concentrations in these wells have been fairly steady during the last few years except for a gradual increase in well DD. The proposed NRC site standard is shown in the legend on Figure 4.3-53.

A decrease in uranium concentrations was observed in 2004 for wells S2 and S3 (see Figure 4.3-55). Uranium concentrations remained low in well NC and exhibited a general increase in wells S4 and S11.

Figure 4.3-56 presents the uranium concentration time plots for alluvial wells west of the Large Tailings Pile. Uranium concentrations are low with a modest gradual increase in wells BC and MO in 2004. Concentrations were also low in wells DC, MU and W.

Figure 4.3-57 presents time plots of uranium concentrations for alluvial wells B, BP, D1 and M5. Relatively stable uranium concentrations were observed in well B in 2004. Uranium concentrations generally decreased in the year 2004 samples from wells BP and M5 and were steady in well D1.

Plots of uranium concentration versus time are presented on Figure 4.3-58 for alluvial wells B11, DZ, SQ, T and TA. In general, concentrations in collection wells B11, DZ and SQ decreased in 2004. Small concentrations were observed in water from wells T and TA during 2004.

Figure 4.3-59 presents plots of uranium concentration versus time for collection wells on the west side of the Small Tailings Pile. Uranium concentrations in collection wells C6, C9 and C12 are gradually declining. Uranium concentrations remained low in well C2 during 2004.

Figure 4.3-60 presents uranium concentrations for wells on the south side of the Small Tailings Pile. Uranium concentrations are low in each of these wells, due to the injection of R.O. product water into this area.

Uranium concentrations in wells K4, K5 and K10 were steady or gradually increased in 2004 (see Figure 4.3-61). A slightly increasing trend was observed in collection well K7.

Uranium concentrations in water from alluvial wells L5, L6, L7, L8, L9 and L10 are presented on Figure 4.3-62. Uranium concentrations decreased in 2004 in all of these wells.

Figure 4.3-63 presents uranium concentrations versus time for four Broadview Acres alluvial wells: GH, SUB1, SUB2 and SUB3. Uranium concentrations in wells SUB1 and SUB2 gradually declined in 2004. Uranium concentrations to the north in wells GH and SUB3 have been small for several years.

Figure 4.3-64 presents the uranium concentration time plots for Felice Acres wells 490, 491, 496 and 497. Uranium concentrations in alluvial wells 490 and 491 have been fairly stable during the last few years, while a gradually decreasing trend has been observed in well 496. A small increase in concentration was observed in well 497 in 2004.

Figure 4.3-65 presents uranium concentrations for wells in the Murray Acres and Pleasant Valley Estates subdivision areas. Uranium concentrations gradually declined in well 802 in 2004 and are expected to continue to gradually decrease with time. Uranium concentrations in the remainder of the wells in this area are low.

The uranium concentrations for five wells in Section 3 southwest of Felice Acres are plotted on Figure 4.3-66. The uranium concentrations in the two western wells 631 and 855 have been low throughout the period of record. Uranium concentrations are gradually increasing in well 862 but this trend is expected to be reversed as a result of fresh water injection in this area. The concentration at the leading edge of the uranium plume, as demonstrated by the values measured in wells 653 and 869, was fairly steady in 2004.

Uranium concentrations from four Section 28 wells and one western Section 27 well are plotted on Figure 4.3-67. Relatively steady concentrations were observed in these wells in 2004 with a small increase in well MR over the last two years.

Uranium concentration time plots for wells in the eastern area of Section 29 are presented on Figure 4.3-68. The uranium concentrations to the north of Section 29 (well 686) are gradually decreasing with time. Well 686 is located in the Rio San Jose alluvial system up-gradient of its confluence with the San Mateo alluvial system. A gradual decline was also noted in alluvial well 935 in southern Section 29. Concentrations during 2004 also gradually declined in wells 895 and 899. The uranium concentrations in well 687, which is located farther south in the northeast portion of Section 33, also decreased.

Uranium concentrations in wells located in Section 33 are relatively small and are plotted on Figure 4.3-69. Concentrations have remained low with steady low values in wells 648, 649 and 996 during 2004. The concentration in well 657 increased slightly in 2004.

4.3.5 SELENIUM - ALLUVIAL

Selenium is an important constituent at the Grants Project site because, like uranium, it is present in significant concentrations in the tailings water. Figure 4.3-70 presents a map of the spatial distribution of selenium concentrations throughout the site. Although the present NRC selenium site standard is 0.1 mg/l, the upper limit of background based on statistical analysis and the proposed NRC site standard is 0.27 mg/l. Concentrations that exceed 0.27 mg/l are considered indicative of seepage impacts, while smaller concentrations are within the range of natural variation. A green pattern is superimposed on the concentration contour figure to show where concentrations exceed 0.27 mg/l. A 0.1 mg/l selenium concentration contour extends approximately 0.8 miles into Section 28. Selenium concentrations in excess of 0.1 mg/l were measured southwest of Felice Acres in areas of Section 3 to its western border.

Selenium concentrations exceeding 0.27 mg/l were measured in wells around the Large and Small Tailings Piles and extend approximately 900 feet to the west of the Large Tailings Pile and also extend to the south of the Small Tailings Pile in the area near the northern edge of the L collection wells. Concentrations in a small isolated area in central Section 27 also exceed the background level. Selenium concentrations were reduced to below the proposed standard in all of the L collection wells during 2004. Selenium concentrations also slightly exceed 0.27 mg/l in one small area of Section 3, southwest of Felice Acres. None of the selenium concentrations in alluvial wells located in the subdivisions exceeded 0.1 mg/l. This shows that only the area near the tailings and a small area in Section 3 need additional restoration in order to reduce selenium concentration.

Figure 4.3-2 presents the location and grouping of wells for selenium concentration plots. The symbols and colors used on Figure 4.3-2 are the same as those used on each constituent time plot.

Figure 4.3-71 presents plots of selenium concentration versus time for up-gradient wells DD, ND, P, P3, Q and R. There has been an increasing selenium concentration trend in up-gradient well R which is the farthest near-up-gradient well from the tailings. A decrease in the concentration in well R, however, was observed in 2004. A smaller increasing trend or steady concentrations have also been observed in the data for wells Q, ND and P3. Collection of water from up-gradient well P began in 1993. However, the pumping from well P has not been continuous since 1998. Thus, the concentrations of selenium have remained higher in this well.

The selenium concentration in well DD was less than that of other up-gradient wells during 2004.

Figure 4.3-72 shows a decreasing selenium concentration trend in well S2 during 2004. An overall gradually decreasing trend has been observed in well S3 over the last few years. Low, and relatively unchanged concentrations, have been observed in well NC for the last few years. An overall increase in selenium concentration was observed in wells S4 and S11 in 2004.

Figure 4.3-73 presents selenium concentrations for wells BC, DC, MO, MU and W. Selenium concentrations have remained low in all of these wells.

Selenium concentrations in water from alluvial wells located southwest of the Large Tailings Pile are plotted on Figure 4.3-74. This figure shows an overall decrease in selenium concentrations in wells B and BP in 2004. A gradual increasing trend was observed for data from well D1.

Figure 4.3-75 presents plots of selenium concentrations for wells B11, DZ, SQ, T and TA. An overall decreasing trend in selenium was noted for well B11 in 2004, while selenium concentrations in well SQ were steady. Fairly steady selenium concentrations in wells T and TA were also observed during 2004.

The selenium concentrations for collection wells located on the west side of the Small Tailings Pile are plotted on Figure 4.3-76. Selenium concentrations in samples collected from wells C6 and C9 have generally decreased over the last few years. Relatively steady concentrations were observed in wells C2 and C12.

Figure 4.3-77 presents selenium concentrations for wells KEB, KF, KZ and X, which are located on the south side of the Small Tailings Pile. Only small concentrations were measured in water taken from these wells and this is attributed to restoration by injection of R.O. product water in this area.

Selenium concentrations in wells K5, K7 and K10 were fairly steady in 2004 (see Figure 4.3-78). Concentrations in 2004 in collection well K4 increased above the late 2003 level.

Figure 4.3-79 presents selenium concentration for wells L5, L6, L7, L8, L9 and L10. A decreasing trend is indicated by the data for wells L5, L6 and L8. Fairly steady selenium concentrations with time were observed in collection wells L7, L9 and L10 during 2004.

Figures 4.3-80 and 4.3-81 present selenium concentration plots for the Broadview Acres 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.

Selenium concentrations are presented for wells in the Murray Acres and Pleasant Valley Estates areas on Figure 4.3-82. This plot shows continuing low selenium concentrations in monitoring wells in this area of the alluvial aquifer.

Selenium concentrations for five wells in Section 3 are plotted on Figure 4.3-83. Wells 631 and 855 are located in the western portion of Section 3. Selenium concentrations in these two wells were similar to their 2003 values. Concentrations in wells 653 and 862, which are located in the eastern and central portion of Section 3, do not indicate any significant trend with time. A gradual decline was observed in concentrations in well 869.

The selenium concentrations in alluvial water in Section 28 have been fairly steady with time. Figure 4.3-84 presents the selenium concentrations from the Section 28 alluvial wells. A small decline was observed in concentrations in wells 886 and MR in 2004.

Figure 4.3-85 displays selenium concentrations in wells in Section 29 and in wells 686 and 687, which are located to the north and south of Section 29, respectively. Fairly steady and small selenium concentrations were observed in 2004 in these wells.

Selenium concentrations from wells in Section 33 are presented on Figure 4.3-86. The data demonstrated small and steady selenium concentrations in 2004 in these wells.

4.3.6 MOLYBDENUM - ALLUVIAL

This section discusses the molybdenum concentrations in the alluvial aquifer at the Grants Project during 2004. Figure 4.3-87 is a spatial presentation of the concentration data and contours. Molybdenum concentrations in alluvial water in the west area of this figure have typically been less than 0.03 mg/l and, therefore, samples from the western wells are not routinely analyzed for molybdenum. Numerous samples were taken from these wells in 2004 to update the molybdenum database. The movement of molybdenum in the alluvial aquifer is dramatically attenuated in comparison to that of selenium and uranium. Molybdenum concentrations exceed 100 mg/l near the Large Tailings Pile and a 10 mg/l contour extends around most of the Large Tailings Pile and the western portion of the Small Tailings Pile.

The light green pattern on Figure 4.3-87 shows the area where molybdenum concentrations exceed 0.05 mg/l, the proposed NRC site standard. A molybdenum concentration of 0.05 mg/l is considered the threshold of significance for this constituent at this site. Significant molybdenum concentrations extend approximately 900 feet west of the Large Tailings Pile and also to the southeast of the Small Tailings Pile to the L collection wells. Concentrations in two wells in the central portion of Section 27 exceed the proposed molybdenum background level of 0.05 mg/l. Concentrations in two alluvial wells in Felice Acres and one well in Murray Acres slightly exceeded 0.05 mg/l of molybdenum.

Figure 4.3-88 presents molybdenum concentration for the up-gradient wells DD, ND, P, P3, Q and R. Concentrations have remained low in these six wells.

A decreasing trend in molybdenum concentration was observed in wells S2 and S3 in 2004, while overall the molybdenum concentrations in wells S4 and S11 increased (see Figure 4.3-89). Molybdenum concentrations in well NC were small in 2004.

Figure 4.3-90 presents time plots of molybdenum concentration for wells BC, DC, MO, MU and W. Molybdenum concentrations in each of these wells were small and no trend is apparent.

Figure 4.3-91 displays molybdenum concentrations for wells B, BP, D1 and M5. Molybdenum concentrations in well M5 were fairly steady in 2004 after significantly declining prior to 2000. Relatively stable concentrations with time were observed in wells B, BP and D1.

Figure 4.3-92 presents molybdenum concentrations for wells B11, DZ, SQ, T and TA. A sharp decrease in the molybdenum concentration in well B11 was observed in 2004. Molybdenum concentrations in well T were steady in 2004 while concentration in well DZ slightly increased. Molybdenum concentrations in wells SQ and TA declined in 2004.

Molybdenum concentrations in wells on the west side of the Small Tailings Pile are presented on Figure 4.3-93. Large molybdenum concentrations continued to decline in the water in wells C6 and C9 in 2004. Steady concentrations were observed in well C12.

Figure 4.3-94 presents molybdenum concentrations for wells on the south side of the Small Tailings Pile. Small molybdenum concentrations continued to be observed in wells KEB, KF, KZ and X during the last year.

Figure 4.3-95 shows steady molybdenum concentrations in wells K4, K5, K7 and K10 in 2004. Additional restoration of this constituent was not obtained in 2004 in this area.

Figure 4.3-96 presents molybdenum concentrations in wells L5, L6, L7, L8, L9 and L10 which are located further to the southeast of the Small Tailings Pile. Fairly steady concentrations were observed in these wells during 2004.

Molybdenum concentrations in alluvial wells located in Broadview Acres and Felice Acres are plotted on Figures 4.3-97 and 4.3-98, respectively. The molybdenum concentrations in Broadview wells GH, SUB1, SUB2 and SUB3 have been low for the last several years. Slightly higher molybdenum concentrations were measured in wells 490 and 491 in Felice Acres.

Figure 4.3-99 presents the molybdenum concentrations for wells in the Murray Acres and the Pleasant Valley Estates areas. This plot shows that molybdenum concentrations have remained low in these alluvial wells.

Molybdenum concentration plots for the irrigation area wells have been updated. Figures 4.3-100 through 4.3-103 present the molybdenum concentration time plots for the Section 3, Section 28, Section 29 and Section 33 wells, respectively. All of the molybdenum concentrations have remained low in wells located in these areas in 2004. Unusually large molybdenum concentrations observed in wells 631, 648 and 657 for a sampling cycle in early 2003 are considered anomalous because the elevated concentrations occurred within a single sampling cycle in the midst of measured concentrations below the detection level. This updated molybdenum concentration data confirms that migration of molybdenum beyond the tailings area has been very limited.

4.3.7 NITRATE - ALLUVIAL

The presence of relatively large nitrate concentrations up-gradient of the Grants site has resulted in a proposed NRC site standard of 23 mg/l (see Table 3.1-1). A statistical analysis of the up-gradient data through 1998 produced the nitrate concentration of 23 mg/l based on the 95th percentile of background. Figure 4.3-104 presents nitrate concentrations measured in 2004 in the alluvial aquifer. The nitrate concentrations north and up-gradient of the tailings ultimately impact the nitrate concentrations down-gradient of the Large Tailings Pile in the northern portion of Sections 27 and 28. It is difficult to determine whether seepage from the tailings has any significant impact on the nitrate concentrations in this area, because the naturally higher concentrations up-gradient of the Large Tailings Pile makes modestly elevated nitrate concentrations indistinguishable from background. The nitrate concentrations in the northeast

portion of Section 27 did exceed 23 mg/l prior to 2004 but no values exceeded 23 mg/l in 2004. Figure 4.3-104 shows that higher nitrate concentrations exist in Section 20, and the area of elevated concentrations extends into Section 29. This higher measured nitrate concentration in the Rio San Jose alluvial system are up-gradient from the confluence with the San Mateo alluvial system. Therefore, none of the elevated nitrate concentrations in this area can be attributed to Homestake tailings seepage.

Nitrate concentrations exceed 10 mg/l in one well on the south side of the Large Tailings Pile but this value does not exceed 23 mg/l. The water-quality restoration with respect to nitrate is complete. Additional monitoring should confirm that concentrations below background can be maintained and/or reduced further.

Plots of nitrate concentration over time were prepared for the alluvial wells that are listed on Figure 4.3-2. Figure 4.3-105 presents the nitrate concentrations for the background wells. Concentrations in these wells have been relatively stable except for a gradual increasing trend over the last few years in well R.

The nitrate concentrations in wells NC, S2, S3, S4 and S11 are plotted on Figure 4.3-106. This figure shows small and steady concentrations except for the higher levels in wells S4 and S11 in 2004. A decrease in nitrate concentration in well S11 occurred in 2004 while the level in S4 increased.

Figure 4.3-107 presents the nitrate concentrations for wells BC, DC, MO, MU and W. Nitrate concentrations increased in 2004 in these wells except for a significant decrease observed in well MU.

Nitrate concentrations in the group of wells southwest of the Large Tailings Pile are presented as time plots on Figure 4.3-108. All of the concentrations in these wells are fairly steady and small.

Figure 4.3-109 presents nitrate concentrations in wells B11, DZ, SQ, T and TA. Nitrate concentrations were fairly steady in these wells in 2004.

Nitrate concentrations in wells on the west side of the Small Tailings Pile are plotted on Figure 4.3-110. A gradually decreasing trend has occurred in wells C6 and C9 while the level in well C12 increased slightly in 2004.

Figure 4.3-111 shows nitrate concentrations for wells on the south side of the Small Tailings Pile. All of the nitrate concentrations in these wells are low.

The nitrate concentrations in the K and L series wells are presented on Figures 4.3-112 and 4.3-113, respectively. Concentrations in recent samples have been very small in all of these wells.

Nitrate concentrations in the Broadview Acres wells are presented on Figure 4.3-114. Small nitrate concentrations were measured in water from all of these wells. A minor gradual increase in nitrate concentrations has occurred in well SUB1.

Nitrate concentrations for the Felice Acres wells are presented on Figure 4.3-115, with relatively steady concentrations over time.

Nitrate concentrations in Murray Acres and Pleasant Valley Estates wells are presented on Figure 4.3-116. Nitrate concentrations in well 846 are slightly higher than the other four wells shown, but the recent measurements from all four wells show fairly steady concentrations in 2004.

Nitrate concentrations in Section 3 wells are presented on Figure 4.3-117. The nitrate concentrations in these wells were low and relatively stable in 2004.

Nitrate concentrations for the Section 28 wells are presented on Figure 4.3-118. There had been a gradual increasing trend with time for well 886 but a decline was observed in 2004. The nitrate concentrations for the remainder of the wells have been reasonably steady.

Figure 4.3-119 presents nitrate concentrations in wells 686, 687, 895, 899 and 935. The nitrate concentrations have been decreasing over the last few years in each of these wells except for an increase in 2003 and 2004 in well 899.

Nitrate concentrations in the Section 33 wells are presented on Figure 4.3-120, and, in these wells, nitrate concentrations were steady in 2004 except for a small increase in well 657.

4.3.8 RADIUM-226 AND RADIUM-228 - ALLUVIAL

Figure 4.3-121 presents radium concentrations for the alluvial ground water in the Grants Project area. Radium concentrations are very small in the alluvial aquifer except directly underneath the Large Tailings Pile. The monitoring program for radium has been scaled back, because radium is not present in significant concentrations in the alluvial aquifer. The radium-226 concentrations are printed horizontally in black, while the radium-228 values are shown at a 45^{o} angle and in magenta. The State standard for radium-226 plus radium-228 is 30 pCi/l, while the existing and proposed NRC site standard is 5 pCi/l. Measured activities of radium-226 in

alluvial wells beneath the Large Tailings Pile exceed 100 pCi/l in some areas and therefore exceeded the existing and proposed NRC site standard in 2004. This data shows that radium-228 is not important even beneath the Large Tailings Pile at this site. No radium concentrations outside of the Large Tailings Pile area are in exceedance of the existing and proposed standards. Past data has shown that radium is not mobile in the alluvial aquifer at this site.

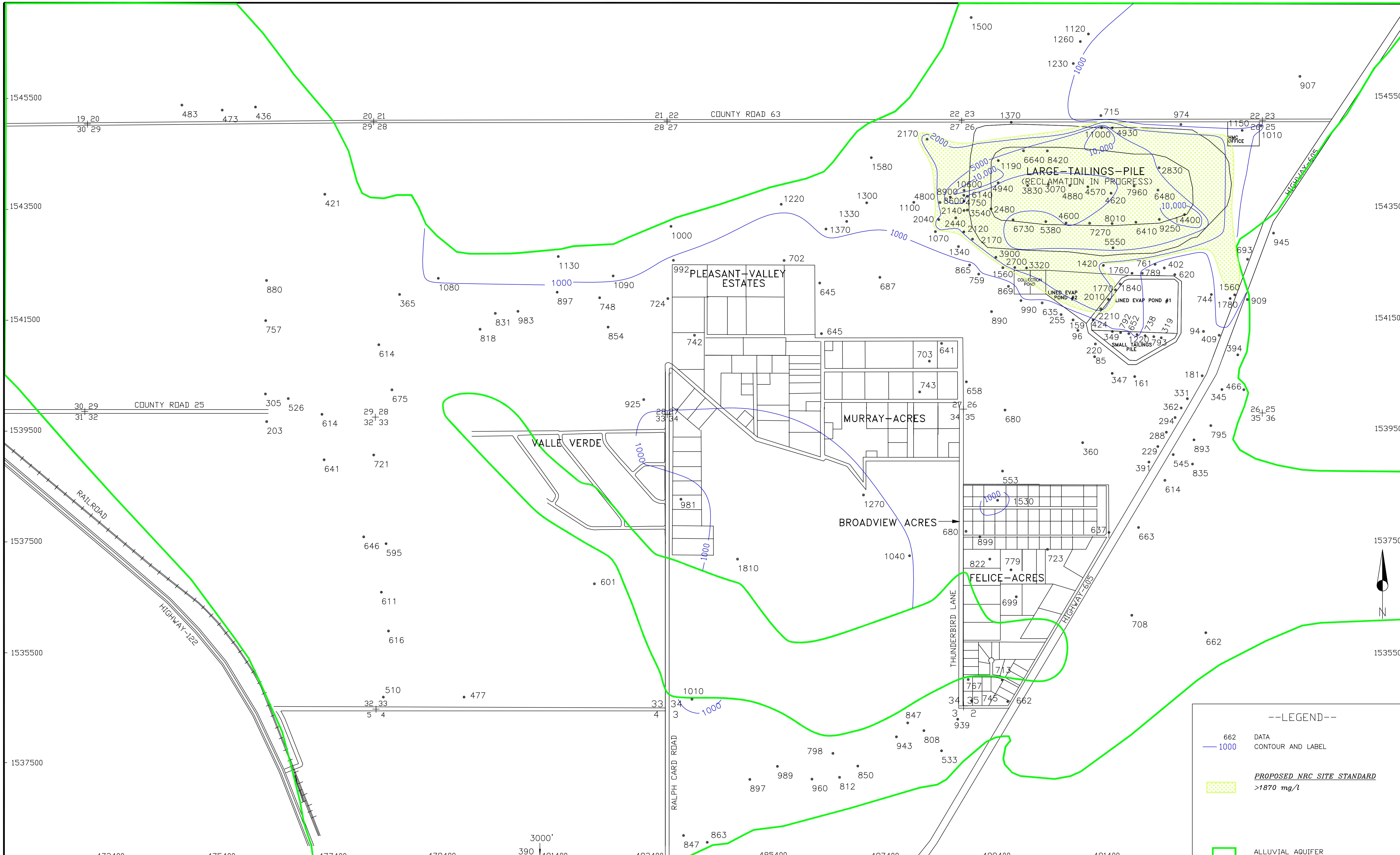
4.3.9 VANADIUM - ALLUVIAL

Vanadium concentrations measured in 2004 are shown on Figure 4.3-122. None of the vanadium concentrations in the POC wells exceeded the existing site standard of 0.02 mg/l. This level (0.02 mg/l) is also the current proposed site standard. POC well X was the only POC well that routinely contained a vanadium concentration above the site standard prior to restoration of that area. Therefore, none of the POC wells are expected to contain vanadium concentrations above the existing and proposed site standard of 0.02 mg/l in the future. Injection of R.O. product water has effectively restored ground water quality in the area near well X. Vanadium concentrations in eight alluvial wells located within the footprint of the Large Tailings Pile were above the present and proposed site standard for vanadium. The ongoing corrective action program will restore the water quality in this area.

4.3.10 THORIUM-230 - ALLUVIAL

Figure 4.3-123 presents the 2004 thorium-230 concentrations in the alluvial aquifer. Thorium-230 concentrations are low at this site. The very low site standard of 0.3 pCi/l was established to reflect the low background concentrations. The thorium-230 activity is significant in some of the alluvial wells underneath the Large Tailings Pile. Thorium-230 has not been mobile in the alluvial aquifer except in the immediate vicinity of the tailings. The existing and proposed site standard for thorium-230 was exceeded in 2004 in ten wells in the alluvial aquifer underneath the Large Tailings Pile. This area is within the collection area, and additional restoration will result from the ongoing collection/injection programs. Also, activities in wells X, 846 and 541 slightly exceeded the standard in 2004 with a value of 0.4 pCi/l. These minor exceedances are thought to be a result of laboratory variation at activities near the detection limit. The annual measurements of thorium-230 in well X have not exceeded 0.3 pCi/l since 1998 until

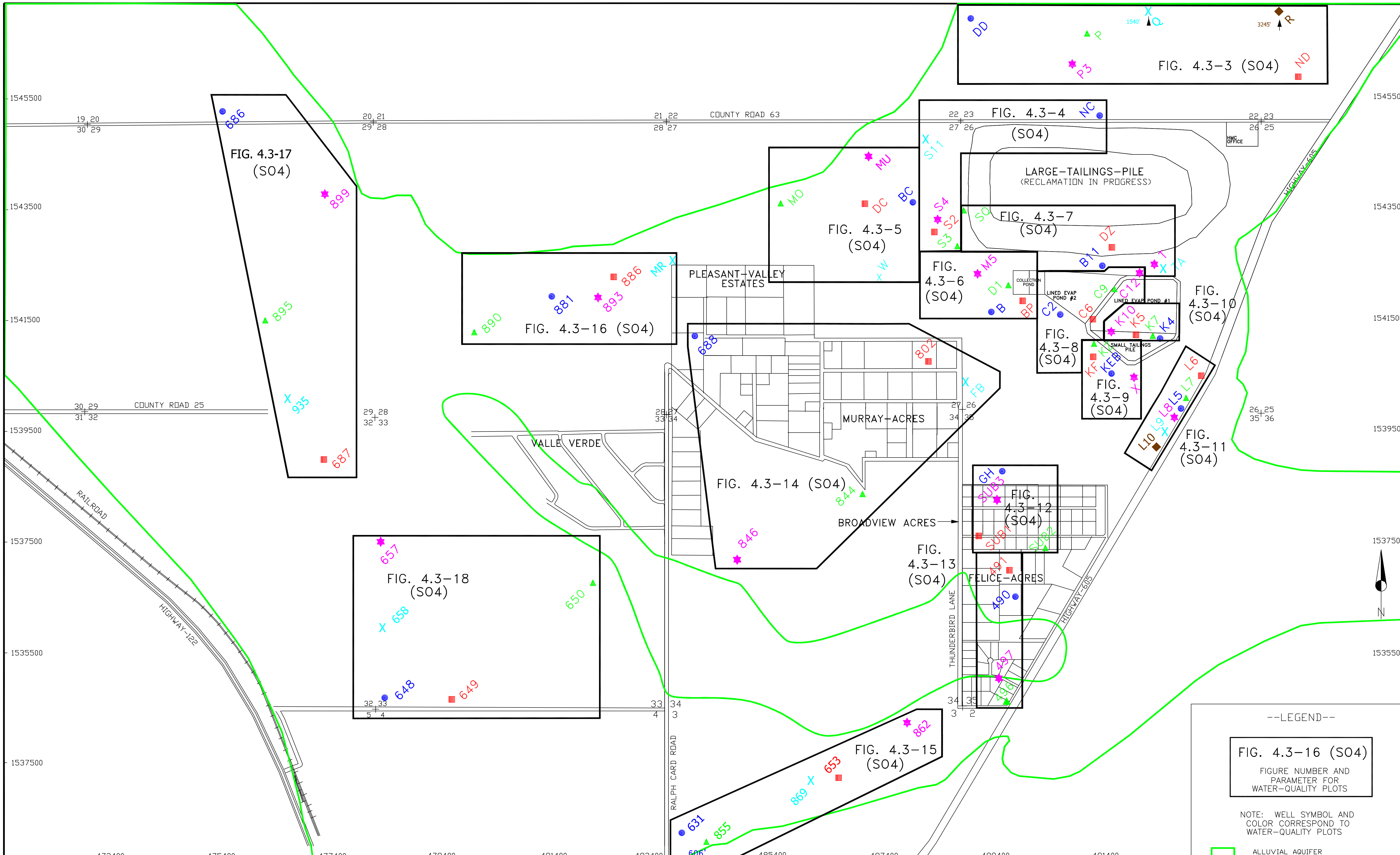
the single measurement in 2004. Therefore, no significance should be given these three slightly higher values.



SCALE: 1"=1600'
C:\PROJECTS\2004-06\C-QAL04
DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-1. SULFATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, mg/l



SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

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

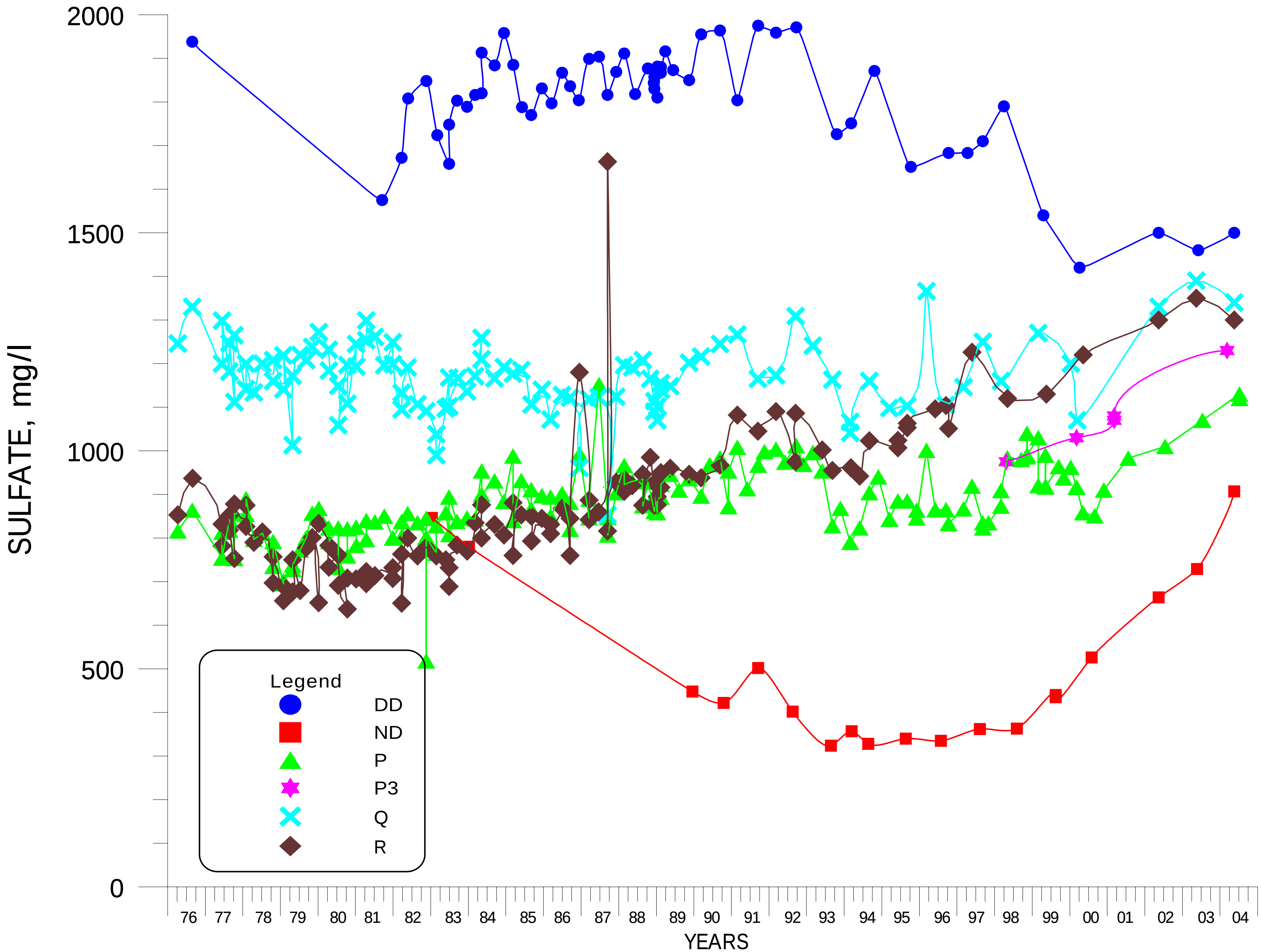


FIGURE 4.3-3. SULFATE CONCENTRATIONS FOR WELLS DD, ND, P, P3, Q AND R.

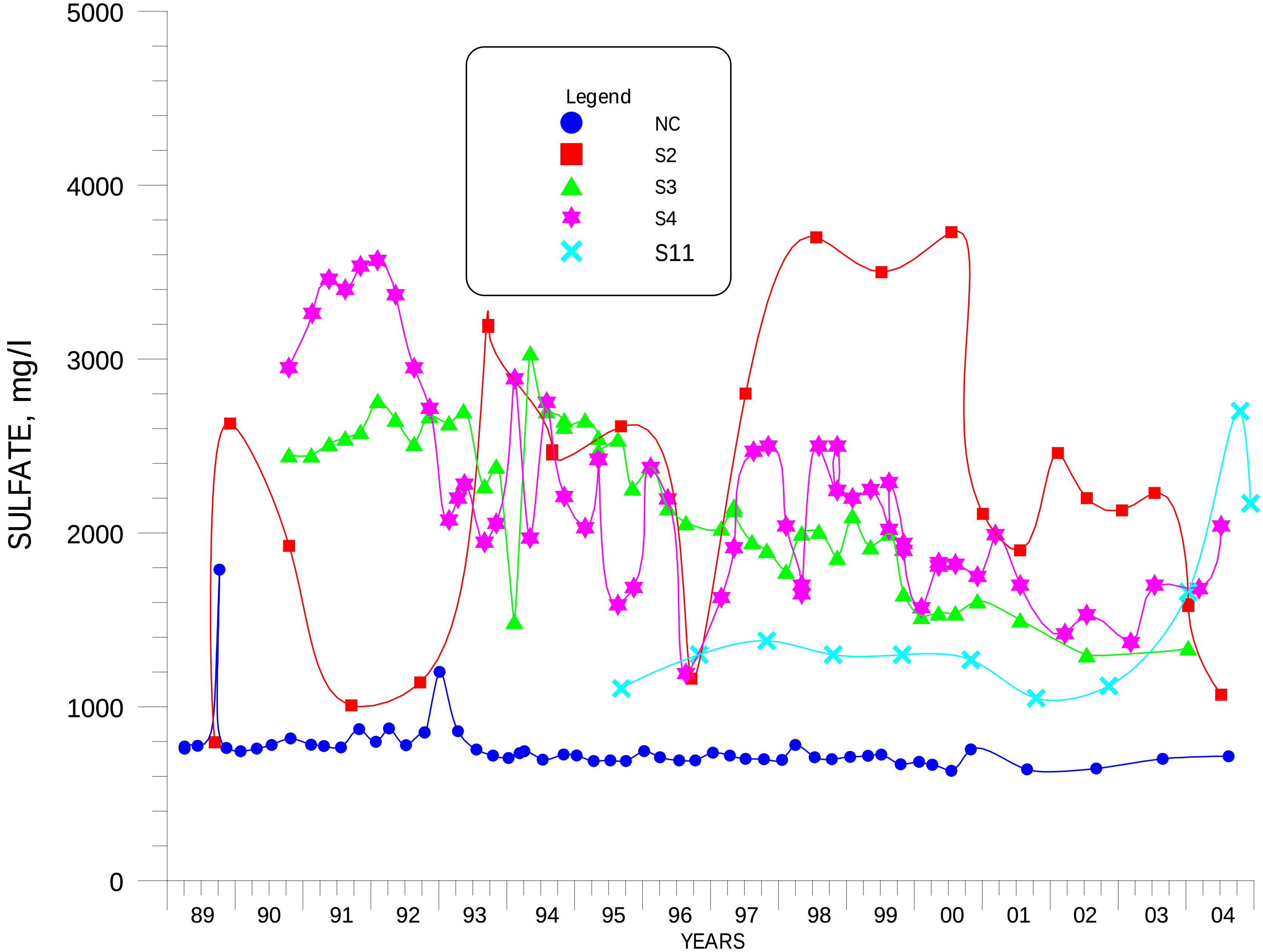


FIGURE 4.3-4. SULFATE CONCENTRATIONS FOR WELLS NC, S2, S3, S4 AND S11.

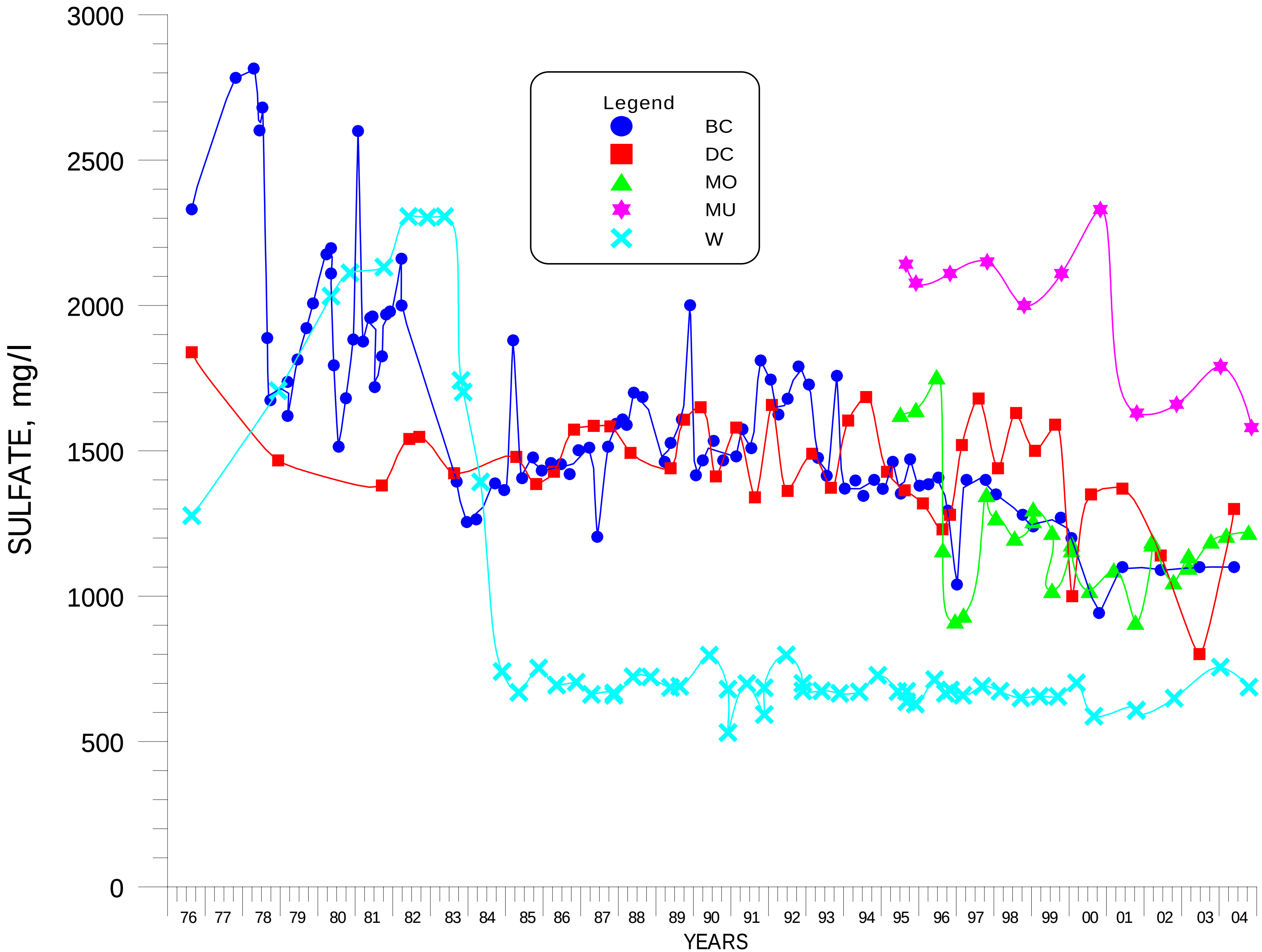


FIGURE 4.3-5. SULFATE CONCENTRATIONS FOR WELLS BC, DC, MO, MU AND W.

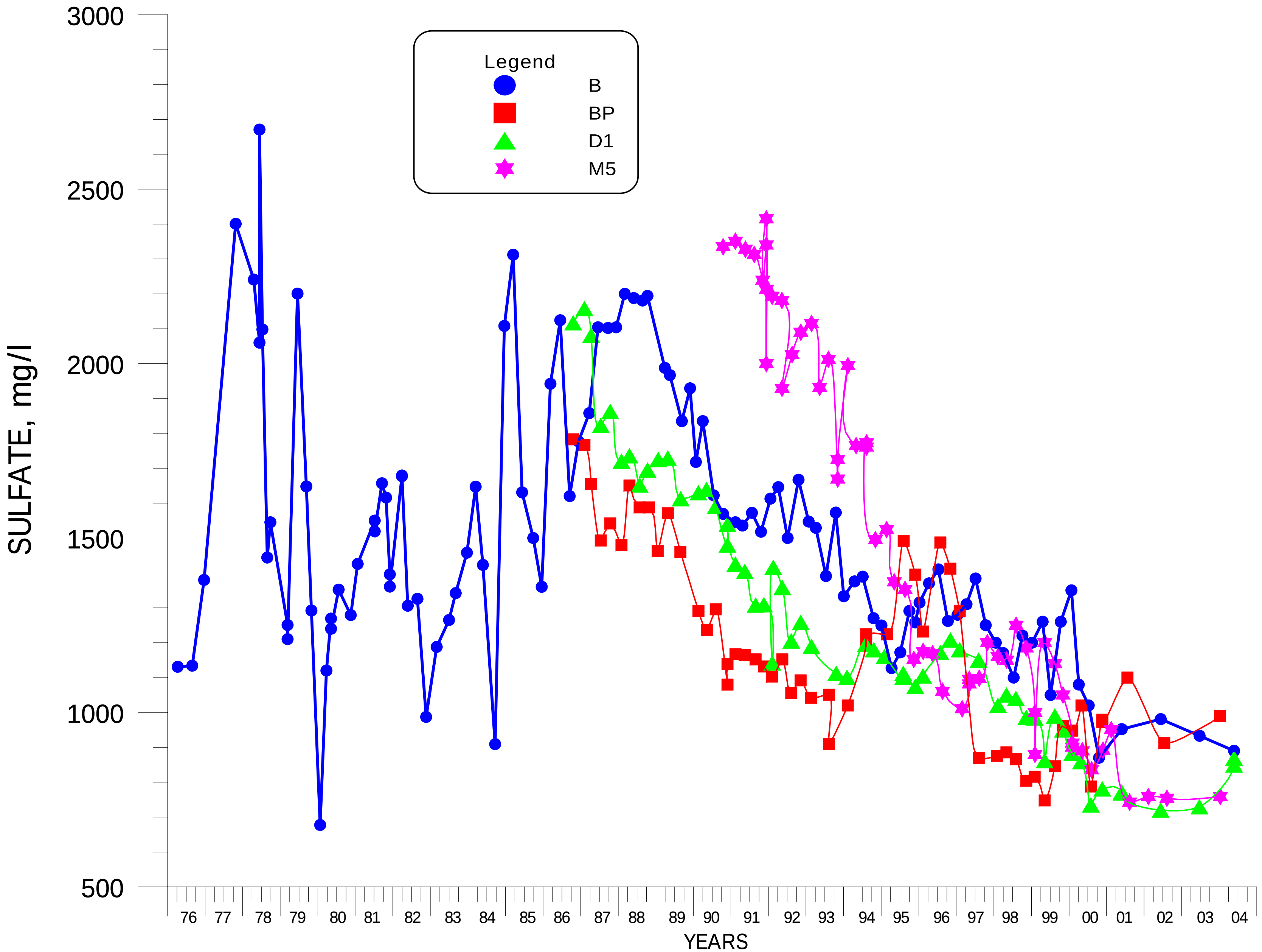


FIGURE 4.3-6. SULFATE CONCENTRATIONS FOR WELLS B, BP, D1 AND M5.

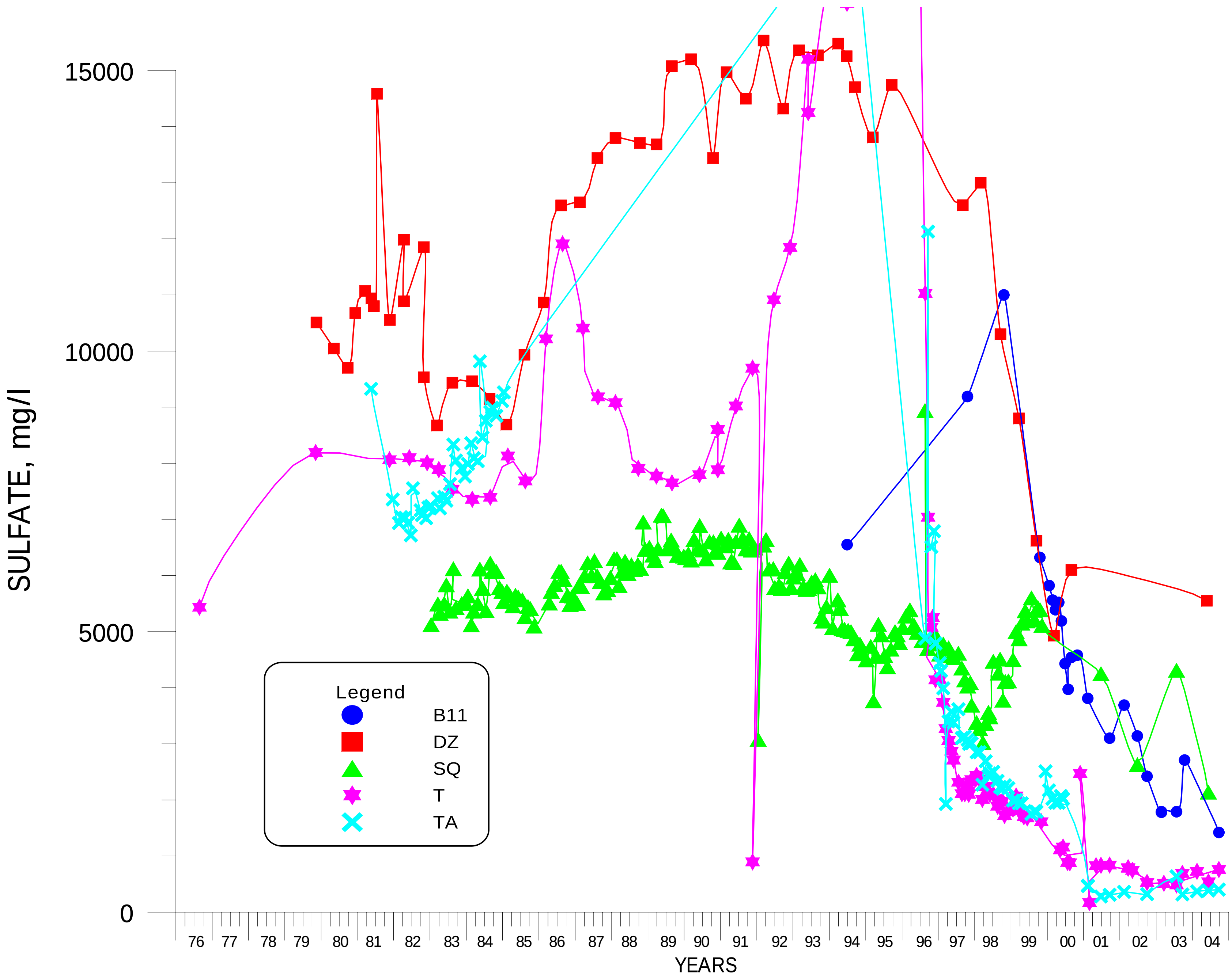


FIGURE 4.3-7. SULFATE CONCENTRATIONS FOR WELLS B11, DZ, SQ, T AND TA.

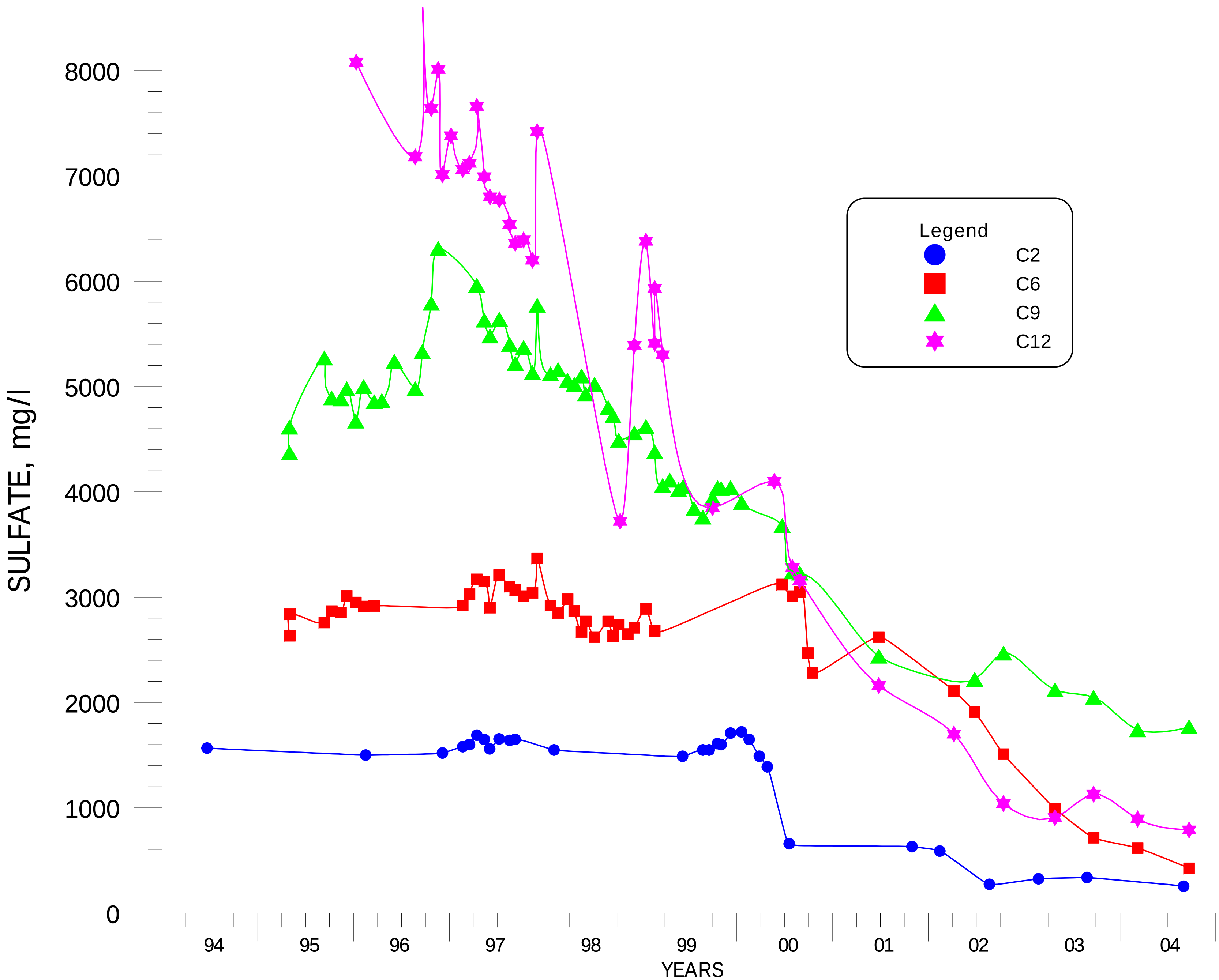


FIGURE 4.3-8. SULFATE CONCENTRATIONS FOR WELLS C2, C6, C9 AND C12.

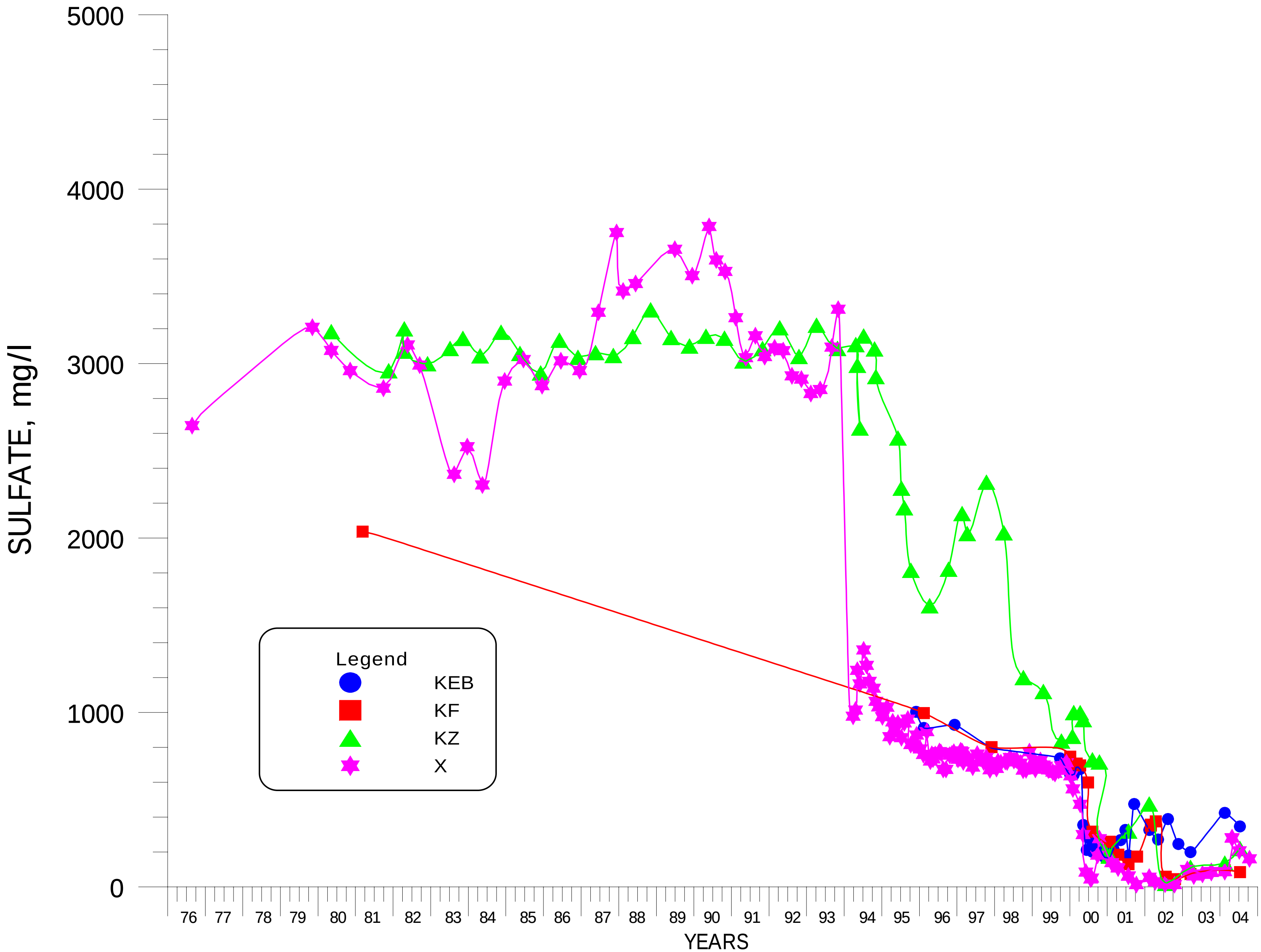


FIGURE 4.3-9. SULFATE CONCENTRATIONS FOR WELLS KEB, KF, KZ AND X.

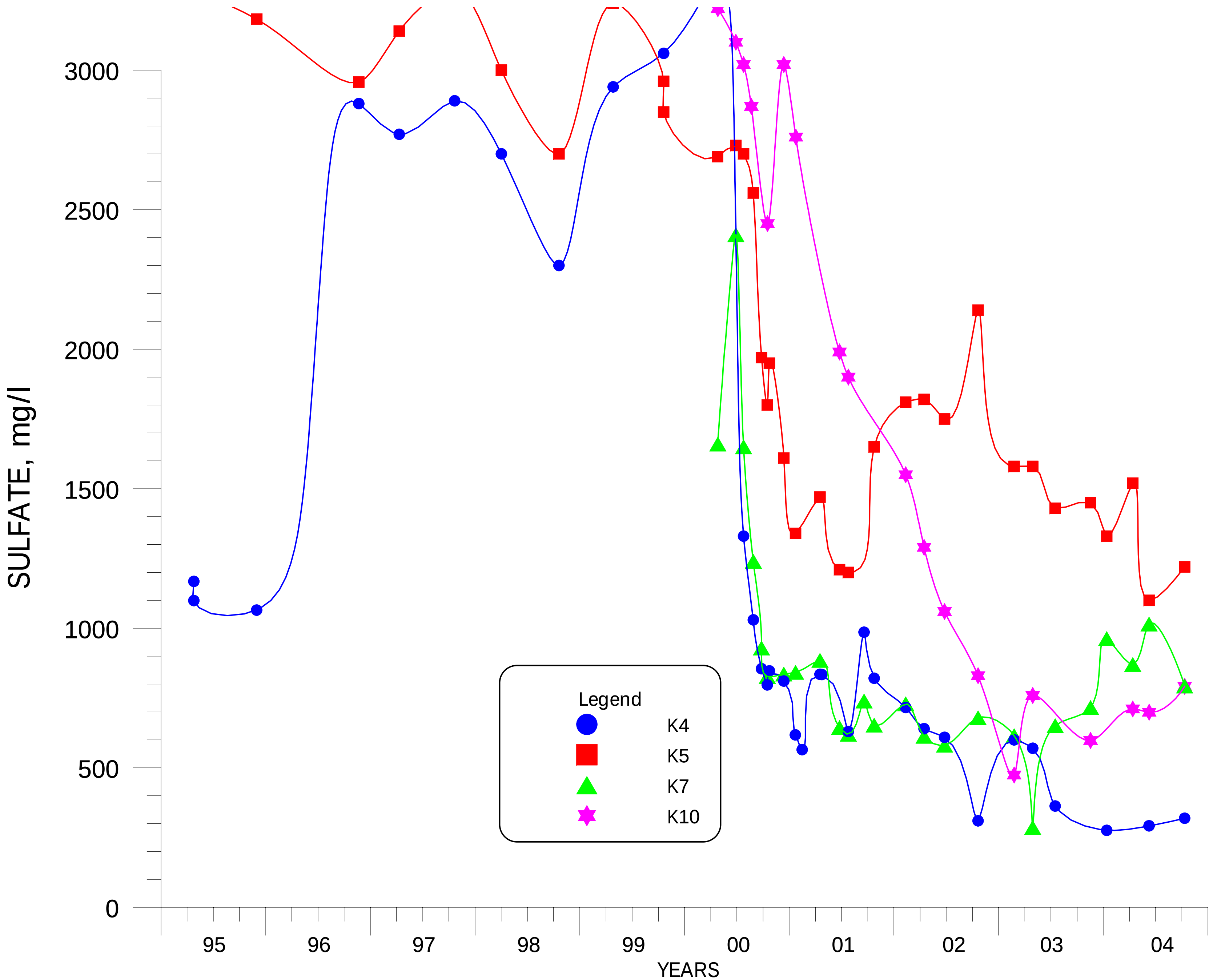


FIGURE 4.3-10. SULFATE CONCENTRATIONS FOR WELLS K4, K5, K7 AND K10.

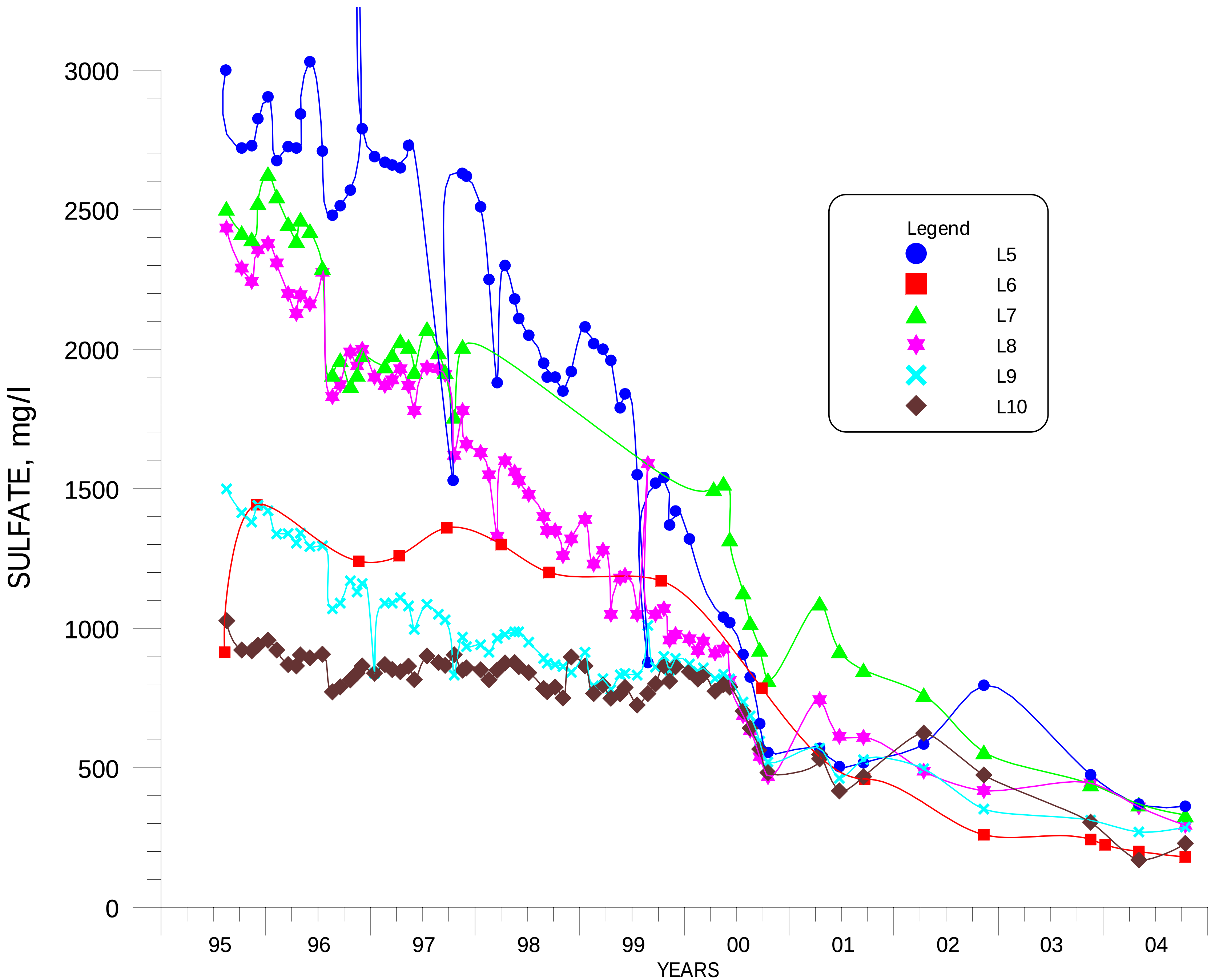


FIGURE 4.3-11. SULFATE CONCENTRATIONS FOR WELLS L5, L6, L7, L8, L9 AND L10.

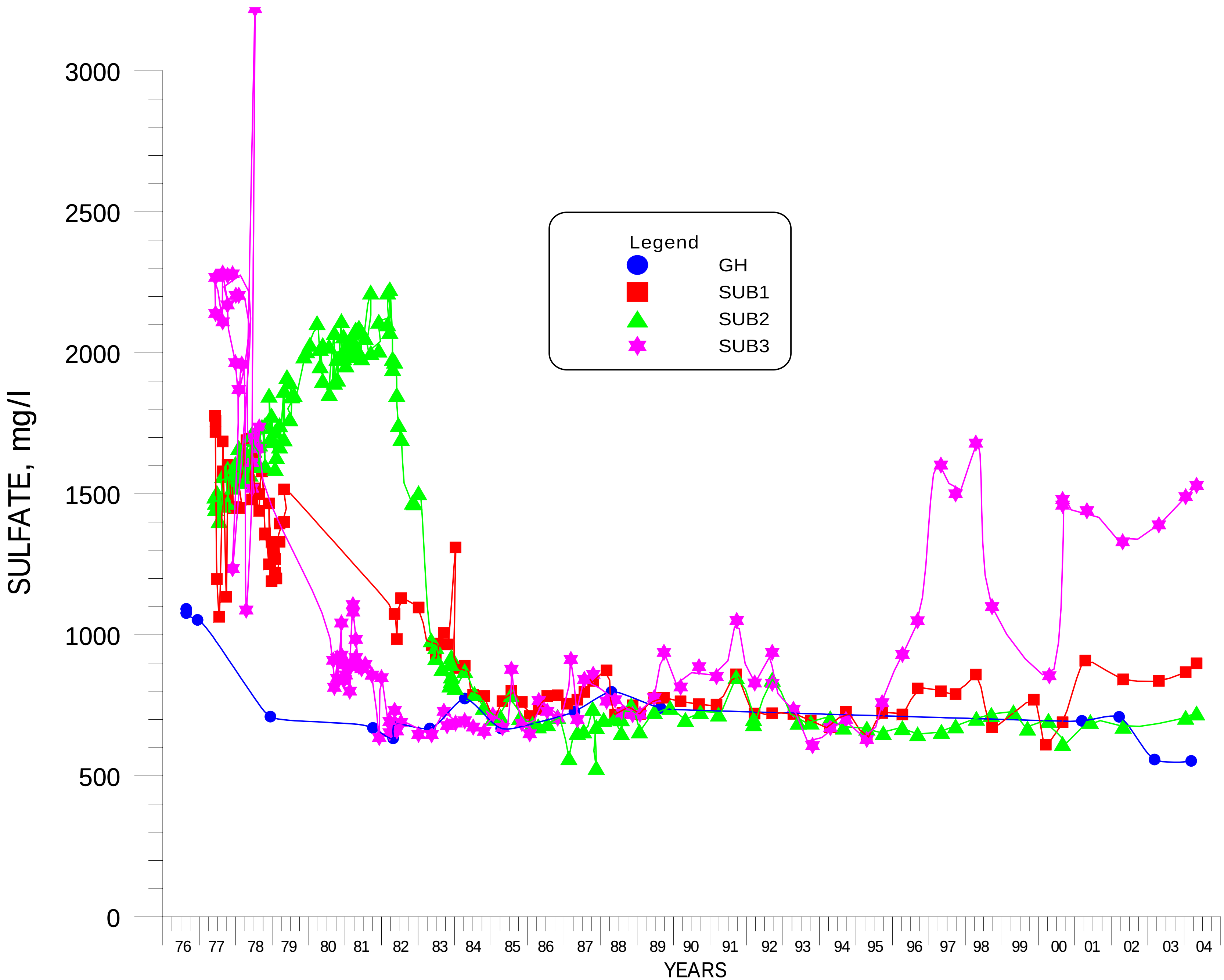


FIGURE 4.3-12. SULFATE CONCENTRATIONS FOR WELLS GH, SUB1, SUB2 AND SUB3.

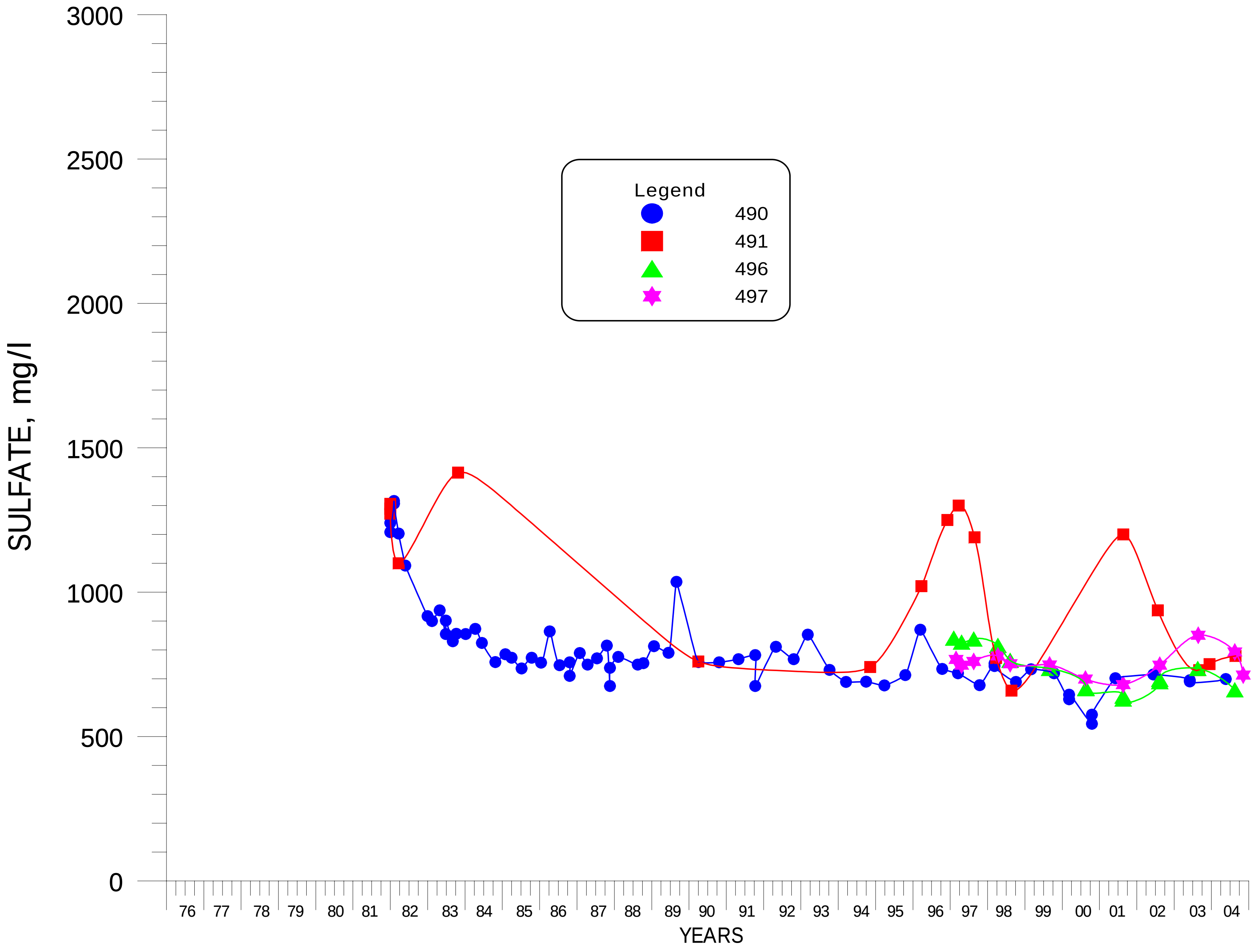


FIGURE 4.3-13. SULFATE CONCENTRATIONS FOR WELLS 490, 491, 496 AND 497.

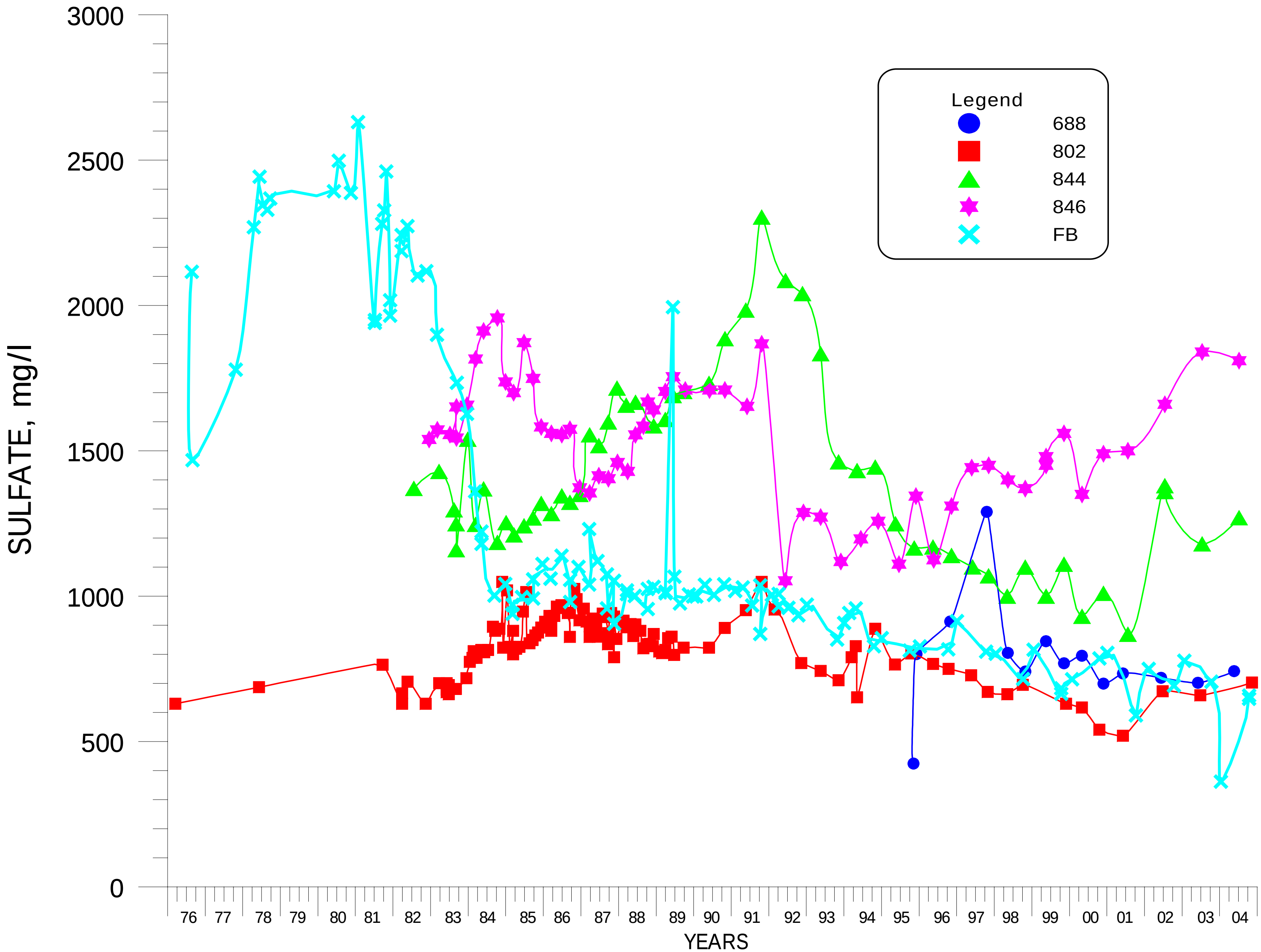


FIGURE 4.3-14. SULFATE CONCENTRATIONS FOR WELLS 688, 802, 844, 846 AND FB.

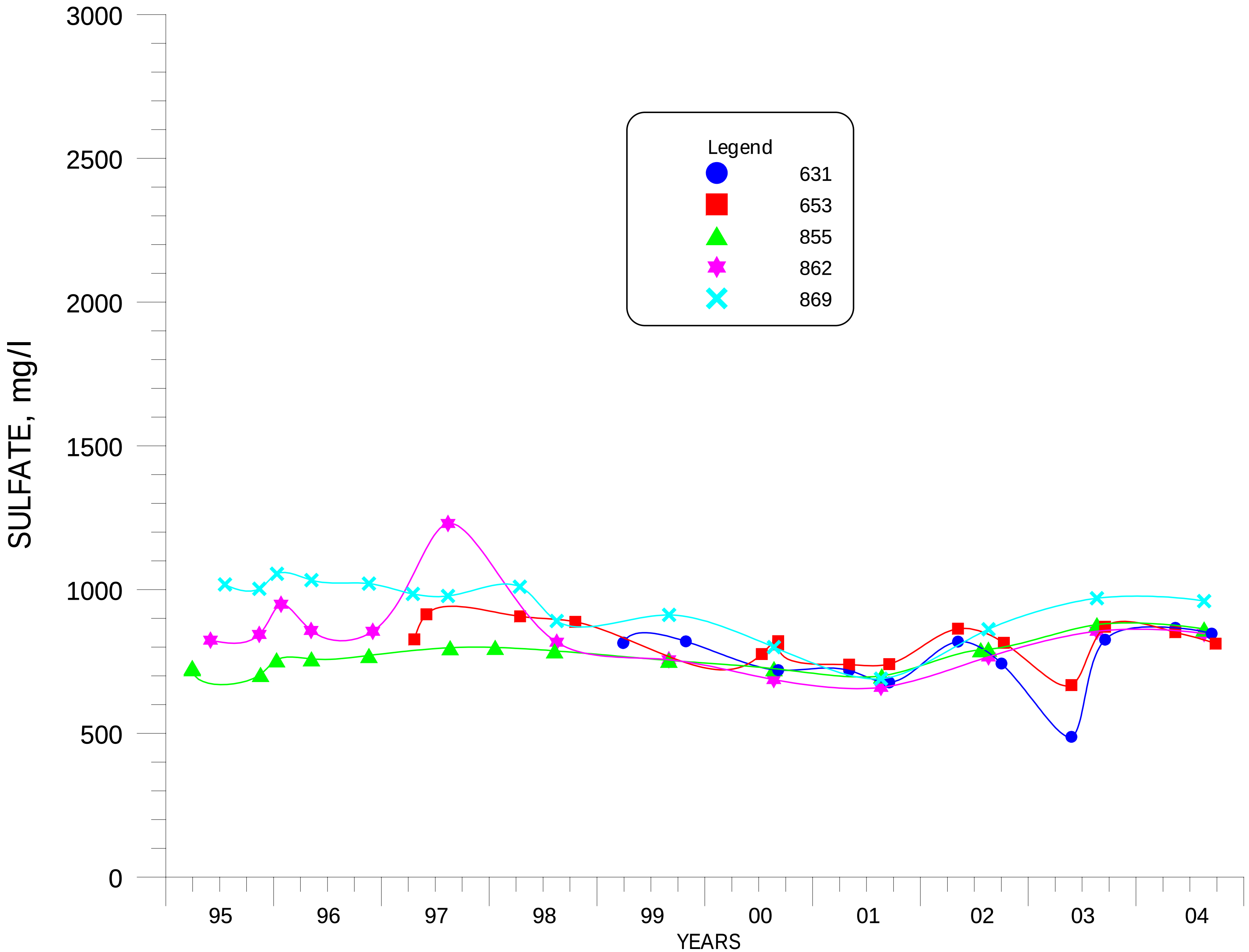


FIGURE 4.3-15. SULFATE CONCENTRATIONS FOR WELLS 631, 653, 855, 862 AND 869.

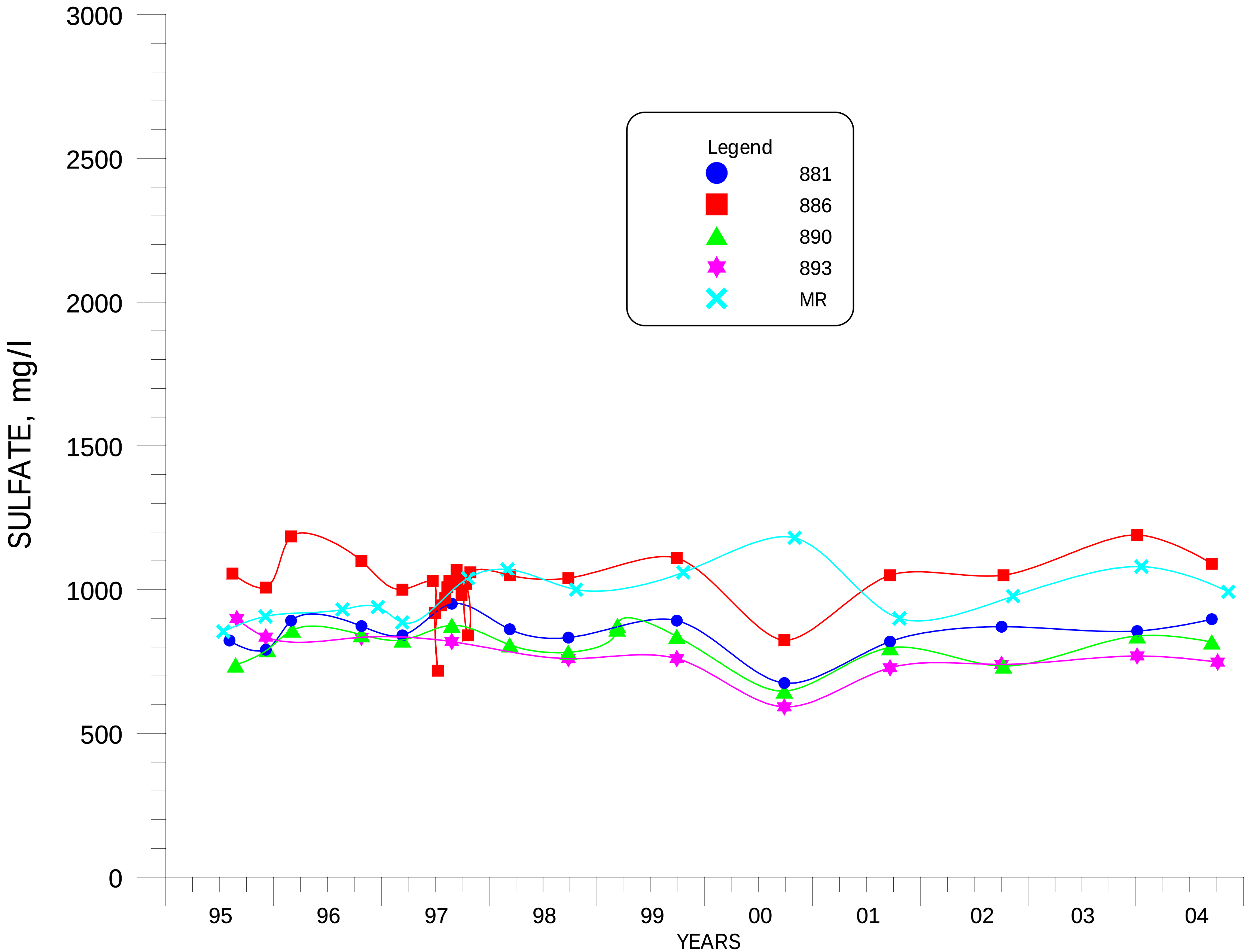


FIGURE 4.3-16. SULFATE CONCENTRATIONS FOR WELLS 881, 886, 890, 893 AND MR.

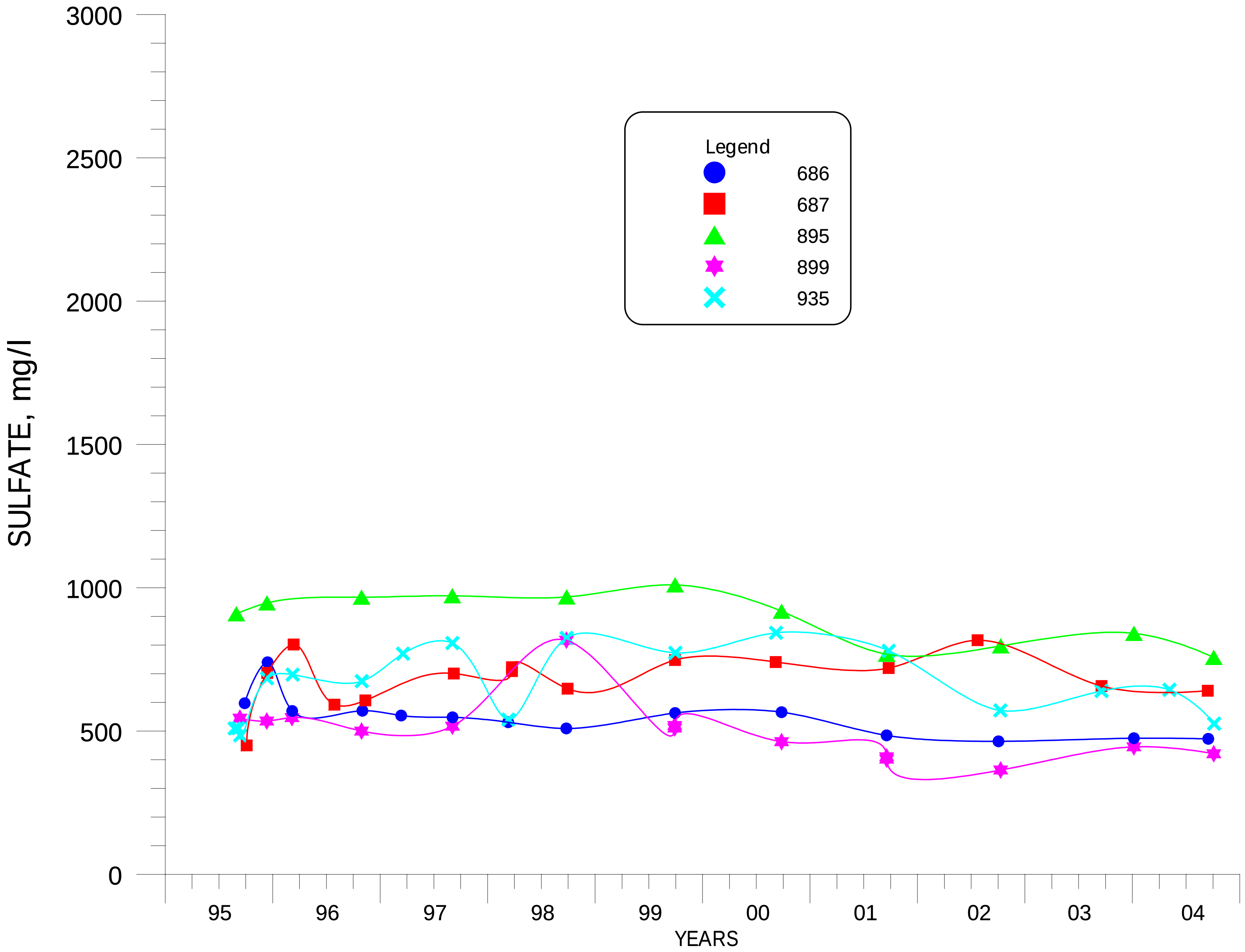


FIGURE 4.3-17. SULFATE CONCENTRATIONS FOR WELLS 686, 687, 895, 899 AND 935.

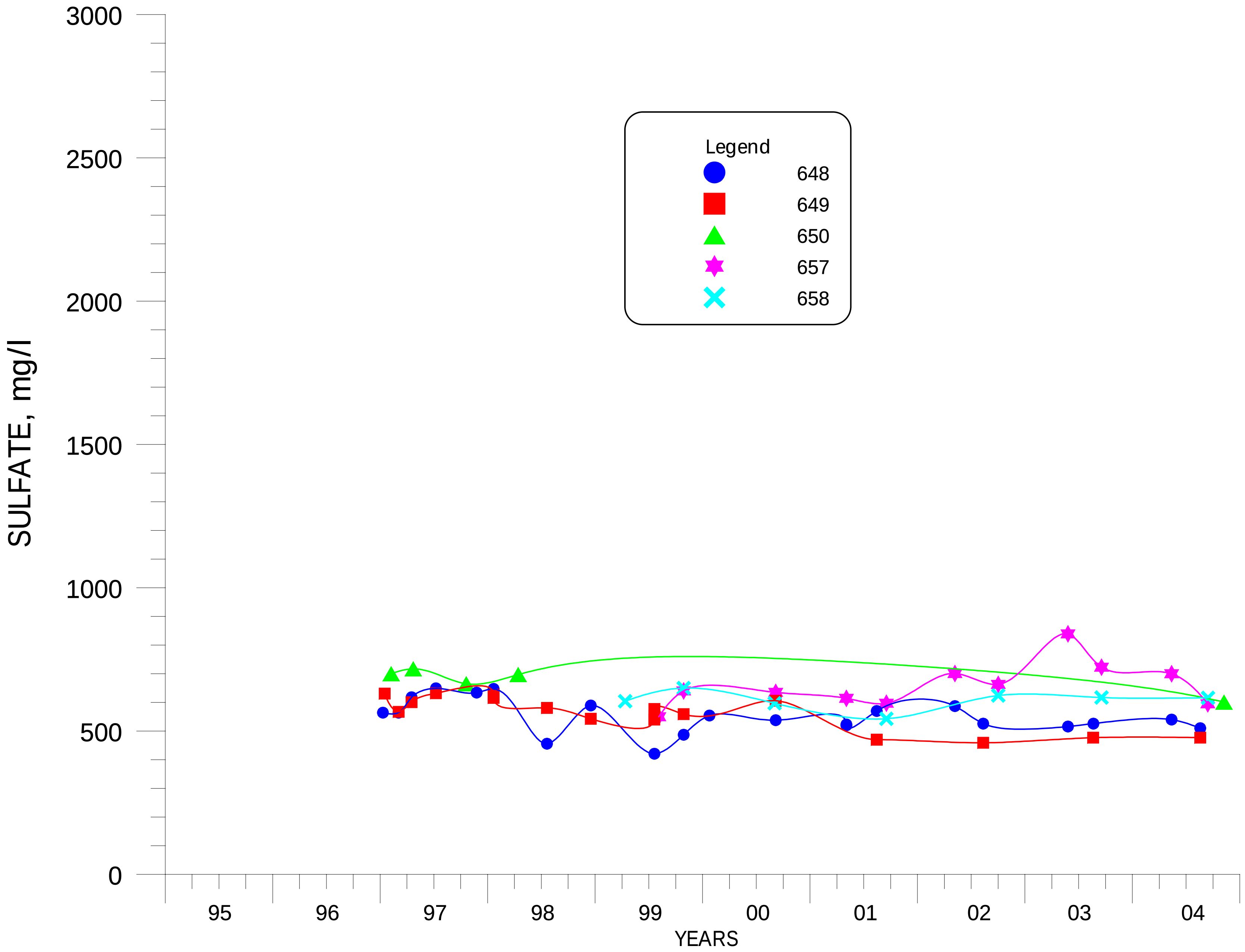
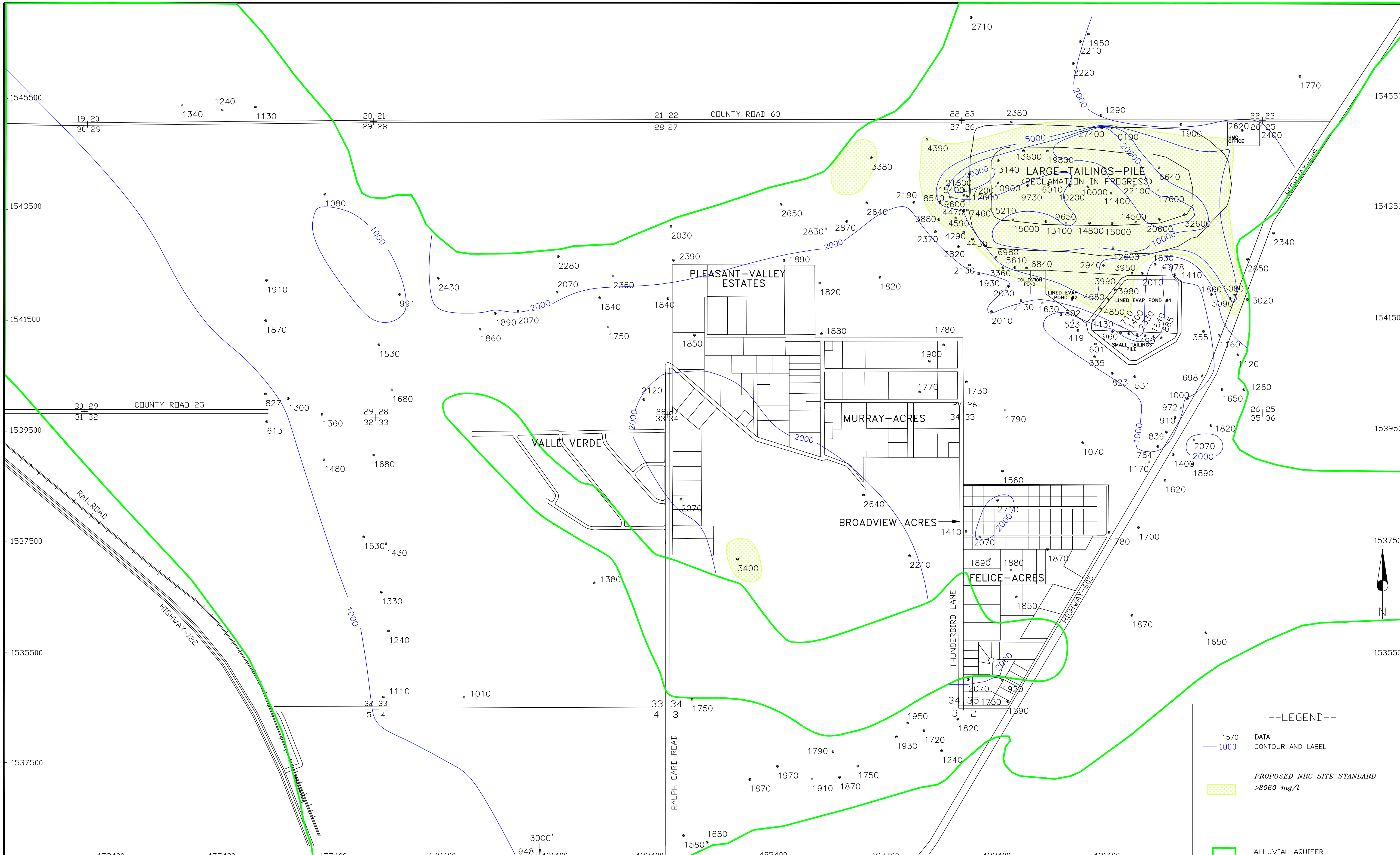


FIGURE 4.3-18. SULFATE CONCENTRATIONS FOR WELLS 648, 649, 650, 657 AND 658.



SCALE: 1"=1600'

C:\PROJECTS\
2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-19. TDS CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, mg/l

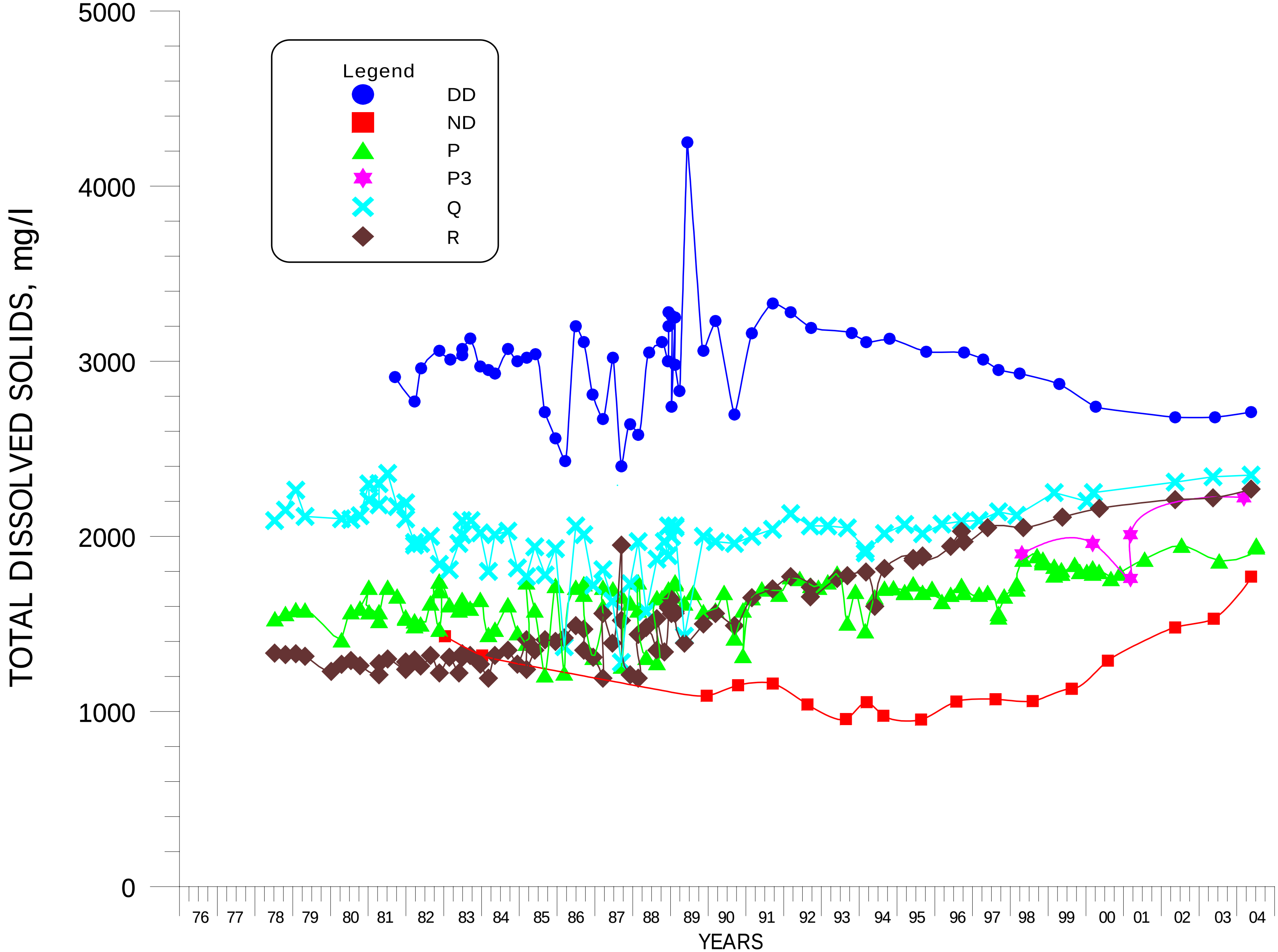


FIGURE 4.3-20. TDS CONCENTRATIONS FOR WELLS DD, ND, P, P3, Q AND R.

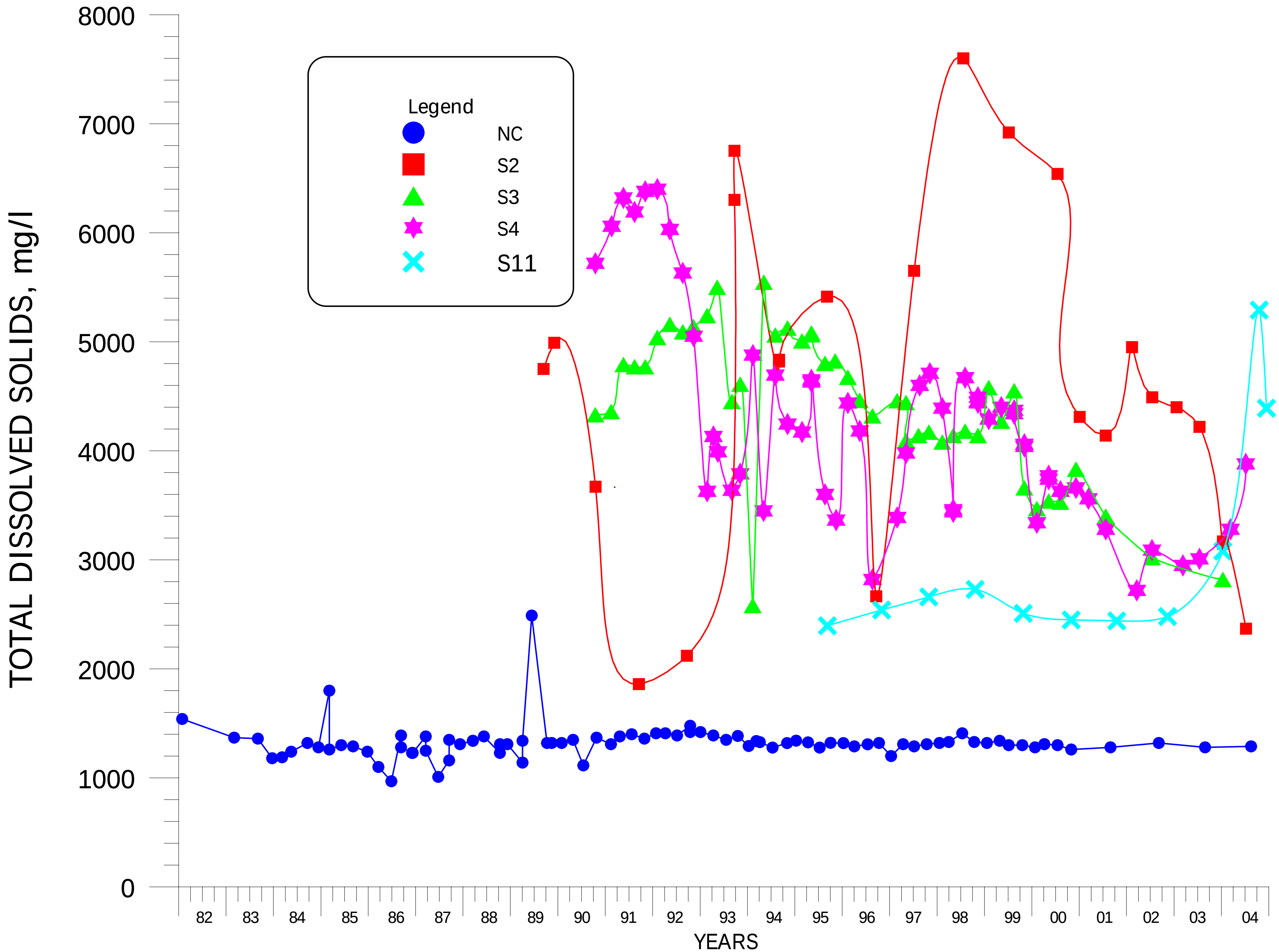


FIGURE 4.3-21. TDS CONCENTRATIONS FOR WELLS NC, S2, S3, S4 AND S11.

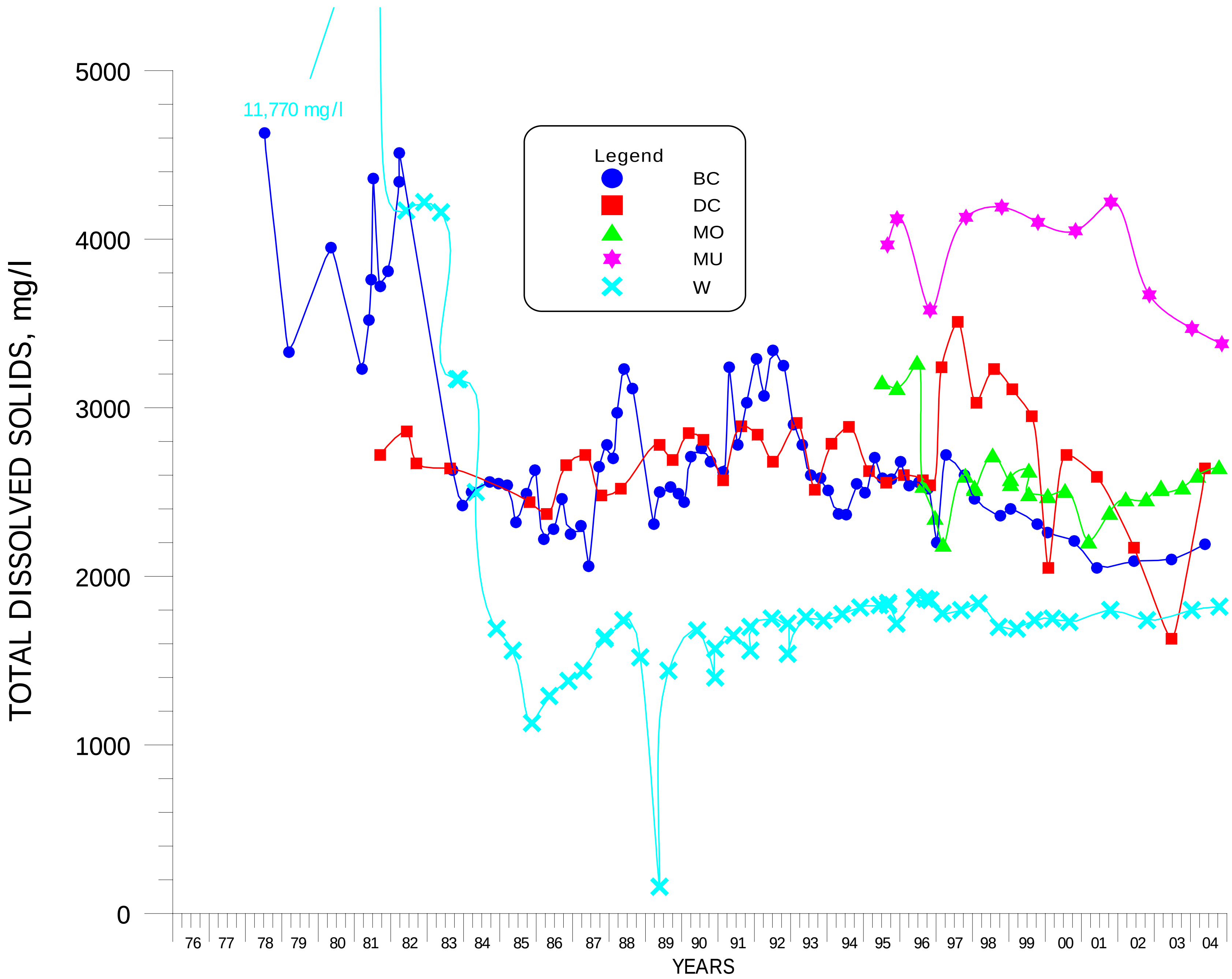


FIGURE 4.3-22. TDS CONCENTRATIONS FOR WELLS BC, DC, MO, MU AND W.

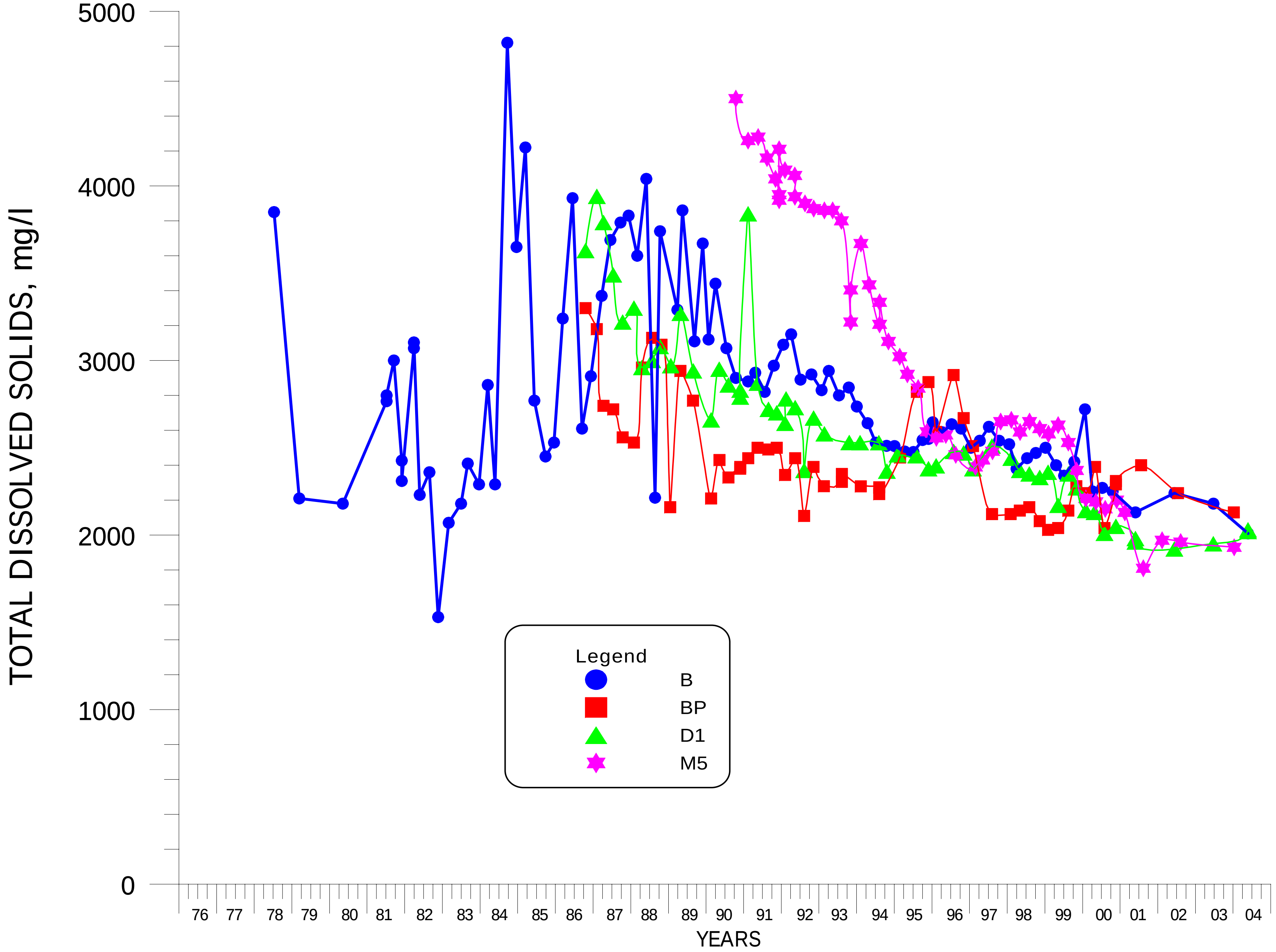


FIGURE 4.3-23. TDS CONCENTRATIONS FOR WELLS B, BP, D1 AND M5.

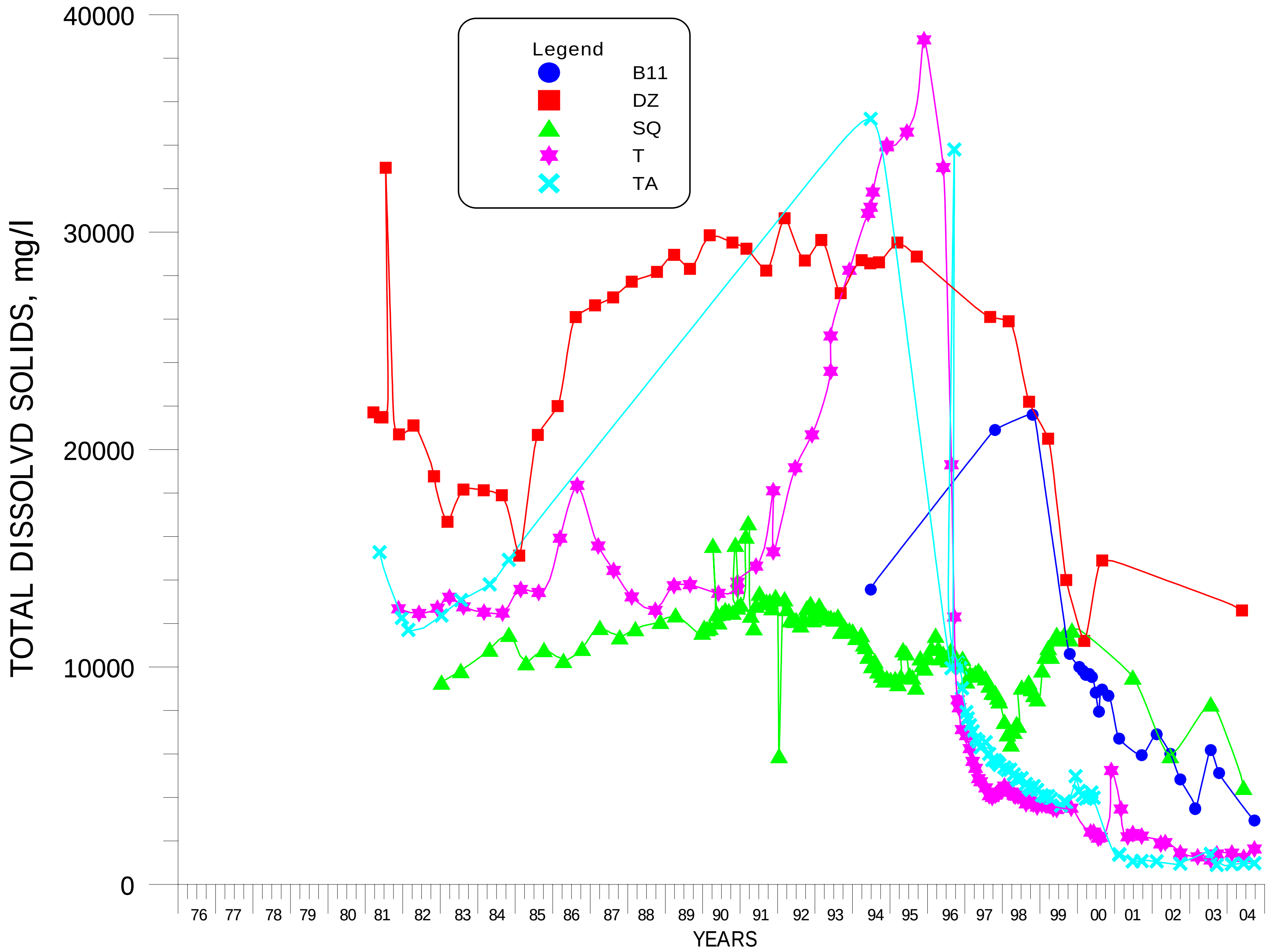


FIGURE 4.3-24. TDS CONCENTRATIONS FOR WELLS B11, DZ, SQ, T AND TA.

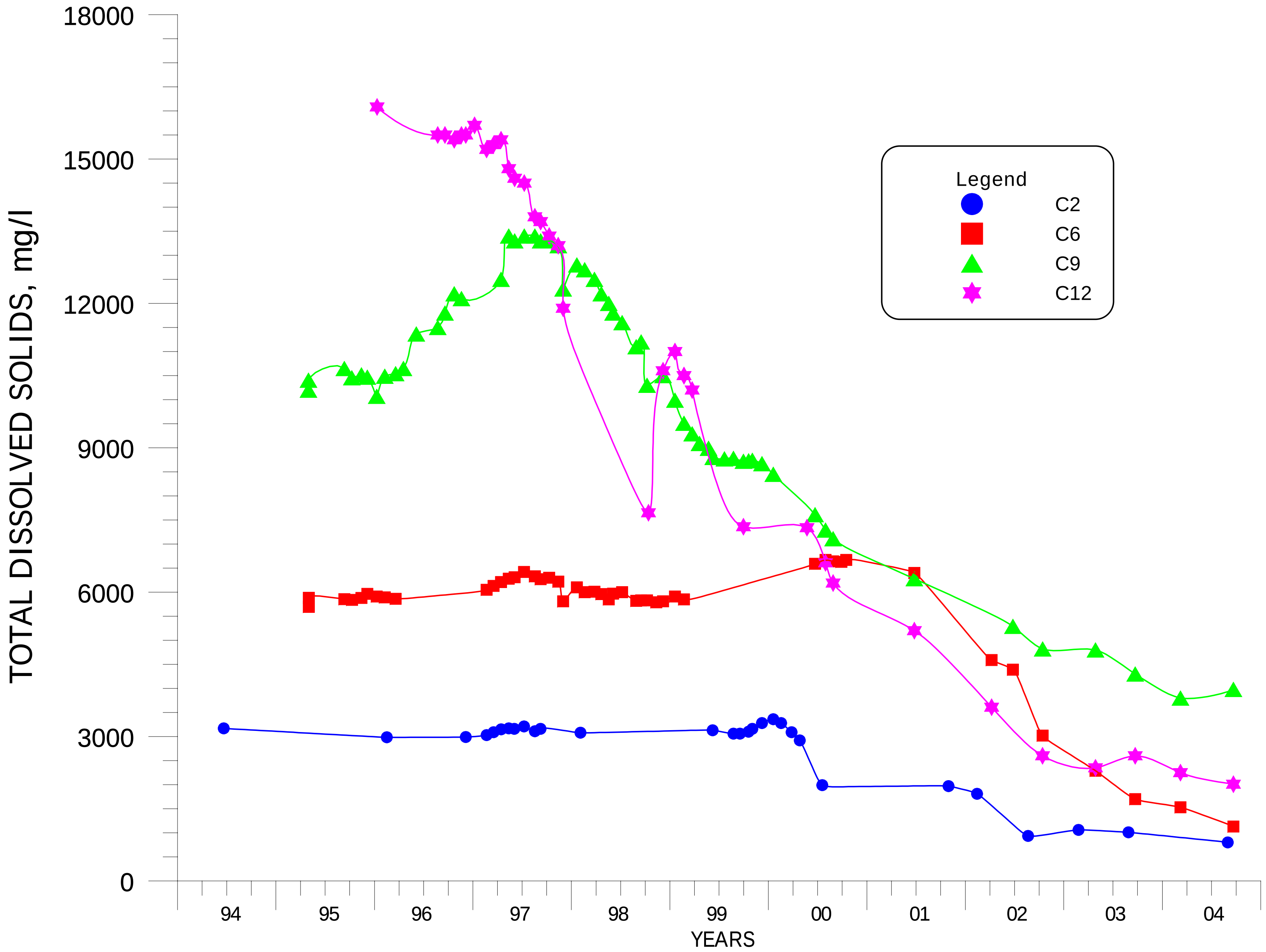


FIGURE 4.3-25. TDS CONCENTRATIONS FOR WELLS C2, C6, C9 AND C12.

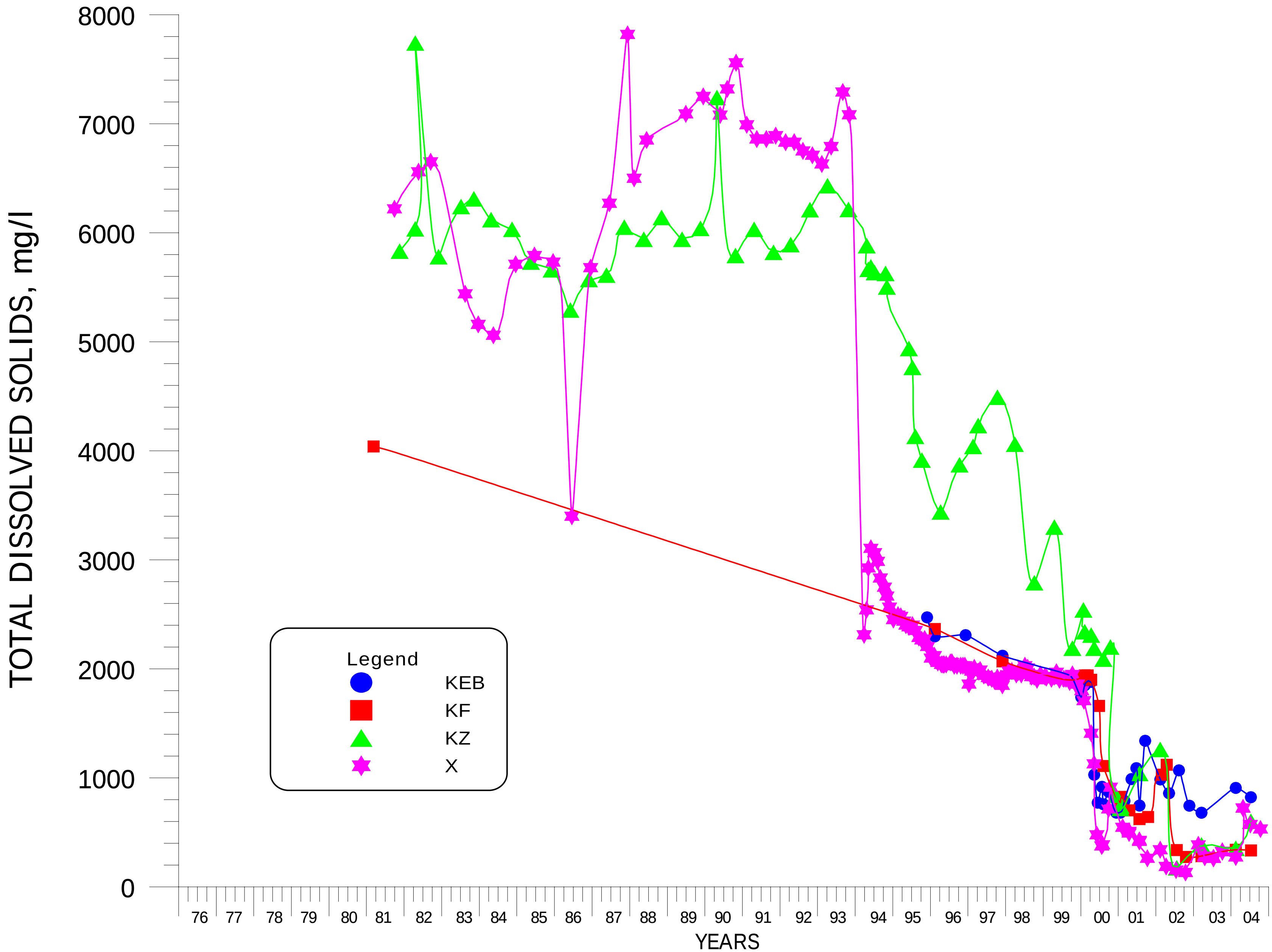


FIGURE 4.3-26. TDS CONCENTRATIONS FOR WELLS KEB, KF, KZ AND X.

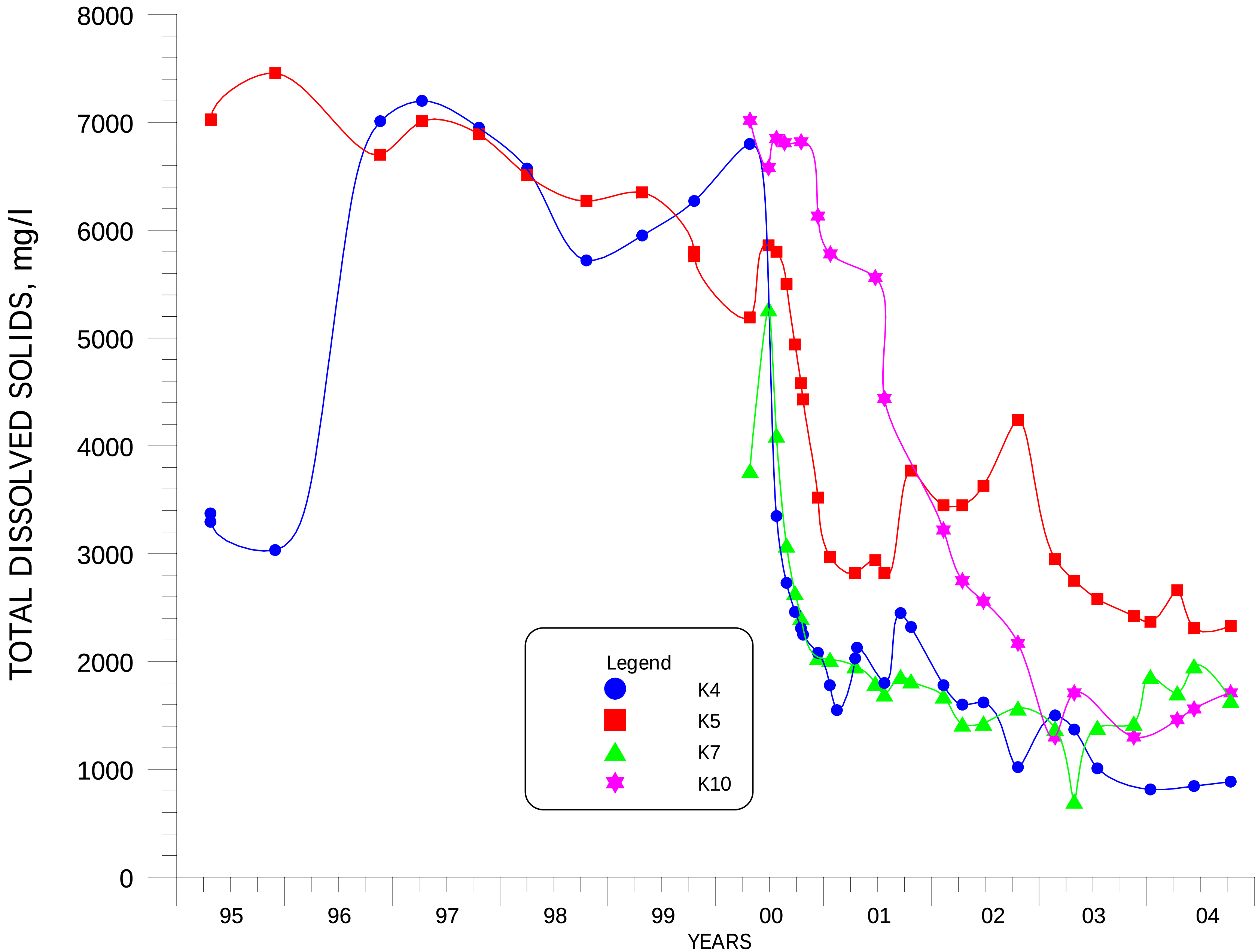


FIGURE 4.3-27. TDS CONCENTRATIONS FOR WELLS K4, K5, K7 AND K10.

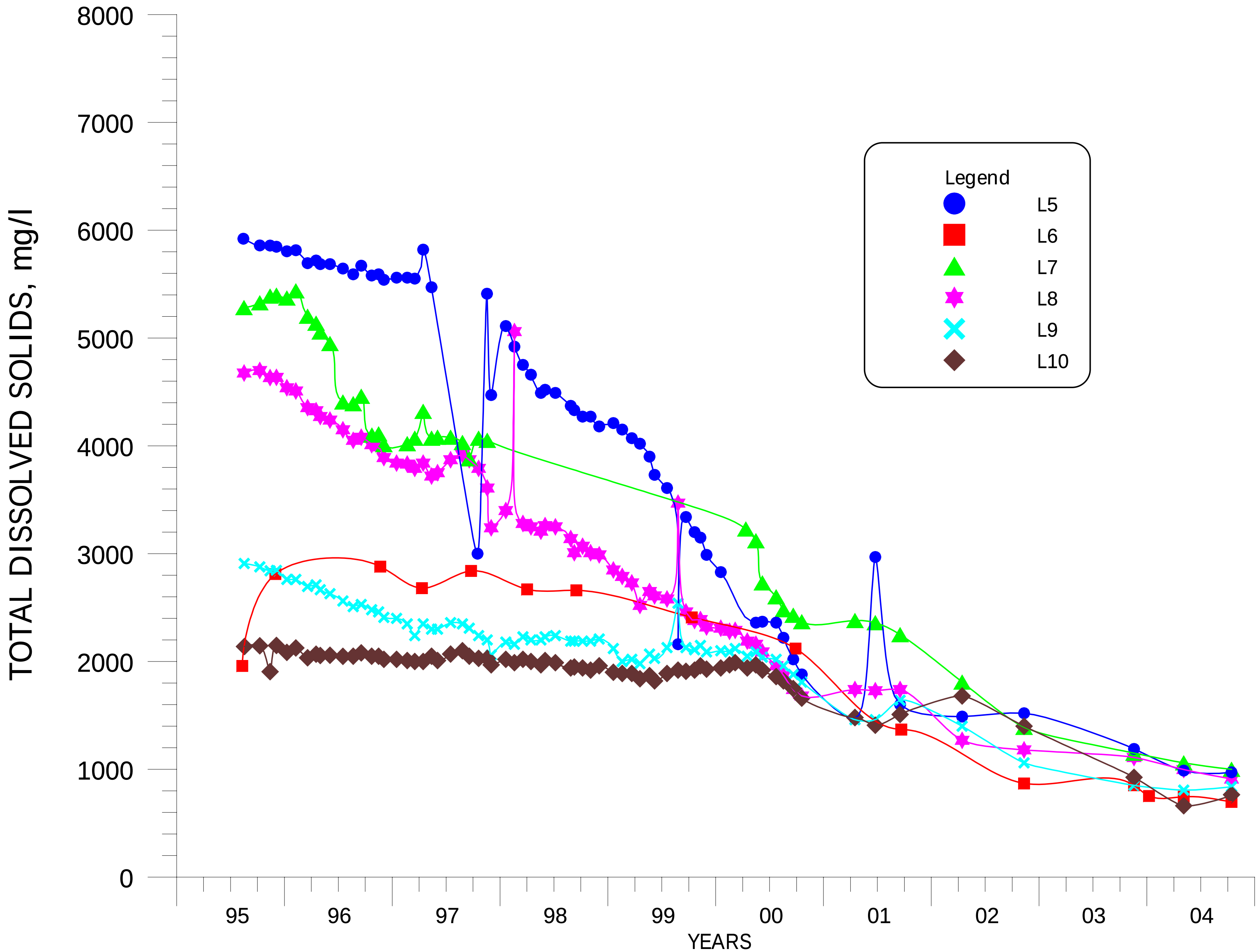


FIGURE 4.3-28. TDS CONCENTRATIONS FOR WELLS L5, L6, L7, L8, L9 AND L10.

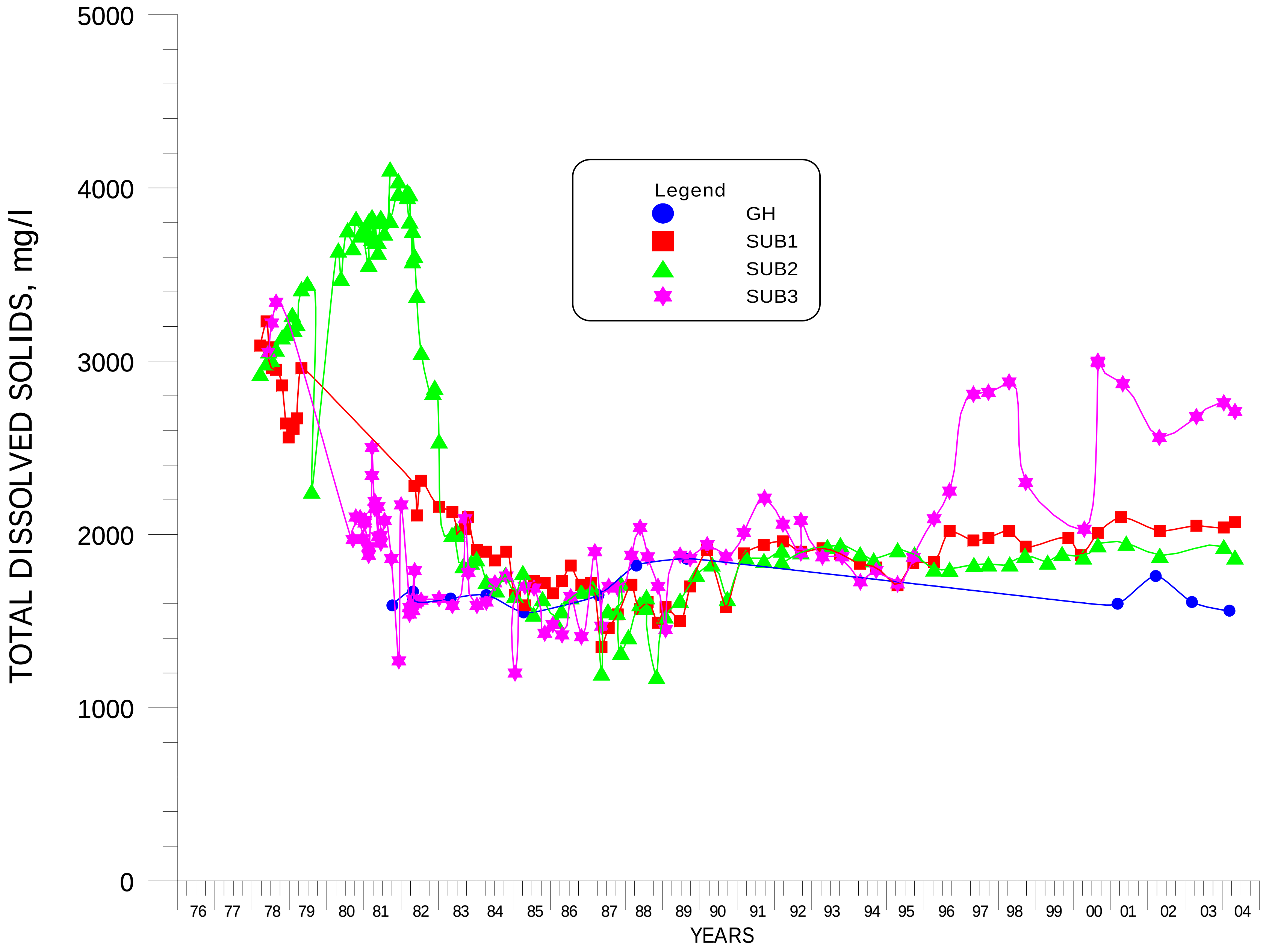


FIGURE 4.3-29. TDS CONCENTRATIONS FOR WELLS GH, SUB1, SUB2 AND SUB3.

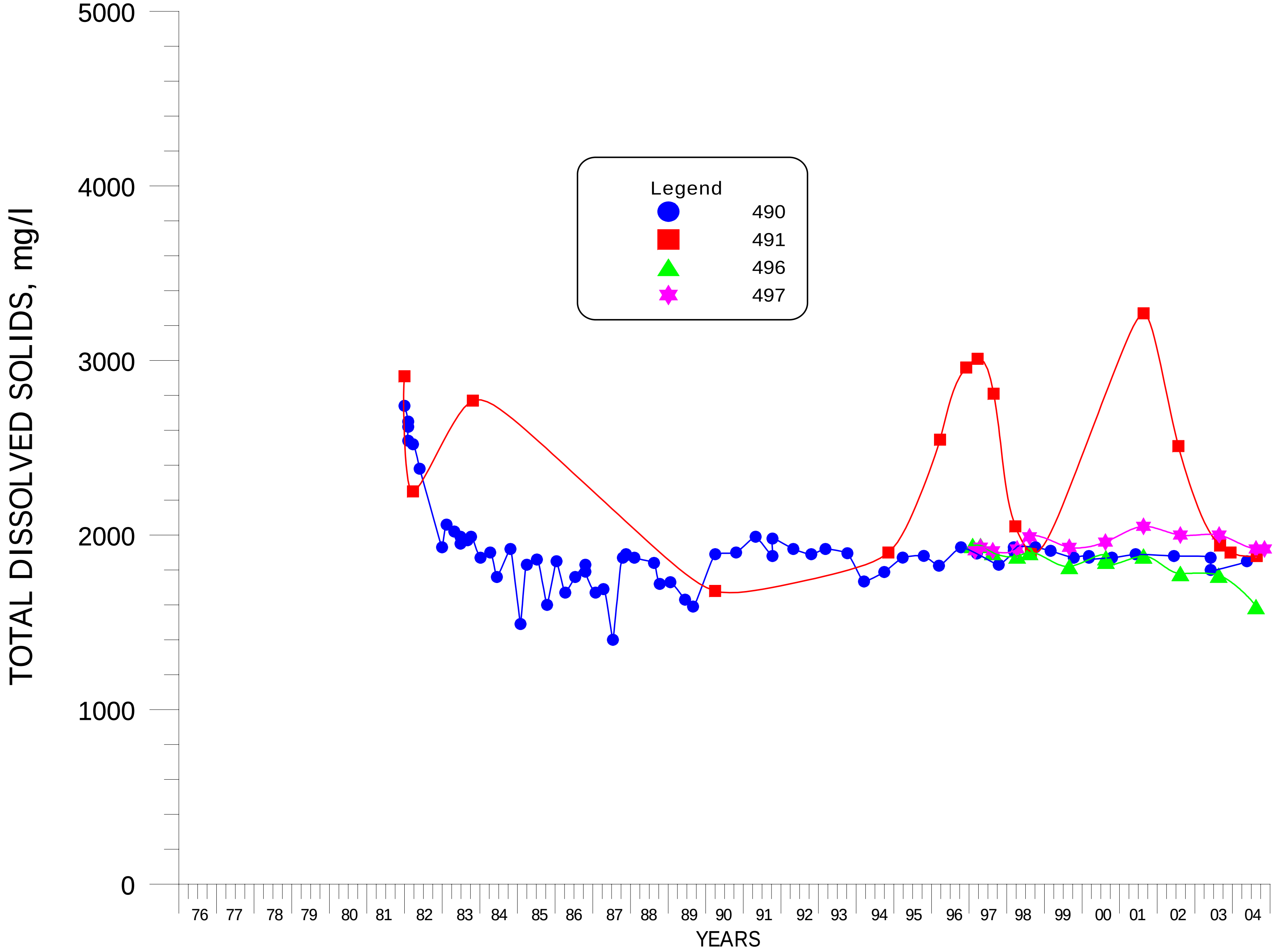


FIGURE 4.3-30. TDS CONCENTRATIONS FOR WELLS 490, 491, 496 AND 497.

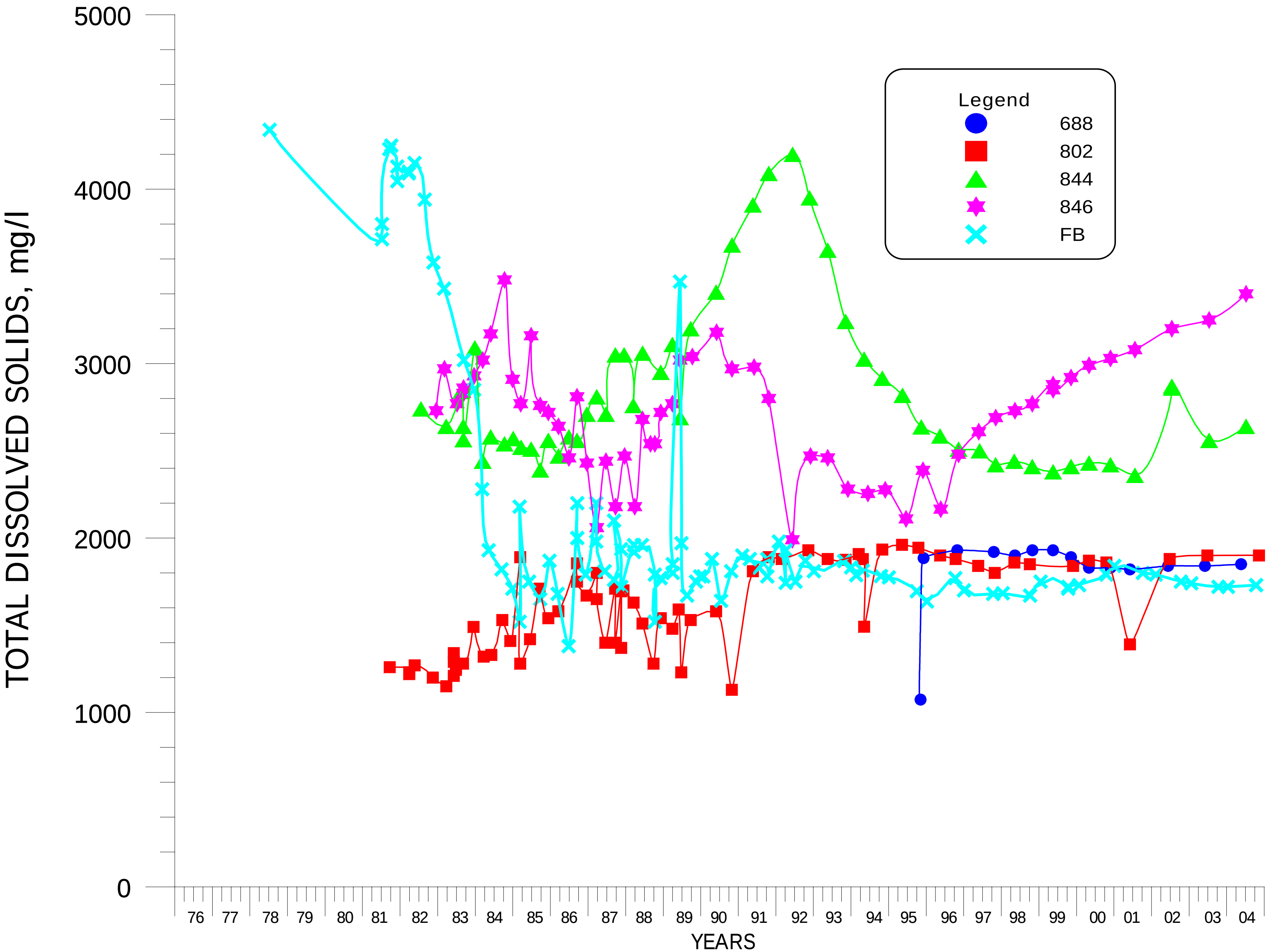


FIGURE 4.3-31. TDS CONCENTRATIONS FOR WELLS 688, 802, 844, 846 AND FB.

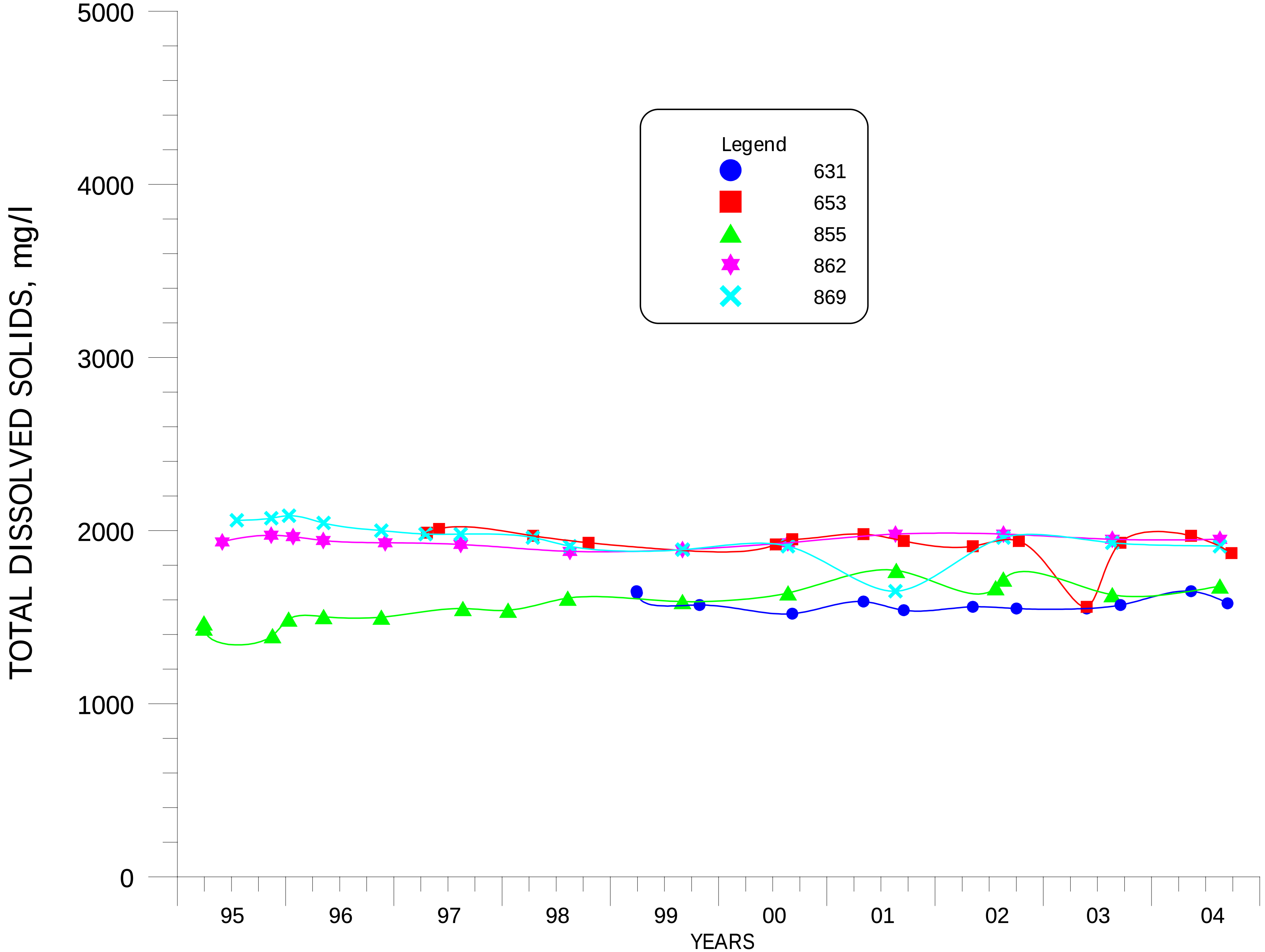


FIGURE 4.3-32. TDS CONCENTRATIONS FOR WELLS 631, 653, 855, 862 AND 869.

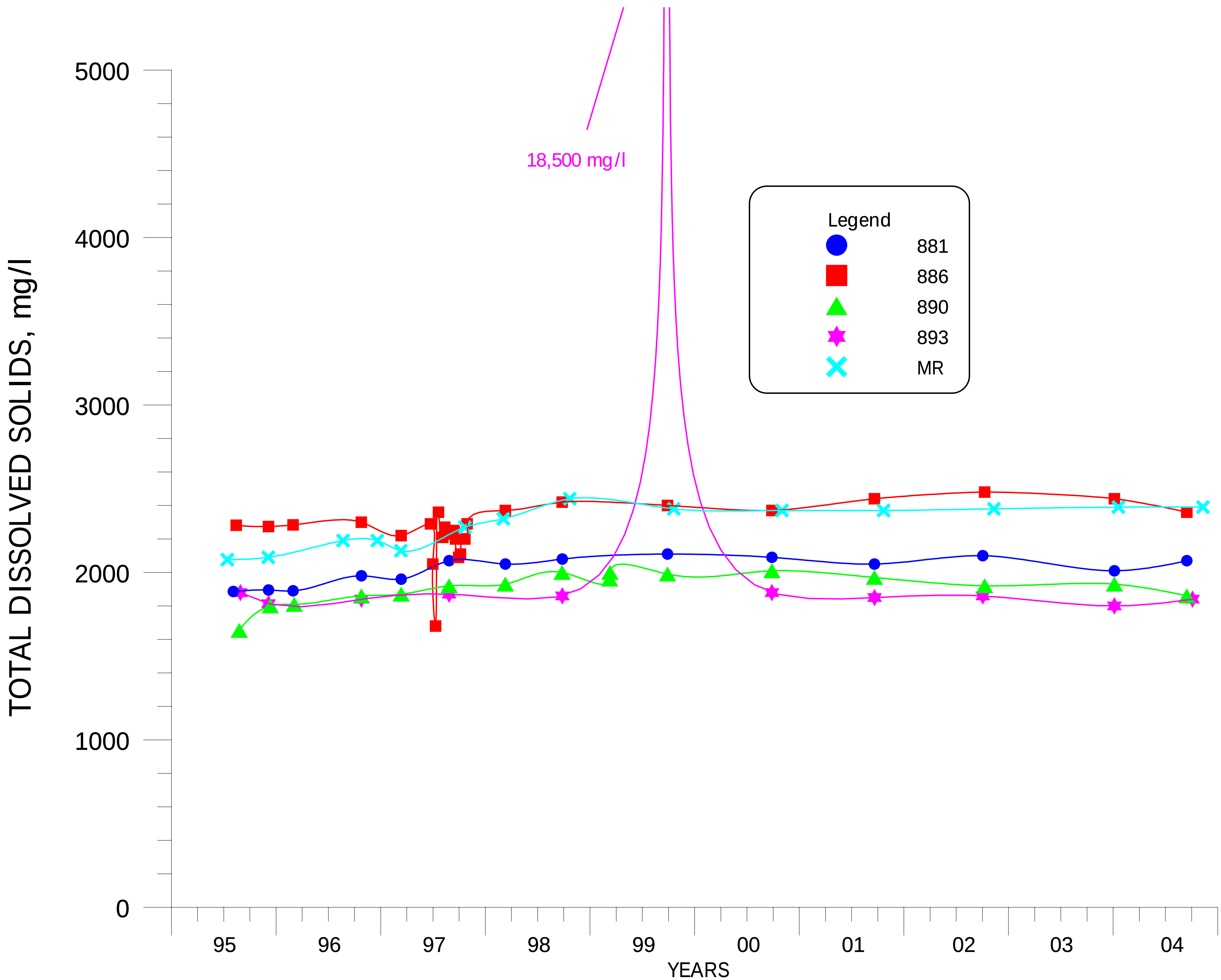


FIGURE 4.3-33. TDS CONCENTRATIONS FOR WELLS 881, 886, 890, 893 AND MR.

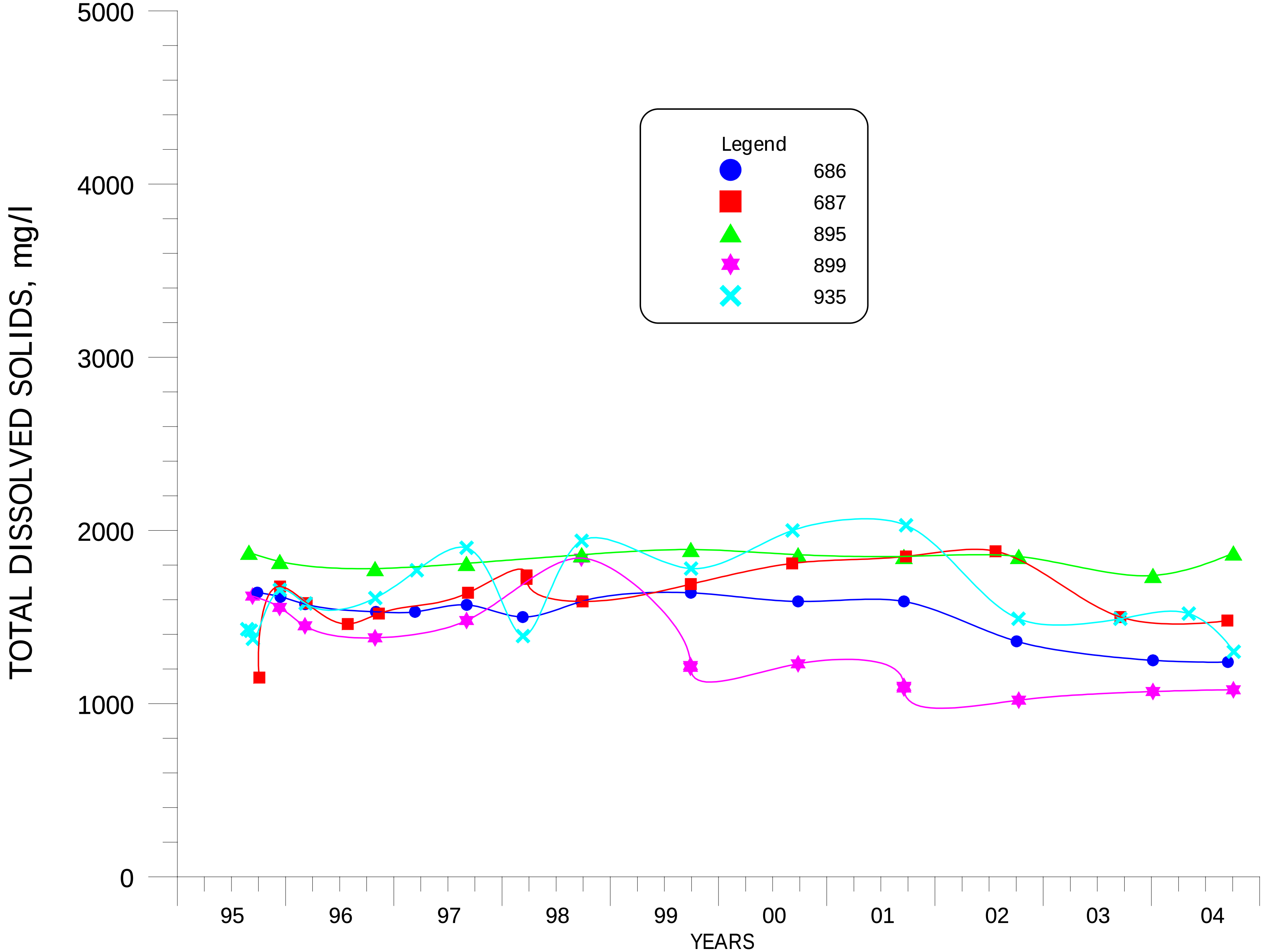


FIGURE 4.3-34. TDS CONCENTRATIONS FOR WELLS 686, 687, 895, 899 AND 935.

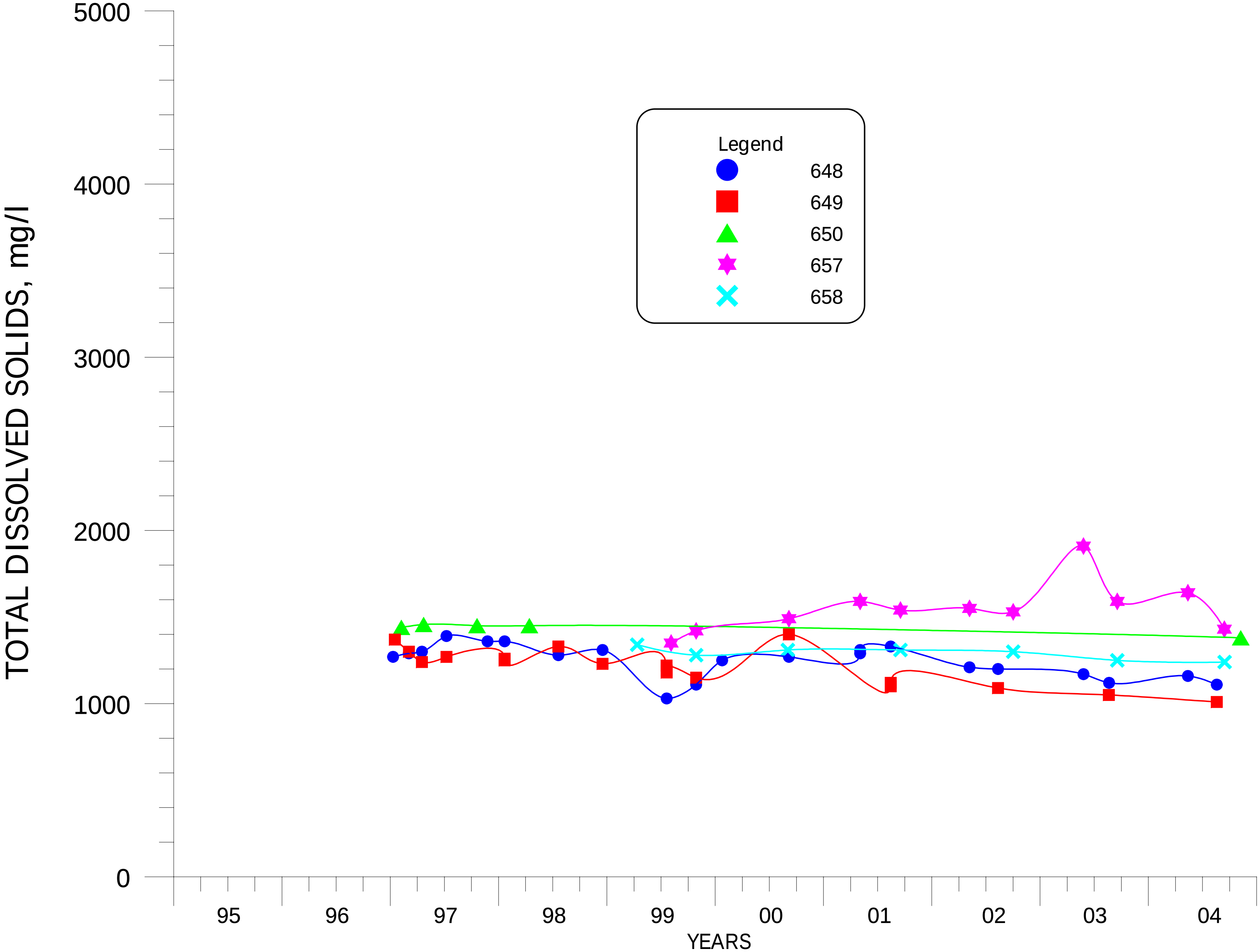
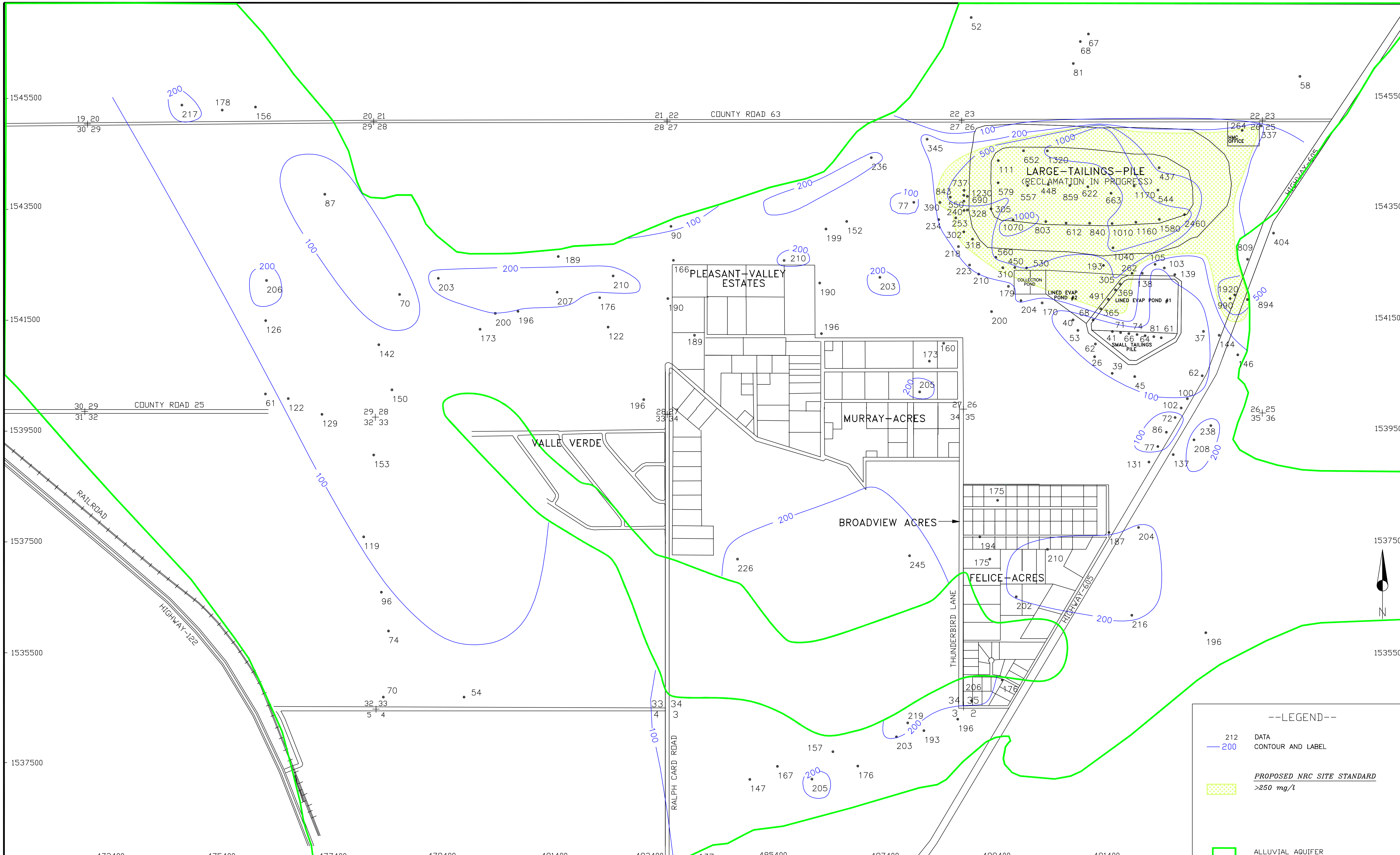


FIGURE 4.3-35. TDS CONCENTRATIONS FOR WELLS 648, 649, 650, 657 AND 658.



SCALE: 1"=1600'
C:\PROJECTS\2004-06\C-QAL04
DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-36. CHLORIDE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, mg/l

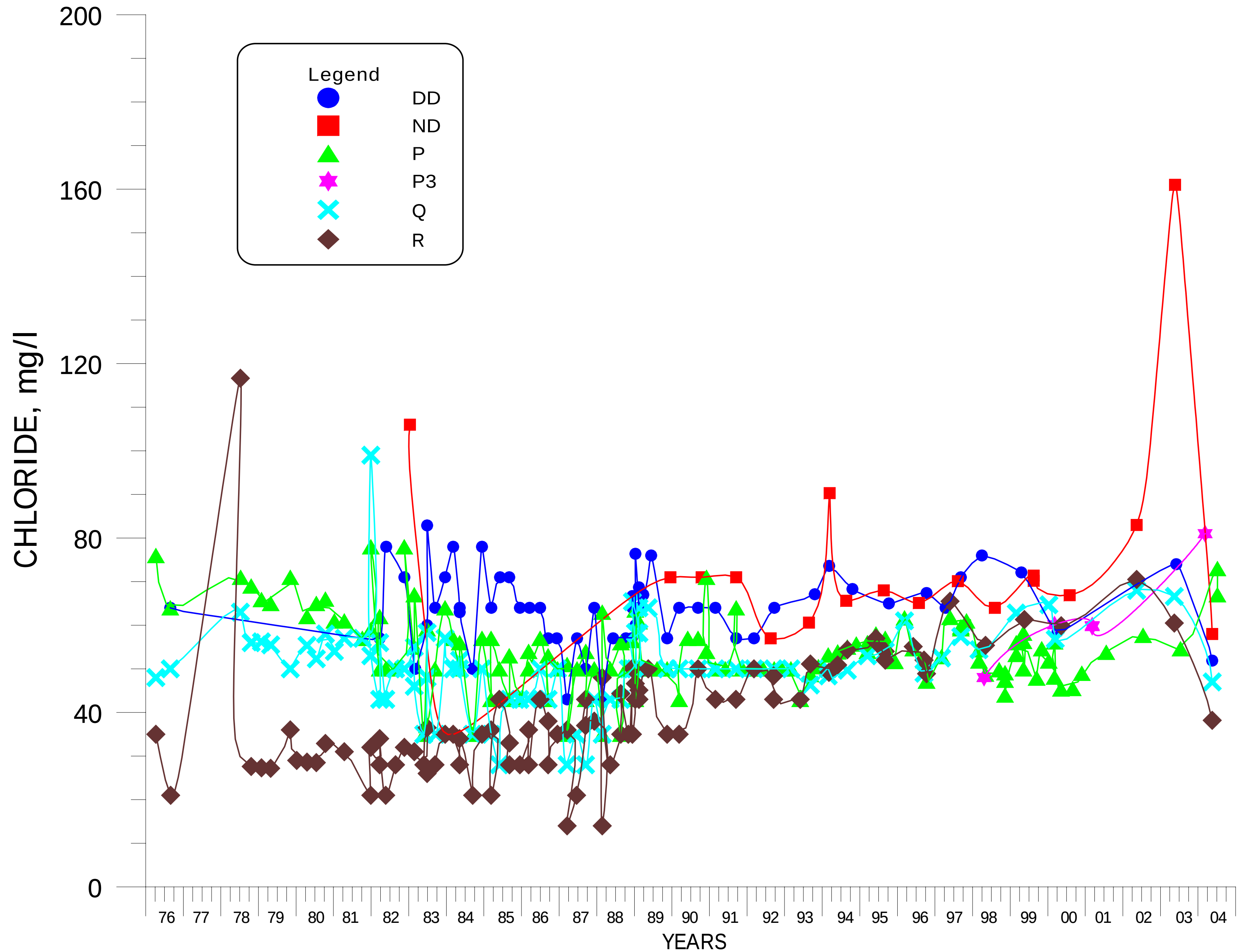


FIGURE 4.3-37. CHLORIDE CONCENTRATIONS FOR WELLS DD, ND, P, P3, Q AND R.

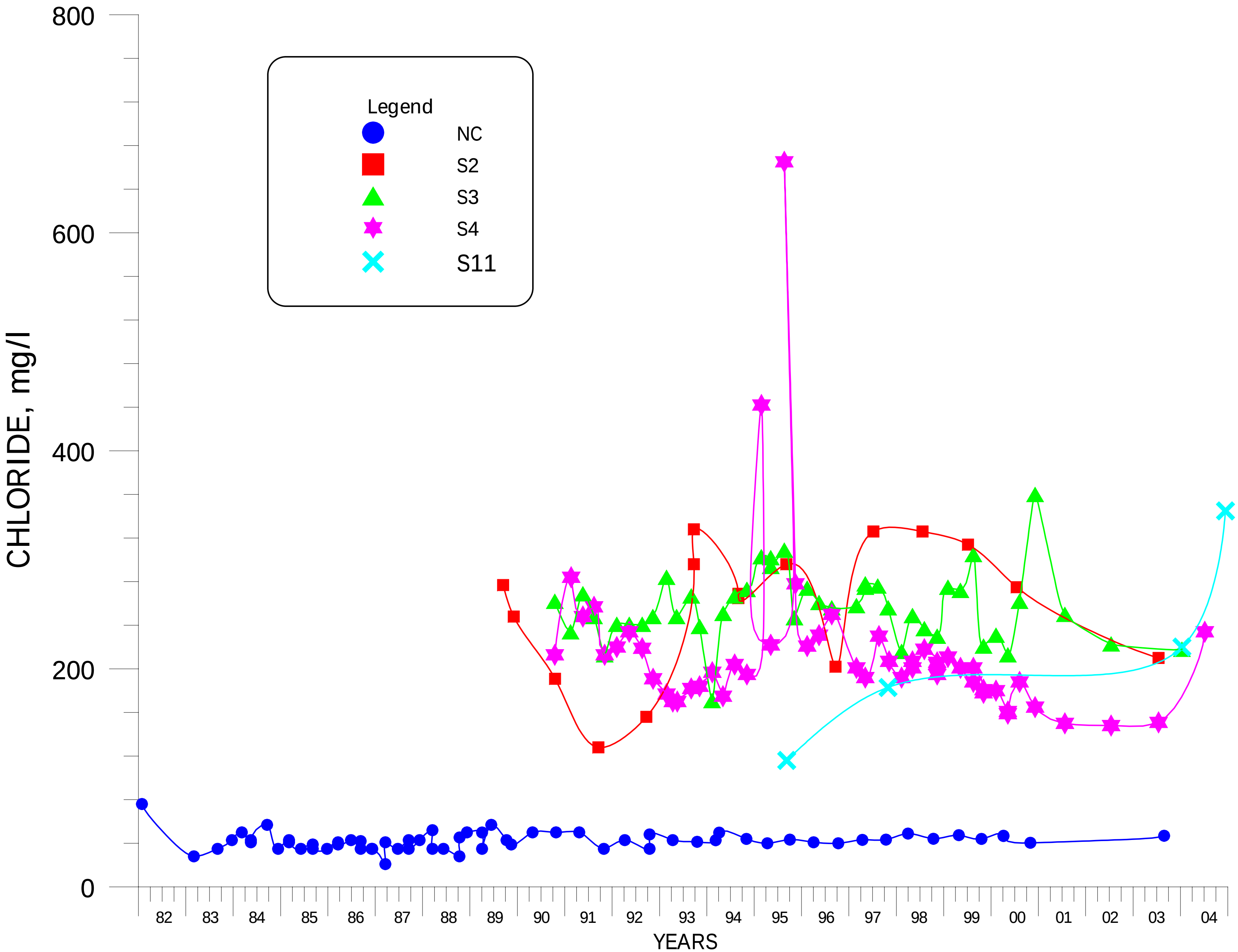


FIGURE 4.3-38. CHLORIDE CONCENTRATIONS FOR WELLS NC, S2, S3, S4 AND S11.

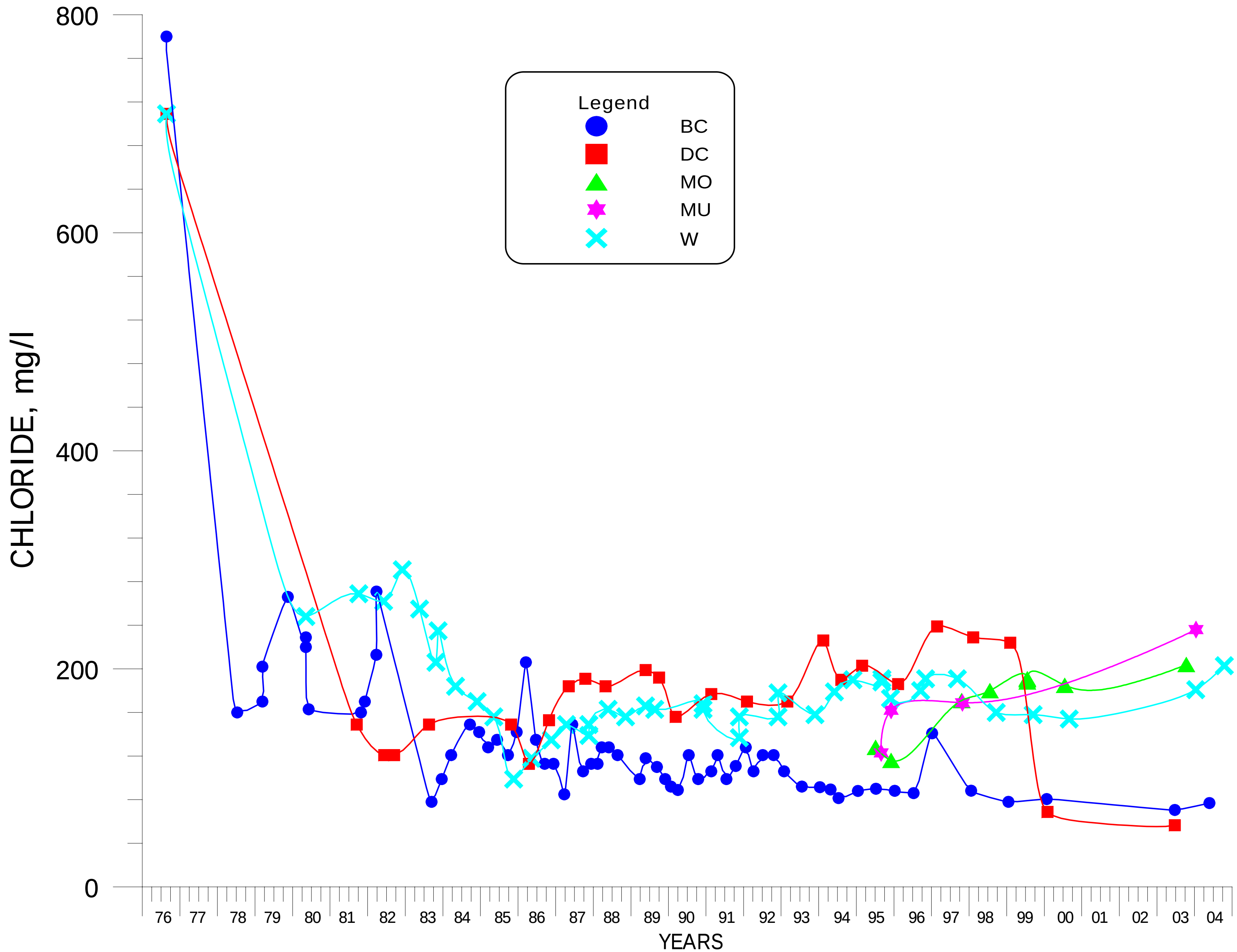


FIGURE 4.3-39. CHLORIDE CONCENTRATIONS FOR WELLS BC, DC, MO, MU AND W.

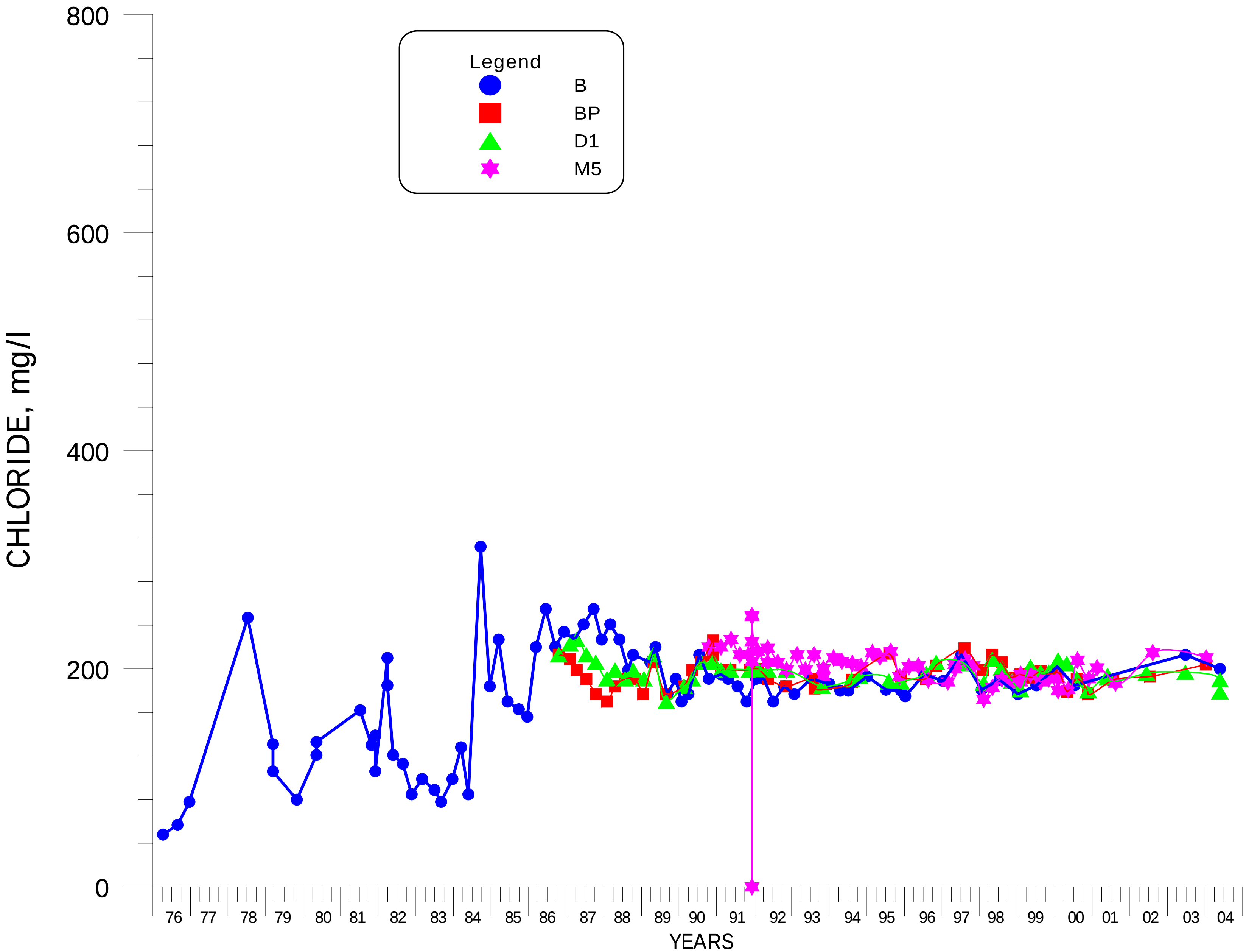


FIGURE 4.3-40. CHLORIDE CONCENTRATIONS FOR WELLS B, BP, D1 AND M5.

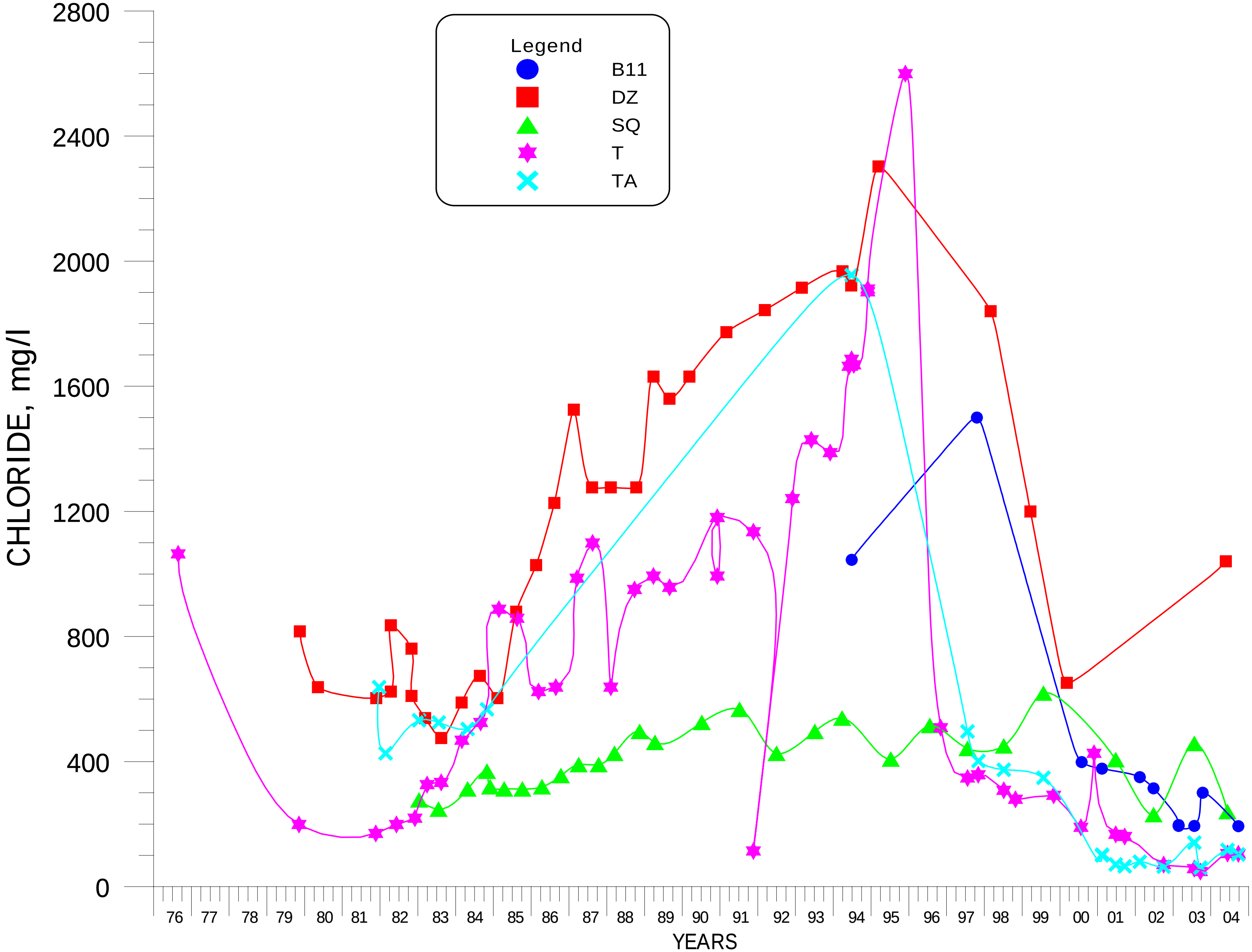


FIGURE 4.3-41. CHLORIDE CONCENTRATIONS FOR WELLS B11, DZ, SQ, T AND TA.

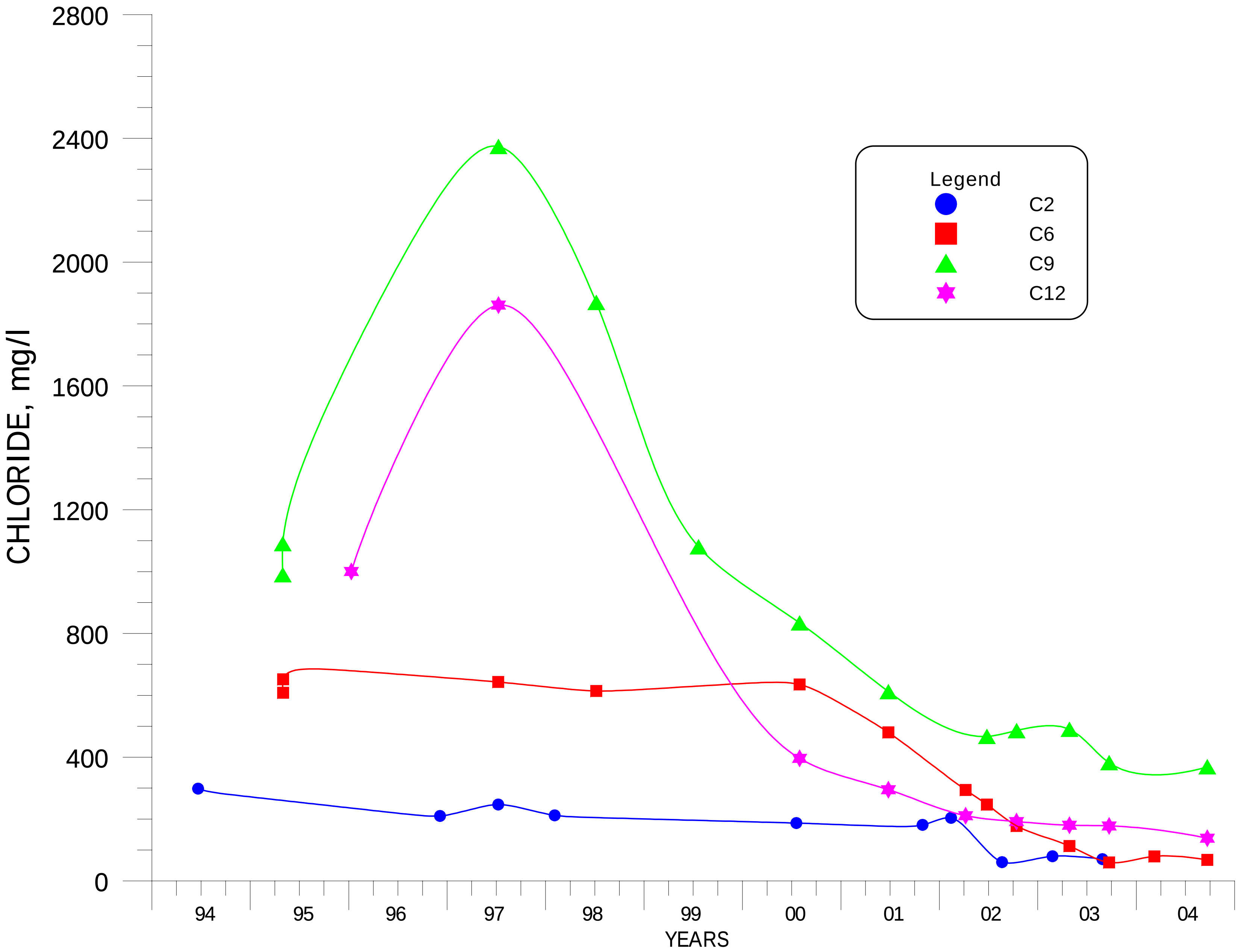


FIGURE 4.3-42. CHLORIDE CONCENTRATIONS FOR WELLS C2, C6, C9 AND C12.

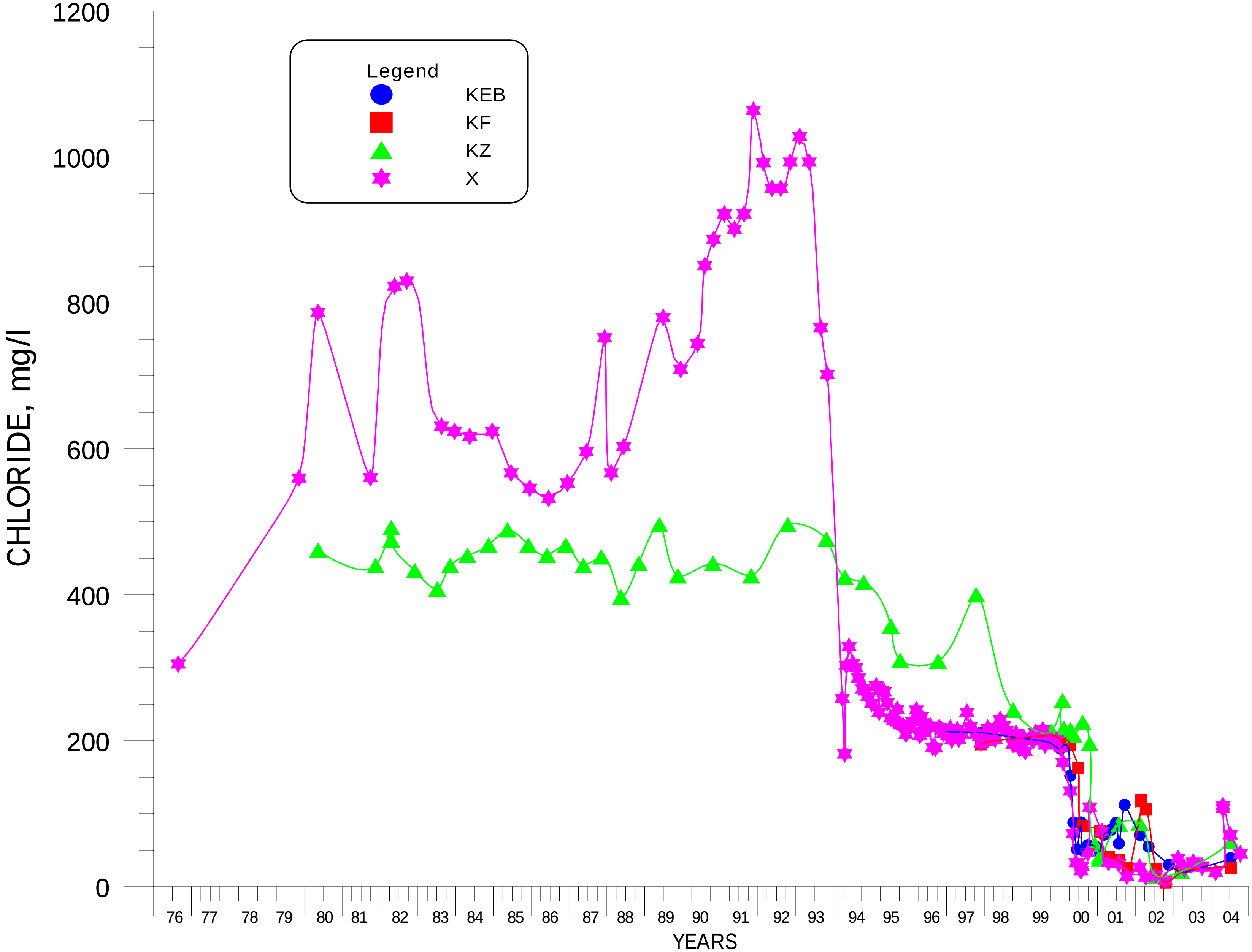


FIGURE 4.3-43. CHLORIDE CONCENTRATIONS FOR WELLS KEB, KF, KZ AND X.

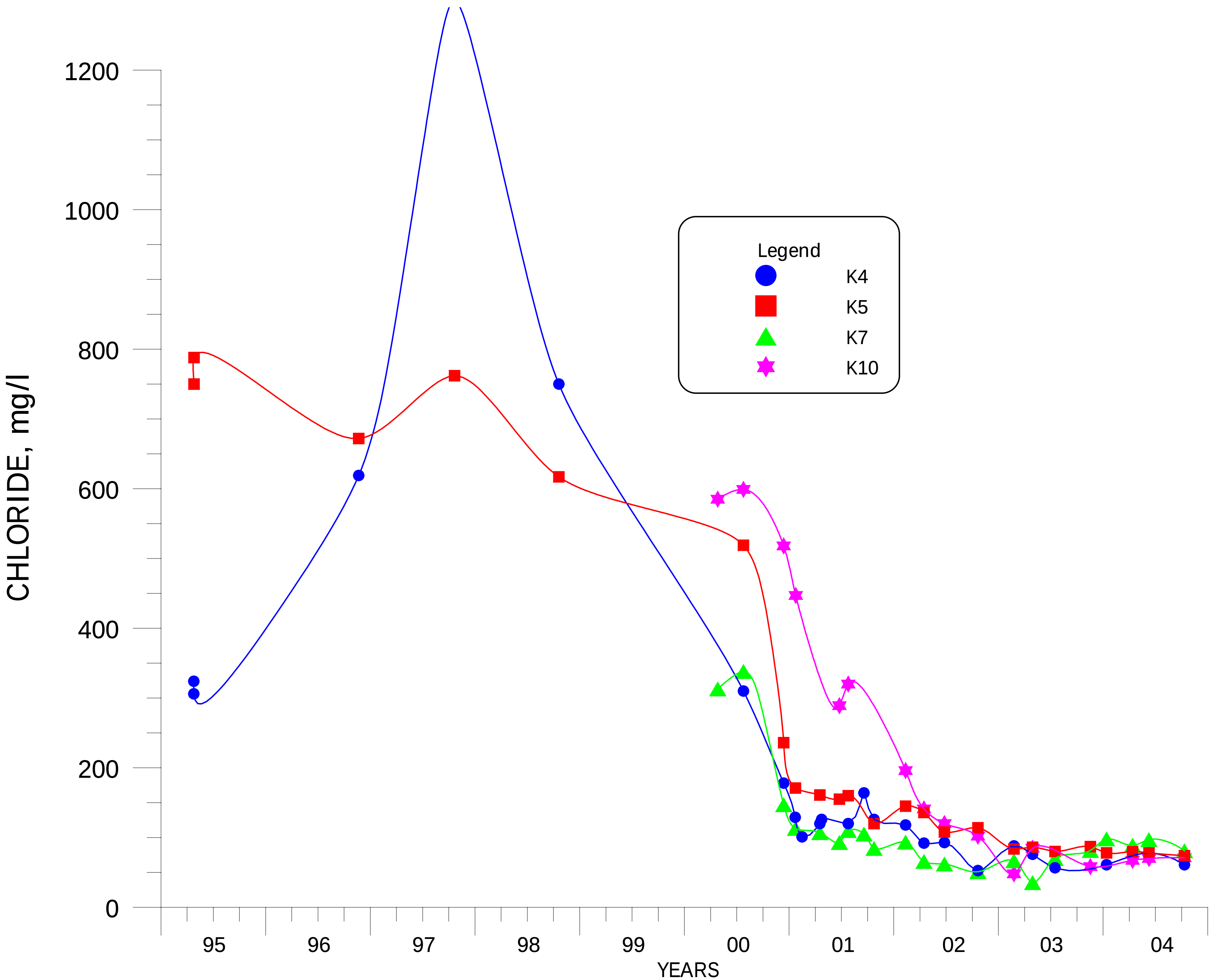


FIGURE 4.3-44. CHLORIDE CONCENTRATIONS FOR WELLS K4, K5, K7 AND K10.

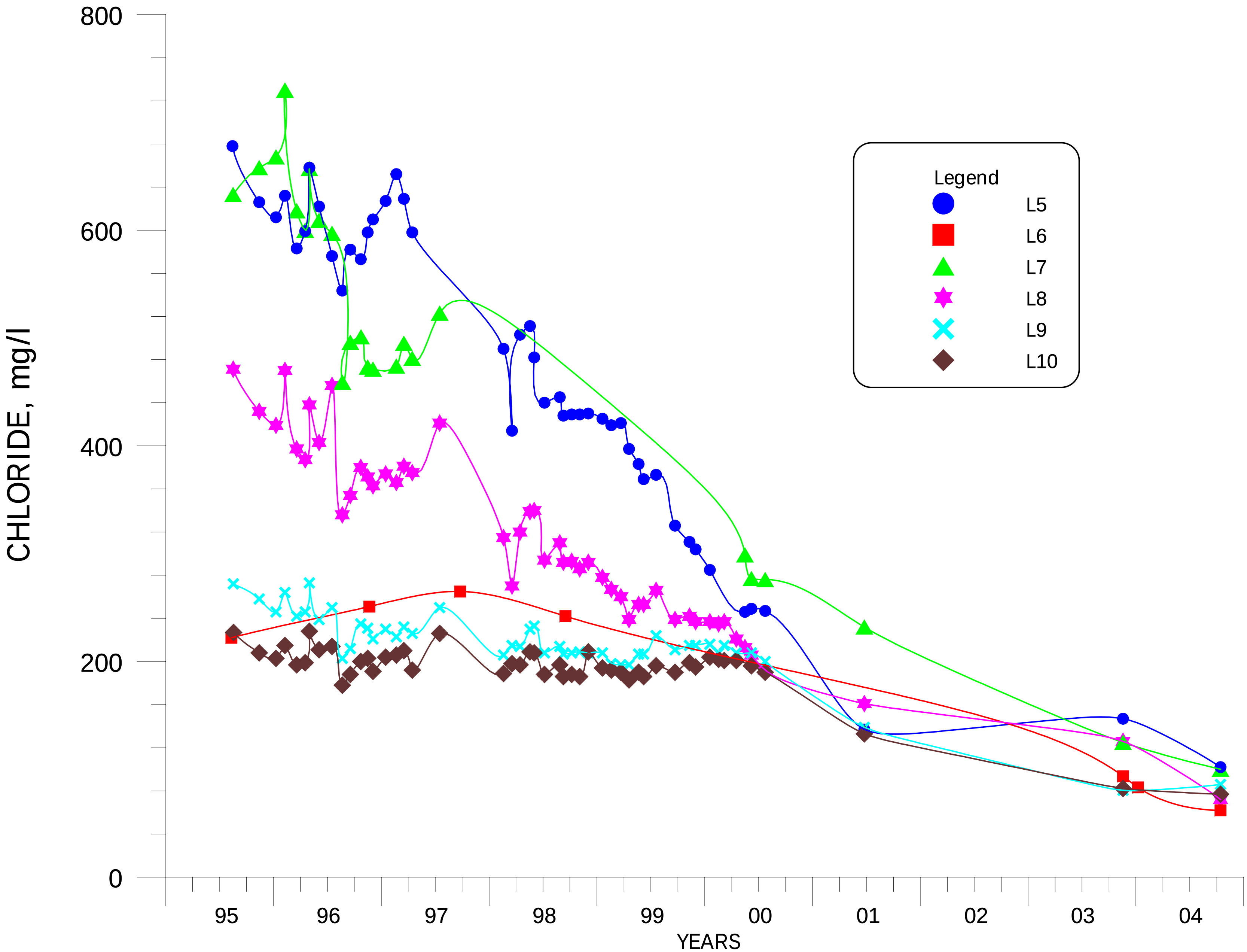


FIGURE 4.3-45. CHLORIDE CONCENTRATIONS FOR WELLS L5, L6, L7, L8, L9 AND L10.

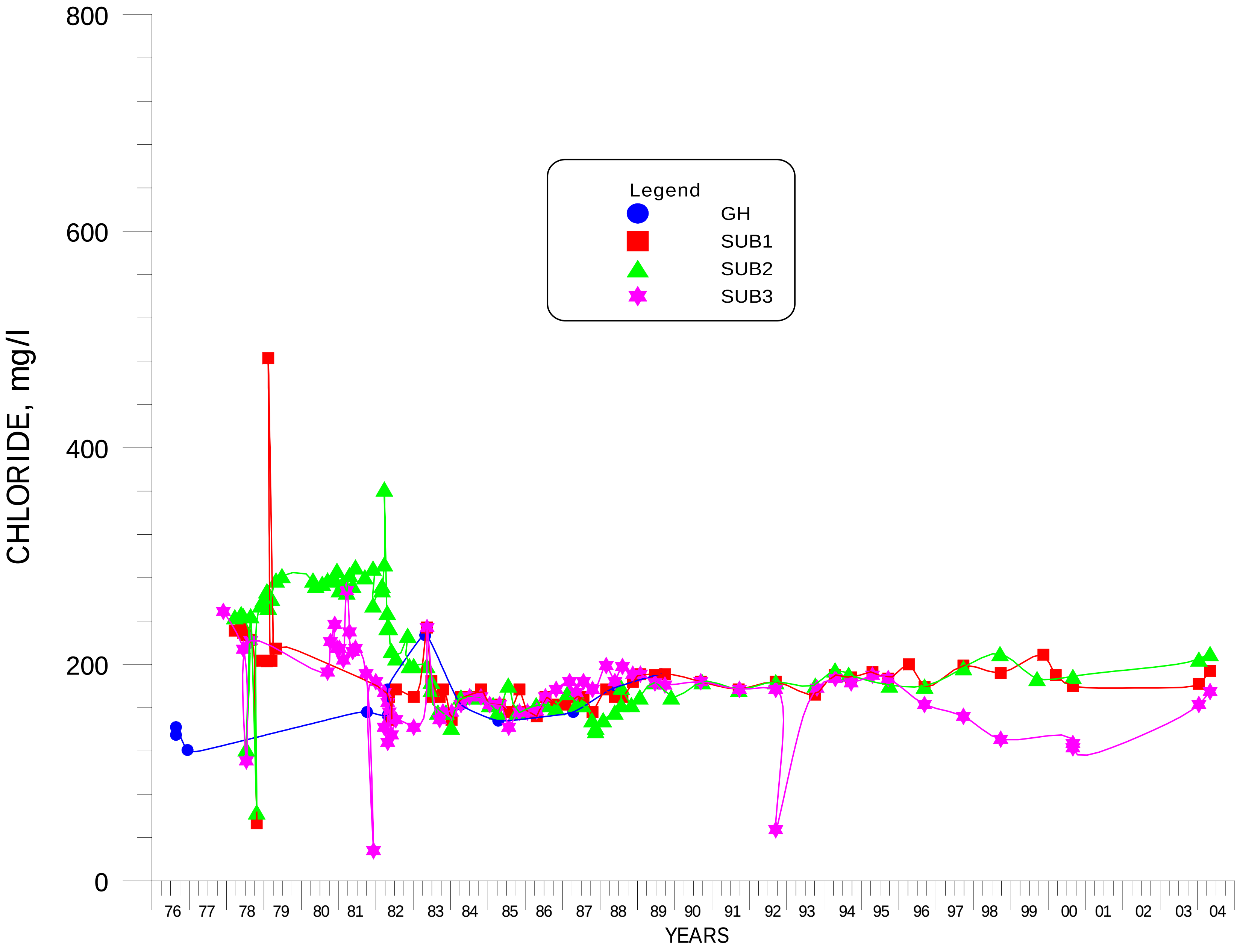


FIGURE 4.3-46. CHLORIDE CONCENTRATIONS FOR WELLS GH, SUB1, SUB2 AND SUB3.

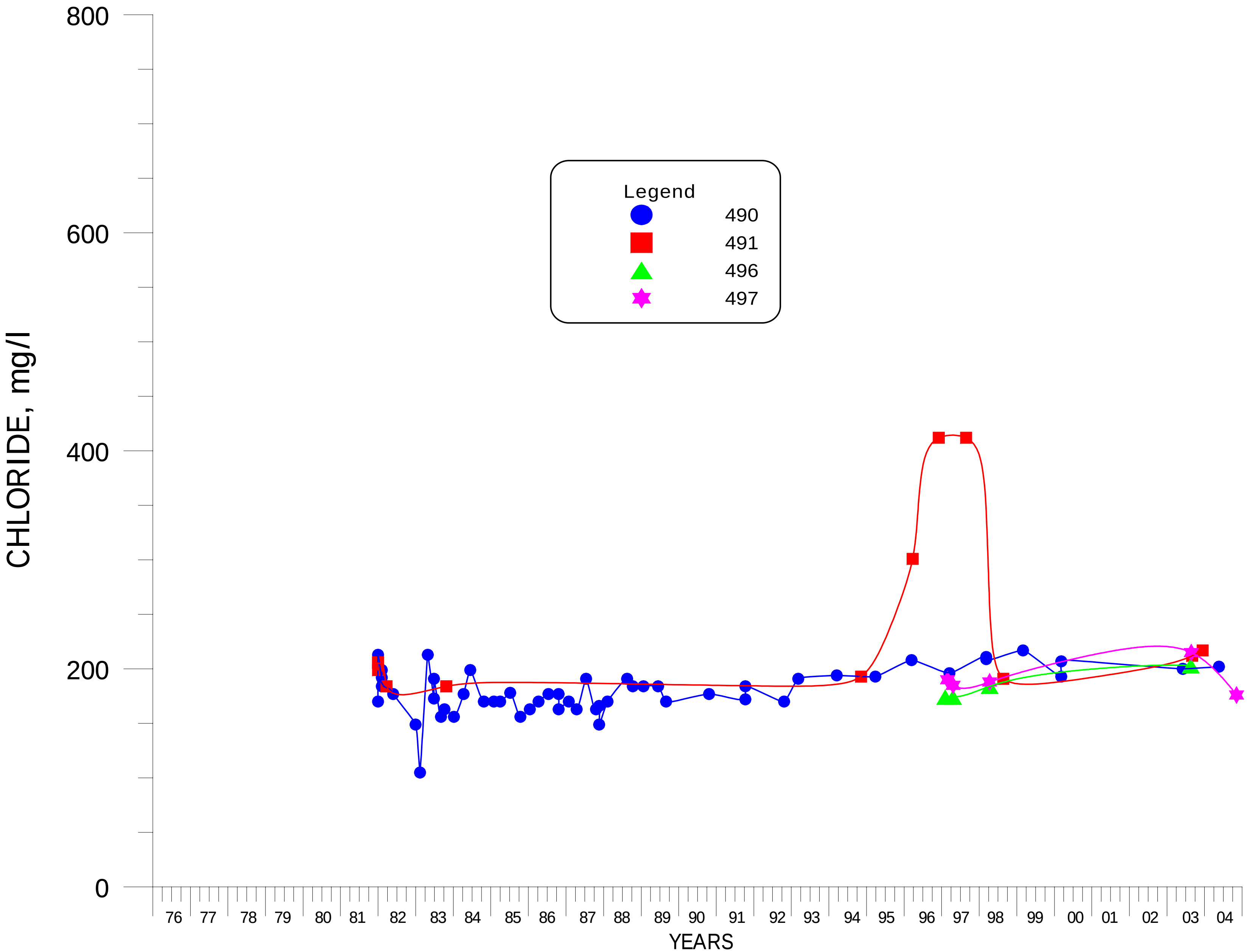


FIGURE 4.3-47. CHLORIDE CONCENTRATIONS FOR WELLS 490, 491, 496 AND 497.

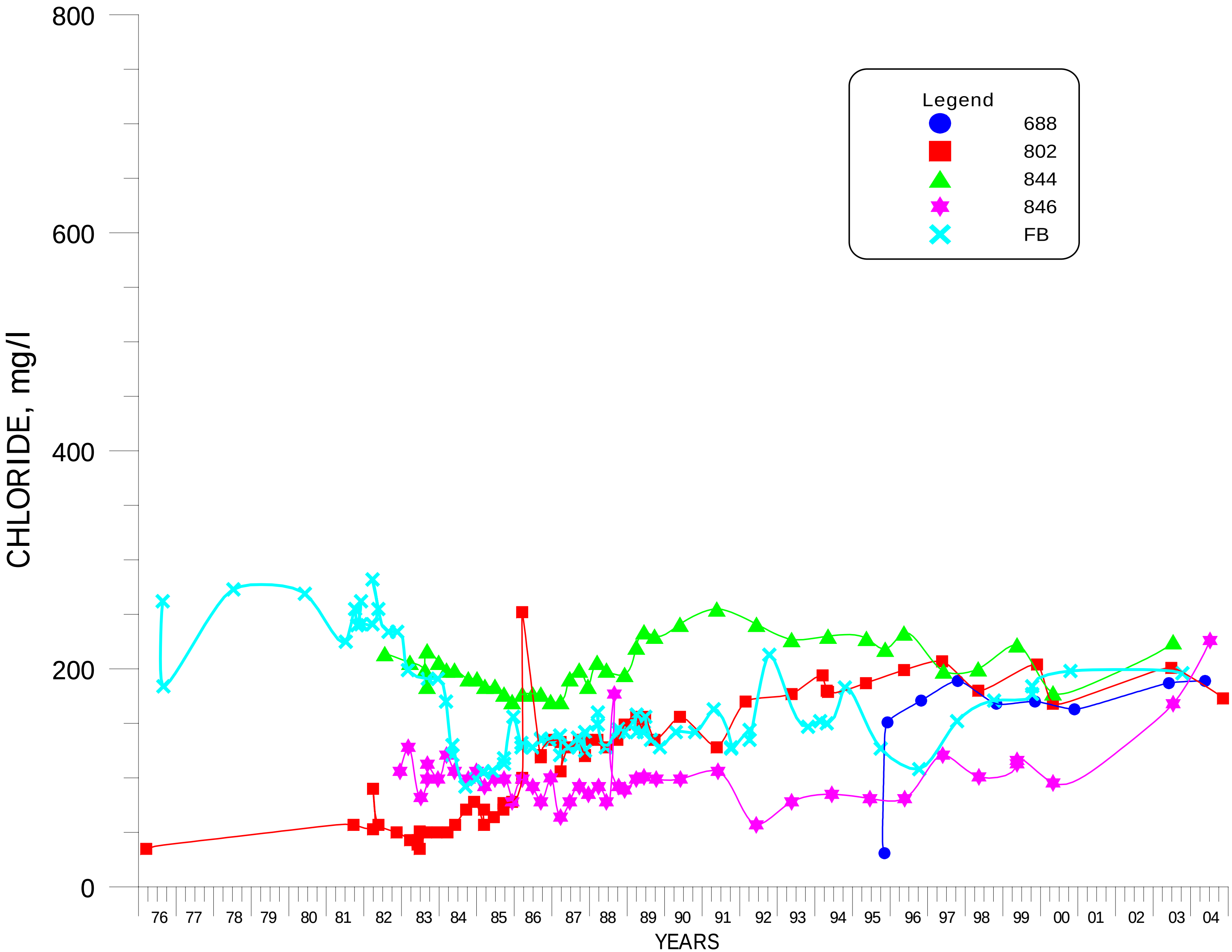


FIGURE 4.3-48. CHLORIDE CONCENTRATIONS FOR WELLS 688, 802, 844, 846 AND FB.

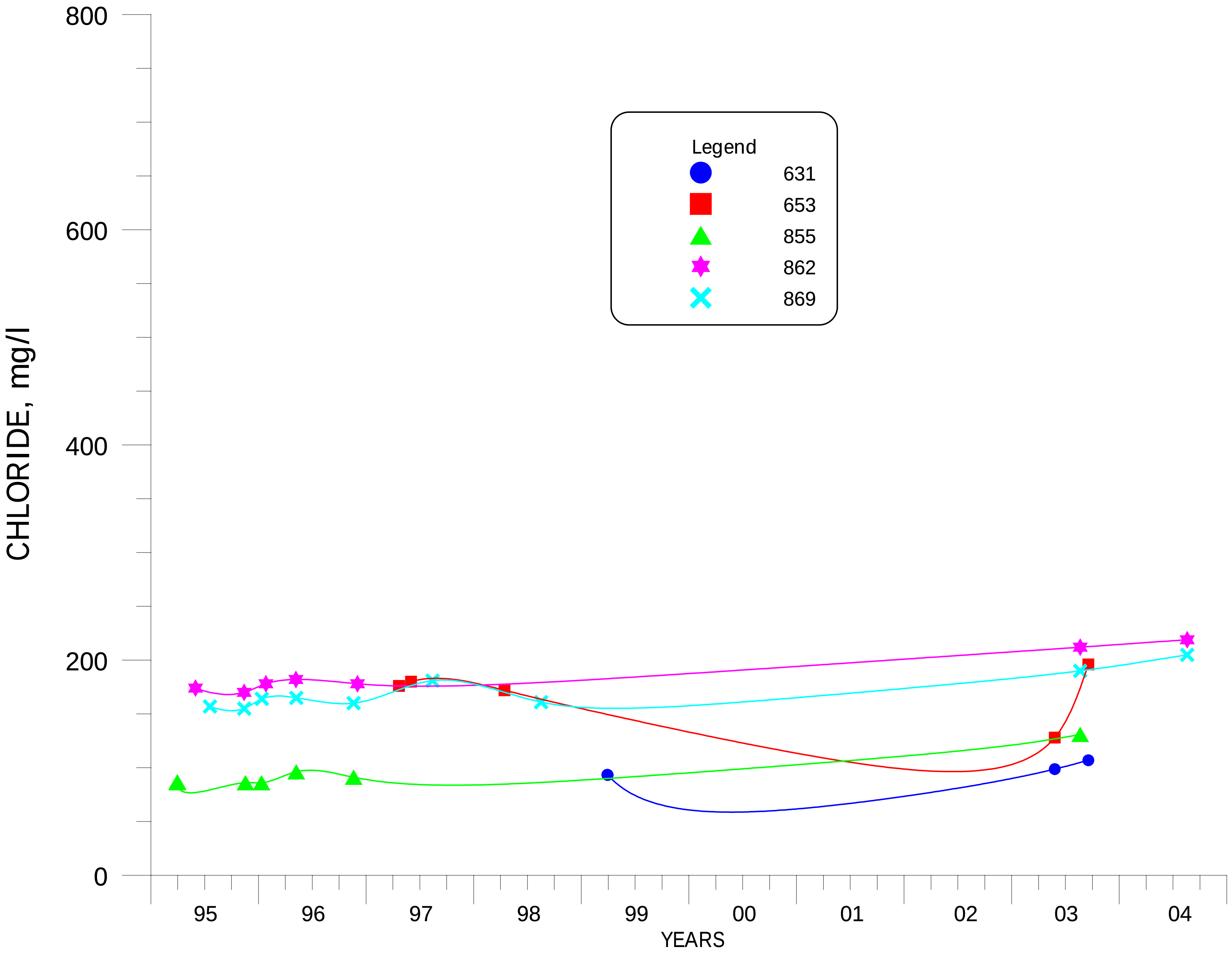


FIGURE 4.3-49. CHLORIDE CONCENTRATIONS FOR WELLS 631, 653, 855, 862 AND 869.

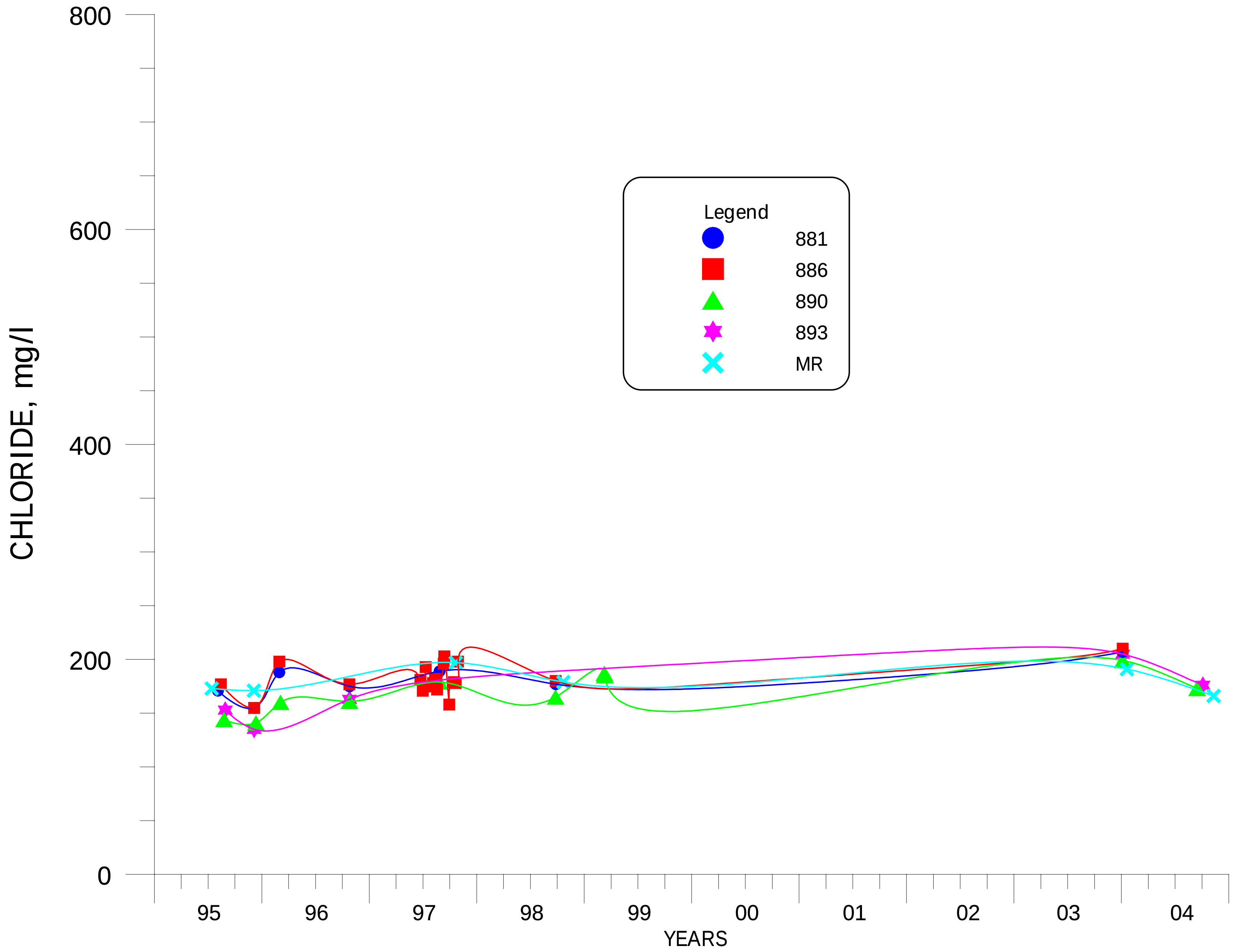


FIGURE 4.3-50. CHLORIDE CONCENTRATIONS FOR WELLS 881, 886, 890, 893 AND MR.

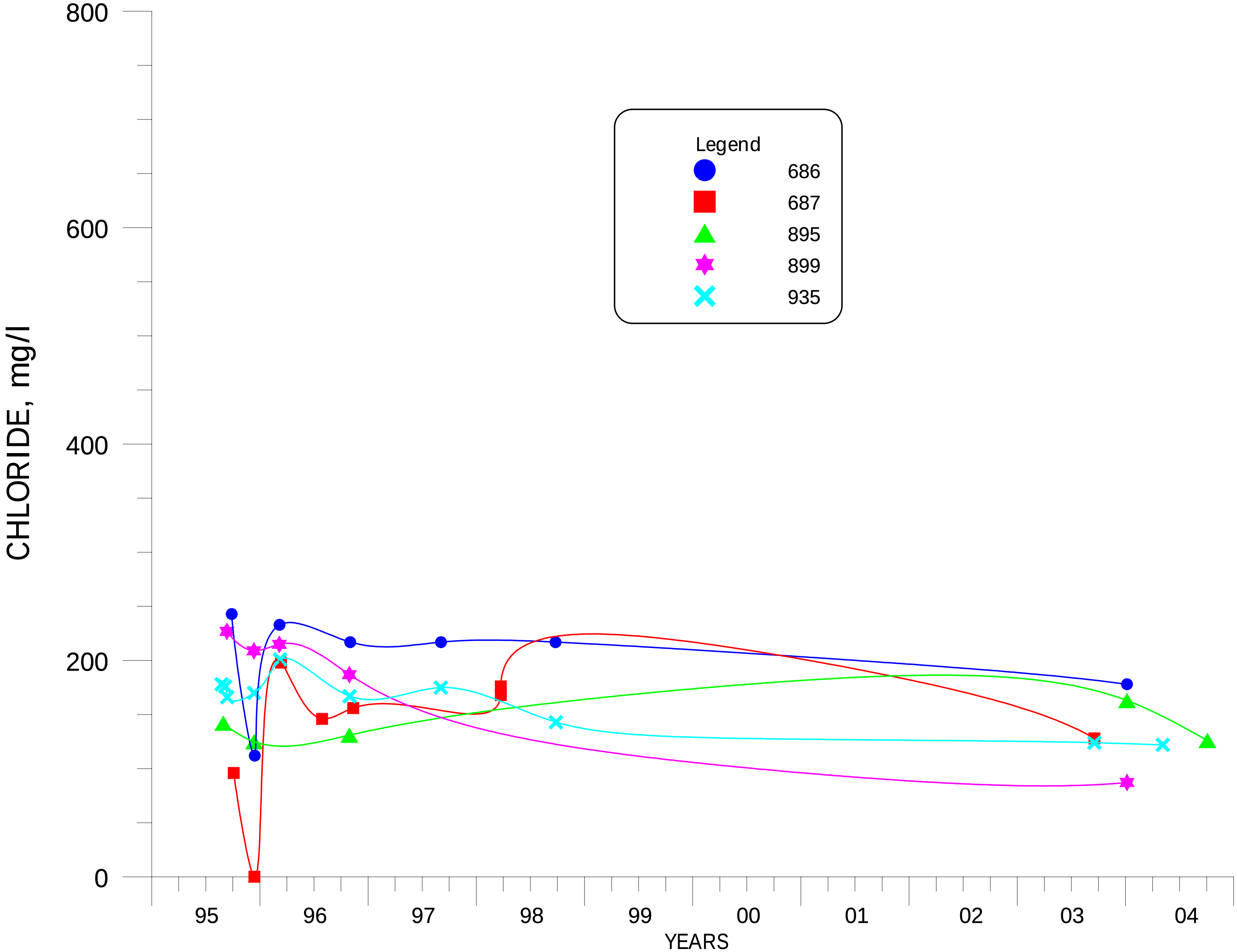


FIGURE 4.3-51. CHLORIDE CONCENTRATIONS FOR WELLS 686, 687, 895, 899 AND 935.

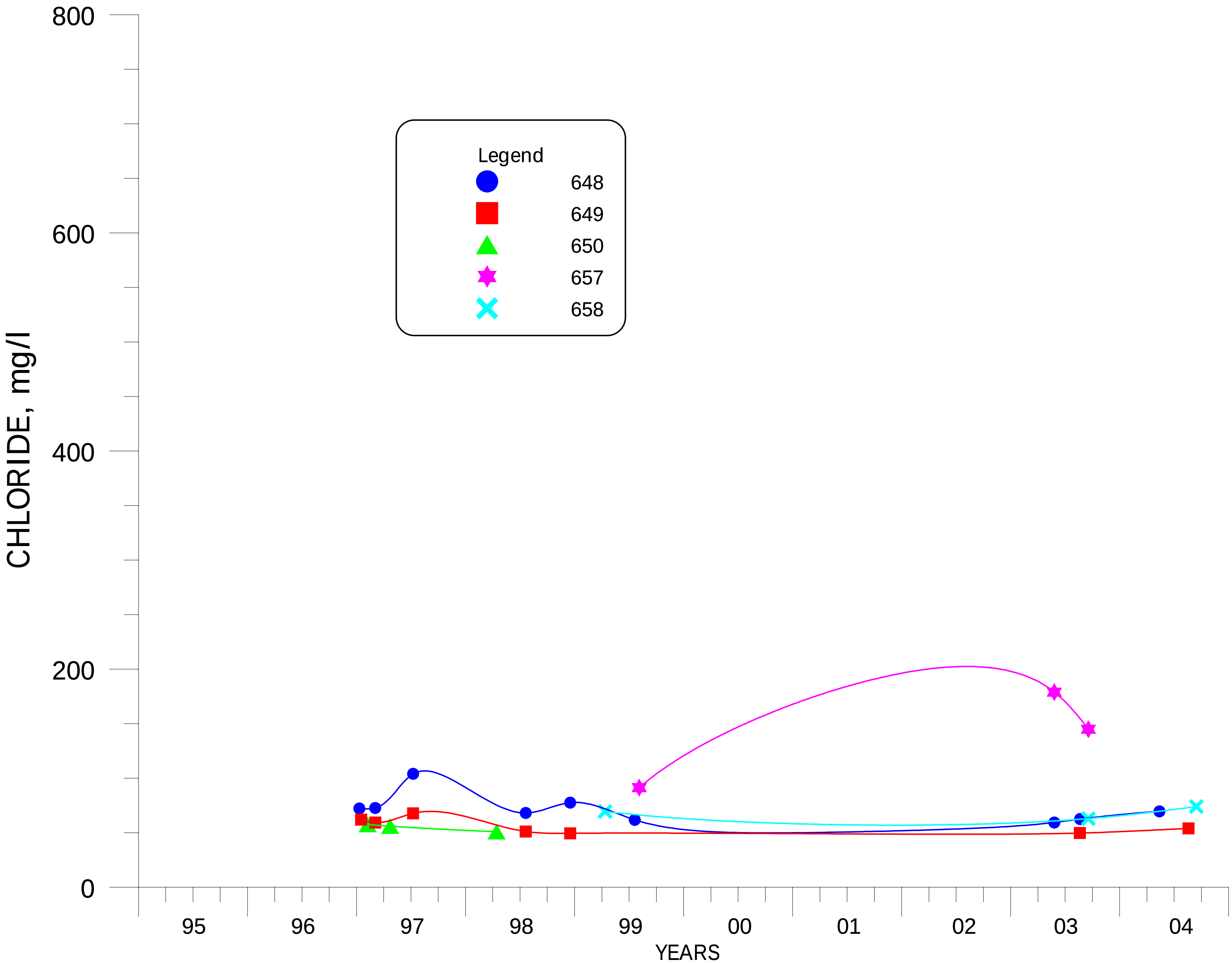
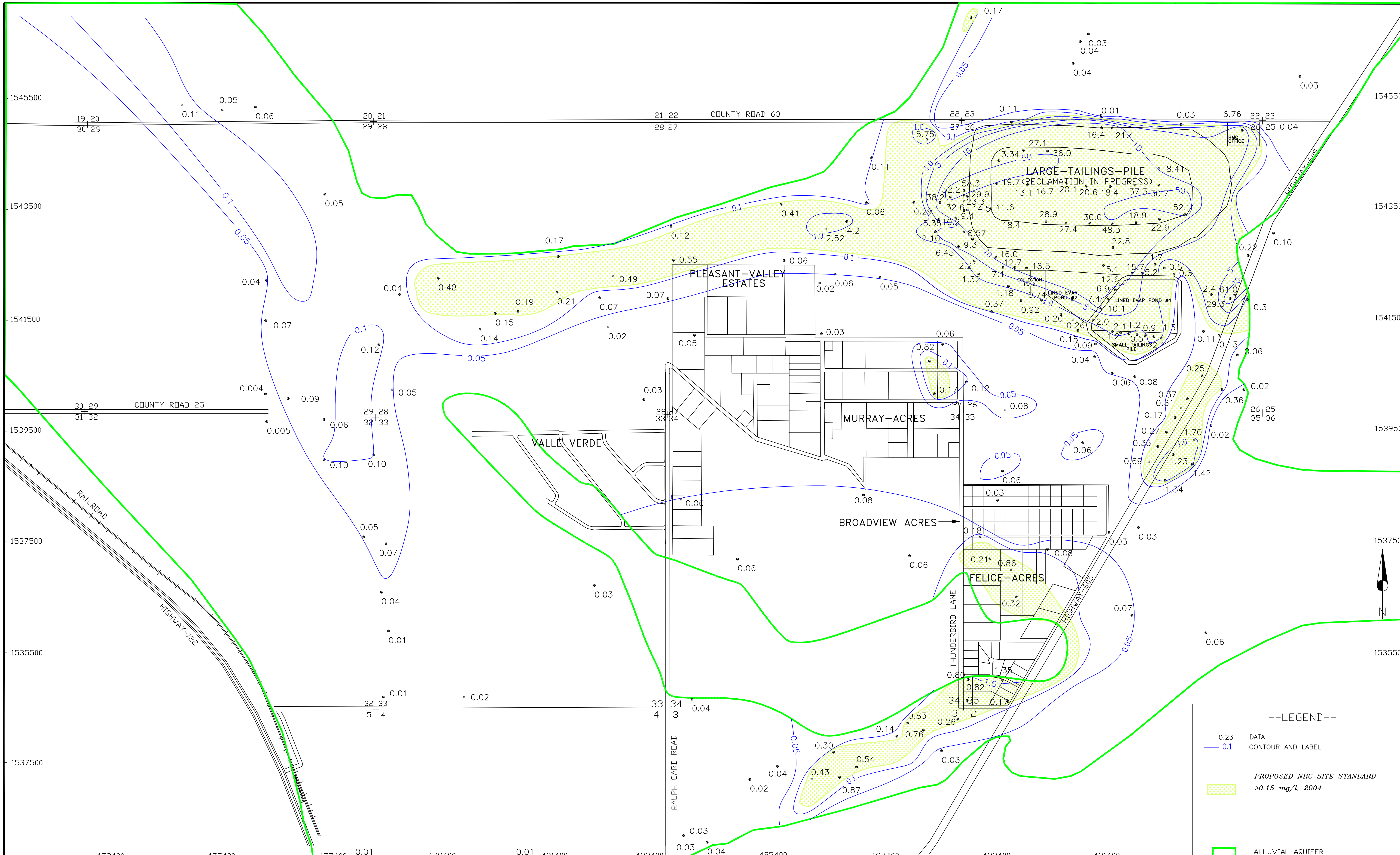


FIGURE 4.3-52. CHLORIDE CONCENTRATIONS FOR WELLS 648, 649, 650, 657 AND 658.



SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-53. URANIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, mg/l

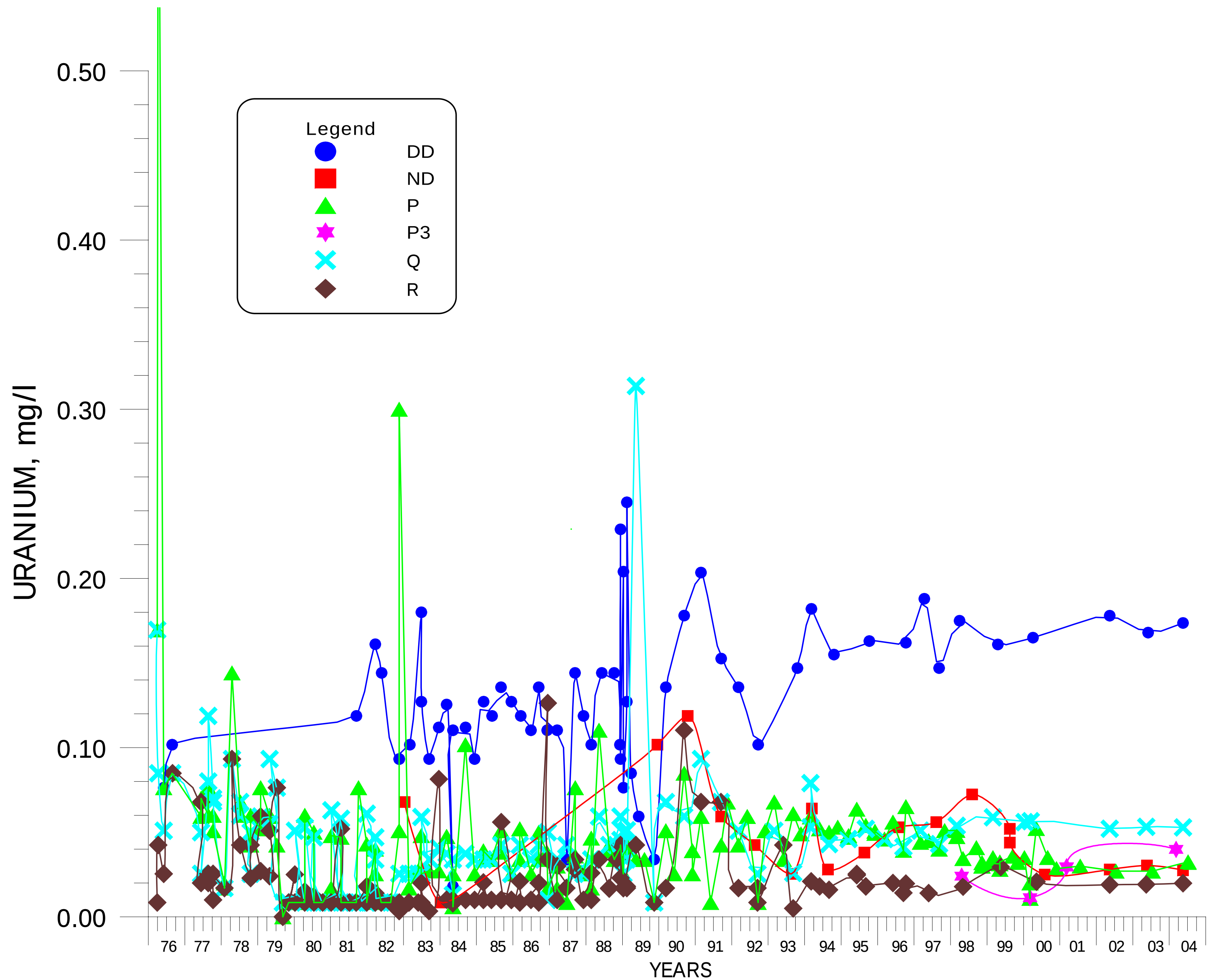


FIGURE 4.3-54. URANIUM CONCENTRATIONS FOR WELLS DD, ND, P, P3, Q AND R.

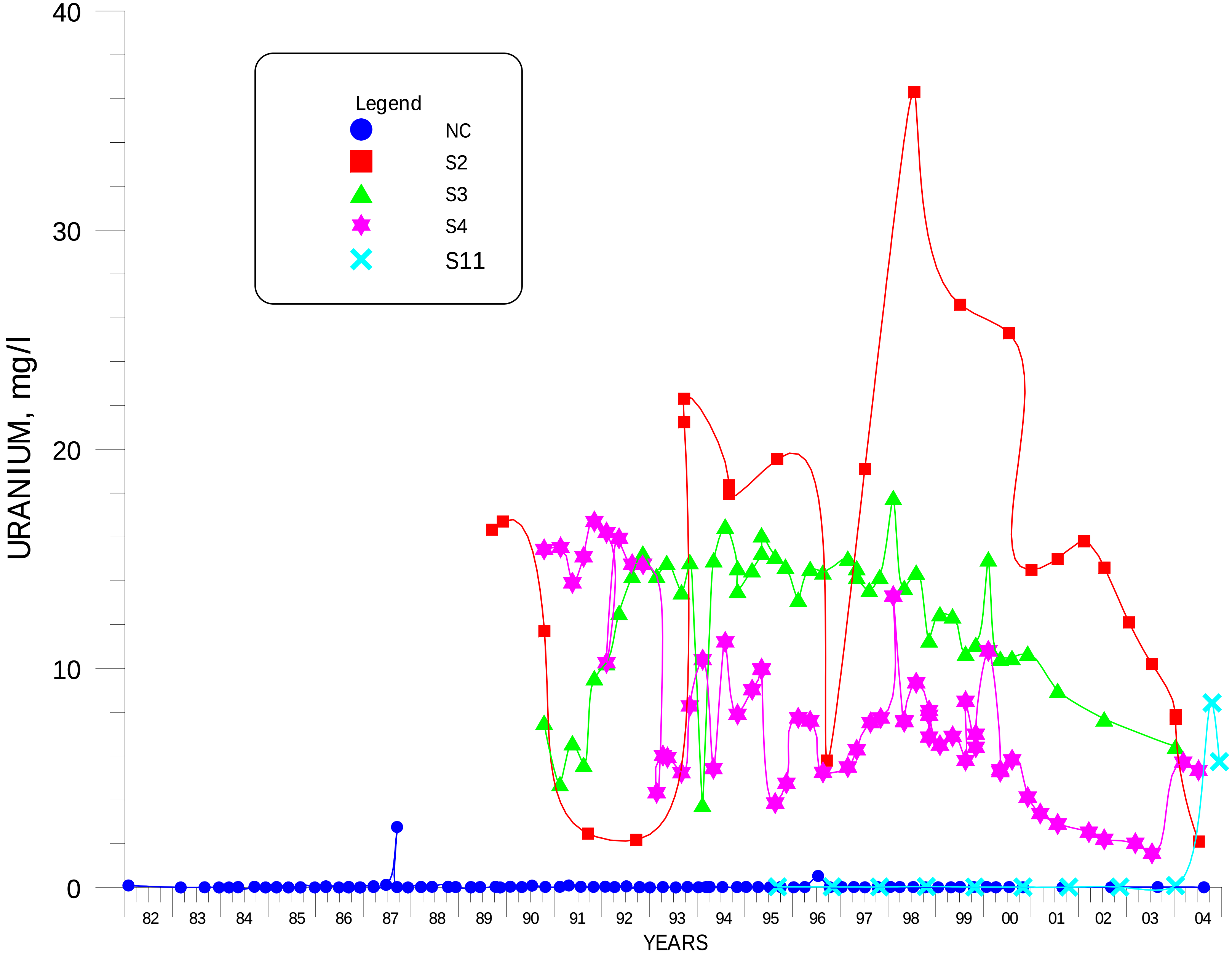


FIGURE 4.3-55. URANIUM CONCENTRATIONS FOR WELLS NC, S2, S3, S4 AND S11.

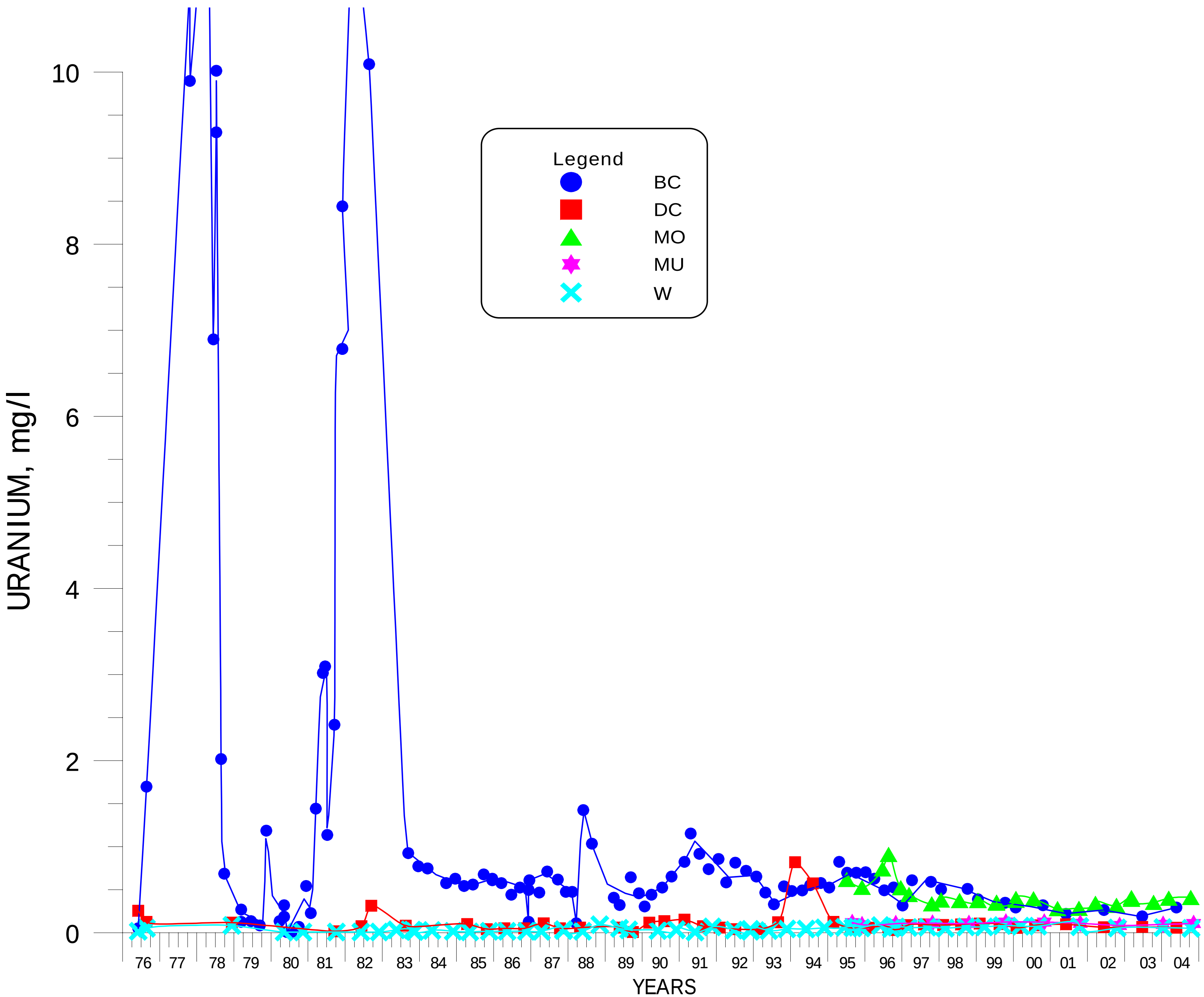


FIGURE 4.3-56. URANIUM CONCENTRATIONS FOR WELLS BC, DC, MO, MU AND W.

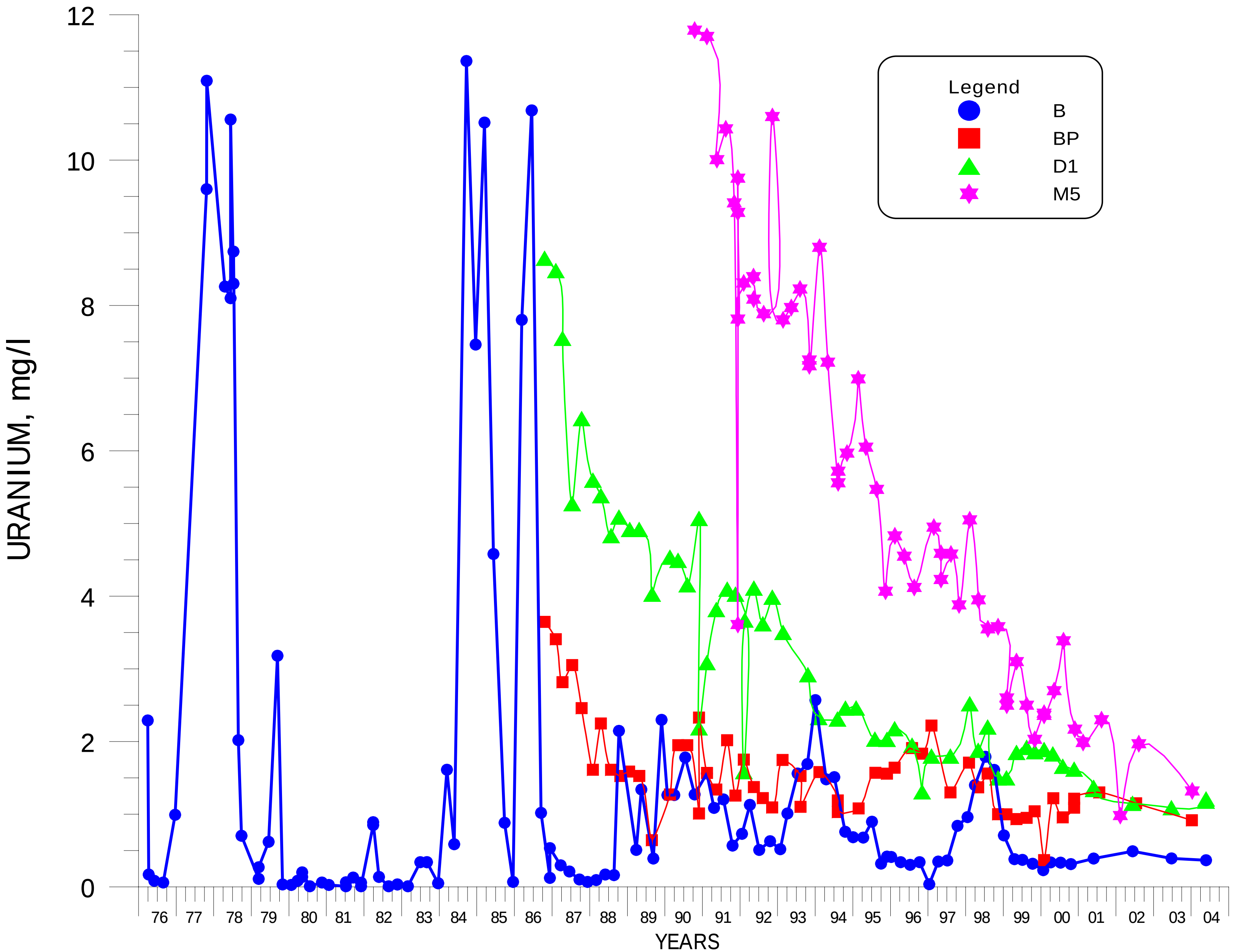


FIGURE 4.3-57. URANIUM CONCENTRATIONS FOR WELLS B, BP, D1 AND M5.

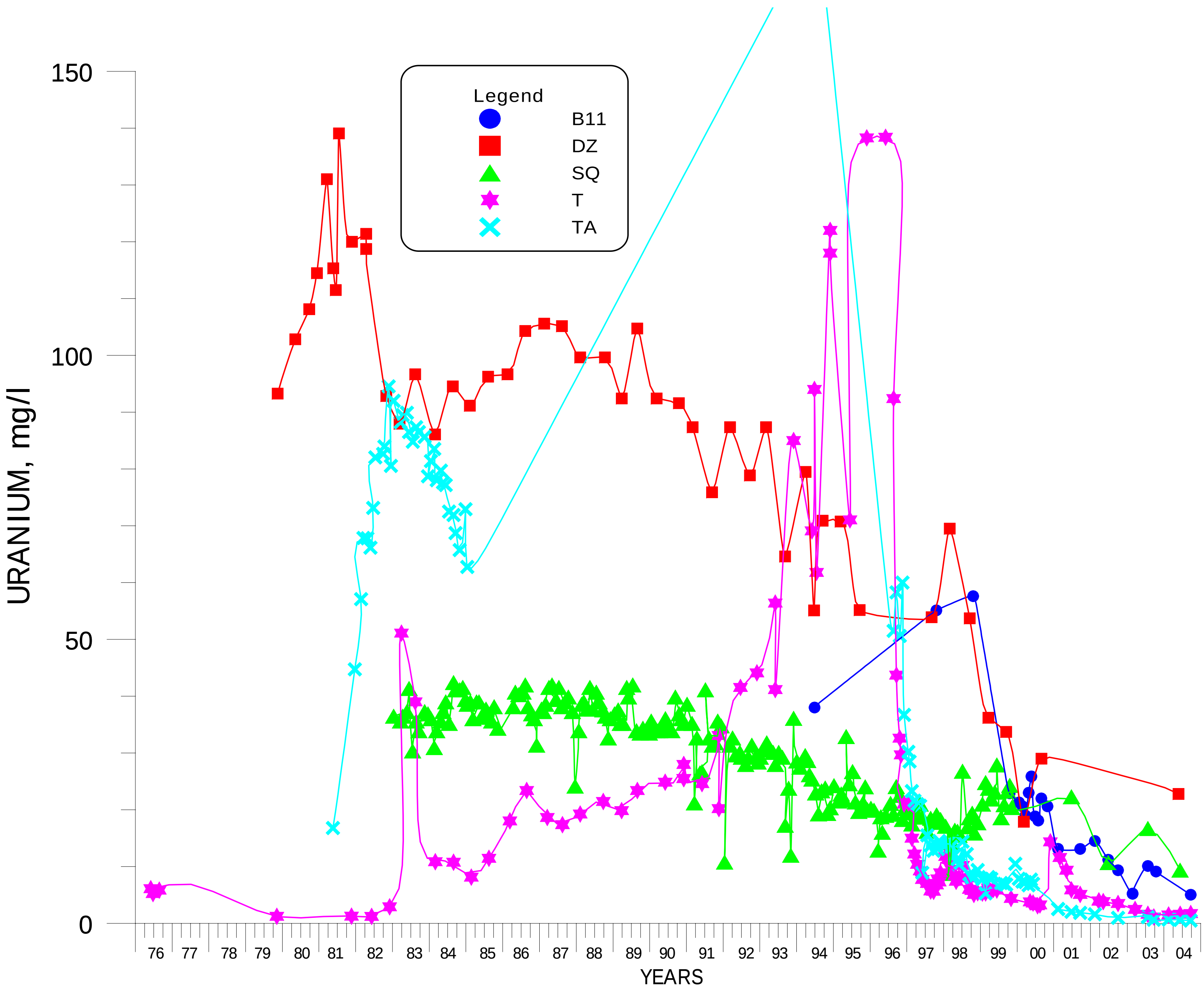


FIGURE 4.3-58. URANIUM CONCENTRATIONS FOR WELLS B11, DZ, SQ, T AND TA.

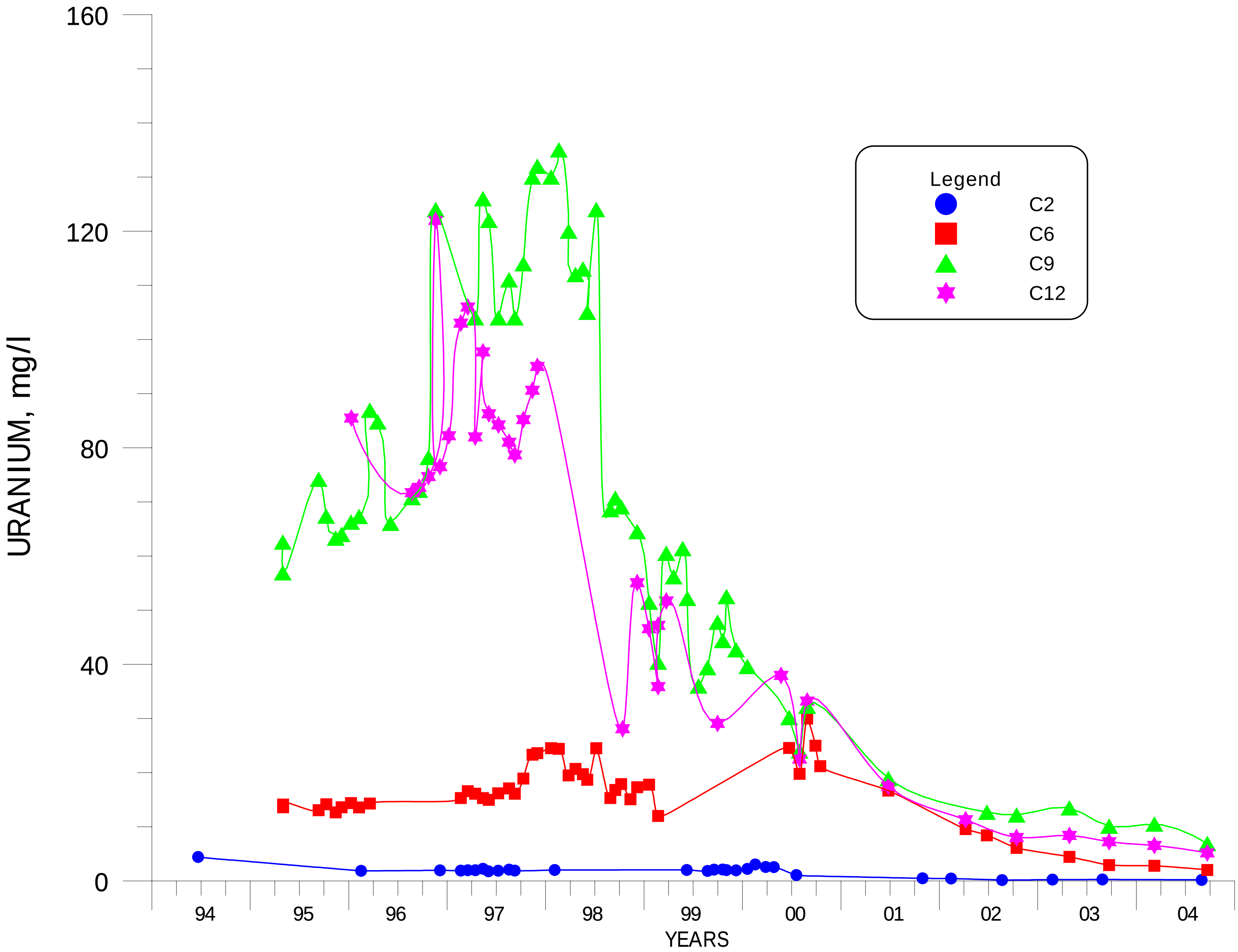


FIGURE 4.3-59. URANIUM CONCENTRATIONS FOR WELLS C2, C6, C9 AND C12.

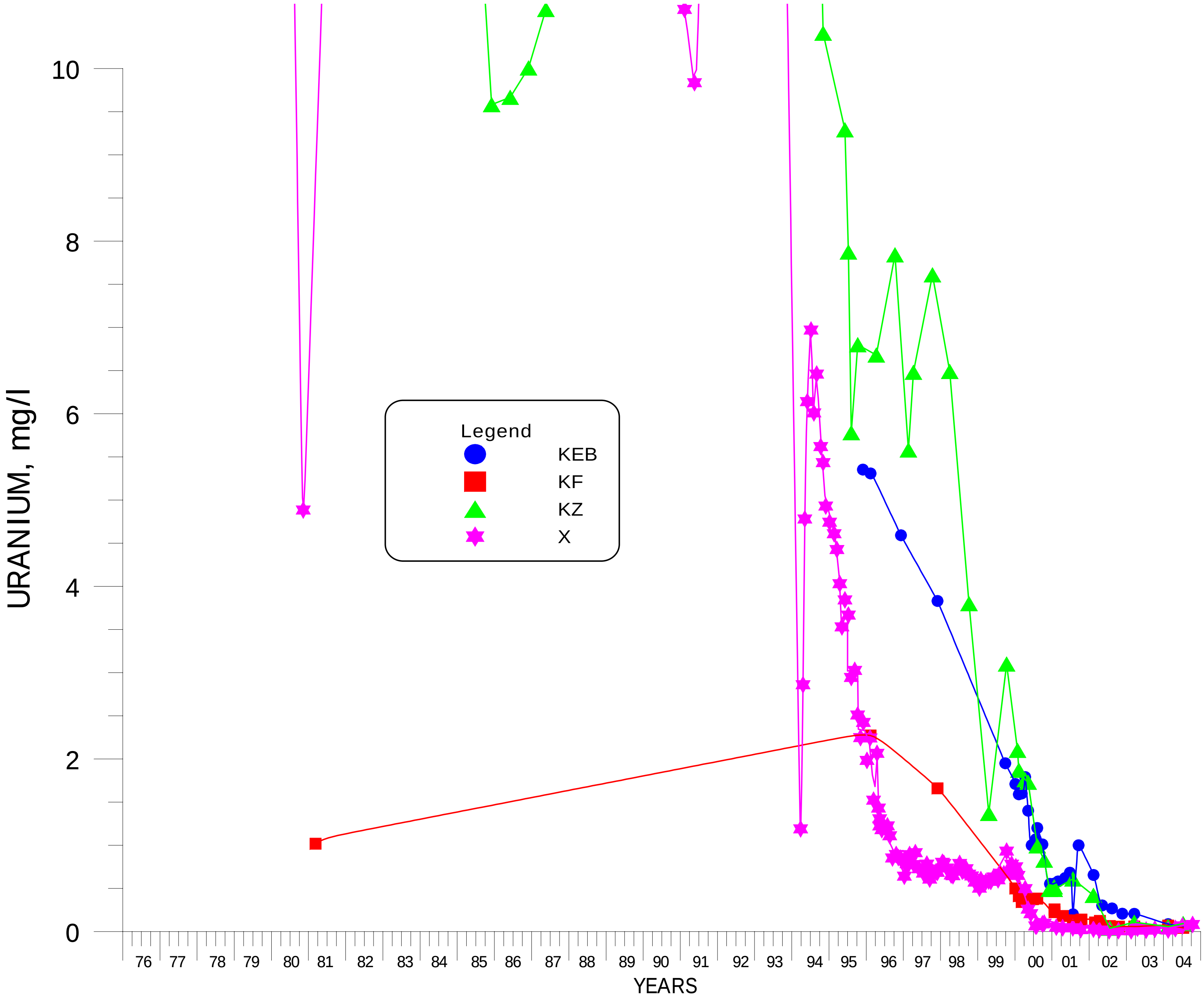


FIGURE 4.3-60. URANIUM CONCENTRATIONS FOR WELLS KEB, KF, KZ AND X.

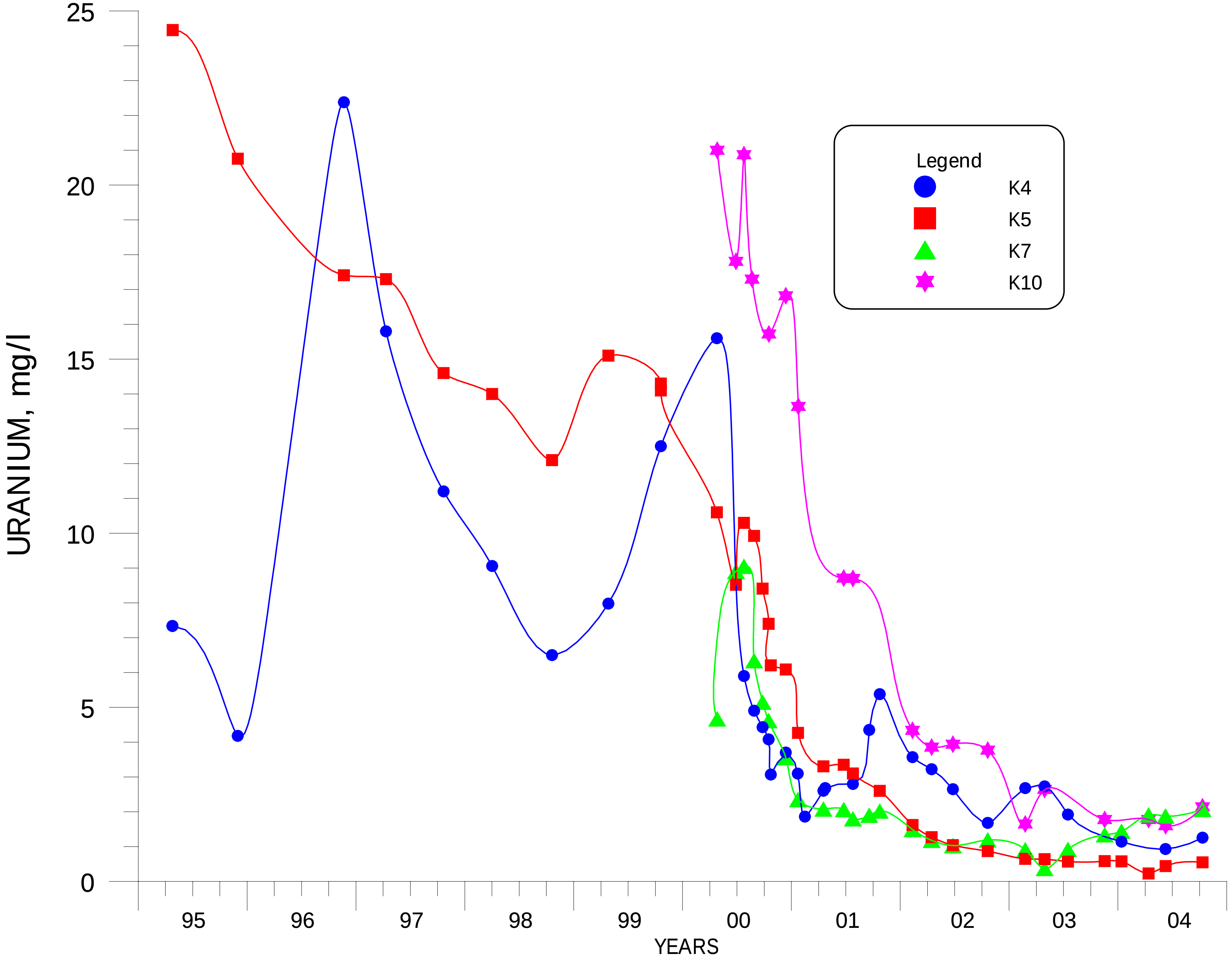


FIGURE 4.3-61. URANIUM CONCENTRATIONS FOR WELLS K4, K5, K7 AND K10.

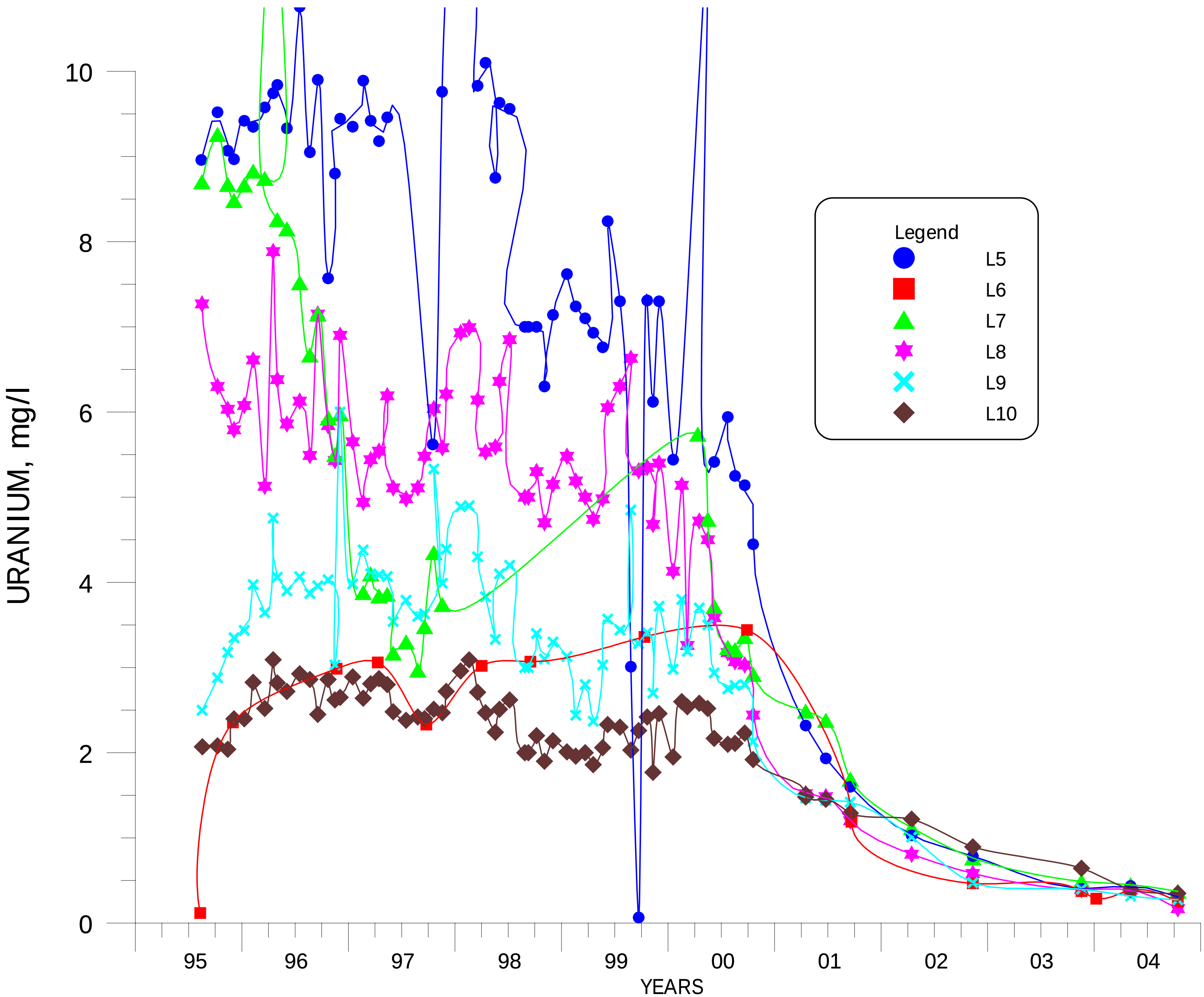


FIGURE 4.3-62. URANIUM CONCENTRATIONS FOR WELLS L5, L6, L7, L8, L9 AND L10.

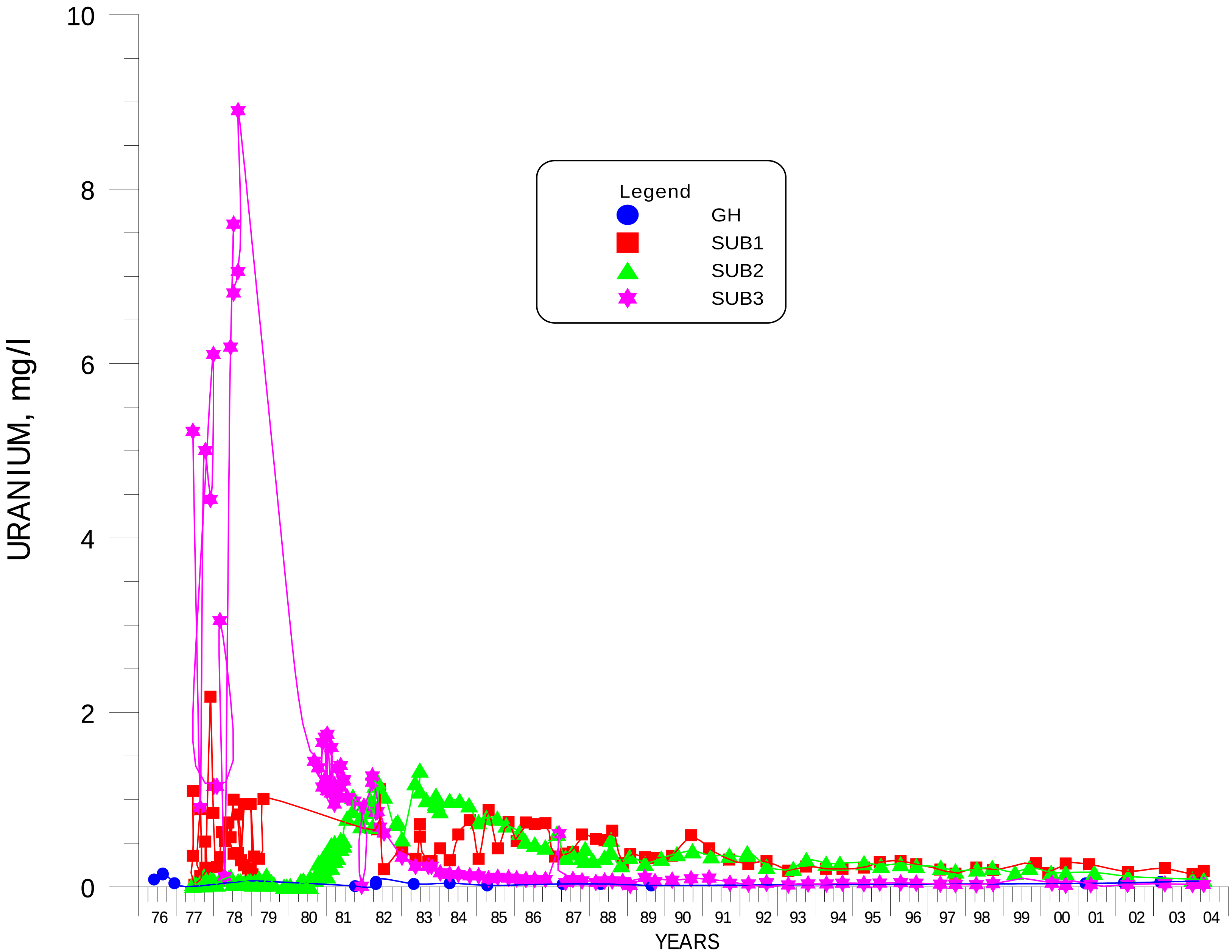


FIGURE 4.3-63. URANIUM CONCENTRATIONS FOR WELLS GH, SUB1, SUB2 AND SUB3.

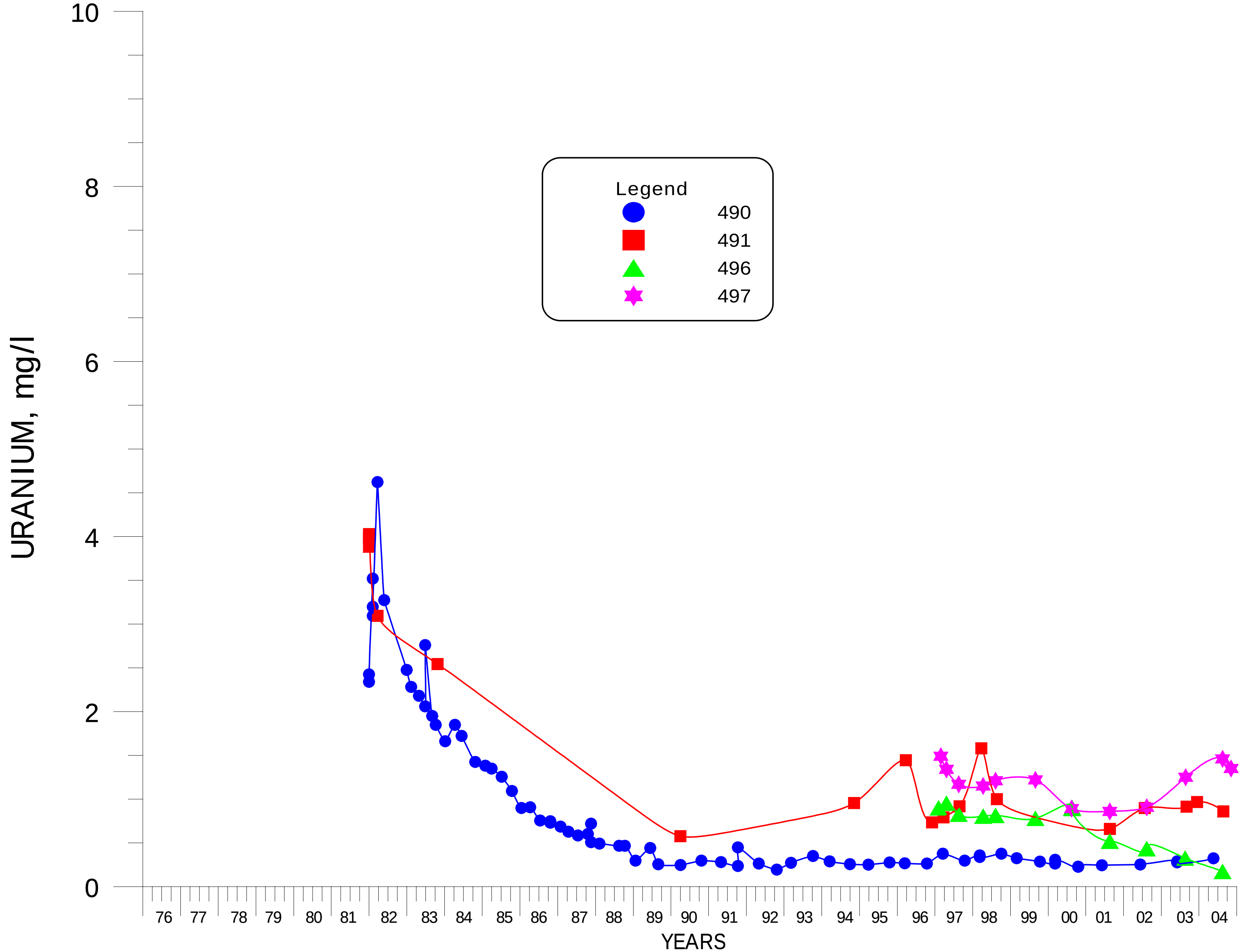


FIGURE 4.3-64. URANIUM CONCENTRATIONS FOR WELLS 490, 491, 496 AND 497.

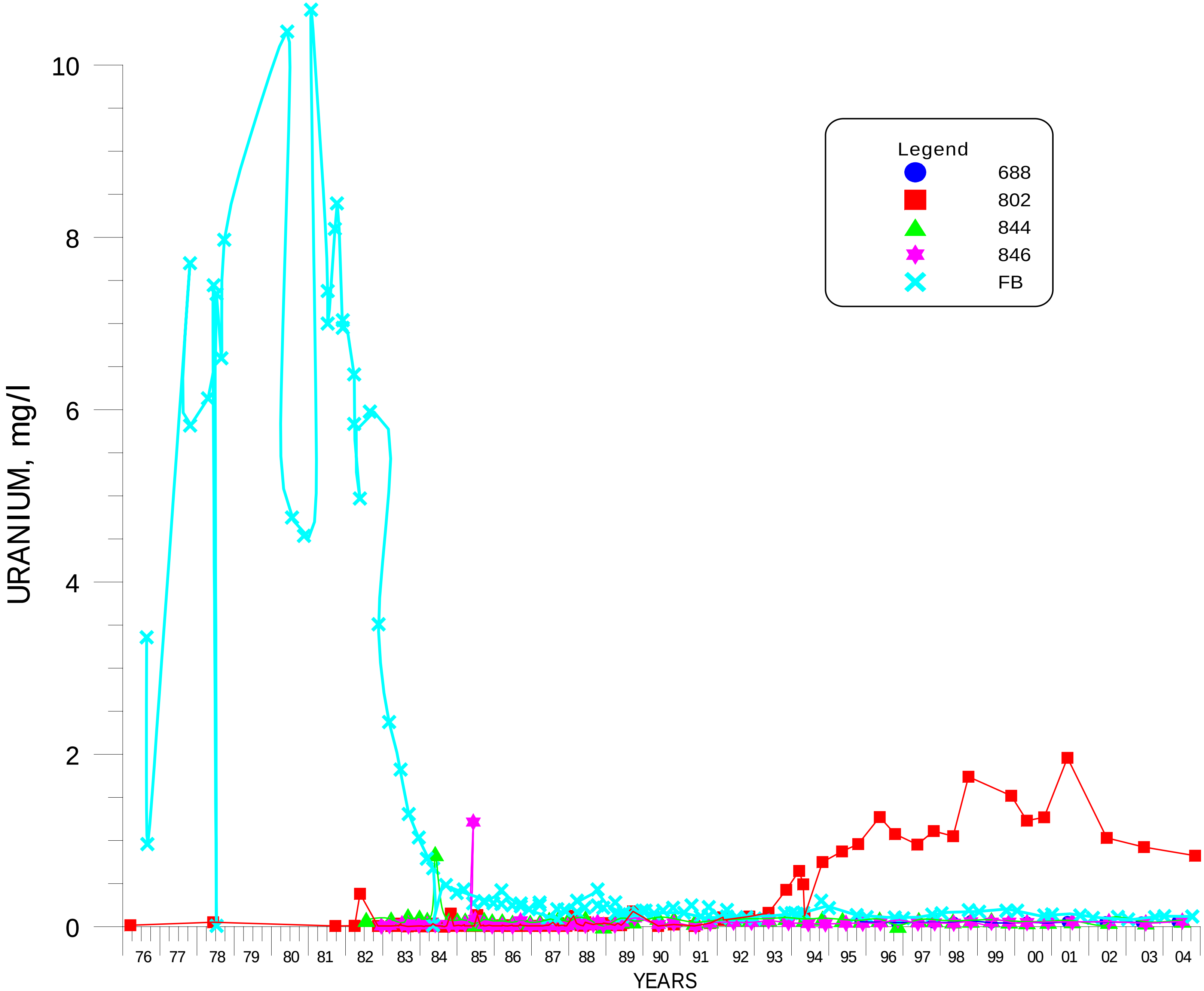


FIGURE 4.3-65. URANIUM CONCENTRATIONS FOR WELLS 688, 802, 844, 846 AND FB.

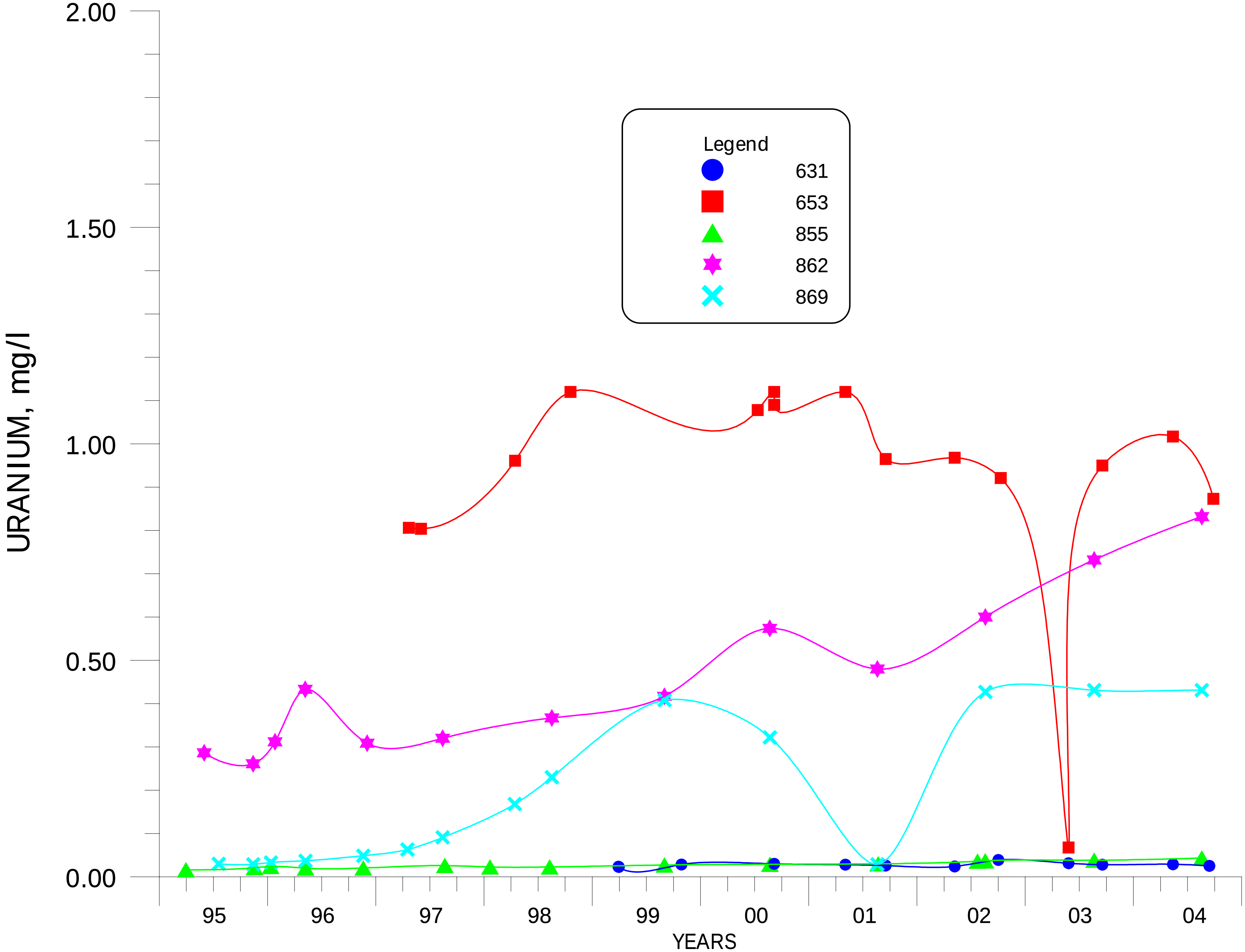


FIGURE 4.3-66. URANIUM CONCENTRATIONS FOR WELLS 631, 653, 855, 862 AND 869.

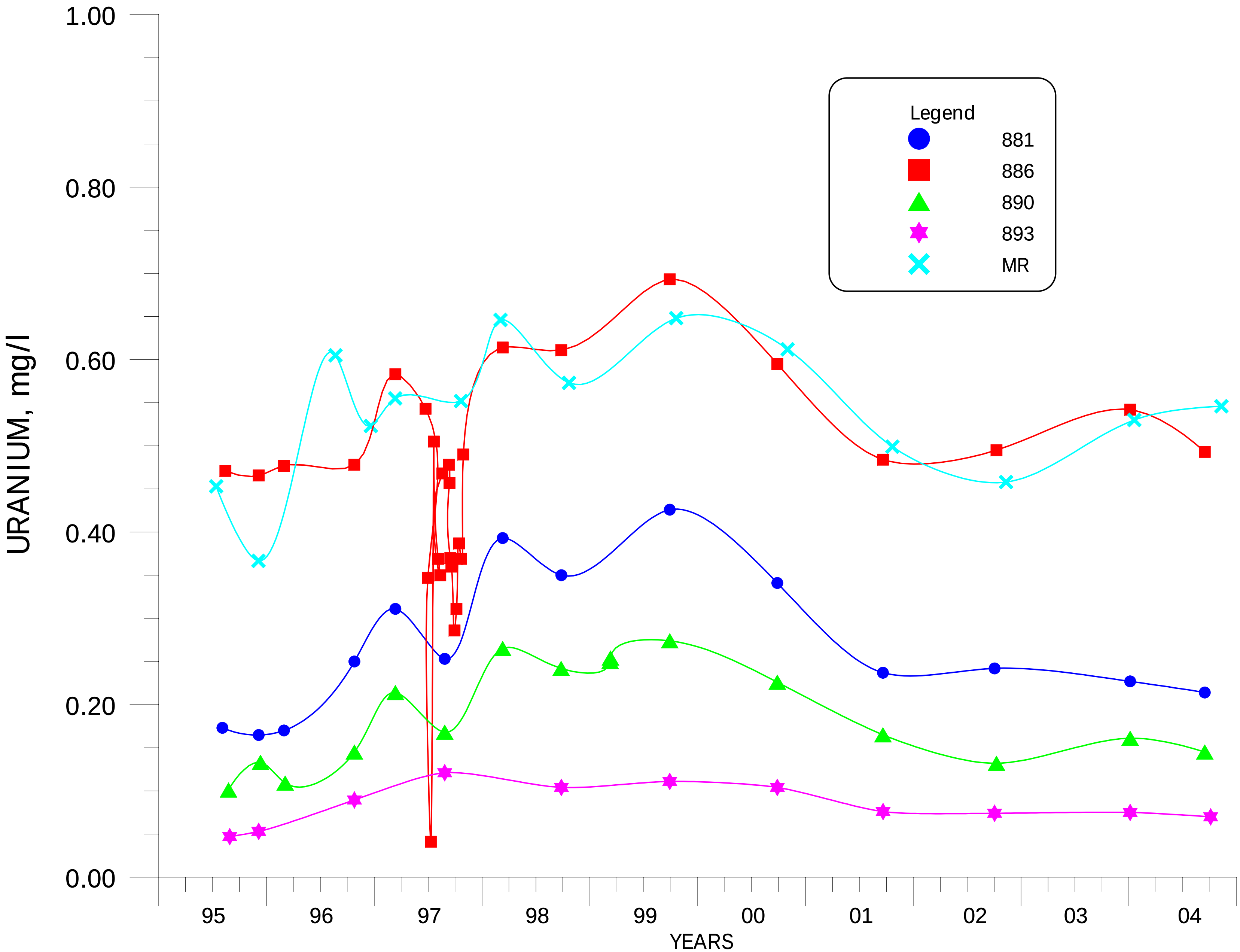


FIGURE 4.3-67. URANIUM CONCENTRATIONS FOR WELLS 881, 886, 890, 893 AND MR.

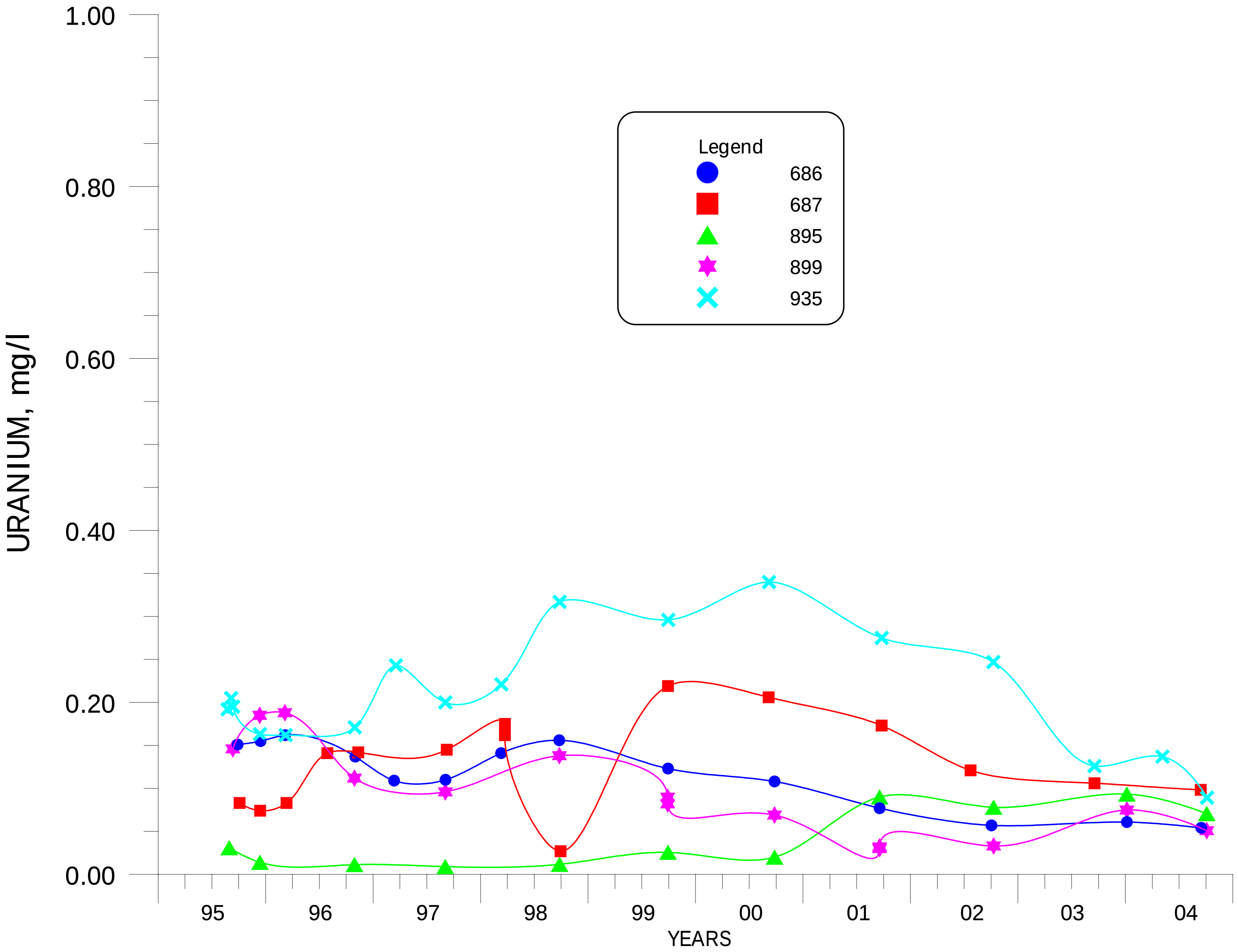


FIGURE 4.3-68. URANIUM CONCENTRATIONS FOR WELLS 686, 687, 895, 899 AND 935.

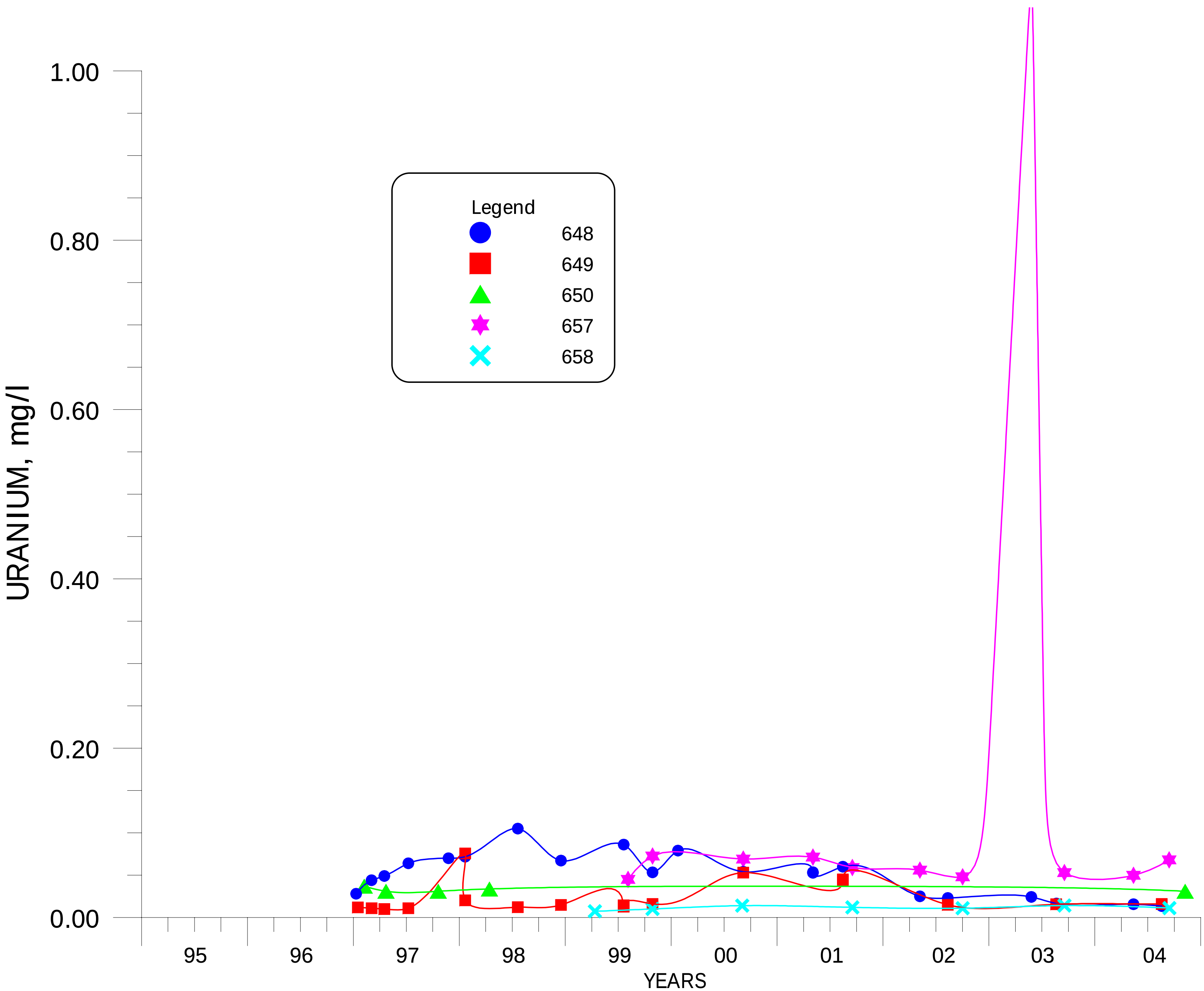
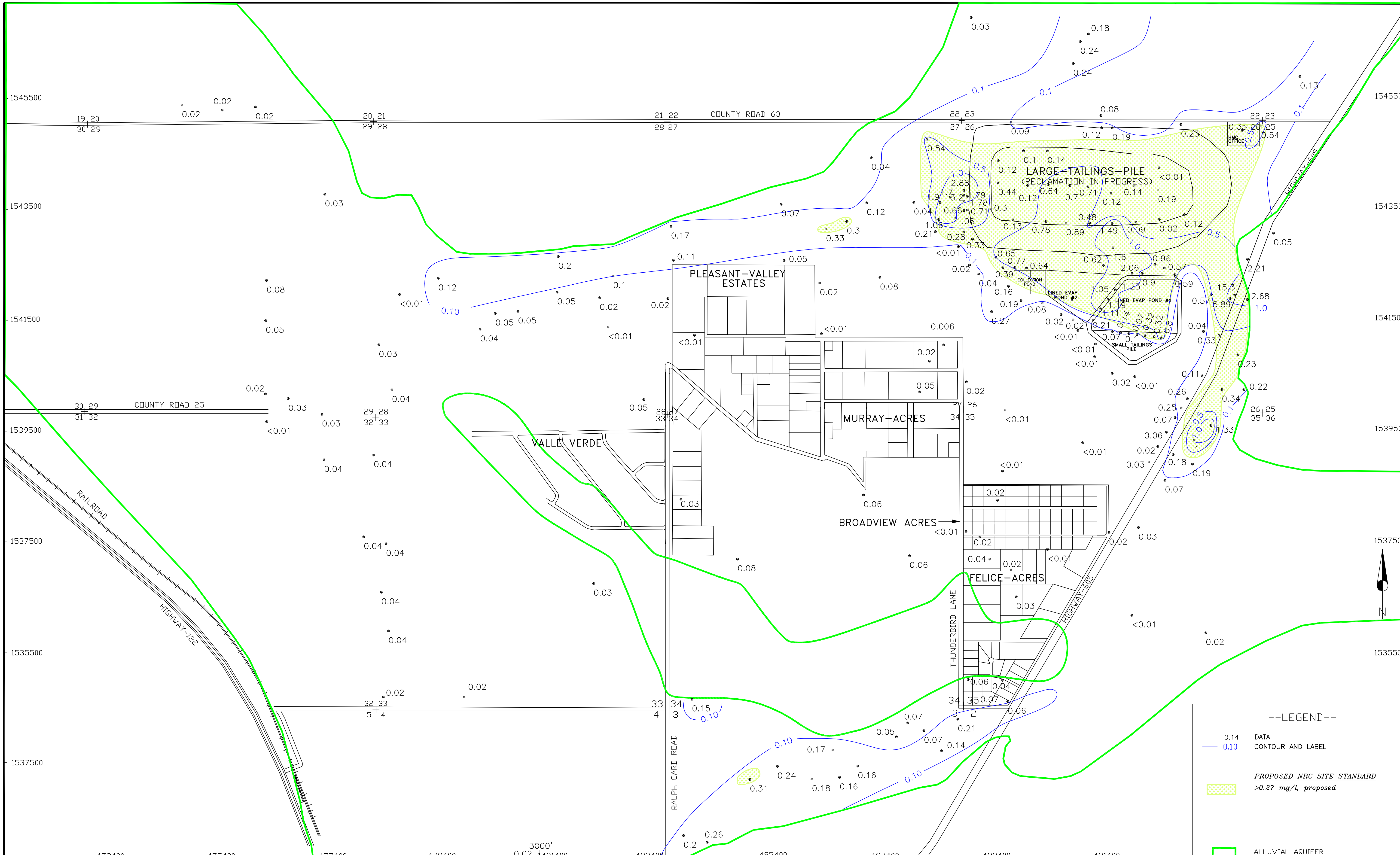


FIGURE 4.3-69. URANIUM CONCENTRATIONS FOR WELLS 648, 649, 650, 657 AND 658.



SCALE: 1"=1600'
C:\PROJECTS\
2004-06\C-QAL04
DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-70. SELENIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, mg/l

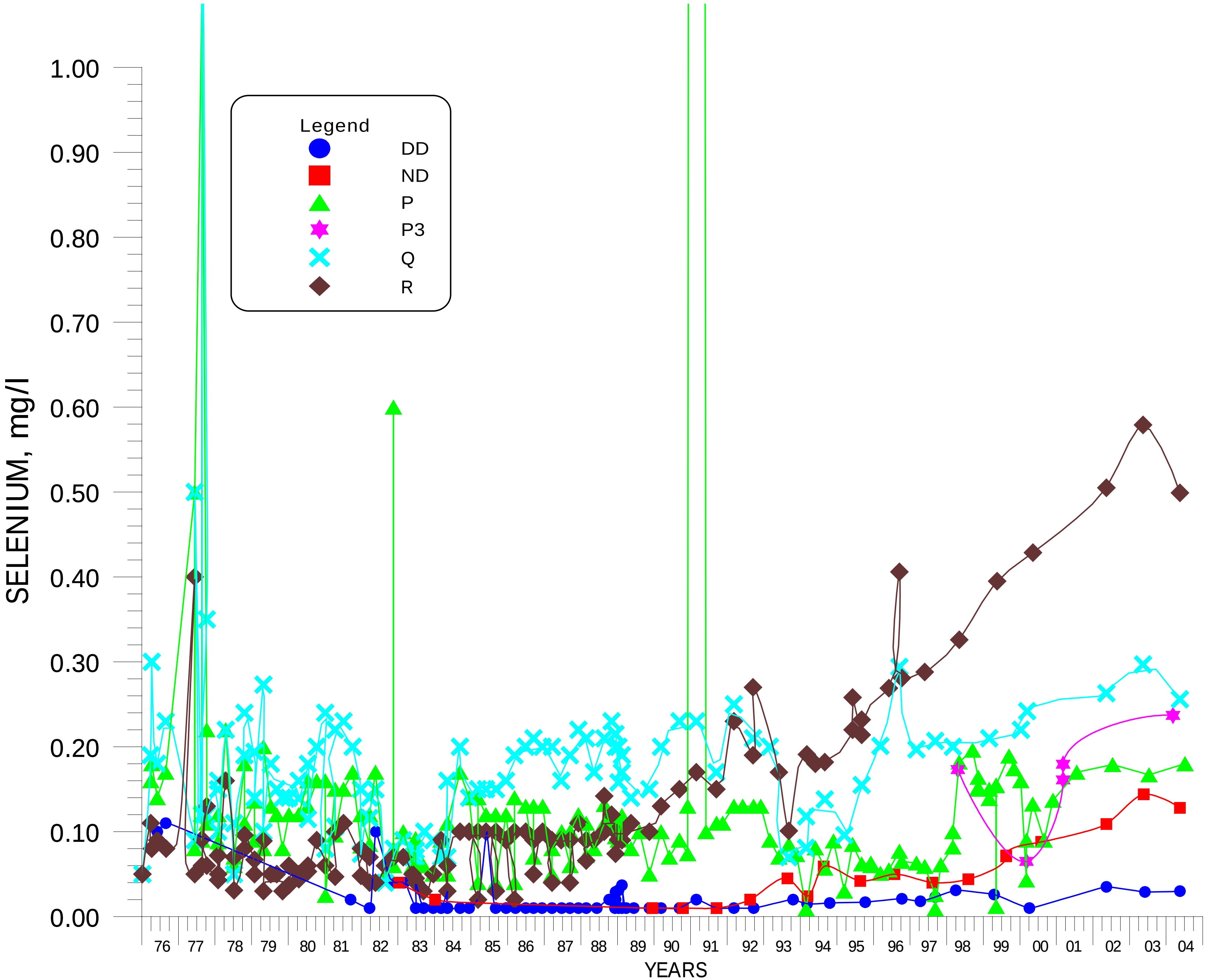


FIGURE 4.3-71. SELENIUM CONCENTRATIONS FOR WELLS DD, ND, P, P3, Q AND R.

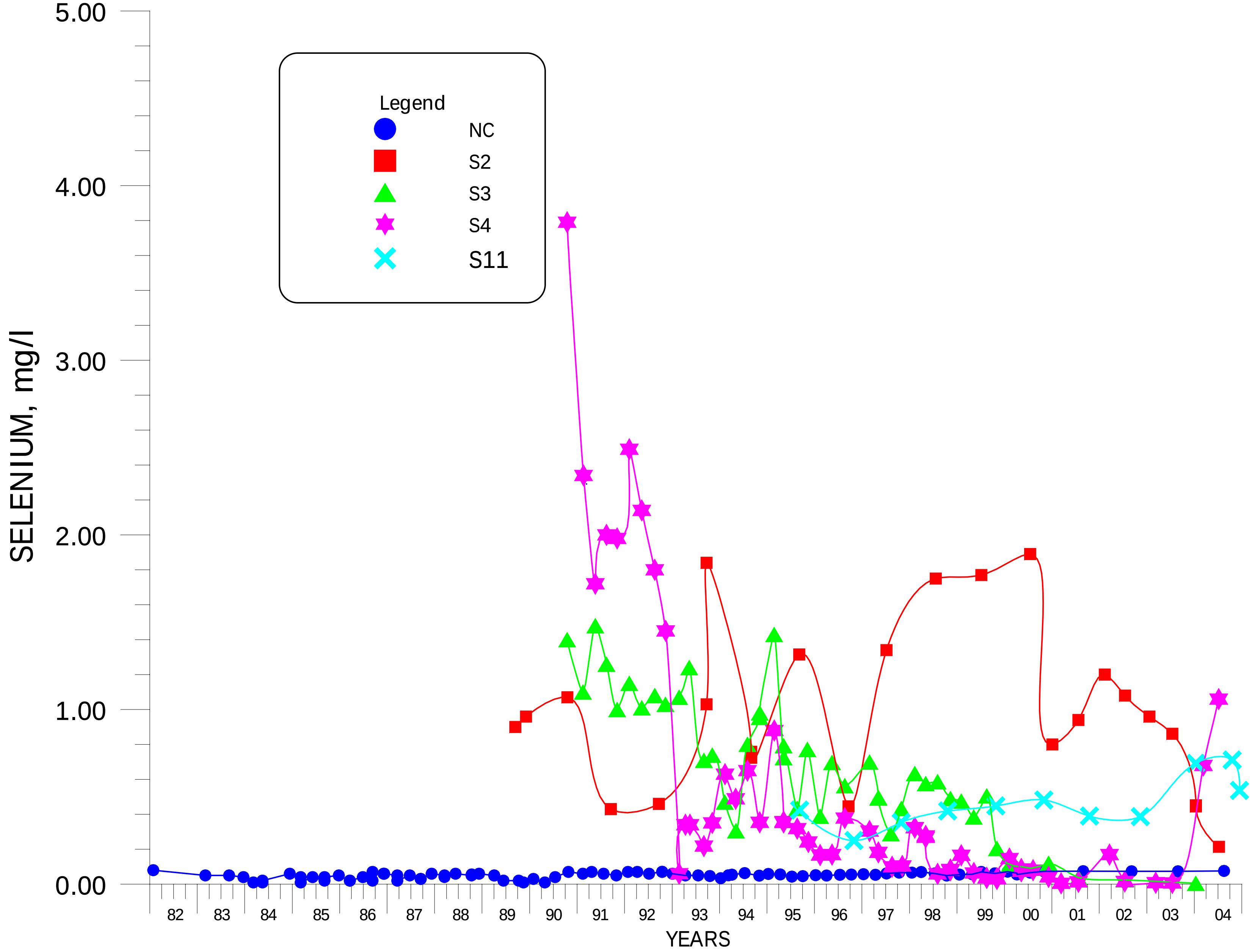


FIGURE 4.3-72. SELENIUM CONCENTRATIONS FOR WELLS NC, S2, S3, S4 AND S11.

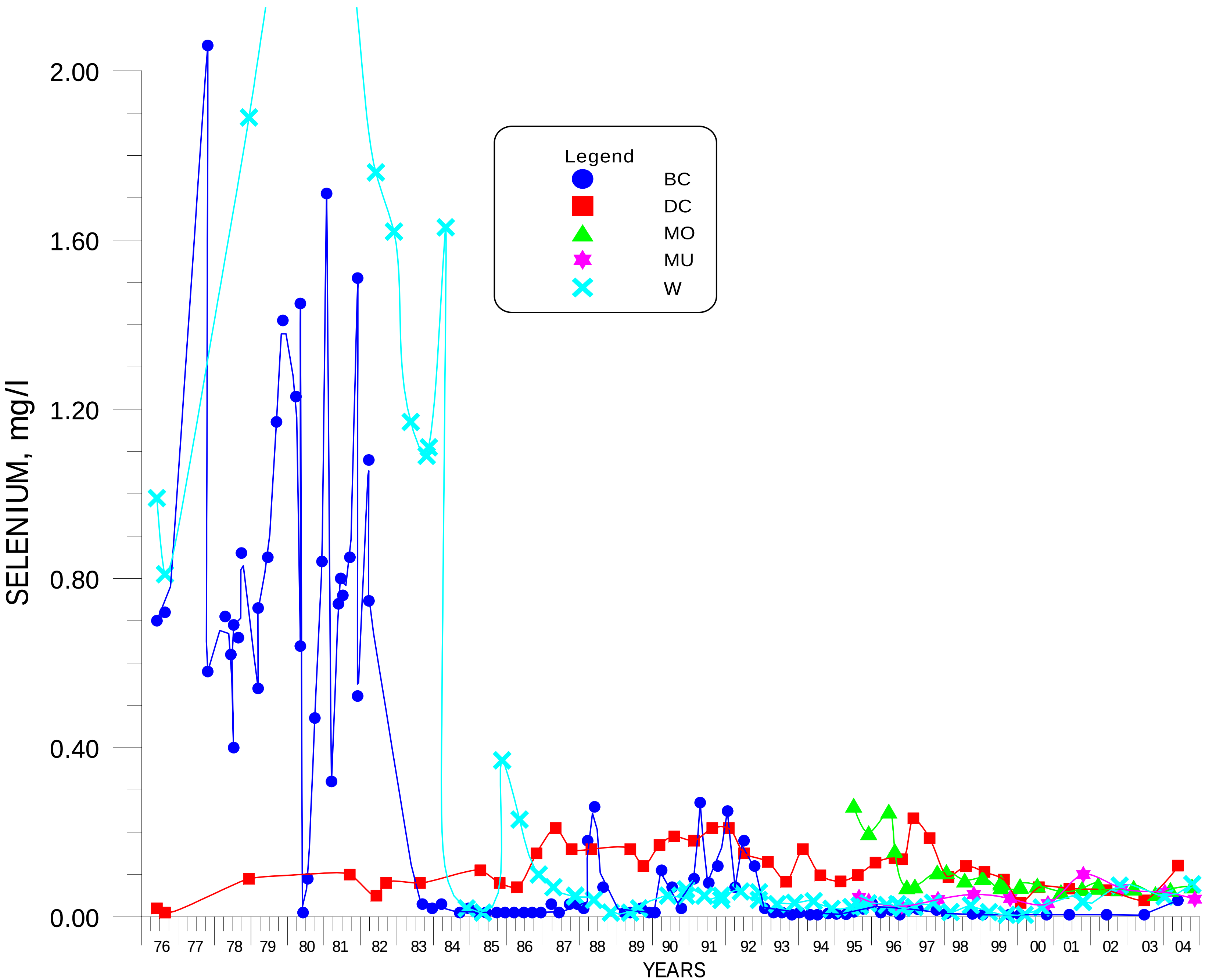


FIGURE 4.3-73. SELENIUM CONCENTRATIONS FOR WELLS BC, DC, MO, MU AND W.

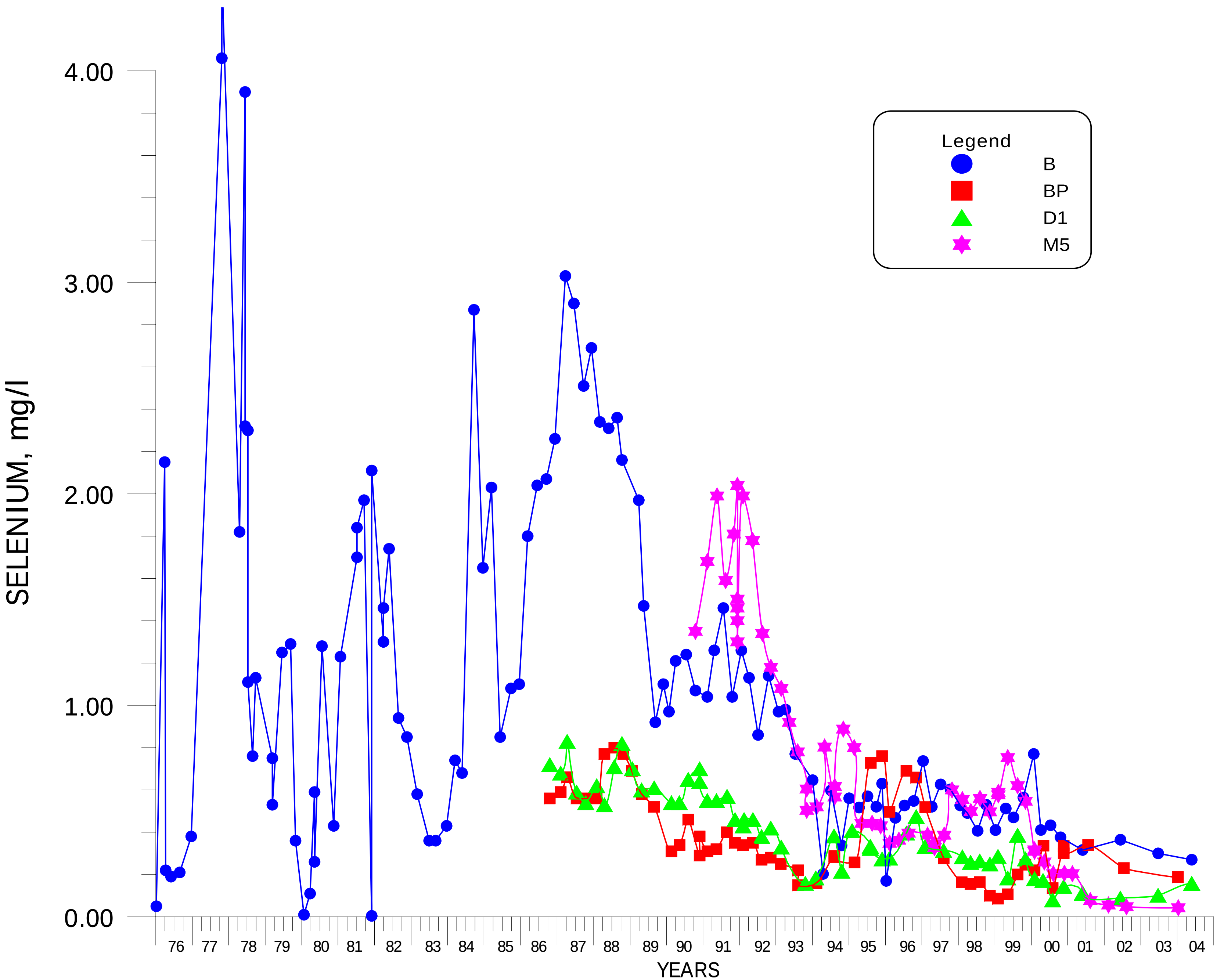


FIGURE 4.3-74. SELENIUM CONCENTRATIONS FOR WELLS B, BP, D1 AND M5.

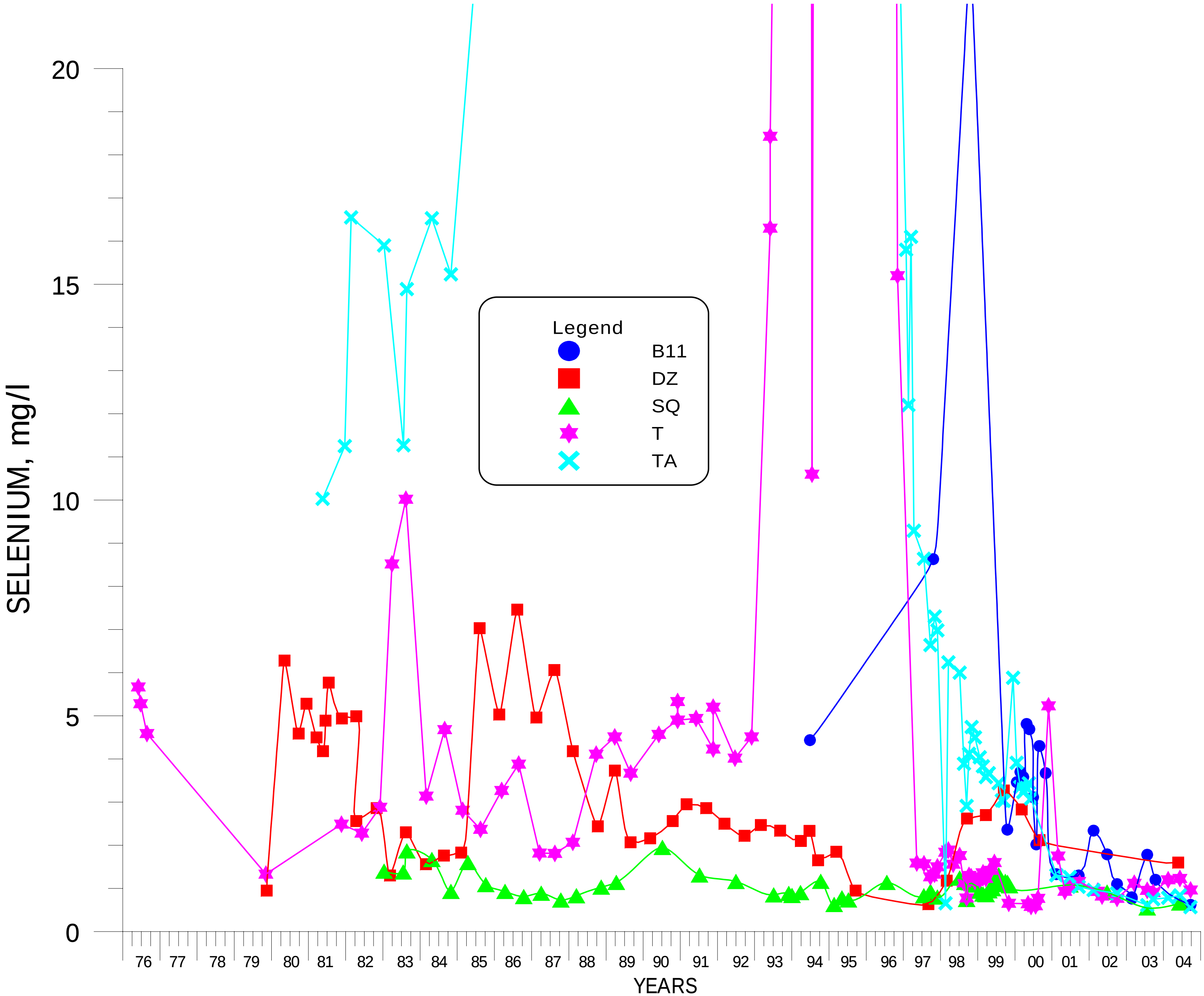


FIGURE 4.3-75. SELENIUM CONCENTRATIONS FOR WELLS B11, DZ, SQ, T AND TA.

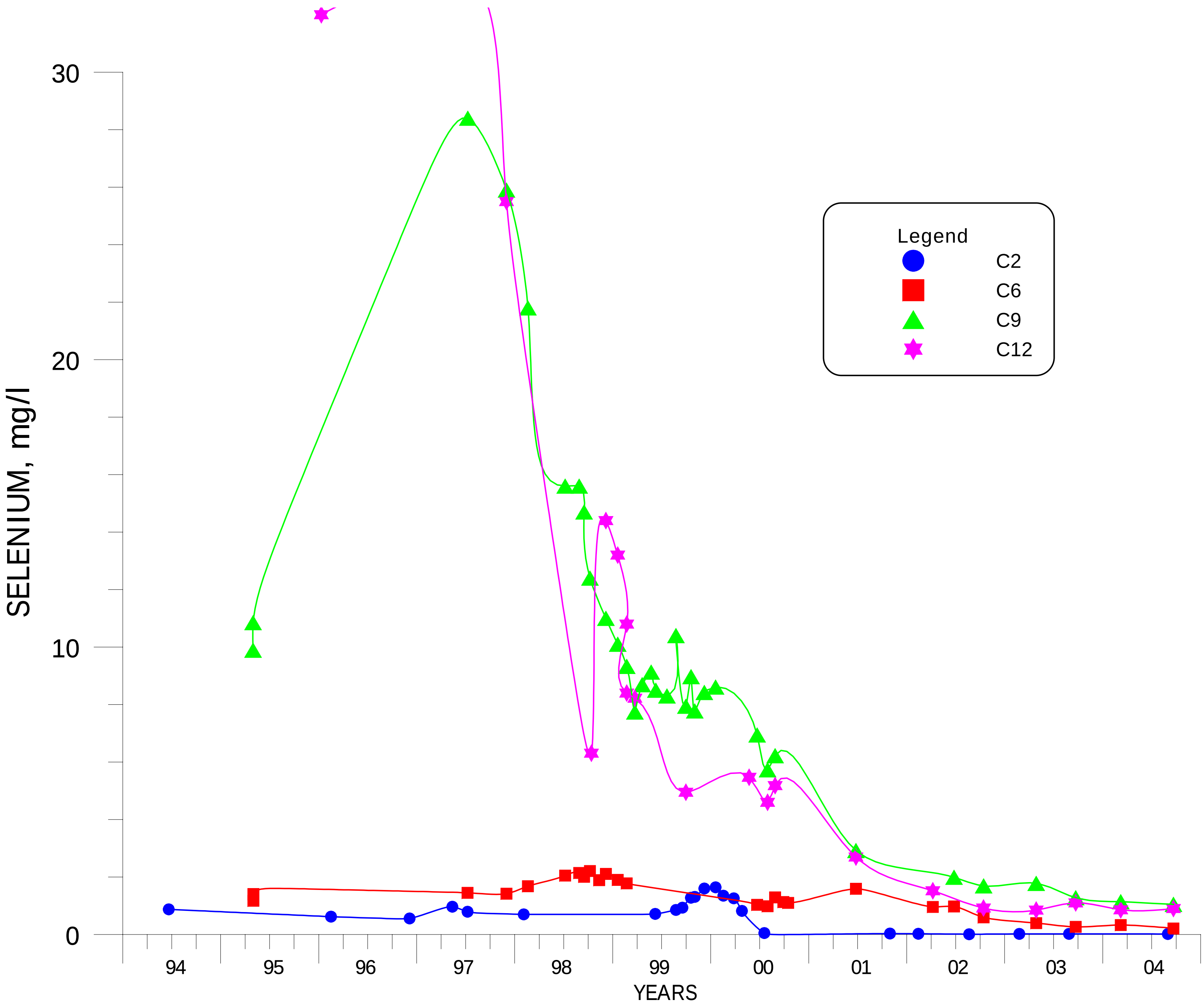


FIGURE 4.3-76. SELENIUM CONCENTRATIONS FOR WELLS C2, C6, C9 AND C12.

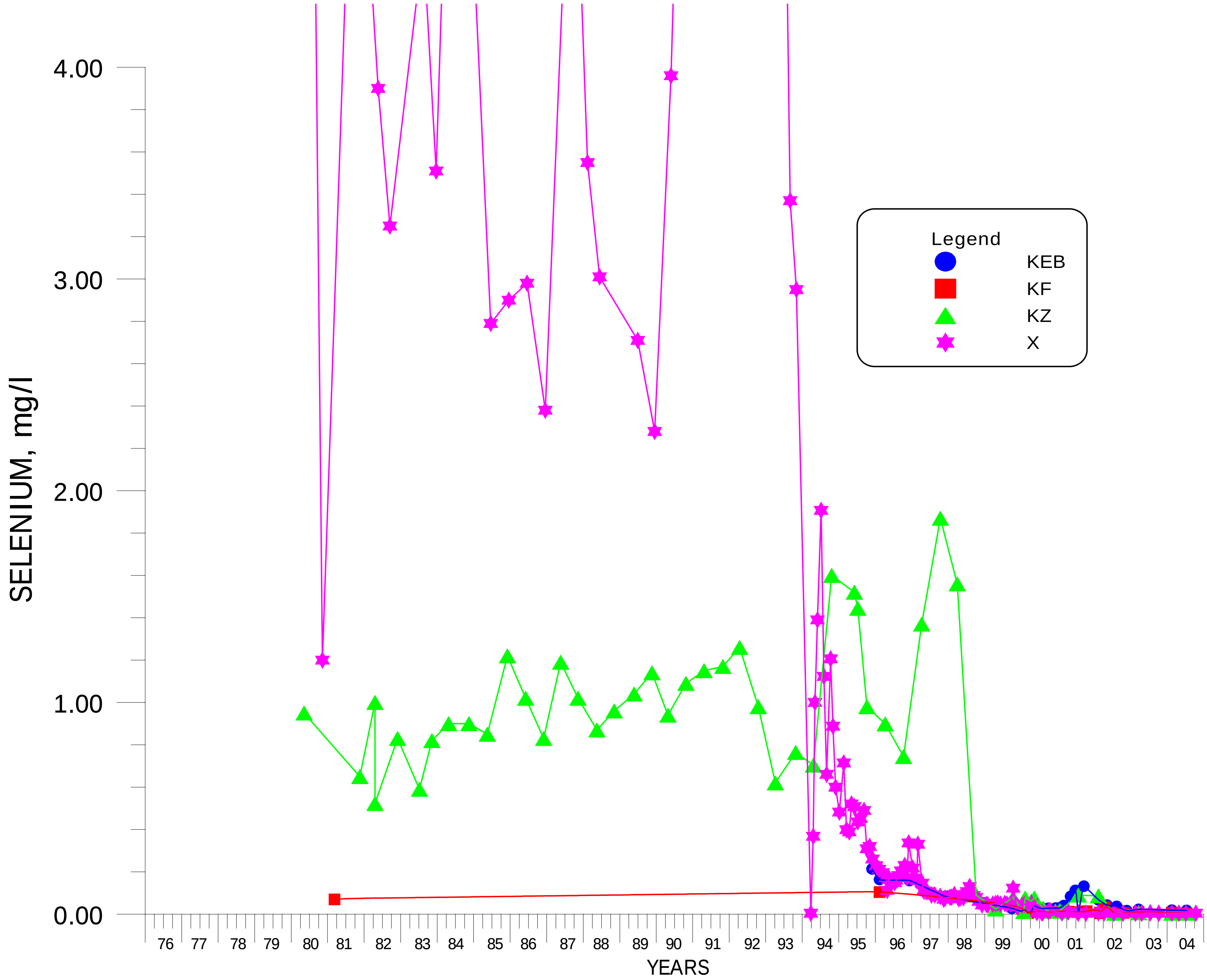


FIGURE 4.3-77. SELENIUM CONCENTRATIONS FOR WELLS KEB, KF, KZ AND X.

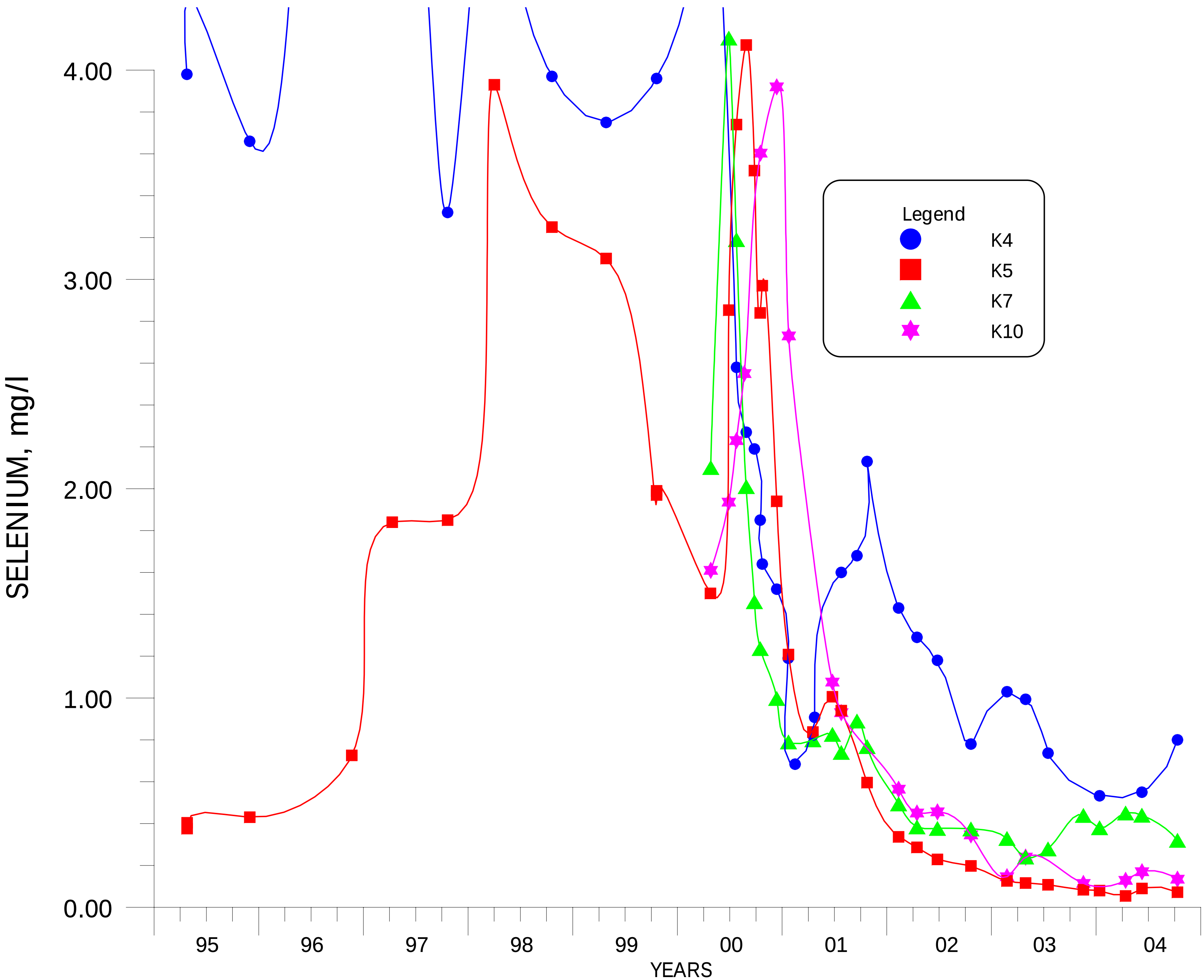


FIGURE 4.3-78. SELENIUM CONCENTRATIONS FOR WELLS K4, K5, K7 AND K10.

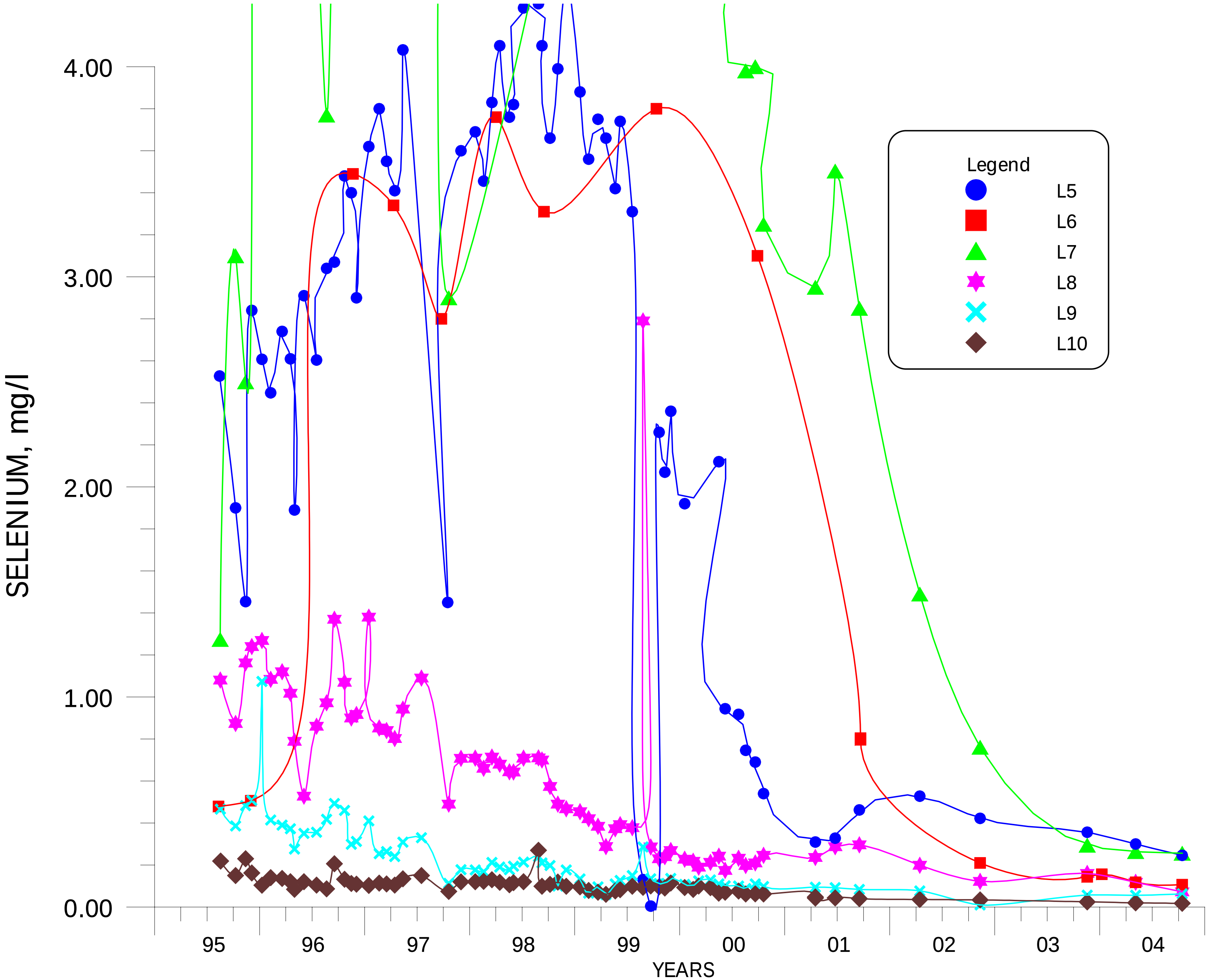


FIGURE 4.3-79. SELENIUM CONCENTRATIONS FOR WELLS L5, L6, L7, L8, L9 AND L10.

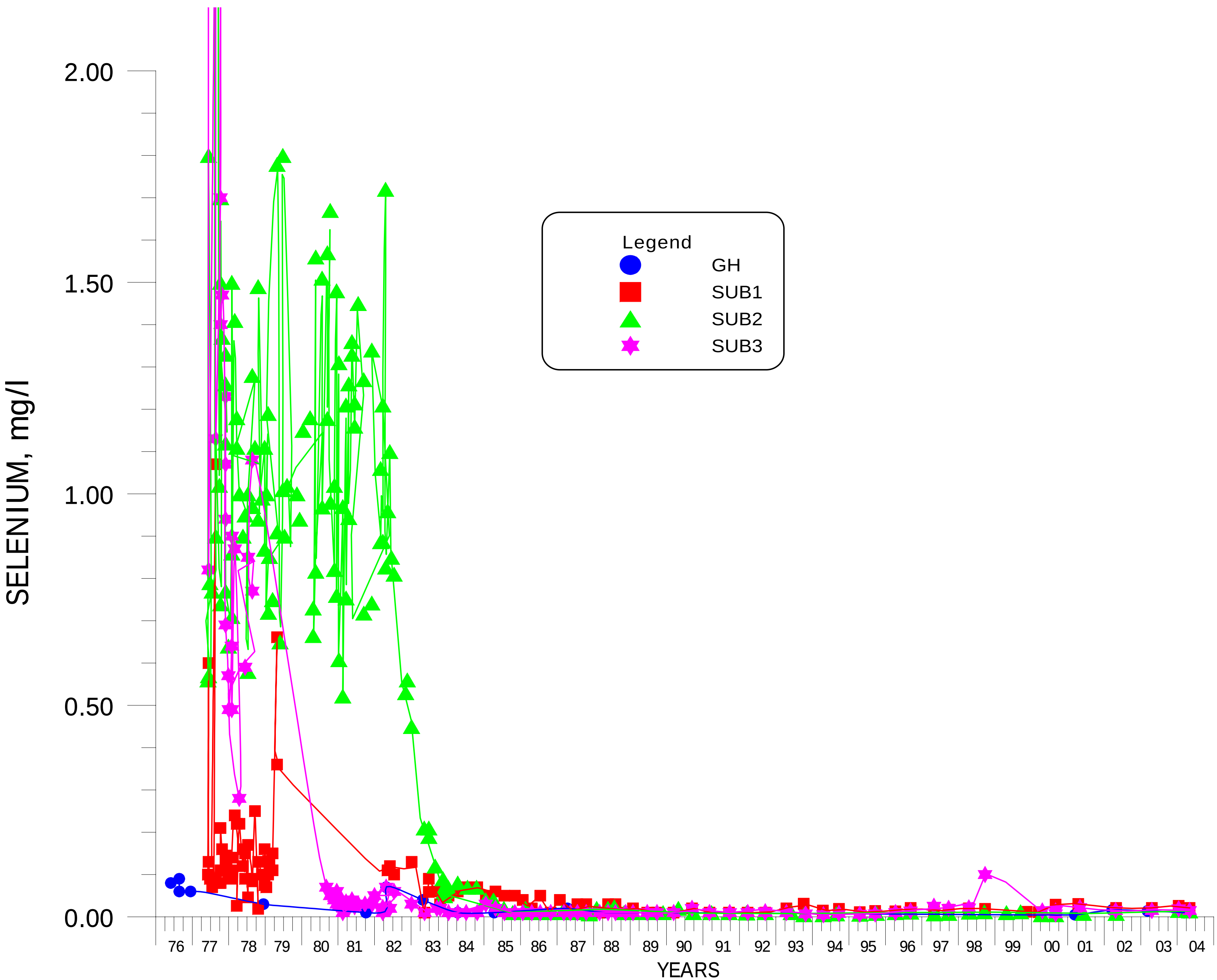


FIGURE 4.3-80. SELENIUM CONCENTRATIONS FOR WELLS GH, SUB1, SUB2 AND SUB3.

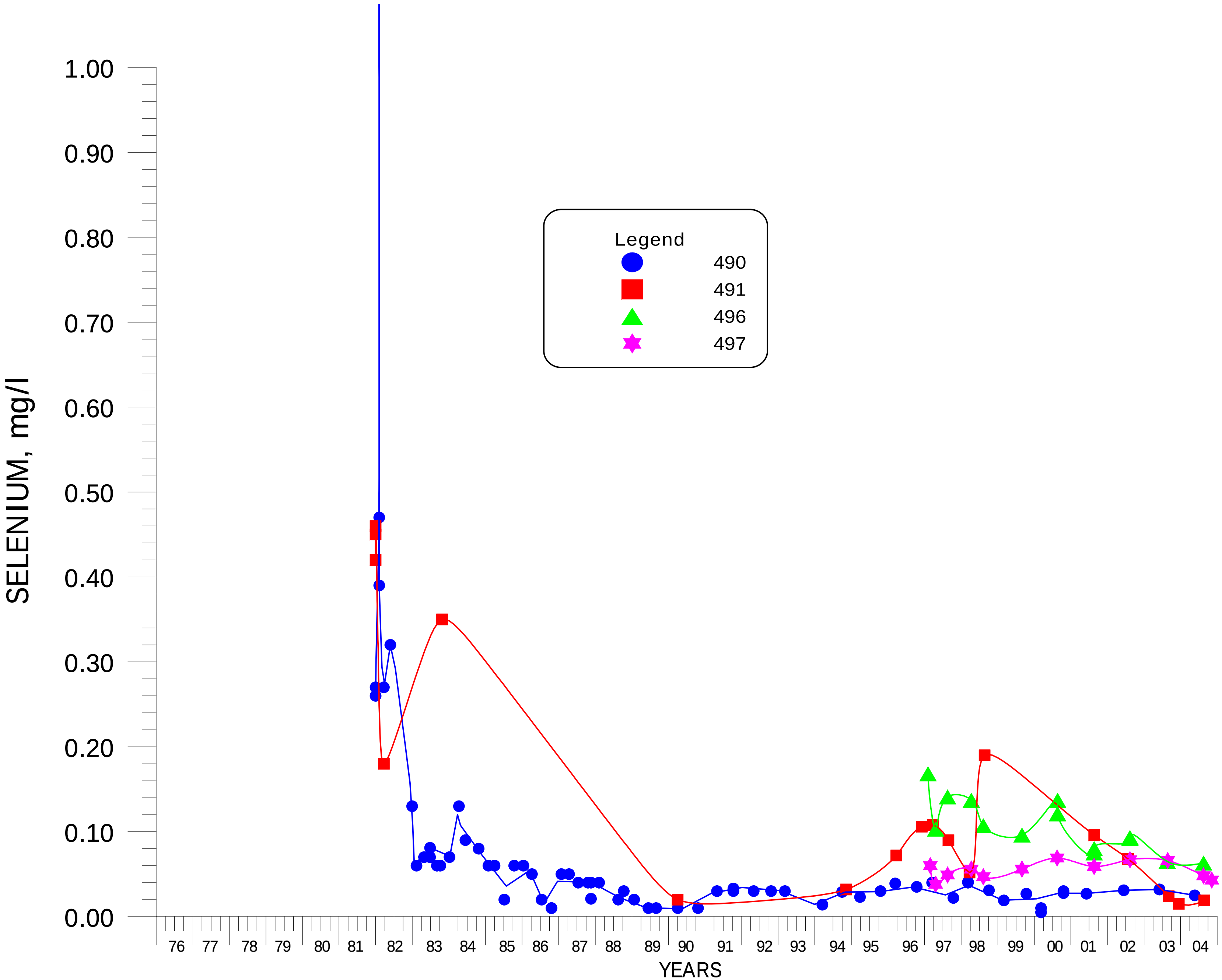


FIGURE 4.3-81. SELENIUM CONCENTRATIONS FOR WELLS 490, 491, 496 AND 497.

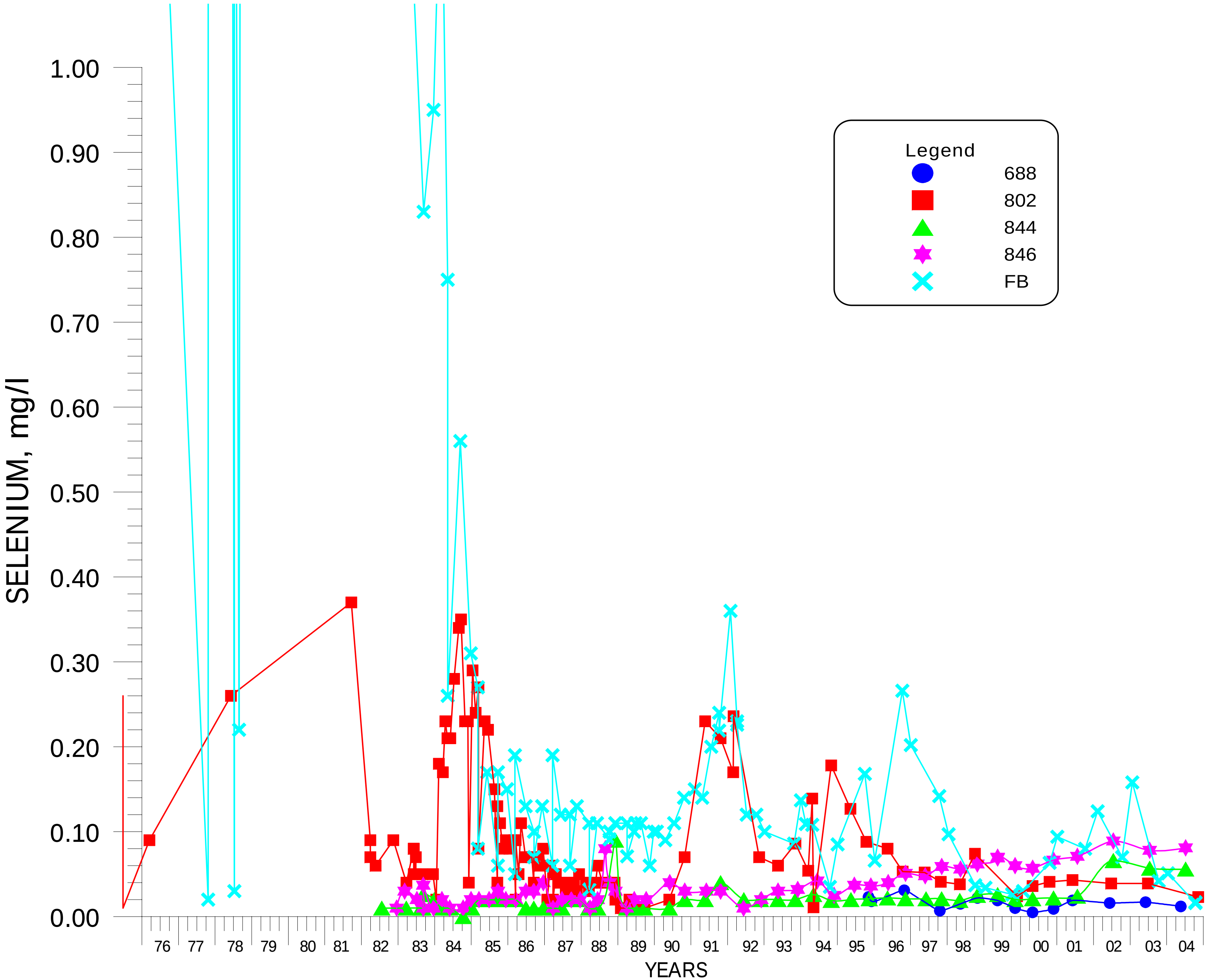


FIGURE 4.3-82. SELENIUM CONCENTRATIONS FOR WELLS 688, 802, 844, 846 AND FB.

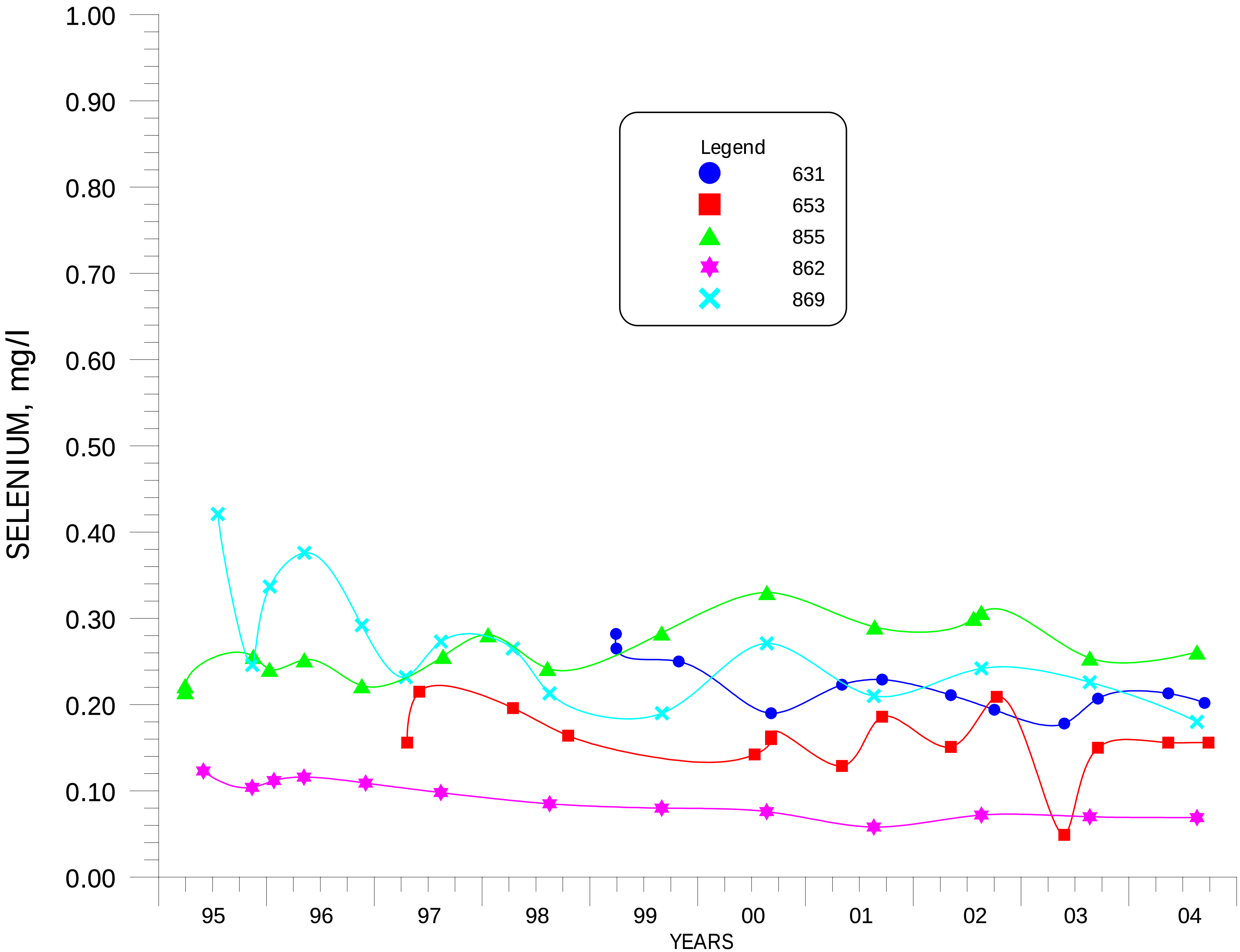


FIGURE 4.3-83. SELENIUM CONCENTRATIONS FOR WELLS 631, 653, 855, 862 AND 869.

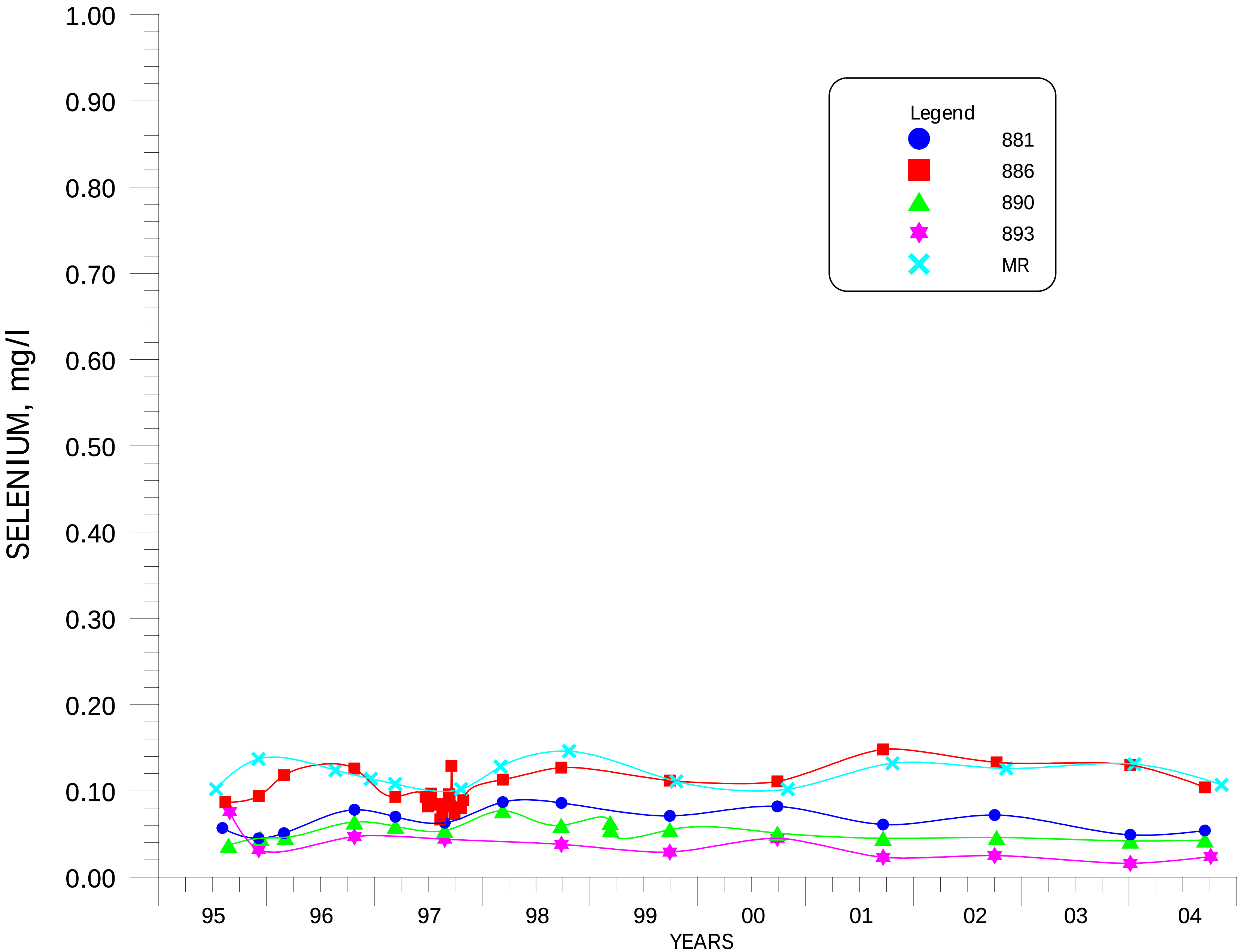


FIGURE 4.3-84. SELENIUM CONCENTRATIONS FOR WELLS 881, 886, 890, 893 AND MR.

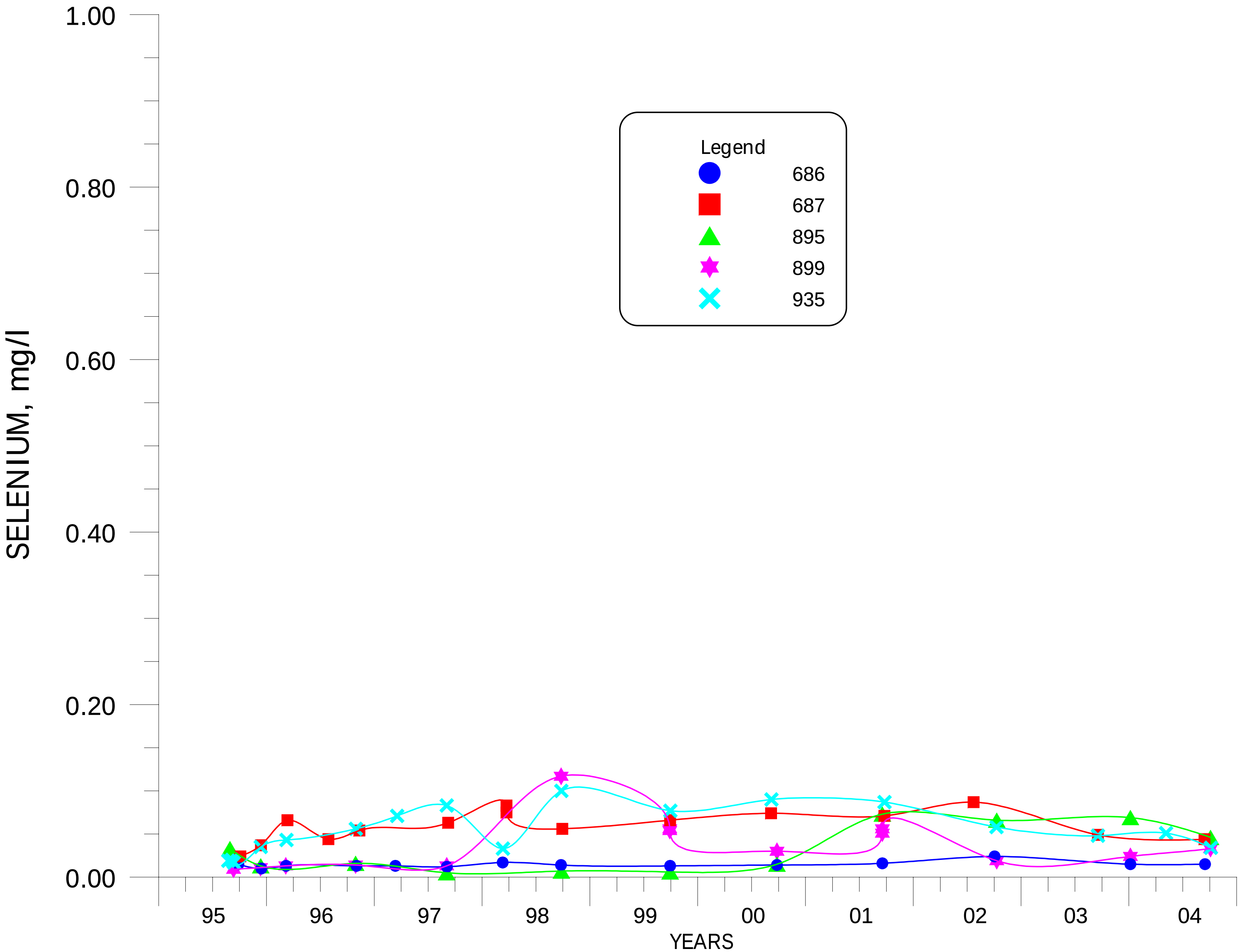


FIGURE 4.3-85. SELENIUM CONCENTRATIONS FOR WELLS 686, 687, 895, 899 AND 935.

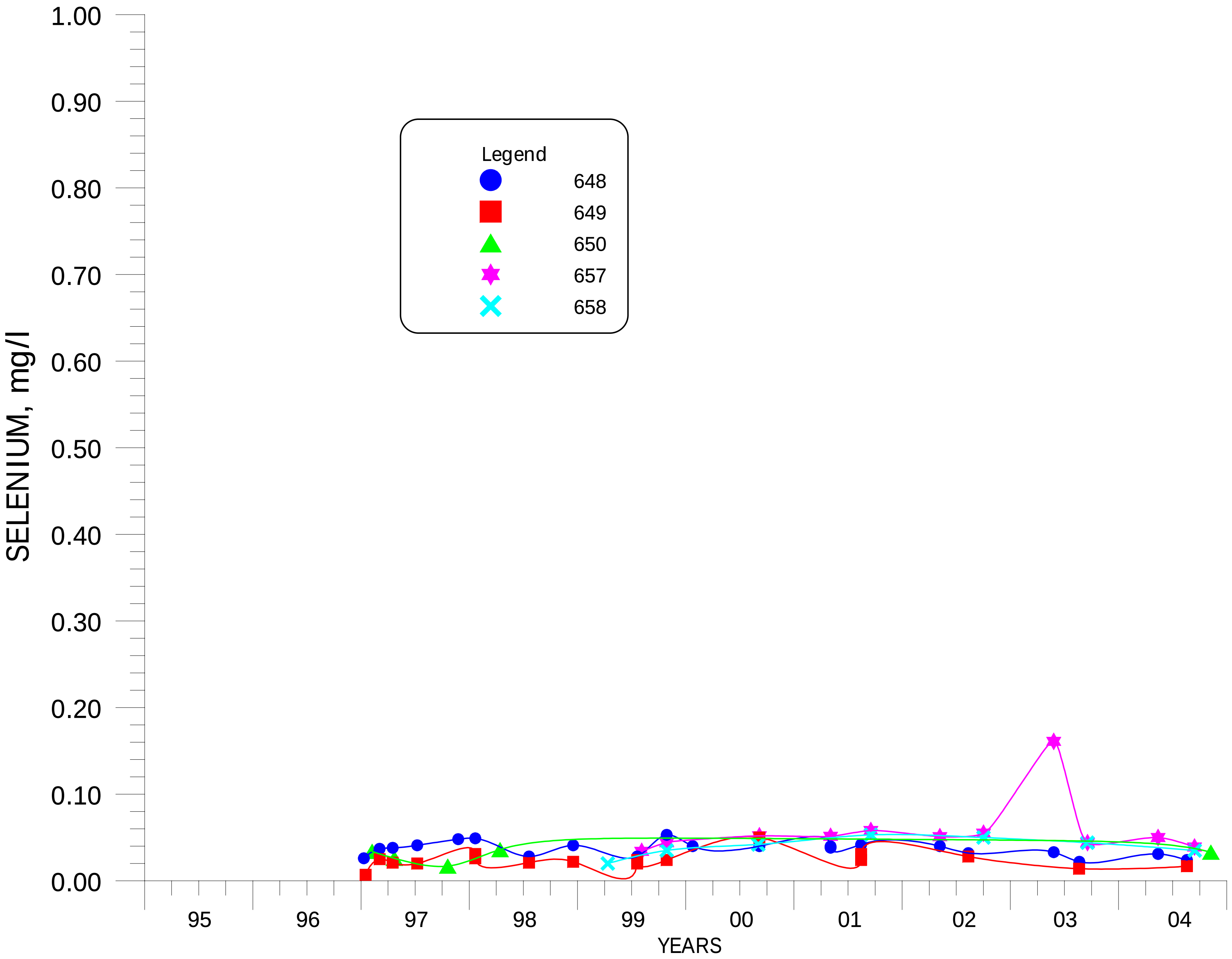
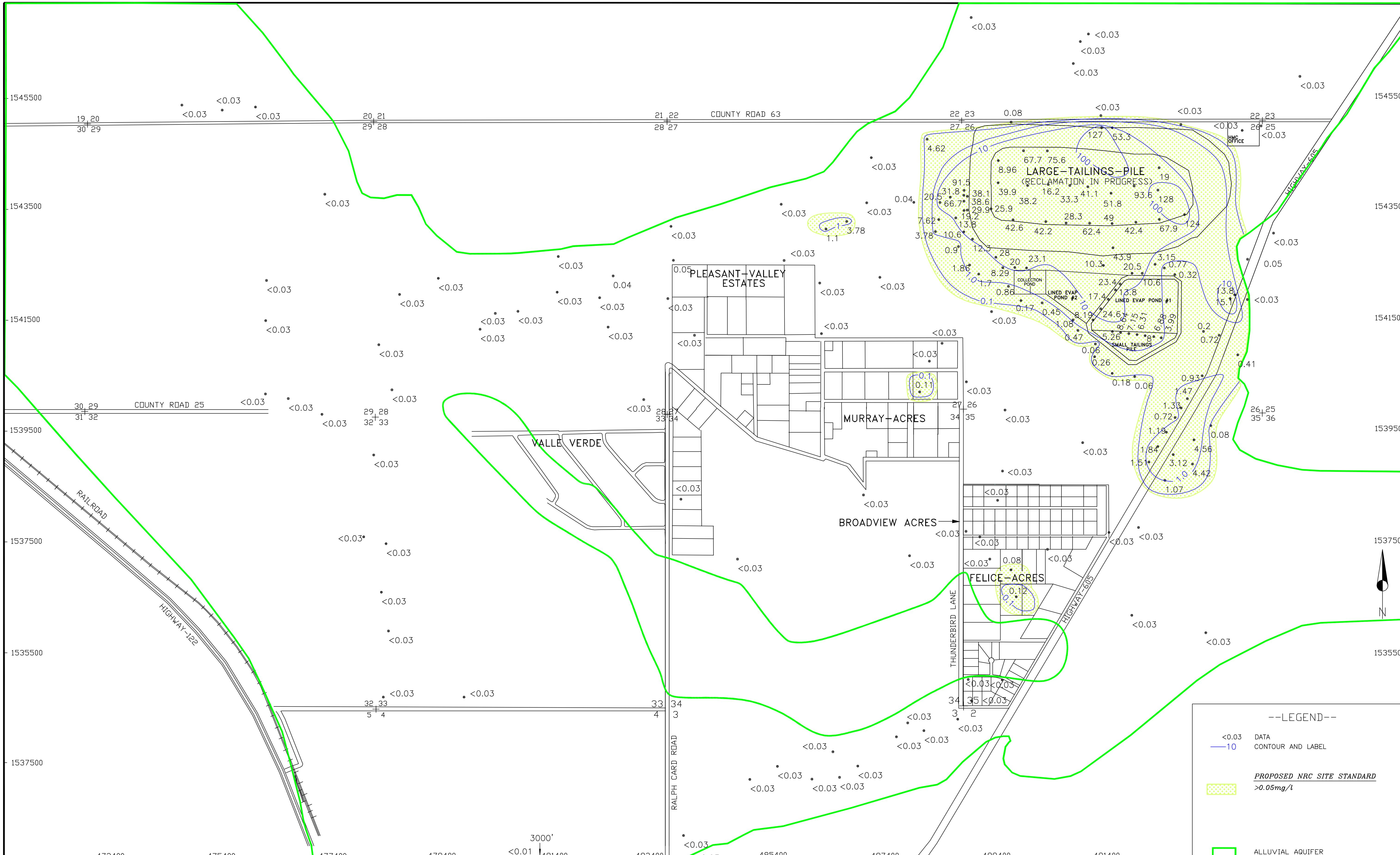


FIGURE 4.3-86. SELENIUM CONCENTRATIONS FOR WELLS 648, 649, 650, 657 AND 658.



SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-87. MOLYBDENUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, mg/l

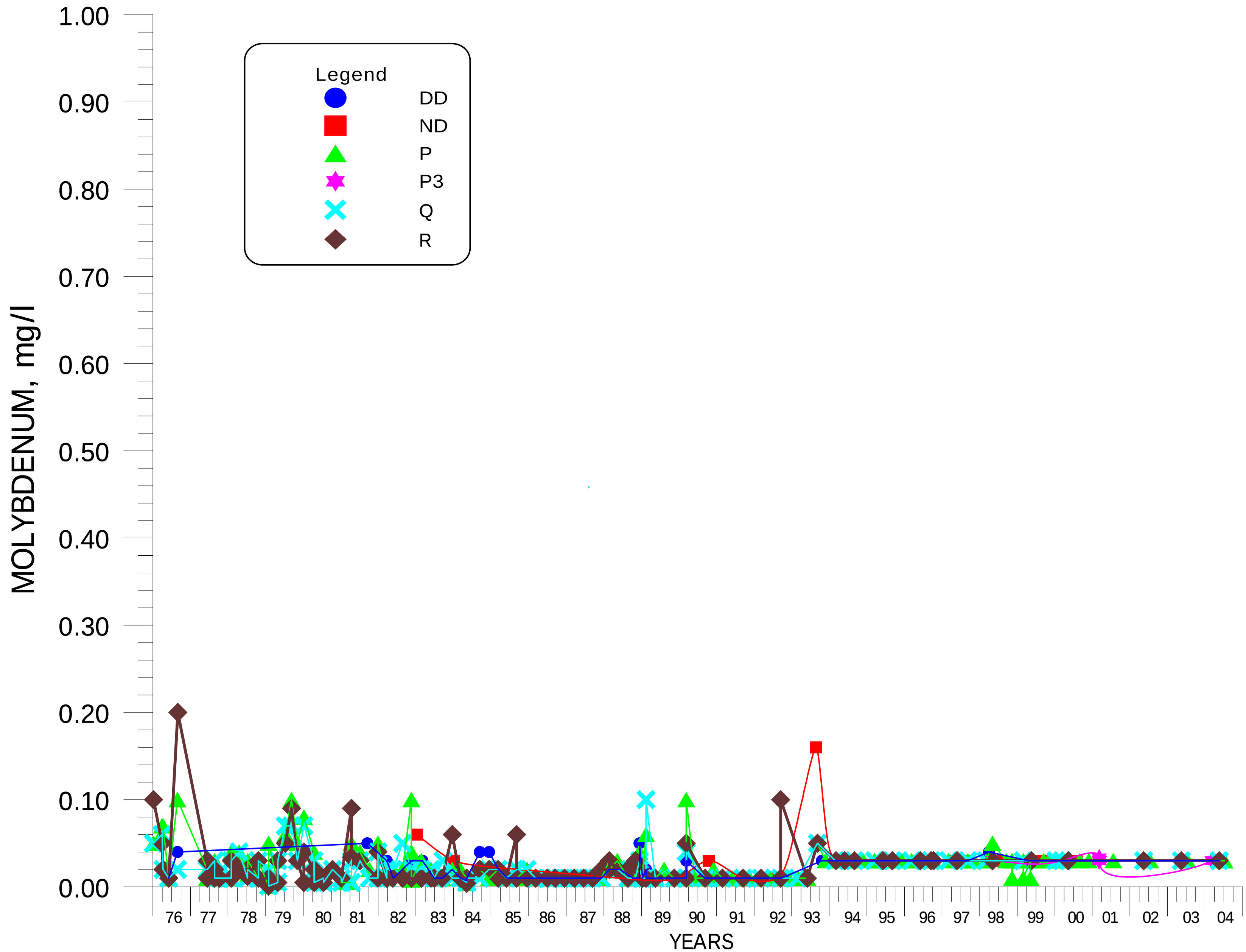


FIGURE 4.3-88. MOLYBDENUM CONCENTRATIONS FOR WELLS DD, ND, P, P3, Q AND R.

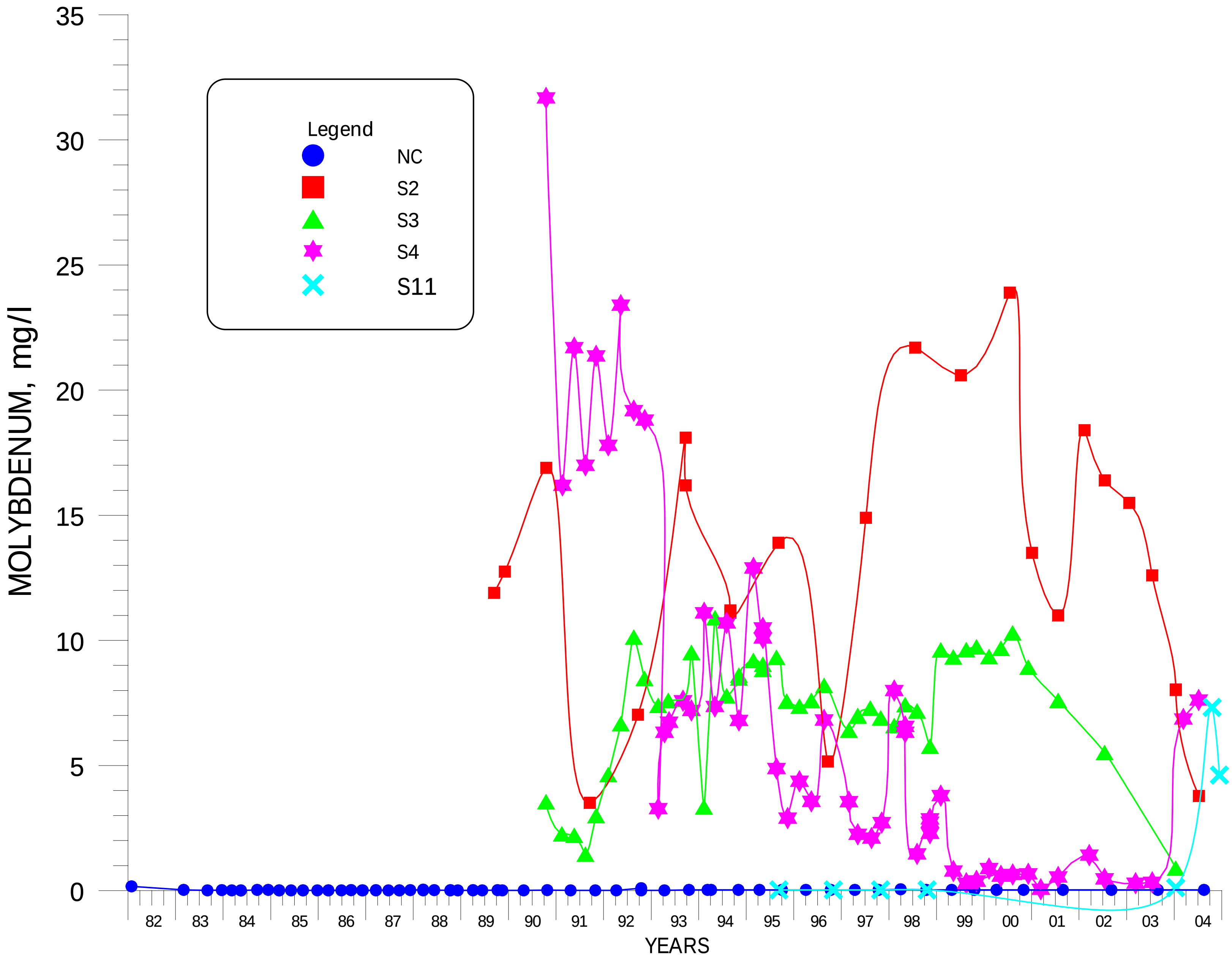


FIGURE 4.3-89. MOLYBDENUM CONCENTRATIONS FOR WELLS NC, S2, S3, S4 AND S11.

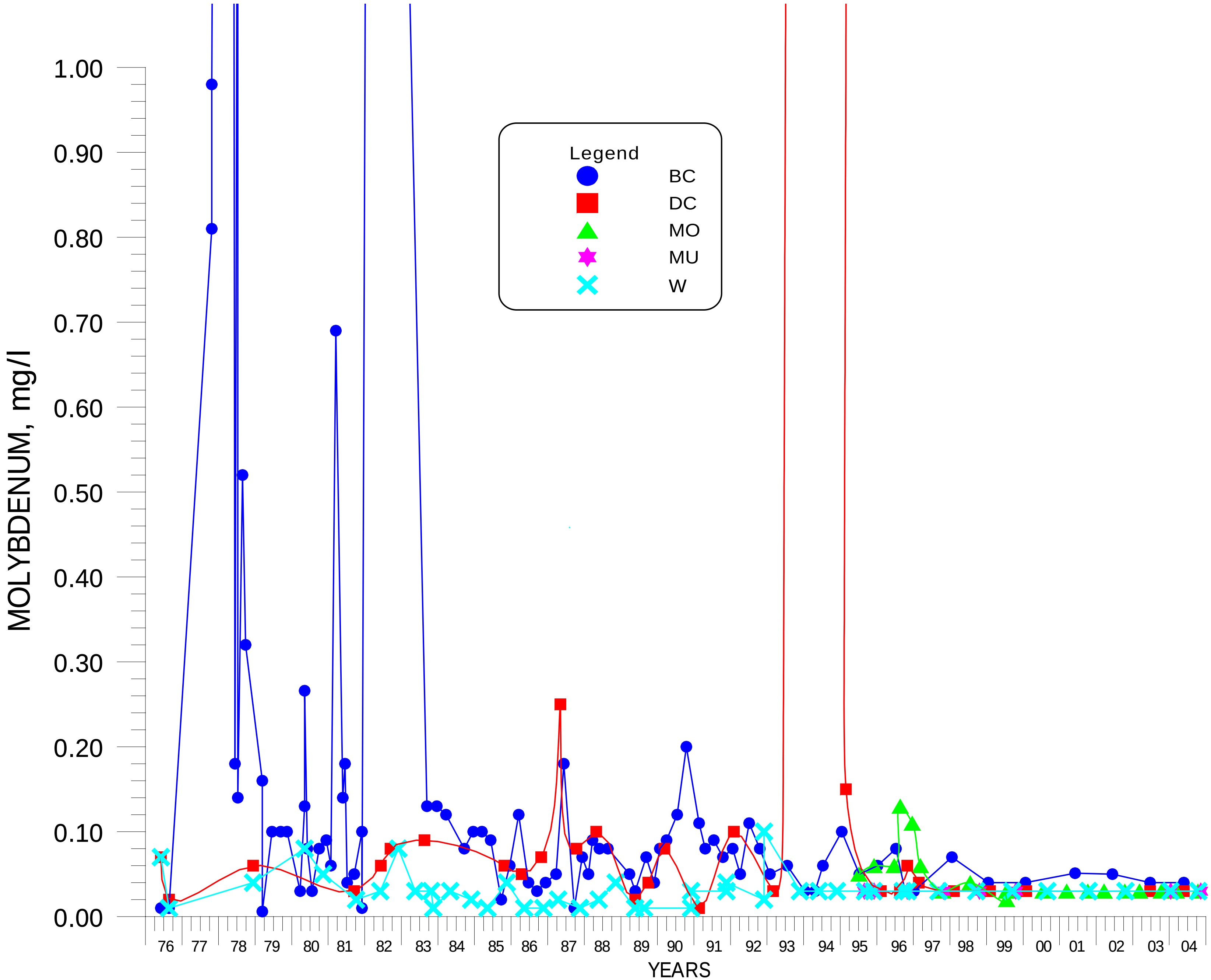


FIGURE 4.3-90. MOLYBDENUM CONCENTRATIONS FOR WELLS BC, DC, MO, MU AND W.

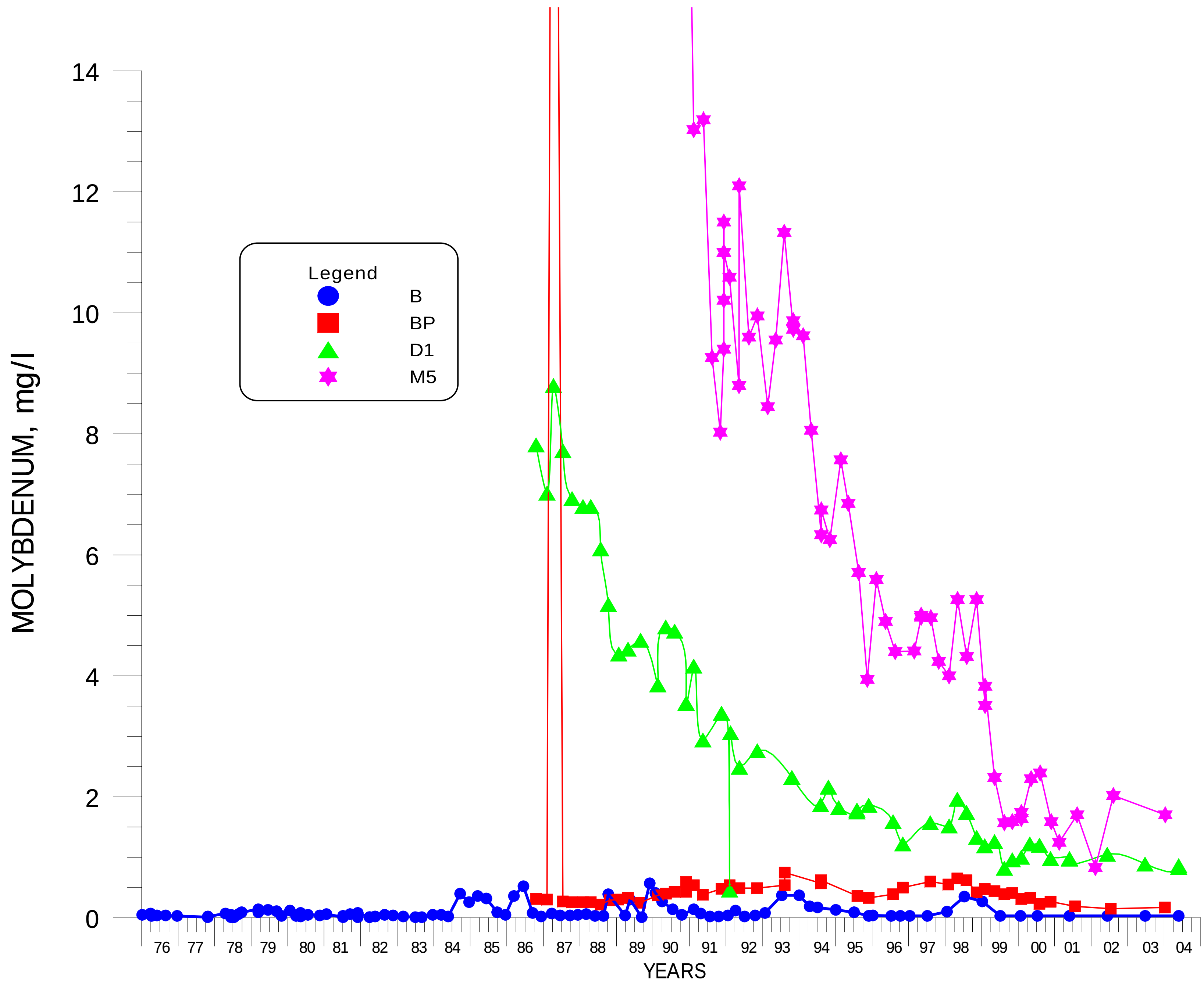


FIGURE 4.3-91. MOLYBDENUM CONCENTRATIONS FOR WELLS B, BP, D1 AND M5.

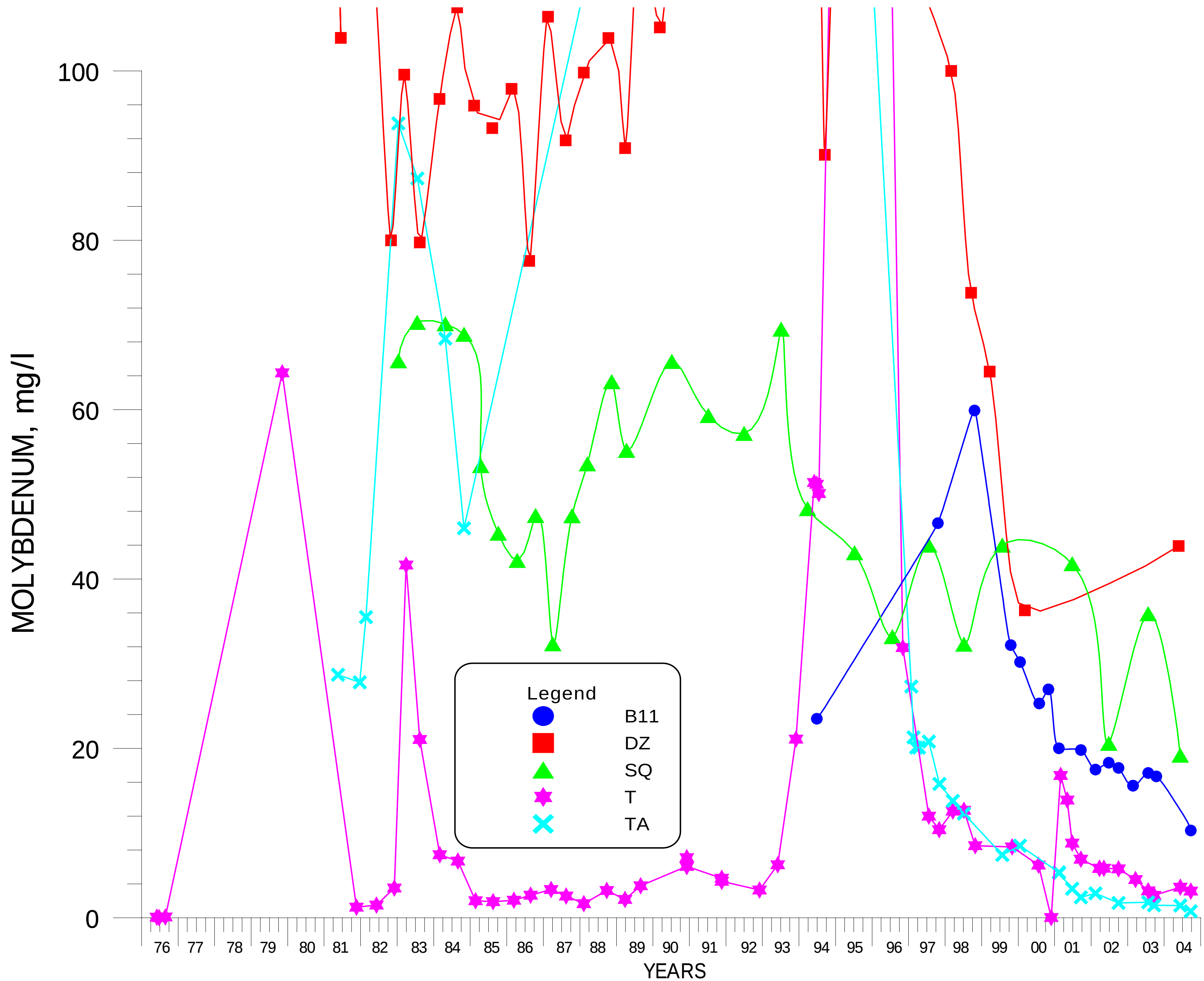


FIGURE 4.3-92. MOLYBDENUM CONCENTRATIONS FOR WELLS B11, DZ, SQ, T AND TA.

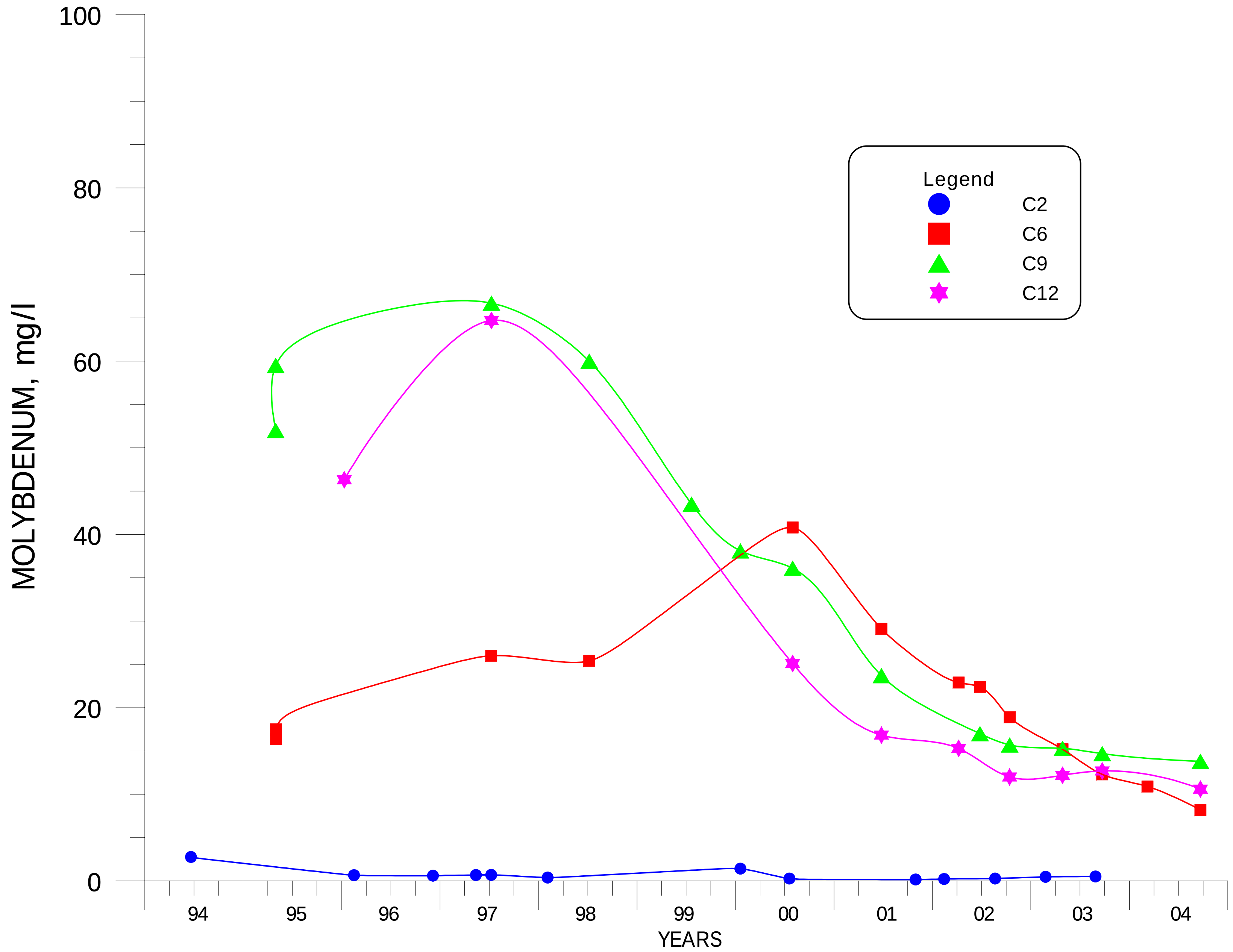


FIGURE 4.3-93. MOLYBDENUM CONCENTRATIONS FOR WELLS C2, C6, C9 AND C12.

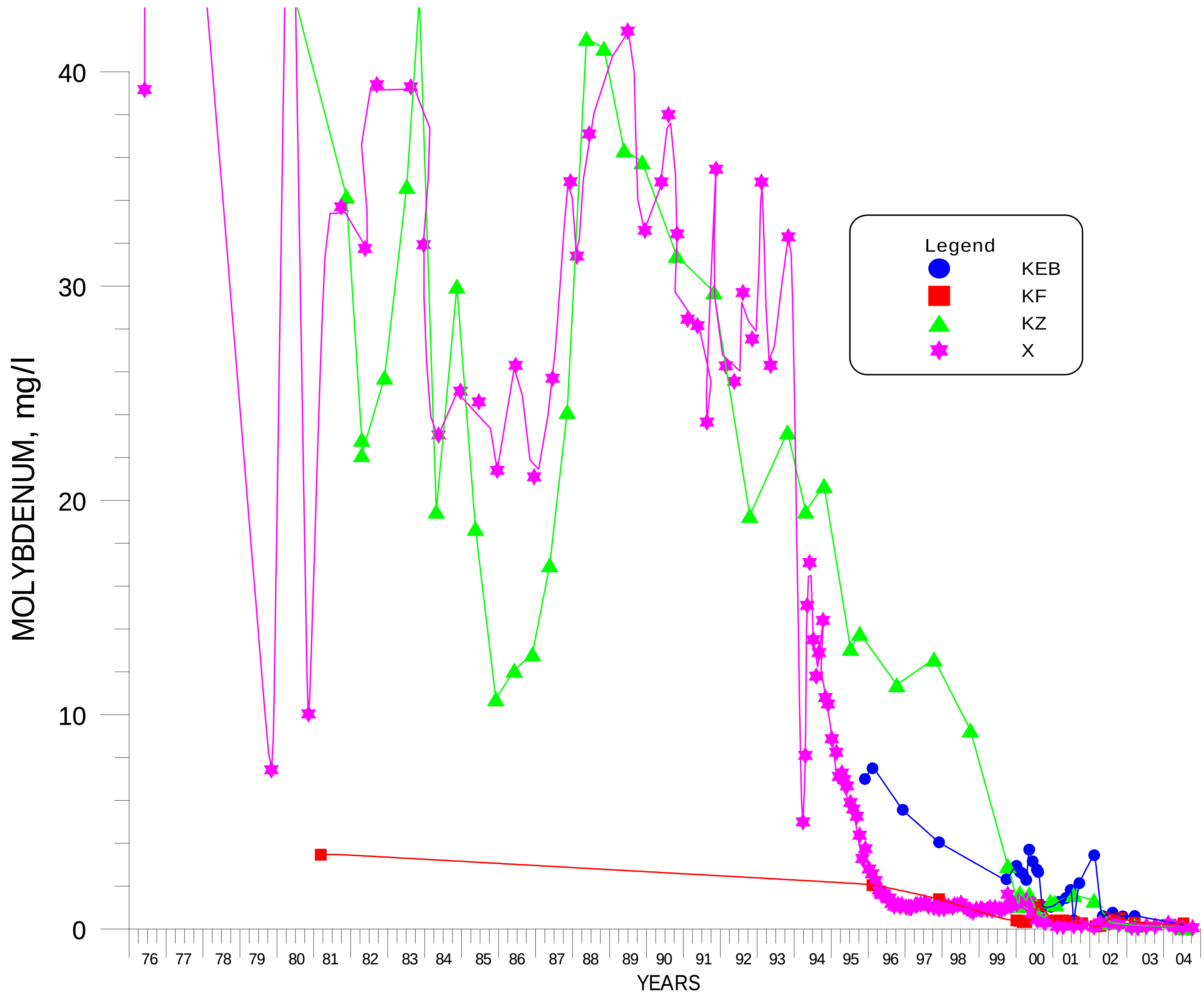


FIGURE 4.3-94. MOLYBDENUM CONCENTRATIONS FOR WELLS KEB, KF, KZ AND X.

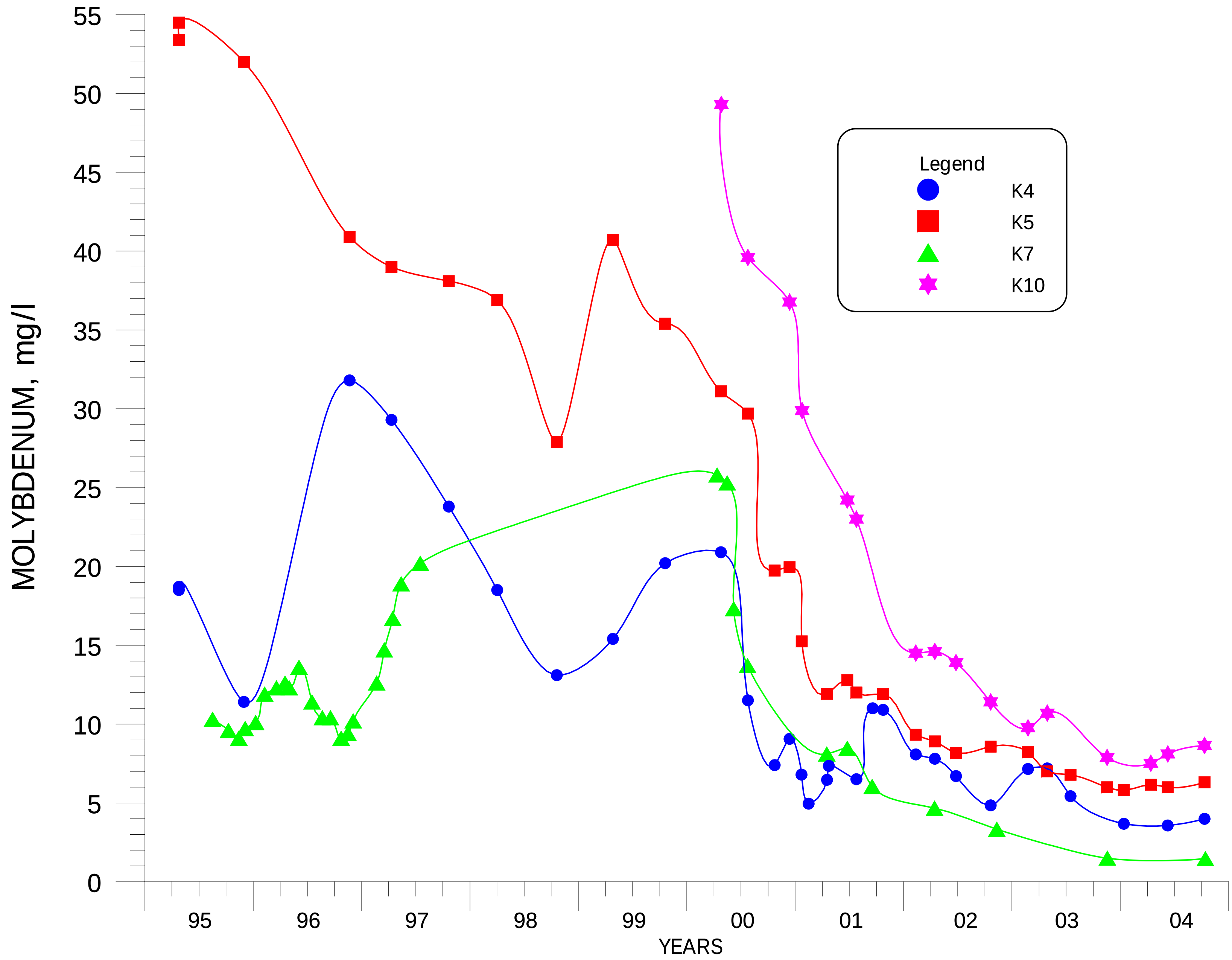


FIGURE 4.3-95. MOLYBDENUM CONCENTRATIONS FOR WELLS K4, K5, K7 AND K10.

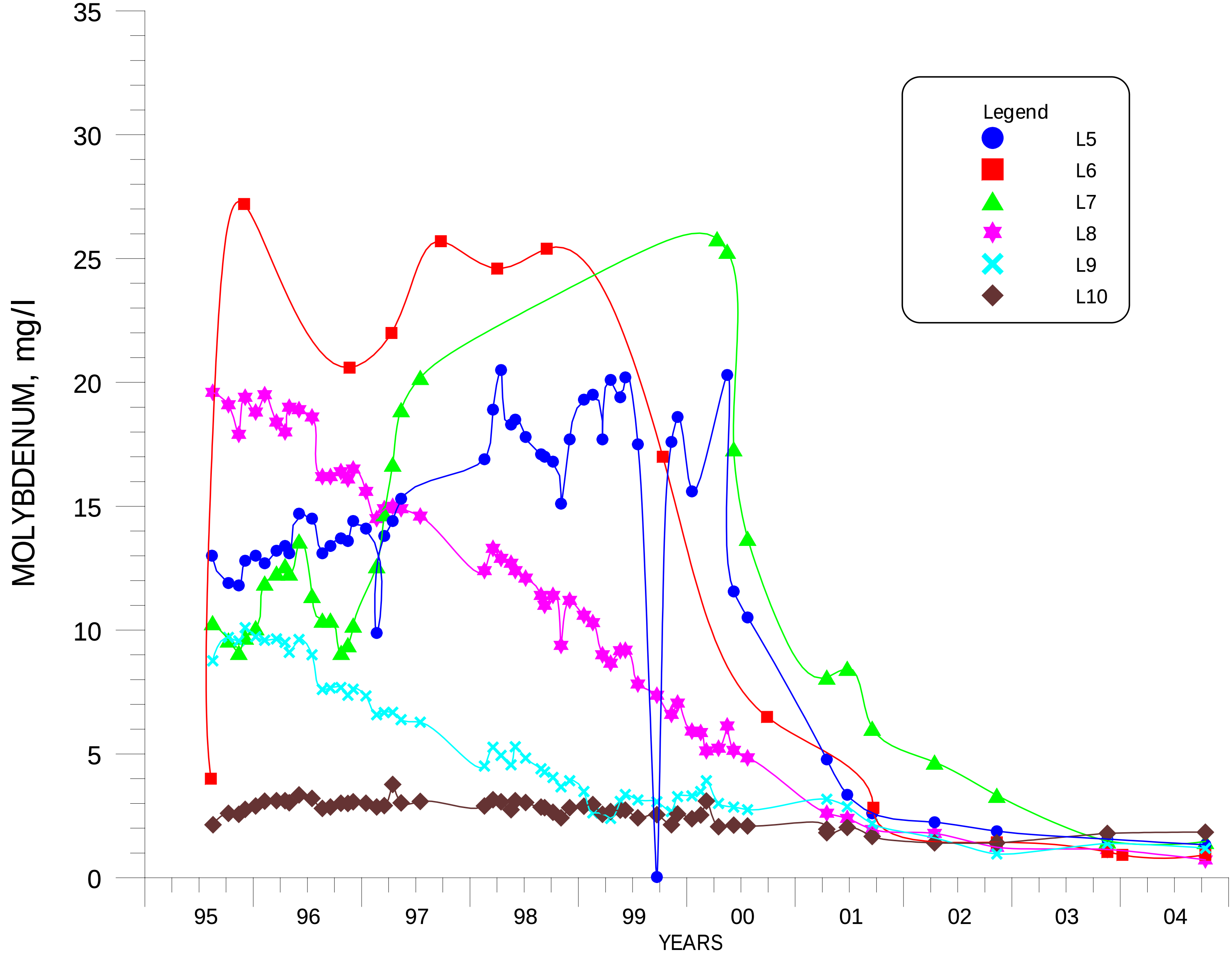


FIGURE 4.3-96. MOLYBDENUM CONCENTRATIONS FOR WELLS L5, L6, L7, L8, L9 AND L10.

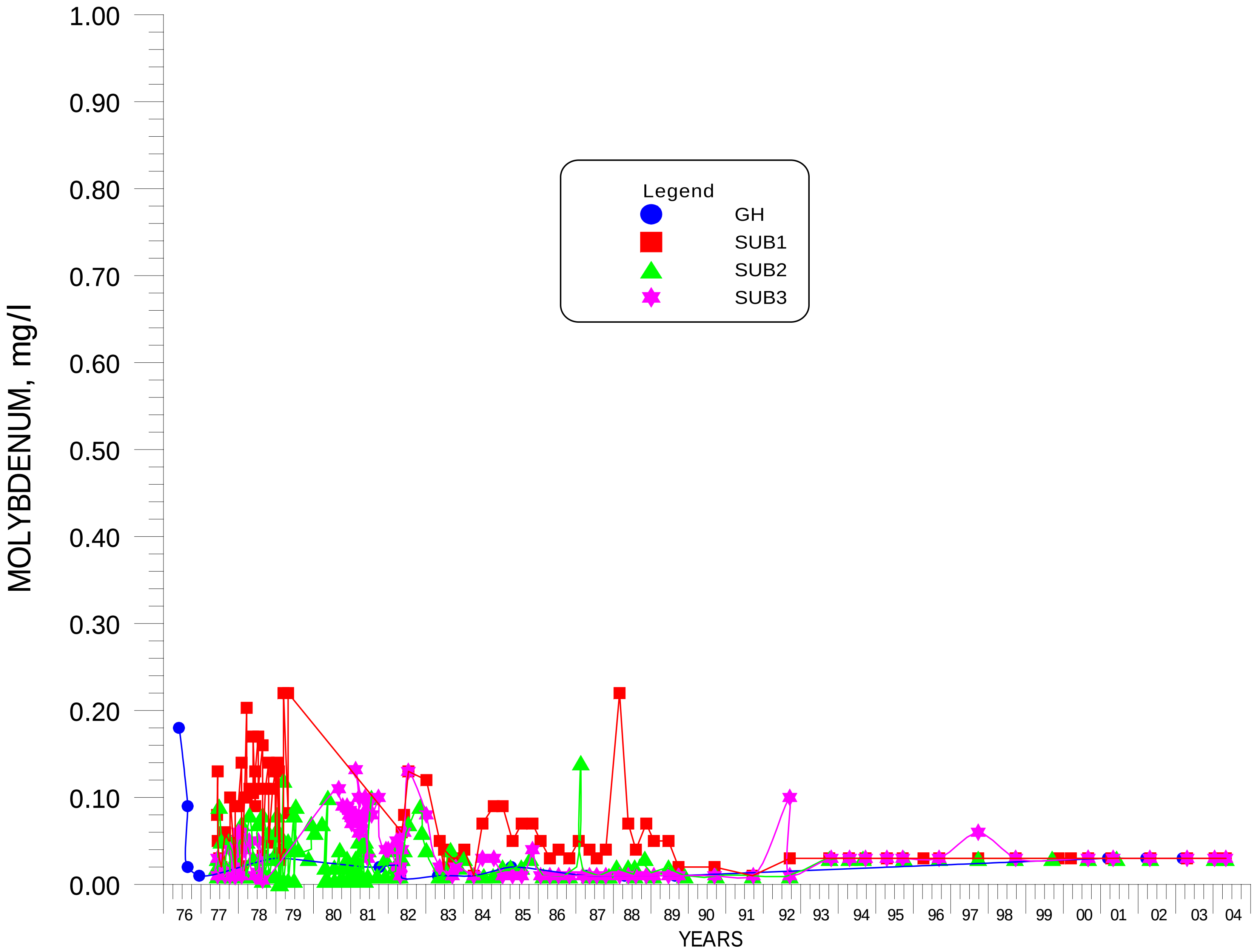


FIGURE 4.3-97. MOLYBDENUM CONCENTRATIONS FOR WELLS GH, SUB1, SUB2 AND SUB3.

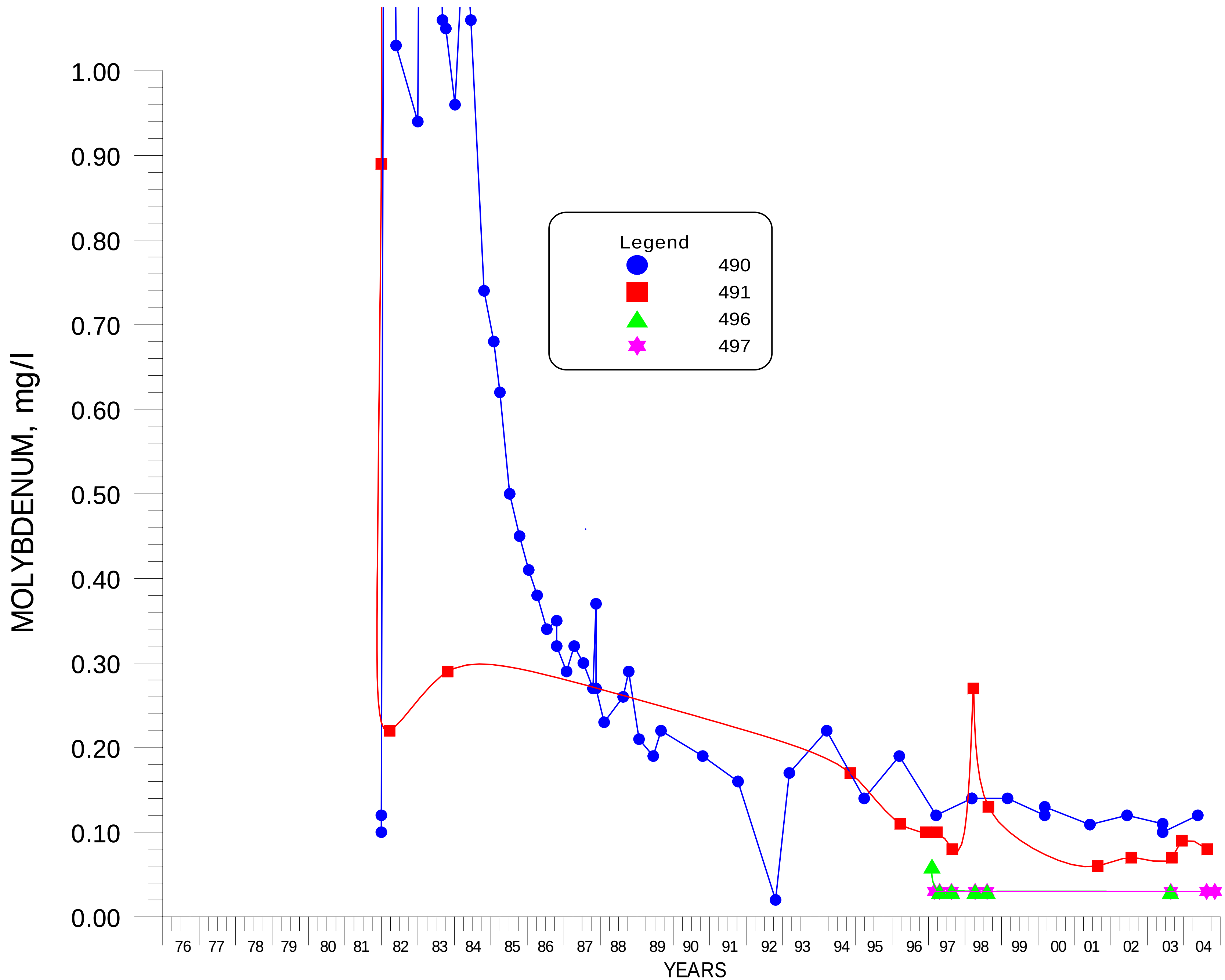


FIGURE 4.3-98. MOLYBDENUM CONCENTRATIONS FOR WELLS 490, 491, 496 AND 497.

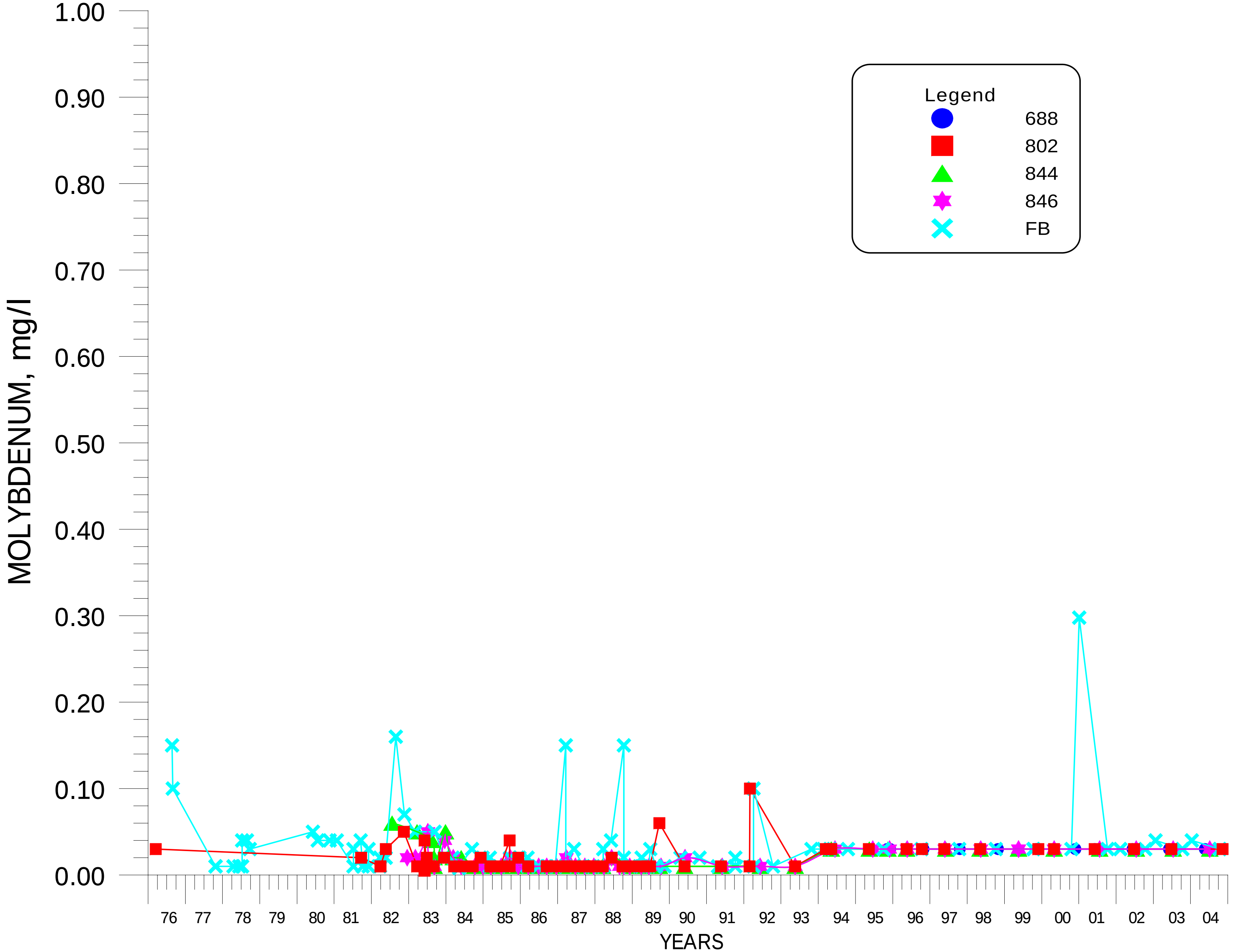


FIGURE 4.3-99. MOLYBDENUM CONCENTRATIONS FOR WELLS 688, 802, 844, 846 AND FB.

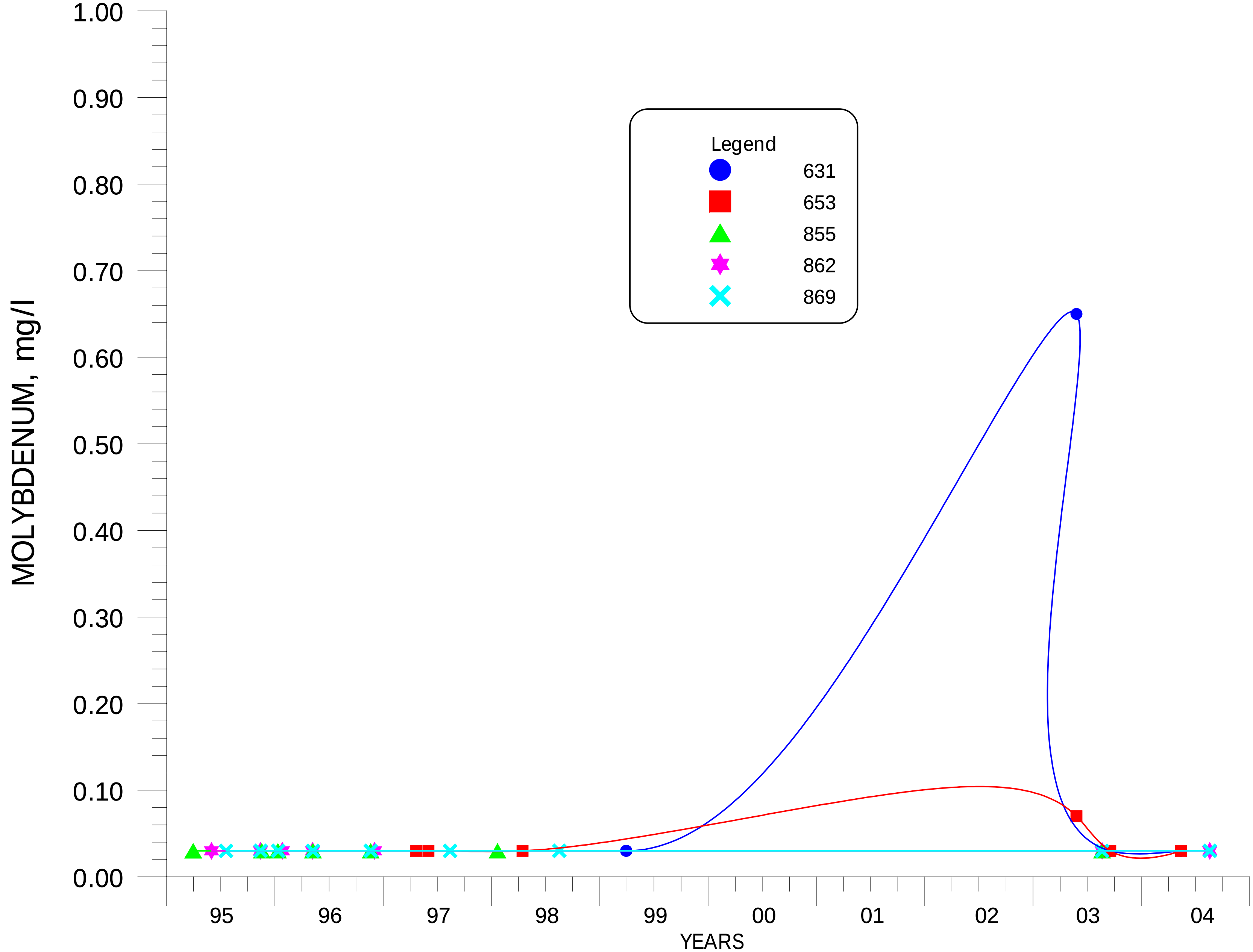


FIGURE 4.3-100. MOLYBDENUM CONCENTRATIONS FOR WELLS 631, 653, 855, 862 AND 869.

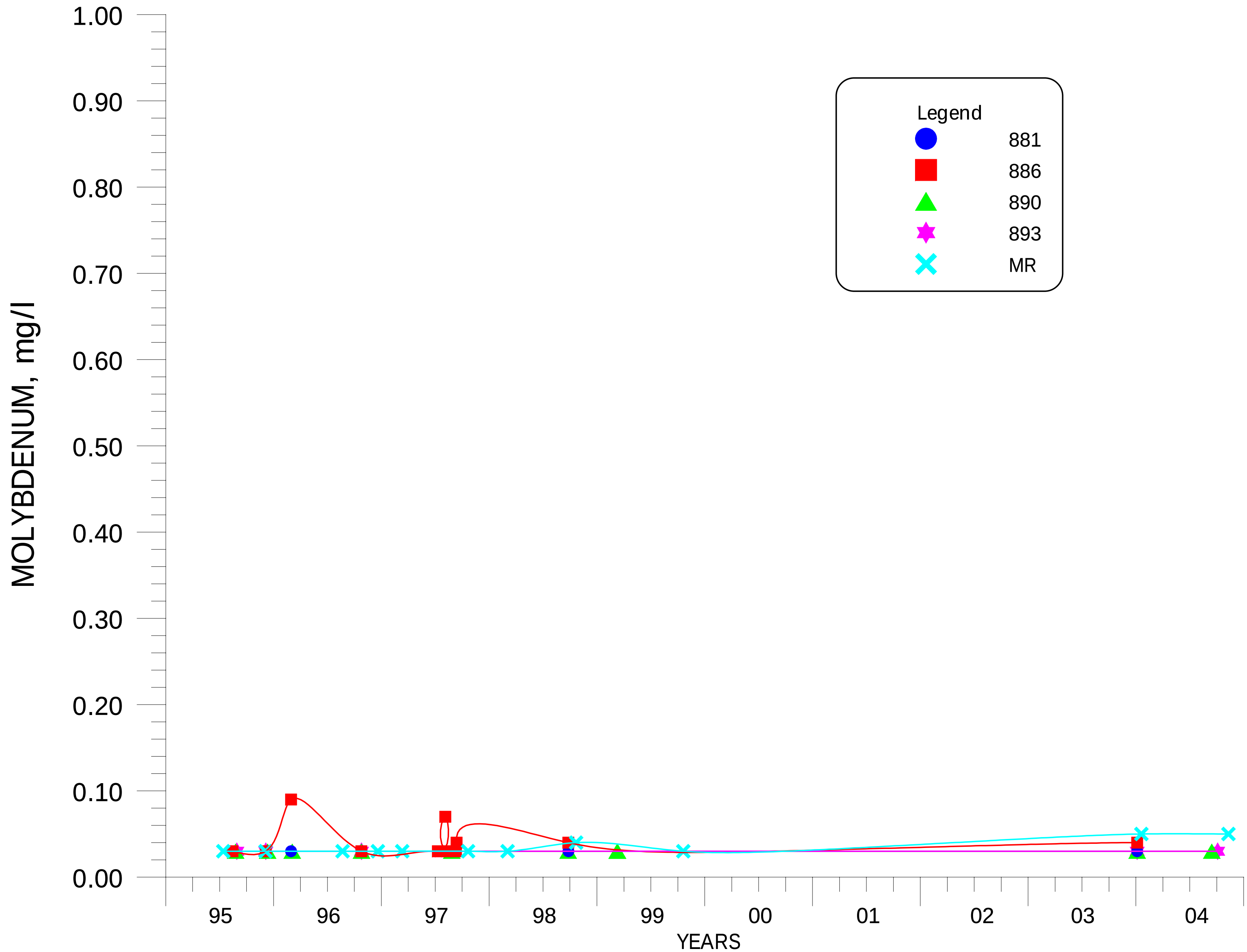


FIGURE 4.3-101. MOLYBDENUM CONCENTRATIONS FOR WELLS 881, 886, 890, 893 AND MR.

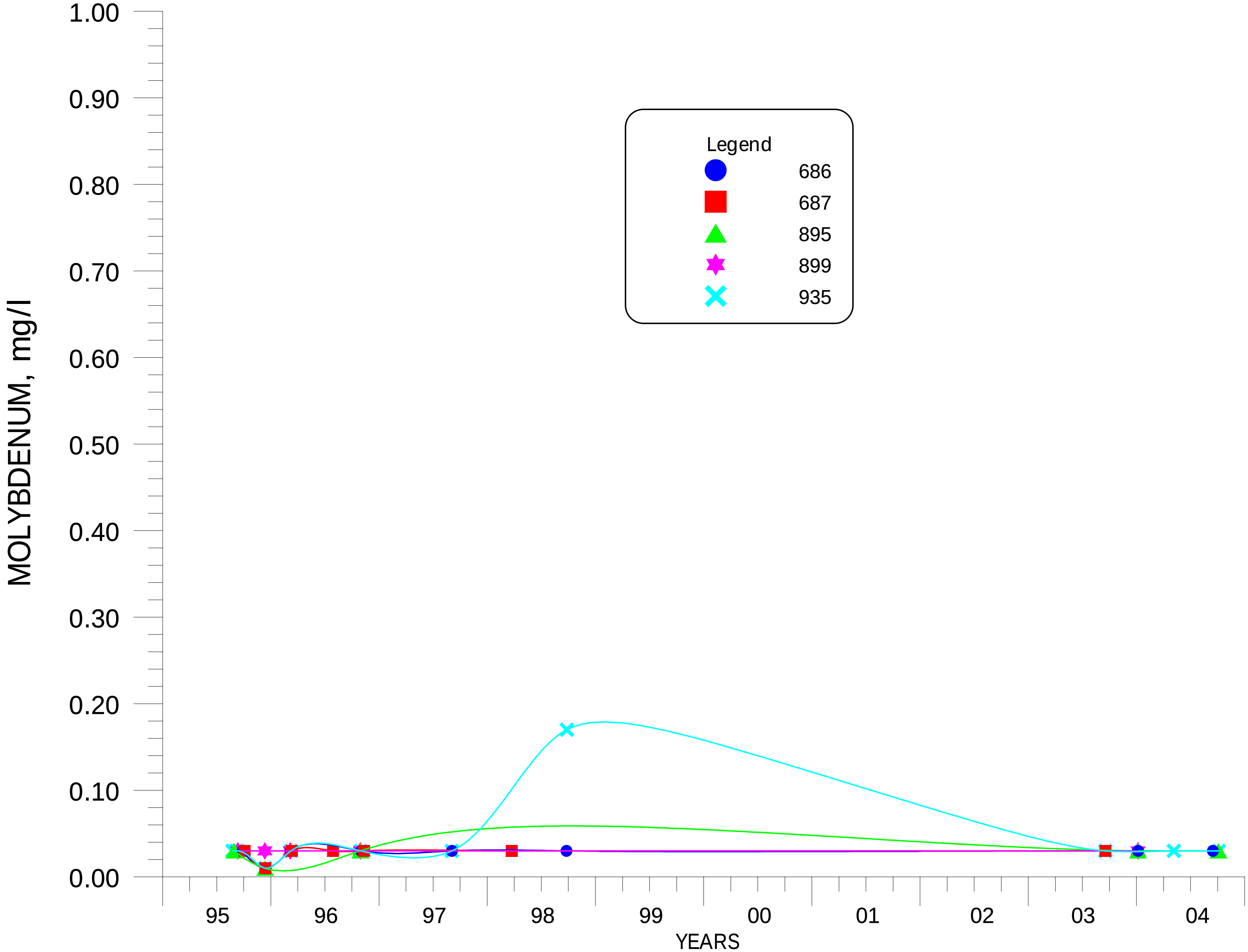


FIGURE 4.3-102. MOLYBDENUM CONCENTRATIONS FOR WELLS 686, 687, 895, 899 AND 935.

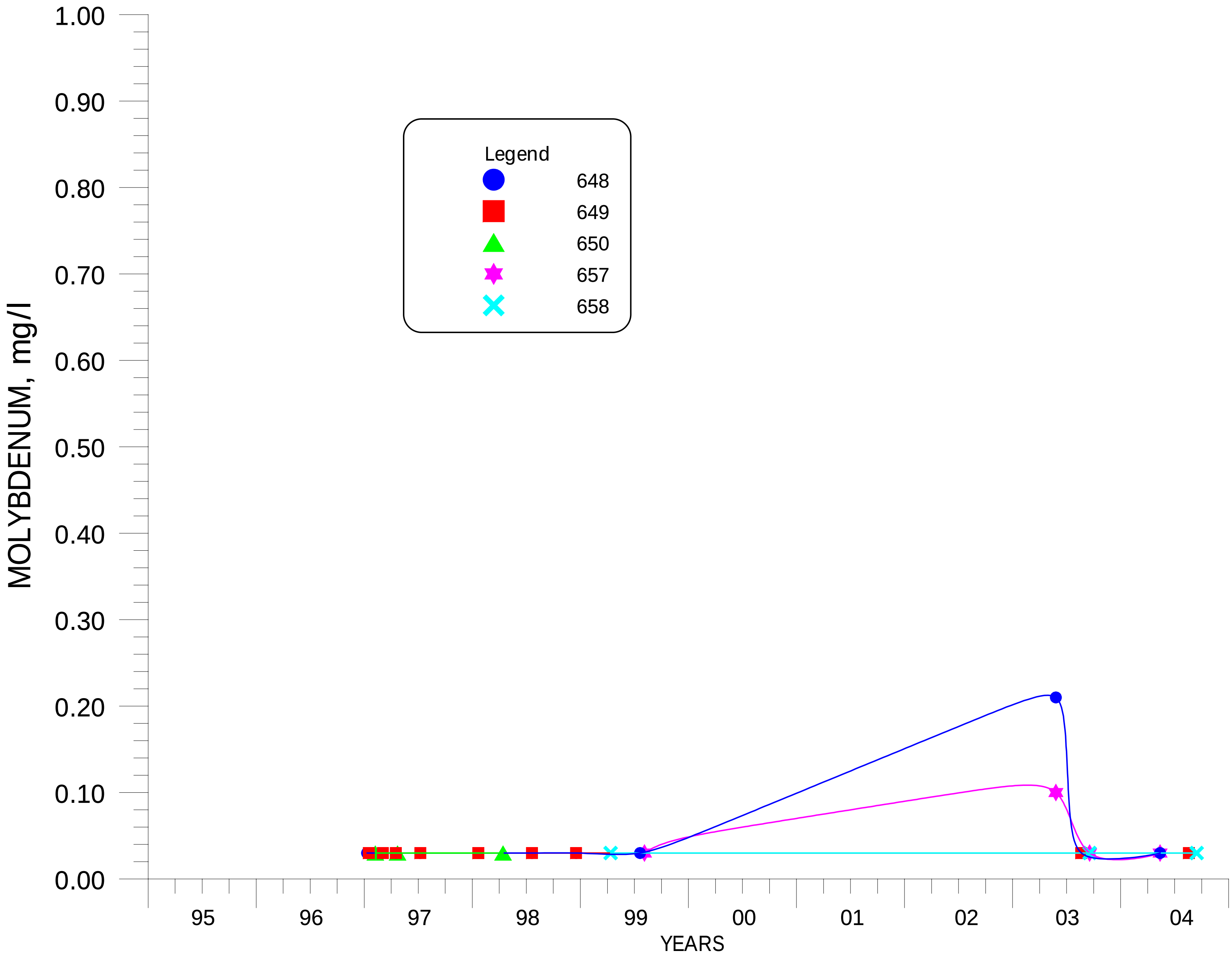
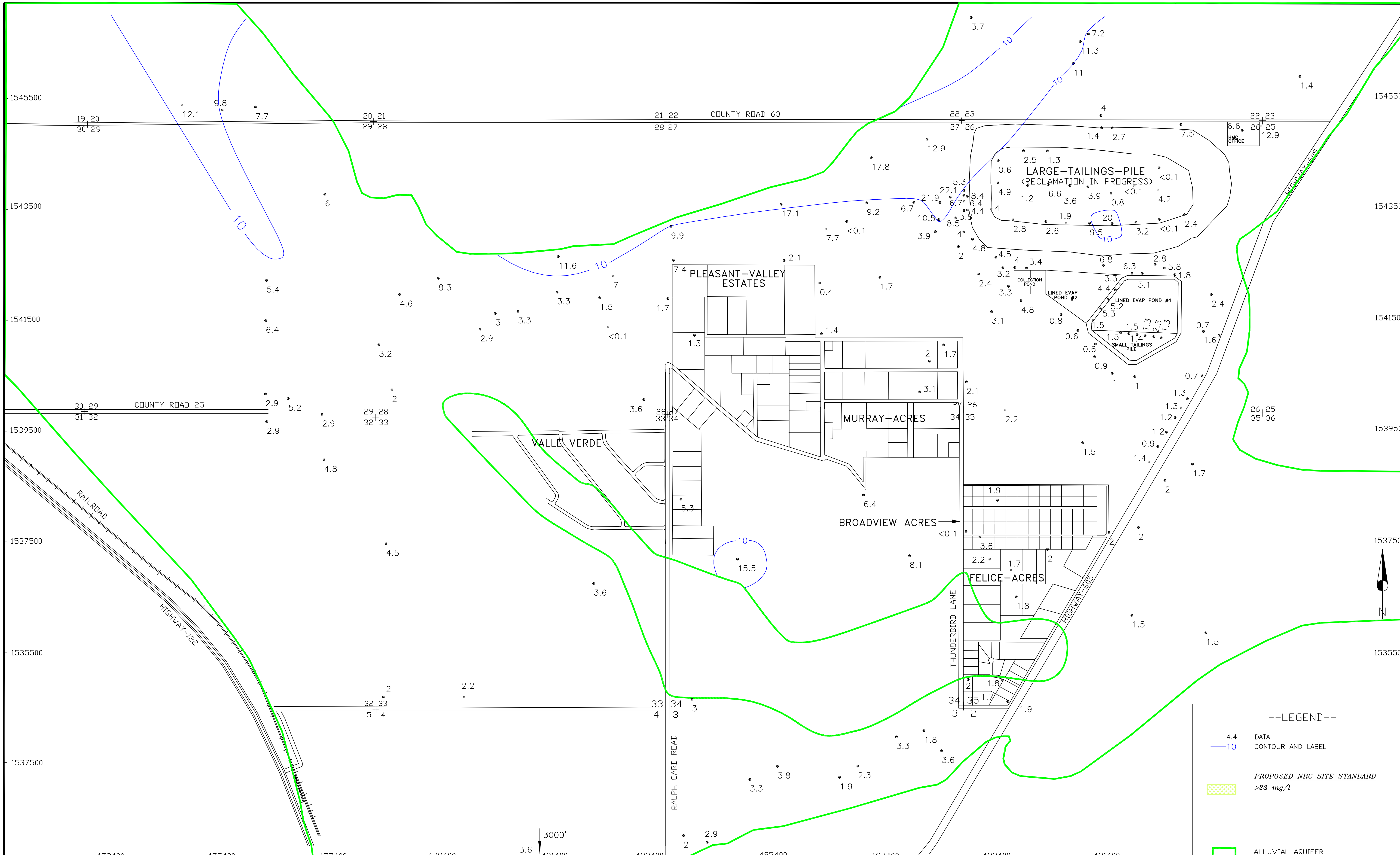


FIGURE 4.3-103. MOLYBDENUM CONCENTRATIONS FOR WELLS 648, 649, 650, 657 AND 658.



SCALE: 1"=1600'

C:\PROJECTS\ 2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-104. NITRATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, mg/l

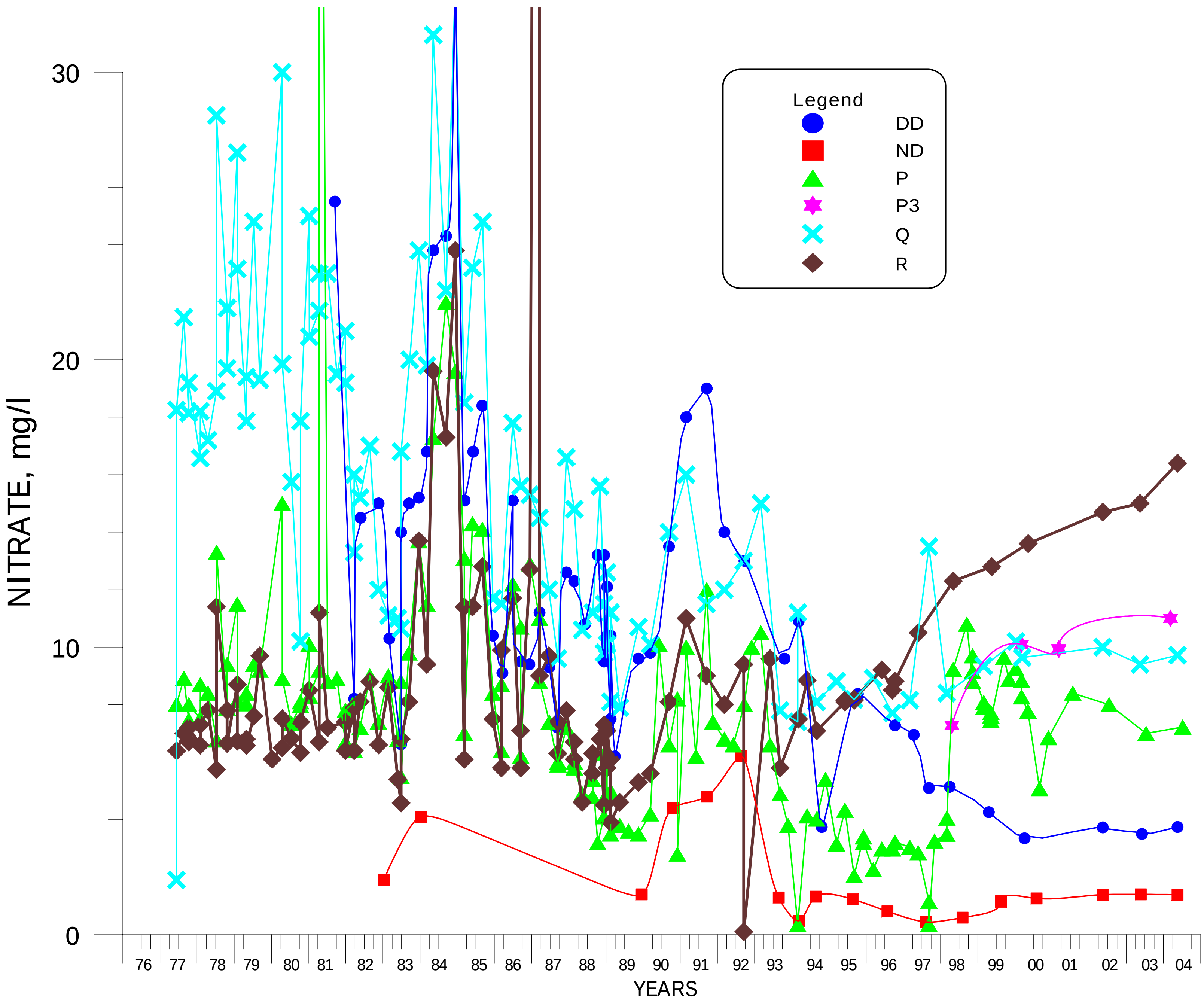


FIGURE 4.3-105. NITRATE CONCENTRATIONS FOR WELLS DD, ND, P, P3, Q AND R.

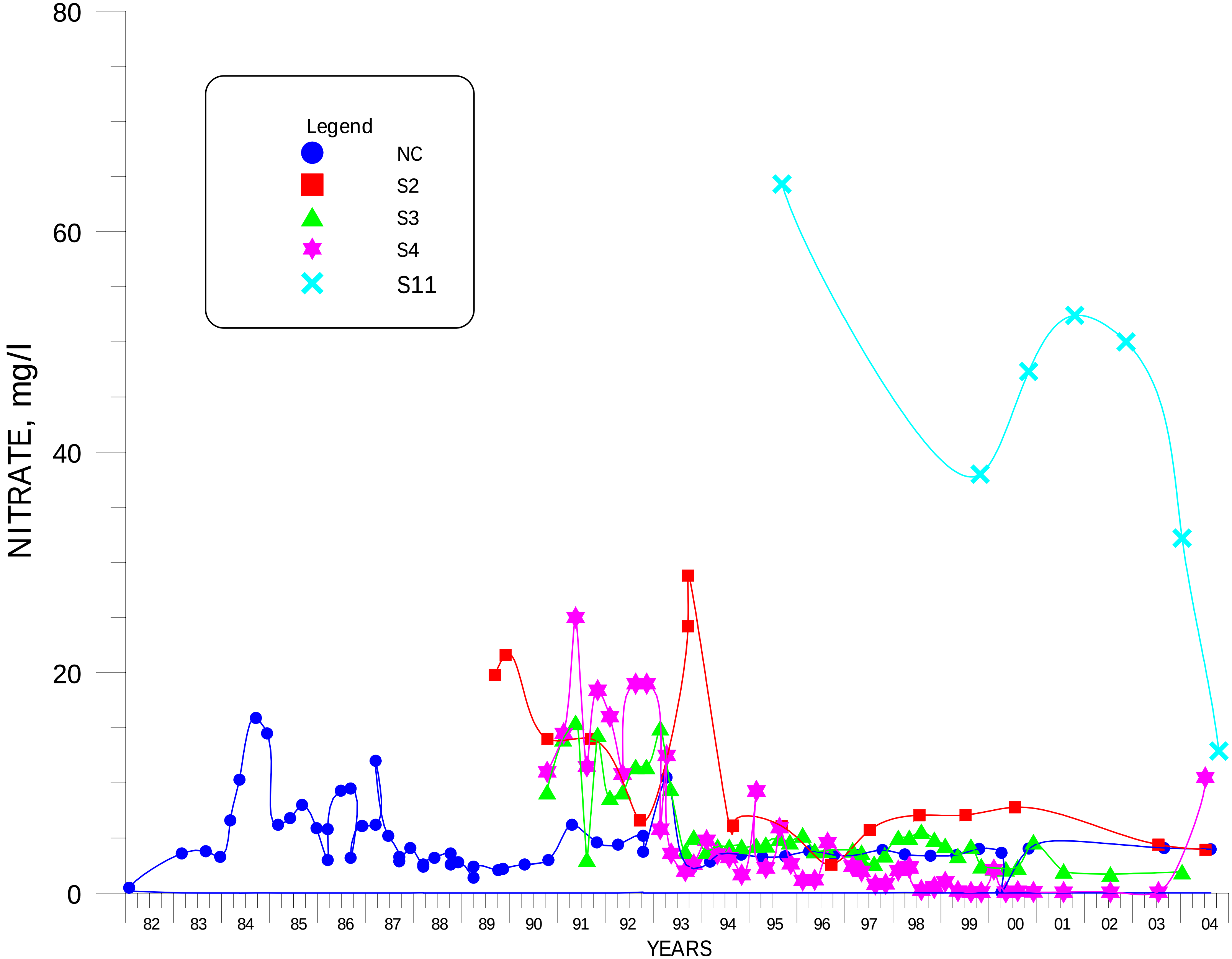


FIGURE 4.3-106. NITRATE CONCENTRATIONS FOR WELLS NC, S2, S3, S4 AND S11.

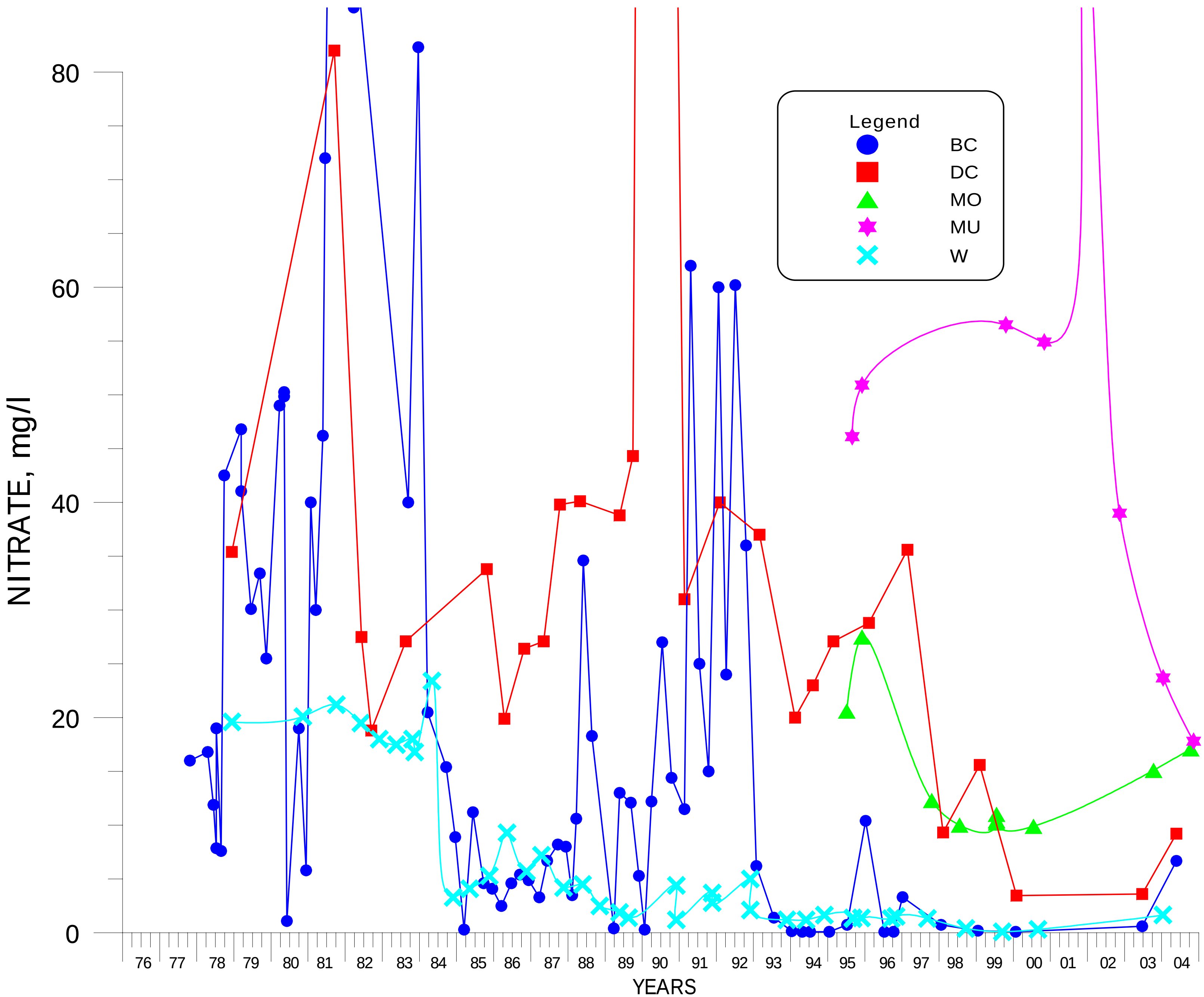


FIGURE 4.3-107. NITRATE CONCENTRATIONS FOR WELLS BC, DC, MO, MU AND W.

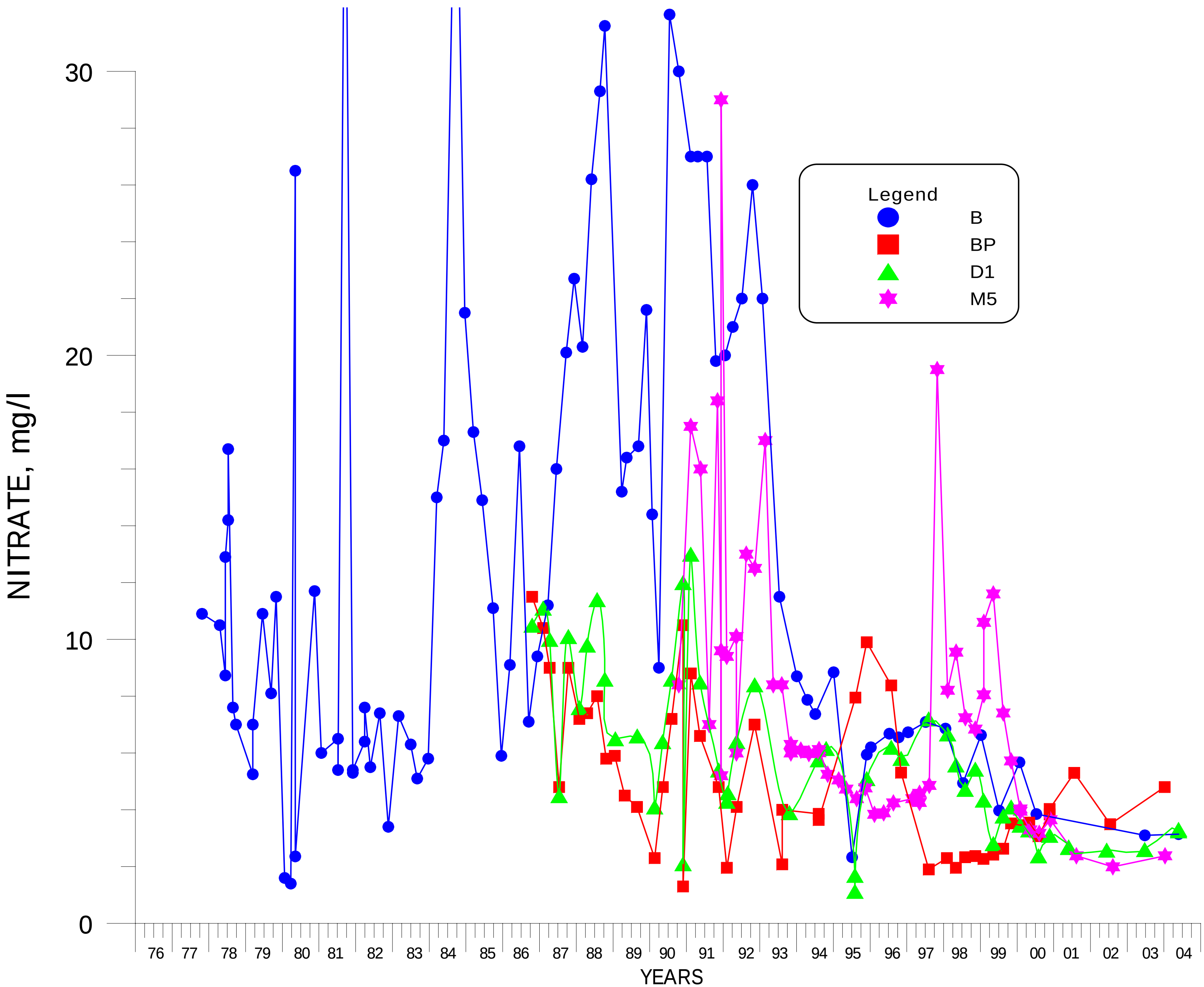


FIGURE 4.3-108. NITRATE CONCENTRATIONS FOR WELLS B, BP, D1 AND M5.

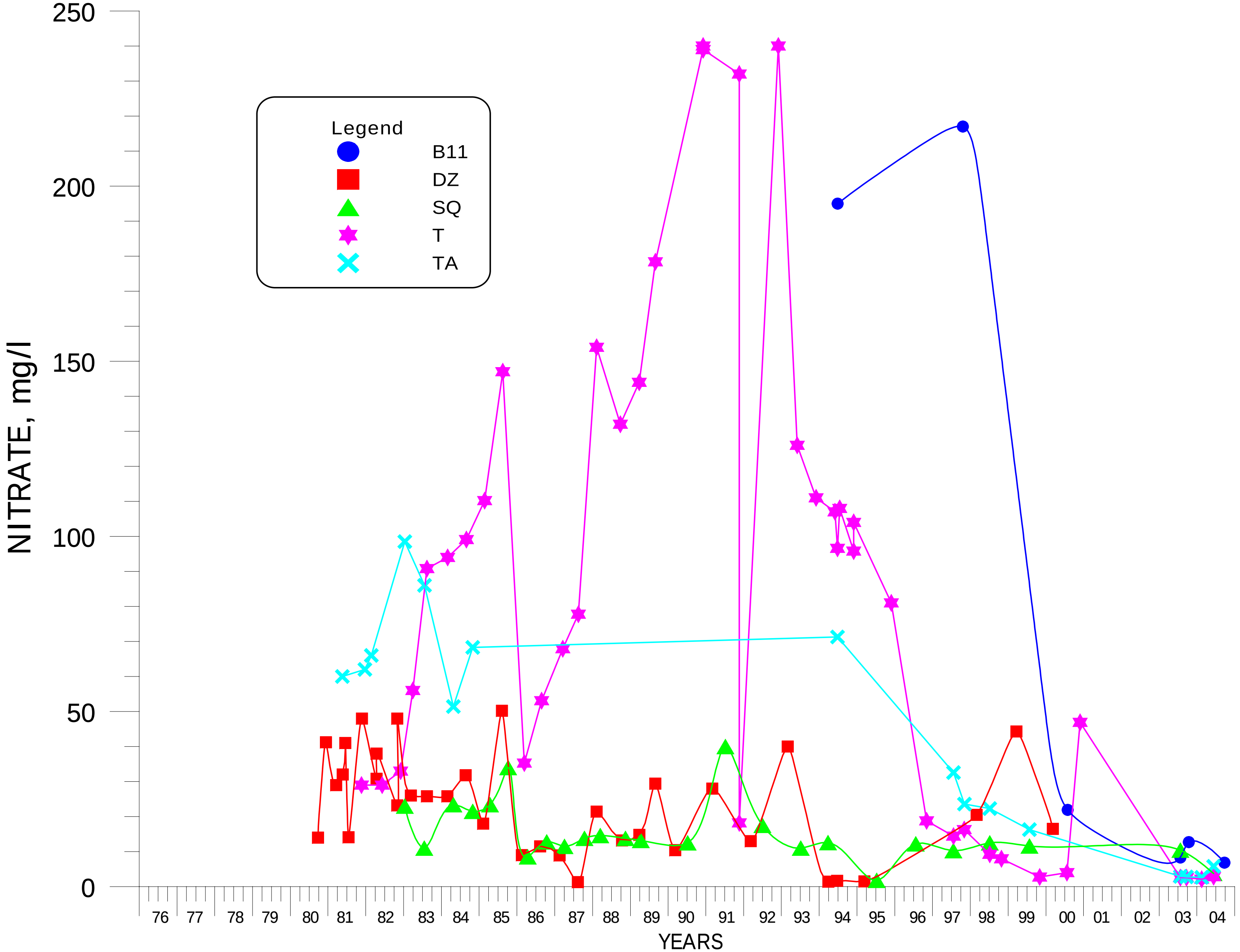


FIGURE 4.3-109. NITRATE CONCENTRATIONS FOR WELLS B11, DZ, SQ, T AND TA.

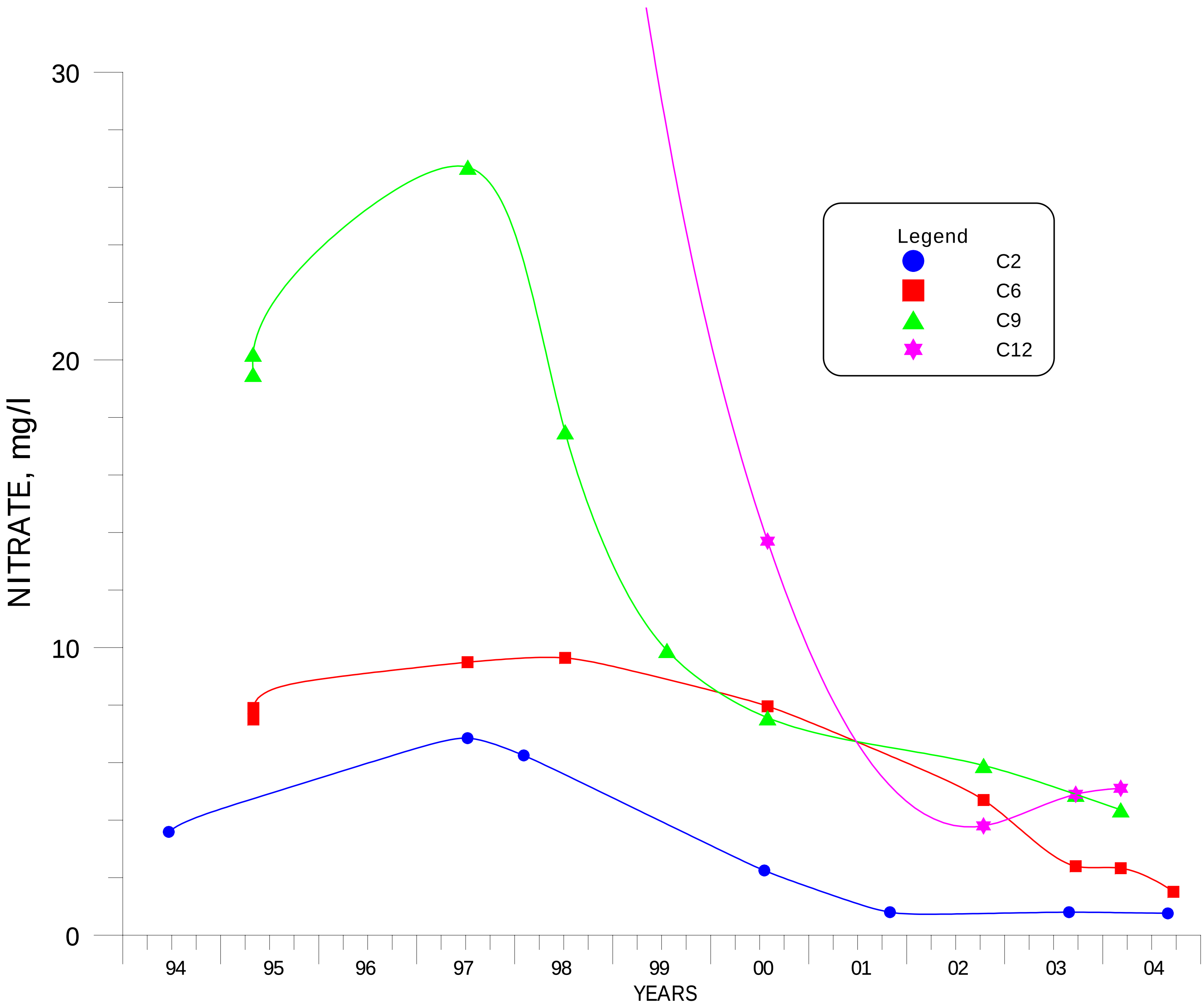


FIGURE 4.3-110. NITRATE CONCENTRATIONS FOR WELLS C2, C6, C9 AND C12.

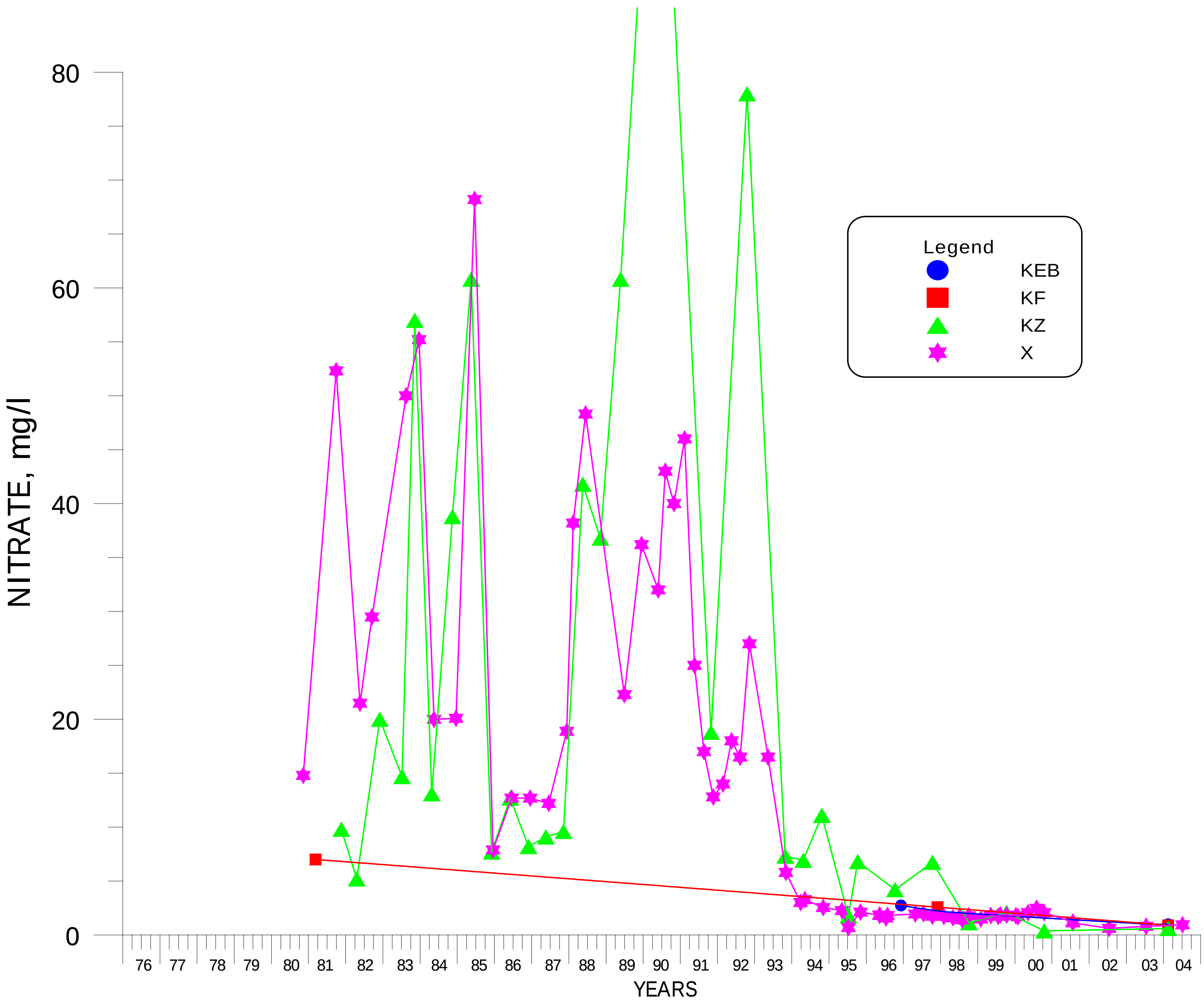


FIGURE 4.3-111. NITRATE CONCENTRATIONS FOR WELLS KEB, KF, KZ AND X.

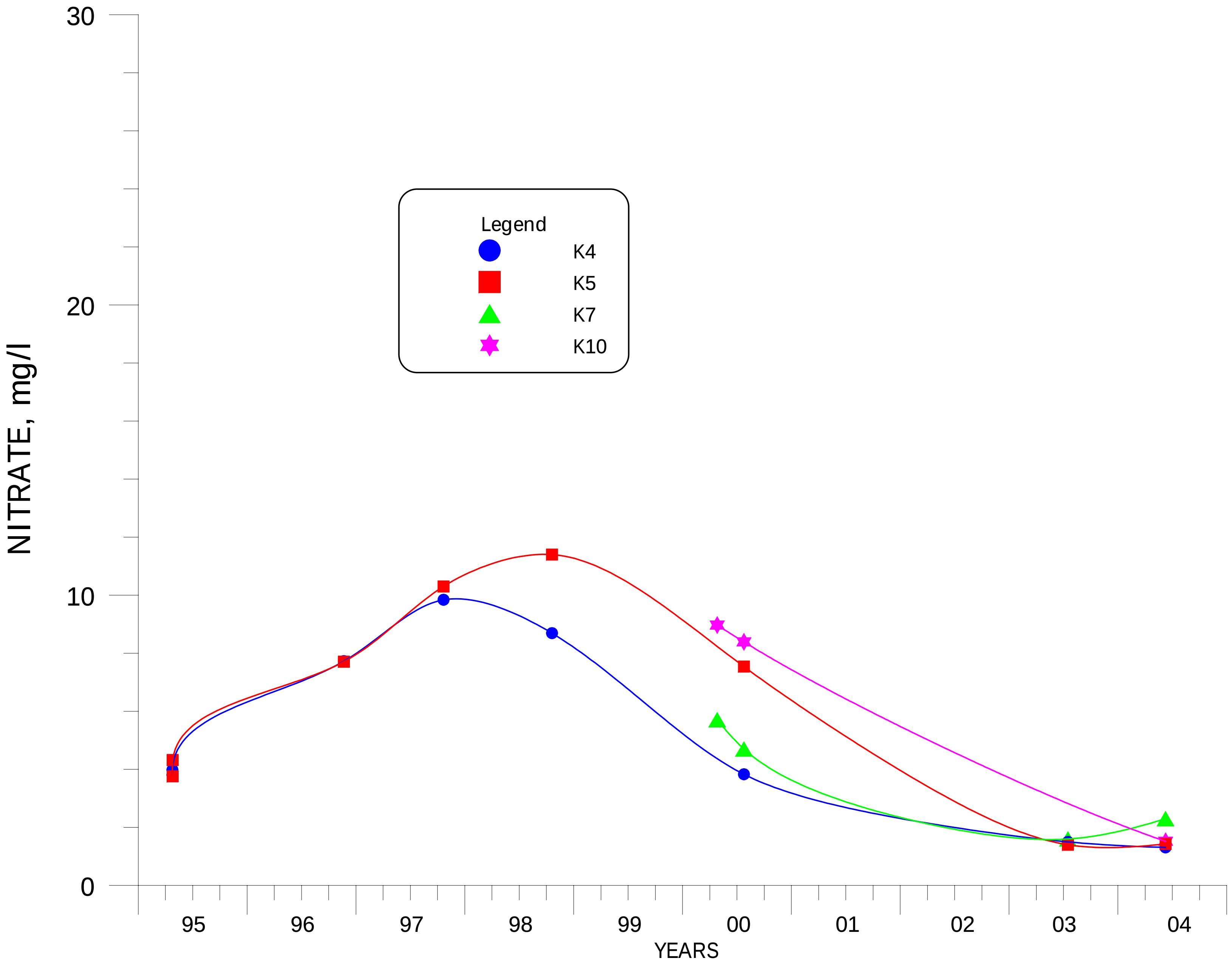


FIGURE 4.3-112. NITRATE CONCENTRATIONS FOR WELLS K4, K5, K7 AND K10.

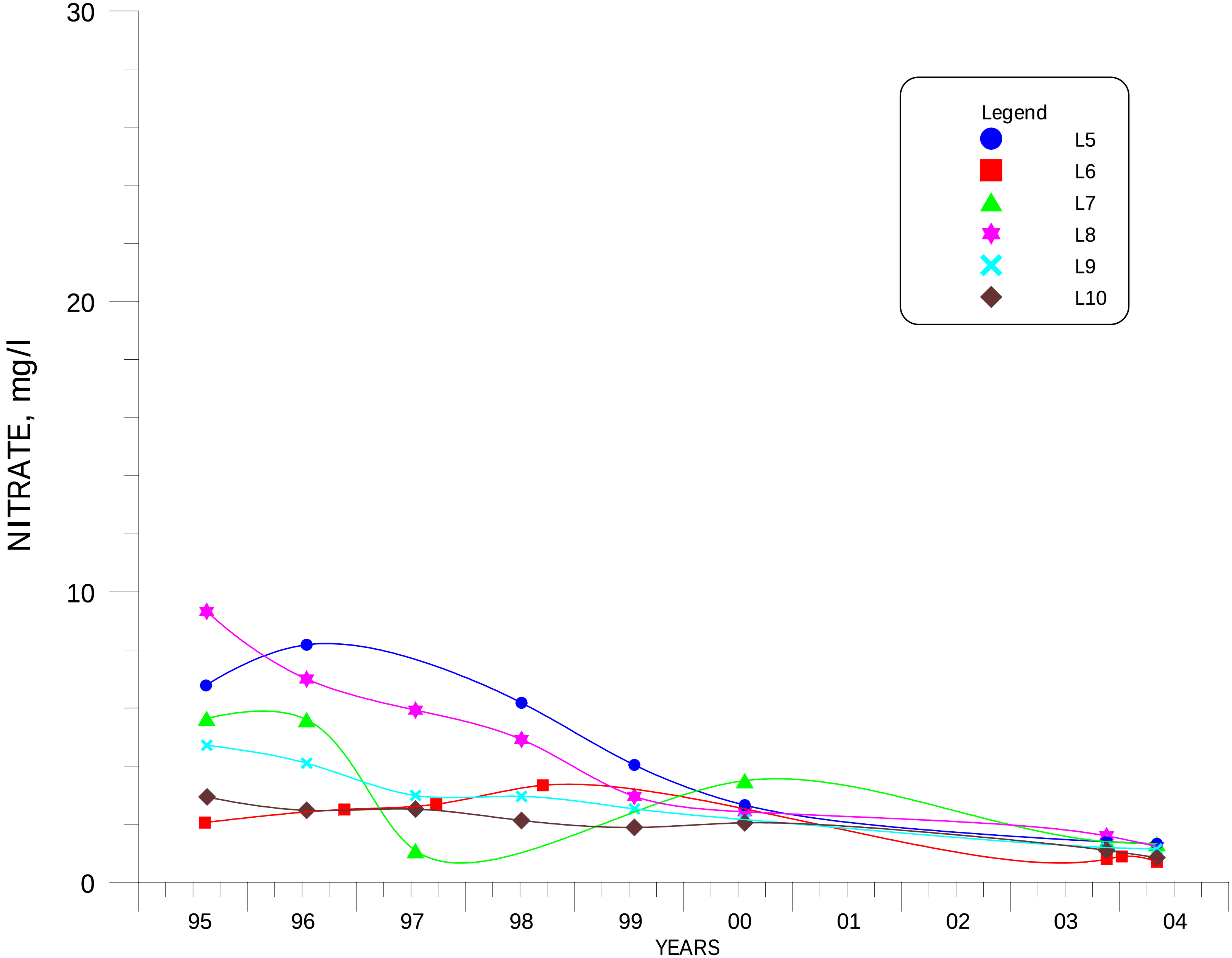


FIGURE 4.3-113. NITRATE CONCENTRATIONS FOR WELLS L5, L6, L7, L8, L9 AND L10.

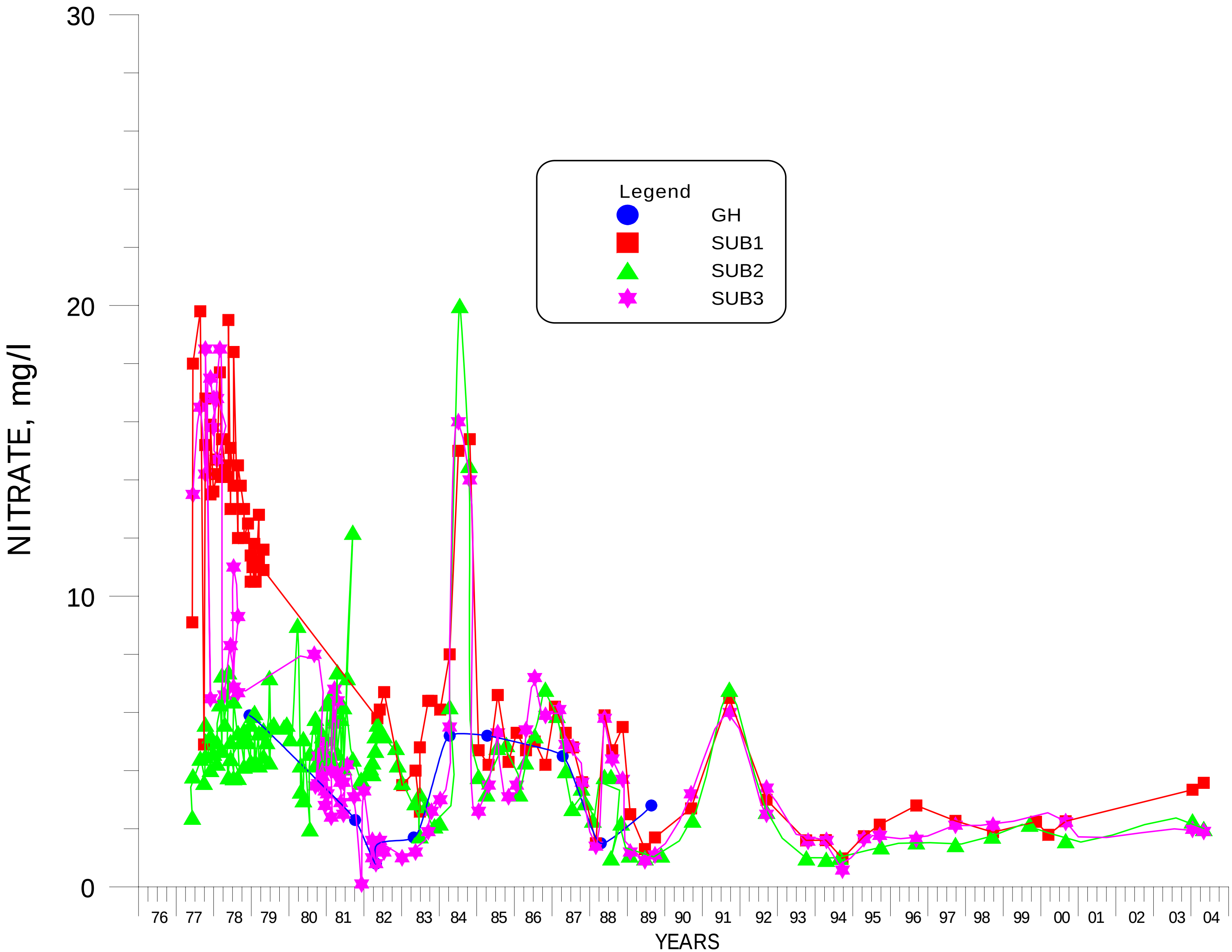


FIGURE 4.3-114. NITRATE CONCENTRATIONS FOR WELLS GH, SUB1, SUB2 AND SUB3.

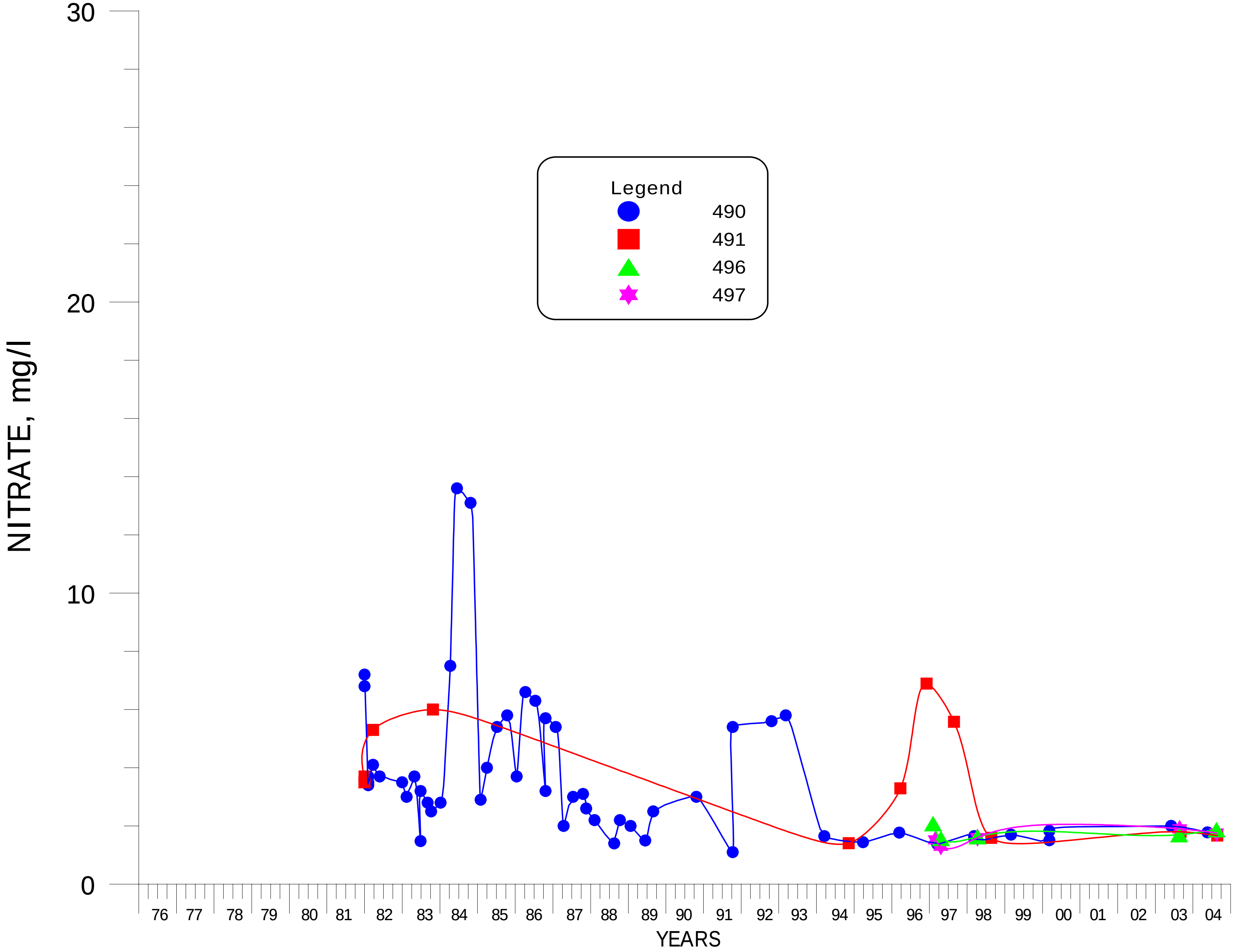


FIGURE 4.3-115. NITRATE CONCENTRATIONS FOR WELLS 490, 491, 496 AND 497.

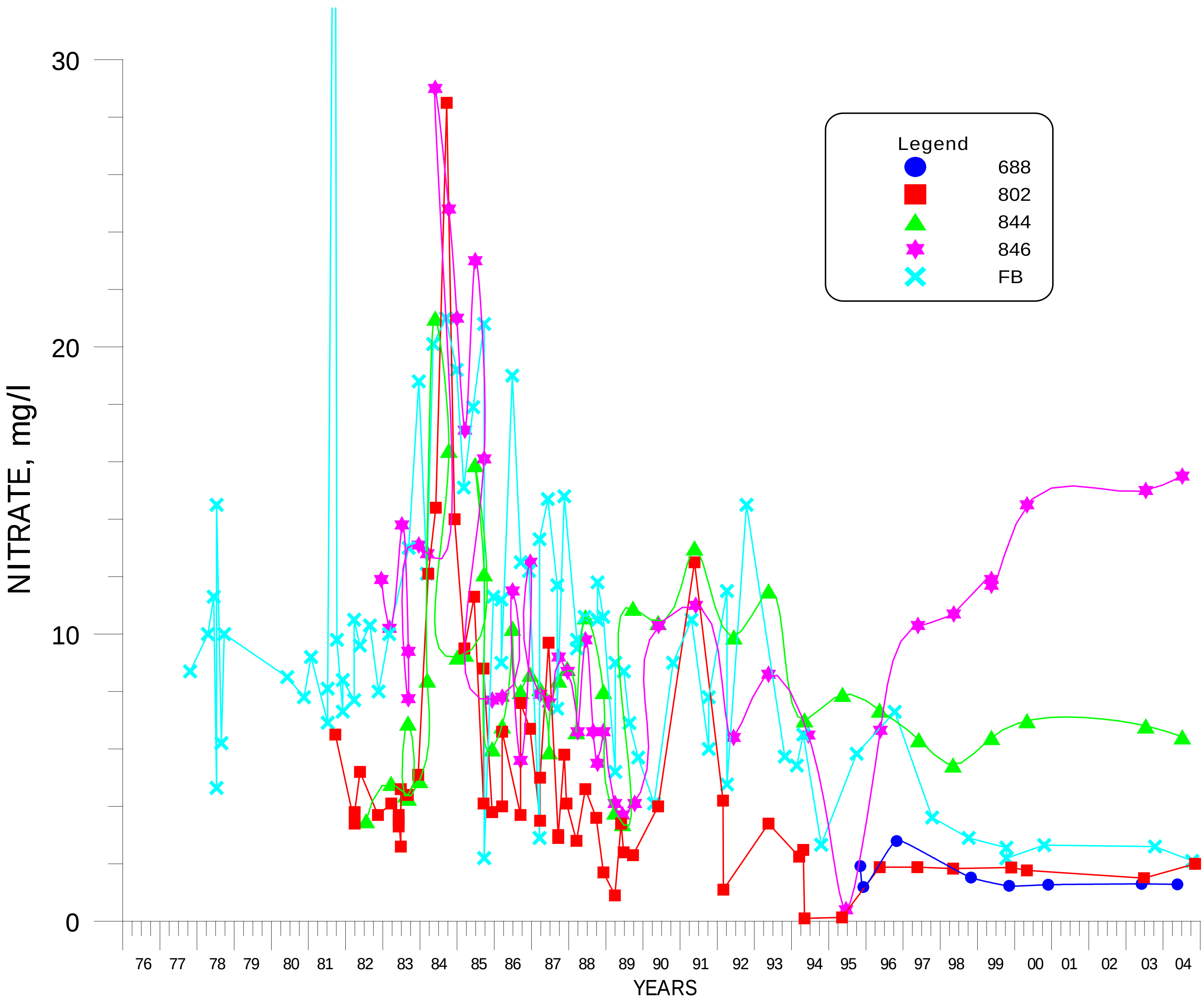


FIGURE 4.3-116. NITRATE CONCENTRATIONS FOR WELLS 688, 802, 844, 846 AND FB.

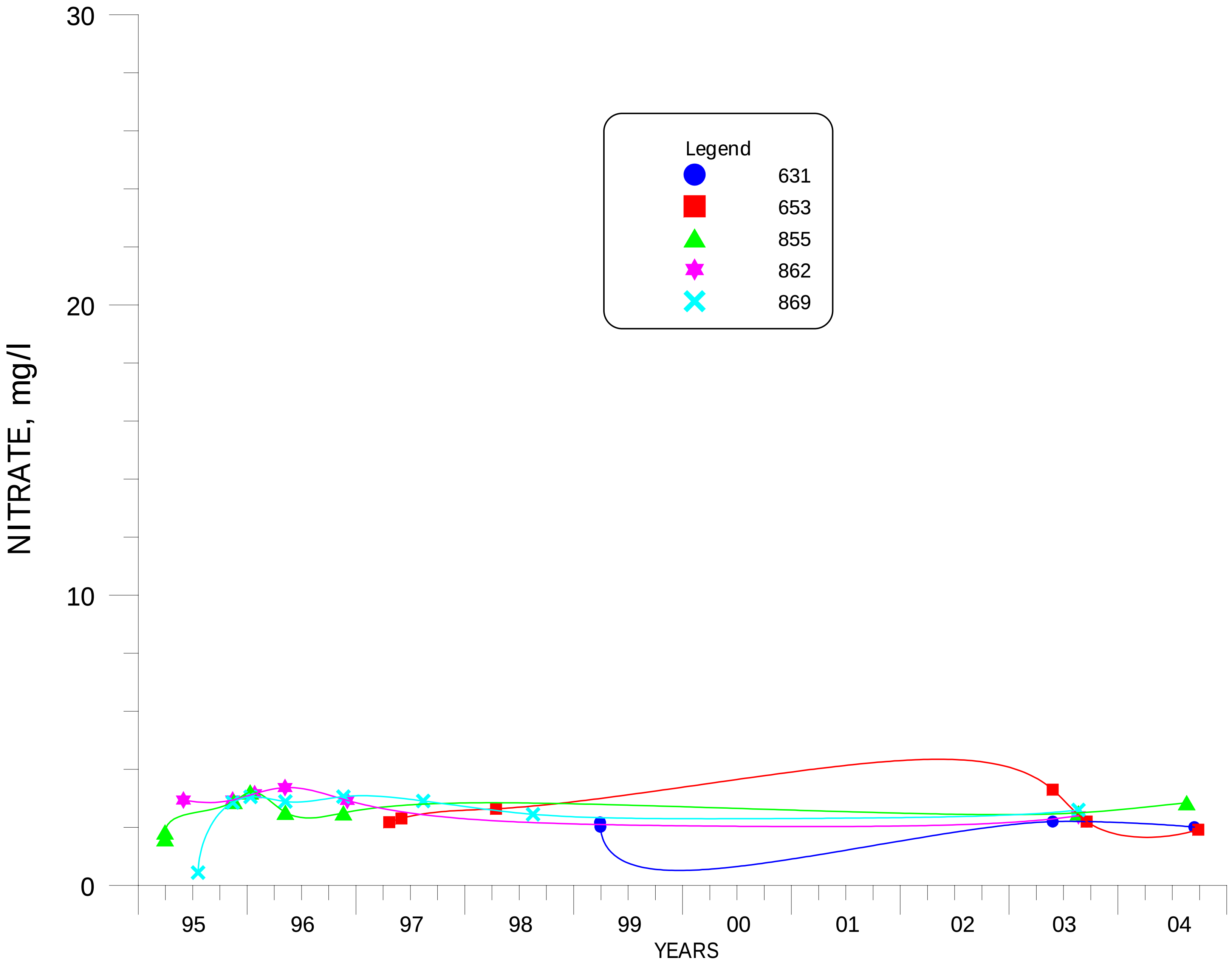


FIGURE 4.3-117. NITRATE CONCENTRATIONS FOR WELLS 631, 653, 855, 862 AND 869.

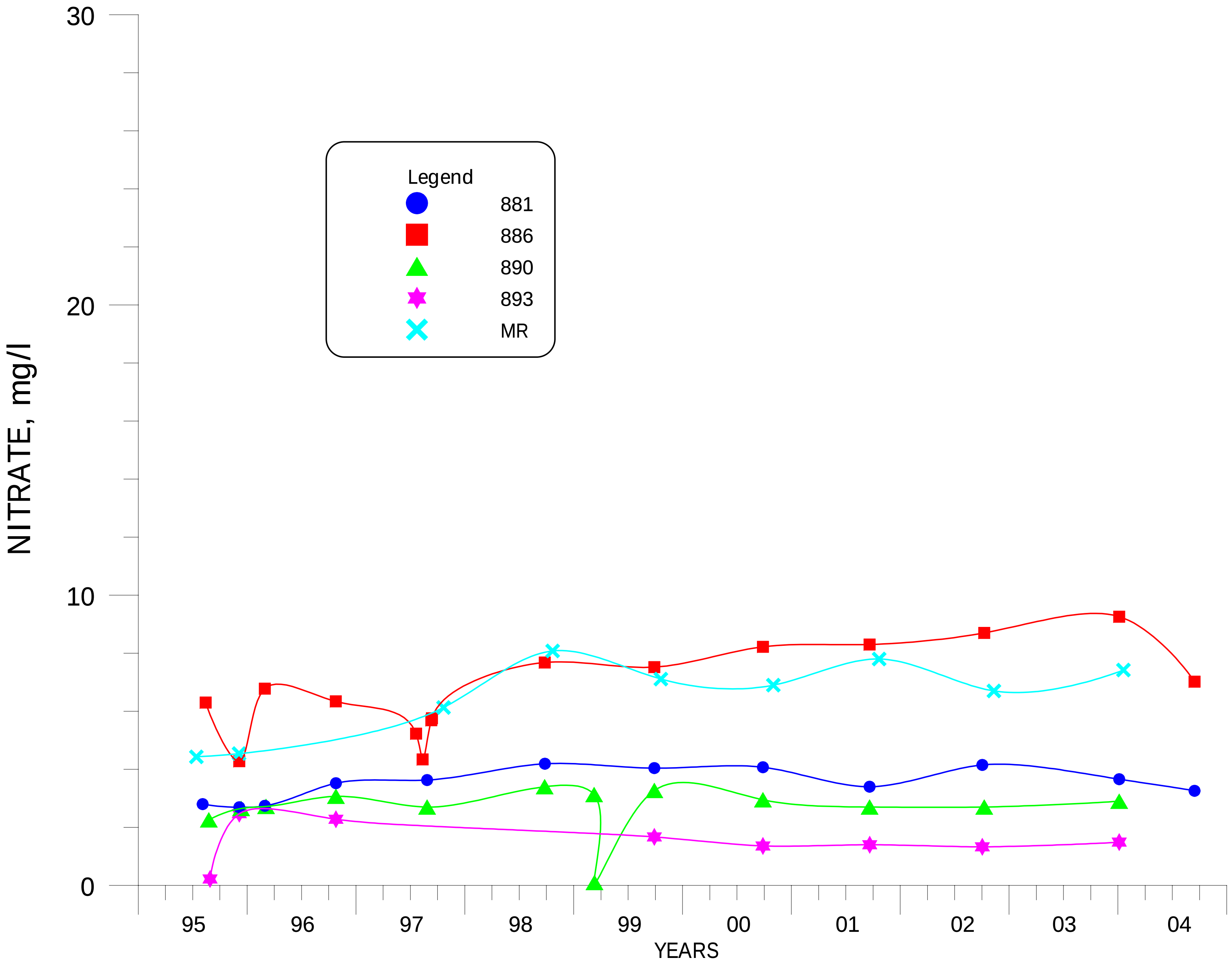


FIGURE 4.3-118. NITRATE CONCENTRATIONS FOR WELLS 881, 886, 890, 893 AND MR.

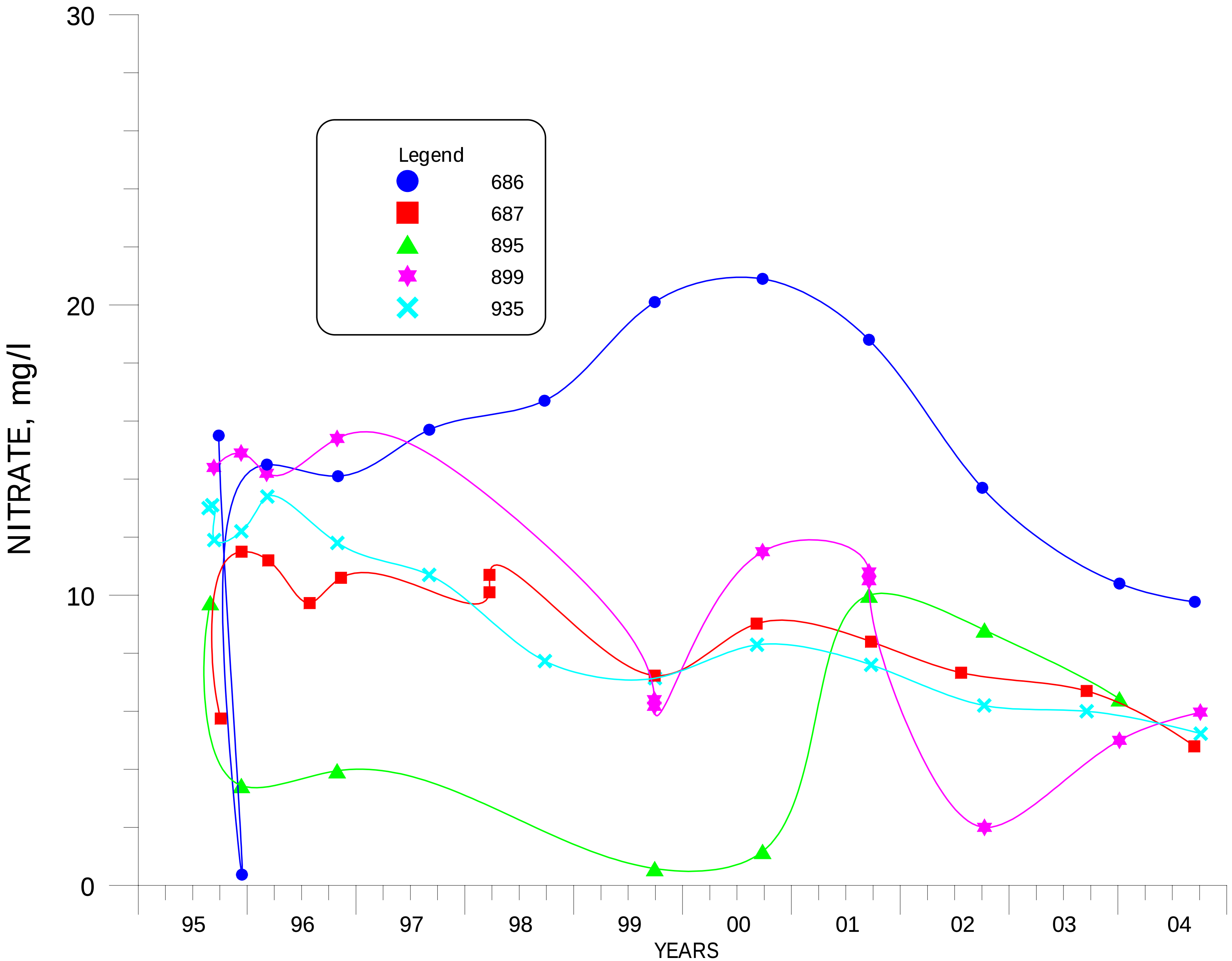


FIGURE 4.3-119. NITRATE CONCENTRATIONS FOR WELLS 686, 687, 895, 899 AND 935.

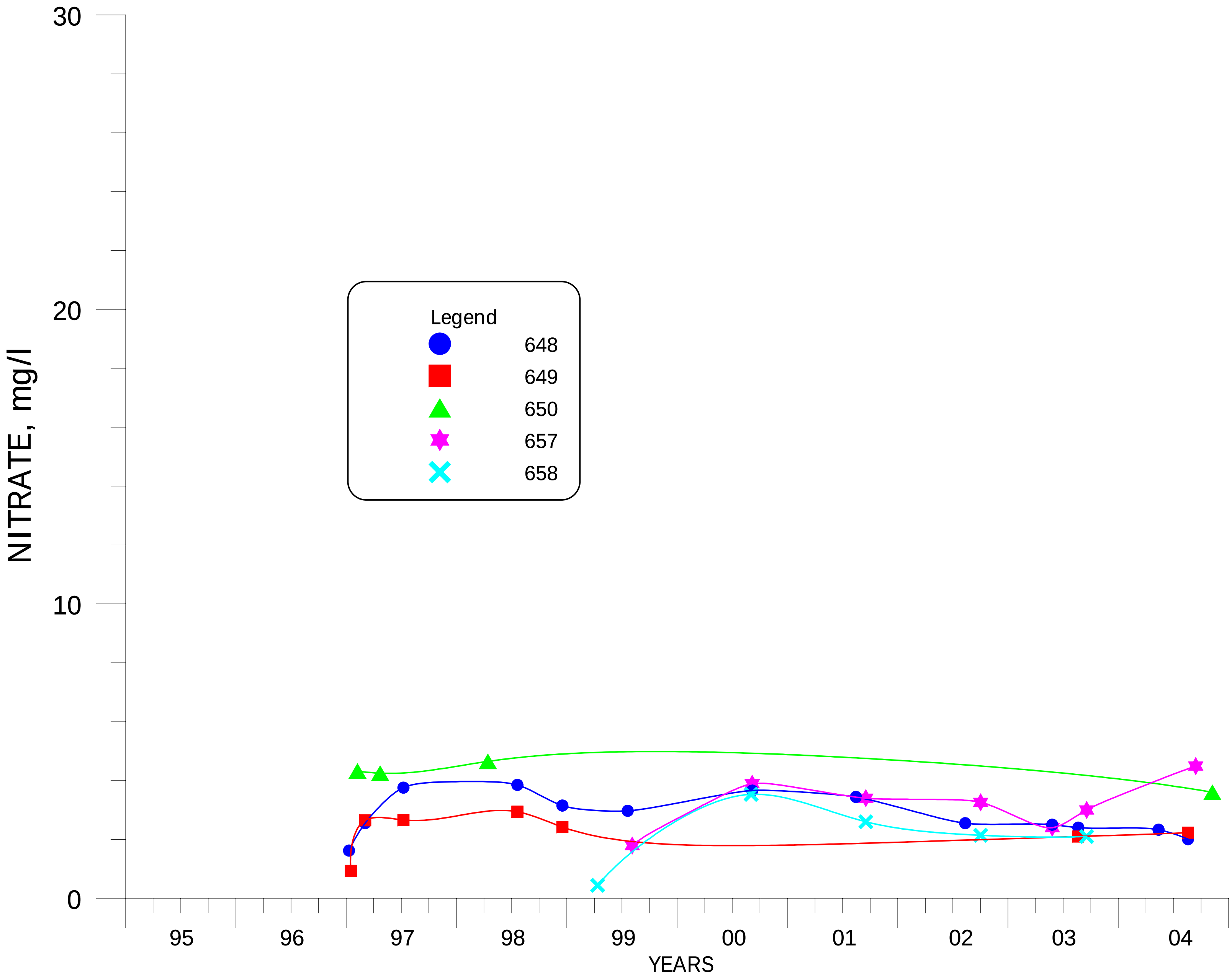
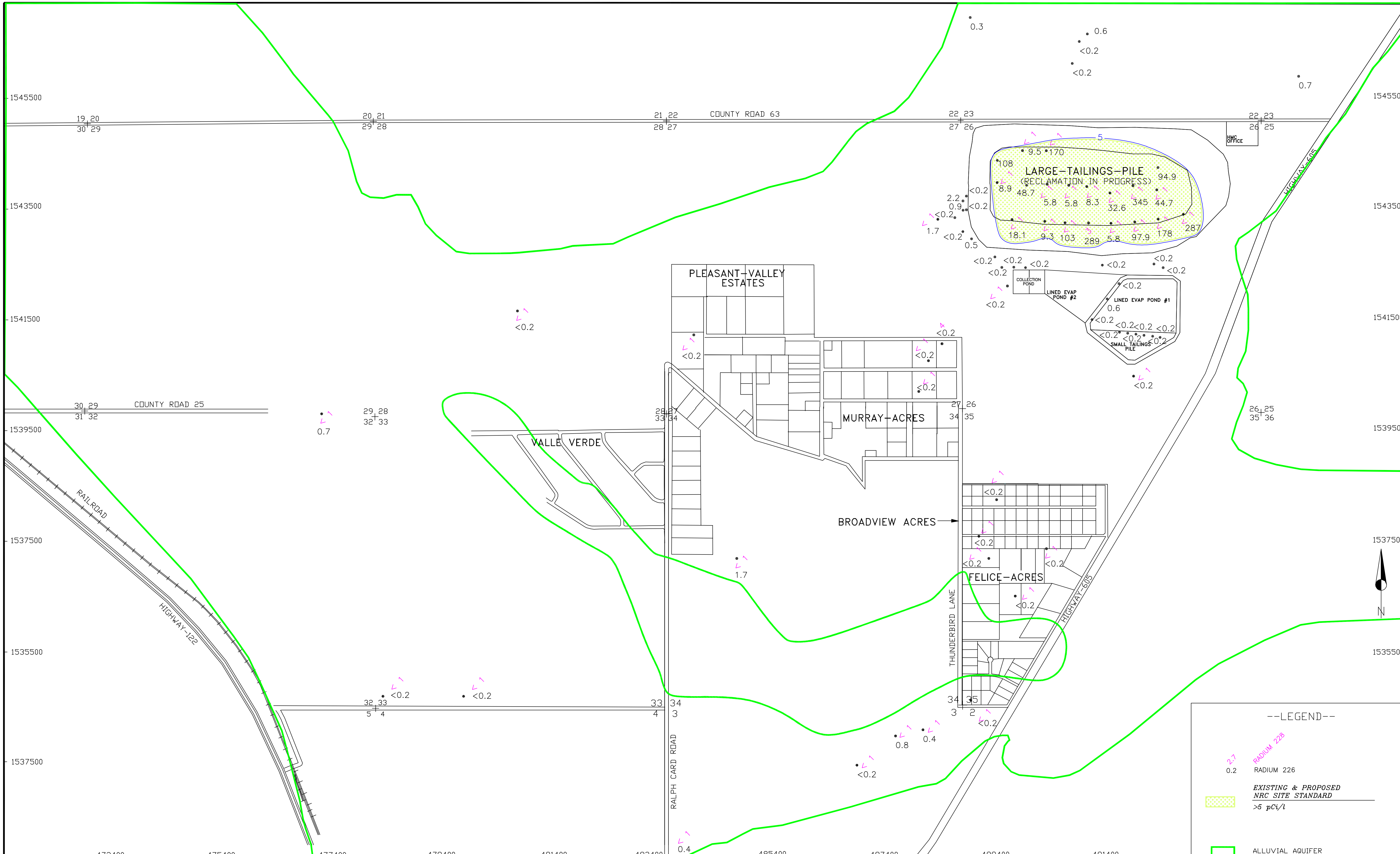


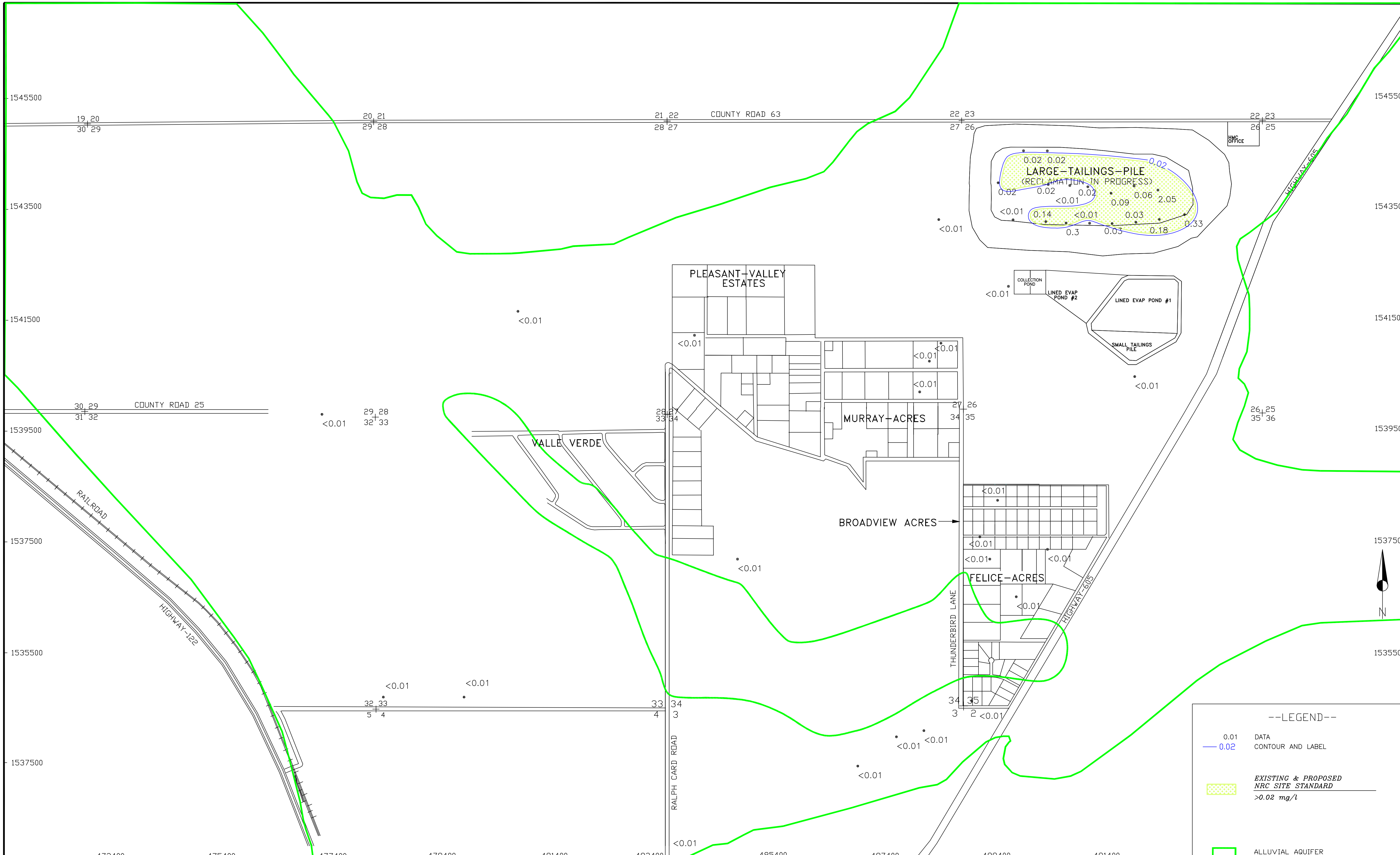
FIGURE 4.3-120. NITRATE CONCENTRATIONS FOR WELLS 648, 649, 650, 657 AND 658.



SCALE: 1"=1600'
C:\PROJECTS\ 2004-06\C-QAL04
DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-121. RADIUM-226 AND RADIUM-228 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, pCi/l



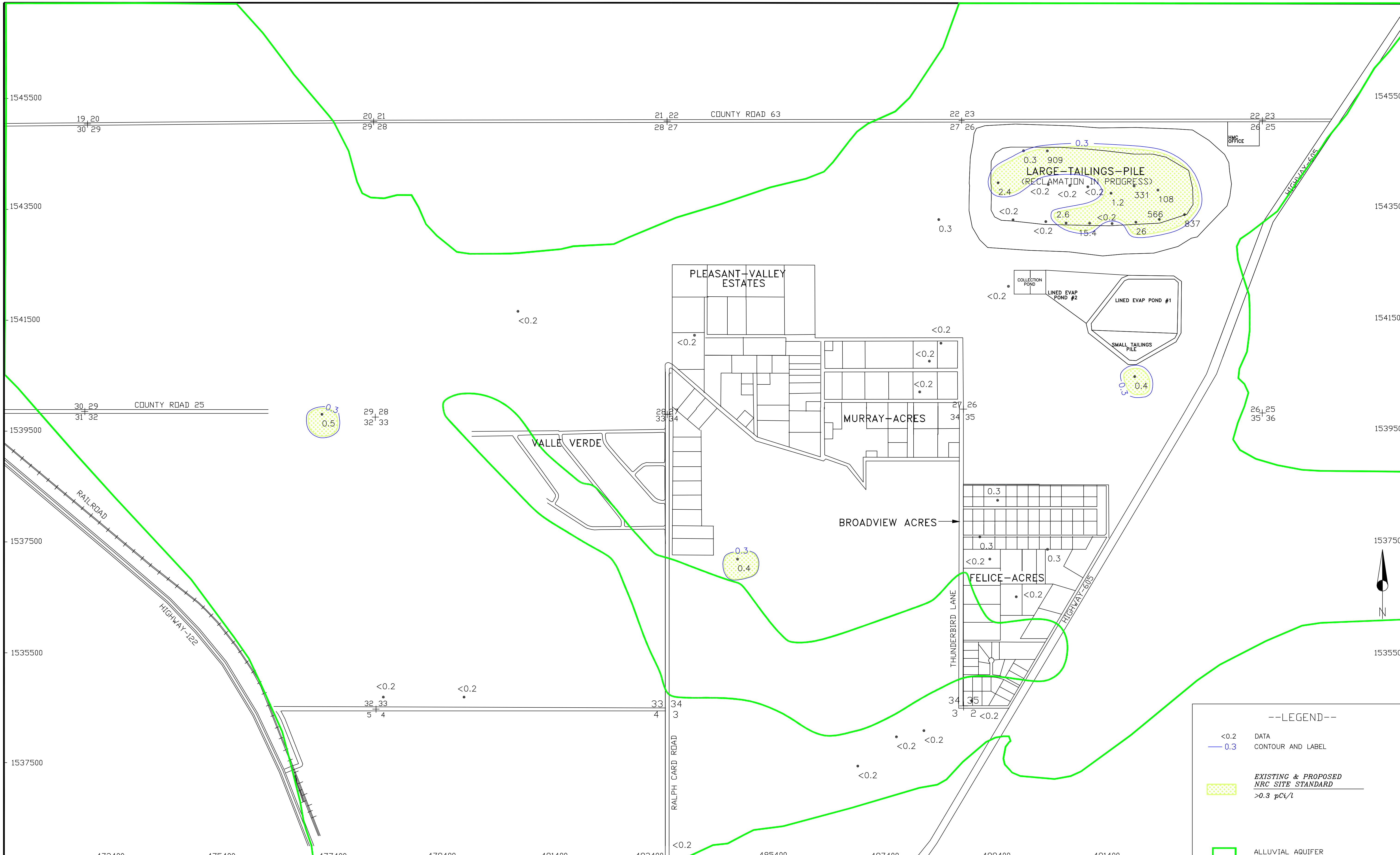
SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-122. VANADIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, mg/l



SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-QAL04

DATE: 03/23/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 4.3-123. THORIUM-230 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2004, pCi/l

SECTION 5

TABLE OF CONTENTS

**GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT**

Page Number

FIGURES

SECTION 5

TABLE OF CONTENTS

GROUND WATER MONITORING FOR HOMESTAKE'S GRANTS PROJECT

FIGURES (continued)

SECTION 5

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

Page Number

TABLES

5.0 UPPER CHINLE AQUIFER MONITORING

5.1 UPPER CHINLE WELL COMPLETION

Chinle aquifer well locations are shown on Figure 5.1-1. The Upper and Middle Chinle aquifers do not exist in the area west of Ralph Card Road. Table 5.1-1 presents basic information for the Chinle wells located on the Homestake property. This table indicates well coordinates, well depth, casing diameter, water level, measuring point in feet above land surface and elevation, and depth and elevation to the top of the Chinle aquifers. A “U” follows the elevation of the top of the Upper Chinle aquifer, and an “M” and an "L" have the same meaning for the Middle and Lower Chinle aquifers, respectively. Some of the wells have been used to define the depth to the base of the alluvium, and an “A” is presented following the elevation to denote that these values are for the base of the alluvium. The casing perforation interval and aquifer unit are also presented in this table.

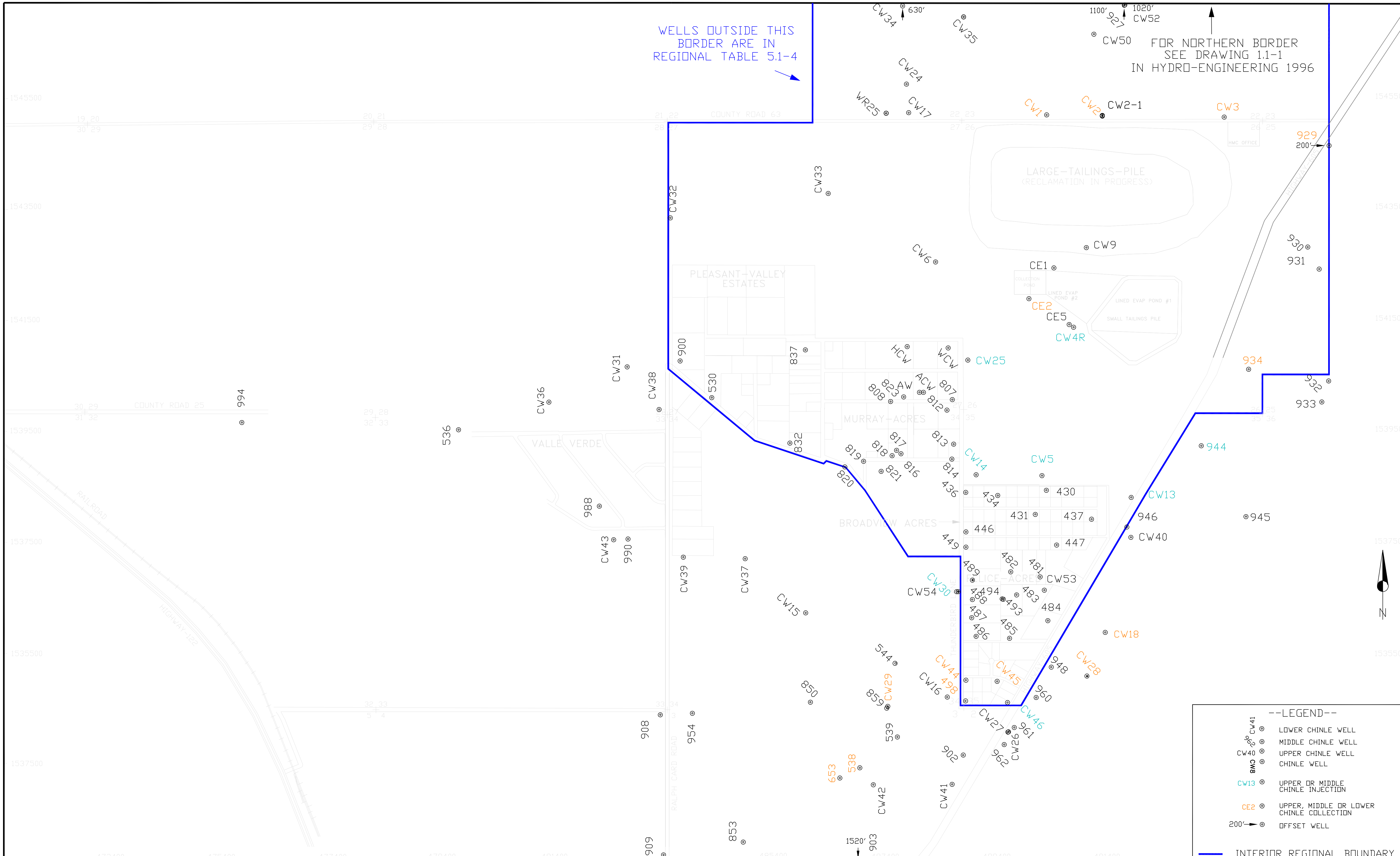
Table 5.1-2 presents basic well data for Chinle wells in Broadview Acres and Felice Acres. Table 5.1-3 presents similar data for Murray Acres and Pleasant Valley Estates Chinle wells. Wells that are not located within the immediate Grants Project property or within the four subdivision boundaries are denoted on Table 5.1-4 as the regional Chinle wells (see Figure 5.1-1 for inner regional boundary). Upper Chinle wells CW53 in Felice Acres and well CW54 just west of Felice Acres were drilled in 2004.

An analysis of the background water quality for the Chinle aquifers was presented in Hydro-Engineering 2003b. Background values for the Chinle mixing zone and the Upper, Middle and Lower Chinle non-mixing zones were also defined in the previously cited report. These proposed background values are listed in the title block of the water-quality figures in this report.

The location of Upper Chinle wells is shown on Figure 5.1-2, with the areal extent of the Upper Chinle aquifer at the Grants Project also shown. Upper Chinle wells CW4R, CW5, CW13, CW25 and 944 are shown in cyan to denote that these are fresh-water injection wells. Upper Chinle wells CE2, CW3, 929 and 934 were pumped as a source of flushing water for the Large Tailings Pile in 2004 and are shown in orange. Well CW18 is also shown in orange, because this well was used as a supply for fresh-water injection starting in late September of 2002 but was not used continuously after May of 2004. This figure also shows the location of

the West and East Faults. A blue dot pattern is used to show the limits of the Upper Chinle sandstone where Chinle shale exists between the sandstone and the alluvium. Figure 5.1-3 presents a typical geologic cross section to show the relative position of the alluvial and Chinle aquifers (see Figure 5.1-2 for the location of this cross section).

The subcrop of the Upper Chinle sandstone where the alluvium is saturated or unsaturated above the Upper Chinle sandstone is also shown on Figure 5.1-2. The Upper Chinle aquifer does not exist to the west and south of the subcrop area. The Upper Chinle sandstone, therefore, does not exist west of the West Fault.



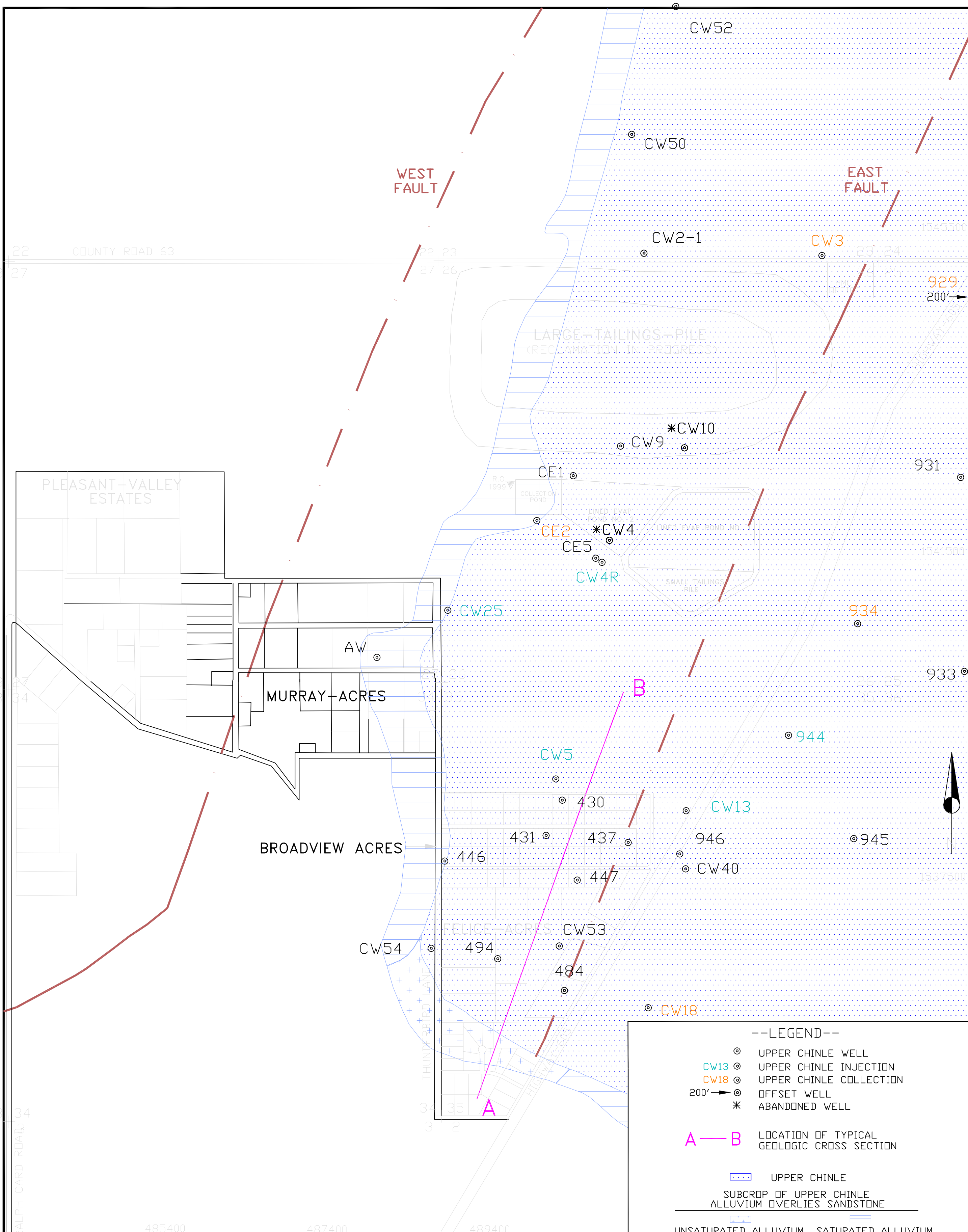
SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-BASE

DATE: 02/04/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 5.1-1. CHINLE AQUIFER WELL LOCATIONS



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES | GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 5.1-2. LIMITS OF UPPER CHINLE AQUIFER AND WELL LOCATIONS

c:\projects\2004-06\UP1600

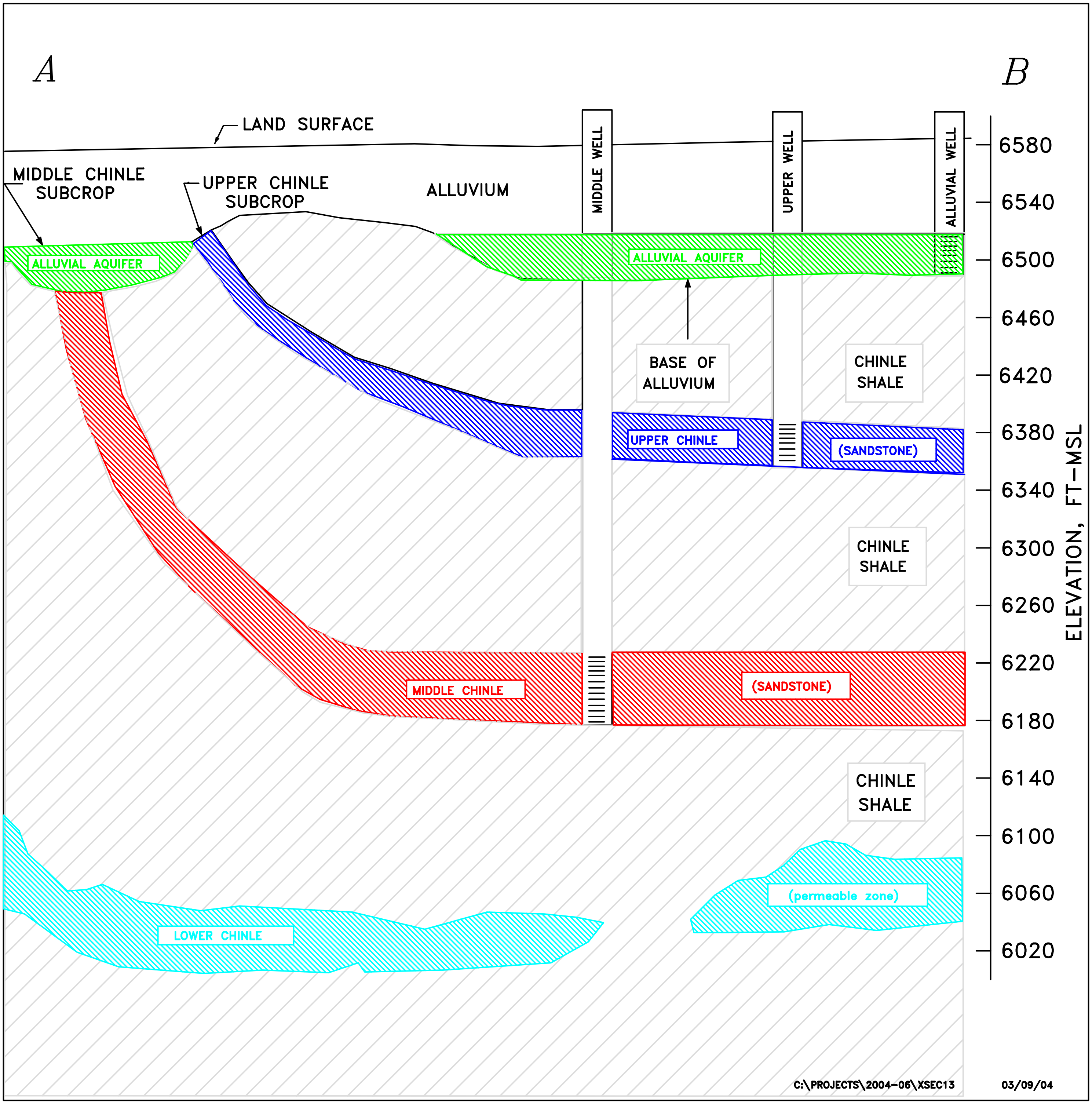


FIGURE 5.1-3. TYPICAL GEOLOGIC CROSS SECTION

TABLE 5.1-1. WELL DATA FOR THE CHINLE 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 AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)		CASING PERFOR-ATIONS (FT-LSD)	AQUIFER
0930	1542848	494997	410.0	6.0	12/14/2004	131.55	6466.99	0.0	6598.54	30	6569	A	-	---
										335	6264	M	330-400	Middle
0931	1542461	495207	366.7	6.0	12/14/2004	58.64	6551.92	0.9	6610.56	339	6271	U	-	Upper
0934	1540641	493941	293.0	6.0	11/29/2004	125.80	6459.79	2.0	6585.59	30	6554	A	-	---
										282	6302	U	330-400	Upper
CE1	1541923	489979	137.0	5.0	12/14/2004	49.63	6520.56	4.4	6570.19	75	6491	A	-	---
										106	6460	U	98-138	Upper
CE2	1542475	490434	119.7	5.0	11/29/2004	66.74	6509.61	1.8	6576.35	74	6501	U	78-118	Upper
										74	6501	A	-	---
CE5	1541453	490695	140.0	5.0	12/14/2004	40.30	6528.25	1.6	6568.55	63	6504	A	-	---
										103	6464	U	100-140	Upper
CW1	1545235	490295	325.0	5.0	11/29/2004	148.59	6436.63	0.7	6585.22	105	6480	A	-	---
										272	6313	M	212-323	Middle
CW2	1545212	491302	355.0	5.0	11/29/2004	148.27	6437.21	1.7	6585.48	85	6499	A	-	---
										136	6448	U	-	---
										305	6279	M	306-353	Middle
CW2-1	1545212	491302	168.0	5.0	12/14/2004	61.66	6523.82	1.7	6585.48	85	6499	A	-	---
										136	6448	U	243-253	Upper
CW3	1545200	493496	235.0	5.0	11/29/2004	148.81	6438.37	0.7	6587.18	70	6516	A	-	---
										209	6377	U	210-235	Upper
										348	6238	M	-	---
* CW4	1541682	490874	145.0	5.0	9/7/1994	39.06	6531.89	0.8	6570.95	70	6500	A	-	---
										112	6458	U	110-145	Upper
CW4R	1541416	490787	138.9	6.0	11/29/2004	2.00	6566.73	1.3	6568.73	61	6506	A	-	---
										104	6463	U	102-142	Upper
CW5	1538729	490221	170.0	5.0	11/29/2004	5.00	6564.34	1.6	6569.34	65	6503	A	-	---
										137	6431	U	135-170	Upper
CW6	1542588	488301	282.0	4.0	12/14/2004	117.42	6458.22	1.0	6575.64	236	6339	M	246-276	Middle
CW7	1545285	488773	---	---	10/17/1995	60.80	6522.79	0.0	6583.59	---	---	C	120-130	Chinle
CW8	1545009	491238	285.0	6.0	12/5/2000	38.90	6552.93	0.0	6591.83	---	---	C	276-286	Chinle
										85	6507	A	-	---
CW9	1542840	491015	180.0	5.0	12/14/2004	63.77	6528.06	0.0	6591.83	---	---	U	130-180	Upper
										80	6512	A	-	---
* CW10	1542823	491803	185.0	5.0	11/13/1995	50.03	6537.86	0.0	6587.89	75	6513	A	-	---
										167	6421	U	155-185	Upper
CW13	1538349	491827	267.7	6.0	11/29/2004	8.00	6568.70	2.7	6576.70	230	6344	U	225-265	Upper
										378	6196	M	-	---
CW14	1538786	488884	360.9	6.0	11/29/2004	12.00	6554.09	2.9	6566.09	56	6507	A	-	---
										66	6497	U	-	---
										310	6253	M	278-358	Middle

TABLE 5.1-1. WELL DATA FOR THE CHINLE 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 AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)		CASING PERFOR-ATIONS (FT-LSD)	AQUIFER
CW17	1545279	487771	108.0	5.0	12/14/2004	57.96	6531.36	3.1	6589.32	73	6513	A	-	---
										85	6501	M	83-103	Middle
CW24	1545773	487760	118.0	5.0	12/14/2004	56.79	6531.88	3.0	6588.67	61	6525	A	-	---
										65	6521	M	78-118	Middle
CW25	1540802	488866	102.0	5.0	11/29/2004	4.00	6563.20	3.0	6567.20	53	6511	A	-	---
										53	6511	U	62-102	Upper
CW32	1543413	483523	300.0	6.0	12/14/2004	129.13	6438.15	1.7	6567.28	70	6496	A	-	---
										157	6409	L	218-303	---
										157	6409	L	158-188	Lower
CW33	1543814	486347	347.0	6.0	12/14/2004	106.18	6468.71	1.8	6574.89	83	6490	A	-	---
										272	6301	L	267-287	Lower
										272	6301	L	307-347	---
CW34	1547827	487707	65.7	6.0	8/27/1996	65.65	6528.75	3.2	6594.40	20	6571	A	-	---
										40	6551	M	33-63	Middle
CW35	1547001	488794	120.0	5.0	12/14/2004	58.48	6532.69	1.9	6591.17	63	6526	A	-	---
										90	6499	M	93-118	Middle
CW50	1546687	491159	170.9	5.0	12/14/2004	63.74	6524.82	3.0	6588.56	128	6458	U	130-170	Upper
CW52	1548171	491887	180.0	5.0	12/14/2004	78.68	6513.72	2.0	6592.40	138	6452	U	140-180	Upper
WR25	1545267	487430	113.3	5.0	12/14/2004	55.30	6531.16	2.8	6586.46	50	6534	A	-	---
										71	6513	M	71-111	Middle

NOTE: A = Alluvial Aquifer, Base
C = Chinle Shale
U = Upper Chinle Aquifer,Top
M = Middle Chinle Aquifer,Top
L = Lower Chinle Aquifer,Top
* = Abandoned

TABLE 5.1-2. WELL DATA FOR THE CHINLE 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 AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)		CASING PERFOR-ATIONS (FT-LSD)	AQUIFER
						Broadview								
0430	1538469	490300	145.0	---	---	---	---	0.0	6568.00	72	6496	A	-	Alluvium
										135	6433	U	-	Upper
0431	1538045	490090	130.0	6.0	---	---	---	0.0	6568.00	60	6508	A	125-130	Alluvium
										118	6450	U	125-130	Upper
0434	1538370	489420	280.0	6.0	5/4/2004	36.10	6527.58	0.0	6563.68	75	6489	A	-	---
										265	6299	M	-	Middle
0436	1538430	488850	295.0	5.0	10/29/1996	71.82	6490.91	0.0	6562.73	90	6473	A	-	---
										280	6283	M	280-295	Middle
0437	1537940	491100	340.0	5.0	10/29/1996	63.23	6508.77	1.8	6572.00	90	6480	A	-	---
										180	6390	U	-	---
										280	6290	M	240-300	Middle
0446	1537720	488850	110.0	6.0	---	---	---	0.0	6560.00	60	6500	A	60-95	Alluvium
										60	6500	U	60-95	Upper
0447	1537490	490480	142.0	6.0	---	---	---	0.0	6568.00	80	6488	A	120-142	Alluvium
										138	6430	U	120-142	Upper
0449	1537440	488830	267.0	6.0	---	---	---	0.0	6560.00	---	---	M	-	Middle
						Felice Acres								
0481	1538350	490180	320.0	4.0	---	---	---	0.0	6568.00	110	6458	A	270-310	Alluvium
										270	6298	M	270-310	Middle
0482	1536985	489604	260.0	5.0	12/12/2003	40.00	6522.66	0.0	6562.66	80	6483	A	220-260	Alluvium
										210	6353	M	220-260	Middle
0483	1536586	489753	280.0	5.0	7/24/1996	36.93	6525.73	0.0	6562.66	40	6523	A	-	Alluvium
										65	6498	U	-	---
										236	6327	M	270-300	Middle
0484	1536448	490356	320.0	5.0	12/26/1996	39.43	6524.55	0.0	6563.98	38	6526	A	-	---
										129	6435	U	-	---
										280	6284	M	220-300	Middle
0485	1535800	489630	260.0	6.0	7/18/1996	70.90	6494.10	0.0	6565.00	35	6530	A	-	---
										70	6495	U	-	---
										223	6342	M	220-260	Middle
0486	1535800	489024	179.2	4.0	8/4/2004	90.40	6468.00	0.0	6558.40	---	---	M	200-260	Middle
										21	6537	U	-	---
										21	6537	A	-	---
0487	1536175	488950	260.0	---	7/24/1996	49.20	6511.80	0.0	6561.00	---	---	M	-	Middle
0488	1536500	488950	---	---	8/19/2003	113.80	6448.20	0.0	6562.00	---	---	M	-	Middle
0489	1536850	488950	---	---	---	---	---	0.0	6562.00	---	---	M	-	Middle
0493	1536524	489586	---	5.0	12/14/2004	104.27	6456.01	0.9	6560.28	40	6519	A	-	---
										65	6494	U	-	---

TABLE 5.1-2. WELL DATA FOR THE CHINLE 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 AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)		CASING PERFOR-ATIONS (FT-LSD)	AQUIFER
0493	1536524	489586	---	5.0	12/14/2004	104.27	6456.01	0.9	6560.28	236	6323	M	270-300	Middle
0494	1536510	489590	---	5.0	12/14/2004	34.28	6525.86	0.6	6560.14	40	6520	A	-	---
										65	6495	U	65-85	Upper
0498	1534661	488953	150.0	6.0	12/10/2004	58.28	6502.31	2.0	6560.59	80	6479	M	130-150	Middle
										80	6479	A	70-110	Alluvium
CW44	1535048	488891	208.0	6.0	12/14/2004	60.20	6500.54	2.5	6560.74	94	6464	A	-	Alluvium
										130	6428	M	69-208	Middle
CW45	1535036	489494	193.0	5.0	12/14/2004	58.60	6502.71	0.6	6561.31	90	6471	A	-	---
										166	6395	M	163-193	Middle
CW46	1534642	489595	187.3	5.0	12/20/2004	17.70	6544.56	1.5	6562.26	88	6473	A	-	---
										112	6449	M	125-185	Middle
CW53	1536668	490262	159.8	5.0	12/20/2004	3.40	6561.54	3.0	6564.94	110	6452	U	117-157	Upper

NOTE: A = Alluvial Aquifer, Base
C = Chinle Shale
U = Upper Chinle Aquifer,Top
M = Middle Chinle Aquifer,Top
L = Lower Chinle Aquifer,Top
* = Abandoned

TABLE 5.1-3. WELL DATA FOR THE CHINLE MURRAY ACRES AND PLEASANT VALLEY WELLS.

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL			MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)		CASING PERFOR-ATIONS (FT-LSD)	AQUIFER
					DATE	DEPTH (FT-MP)	ELEV. (FT-MSL)							
						Murray								
0803	1540800	487430	---	6.0	9/19/1983	84.86	6476.14	0.0	6561.00	---	---	C	85-180	Chinle
										85	6476	A	85-180	Alluvium
0807	1540100	488605	287.0	6.0	---	---	---	0.0	6565.00	63	6502	A	-	---
										275	6290	M	275-285	Middle
0808	1540080	487490	290.0	5.0	---	---	---	1.6	6561.00	85	6474	A	-	---
										255	6304	M	260-290	Middle
0812	1539910	488505	300.0	6.0	---	---	---	0.6	6566.00	68	6497	A	-	---
										268	6297	M	264-284	Middle
0813	1539300	488620	280.0	6.0	---	---	---	0.0	6565.00	63	6502	A	-	---
										230	6335	M	235-255	Middle
0814	1539030	488590	---	---	---	---	---	0.0	6565.00	---	---	M	-	Middle
0816	1539110	487705	255.0	6.0	---	---	---	0.0	6557.00	35	6522	A	-	---
										240	6317	M	240-250	Middle
0817	1539190	487590	---	---	7/22/1995	70.34	6486.66	0.0	6557.00	---	---	M	-	Middle
0818	1539090	487510	243.0	4.0	---	---	---	0.0	6557.00	62	6495	A	-	---
										230	6327	M	223-243	Middle
0819	1539000	487000	222.0	6.0	---	---	---	0.0	6557.00	62	6495	A	-	---
										210	6347	M	210-220	Middle
0820	1538890	486660	230.0	---	5/9/2002	99.20	6458.80	0.0	6558.00	---	---	M	125-230	Middle
0821	1538810	487320	260.0	7.0	11/1/1994	35.88	6524.12	0.0	6560.00	---	---	M	-	Middle
0823	1540150	487720	265.0	6.0	---	---	---	0.0	6561.00	---	---	M	257-267	Middle
										40	6521	A	-	---
ACW	1540235	488070	325.0	6.0	6/29/2004	119.50	6444.30	1.2	6563.80	40	6523	A	-	---
										57	6506	U	-	---
										264	6299	M	265-325	Middle
AW	1540235	488015	156.0	6.0	6/29/2004	36.50	6526.93	0.1	6563.43	63	6500	A	-	Alluvium
										100	6463	U	66-155	Upper
HCW	1541060	487785	295.0	6.0	7/20/2000	75.61	6486.39	1.0	6562.00	82	6479	A	-	---
										264	6297	M	264-295	Middle
WCW	1541045	488520	307.0	6.0	12/14/2004	117.96	6449.41	0.8	6567.37	83	6484	A	-	---
										254	6313	M	257-307	Middle
						Pleasant Valley								
0530	1540229	484358	490.0	5.0	10/30/1998	95.78	6463.41	1.5	6559.19	265	6293	L	-	Lower
0832	1539320	485670	280.0	4.0	---	---	---	0.0	6557.00	85	6472	A	-	---
										240	6317	L	238-278	Lower
0837	1540995	485950	200.0	5.0	9/7/1983	59.87	6507.13	0.0	6567.00	80	6487	A	-	---
										160	6407	L	160-200	Lower
* 0842	1541650	483980	250.0	---	---	---	---	0.0	6558.00	---	---	L	-	Lower

TABLE 5.1-3. WELL DATA FOR THE CHINLE MURRAY ACRES AND PLEASANT VALLEY WELLS. (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	WATER LEVEL			MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	AQUIFER
					DATE	DEPTH (FT-MP)	ELEV. (FT-MSL)						
0900	1540800	483700	172.1	---	7/24/1995	91.41	6468.59	1.5	6560.00	---	---	L -	Lower

NOTE: A = Alluvial Aquifer, Base

C = Chinle Shale

U = Upper Chinle Aquifer,Top

M = Middle Chinle Aquifer,Top

L = Lower Chinle Aquifer,Top

* = Abandoned

TABLE 5.1-4. WELL DATA FOR THE CHINLE 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 AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)		AQUIFER
0536	1539560	479701	160.0	5.0	9/12/2000	144.70	---	-2.0	---	---	---	L	-	Lower
0536R	1539560	479721	264.0	4.0	6/1/2001	75.00	6480.00	2.0	6555.00	62	6491	A	-	---
										160	6393	L	-	Lower
0538	1533486	486899	170.0	6.0	12/10/2004	81.98	6466.96	2.2	6548.94	95	6452	A	50-90	Alluvium
										133	6414	L	130-170	Lower
0539	1534014	487596	210.0	6.0	12/10/2004	75.60	6479.72	2.0	6555.32	100	6453	A	80-100	---
										100	6453	A	50-70	Alluvium
										175	6378	L	170-210	Lower
0544	1535350	487580	0.0	---	---	---	---	---	---	40	---	A	-	---
										60	---	M	60-80	Middle
0653	1533283	486570	206.0	6.0	12/10/2004	79.76	6465.21	1.3	6544.97	97	6447	A	69-206	Alluvium
										135	6409	L	-	Lower
0850	1534652	486044	54.0	5.0	12/14/2004	56.73	6492.42	3.2	6549.15	37	6509	A	-	---
										37	6509	M	29-54	Middle
0853	1532124	484824	95.0	5.0	12/14/2004	82.08	6459.30	1.7	6541.38	60	6480	L	55-95	Lower
										60	6480	A	-	---
0859	1534549	487426	83.0	5.0	12/14/2004	74.84	6477.92	2.7	6552.76	52	6498	M	50-83	Middle
0901	1531900	492900	270.0	5.0	11/4/1981	46.88	6552.12	0.0	6599.00	40	6559	A	-	---
										190	6409	L	240-260	Lower
0902	1533700	488800	150.0	6.0	1/28/1995	52.10	6507.90	0.0	6560.00	72	6488	M	78-102	Middle
										72	6488	A	-	---
0903	1530250	486900	281.0	5.0	---	---	---	0.0	6559.00	220	6339	L	120-260	Lower
0904	1531100	487150	200.0	4.0	---	---	---	0.0	6560.00	---	---	L	170-200	Lower
0908	1534430	483325	282.8	5.0	11/3/1998	81.16	6463.21	1.5	6544.37	107	6436	A	-	---
										232	6311	L	-	Lower
0909	1531900	483400	140.0	4.0	11/19/1982	77.45	6461.45	0.0	6538.90	112	6427	L	80-135	Lower
										112	6427	A	80-135	Alluvium
0927	1548300	491700	---	---	12/17/2001	147.94	6447.06	1.0	6595.00	---	---	M	-	Middle
0929	1544684	495585	320.0	5.0	12/14/2004	39.42	6553.15	2.0	6592.57	---	---	U	290-320	Upper
0932	1540434	495401	501.0	6.0	4/19/2001	86.73	6515.38	0.0	6602.11	354	6248	U	-	---
										492	6110	M	450-490	Middle
0933	1540050	499730	---	5.0	12/17/1997	52.78	6547.73	0.5	6600.51	---	---	U	-	Upper
0937	1542200	481250	182.0	5.0	---	---	---	0.0	6578.00	70	6508	A	-	---
										160	6418	L	95-182	Lower
0944	1539280	493091	300.0	5.0	11/29/2004	2.00	6586.61	1.6	6588.61	64	6523	A	-	---
										252	6335	U	220-280	Upper
0945	1537986	493900	300.0	---	3/21/1985	92.41	6498.08	0.0	6590.49	---	---	U	-	Upper
0946	1537804	491754	260.0	5.0	10/17/1996	37.45	6541.59	0.0	6579.04	220	6359	U	230-260	Upper
0948	1535190	490400	255.0	5.0	---	---	---	0.0	6568.10	200	6368	M	200-255	Middle

TABLE 5.1-4. WELL DATA FOR THE CHINLE 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 AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)	AQUIFER
0949	1540350	483600	551.0	---	---	---	---	0.0	6562.30	112	6450	A -	---
										155	6407	L 260-290	Lower
										460	6102	S 400-493	San Andres
										460	6102	S 505-551	San Andres
0954	1534390	484260	307.0	5.0	12/27/1994	77.22	6467.78	0.0	6545.00	225	6320	L 285-307	Lower
0960	1534730	490110	305.0	6.0	4/5/1995	67.46	6497.54	0.0	6565.00	280	6285	M 285-305	Middle
0961	1534190	489720	240.0	5.0	4/5/1995	67.40	6497.60	6.9	6565.00	200	6358	M 200-240	Middle
0962	1533880	489530	238.0	6.0	---	---	---	0.0	6560.00	225	6335	M 220-238	Middle
0963	1532700	488900	---	4.0	---	---	---	0.0	6557.00	---	---	L -	Lower
0964	1531500	488000	200.0	6.0	---	---	---	0.0	6560.00	170	6390	L 170-200	Lower
0965	1531550	489100	200.0	4.0	8/21/2003	3.00	6572.00	0.0	6575.00	---	---	L 130-200	Lower
0966	1531300	489000	---	---	---	---	---	0.0	6575.00	---	---	L -	Lower
0967	1530500	487600	---	---	---	---	---	0.0	6570.00	---	---	L -	Lower
0968	1529700	488400	---	---	---	---	---	0.0	6630.00	---	---	L -	Lower
0969	1529400	488450	---	---	---	---	---	0.0	6640.00	---	---	L -	Lower
0970	1529100	488500	---	5.0	---	---	---	0.0	6660.00	---	---	L -	Lower
0988	1538140	482200	155.0	5.0	7/18/1996	59.86	6589.14	1.3	6649.00	18	6630	A -	---
										152	6496	L 152-155	Lower
0990	1537600	482750	---	---	---	---	---	0.5	6550.00	---	---	L -	Lower
0994	1539700	476240	144.0	6.0	10/20/2004	92.27	6462.73	0.0	6555.00	---	---	A 95-110	Alluvium
										---	---	L 95-110	Lower
CW15	1536259	485961	134.6	5.0	12/14/2004	90.06	6461.26	2.6	6551.32	50	6499	A -	---
										91	6458	M 73-133	Middle
										311	6238	L -	---
CW16	1534747	488507	---	5.0	12/26/1996	68.02	6490.52	0.0	6558.54	82	6477	A -	---
										82	6477	M 112-152	Middle
CW18	1535924	491378	230.7	5.0	12/14/2004	7.25	6565.40	1.5	6572.65	90	6481	A -	---
										190	6381	U 177-232	Upper
										340	6231	M -	---
CW26	1534116	489593	300.0	5.0	12/14/2004	102.94	6458.49	0.5	6561.43	50	6511	M -	---
										50	6511	A -	---
										231	6330	L 245-285	Lower
CW27	1534109	489600	110.0	5.0	12/14/2004	65.93	6496.95	1.9	6562.88	50	6511	A -	---
										50	6511	M 80-110	Middle
CW28	1535112	491008	370.0	5.0	11/29/2004	118.83	6452.85	1.9	6571.68	90	6480	A -	---
										110	6460	U -	---
										294	6276	M 280-360	Middle
CW29	1534551	487435	290.0	5.0	12/14/2004	93.08	6459.14	1.7	6552.22	52	6499	M -	---
										52	6499	A -	---

TABLE 5.1-4. WELL DATA FOR THE CHINLE REGIONAL WELLS. (cont'd.)

WELL NAME	NORTH. COORD.	EAST. COORD.	WELL DEPTH (FT-MP)	CASING DIAM (IN)	DATE	WATER LEVEL DEPTH (FT-MP)	WATER LEVEL ELEV. (FT-MSL)	MP ABOVE LSD (FT)	MP ELEV. (FT-MSL)	DEPTH TO AQUIFER (FT-LSD)	ELEV. OF AQUIFER (FT-MSL)		CASING PERFOR-ATIONS (FT-LSD)	AQUIFER
CW29	1534551	487435	290.0	5.0	12/14/2004	93.08	6459.14	1.7	6552.22	228	6323	L	230-270	Lower
CW30	1536642	488704	251.5	5.0	12/14/2004	8.00	6550.31	2.0	6558.31	35	6521	A	-	---
										220	6336	M	219-249	Middle
CW31	1540689	482738	311.0	6.0	12/14/2004	85.23	6475.03	2.0	6560.26	111	6447	A	-	---
										254	6304	L	136-156	Lower
										254	6304	L	231-271	---
										254	6304	L	291-311	---
CW36	1540053	481329	180.0	5.0	12/14/2004	76.51	6474.58	2.8	6551.09	96	6452	A	-	---
										152	6396	L	155-177	Lower
CW37	1537240	484853	150.1	5.0	12/14/2004	63.04	6488.13	1.3	6551.17	55	6495	A	-	---
										100	6450	L	100-150	Lower
CW38	1540103	483429	174.8	5.0	11/14/1997	55.18	6500.42	2.1	6555.60	108	6446	A	-	---
										130	6424	L	133-173	Lower
CW39	1537260	483754	126.3	5.0	12/14/2004	65.90	6484.81	3.4	6550.71	40	6507	A	-	---
										87	6460	L	90-123	Lower
CW40	1537624	491819	264.0	5.0	12/14/2004	12.32	6566.62	2.6	6578.94	75	6501	A	-	---
										220	6356	U	224-264	Upper
CW41	1533174	488584	206.0	6.0	12/14/2004	96.96	6458.45	1.5	6555.41	59	6495	A	-	---
										138	6416	L	146-206	Lower
CW42	1533169	487177	205.0	6.0	12/14/2004	85.45	6463.33	0.0	6548.78	98	6451	A	-	---
										124	6425	L	125-205	Lower
CW43	1537587	482493	104.1	5.0	12/14/2004	69.30	6479.49	2.0	6548.79	57	6490	L	81-101	Lower
										57	6490	A	-	---
CW54	1536645	488675	103.1	5.0	12/14/2004	51.40	6507.15	2.2	6558.55	70	6486	U	60-100	Upper

NOTE: A = Alluvial Aquifer, Base
U = Upper Chinle Aquifer,Top
M = Middle Chinle Aquifer,Top
L = Lower Chinle Aquifer,Top
* = Abandoned

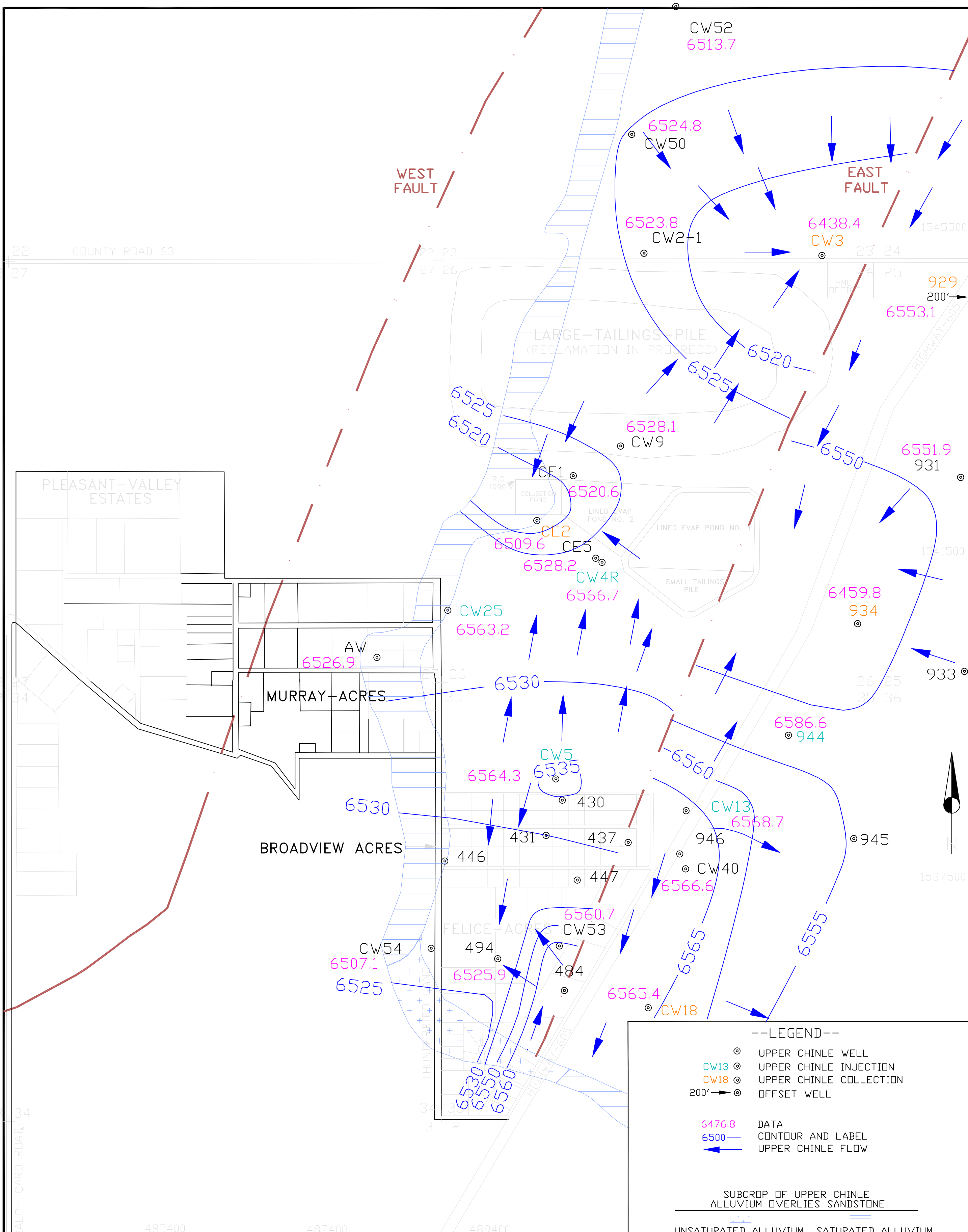
5.2 UPPER CHINLE WATER LEVELS

Measured water levels in Homestake's Upper, Middle and Lower Chinle aquifer wells are presented in Appendix A. Table A.2-1 of Appendix A includes water levels for Homestake, subdivision, and regional Chinle wells. Figure 5.2-1 presents water-level elevation contours of the Upper Chinle aquifer during the Fall of 2004. The blue arrows on Figure 5.2-1 show the direction of ground-water flow, which is greatly influenced by the fresh-water injection into the Upper Chinle at wells CW4R, CW5, CW13, CW25 and 944 and collection from wells CE2, CW3, CW18, 929 and 934. Well CW13, an injection well on the east side of the East Fault, is in the high permeability zone of the Upper Chinle aquifer that parallels the East Fault. This high permeability zone extends to a distance of at least 1000 feet perpendicular to the East Fault near well CW18. Injection of fresh water has created piezometric-surface mounds along the east side of the East Fault and a depression in the piezometric surface near collection well 934. Wells 929 and CW18 were not being pumped when these water levels were collected. The permeability is much smaller at greater distances to the east of the East Fault and, therefore, an easterly gradient occurs in the Upper Chinle away from the East Fault near injection well CW13. Upper Chinle ground water flow is presently inward toward the depression near well 934, and this phenomenon is caused by the pumping of this well adjacent to the East Fault. The blue arrows on Figure 5.2-1 show the direction of ground-water flow in this area. The CW13 injection has created a mound on the west side of the East Fault in the area of new Upper Chinle well CW53. Water level changes in well CW53 respond quickly to change in levels in well CW13 showing that a good connection exists in the Upper Chinle where the East Fault pinches out south of well CW53.

Injection of fresh water into Upper Chinle well CW5 is causing ground water flow to the north and south of this area. The flow that moves to the south discharges to the alluvial aquifer in the subcrop area of the Upper Chinle, and the flow that moves to the north converges toward collection wells CE2 or CW3. Injection into Upper Chinle well CW25 was started in 2000, and this injection is causing ground water to flow from this well back toward collection well CE2. The naturally occurring flow direction in the Upper Chinle aquifer west of the East Fault is from the north. The collection of water from well CW3 intercepts this flow and also pulls some Upper Chinle water from the south.

Figure 5.2-2 shows the location of the Upper Chinle wells that are used to monitor water-level changes with time. Figure 5.2-3 presents water-level elevations for Upper Chinle wells 494, CE2, CW3, CW4R, CW5, CW25 and CW50. Water levels in the Upper Chinle injection wells CW4R, CW5 and CW25 remained high during 2004. The changes in water levels from collection well CE2 are due to variations in pumping rates in this well. Water levels in well 494 and well CW50 were fairly steady in 2004.

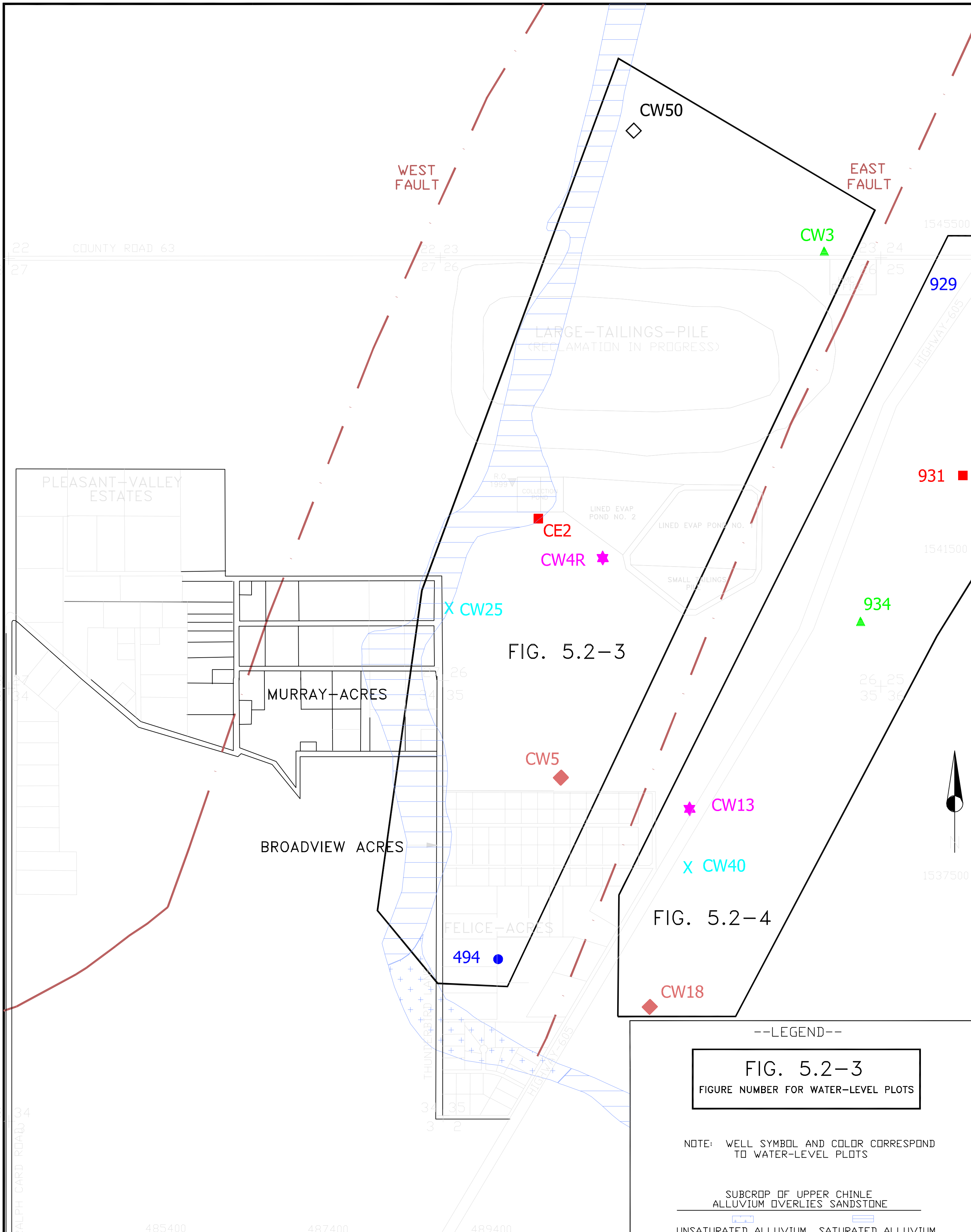
Figure 5.2-4 presents the water-level elevation changes for the Upper Chinle wells east of the East Fault. The large water-level variations in wells 929 and CW18 were due to less pumping from these wells in 2004. The water-level elevation in well CW40 in the Upper Chinle increased in 2004 due to less pumping from the Upper Chinle east of the East Fault.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 5.2-1. WATER-LEVEL ELEVATIONS OF THE UPPER CHINLE AQUIFER, FALL 2004, FT-MSL

c:\projects\2004-06\UP1600



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 5.2-2. LOCATION OF UPPER CHINLE WELLS WITH WATER-LEVEL PLOTS

c:\projects\2004-06\UP1600

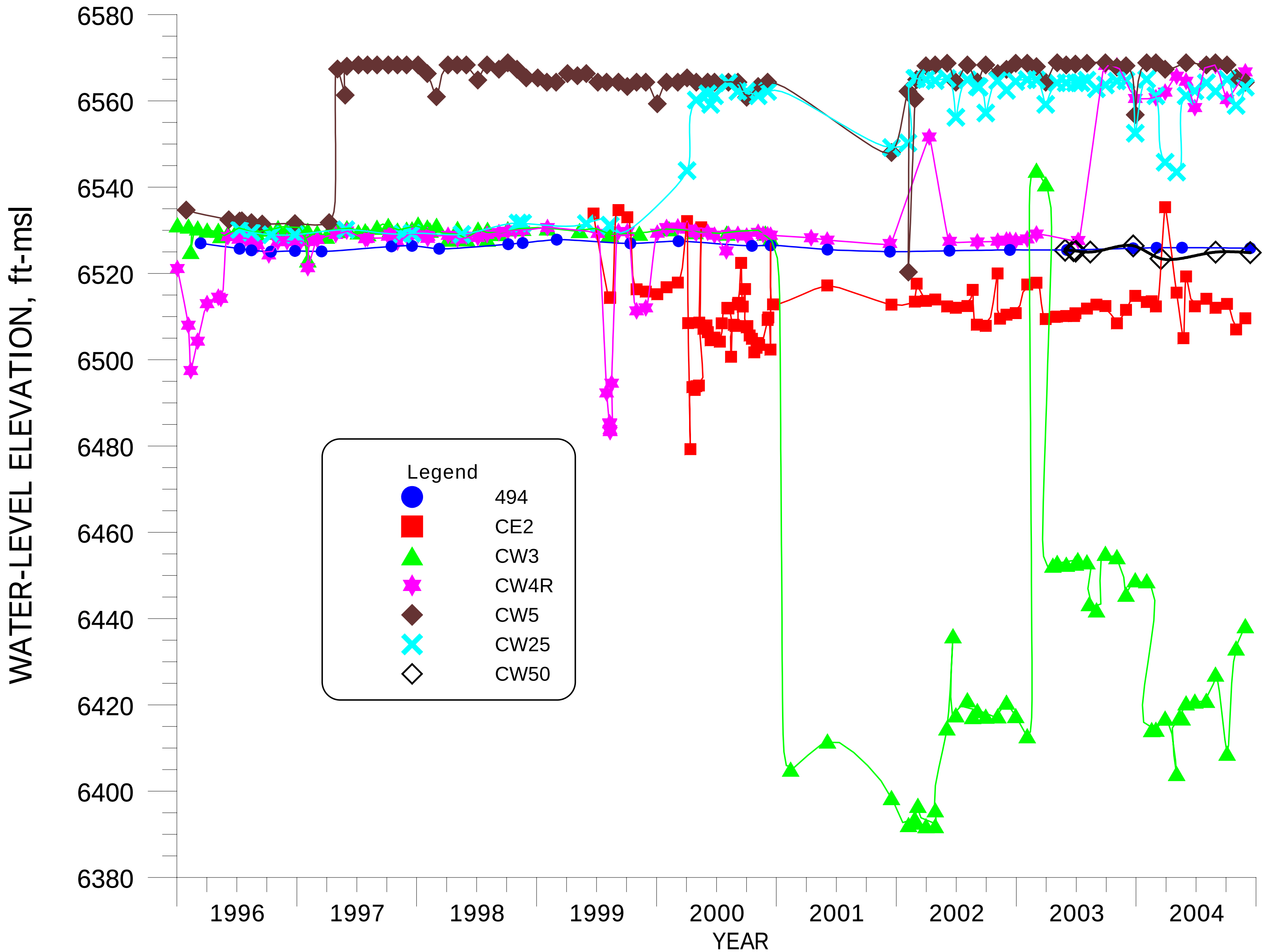


FIGURE 5.2-3. WATER-LEVEL ELEVATION FOR WELLS 494, CE2, CW3, CW4R, CW5, CW25 AND CW50.

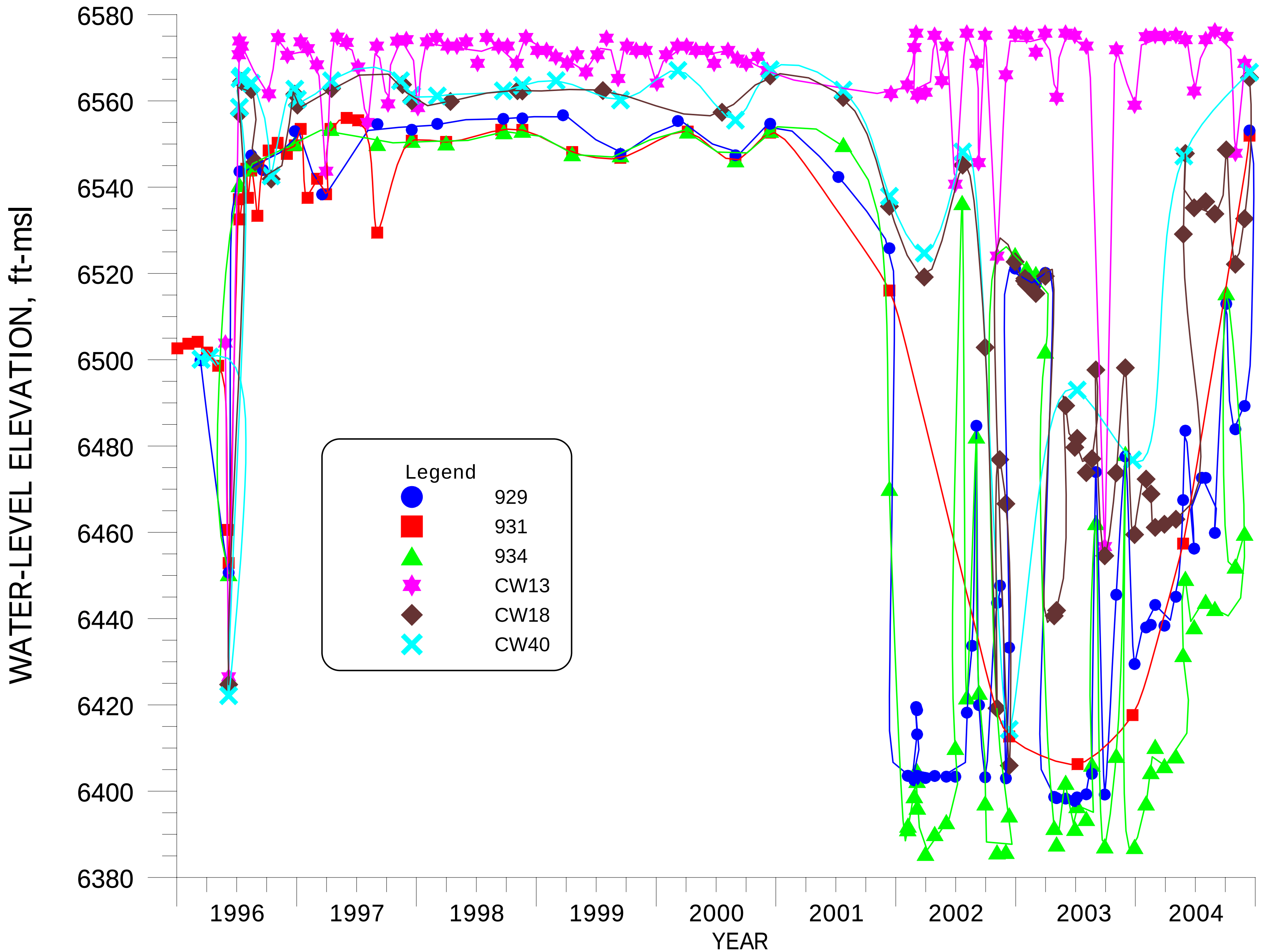


FIGURE 5.2-4. WATER-LEVEL ELEVATION FOR WELLS 929, 931, 934, CW13, CW18 AND CW40.

5.3 UPPER CHINLE WATER QUALITY

Water-quality data for 2004 for the Chinle aquifers is presented in Tables B.5-1 and B.5-2 of Appendix B. The basic well data is presented in Tables 5.1-1 through 5.1-4 and Figure 5.1-2 shows locations of the Upper Chinle wells.

Concentrations of key constituents exceed background conditions for the Upper Chinle aquifer in only a few locations. Sulfate concentrations have been adequately restored in the Upper Chinle aquifer except for an area near the northeast corner of the Large Tailings Pile. Selenium concentrations during 2004 are less than the proposed NRC site standard in all Upper Chinle wells except well CW3 where the measured concentration slightly exceeds the proposed standard. Uranium concentrations exceed the full range of proposed background water quality in six wells. The slower pace of restoration is attributed to leaching of this constituent from the formation. Molybdenum concentrations in the Upper Chinle aquifer exceed the proposed background level in five wells.

5.3.1 SULFATE - UPPER CHINLE

Figure 5.3-1 presents sulfate concentrations in the Upper Chinle aquifer during 2004. Upper Chinle sulfate concentrations varied from 270 to 1100 mg/l. Only the value from well CW3 exceeded the full range of the non-mixing zone background concentration of 914 mg/l in the Upper Chinle in 2004. None of the Upper Chinle concentrations in the mixing zone (see Section 3 or the well grouping on Figure 5.3-2 for zone areas) exceeded the mixing-zone sulfate background value of 1750 mg/l. Proposed NRC Upper Chinle standards based on background data are presented for sulfate in the legend of Figure 5.3-1. These proposed site standards have a greater than sign in front of the numeric value which is associated with the pattern for the particular zone. Therefore, only a small area near well CW3 requires restoration with respect to sulfate. The information regarding the analysis of background results that were used to develop the proposed background and NRC standards is presented in Section 3 of this report.

The locations of wells used in the time plots of water quality are presented on Figure 5.3-2. The color and symbol of the individual wells correspond with those used on the various water-quality time plots. Sulfate time-plot figure numbers are also shown on Figure 5.3-2 for each group. The same color and symbol scheme is also used for other constituents in the Upper

Chinle. Notations on Figure 5.3-2 indicate that mixing zone Upper Chinle wells 446, 494, CE2, CE5 and CW50 are grouped together on the water-quality time plots, and non-mixing zone wells 929, 934, CW3, CW18 and CW40 are grouped together on a second plot.

Figure 5.3-3 presents sulfate concentrations versus time for the mixing zone group of wells listed above. The sulfate concentrations in water sampled from each of these wells are less than the mixing-zone background value, indicating that restoration of the Upper Chinle is not needed west of the East Fault in the mixing zone (see Figure 5.3-3). Sulfate concentrations in well CE2, near the subcrop area south of the Large Tailings Pile, have declined to a level below those in the remainder of the Upper Chinle wells. A small decrease in sulfate concentration in well CE5 was likely due to the fresh-water injection into CW4R which was restarted in August of 2003.

A plot of sulfate concentrations versus time for non-mixing zone Upper Chinle wells 929, 934, CW3, CW18 and CW40 is presented on Figure 5.3-4 (see Figure 5.3-2 for location of these wells). This plot shows some minor variability, but overall steady sulfate concentrations in these Upper Chinle wells in 2004. A steady sulfate concentration in 2004 was observed in well CW3 after an increase due to the continued pumping of this well that is pulling sulfate concentrations from the Upper Chinle aquifer in the western portion of the Large Tailings Pile.

5.3.2 TOTAL DISSOLVED SOLIDS - UPPER CHINLE

Figure 5.3-5 presents contours of total dissolved solids (TDS) concentrations for the Upper Chinle aquifer during 2004. All concentrations are less than 2000 mg/l, with the exception of areas of the Upper Chinle near the Large Tailings Pile, near well CW54 west of Felice Acres and east of State Highway 605 in Sections 35 and 36. The TDS concentration naturally increases with increasing distance east of the East Fault due to the slower movement of ground water in this less transmissive portion of the aquifer. The blue pattern on Figure 5.3-5 shows where the Upper Chinle TDS concentrations are greater than 2010 mg/l, which is the non-mixing zone proposed site standard. None of the sulfate concentrations exceeded the proposed mixing zone background of 3140 mg/l. The Upper Chinle aquifer near the northeast corner of the Large Tailings Pile still requires a small amount of restoration with respect to TDS concentration.

Figure 5.3-6 presents TDS concentrations for mixing zone Upper Chinle wells 446, 494, CE2, CE5 and CW50. The TDS concentrations in well CE2 have continued to decline in 2004. All of these wells contain water with TDS concentrations less than the mixing zone background level of 3140 mg/l.

Time plots of TDS concentrations for wells 929, 934, CW3, CW18 and CW40 are presented in Figure 5.3-7. This figure shows overall steady TDS concentrations in wells 929, 934, CW18 and CW40 for 2004. A small additional increase in the TDS concentration in well CW3 occurred in 2004 and is attributable to the continuous pumping of this well.

5.3.3 CHLORIDE – UPPER CHINLE

Chloride concentrations in the Upper Chinle aquifer during 2004 are presented on Figure 5.3-8. In the two up-gradient Upper Chinle wells CW50 and CW52, chloride concentrations are less than 100 mg/l. Typical measured chloride concentrations are between 100 and 220 mg/l in the Upper Chinle aquifer, because this range encompasses natural variations and the range of chloride concentrations in the injection water. Chloride concentrations east of the East Fault naturally increase due to the slower movement of ground water with increasing distance east of the East Fault.

The chloride concentrations in water collected from mixing zone Upper Chinle wells 446, 494, CE2, CE5 and CW50 are presented on Figure 5.3-9. In Upper Chinle well CE2 chloride concentrations have been decreasing the last few years. Overall, the chloride concentrations in well 494 and CE5 have not changed significantly.

The chloride concentrations in the wells in the non-mixing zone are presented on Figure 5.3-10. This plot shows a significant increase in chloride concentrations in 2003 and 2004 in wells 929 and 934 due to the fresh-water injection into Upper Chinle well CW13. An increase in concentrations in well CW3 was observed in 2004 due to the continual pumping of this Upper Chinle well. The chloride concentrations in Upper Chinle well CW18 have decreased slightly but were similar to the fresh-water injection concentration prior to the injection into well CW13. Fresh water is injected into well CW13 to maintain water levels east of the East Fault in the Upper Chinle aquifer.

5.3.4 URANIUM - UPPER CHINLE

Uranium is an important parameter for identifying impacts to the Upper Chinle aquifer. Figure 5.3-11 presents contours of uranium concentrations in the Upper Chinle aquifer for 2004. Only six of the uranium concentrations measured in Upper Chinle water in 2004 exceeded the corresponding mixing or non-mixing zone background concentrations. The highest value measured east of the East Fault in 2004 was observed in well 934 with a value of 0.05 mg/l. This value is below the corresponding non-mixing zone value of 0.09 mg/l. Six values in 2004 exceeded the proposed NRC Upper Chinle mixing and non-mixing zone standards for uranium (see legend for mixing and non-mixing zone limits in Figure 5.3-11). These concentrations are expected to gradually decrease to below background concentrations with the ongoing ground water-quality restoration efforts in the Large Tailings Pile area and the planned Upper Chinle pumping in Felice Acres.

Plots of uranium concentrations versus time for Upper Chinle wells 446, 494, CE2, CE5 and CW50 are presented on Figure 5.3-12 (see Figure 5.3-2 for location of these wells). This plot demonstrates that the uranium concentrations in Upper Chinle well CE5 declined in 2004 as a result of the nearby fresh water injection into well CW4R. Uranium concentrations in well 494 were steady in 2004. The uranium concentrations in Upper Chinle collection well CE2 declined significantly in 2004 continuing an overall decline for the last few years. Uranium concentrations for background well CW50 (drilled in 2003) are low.

The uranium concentrations in all of the Upper Chinle wells in the non-mixing zone are very low except for a larger value measured in well CW3. The increase in uranium concentration at well CW3 is due to the pumping of this well to supply water for flushing the tailings. Figure 5.3-13 shows uranium concentration plotted versus time for Upper Chinle wells 929, 934, CW3, CW18 and CW40. The low uranium concentrations measured in well 934 during 2004 are within the natural background range. With the exception of well CW3, concentrations in these wells are less than the proposed NRC site standard.

5.3.5 SELENIUM - UPPER CHINLE

Contours of 2004 selenium concentrations in the Upper Chinle aquifer are presented on Figure 5.3-14. This figure shows that all of the selenium concentrations are less than the

mixing-zone site standard of 0.14 mg/l. The non-mixing zone NRC site standard of 0.06 mg/l is slightly exceeded at well CW3 and in the Upper Chinle aquifer in the area near the northeast corner of the Large Tailings Pile. The mixing and non-mixing zone proposed selenium standards for the Upper Chinle aquifer are equal to the upper background levels based on the 95th percentile statistical analysis.

Figure 5.3-15 presents selenium concentrations for wells 446, 494, CE2, CE5 and CW50. The selenium concentration in collection well CE2 stabilized at a low value in 2002 through 2004 following a prior steady decline, whereas in well CE5, selenium concentration decreased to a level slightly smaller than that observed in 2001. The selenium concentrations for all of the remaining wells on this plot are low.

Figure 5.3-16 presents the selenium concentrations for Upper Chinle wells 929, 934, CW3, CW18 and CW40. This plot shows that selenium concentrations for these wells have remained low during 2004. The selenium concentration in water collected from Upper Chinle well CW3 was slightly higher in 2004 and has remained reasonably steady since an increase was detected in 2001 and 2002. The previously observed decreases in selenium concentrations in wells CW40 and CW18 were due to the injection of fresh water in Upper Chinle well CW13 east of the East Fault; selenium concentrations remain low in these wells.

5.3.6 MOLYBDENUM - UPPER CHINLE

Figure 5.3-17 presents the molybdenum concentrations in the Upper Chinle aquifer during 2004. Molybdenum concentrations near the Large Tailings Pile exceeded both the mixing and non-mixing zone proposed NRC site standards. Concentrations are greater than 1.0 mg/l in a region extending from the Upper Chinle-alluvium subcrop area, below the Large Tailings Pile, and toward well CW3. Additional restoration is needed in this area, and should be easily accomplished after the alluvial aquifer is restored in the subcrop area. All molybdenum concentrations south of the Small Tailings Pile and east of the East Fault in the Upper Chinle aquifer are below the proposed site standards.

Figure 5.3-18 presents molybdenum concentrations for Upper Chinle wells from the mixing zone. In 2004, concentrations in wells 446, 494 and CW50 were fairly similar to those observed in previous years. Concentrations decreased slightly at wells CE2 and CE5 in 2004.

Figure 5.3-19 contains time plots of molybdenum concentrations for wells 929, 934, CW3, CW18 and CW40. Small concentrations of molybdenum are generally present in each of these wells except for the larger values observed in well CW3. The increases in the CW3 concentrations are due to the continuous pumping of this well.

5.3.7 NITRATE - UPPER CHINLE

Nitrate concentrations for the Upper Chinle aquifer were measured in 2004 to confirm that concentrations are significantly below the proposed background levels of 15 mg/l for the mixing zone and 4.9 mg/l for the non-mixing zone. Figure 5.3-20 presents nitrate concentrations in the Upper Chinle aquifer during 2004. The largest nitrate concentration observed in 2004 was 2.1 mg/l in wells CE5 and CW18. Therefore, all of the nitrate concentrations are significantly less than the two proposed background levels. Routine monitoring of nitrate concentrations in the Upper Chinle aquifer is not warranted because concentrations are well below levels of concern.

Plots of nitrate concentration versus time were not prepared, because historic values in Upper Chinle wells are similar to the low concentrations measured in 2004. In the future, nitrate concentrations in the Upper Chinle aquifer are not expected to be significant because of the very limited extent of elevated concentrations in the alluvial aquifer. Therefore, a site standard for nitrate for the Upper Chinle aquifer is not considered necessary.

5.3.8 RADIUM-226 AND RADIUM-228 - UPPER CHINLE

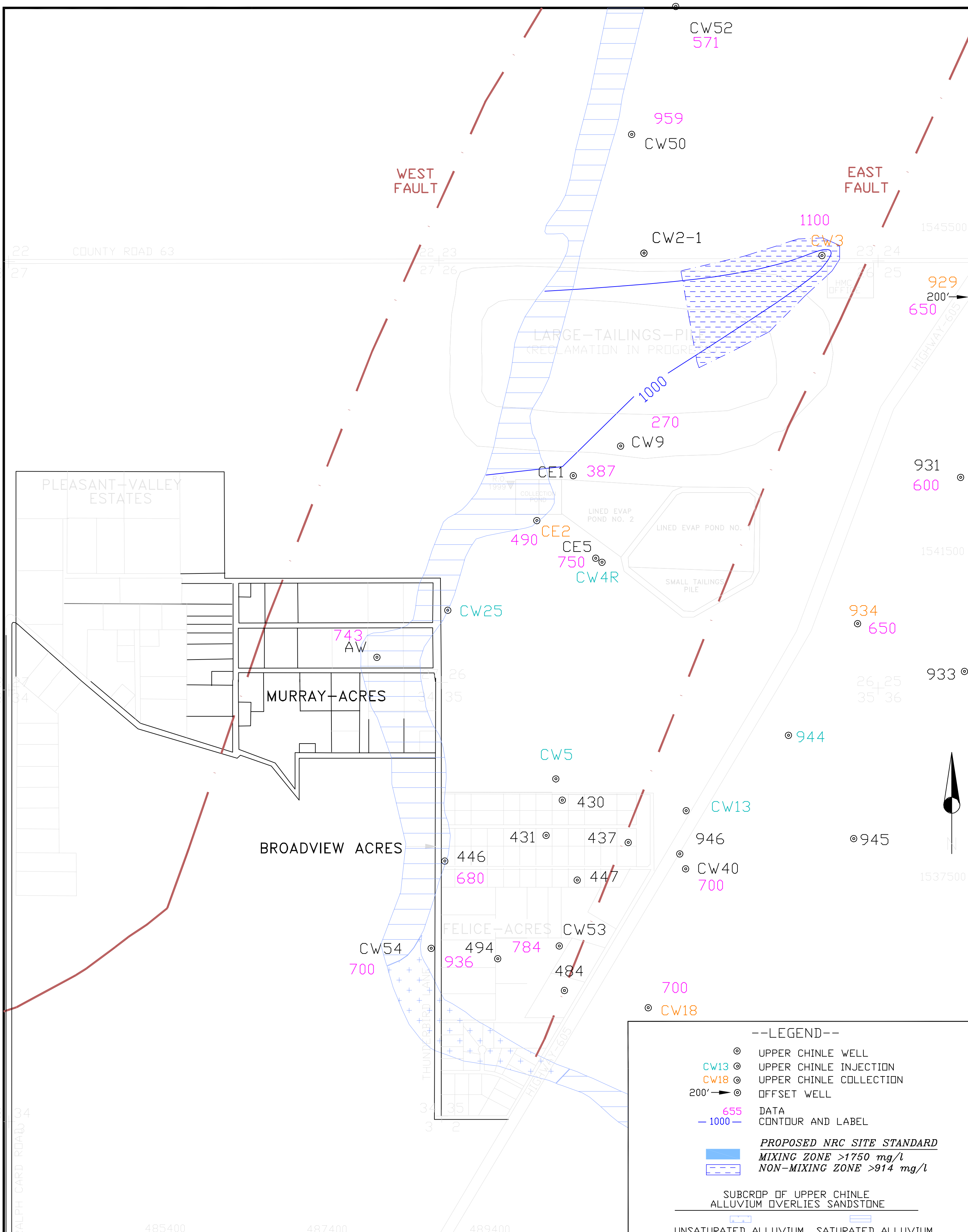
All radium concentrations in the Upper Chinle aquifer have been low in past years. Radium concentrations were analyzed for all Upper Chinle wells in 2003 to update the database. Figure 5.3-21 presents the radium-226 and the radium-228 concentrations measured in 2004. All of the radium-228 concentrations are less than 1 pCi/l. The largest radium-226 value was 1.3 pCi/l in well CW54. This data shows that radium-226 and radium-228 are not present at concentrations that are significant in the Upper Chinle aquifer at the Homestake site. No concentration plots were prepared for radium because observed concentrations have been low and remained so through 2004. A radium site standard is not considered to be necessary for the Upper Chinle aquifer.

5.3.9 VANADIUM - UPPER CHINLE

Vanadium concentrations have always been low in the Upper Chinle aquifer except the recent values in well CW3 that are only slightly elevated above detection limits. The occurrence of significant concentrations in the Upper Chinle aquifer is unlikely because this constituent is not present at elevated concentrations in the alluvial aquifer with the exception of the immediate tailings area. Vanadium concentrations in the Upper Chinle aquifer have been only slightly elevated in well CW3 due to the continuous pumping of this well. Figure 5.3-22 shows the 2004 vanadium concentrations are less than detection except for a value of 0.04 mg/l in well CW3. A small amount of restoration is needed in this area of the Upper Chinle aquifer based on the 2004 vanadium concentration. A site standard is proposed for the Upper Chinle aquifer for vanadium because a small amount of restoration is needed close to the Large Tailings Pile.

5.3.10 THORIUM-230 - UPPER CHINLE

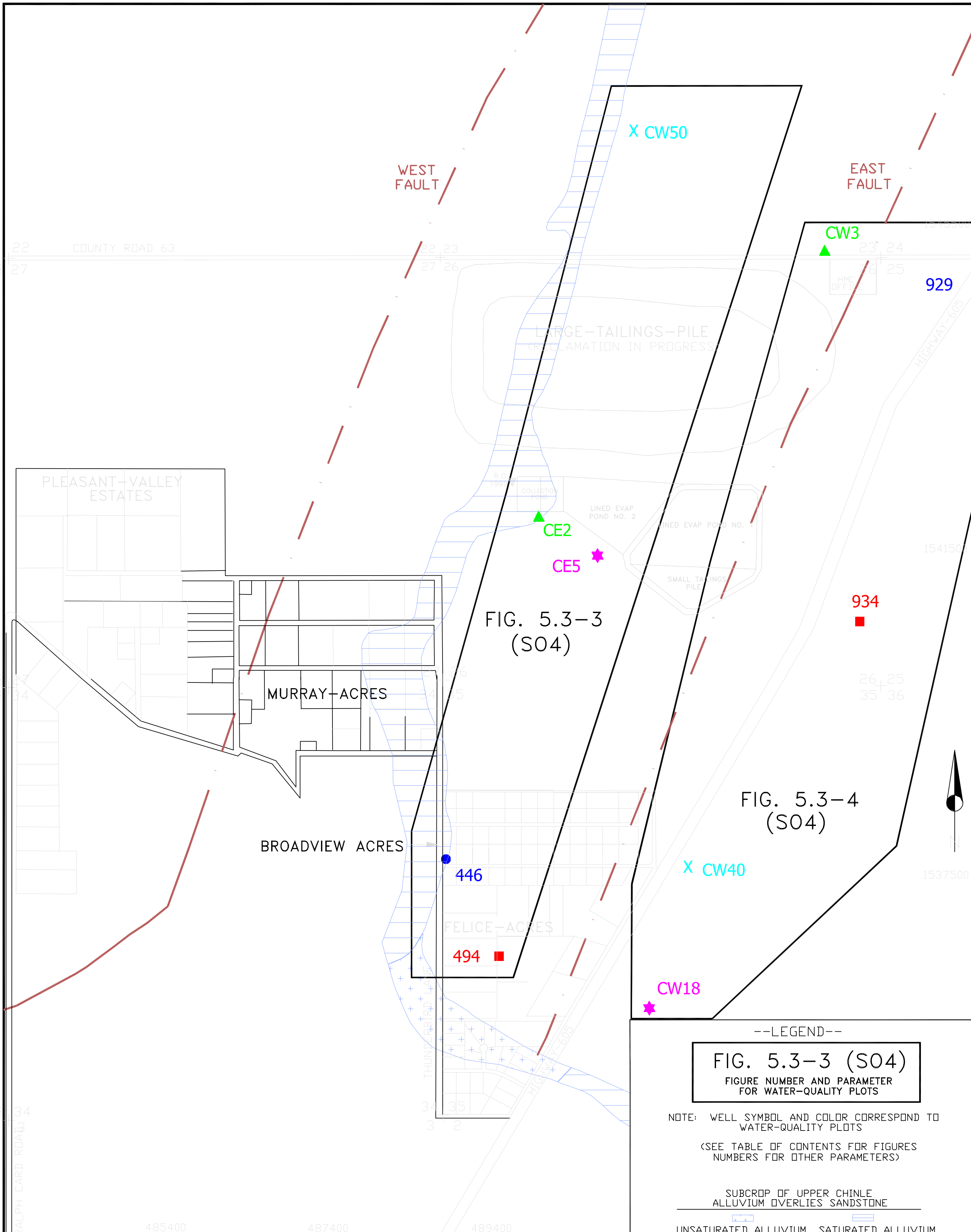
Thorium-230 concentrations have never been significant in the Upper Chinle aquifer. The values measured in 2004 are presented in Figure 5.3-23. This figure shows that all measured thorium-230 concentrations were less than detection. None of the concentrations in 2003 or 2004 exceed the proposed mixing zone or non-mixing zone background values of 0.97 and 0.55 pCi/l, respectively. No plots of the thorium-230 concentration with time were developed due to the lack of any significant change in the low concentrations over the period of record. Thorium-230 levels do not warrant establishment of a site standard for this constituent.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES | GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 5.3-1. SULFATE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\UP1600



SCALE: 1"=1600'	HOMESTAKE–MILL–AND–ADJACENT–PROPERTIES GRANTS–NM–TOWNSHIP–11&12–N–RANGE–10–W	DATE: 03/25/05

FIGURE 5.3–2. LOCATION OF UPPER CHINLE WELLS WITH WATER–QUALITY PLOTS

c:\projects\2004–06\UP1600

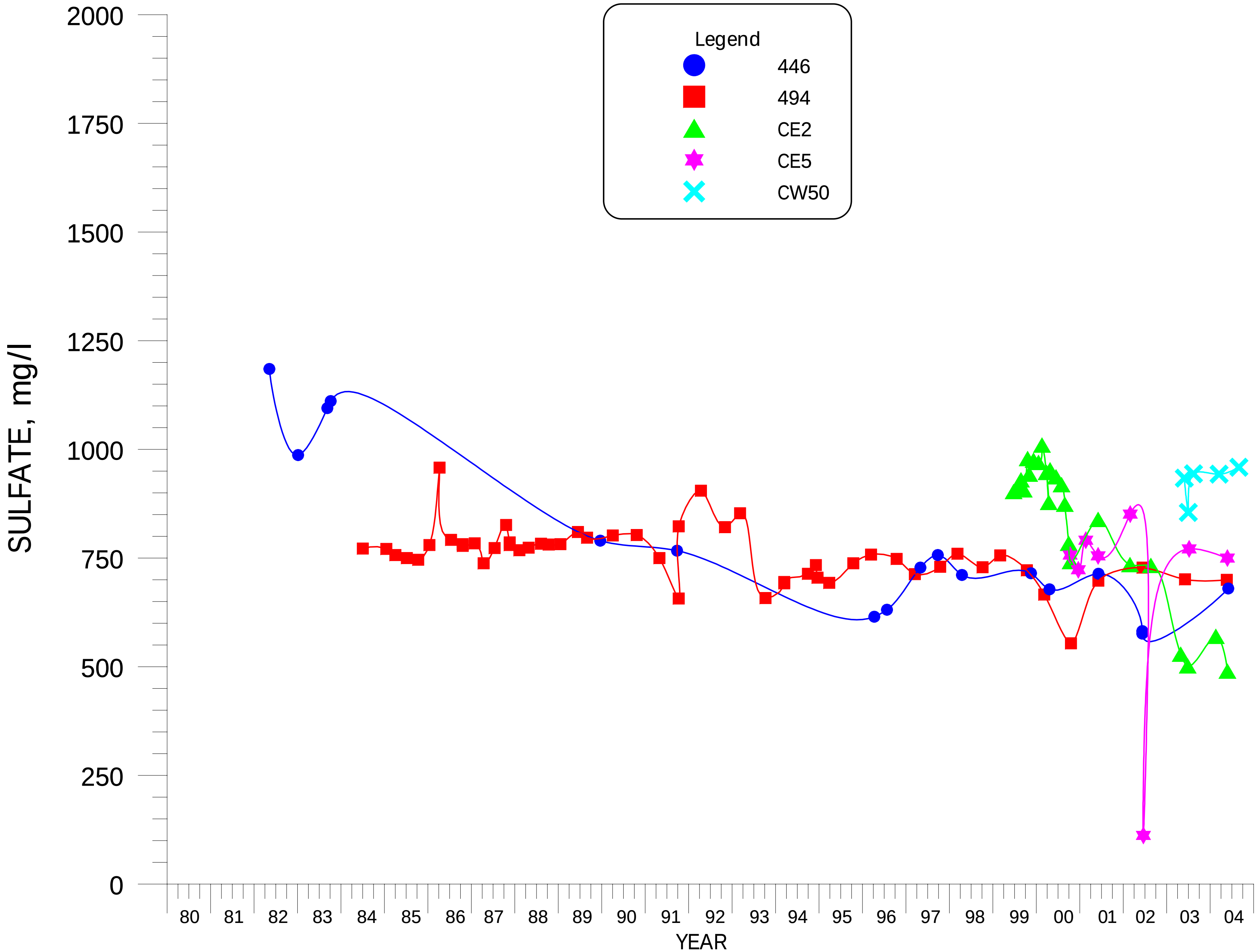


FIGURE 5.3-3. SULFATE CONCENTRATIONS FOR MIXING ZONE WELLS 446, 494, CE2, CE5 AND CW50.

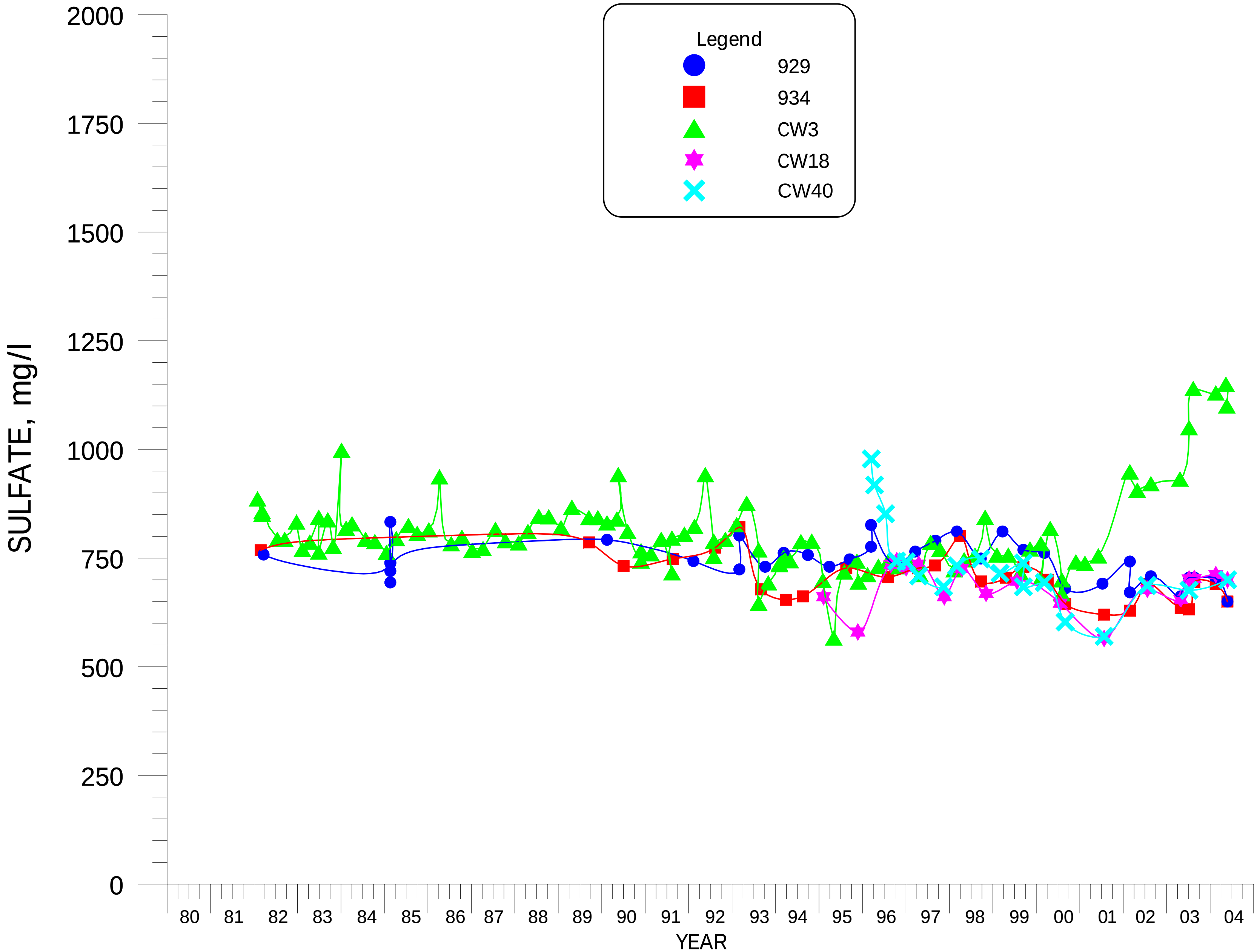
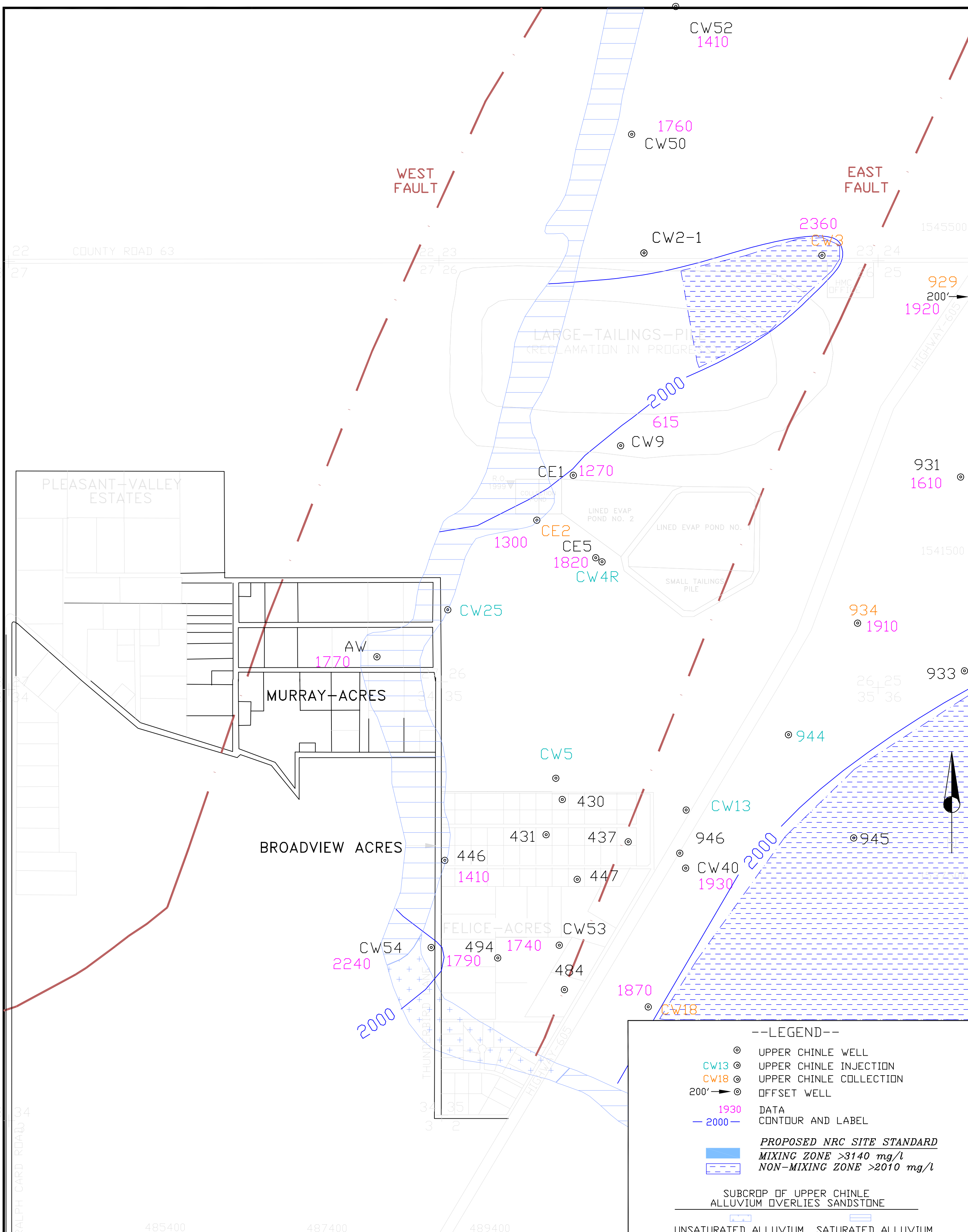


FIGURE 5.3-4. SULFATE CONCENTRATIONS FOR NON-MIXING ZONE WELLS 929, 934, CW3, CW18 AND CW40.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 5.3-5. TDS CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\UP1600

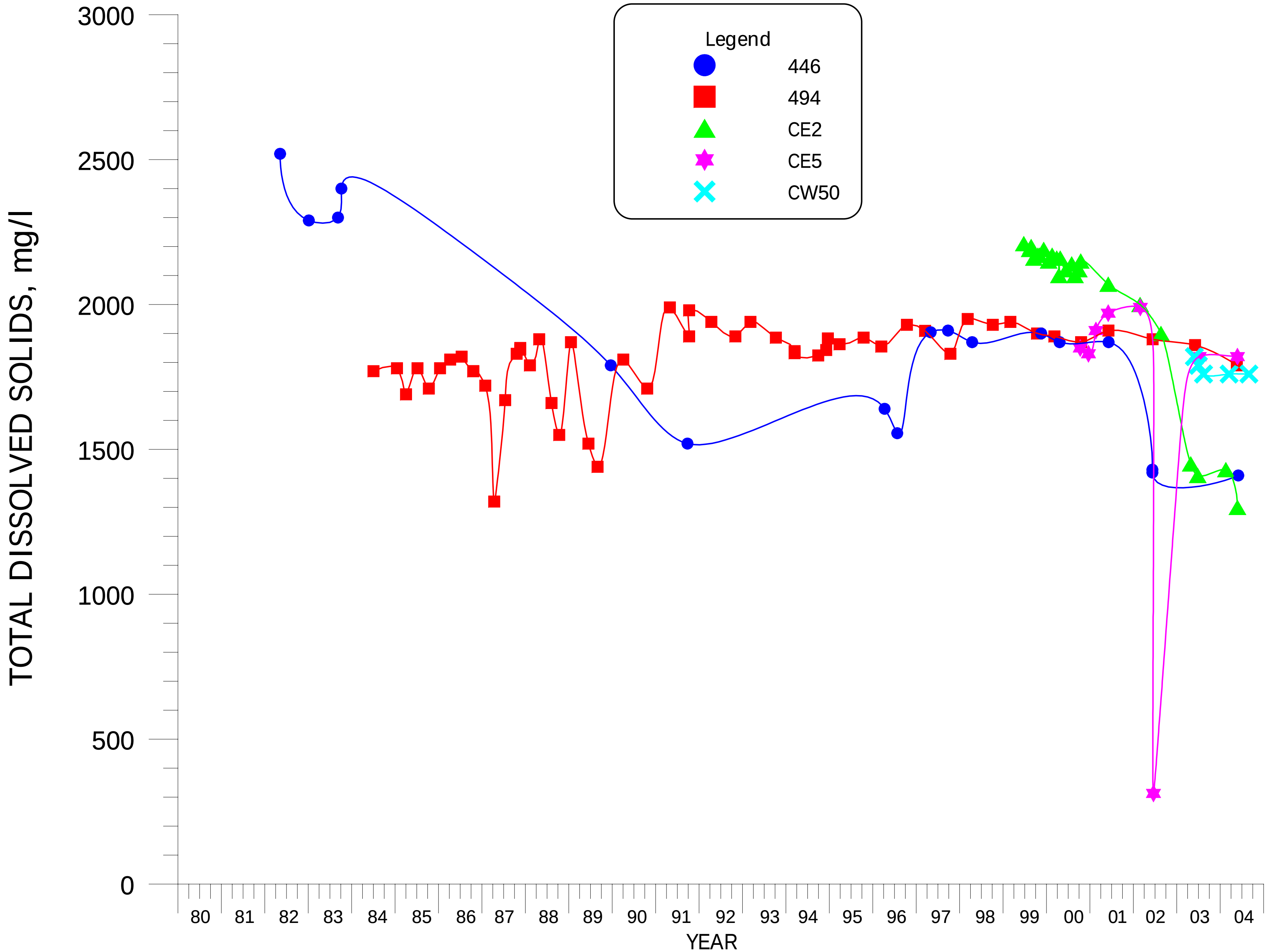


FIGURE 5.3-6. TDS CONCENTRATIONS FOR MIXING ZONE WELLS 446, 494, CE2, CE5 AND CW50.

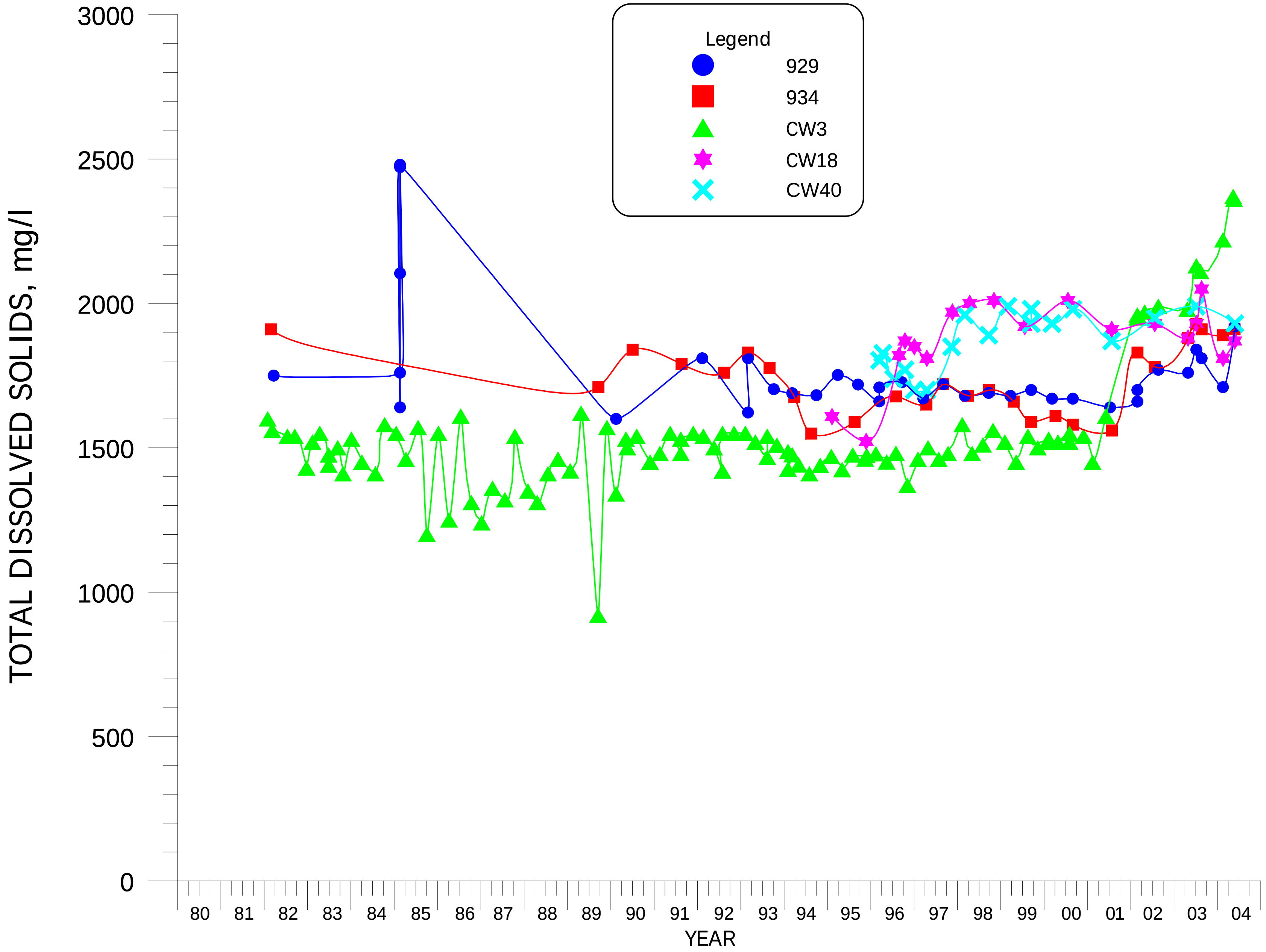
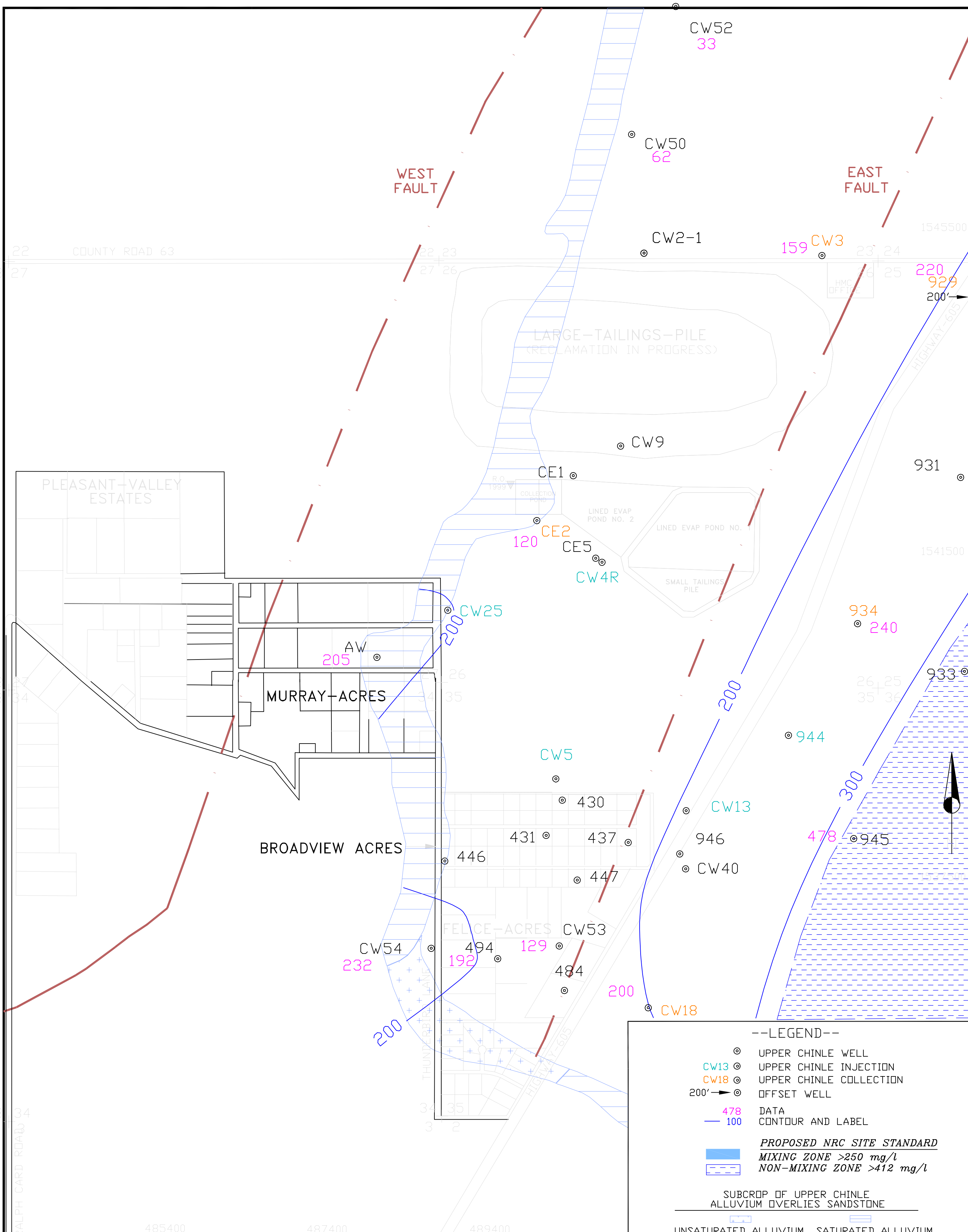


FIGURE 5.3-7. TDS CONCENTRATIONS FOR NON-MIXING ZONE WELLS 929, 934, CW3, CW18 AND CW40.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 5.3-8. CHLORIDE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\UP1600

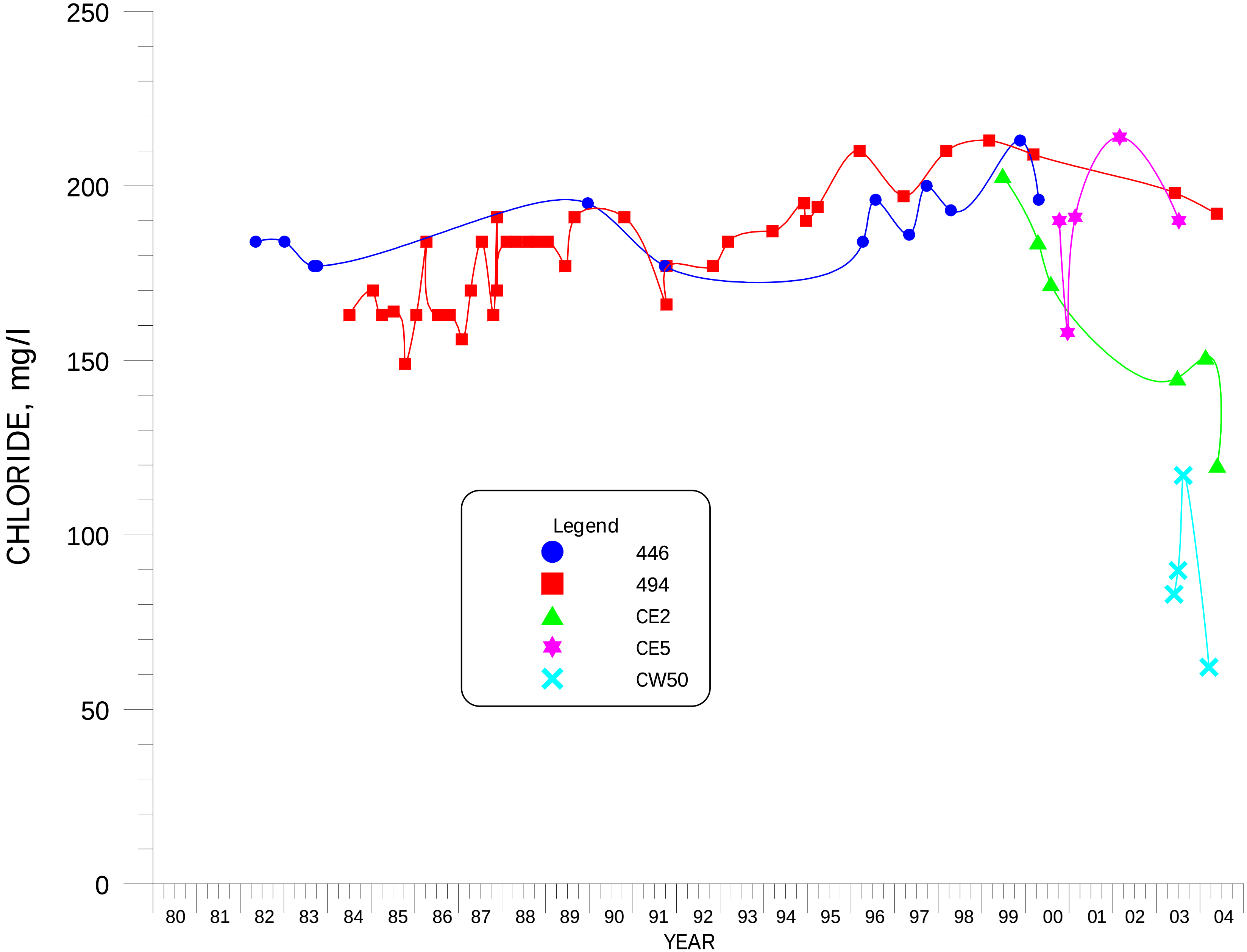


FIGURE 5.3-9. CHLORIDE CONCENTRATIONS FOR MIXING ZONE WELLS 446, 494, CE2, CE5 AND CW50.

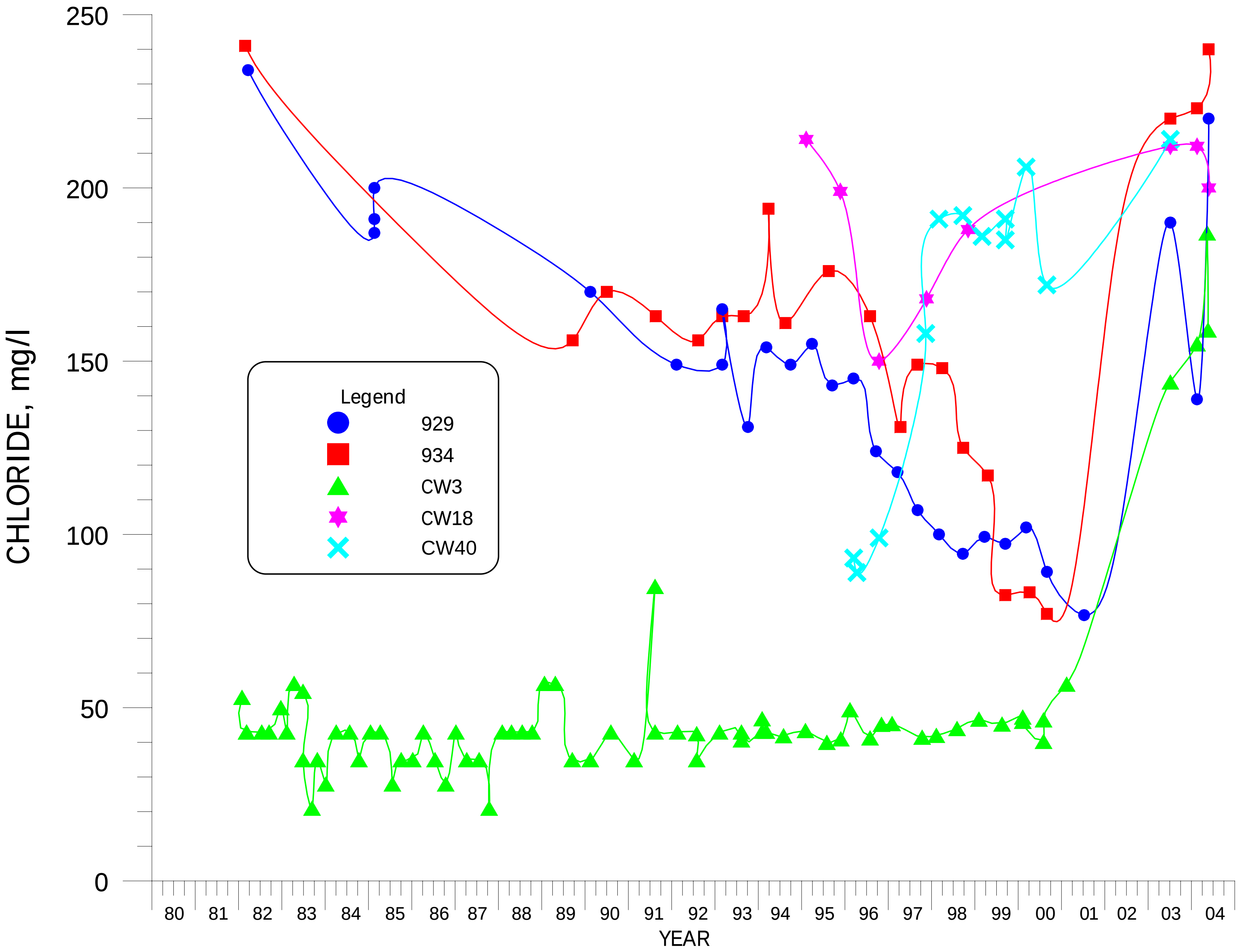
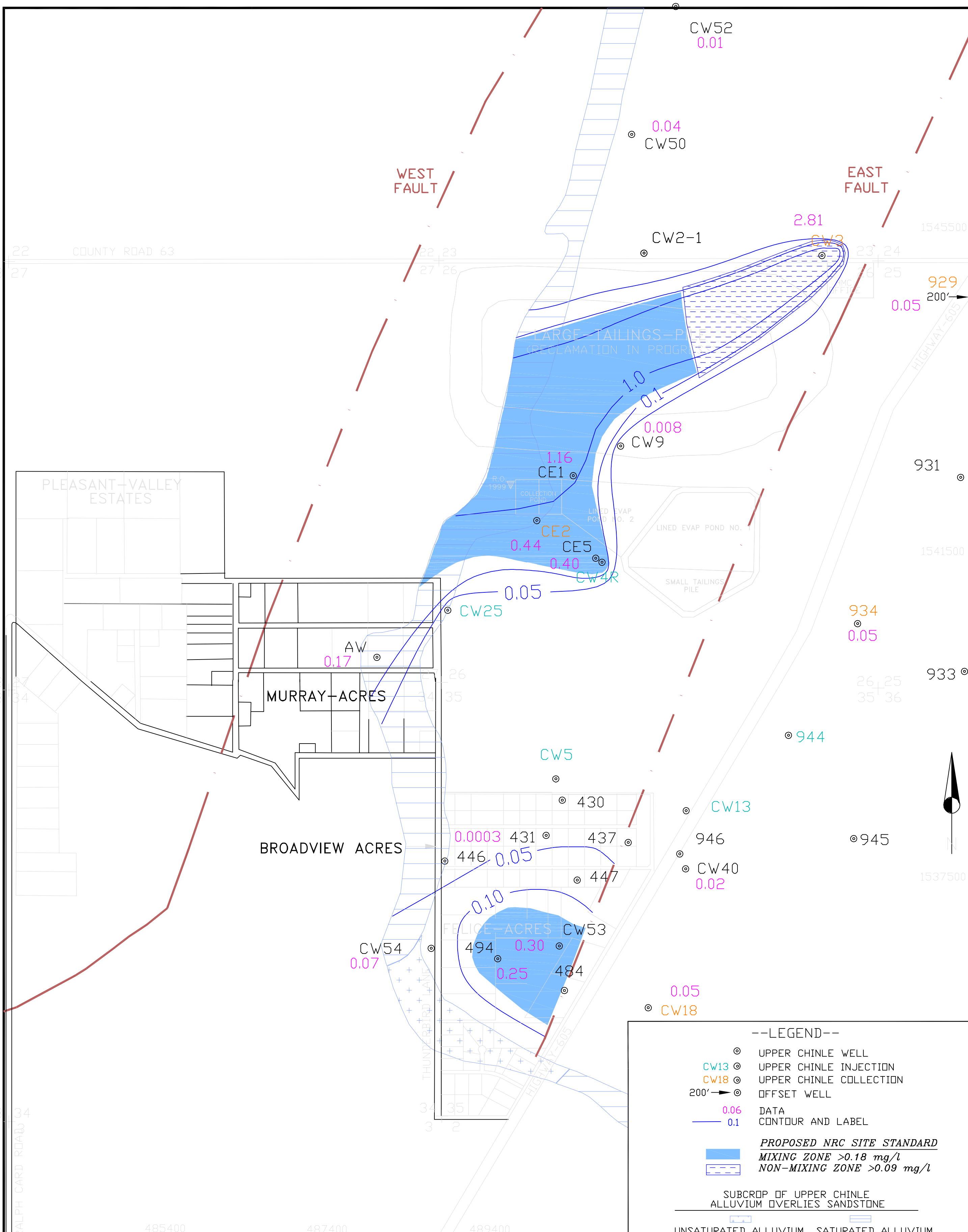


FIGURE 5.3-10. CHLORIDE CONCENTRATIONS FOR NON-MIXING ZONE WELLS 929, 934, CW3, CW18 AND CW40.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 5.3-11. URANIUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\UP1600

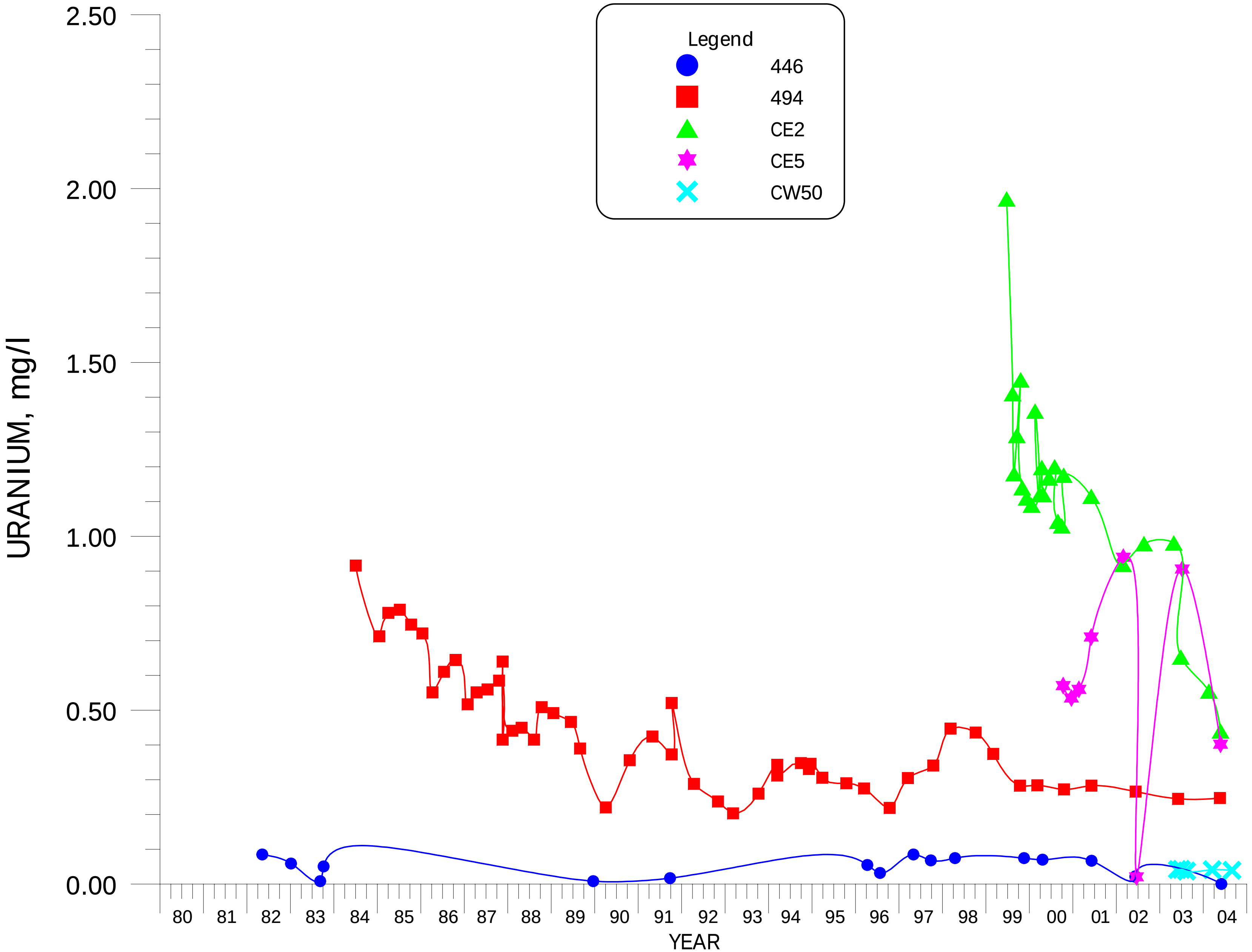


FIGURE 5.3-12. URANIUM CONCENTRATIONS FOR MIXING ZONE WELLS 446, 494, CE2, CE5 AND CW50.

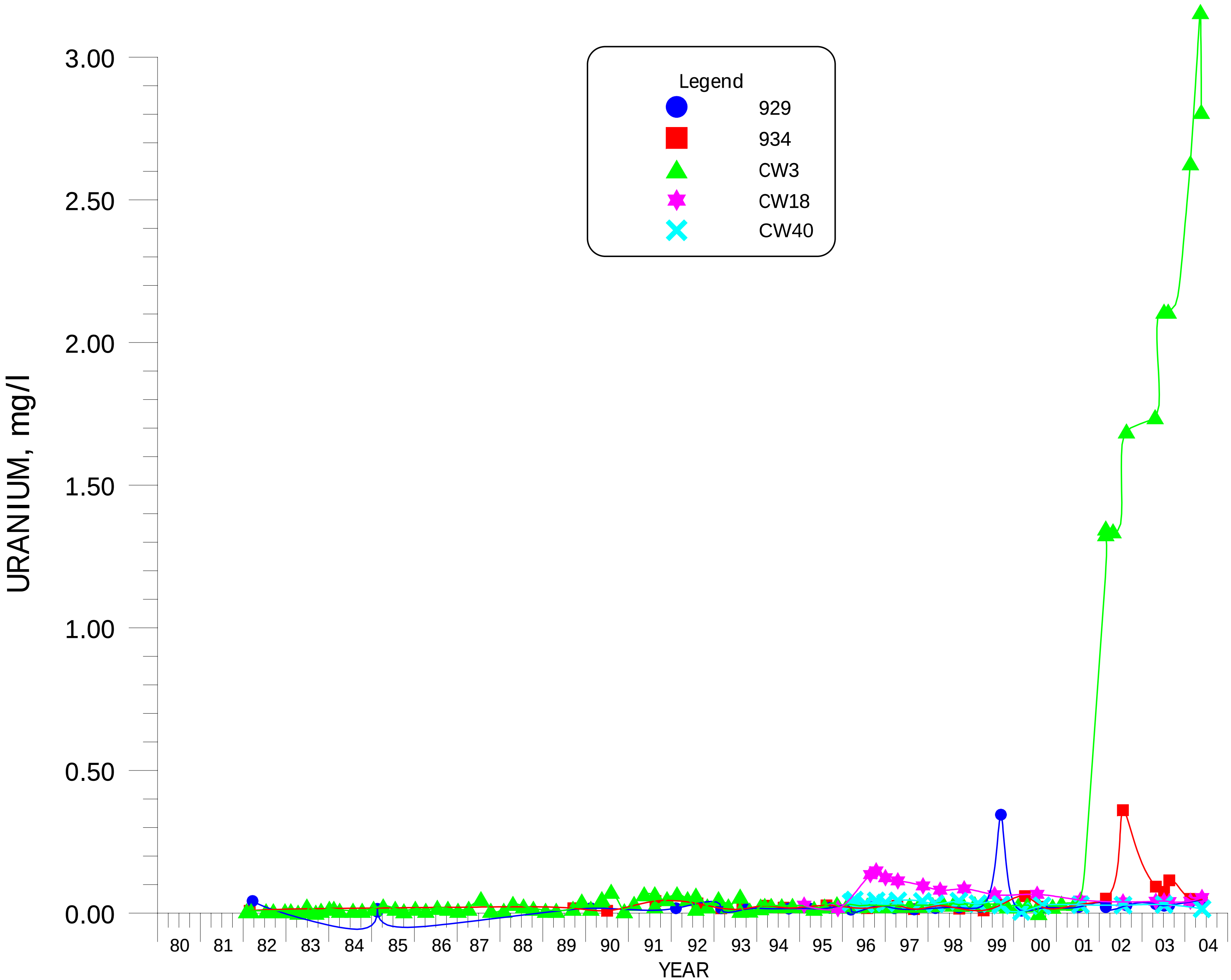
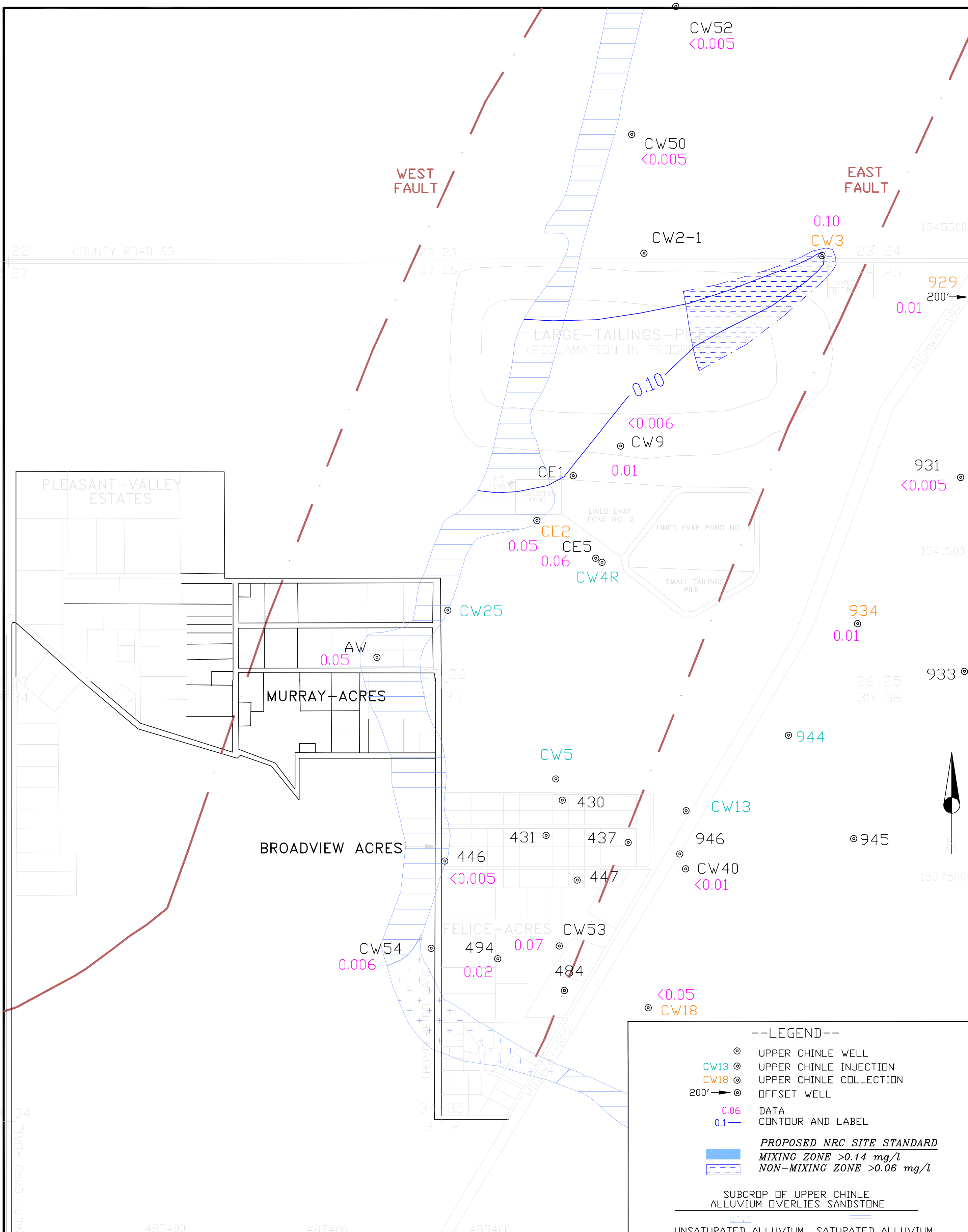


FIGURE 5.3-13. URANIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 929, 934, CW3, CW18 AND CW40.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 5.3-14. SELENIUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\UP1600

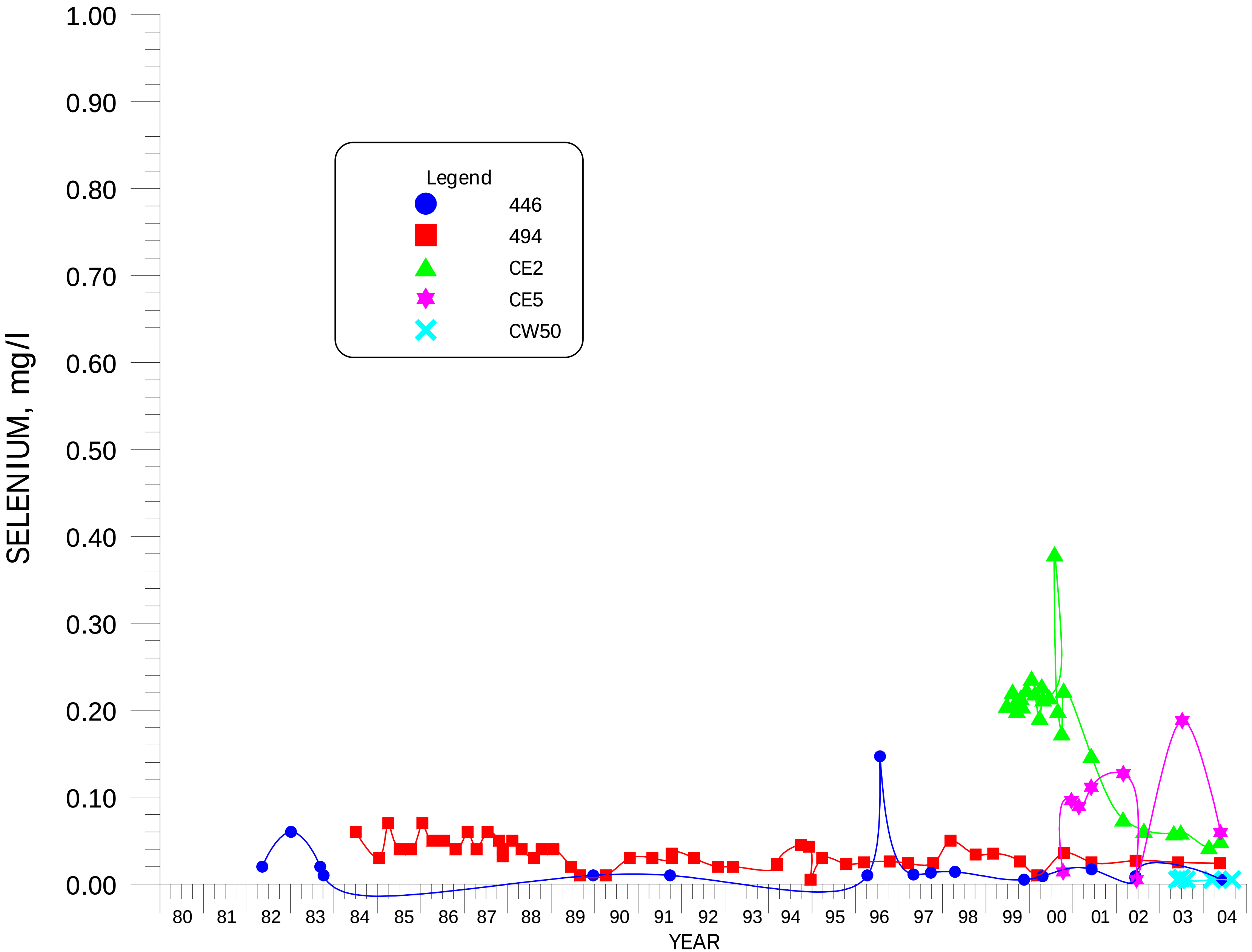


FIGURE 5.3-15. SELENIUM CONCENTRATIONS FOR MIXING ZONE WELLS 446, 494, CE2, CE5 AND CW50.

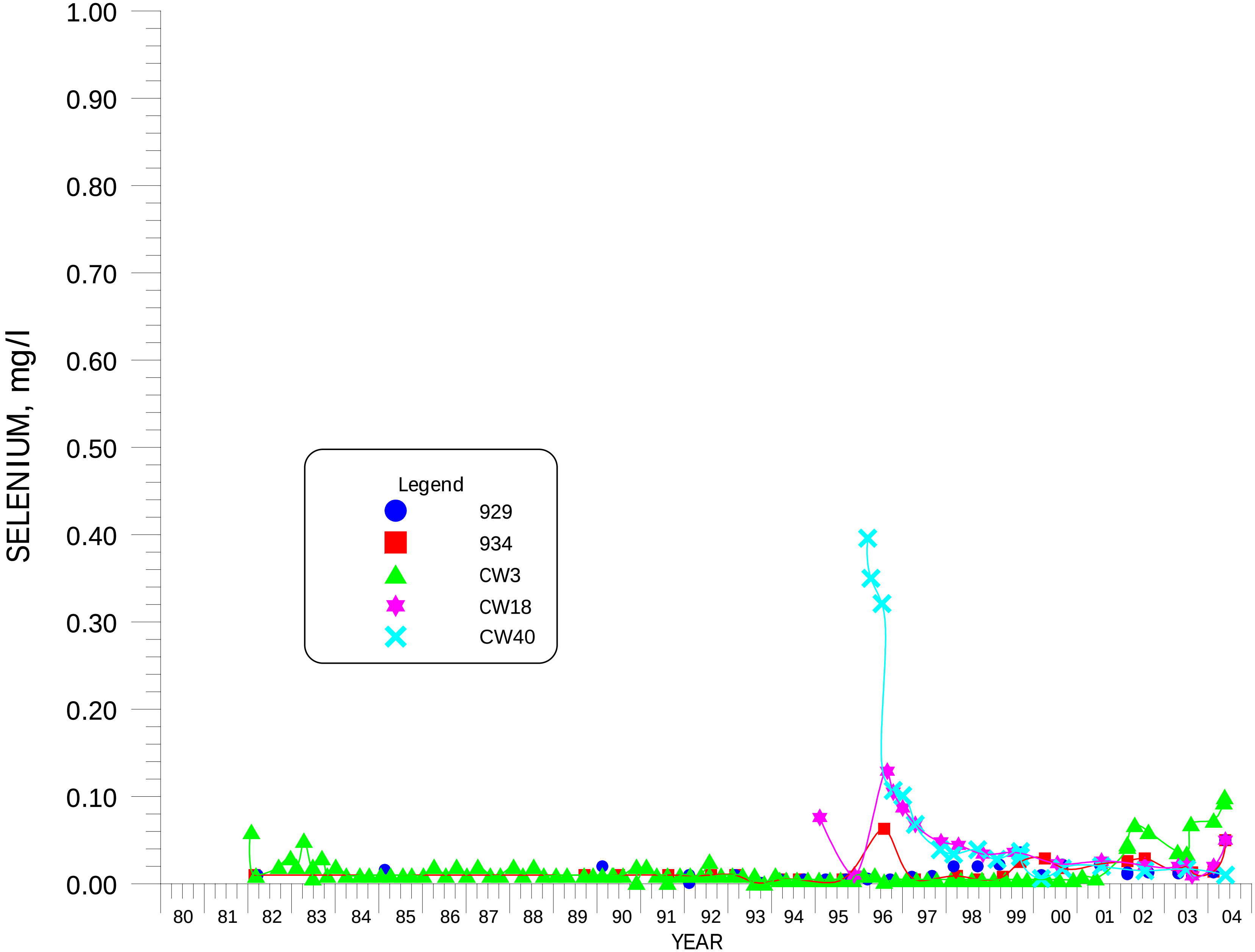
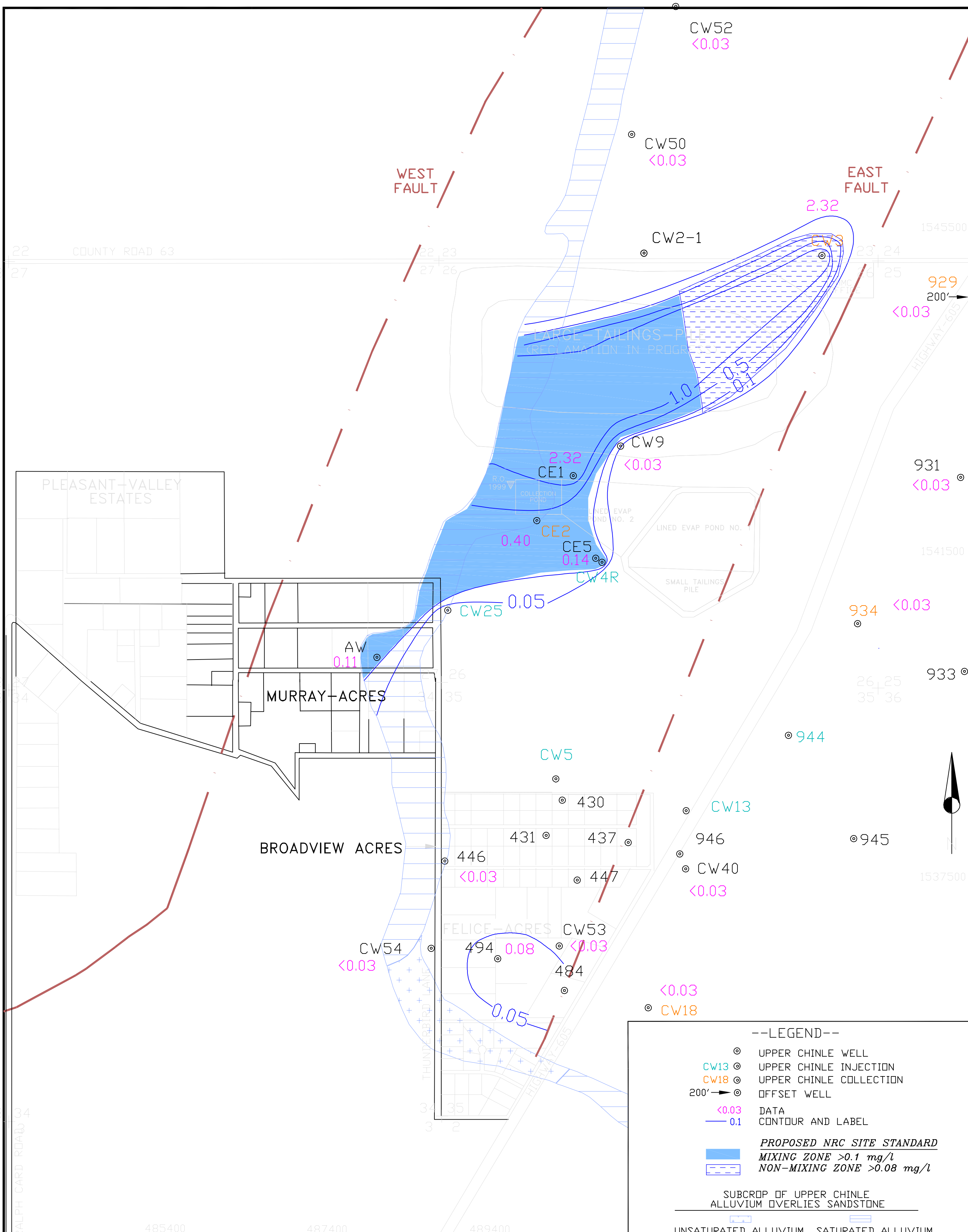


FIGURE 5.3-16. SELENIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 929, 934, CW3, CW18 AND CW40.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES | GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 5.3-17. MOLYBDENUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\UP1600

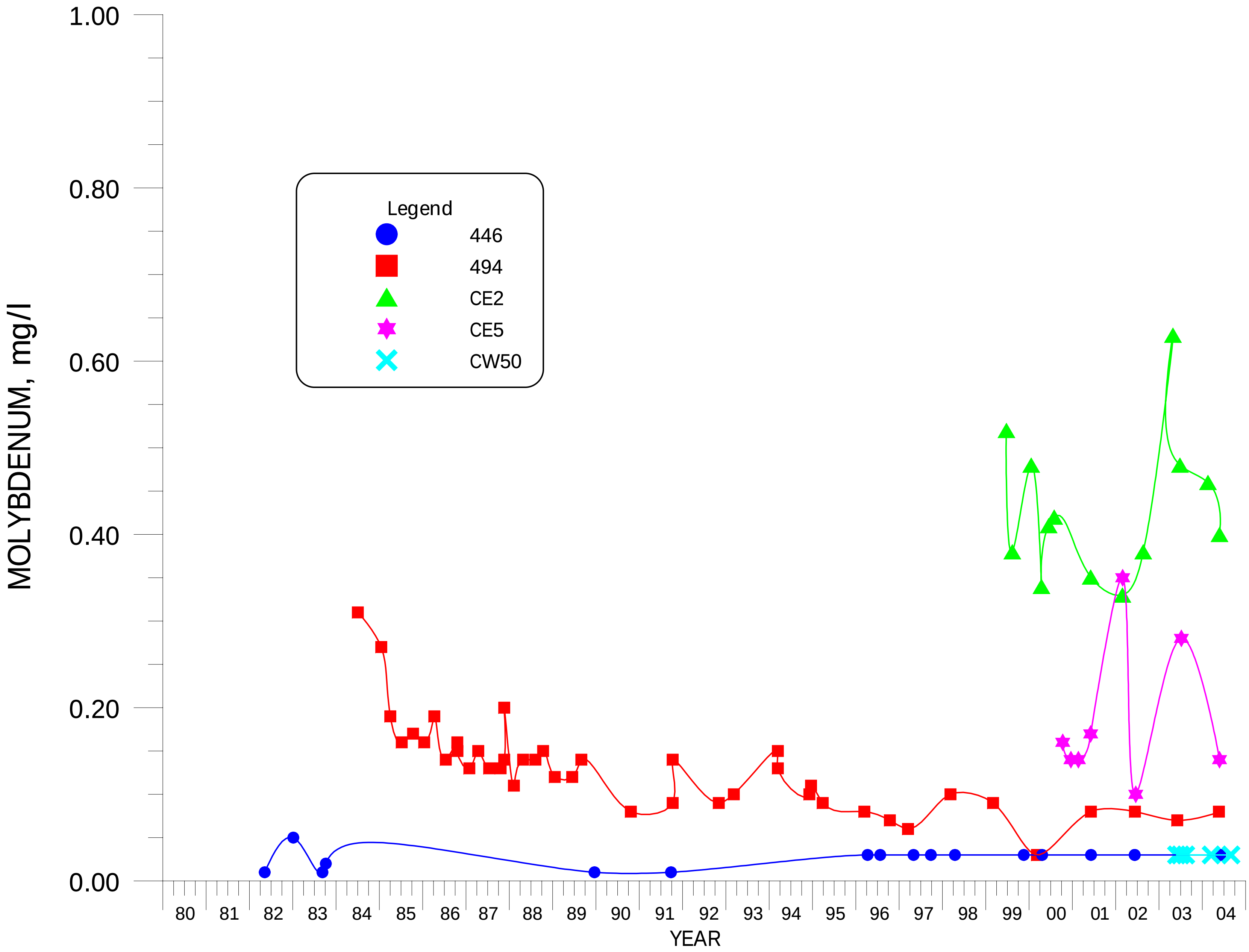


FIGURE 5.3-18. MOLYBDENUM CONCENTRATIONS FOR MIXING ZONE WELLS 446, 494, CE2, CE5 AND CW50.

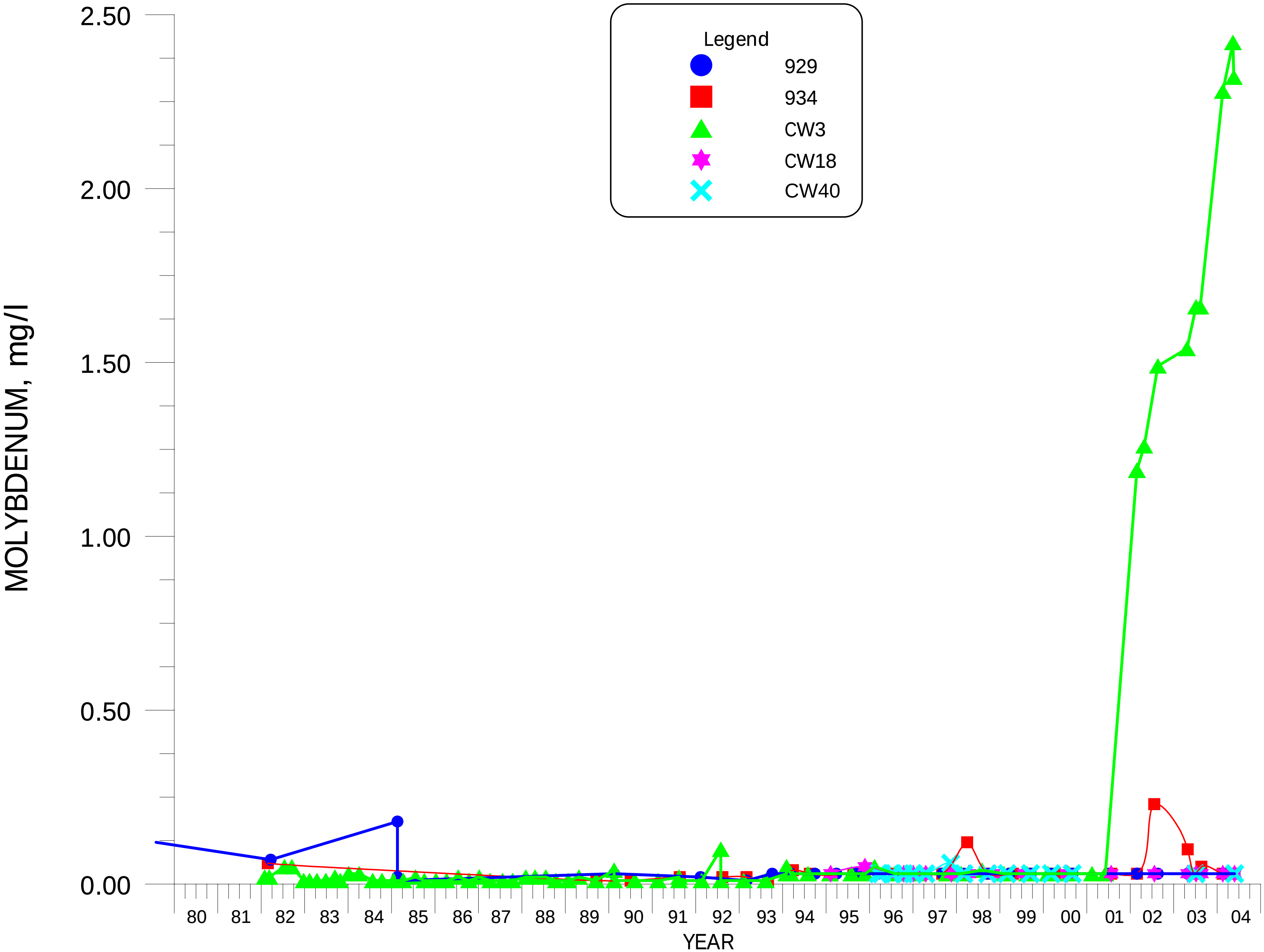
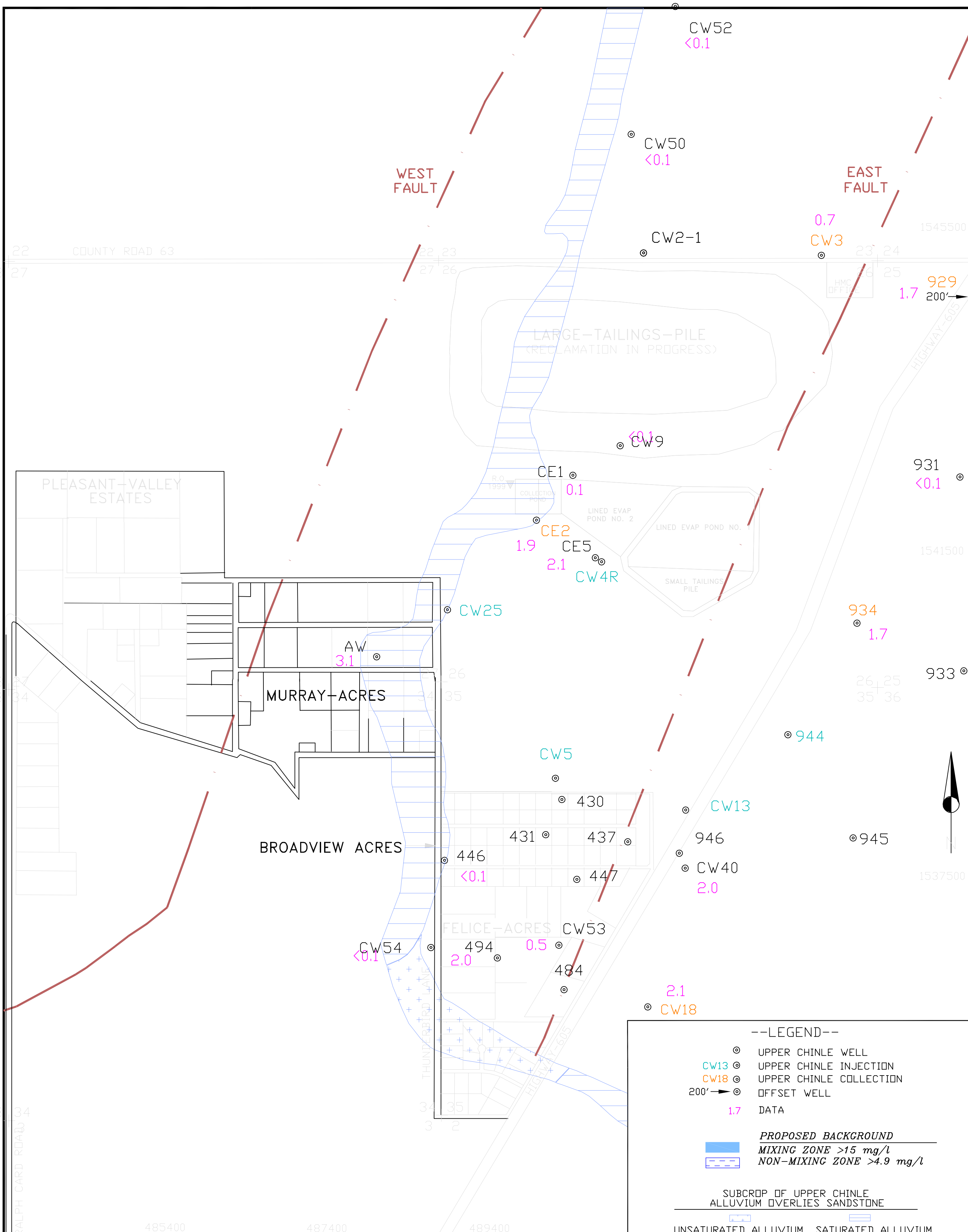


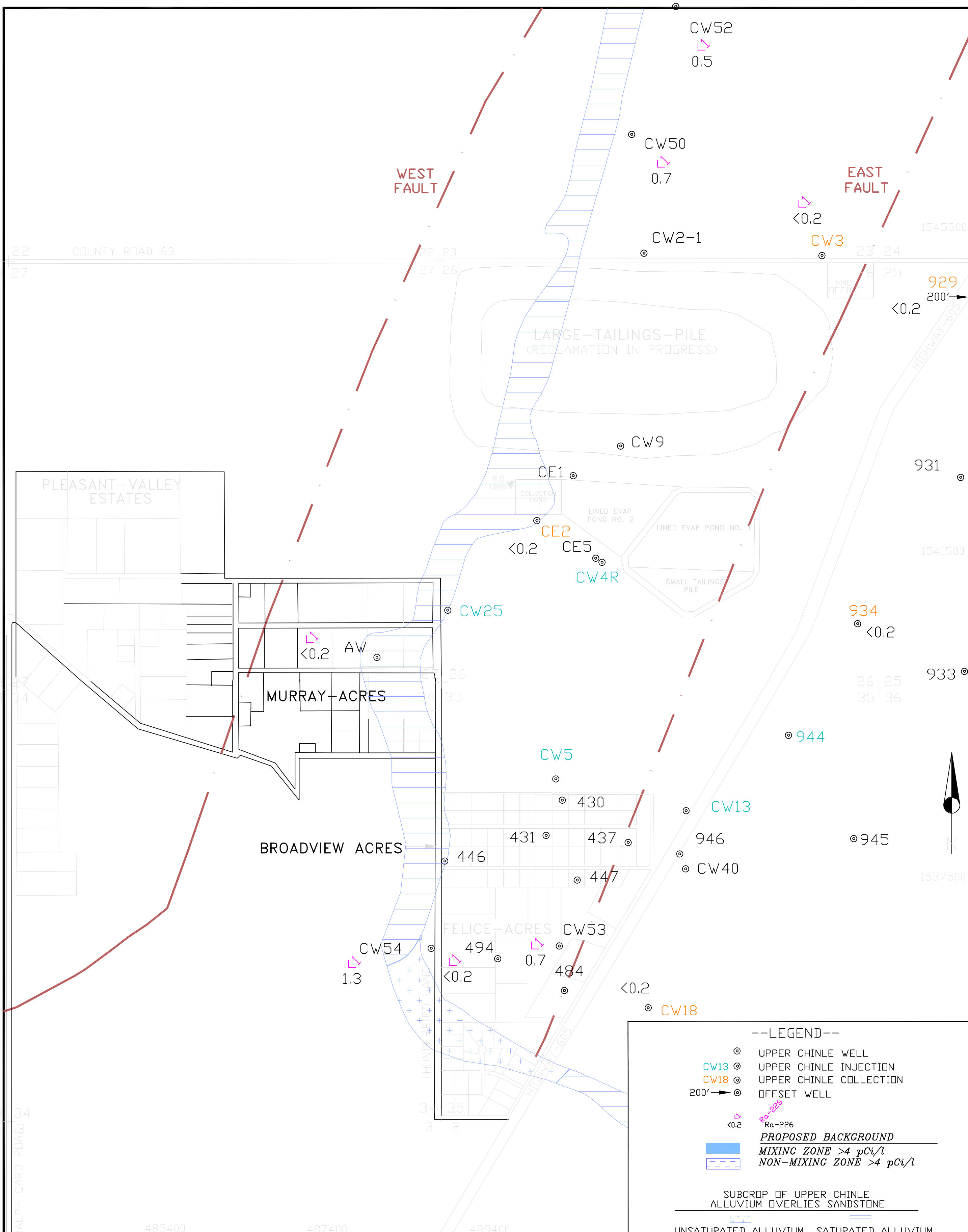
FIGURE 5.3-19. MOLYBDENUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 929, 934, CW3, CW18 AND CW40.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 5.3-20. NITRATE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, mg/l

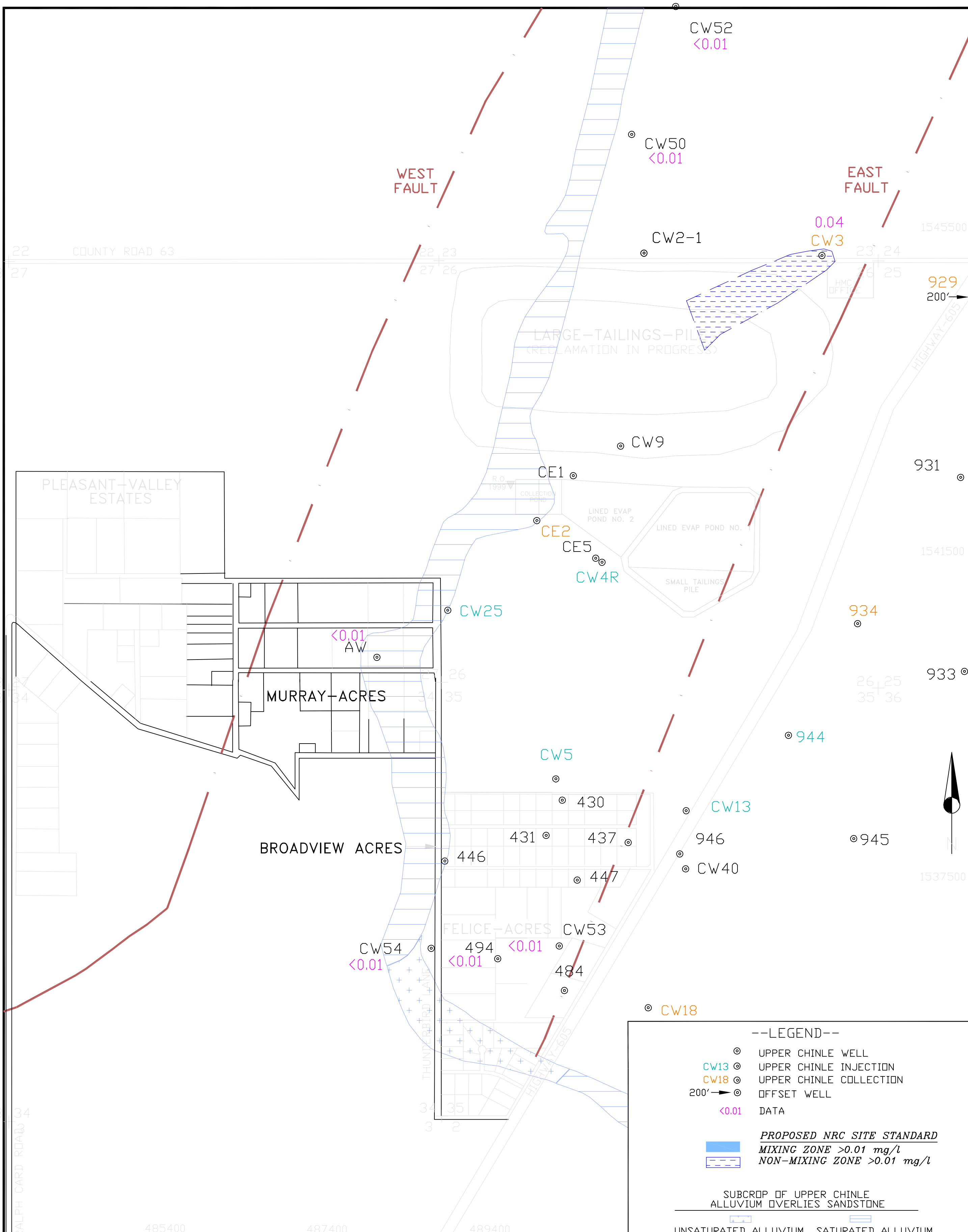
c:\projects\2004-06\UP1600



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 5.3-21. RADIUM-226 AND RADIUM-228 CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, pCi/l

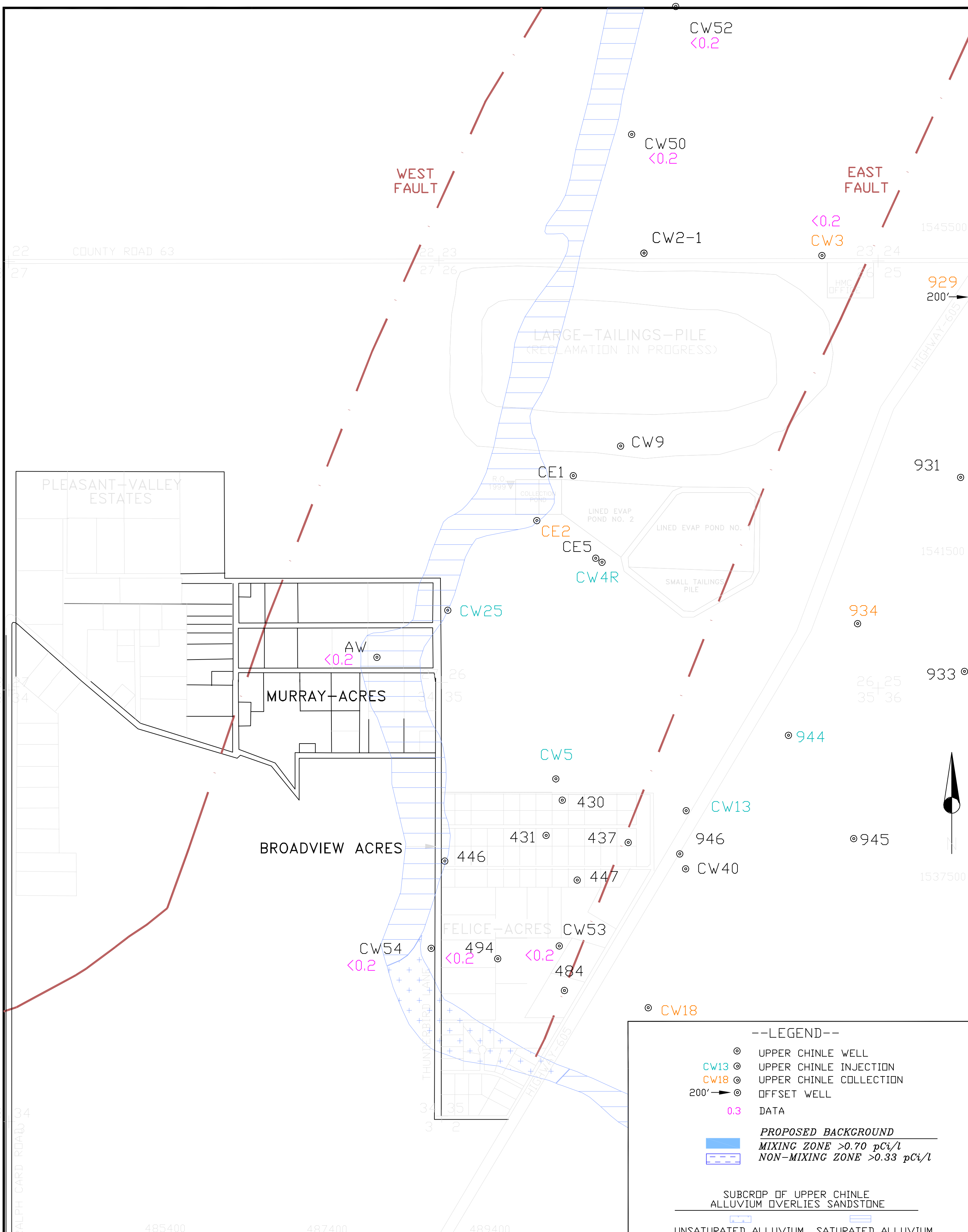
c:\projects\2004-06\UP1600



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 5.3-22. VANADIUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\UP1600



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 5.3-23. THORIUM-230 CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2004, pCi/l

c:\projects\ 2004-06\UP1600

SECTION 6

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES

SECTION 6

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

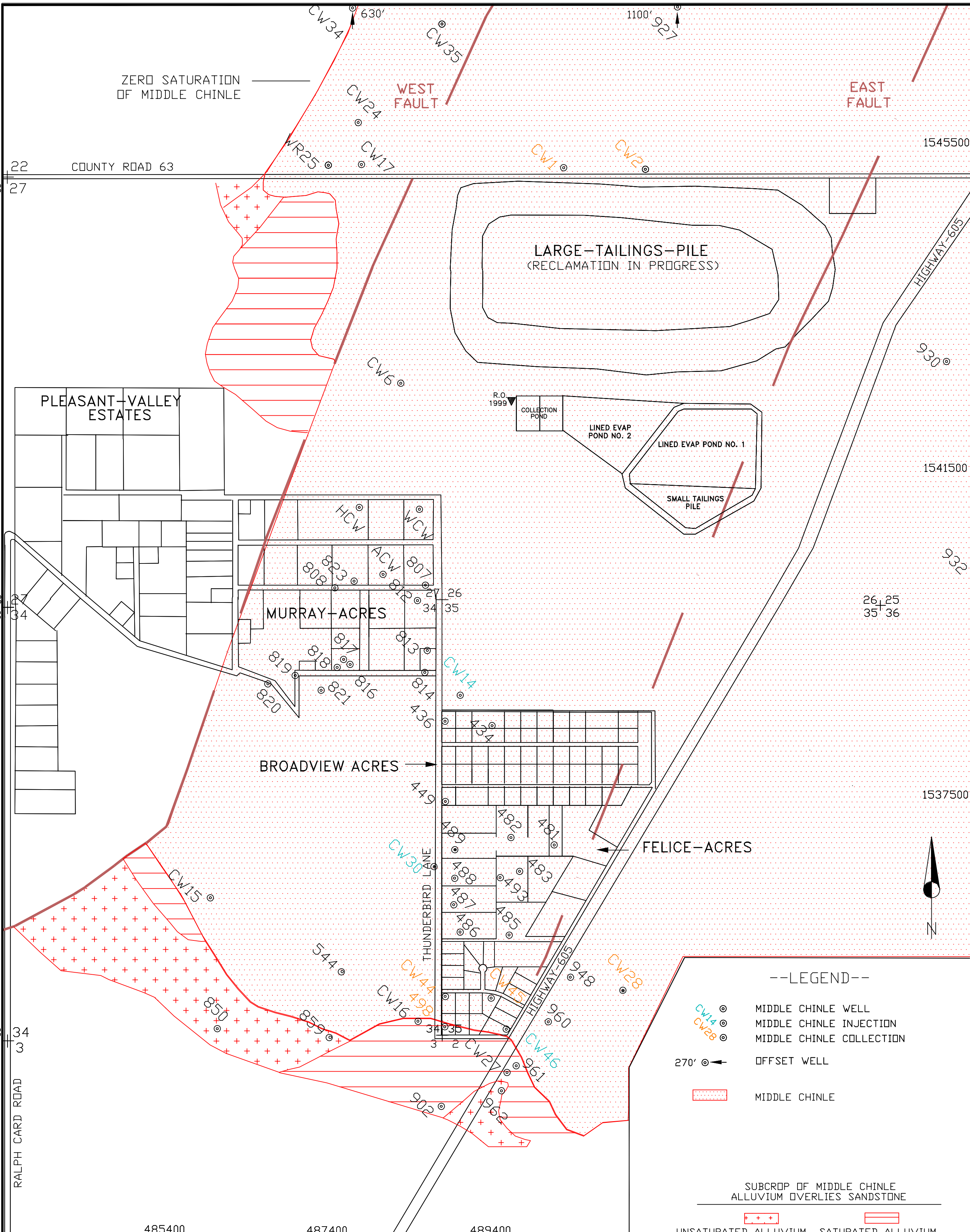
6.0 MIDDLE CHINLE AQUIFER MONITORING

6.1 MIDDLE CHINLE WELL COMPLETION AND LOCATION

Tables 5.1-1 through 5.1-4 (previous section) present the Middle Chinle well data along with other Chinle aquifer wells. Figure 6.1-1 shows the locations of the Middle Chinle wells and areas where the Middle Chinle aquifer exists at the Grants Project. The area where the alluvium is saturated and has direct contact with the Middle Chinle sandstone is very important with respect to transfer of water between these two aquifers and is shown with the red horizontal cross hatch pattern. The area where the Middle Chinle subcrops against alluvium that is not saturated is shown by the red plus (+) pattern.

The Middle Chinle aquifer also exists east of the extension of the East Fault (shown as a red pattern area on Figure 6.1-1) with an alluvium-Middle Chinle subcrop zone on the south side of this area. A limited area of Middle Chinle aquifer exists west of the West Fault. All three of these areas in the Middle Chinle aquifer act as separate ground water systems, except that there is some contact between two of the three areas of the Middle Chinle near the south end of the East Fault in the southwest corner of Section 35.

Middle Chinle wells CW1 and CW2 were used in 2004 as a source of water for the tailings flushing effort, while well CW28 was used as source of fresh water injection in 2004. Wells CW14, CW30 and CW46 were used for fresh-water injection in 2004. Wells 498, CW44 and CW45 were used as irrigation supply wells.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 6.1-1. LIMITS OF MIDDLE CHINLE AQUIFER AND WELL LOCATIONS

c:\projects\2004-06\MID1600

6.2 MIDDLE CHINLE WATER LEVELS

Water levels in Homestake's Upper, Middle and Lower Chinle wells are presented in Appendix A. Fall, 2004 water-level elevation contours for the Middle Chinle aquifer are presented on Figure 6.2-1. The hydraulic gradient in the Middle Chinle aquifer is steeper in its alluvial subcrop area in the southern portion of Felice Acres near wells 498, CW45 and CW46. This increase in gradient is due to an influx of water to the Middle Chinle aquifer from the alluvial aquifer. The red arrows on Figure 6.2-1 show the direction of ground water flow in the Middle Chinle aquifer. Flow on the east side of the East Fault is mainly toward well CW28 near the East Fault.

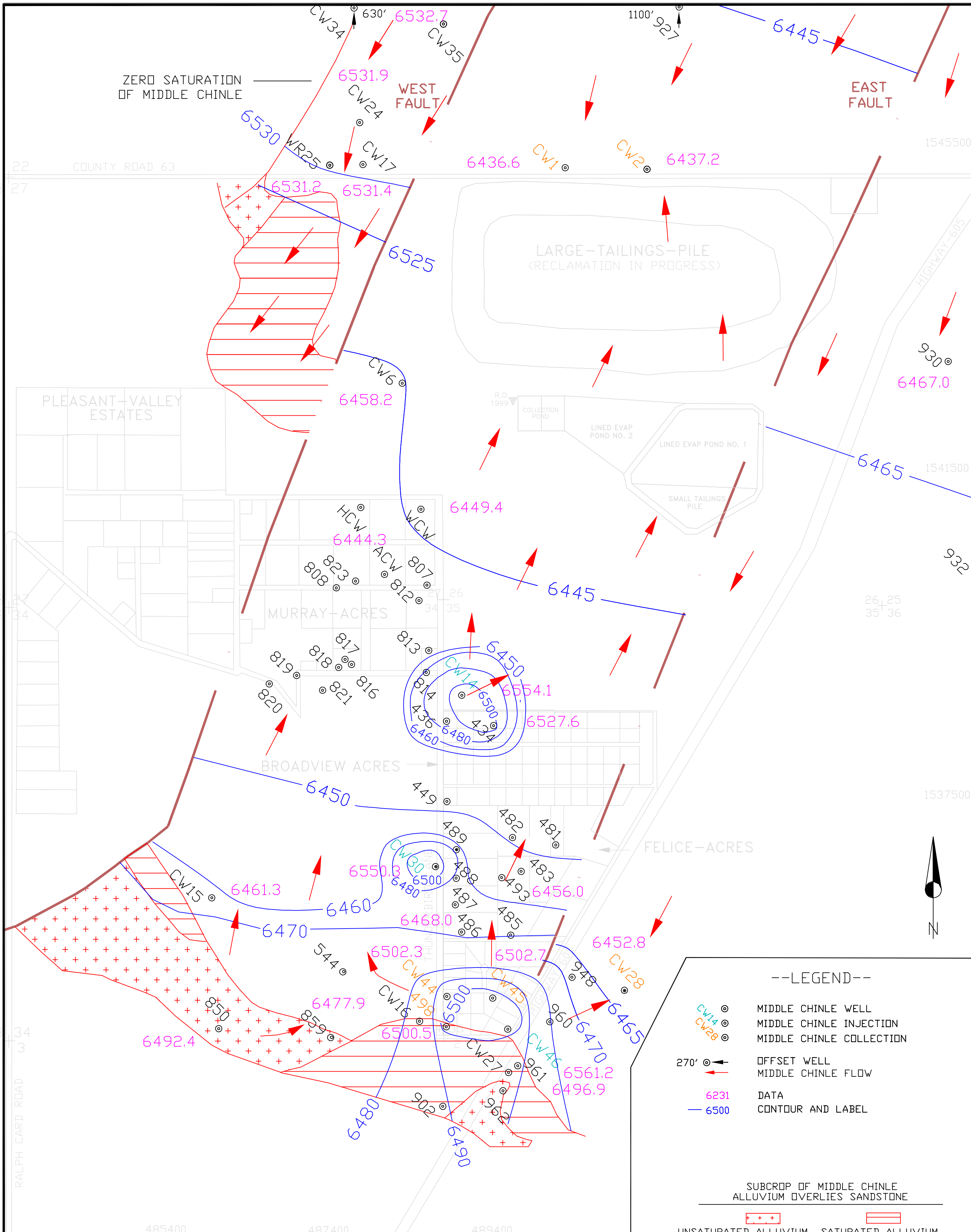
Ground water flow west of the West Fault in the Middle Chinle aquifer is to the southwest, and it discharges into the alluvial aquifer. This prevents the alluvial aquifer from affecting the water quality of the Middle Chinle aquifer on the west side of the West Fault. This Middle Chinle water flows from up-gradient of the site into the area west of the Large Tailings Pile. The remainder of the Middle Chinle aquifer is recharged by the alluvial aquifer south of Felice Acres.

The injection of fresh water into wells CW14 (north of Broadview Acres) and CW30 (west of Felice Acres) has created ground water mounds in their respective areas. These mounds cause the ground water to flow both north and south from these two wells. Collection of ground water from wells CW1 and CW2 intercepts the water flowing from the south in the Middle Chinle aquifer between the two faults. Pumping from these wells also draws water flow from the north. The head in the Middle Chinle aquifer on each side of the two faults is significantly different than the head between the two faults, which demonstrates that the ground water is not readily connected on each side of these faults.

Figure 6.2-2 shows the locations of the Middle Chinle wells that are used to present the water-level changes with time. The colors and symbols used on this figure are the same as those used on the water-level elevation time plots. Figure 6.2-3 presents the water-level elevation changes versus time in Middle Chinle wells 493, 859, CW15, CW27, CW28, CW45 and CW46. The non-pumping water levels are higher in Middle Chinle well CW45 than they are farther north in well 493 except during pumping well CW45 for irrigation water in 2004. The pumping of irrigation wells 498, CW44 and CW45 has caused the water levels in wells 493, 859 and CW15 to decline. Some of this decline could also be attributable collection of water from wells CW1 and CW2. Variations in the pumping rate of well CW28 contribute to the observed

variable water levels. Injection into Upper Chinle well CW46 has caused a rise in water level in this well.

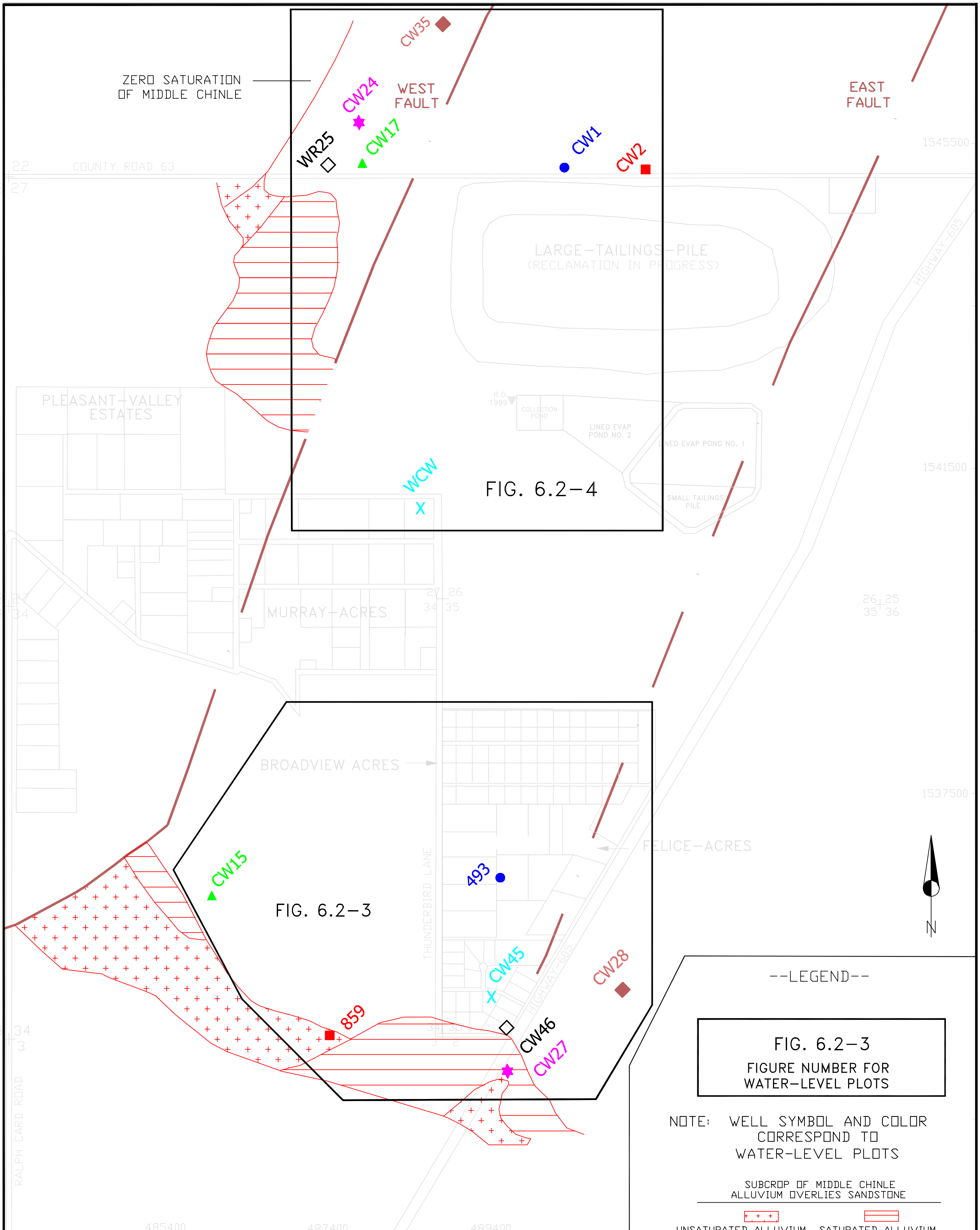
The water-level plots for the Middle Chinle wells located west of the West Fault and wells CW1, CW2 and WCW are presented on Figure 6.2-4. Water levels have generally been gradually increasing in the Middle Chinle aquifer west of the West Fault. Water levels were variable in pumping wells CW1 and CW2 in 2004 due to their variable pumping rates. Water levels have decreased in well WCW as a result of the pumping of wells CW1 and CW2 since 2001. As expected, water levels west of the West Fault have not responded to the pumping of water from wells CW1 and CW2 situated east of the West Fault.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 6.2-1. WATER-LEVEL ELEVATIONS OF THE MIDDLE CHINLE AQUIFER, FALL 2004, FT-MSL

c:\projects\2004-06\MID1600



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 6.2-2. LOCATION OF MIDDLE CHINLE WELLS WITH WATER-LEVEL PLOTS

c:\projects\
2004-06\MID1600
page 6.2-4

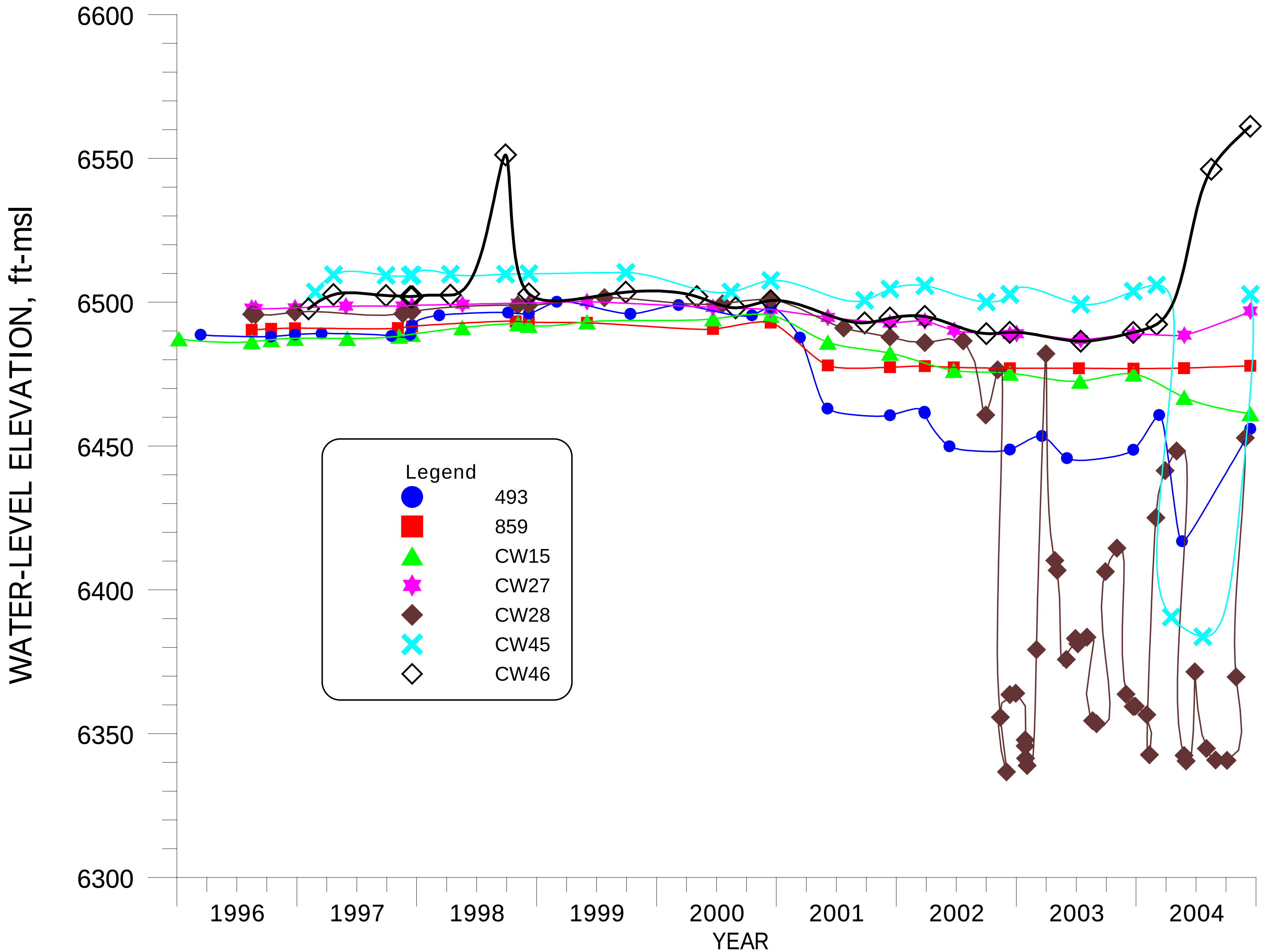


FIGURE 6.2-3. WATER-LEVEL ELEVATION FOR WELLS 493, 859, CW15, CW27, CW28, CW45 AND CW46.

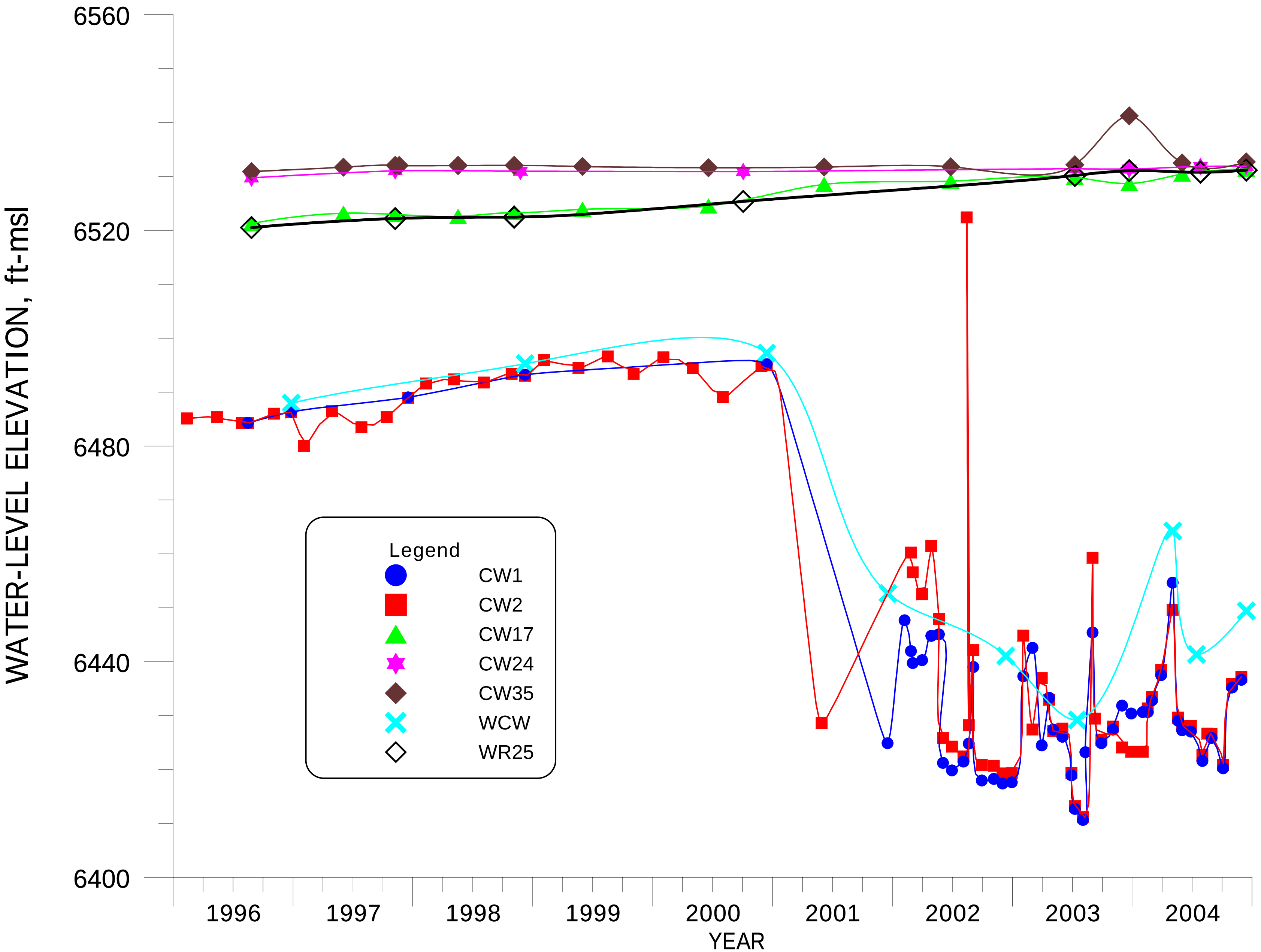


FIGURE 6.2-4. WATER-LEVEL ELEVATION FOR WELLS CW1, CW2, CW17, CW24, CW35, WCW AND WR25.

6.3 MIDDLE CHINLE WATER QUALITY

The water-quality data for Homestake's Middle Chinle aquifer is presented with that of the other Chinle aquifer wells in Tables B.5-1 and B.5-2 of Appendix B. The Chinle aquifer water-quality results for subdivision wells are also presented in these tables. The basic well data for the Middle Chinle aquifer wells is presented in Tables 5.1-1 through 5.1-4 in the Upper Chinle aquifer monitoring section (Section 5).

The area of water-quality concern in the Middle Chinle aquifer exists in the western portion of Broadview Acres and Felice Acres. All sulfate concentrations are within the range of background concentrations except for the concentrations from wells CW17 and WR25, located in the mixing zone west of the West Fault where these concentrations are natural. Uranium concentrations are above background levels only in western Broadview Acres and Felice Acres and immediately to the west and south of Felice Acres. Selenium concentrations also exceed the background values in the same area. The only significant molybdenum concentrations identified in the Middle Chinle aquifer are at well 434.

6.3.1 SULFATE - MIDDLE CHINLE

Figure 6.3-1 presents sulfate concentration contours for the Middle Chinle aquifer for 2004. This figure shows that the Middle Chinle sulfate concentrations range from 410 to a high of 1990 mg/l at well WR25. Proposed sulfate site standard concentrations are given in the legend of Figure 6.3-1. All mixing-zone sulfate concentrations in the Middle Chinle aquifer are within the upper background level of 1750 mg/l except for the values in wells CW17 and WR25. Sulfate concentrations in wells CW17 and WR25, which are located west of the West Fault, are natural. The sulfates are naturally occurring in this area, because the ground water flow in the Middle Chinle aquifer west of the West Fault is from the north to the southwest. All sulfate concentrations in the non-mixing zone of the Middle Chinle are within the natural background range.

Figure 6.3-2 shows the locations of the Middle Chinle wells for which time concentration plots were developed for this report. The sulfate figure number is shown in the group area to define the figure number for each group of wells. Two groups of wells for the

Middle Chinle aquifer are presented. The colors and symbols on Figure 6.3-2 correspond to those used in the concentration time plots.

Figure 6.3-3 presents sulfate concentrations for the mixing zone Middle Chinle wells 859, CW15, CW17, CW35, CW44 and CW45. Fairly stable sulfate concentrations were observed in 2004 in wells 859, CW17, CW35, CW44 and CW45. An increase was observed in the sulfate concentration of well CW15 water; future sampling will identify whether there is a trend that must be addressed in the future.

Figure 6.3-4 presents the sulfate concentrations for non-mixing zone Middle Chinle wells 434, 493, CW1, CW2 and WCW, located between the two faults, and well CW28, which is located east of the East Fault. Data presented on this plot demonstrate that sulfate concentrations have been fairly steady over time in these wells. A decrease in the sulfate concentration in well WCW was observed in 2004 and the recent concentration is similar to historical values. Concentrations in Middle Chinle well CW28 have been fairly steady with time, and they are similar to the lower levels observed in well CW2.

6.3.2 TOTAL DISSOLVED SOLIDS - MIDDLE CHINLE

Total dissolved solids (TDS) and sulfate are used to define changes in major constituents at the Grants Project site. Figure 6.3-5 presents contours of TDS concentrations for the Middle Chinle aquifer during 2004 and shows that a few values are approaching or have exceeded 2000 mg/l near the alluvial subcrop area on the southwest side of Felice Acres.

Background data for the Middle Chinle aquifer were used to determine proposed TDS NRC site standards of 3140 and 1560 mg/l for the mixing and non-mixing zones, respectively. All of the TDS values measured in Middle Chinle aquifer water were less than these values in 2004, except for wells CW17, CW24 and WR25, located in the mixing zone, and wells 434 and WCW in the non-mixing zone. No restoration of TDS is needed in the Middle Chinle aquifer at wells CW17, CW24 and WR25 because concentrations from these wells are natural.

Plots of TDS concentrations for Middle Chinle wells 859, CW15, CW17, CW35, CW44 and CW45 are presented in Figure 6.3-6. The TDS concentrations have been fairly steady over time in wells 859, CW44 and CW45. A very gradual increasing trend has been observed in wells CW15, CW17 and CW35 during the last few years.

Figure 6.3-7 presents TDS concentration-time plots for non-mixing zone Middle Chinle wells 434, 493, CW1, CW2, CW28 and WCW. Analysis of this data indicates stable TDS concentrations in water collected from these wells in 2004 compared to 2003, with the exception of a modest decrease in TDS concentration in Middle Chinle well WCW.

6.3.3 CHLORIDE - MIDDLE CHINLE

Figure 6.3-8 presents chloride concentrations in the Middle Chinle aquifer during 2004, and observed concentrations varied from slightly greater than 50 to slightly less than 200 mg/l. None of the concentrations exceeded the proposed NRC site standard of 250 mg/l for the mixing and non-mixing zones of the Middle Chinle aquifer. Therefore, chloride concentrations are not useful for defining the degree of, or the need for, restoration of the Middle Chinle aquifer.

Time plots of chloride concentration are presented on Figure 6.3-9 for Middle Chinle wells 859, CW15, CW17, CW35, CW44 and CW45. Chloride concentrations were not measured in any of these Middle Chinle wells in 2004.

A second set of chloride concentration plots for the Middle Chinle aquifer is presented in Figure 6.3-10. Data plotted on this figure shows a small increase in 2004 in wells 493, CW1 and CW2. These small changes are deemed to be within natural variation in the Middle Chinle aquifer.

6.3.4 URANIUM - MIDDLE CHINLE

Uranium is an important constituent in the Middle Chinle aquifer due to the presence of elevated concentrations in the aquifer in the southern and western portions of Felice Acres. These elevated concentrations are a result of alluvial recharge to the Middle Chinle aquifer in this area. Water in the saturated portion of the alluvial aquifer flows across a subcrop of the Middle Chinle aquifer just south of Felice Acres, and alluvial ground water has entered the Middle Chinle aquifer in this area. Figure 6.3-11 presents contours of uranium concentrations in the Middle Chinle aquifer during 2004. An area of concentrations greater than the proposed mixing-zone site standard exists in the southwestern portion of Felice Acres. Uranium concentrations in the Middle Chinle aquifer, west of the West Fault, naturally exceed 0.1 mg/l.

The 2004 values from wells CW35 and WR25 exceed the proposed mixing-zone site standard concentration, but they are naturally occurring because the West Fault isolates this area from impacts by seepage from the tailings. Flow in the Middle Chinle aquifer west of the West Fault moves from the area near well CW35 toward the subcrop area to the south. Uranium concentrations exceed 0.07 mg/l (non-mixing zone proposed site standard) in two areas of the Middle Chinle aquifer, at wells 434 and 493 in Broadview Acres and Felice Acres, respectively.

Figure 6.3-12 presents uranium concentration plots versus time for Middle Chinle wells 859, CW15, CW17, CW35, CW44 and CW45 (see Figure 6.3-2 for well locations). The 2004 uranium concentrations shown on this plot are fairly steady, except for a continuing decline in uranium concentrations in well CW45. This plot shows that water taken from Middle Chinle wells CW44 and CW45 contains significant concentrations of uranium, but the concentrations are gradually decreasing and are expected to continue to decrease over the next several years. Additional monitoring of these wells with time will better define this collection-induced trend.

The uranium concentration plots for the Middle Chinle wells in the non-mixing zone are presented on Figure 6.3-13. Uranium concentrations were small in wells CW1, CW2, CW28 and WCW in 2004. The uranium concentration in well 434 water had previously been declining during the last few years, and this trend continued in 2004. A small increase in uranium concentration occurred in well 493 in 2004.

6.3.5 SELENIUM - MIDDLE CHINLE

Only well CW27 in the Middle Chinle mixing zone contained water with selenium concentration exceeding 0.14 mg/l in 2004 (see Figure 6.3-14). The selenium concentration in the non-mixing zone wells 493 and CW28 exceeds the proposed background concentration of 0.07 mg/l. These areas of elevated concentrations have resulted from recharge to the Middle Chinle aquifer from the alluvium in the subcrop area just south of Felice Acres. Flow in the Middle Chinle aquifer in this locale is toward the north causing chemical constituents introduced into the Middle Chinle from the alluvium in the subcrop area to move to the north. Analysis of background selenium concentrations in the mixing and non-mixing zones resulted in proposed NRC site standards of 0.14 and 0.07 mg/l, respectively (see legend of Figure 6.3-14).

Selenium concentrations somewhat less than 0.1 mg/l have been measured in Middle Chinle wells west of the West Fault. These concentrations have been determined to be naturally occurring, because the flow is from the north in this area, and therefore the ground water could not have been influenced by tailings seepage. All other selenium concentrations in the Middle Chinle aquifer beyond these areas are low values.

Selenium concentrations with time for the mixing zone Middle Chinle wells 859, CW15, CW17, CW35, CW44 and CW45 are presented in Figure 6.3-15. A decline in selenium concentration had been observed in well CW45 for the last several years, while the 2004 value exhibited a very modest reversal of this trend.

Selenium concentrations in wells CW1 and CW2, which are located north of the Large Tailings Pile, have increased gradually over the past three years. Figure 6.3-16 presents the selenium concentrations for Middle Chinle wells in the non-mixing zone. In 2004, selenium concentrations measured in water collected from well 434 gradually declined while the concentration from well WCW remained at a low level. Selenium concentrations have varied significantly in well 493. An overall increase in selenium concentrations in water collected from well 493 has been observed over the past fifteen years. The 2004 data indicates a small decrease. The connection between the alluvial aquifer and the Middle Chinle aquifer south of Felice Acres is the cause for the elevated concentrations in well 493. The injection of fresh water into Middle Chinle wells CW14 and CW30 and the use of Middle Chinle wells 498, CW44 and CW45 for irrigation should cause these elevated concentrations to decrease. The 2004 selenium concentration in well CW28 was similar to the 2002 and 2003 concentrations.

6.3.6 MOLYBDENUM - MIDDLE CHINLE

The 2004 molybdenum concentrations in the Middle Chinle aquifer are presented on Figure 6.3-17. None of the molybdenum concentrations for 2004 exceed the detection limit, except for a value of 0.07 mg/l in well 434.

Figure 6.3-18 presents the molybdenum concentrations with time for Middle Chinle wells 859, CW15, CW17, CW35, CW44 and CW45, while Figure 6.3-19 presents the molybdenum concentrations with time for wells 434, 493, CW1, CW2, CW28 and WCW. These plots show that the concentration in each of these wells has been low for 2004 with a small

decrease in the small concentration in well 434. Additional monitoring with time is needed to determine if the small molybdenum concentration in this well is of significance.

6.3.7 NITRATE - MIDDLE CHINLE

Nitrate concentrations have always been low in the Middle Chinle aquifer and therefore are not routinely monitored. However, nitrate concentrations were measured in all of the Middle Chinle aquifer wells in 2003 and in several wells in 2004 in order to update the database. Figure 6.3-20 presents the nitrate concentrations in the Middle Chinle aquifer and shows that the only notable levels of nitrate in the Middle Chinle aquifer are west of the West Fault. Nitrate concentrations are greater than 10 mg/l in two of the four Middle Chinle wells west of West Fault. Due to the flow direction in the Middle Chinle aquifer west of the West Fault, these concentrations are determined to be naturally occurring. Therefore, no restoration of nitrate concentrations in the Middle Chinle aquifer is needed and this constituent does not require a site standard for the Middle Chinle aquifer.

6.3.8 RADIUM-226 AND RADIUM-228 - MIDDLE CHINLE

Radium concentrations in the Middle Chinle aquifer have always been low, showing that these two parameters are not important relative to the restoration of the Middle Chinle aquifer. The 2003 updated radium-226 and radium-228 concentrations in the Middle Chinle aquifer showed the recent values of radium as remaining low. All of the radium-226 values measured in 2004 were less than the detection limit of 0.2 pCi/l. The few radium-228 values measured in 2004 were less than the detection level of 1 pCi/l. Radium-226 and radium-228 are not important parameters relative to the Middle Chinle aquifer and a site standard is not warranted for these two constituents.

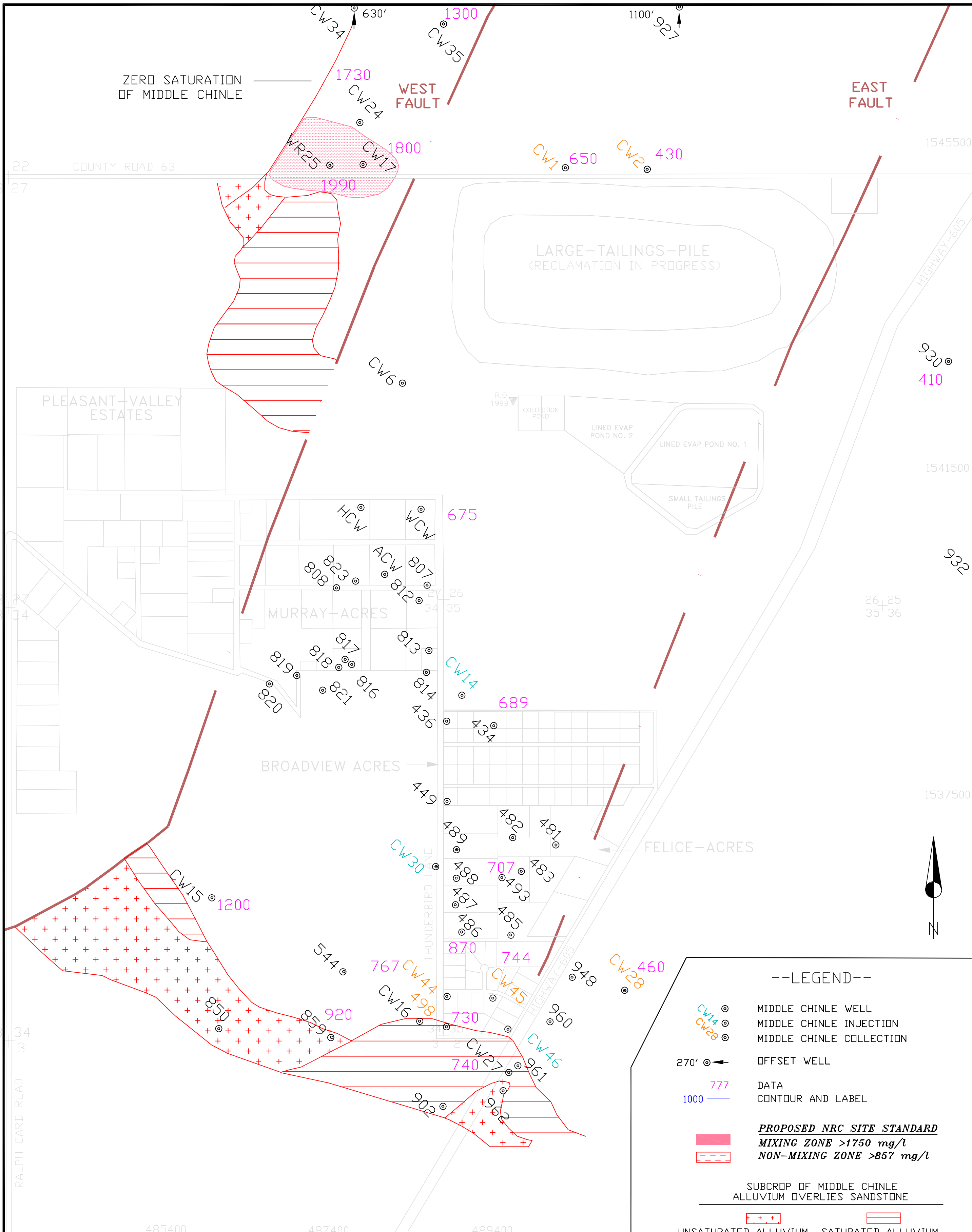
6.3.9 VANADIUM - MIDDLE CHINLE

Vanadium concentrations in the Middle Chinle aquifer have always been low. Previous monitoring of vanadium in the Middle Chinle aquifer has demonstrated that vanadium is not a significant parameter in this aquifer and the 2003 updated vanadium measurements confirmed the low values. Monitoring of vanadium for the Middle Chinle should be eliminated,

because only a few low values have previously been detected in the alluvial aquifer near the tailings piles. All of the 2004 vanadium measurements for the Middle Chinle aquifer are less than detection level of 0.01 mg/l. These values are consistent with values observed previously and, therefore, reinforce the conclusion that continued monitoring of vanadium concentrations in the Middle Chinle aquifer should not be required. A site standard for vanadium is therefore not needed for the Middle Chinle aquifer.

6.3.10 THORIUM-230 - MIDDLE CHINLE

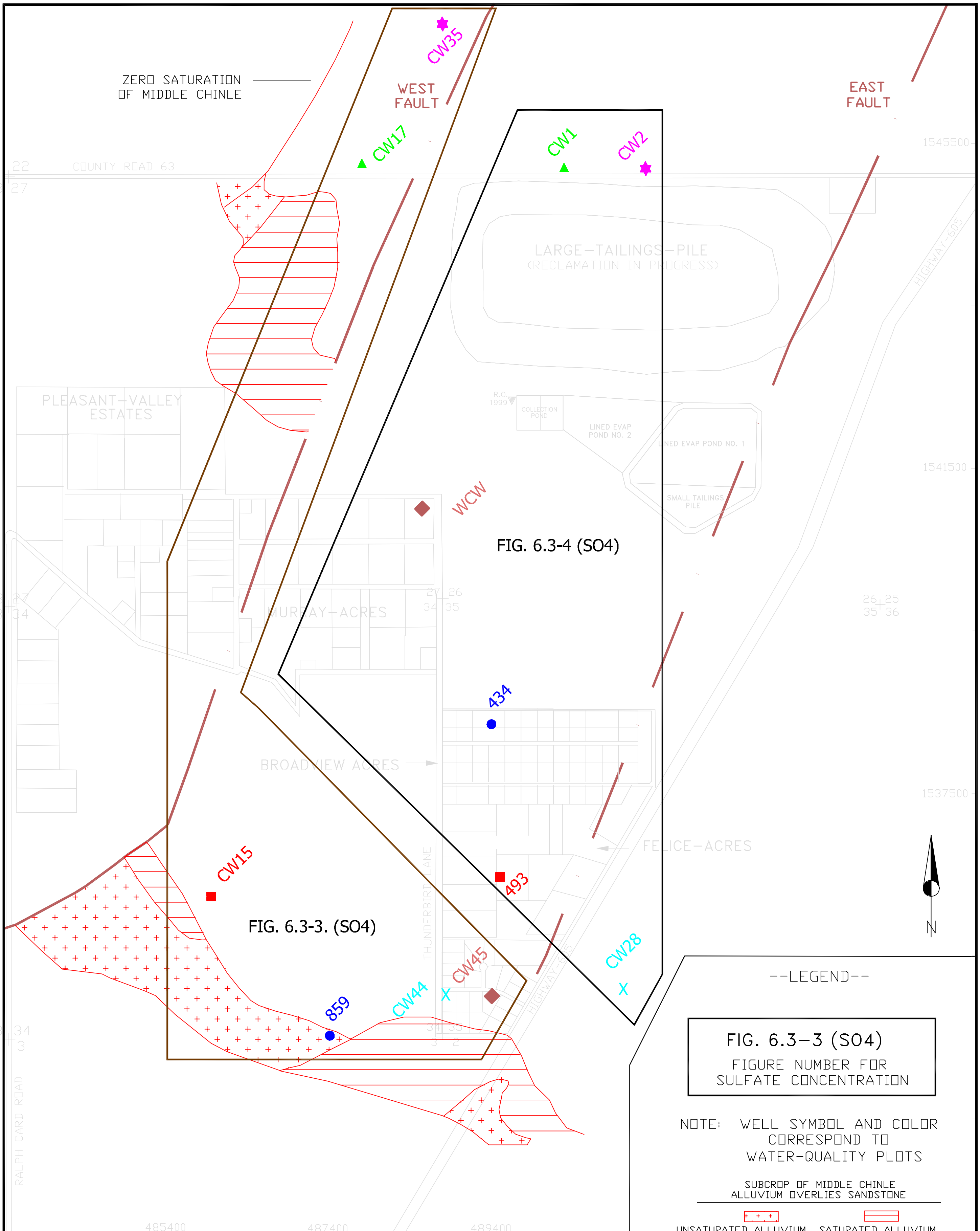
Thorium-230 concentrations are not significant in the alluvial aquifer outside of the Large Tailings. Therefore, the Middle Chinle aquifer does not have the potential for containing significant thorium concentrations from the tailings seepage. Thorium-230 is, therefore, not a significant parameter in the Middle Chinle aquifer and should be eliminated from future monitoring in the Middle Chinle aquifer. Thorium-230 concentrations were measured in all wells sampled from Middle Chinle wells in 2003, and all of these values were less than detection. All of the thorium-230 values measured in 2004 were less than the detection limit. These thorium-230 levels are consistent with concentrations previously measured in the Middle Chinle aquifer, which shows that thorium-230 is not an important parameter in the Middle Chinle aquifer and thus does not warrant establishment of a site standard.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 6.3-1. SULFATE CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\MID1600



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05
FIGURE 6.3-2. LOCATION OF MIDDLE CHINLE WELLS WITH WATER-QUALITY PLOTS		c:\projects\2004-06\MID1600

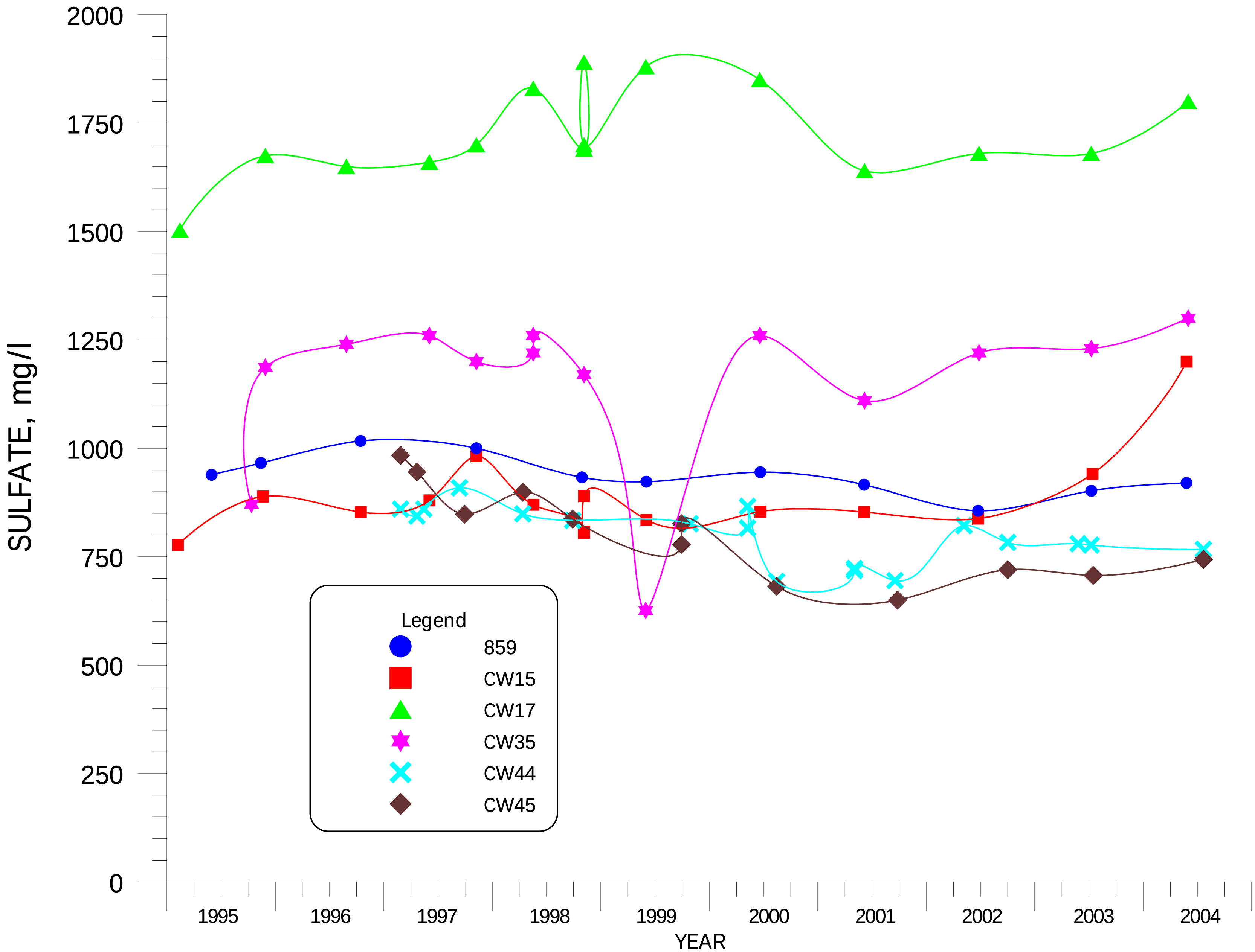


FIGURE 6.3-3. SULFATE CONCENTRATIONS FOR MIXING ZONE WELLS 859, CW15, CW17, CW35, CW44 AND CW45.

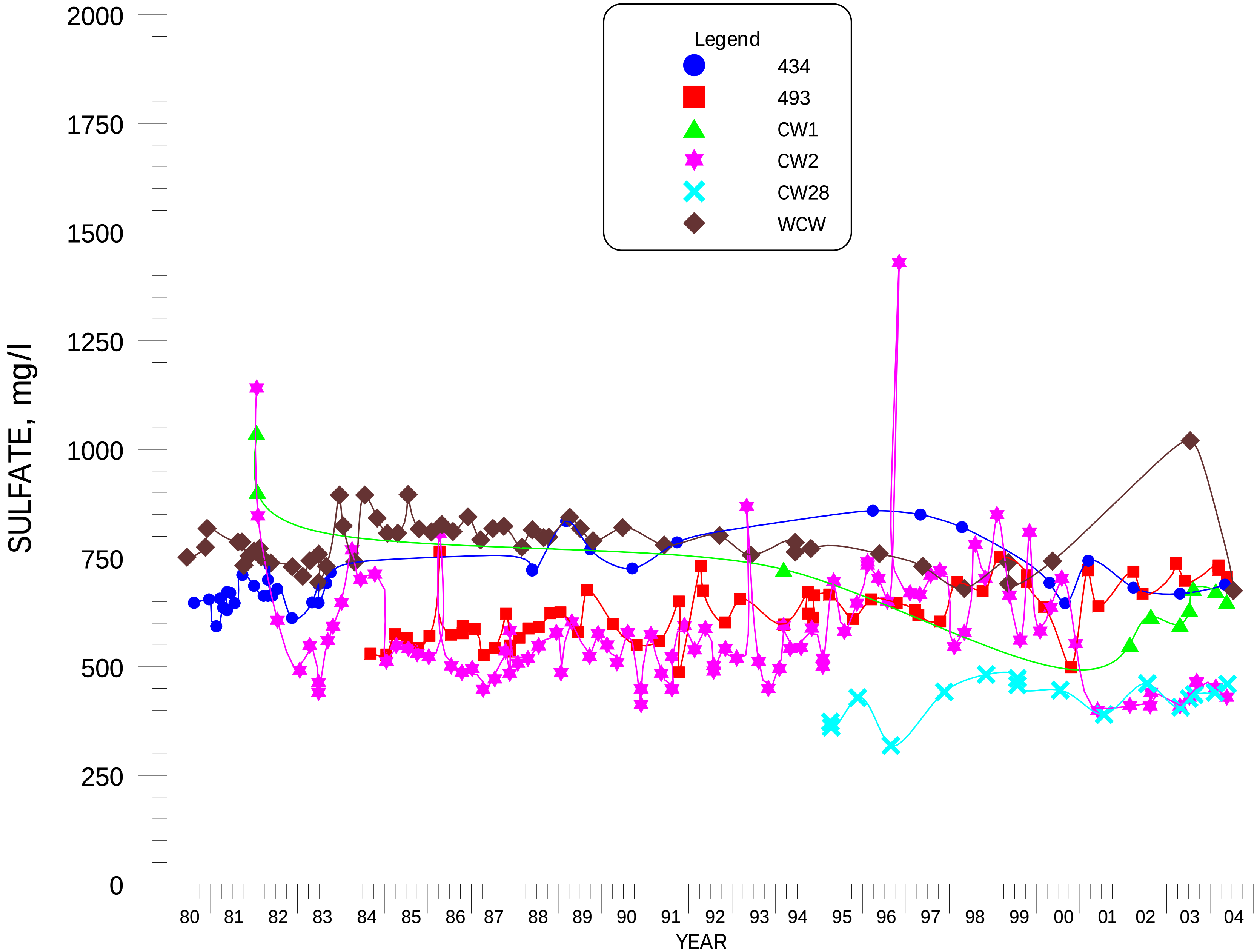
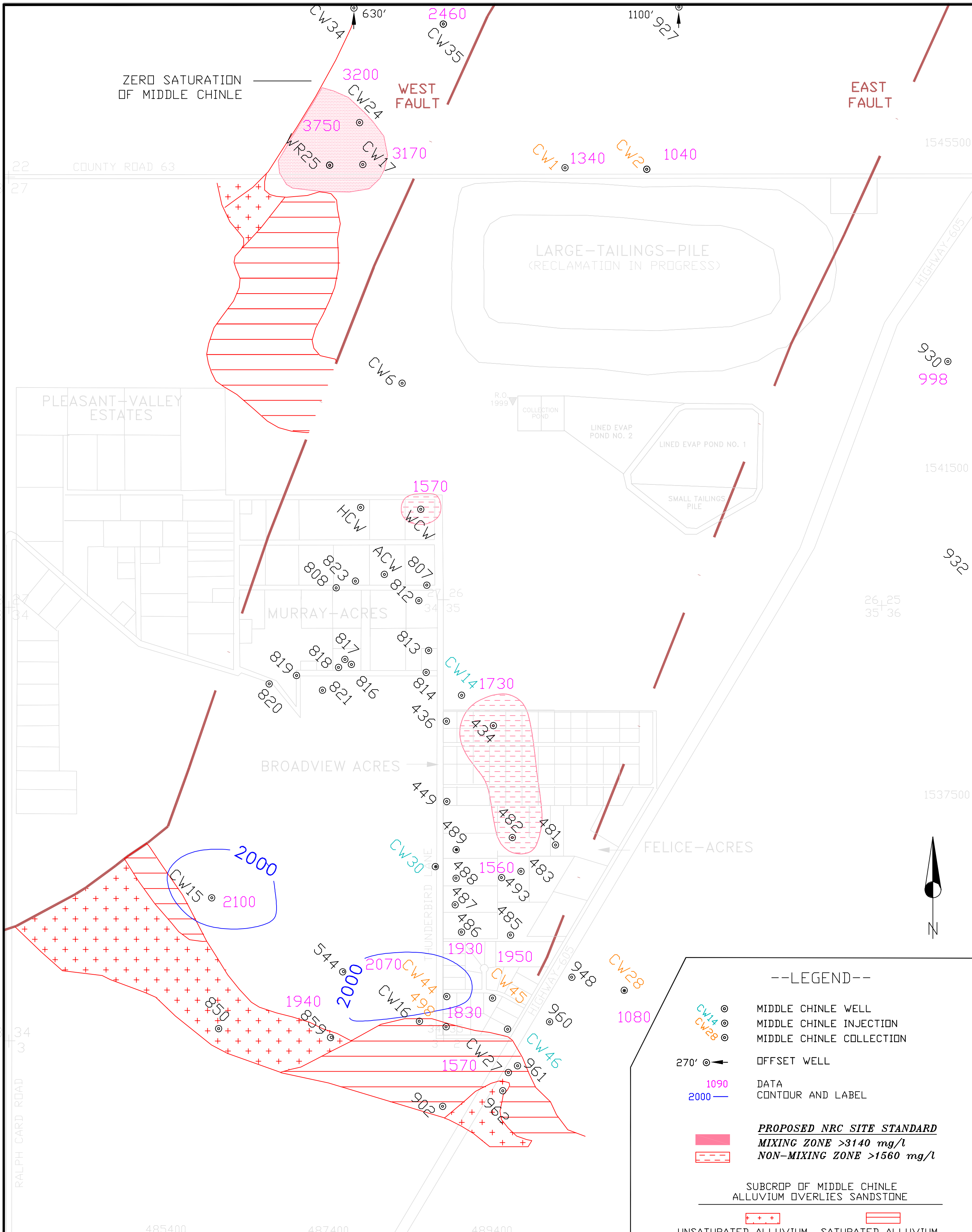


FIGURE 6.3-4. SULFATE CONCENTRATIONS FOR NON-MIXING ZONE WELLS 434, 493, CW1, CW2, CW28 AND WCW.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 6.3–5. TDS CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2004, mg/l

c:\projects\ 2004-06\MID1600

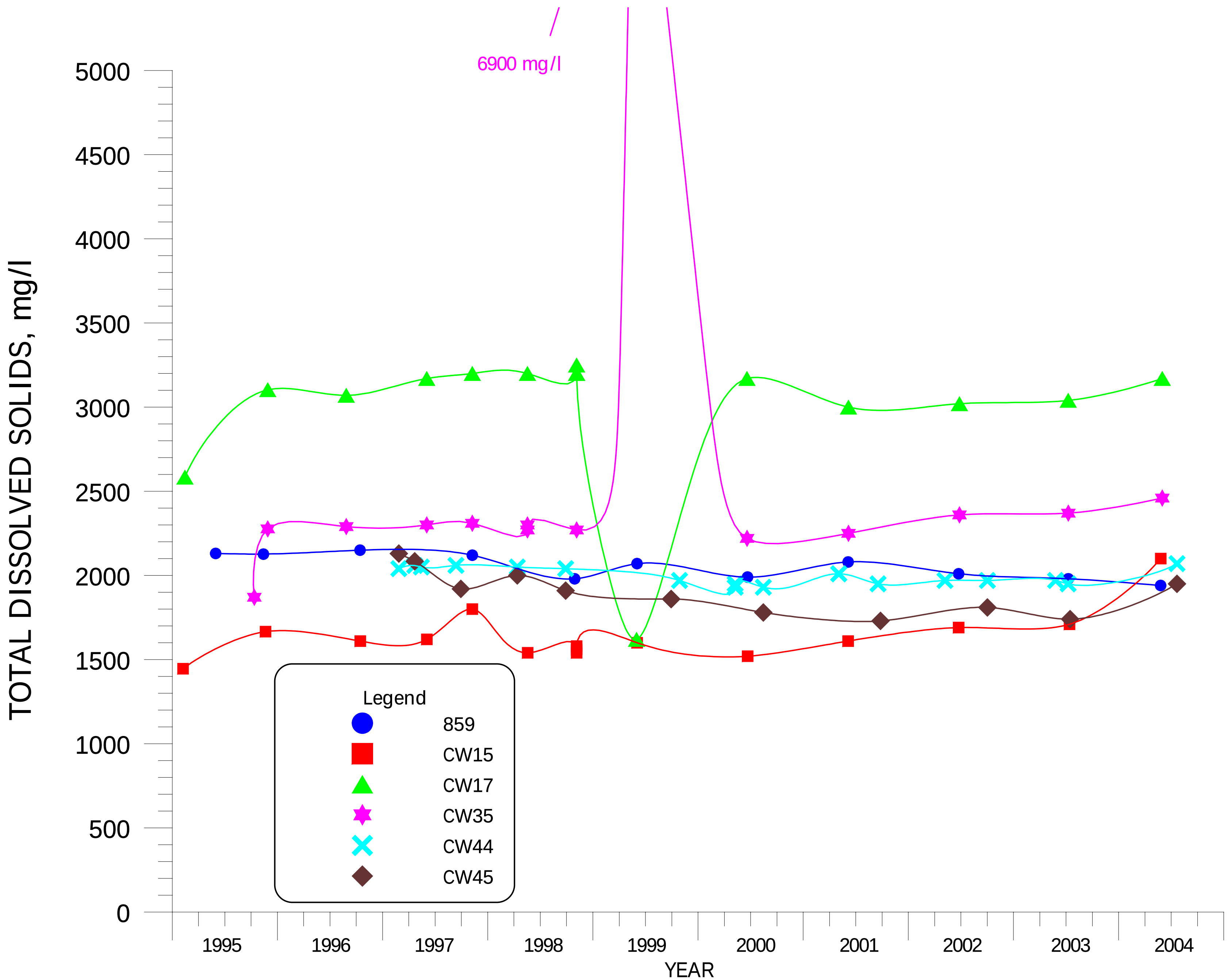


FIGURE 6.3-6. TDS CONCENTRATIONS FOR MIXING ZONE WELLS 859, CW15, CW17, CW35, CW44 AND CW45.

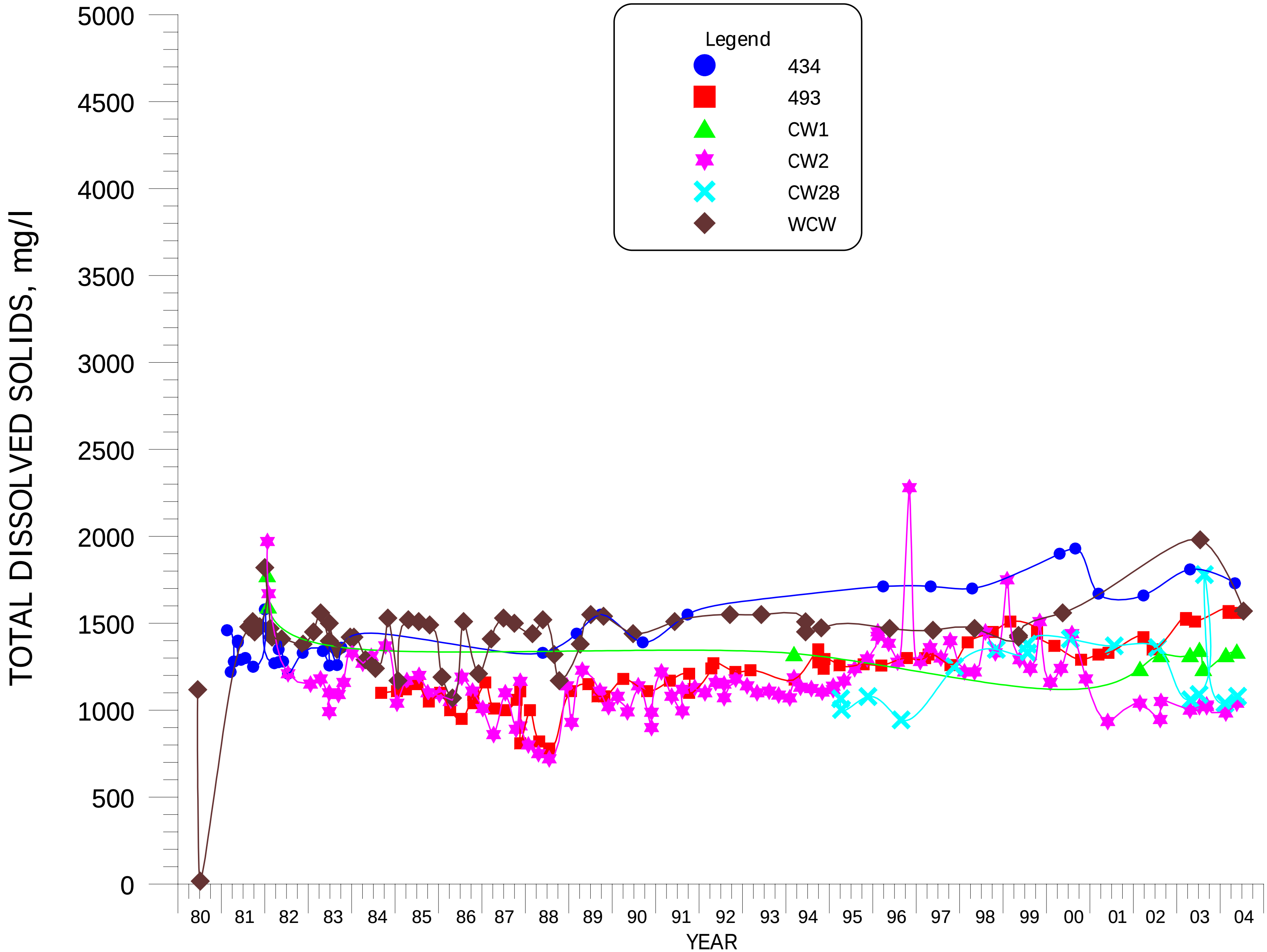
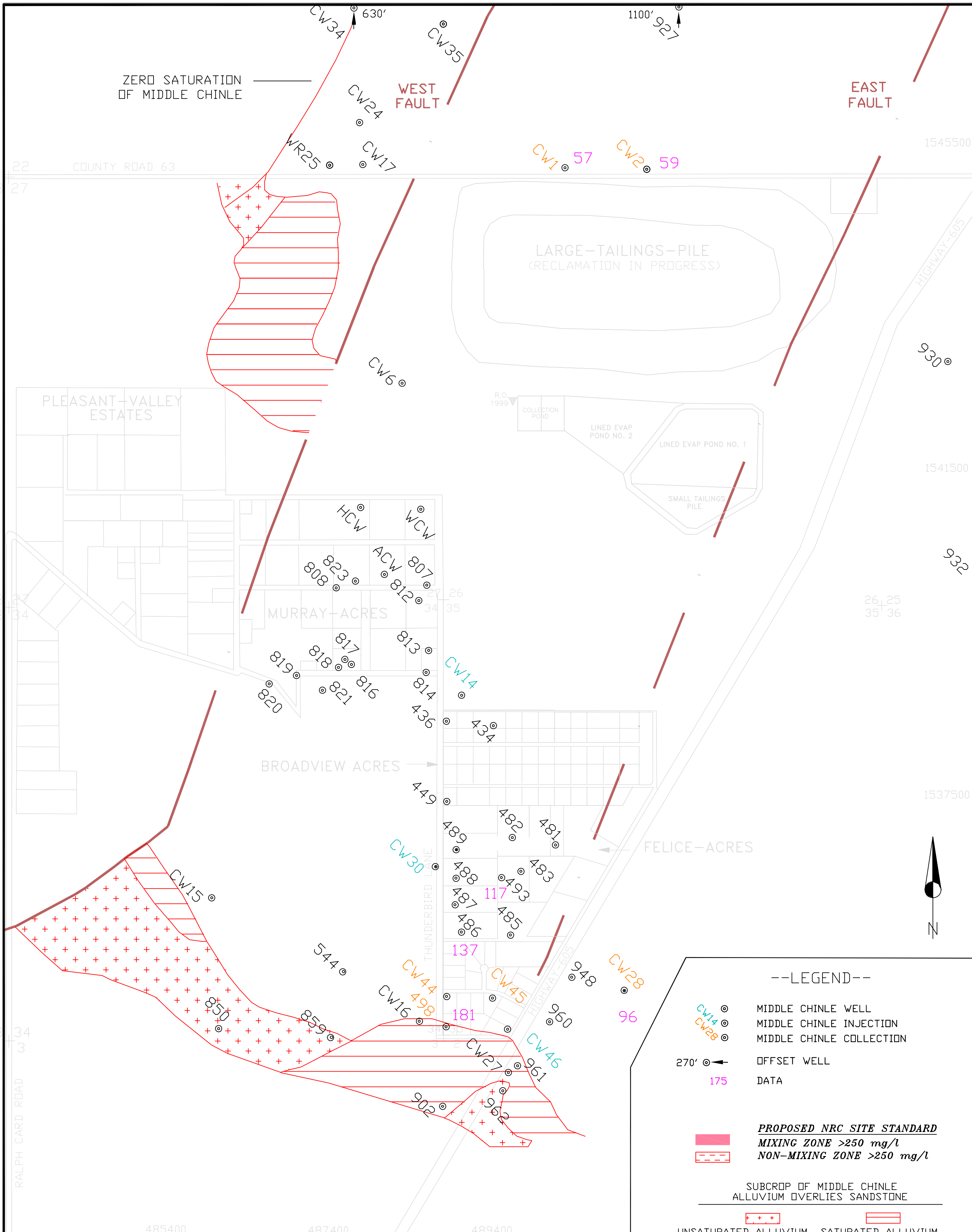


FIGURE 6.3-7. TDS CONCENTRATIONS FOR NON-MIXING ZONE WELLS 434, 493, CW1, CW2, CW28 AND WCW.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 6.3-8. CHLORIDE CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\MID1600

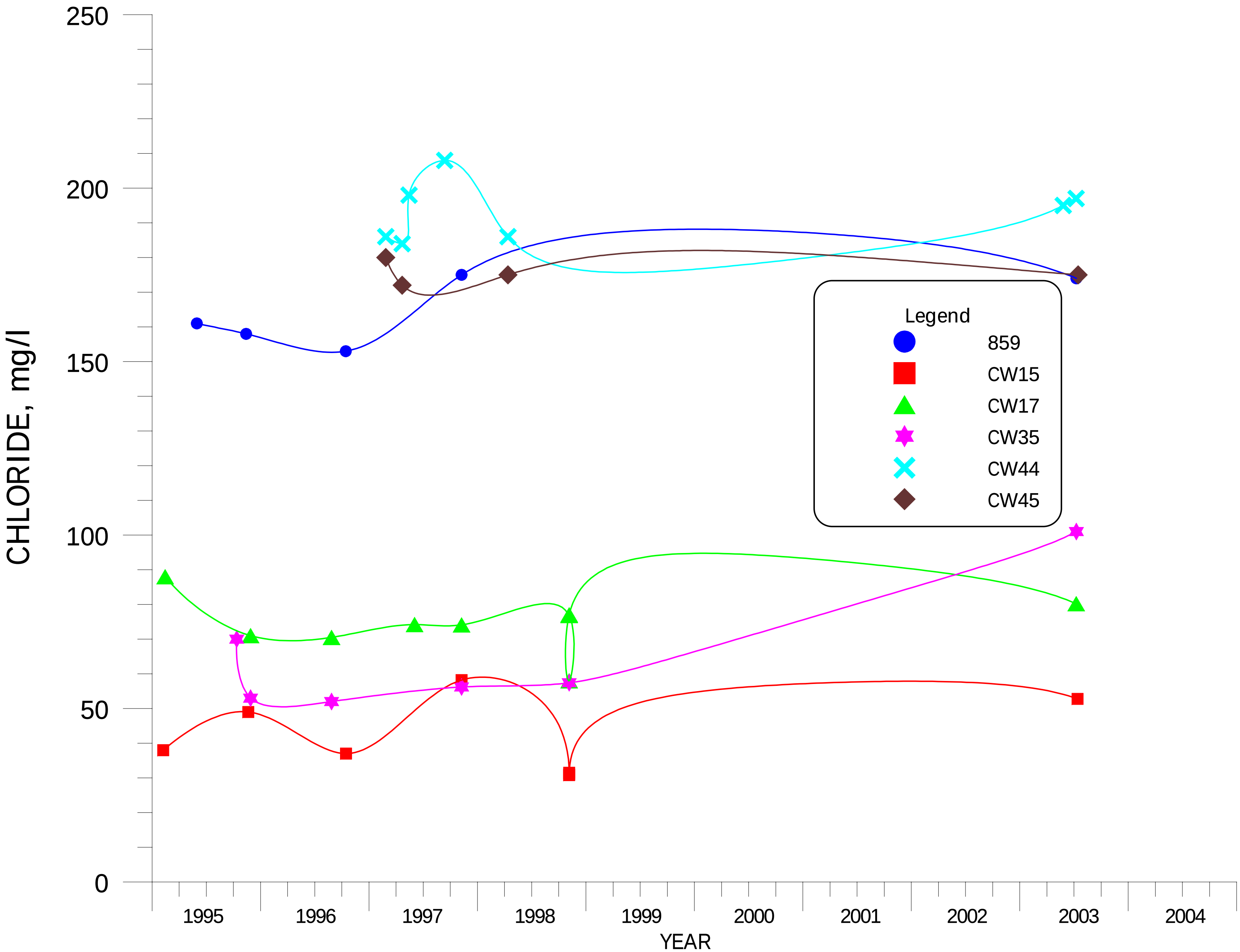


FIGURE 6.3-9. CHLORIDE CONCENTRATIONS FOR MIXING ZONE WELLS 859, CW15, CW17, CW35, CW44 AND CW45.

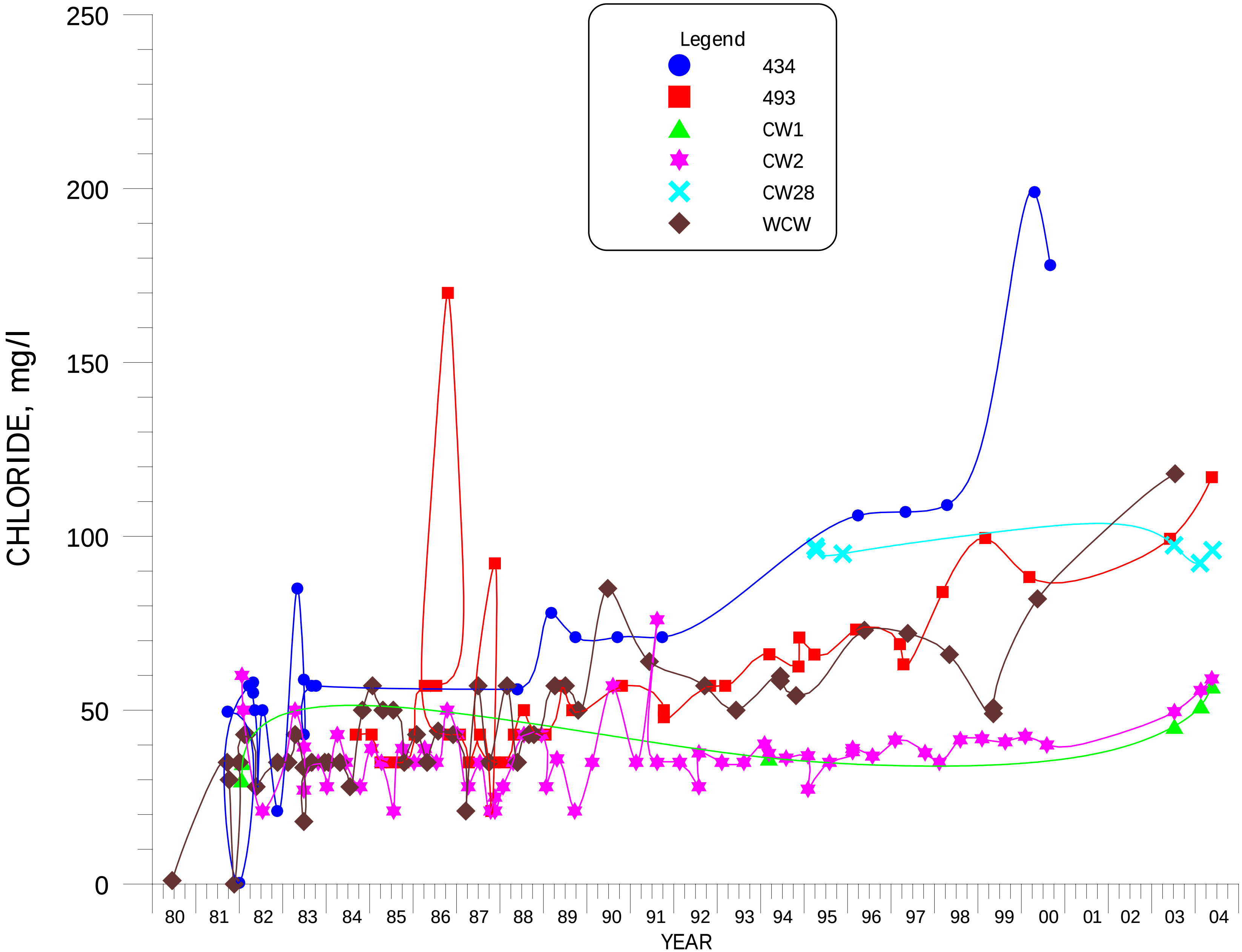
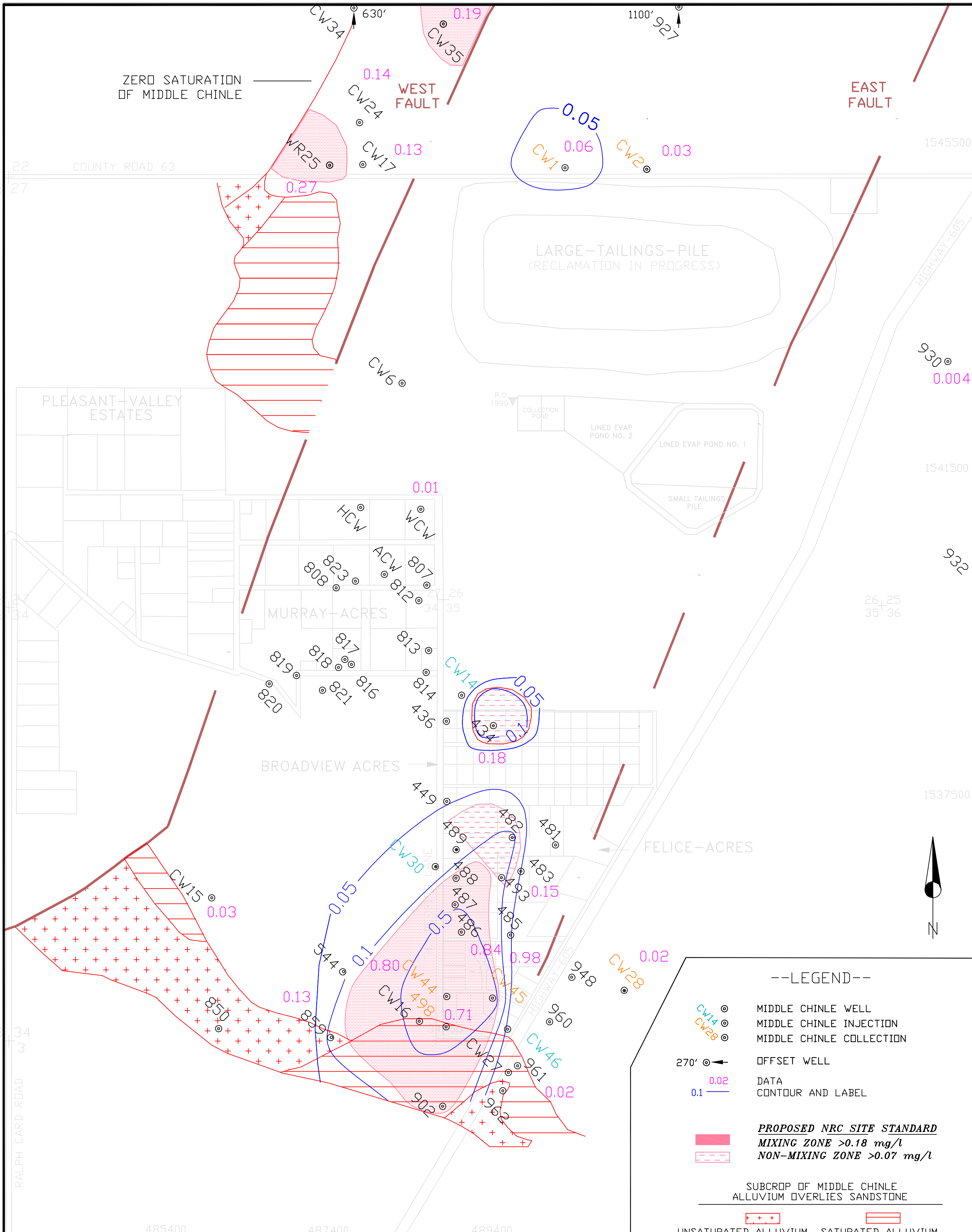


FIGURE 6.3-10. CHLORIDE CONCENTRATIONS FOR NON-MIXING ZONE WELLS 434, 493, CW1, CW2, CW28 AND WCW.



SCALE: 1"=1600' | HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W | DATE: 03/25/05

FIGURE 6.3-11. URANIUM CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\MID1600

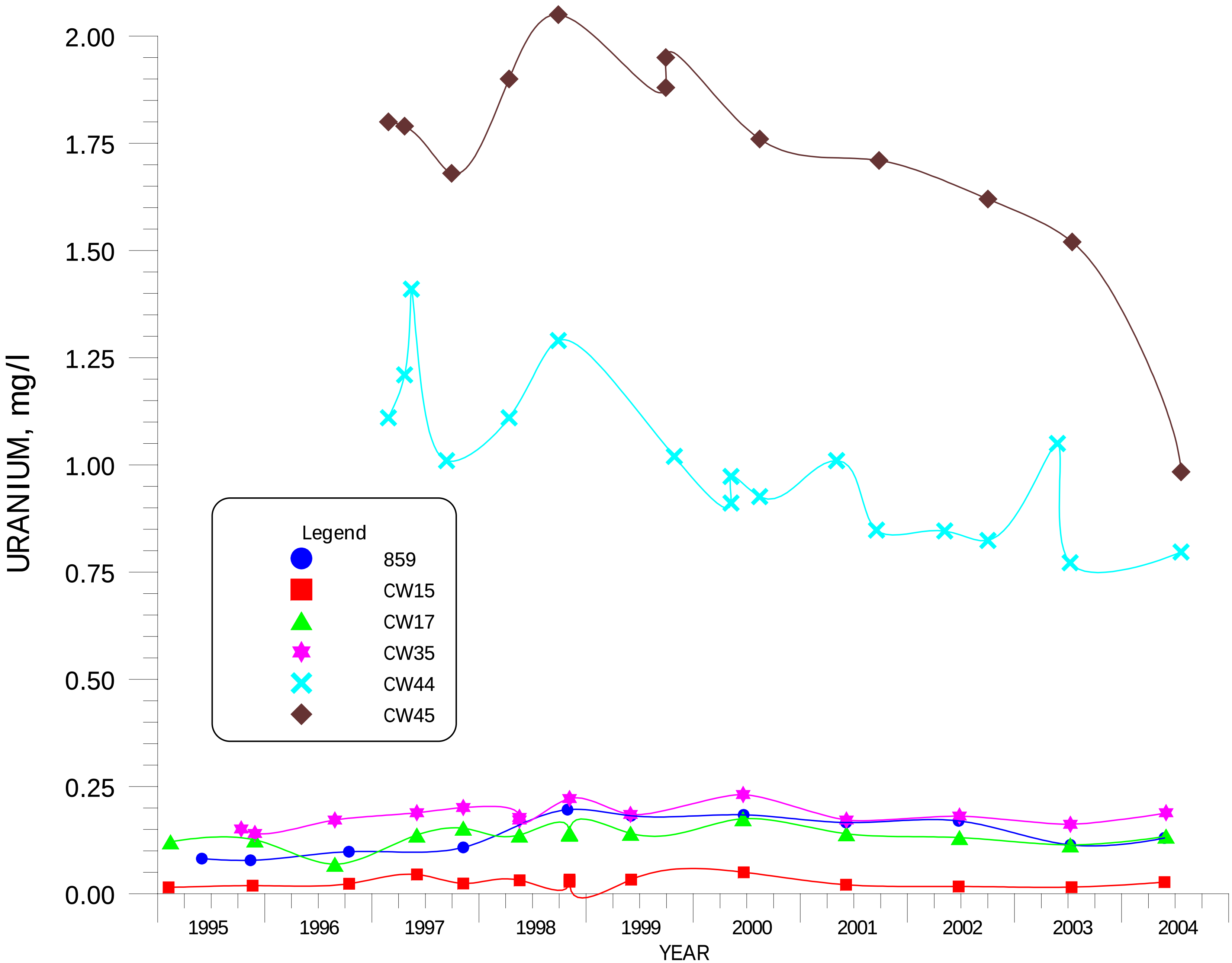


FIGURE 6.3-12. URANIUM CONCENTRATIONS FOR MIXING ZONE WELLS 859, CW15, CW17, CW35, CW44 AND CW45.

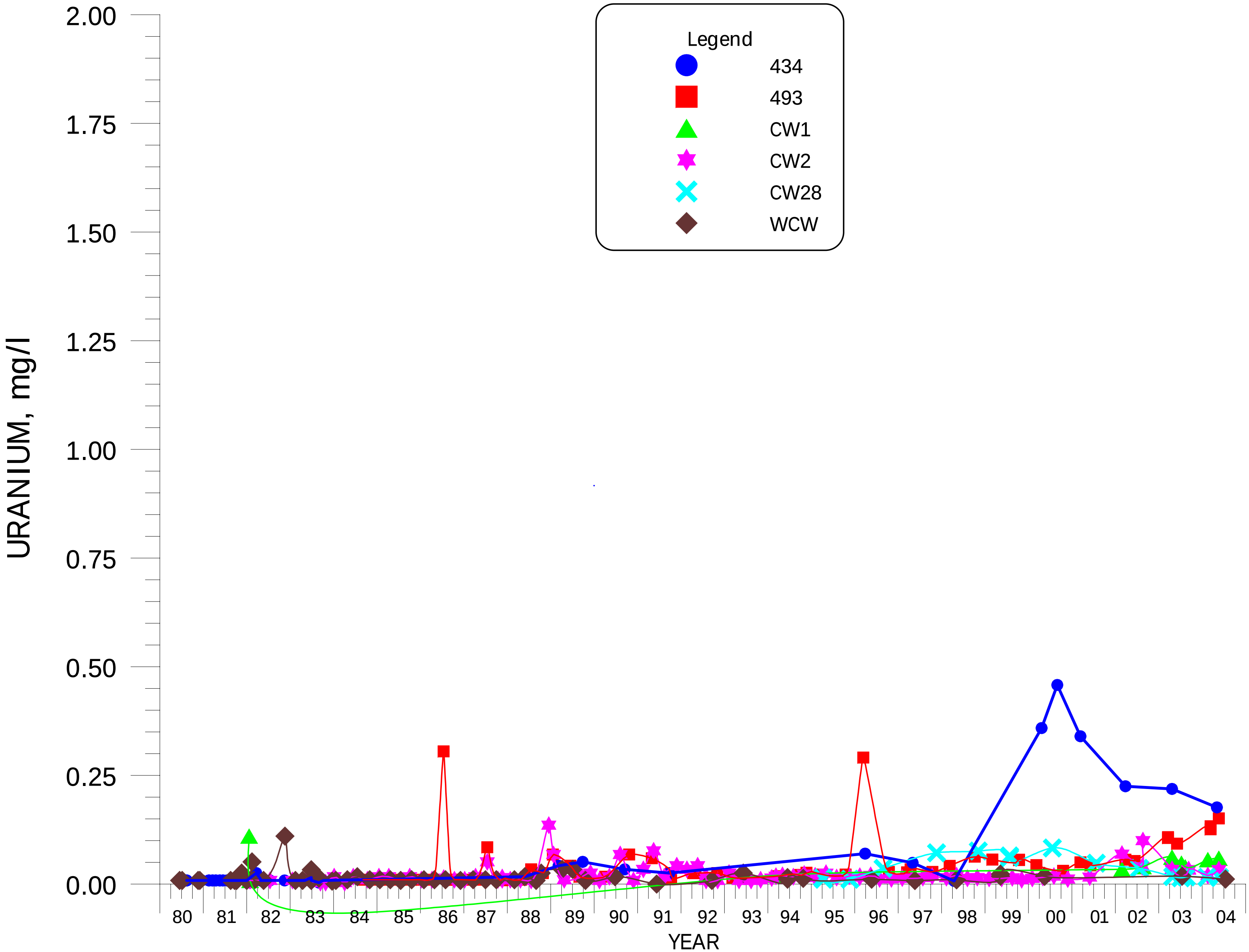
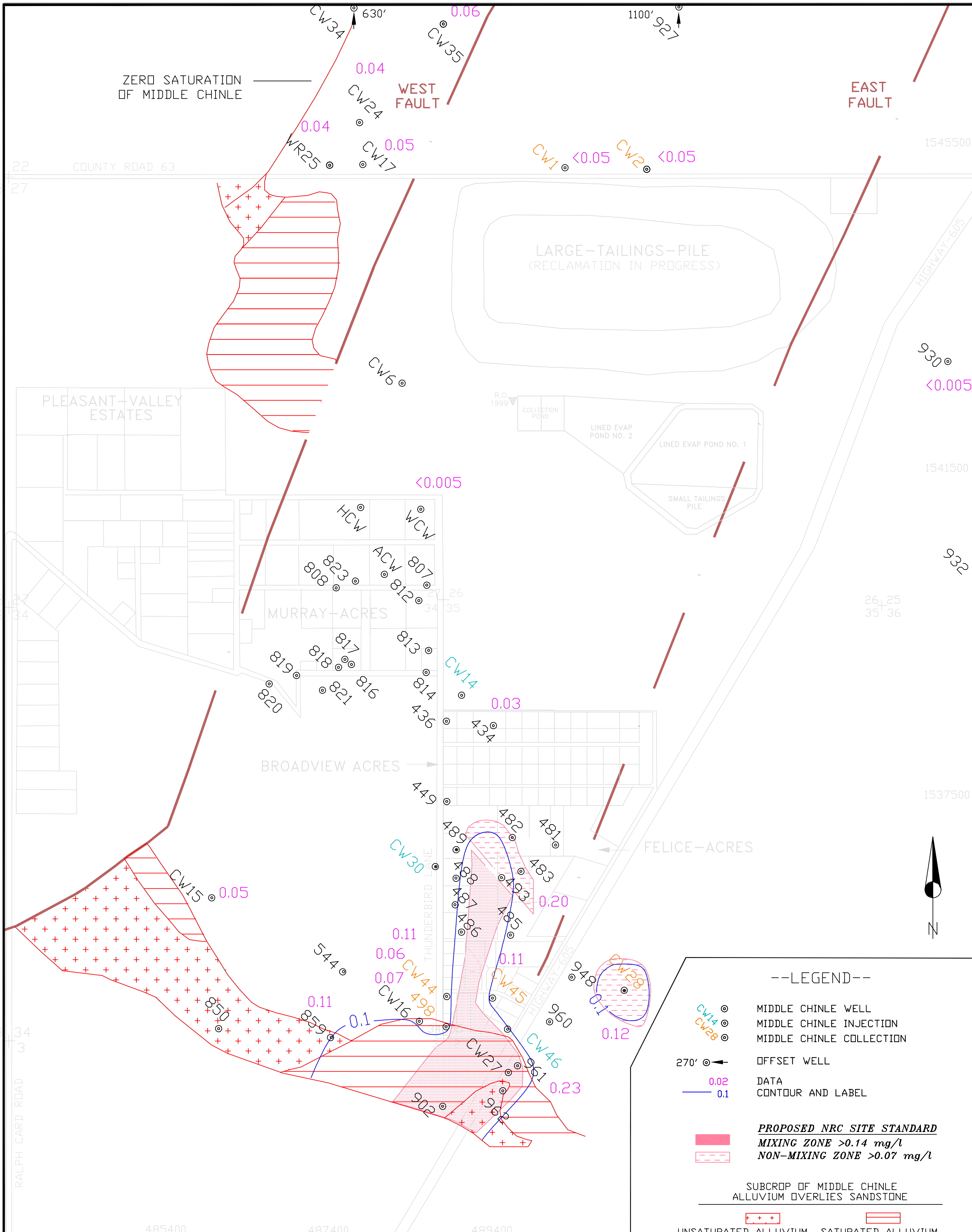


FIGURE 6.3-13. URANIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 434, 493, CW1, CW2, CW28 AND WCW.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 6.3-14. SELENIUM CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\MID1600

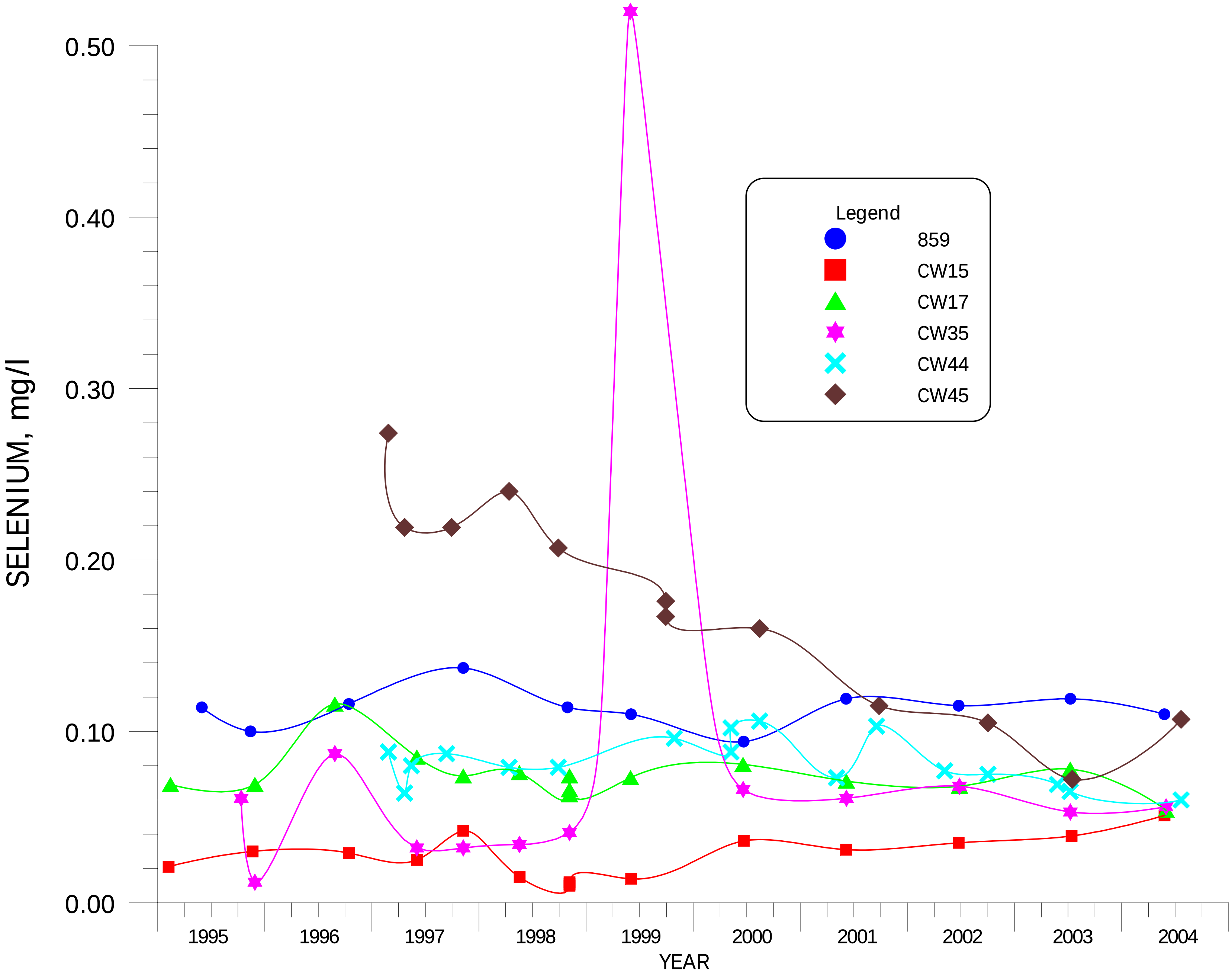


FIGURE 6.3-15. SELENIUM CONCENTRATIONS FOR MIXING ZONE WELLS 859, CW15, CW17, CW35, CW44 AND CW45.

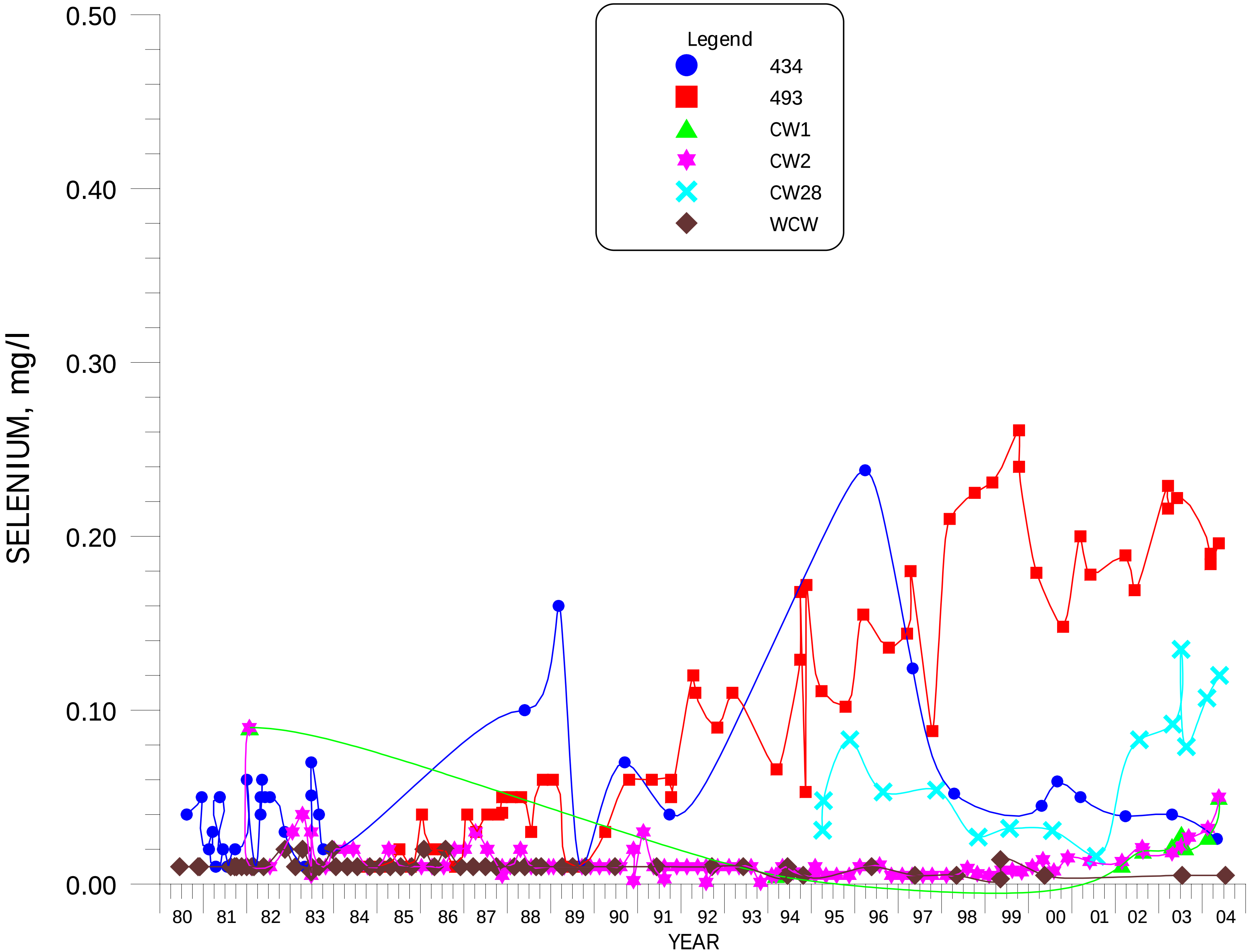
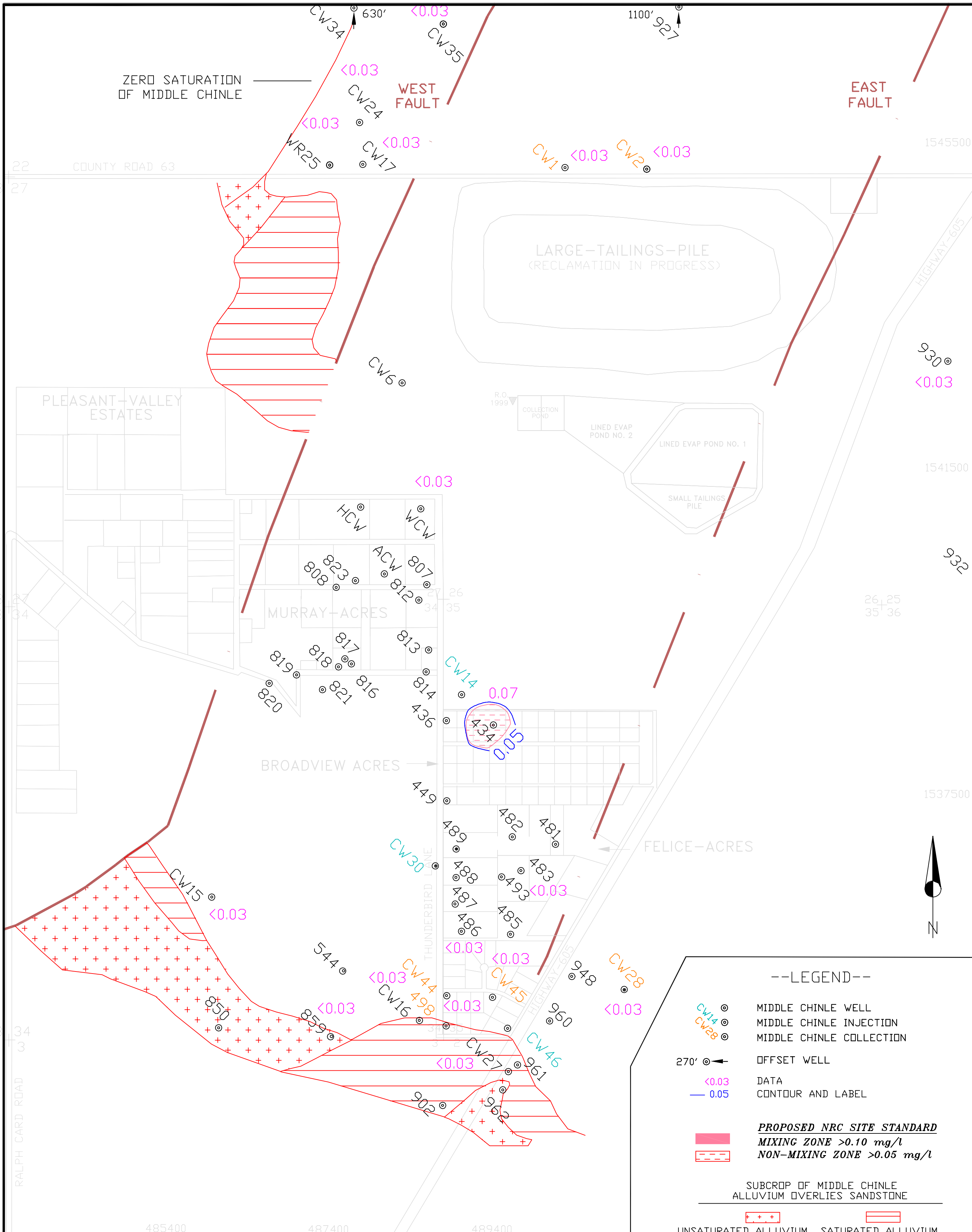


FIGURE 6.3-16. SELENIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 434, 493, CW1, CW2, CW28 AND WCW.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 6.3-17. MOLYBDENUM CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\MID1600

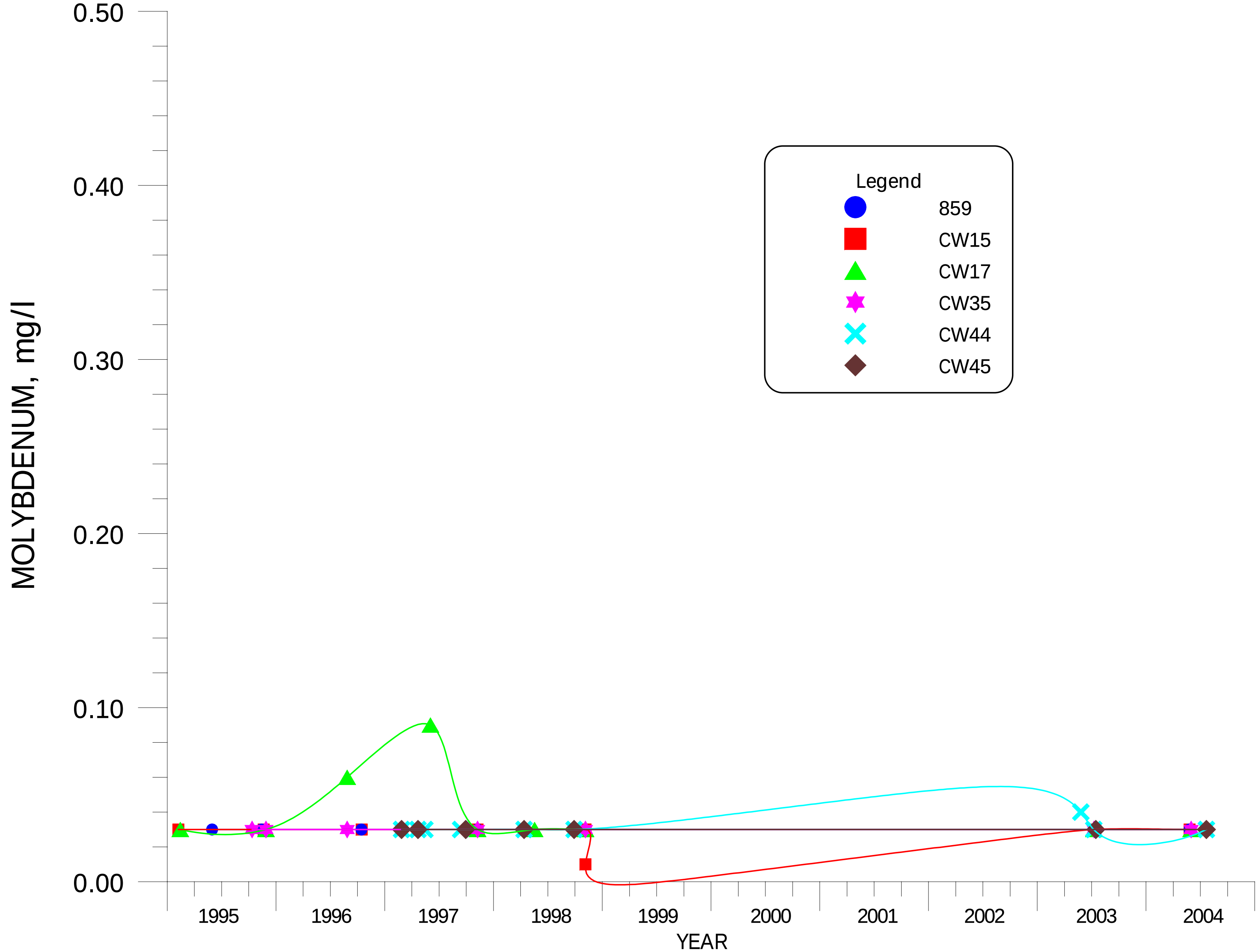


FIGURE 6.3-18. MOLYBDENUM CONCENTRATIONS FOR MIXING ZONE WELLS 859, CW15, CW17, CW35, CW44 AND CW45.

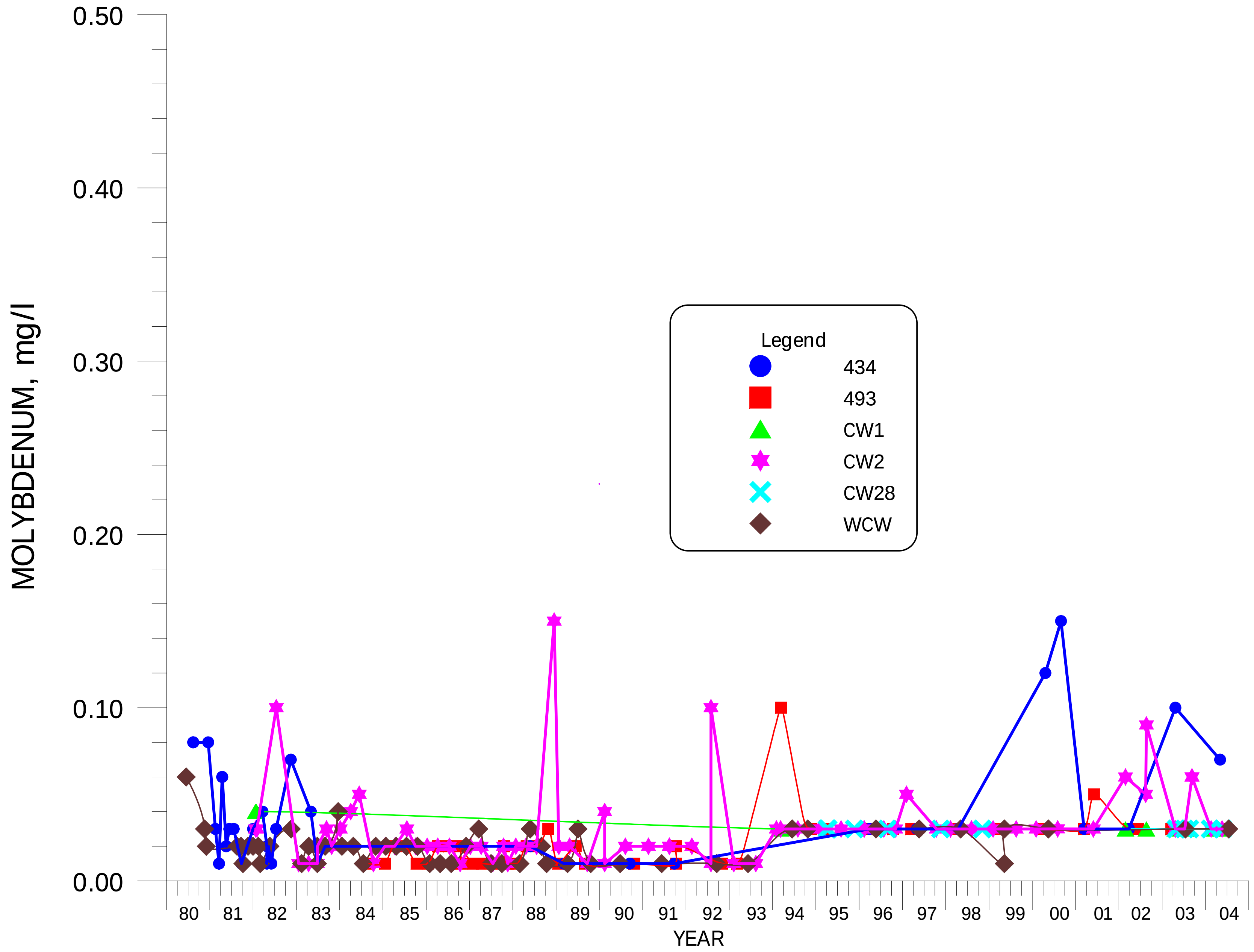
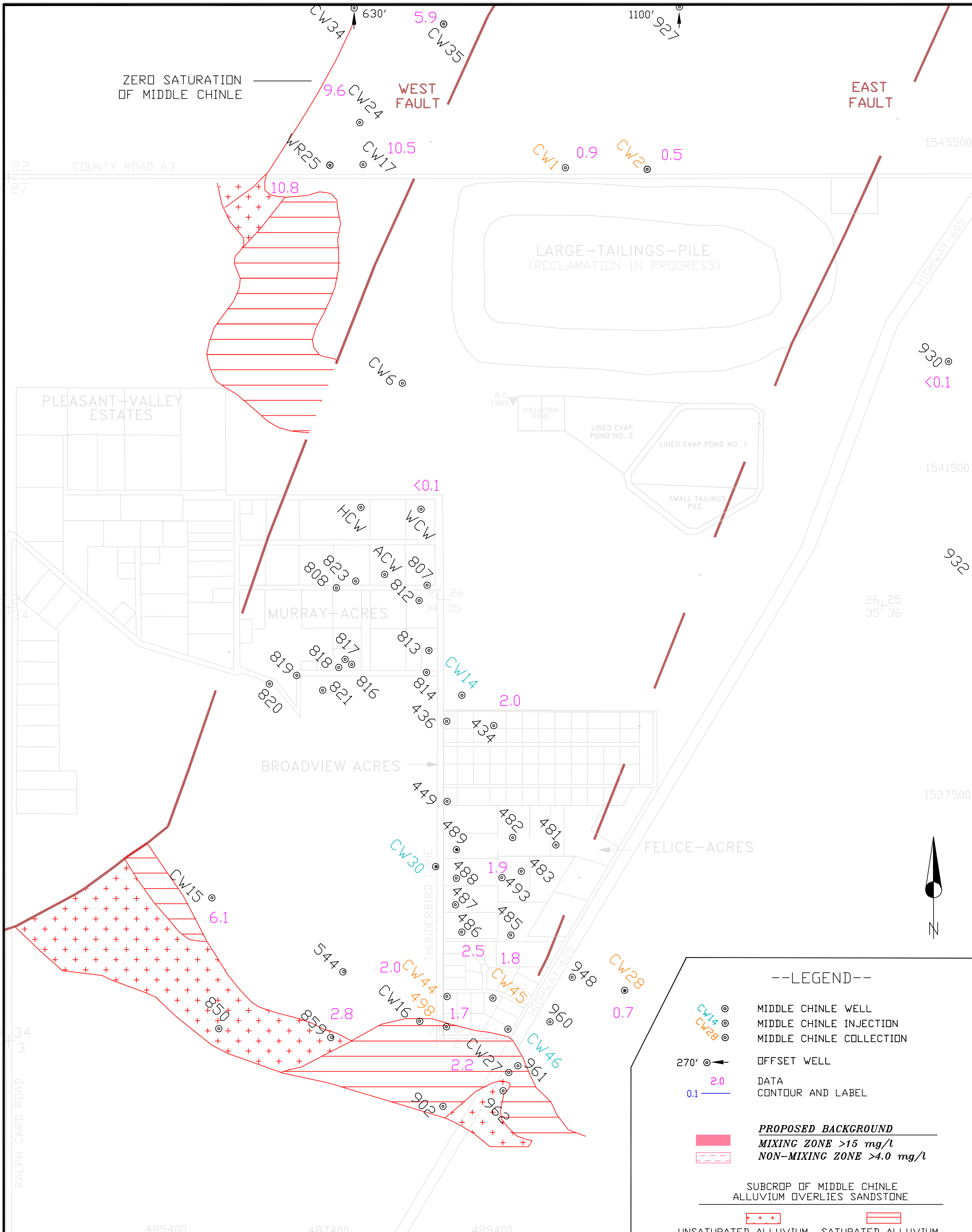


FIGURE 6.3-19. MOLYBDENUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 434, 493, CW1, CW2, CW28 AND WCW.



SCALE: 1"=1600'	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	DATE: 03/25/05

FIGURE 6.3-20. NITRATE CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2004, mg/l

c:\projects\2004-06\MID1600

SECTION 7

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES

SECTION 7

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

FIGURES
(continued)

7.0 LOWER CHINLE AQUIFER MONITORING

7.1 LOWER CHINLE WELL COMPLETION

The Lower Chinle aquifer is a permeable zone in the Chinle shale which exists below the Middle Chinle sandstone and above the San Andres aquifer. The Lower Chinle aquifer becomes important west and southwest of the Homestake Grants Project area where this unit is present at shallower depths. The general permeability of the Lower Chinle aquifer can vary dramatically, because the transmitting ability of this aquifer depends on the presence of a fractured or altered shale that provides secondary permeability. Tables 5.1-1 through 5.1-4 present the Lower Chinle basic well data along with the other Chinle aquifer wells.

Wells that are completed in the Lower Chinle aquifer are shown on Figure 7.1-1. Chinle shale exists above the top of the Lower Chinle aquifer in the area with the dot pattern. This figure also shows the location of the Chinle shale subcrop. The cyan crosshatch pattern shows where the alluvium is saturated in the subcrop area, while the plus-sign pattern shows where the alluvium is not saturated in the subcrop area. Lower Chinle wells 538, 653 and CW29 were used as irrigation supply wells.

SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-LOW03

DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 7.1-1. LIMITS OF LOWER CHINLE AQUIFER AND WELL LOCATIONS

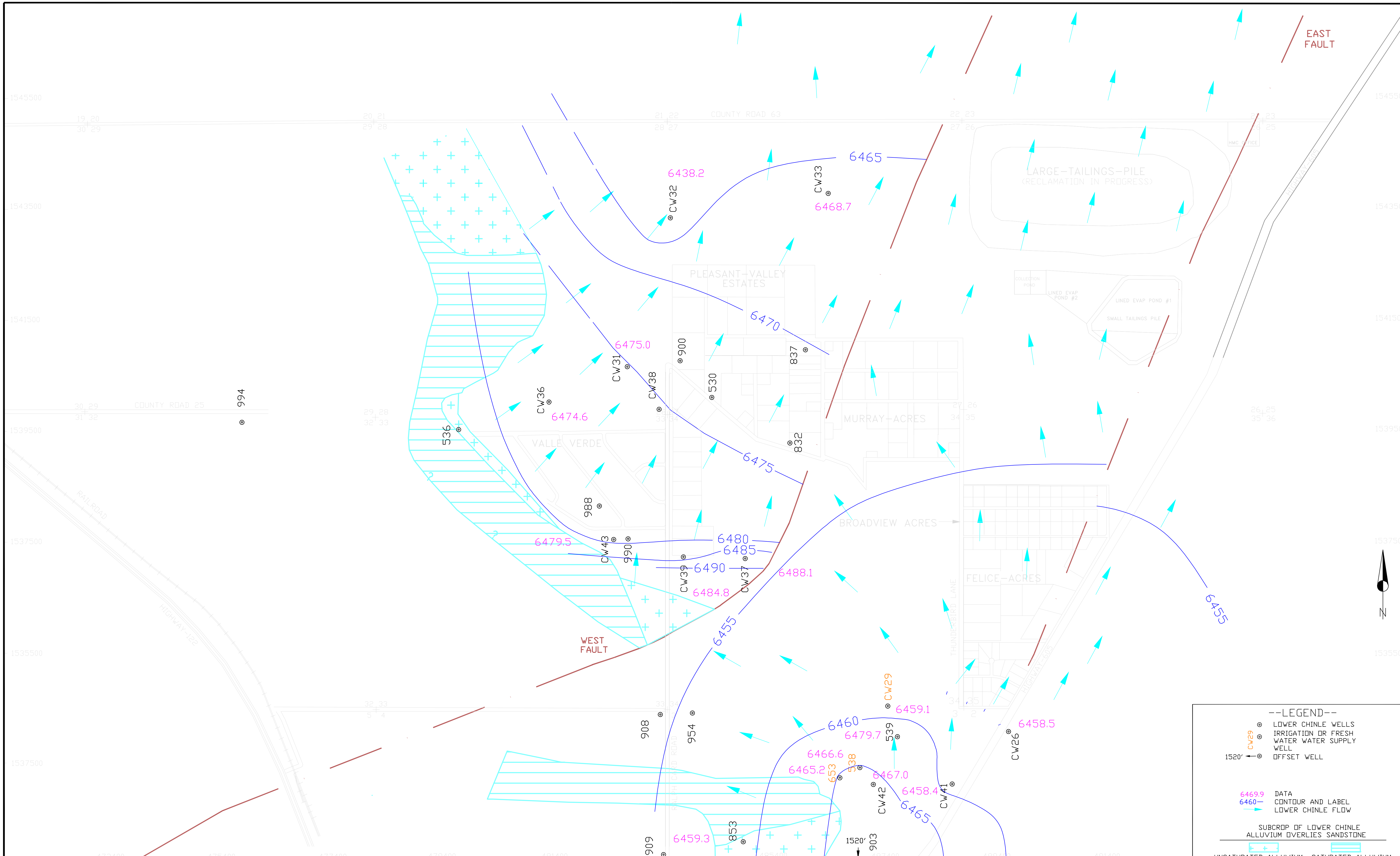
7.2 LOWER CHINLE WATER LEVELS

Water-level elevations in the Lower Chinle wells are presented along with the data for the Upper and Middle Chinle wells in Appendix A. Figure 7.2-1 presents water-level elevations in the Lower Chinle wells and the Fall of 2004 water-level elevation contours. The West and East Faults are also shown on this figure. The approximate alluvial-Lower Chinle subcrop areas are also shown on this figure. Flow west of the West Fault in the Lower Chinle is mainly to the northeast. Flow between the two faults is to the northeast in the area of the tailings. The flow is to the northwest in the southern portion of the Lower Chinle aquifer between the faults. The northwesterly flow direction in this area indicates that the Lower Chinle water moves across the West Fault in the area west of Broadview Acres. Lower Chinle water levels in 2004 were lower in Section 3 as a result of continued pumping for the purpose of providing irrigation supply, and because of the drought. Lower water-level elevation exists in the Lower Chinle piezometric surface around irrigation supply well CW29 due to pumping from this well during the irrigation season.

The Lower Chinle wells for which water-level time plots were prepared are shown on Figure 7.2-2. Water levels are presented for Lower Chinle wells 653, CW26, CW29, CW41 and CW42 on Figure 7.2-3. Water levels in Lower Chinle well 653, which has been used as an irrigation supply well, vary due to the variable pumping rate but have generally declined during the last few years. Water levels gradually decreased in Lower Chinle well CW29 prior to its use as a fresh-water injection supply well in 2003 and irrigation supply in 2004. Small overall water-level decreases have been observed over the last few years in Lower Chinle wells CW26, CW41 and CW42.

Figure 7.2-4 presents water-level elevations versus time for Lower Chinle wells CW31, CW32, CW33, CW37 and CW43 (see Figure 7.2-2 for location of these wells). Water levels have gradually declined over the last few years in wells CW31, CW37 and CW43, while they have been fairly steady in well CW33. Water levels have decreased in Lower Chinle well CW32 for several years, and this overall trend continued in 2004. The rate and magnitude of decrease in this Lower Chinle well is similar to that observed in the alluvial and San Andres aquifers to the west in Sections 29, 32 and 33. These declines are in stark contrast to the steady alluvial water levels near well CW32. This indicates that the Lower Chinle aquifer near well

CW32 is hydrologically connected to the alluvial aquifer west of this area but is isolated from the alluvial aquifer in its immediate area.



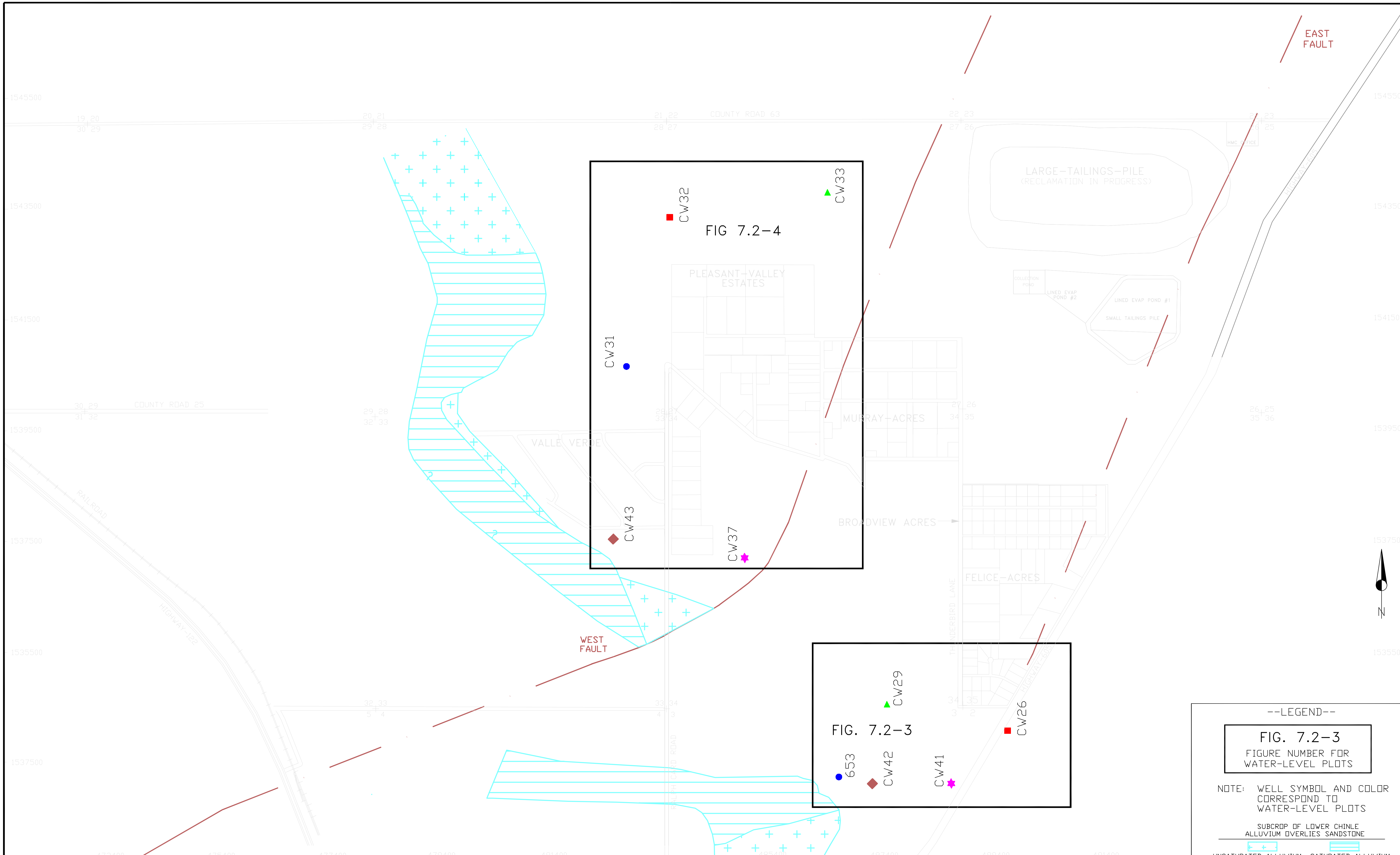
SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-LOW03

DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 7.2-1. WATER-LEVEL ELEVATIONS OF THE LOWER CHINLE AQUIFER, FALL 2004, FT-MSL



SCALE: 1"=1600'
C:\PROJECTS\ 2004-06\C-LOW03
DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 7.2-2. LOCATION OF LOWER CHINLE WELLS WITH WATER-LEVEL PLOTS

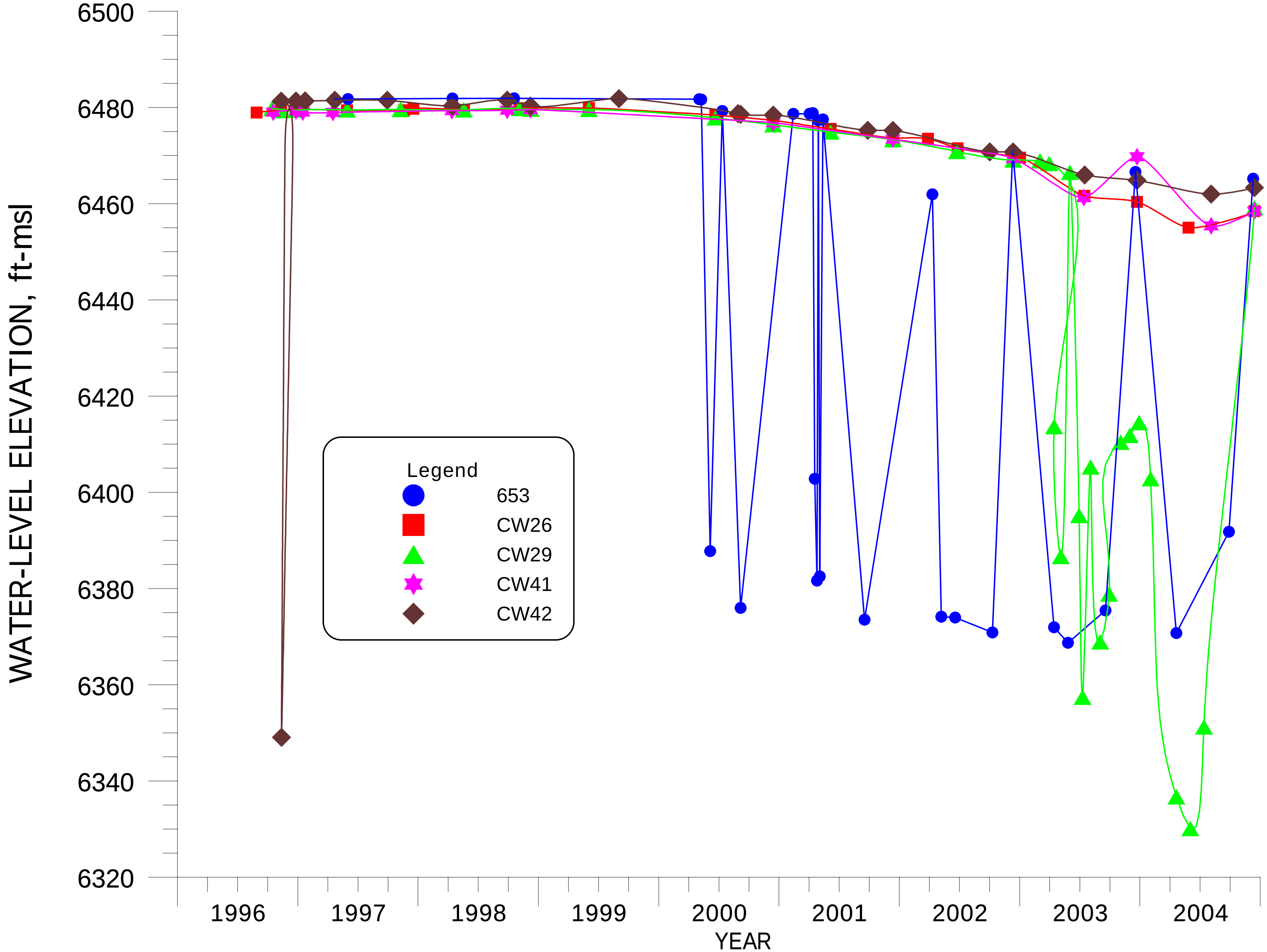


FIGURE 7.2-3. WATER-LEVEL ELEVATION FOR WELLS 653, CW26, CW29, CW41 AND CW42.

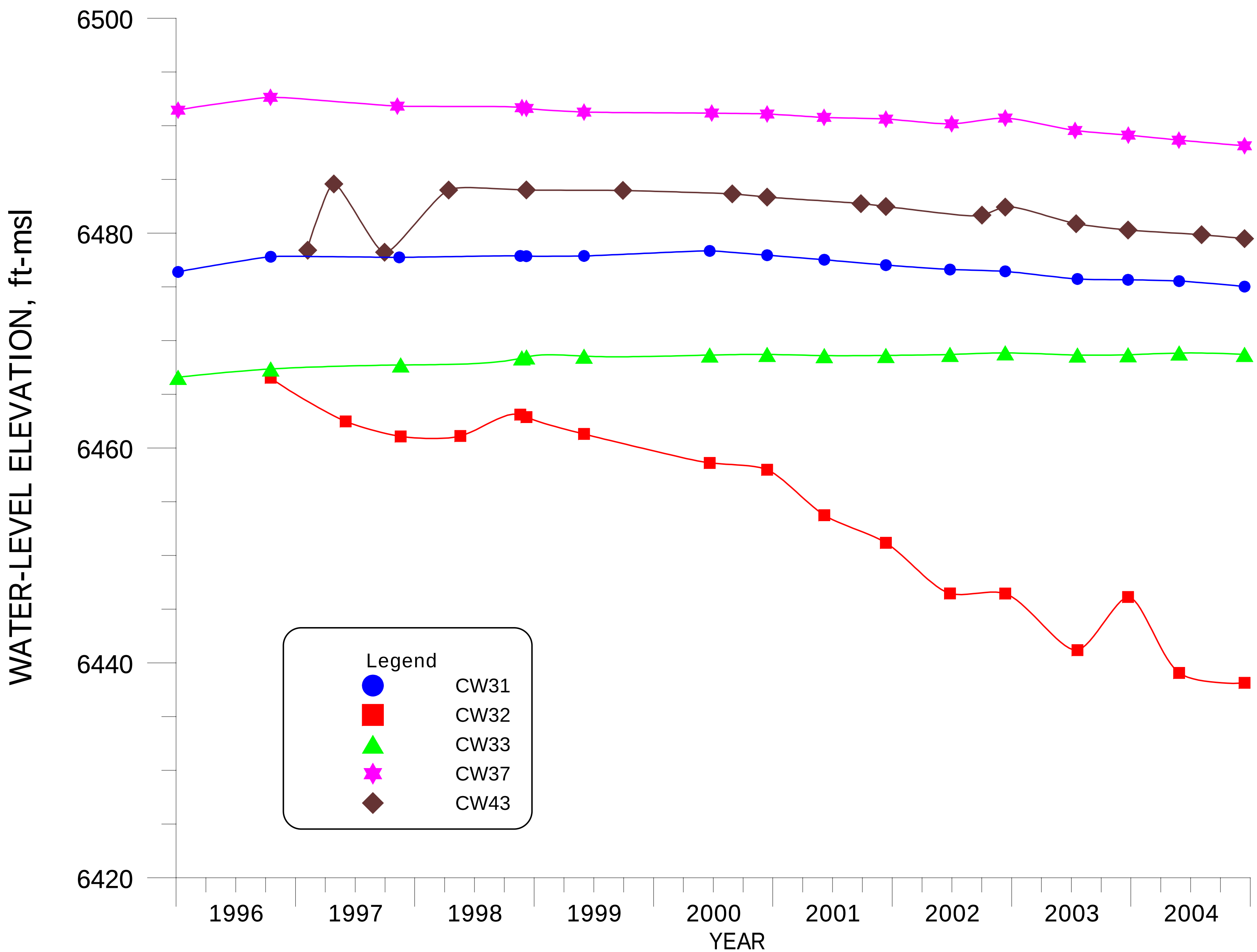


FIGURE 7.2-4. WATER-LEVEL ELEVATION FOR WELLS CW31, CW32, CW33, CW37 AND CW43.

7.3 LOWER CHINLE WATER QUALITY

Water-quality data for 2004 for the Lower Chinle aquifer are presented in Tables B.5-1 and B.5-2 of Appendix B along with water-quality data for the other Chinle aquifer wells. The basic well data presented in Tables 5.1-1 through 5.1-4, and the orientation of the well name on Figure 5.1-1 indicate which of the Chinle wells are completed in the Lower Chinle.

Constituent concentrations in the Lower Chinle aquifer exceed background conditions only in Section 3, except for some natural exceedances in the far down-gradient wells. Sulfate concentrations in the Lower Chinle aquifer are within the proposed NRC standards except in far down-gradient wells CW32 and CW33, where concentrations only slightly exceed the relevant non-mixing background value. These concentrations are deemed to be of natural origin and only slightly exceed the 95th percentile level of the data base. Uranium and selenium concentrations exceed the proposed NRC site standards only in the northeastern and central portions of Section 3. Molybdenum concentrations in the Lower Chinle aquifer are all less than the limit of detection.

7.3.1 SULFATE – LOWER CHINLE

Figure 7.3-1 presents contours of sulfate concentrations in the Lower Chinle aquifer during 2004. Proposed NRC Lower Chinle standards based on background data are presented for sulfate in the legend of Figure 7.3-1. The Lower Chinle concentrations varied from 287 to 2600 mg/l. Only the values from wells CW32 and CW33 exceeded the 2000 mg/l proposed upper limit of background for the non-mixing zone. These concentrations are thought to be naturally occurring and likely exceed the full range of background because the data is limited in the downgradient portion of the Lower Chinle aquifer. None of the Lower Chinle concentrations in the mixing zone (see Section 3 and Figure 7.3-2 for zone areas) exceeded the mixing-zone sulfate background value of 1750 mg/l. Therefore, the Lower Chinle aquifer does not require any restoration with respect to sulfate.

The locations of wells used in the plots of water quality for the Lower Chinle are presented on Figure 7.3-2. Figure 7.3-2 shows that data for mixing zone Lower Chinle wells 653, CW37, CW42 and CW43 are grouped together on the water-quality time plots, and data for

non-mixing zone wells CW26, CW29, CW31, CW32, CW33 and CW41 are presented on a second plot.

Figure 7.3-3 presents sulfate concentrations plotted versus time for the Lower Chinle mixing-zone wells. The sulfate concentrations in water collected from each of these wells are less than that in the mixing-zone background level, showing that sulfate restoration of the Lower Chinle is not needed in the southern portion of the aquifer.

Sulfate concentrations plotted for Lower Chinle wells CW26, CW29, CW31, CW32, CW33 and CW41 are presented on Figure 7.3-4 (see Figure 7.3-2 for location of these wells). Sulfate concentrations have been steady in Lower Chinle wells CW26, CW31 and CW41 over the last few years, while an increasing trend has been observed in water from wells CW29, CW32 and CW33. The data collected since mid-2003 was not available when the background level was calculated. The exceedance in sulfate values from wells CW32 and CW33 is thought to be natural.

7.3.2 TOTAL DISSOLVED SOLIDS – LOWER CHINLE

Figure 7.3-5 presents the total dissolved solids (TDS) concentrations in the Lower Chinle aquifer during 2004. All concentrations are less than the non-mixing zone value of 4140 mg/l except the value from well CW32. Concentrations are thought to naturally exceed this level farther down-gradient as shown by the cyan pattern. The TDS concentration naturally increases down-gradient due to the low permeability and correspondingly slow movement of water through this shale aquifer.

Figure 7.3-6 presents TDS concentrations for Upper Chinle wells 653, CW37, CW42 and CW43. TDS concentrations in these wells have been fairly steady. All of these concentrations are below the mixing-zone background level of 3140 mg/l.

TDS concentrations for wells CW26, CW29, CW31, CW32, CW33 and CW41 are presented on Figure 7.3-7. This figure demonstrates that, overall, TDS concentrations have remained fairly stable during the last few years. Additionally, these historical TDS concentrations are well within the range of natural fluctuation in the non-mixing zone of the Lower Chinle aquifer, except for two values from well CW32 and the outlier from well CW26.

7.3.3 CHLORIDE – LOWER CHINLE

Chloride concentration data in the Lower Chinle aquifer were updated during 2003 to confirm that restoration for this constituent is not necessary in the Lower Chinle aquifer. The chloride concentrations measured during 2004 continue to support this conclusion and are all less than the proposed NRC standard.

7.3.4 URANIUM – LOWER CHINLE

Uranium concentration in the Lower Chinle aquifer is an important constituent with respect to aquifer restoration in Section 3. Figure 7.3-8 presents the uranium concentrations in the Lower Chinle aquifer for 2004. Only three of the uranium concentrations in the Lower Chinle exceeded the mixing-zone background concentration, and three exceeded the non-mixing zone background concentration. The highest values are in the central portion of Section 3 in water collected from wells 538, 653 and CW42. These concentrations should gradually decrease to less than background concentrations with the continuing use of this water in the irrigation program.

Uranium concentrations plotted versus time for Lower Chinle wells 653, CW37, CW42 and CW43 are presented on Figure 7.3-9. The small decreases in uranium concentrations in well CW42 are due to the pumping of wells 538 and 653 to obtain a water supply for the irrigation system. This plot also shows an anomalously low uranium concentration in well 653 in early 2003. Uranium concentrations in wells CW37 and CW43 have stayed low.

The uranium concentrations in all of the Lower Chinle wells with data presented on Figure 7.3-10 have remained at low levels with a small increase in well CW29.

7.3.5 SELENIUM – LOWER CHINLE

Selenium concentrations in the Lower Chinle aquifer for 2004 are presented on Figure 7.3-11. Only the selenium concentrations in water from wells 653 and CW42 exceeded the mixing- zone site standard of 0.14 mg/l. The proposed non-mixing zone NRC site standard of 0.32 mg/l was not exceeded in any of the Lower Chinle wells.

Figure 7.3-12 presents selenium concentration versus time plots for wells 653, CW37, CW42 and CW43. The selenium concentrations in these Lower Chinle aquifer wells were fairly similar to levels observed in 2003.

Figure 7.3-13 presents selenium concentrations plotted versus time for Lower Chinle wells CW26, CW29, CW31, CW32, CW33 and CW41. Selenium concentrations measured during 2004 were consistent with the 2003 levels for each of these wells.

7.3.6 MOLYBDENUM – LOWER CHINLE

Molybdenum concentrations in water samples collected from the Lower Chinle wells in 2004 were all less than detection and, therefore, no areal molybdenum concentration figures or time plots were prepared. The 2004 results are consistent with historical measurements of molybdenum in the Lower Chinle aquifer. Molybdenum is not constituent of concern in the Lower Chinle aquifer.

7.3.7 NITRATE – LOWER CHINLE

Nitrate monitoring of the Lower Chinle aquifer was updated in 2003 to confirm that concentrations remain significantly below the proposed background levels of 15 mg/l for the mixing zone and 3.0 mg/l for the non-mixing zone. All nitrate concentrations measured in 2004 were significantly below these background levels except a nitrate concentration of 7.4 mg/l from well CW41 which is still below the level of a potential standard of 10 mg/l. A nitrate concentration figure was not developed and this constituent does not warrant routine monitoring in the Lower Chinle aquifer.

Plots of nitrate concentrations versus time were not prepared, because historically, values measured in Lower Chinle wells contained very low concentrations, similar to those measured in 2004. Nitrate concentrations are not expected to be significant in the future in the Lower Chinle aquifer due to the very limited extent of elevated concentrations in the alluvial aquifer and establishment of a site standard for nitrate in the Lower Chinle aquifer is not warranted.

7.3.8 RADIUM-226 AND RADUIM-228 – LOWER CHINLE

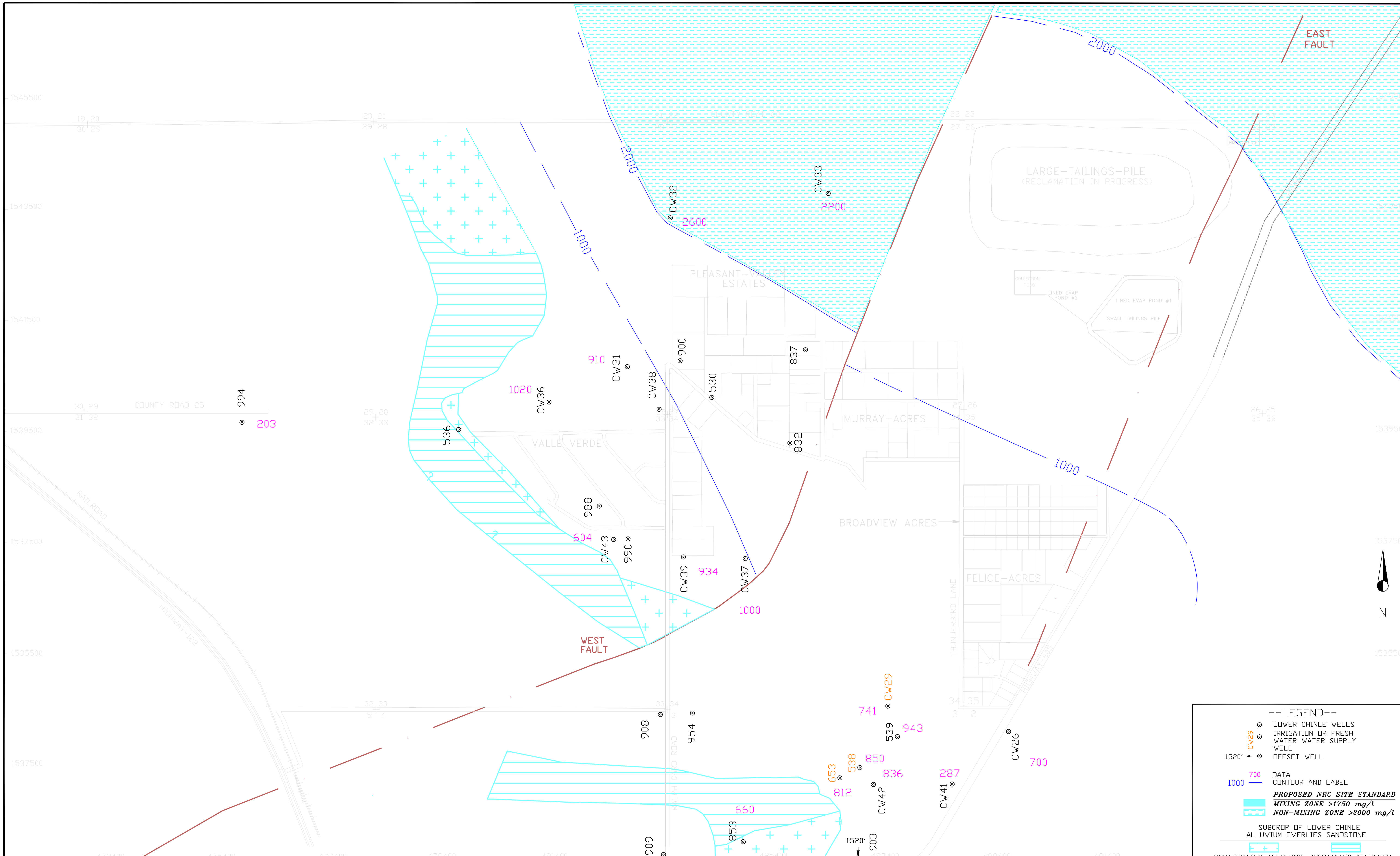
All radium concentrations have been low in past years in the Lower Chinle aquifer. Radium is not an important parameter relative to the Lower Chinle aquifer and an NRC site standard for radium for the Lower Chinle is not warranted. Radium concentrations were analyzed in all Lower Chinle wells in the 2003 update. All radium values measured in 2004 were less than the detection limit, except a radium-228 value of 0.8 pCi/l in well 539. These low levels of radium do not warrant the development of a figure presenting areal distribution of radium. Radium-228 analysis is typically more erratic than other constituents but the available data shows that radium-226 and radium-228 are not significant constituents in the Lower Chinle aquifer at the Homestake site and site standards for these two constituents are not needed for the Lower Chinle aquifer.

7.3.9 VANADIUM - LOWER CHINLE

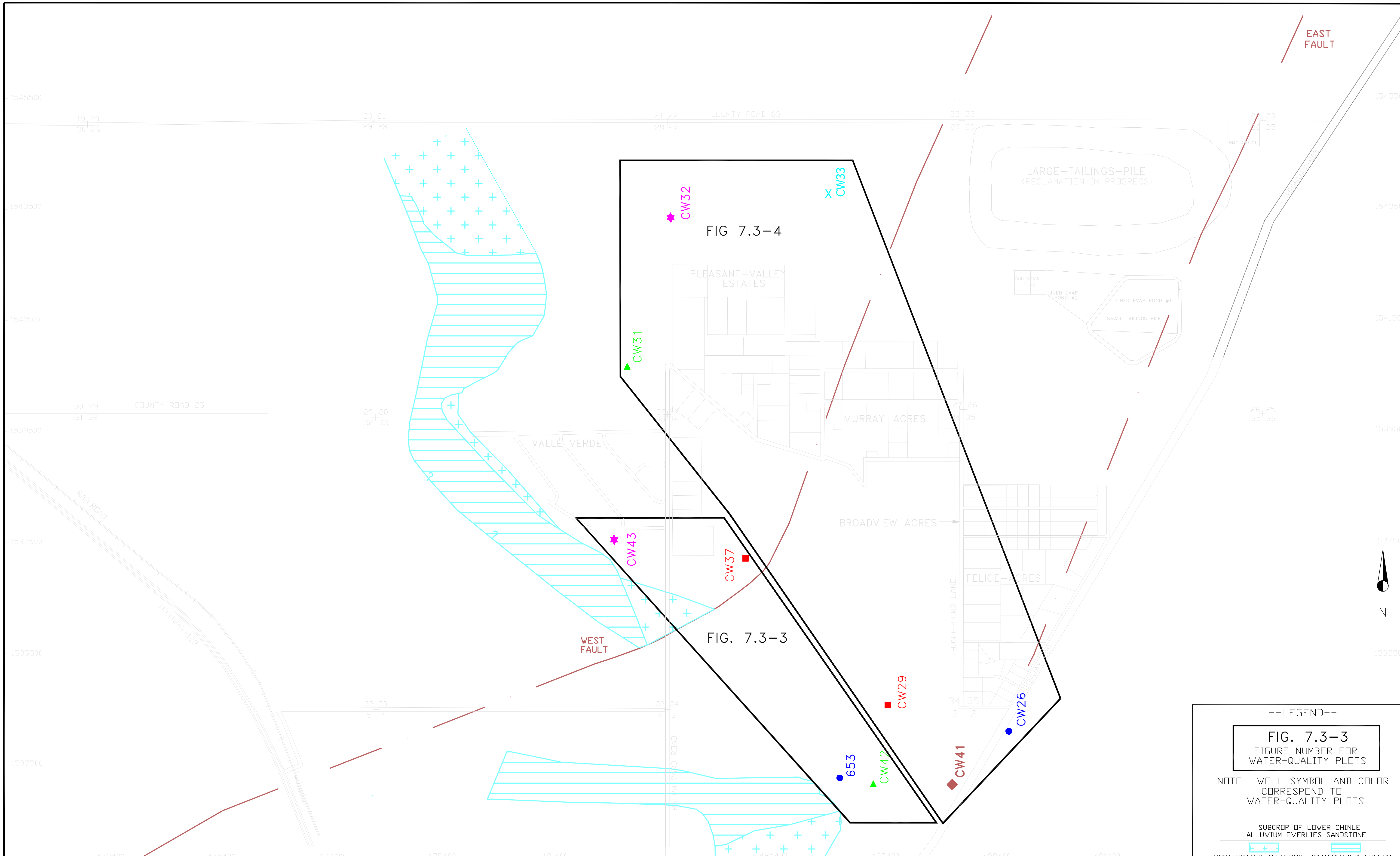
Vanadium concentrations have always been low in the Lower Chinle aquifer. Significant concentrations in the Lower Chinle aquifer would not be expected because concentrations of this constituent have only been slightly elevated in the alluvial aquifer near the tailings. Vanadium concentrations in the Lower Chinle aquifer have never been large enough to support consideration of this constituent as a site standard. The vanadium concentration data was updated in 2003 for the Lower Chinle aquifer. All the measured vanadium concentrations were less than the limit of detection. A vanadium site standard for the Lower Chinle aquifer is not warranted based on all historical and current data.

7.3.10 THORIUM-230 – LOWER CHINLE

Thorium-230 concentrations have never been significant in the Lower Chinle aquifer and, therefore, should be dropped from the Lower Chinle monitoring list and eliminated from consideration as a Lower Chinle standard. The thorium-230 concentrations measured in the Lower Chinle aquifer during 2003 were all less than the proposed background levels of 0.97 and 0.72 pCi/l for the mixing and non-mixing zones, respectively. No plots of thorium-230 concentrations with time were prepared, because concentrations have historically been low.



SCALE: 1"=1600' C:\PROJECTS\ 2004-06\C-LOW03 DATE: 03/24/05	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	FIGURE 7.3-1 SULFATE CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2004, mg/l



SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-LOW03

DATE: 03/24/05

HOMESTAKE MILL AND ADJACENT PROPERTIES
GRANTS NM TOWNSHIP 11&12 N RANGE 10 W

FIGURE 7.3-2. LOCATION OF LOWER CHINLE WELLS WITH WATER-QUALITY PLOTS

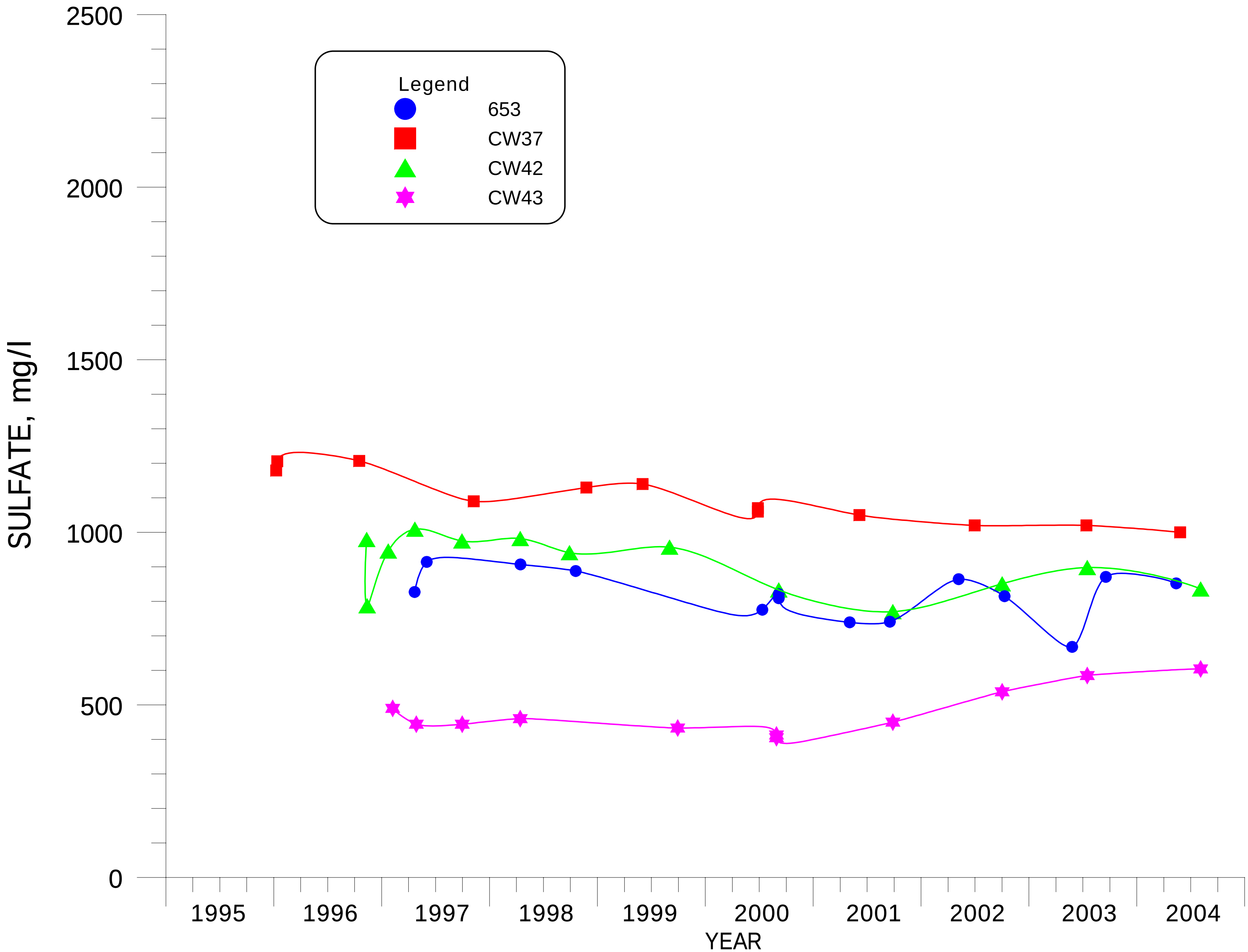


FIGURE 7.3-3. SULFATE CONCENTRATIONS FOR MIXING ZONE WELLS 653, CW37, CW42 AND CW43.

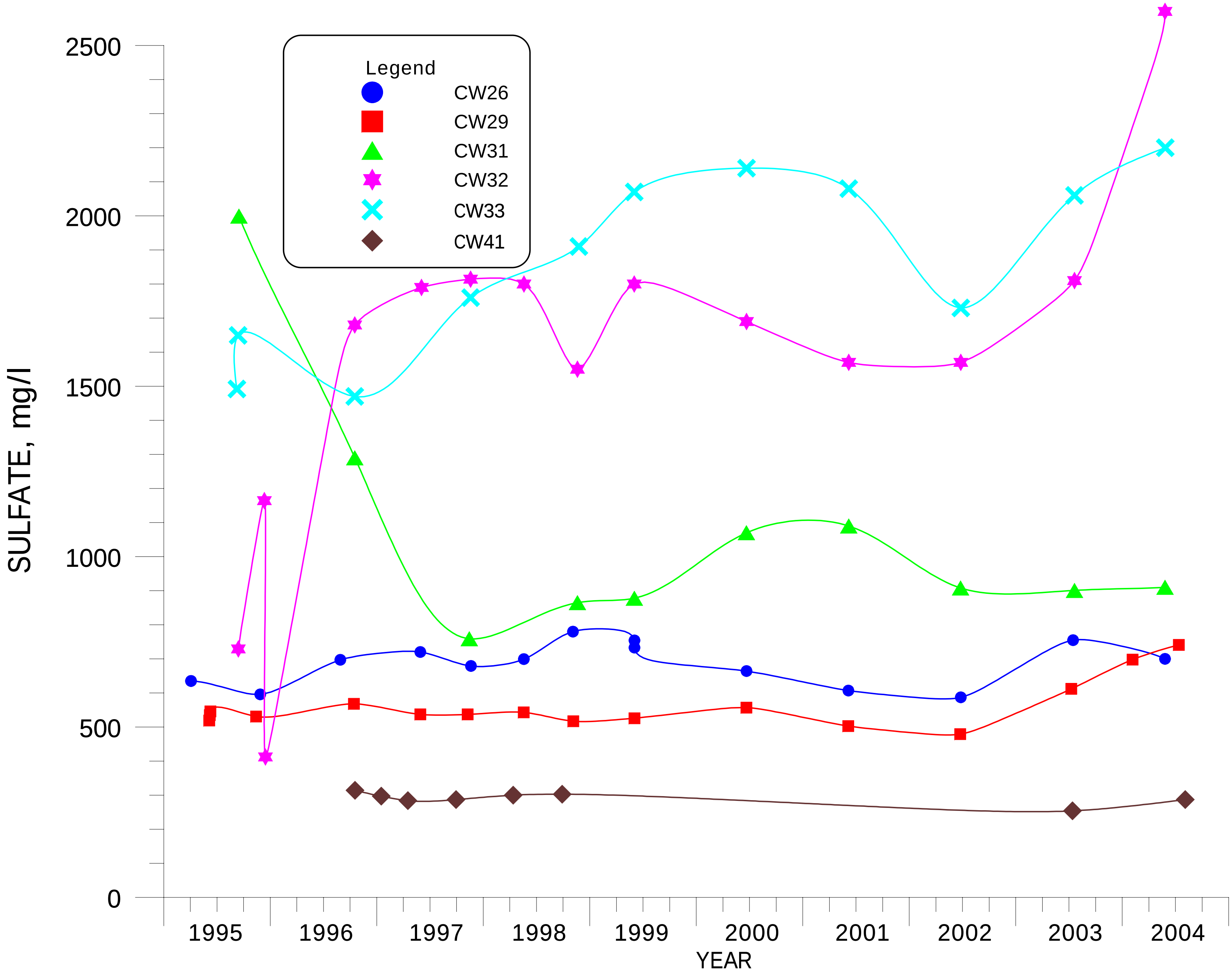
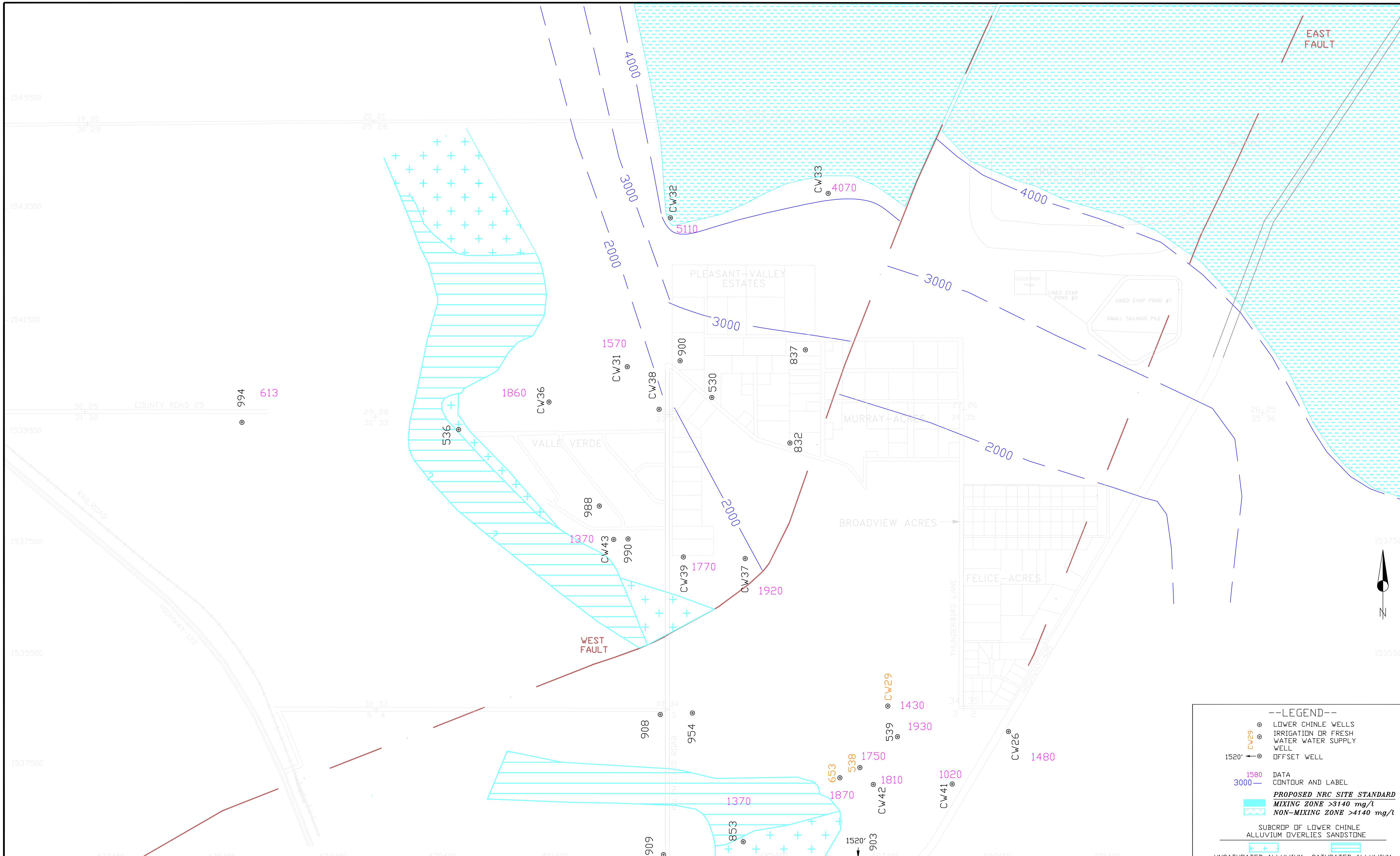


FIGURE 7.3-4. SULFATE CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW26, CW29, CW31, CW32, CW33 AND CW41.



SCALE: 1"=1600'
C:\PROJECTS\2004-06\C-LOW03
DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 7.3-5. TDS CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2004, mg/l

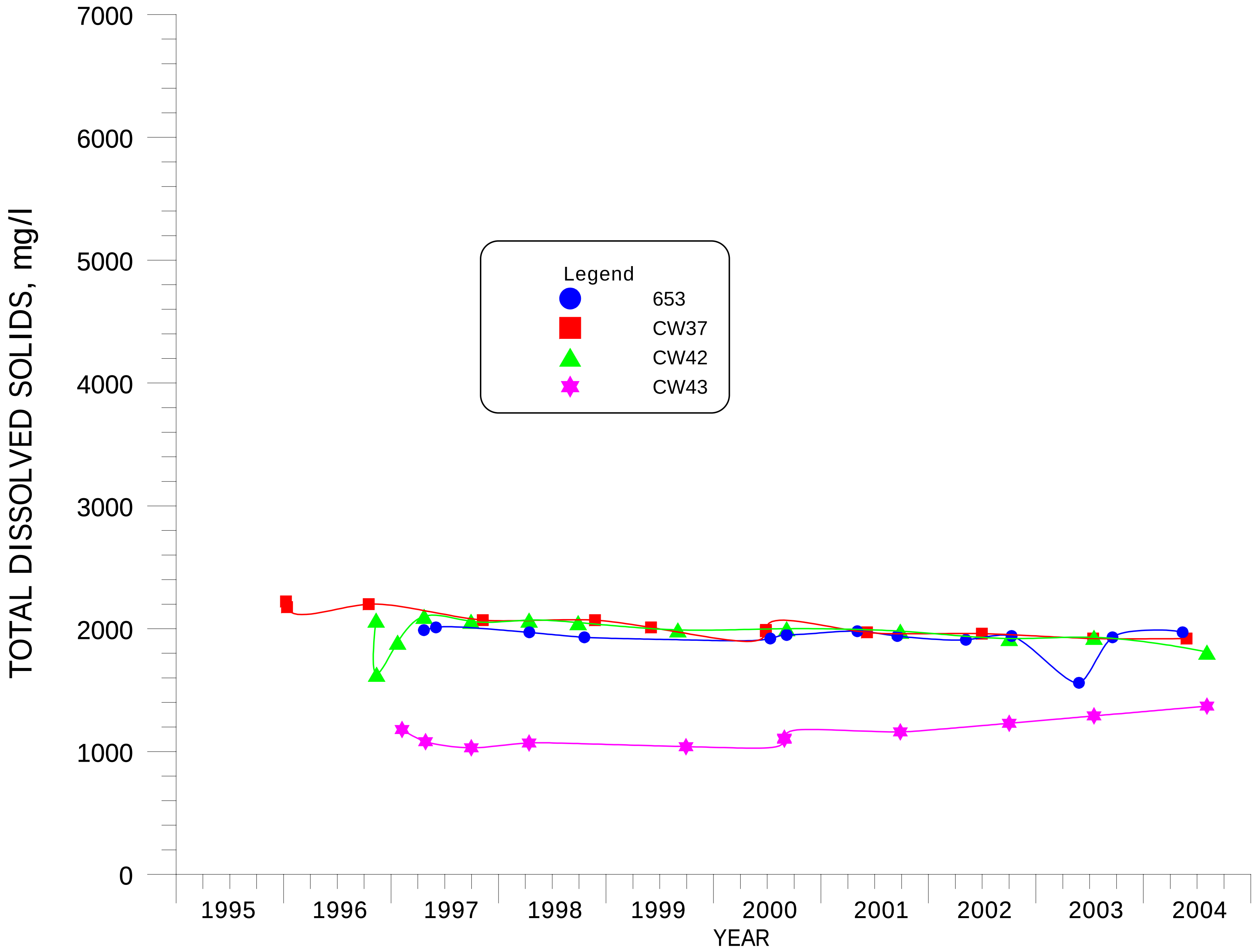


FIGURE 7.3-6. TDS CONCENTRATIONS FOR MIXING ZONE WELLS 653, CW37, CW42 AND CW43.

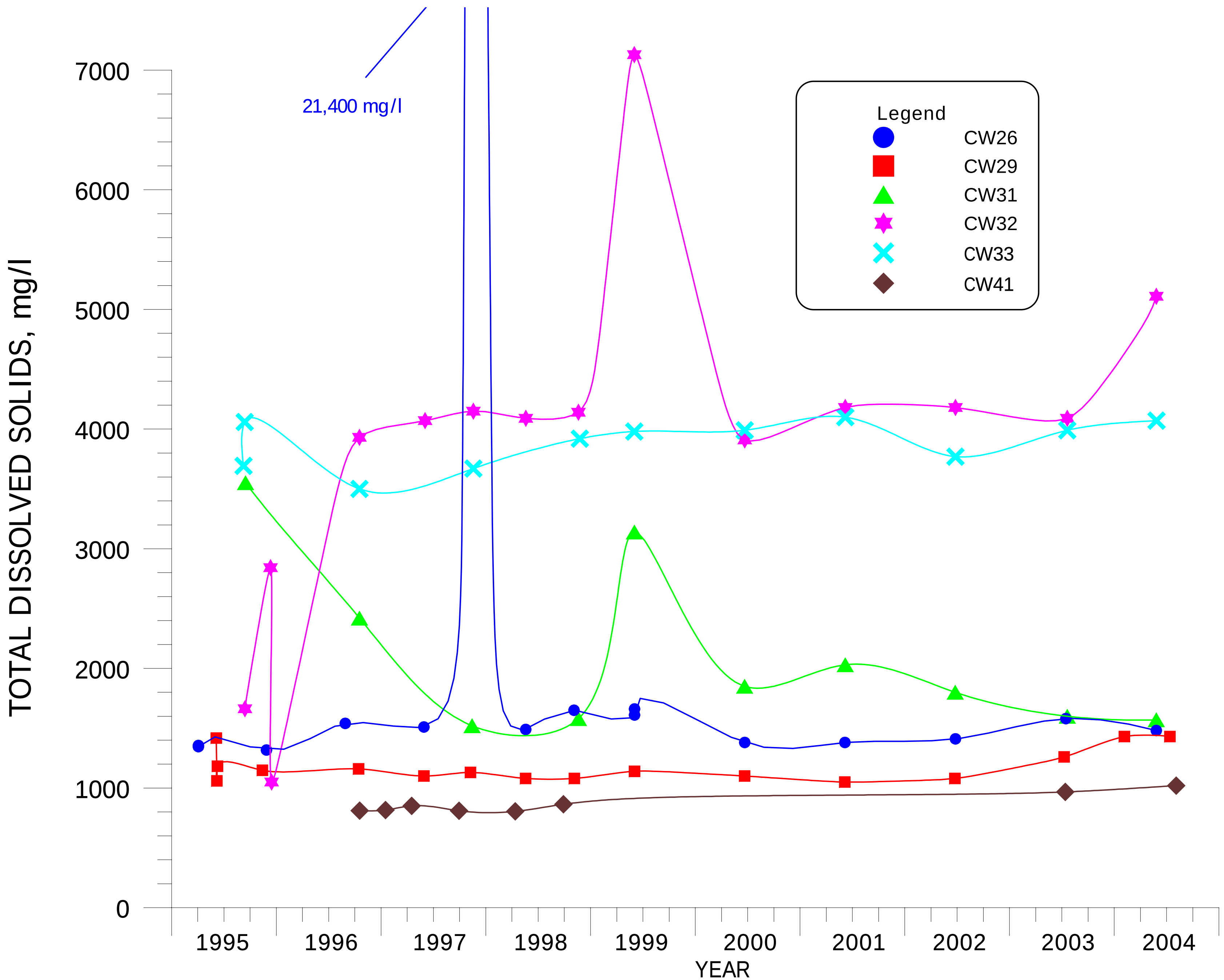
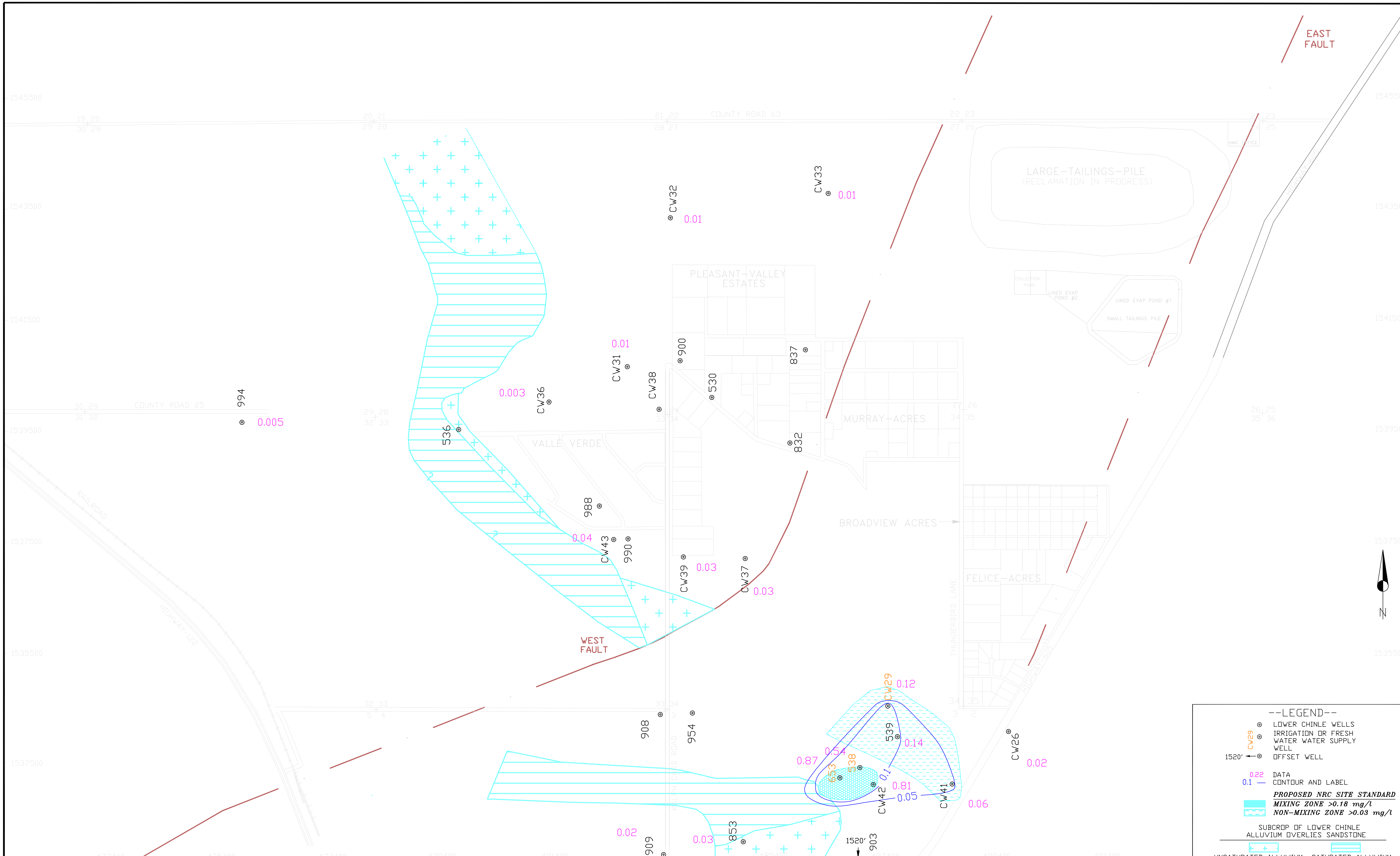


FIGURE 7.3-7. TDS CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW26, CW29, CW31, CW32, CW33 AND CW41.



SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-LOW03

DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 7.3-8. URANIUM CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2004, mg/l

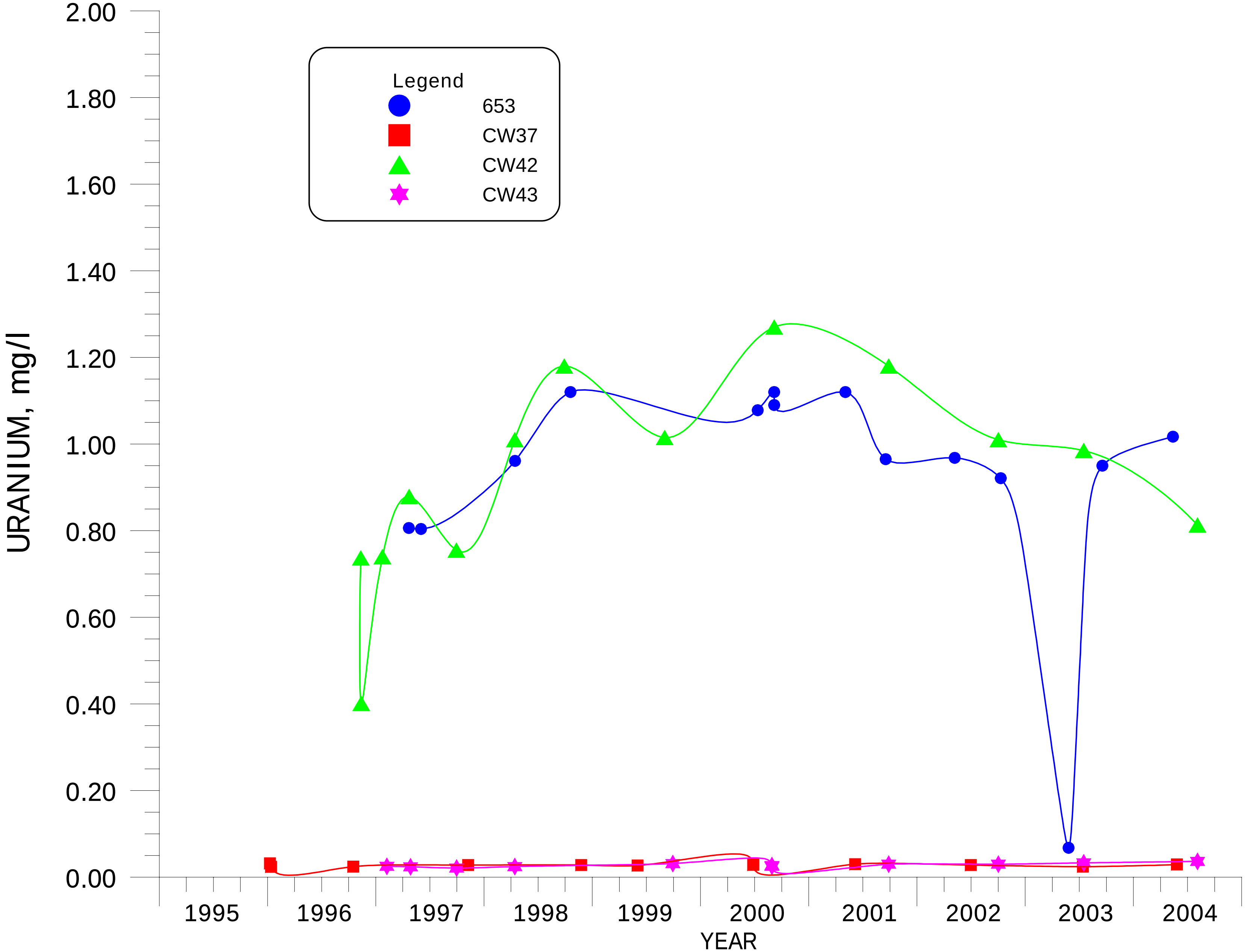


FIGURE 7.3-9. URANIUM CONCENTRATIONS FOR MIXING ZONE WELLS 653, CW37, CW42 AND CW43.

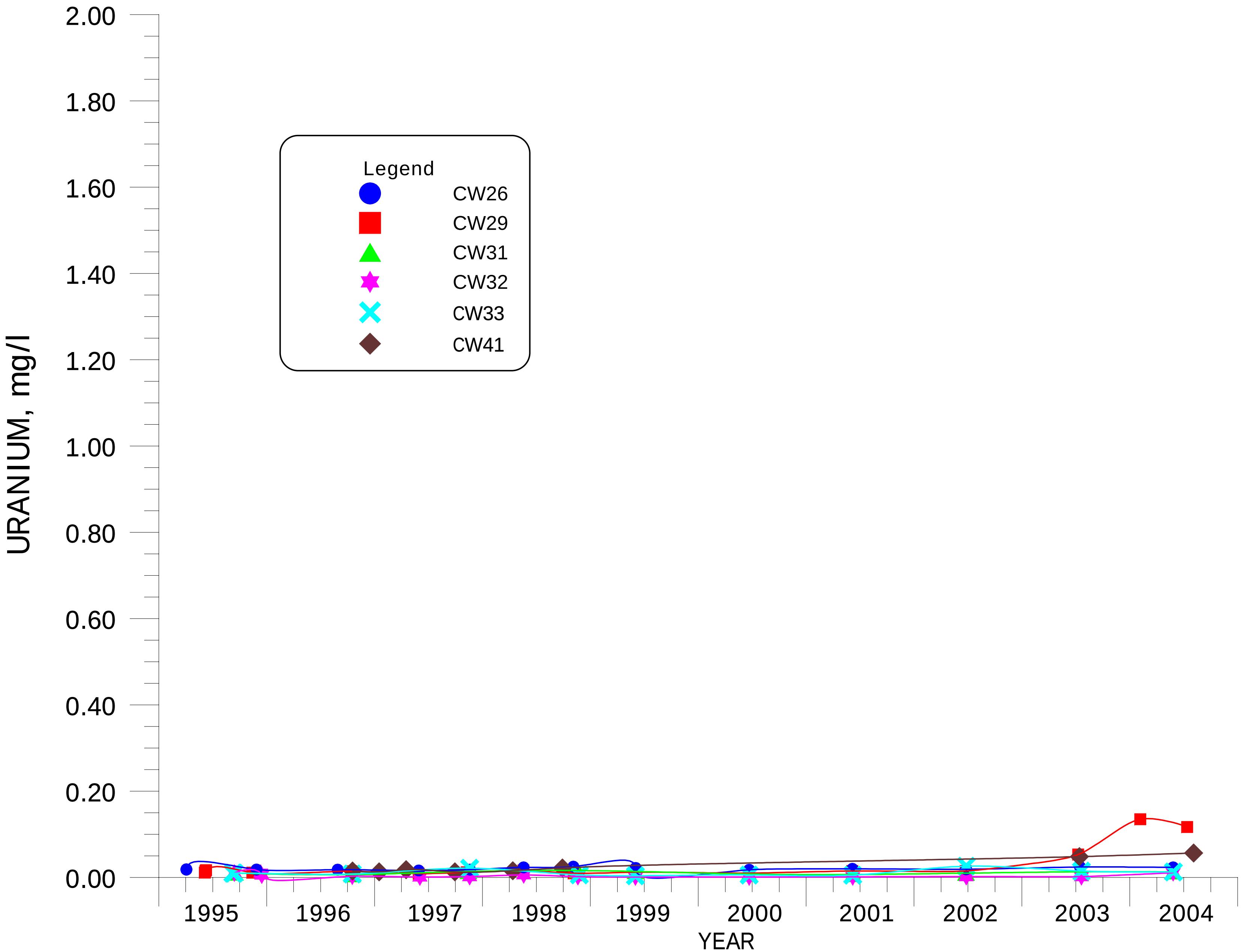
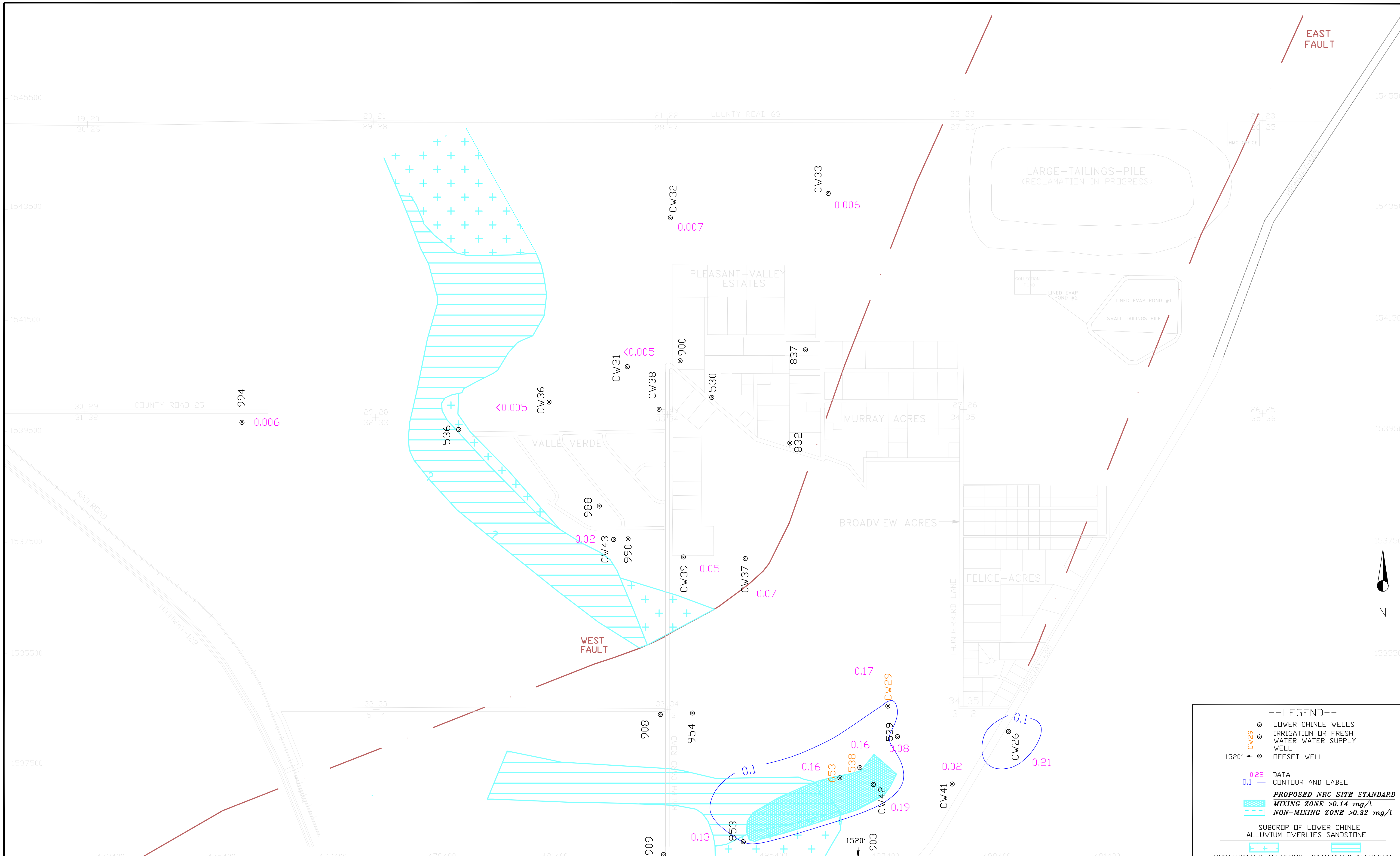


FIGURE 7.3-10. URANIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW26, CW29, CW31, CW32, CW33 AND CW41.



SCALE: 1"=1600'

C:\PROJECTS\2004-06\C-LOW03

DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 7.3-11. SELENIUM CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2004, mg/l

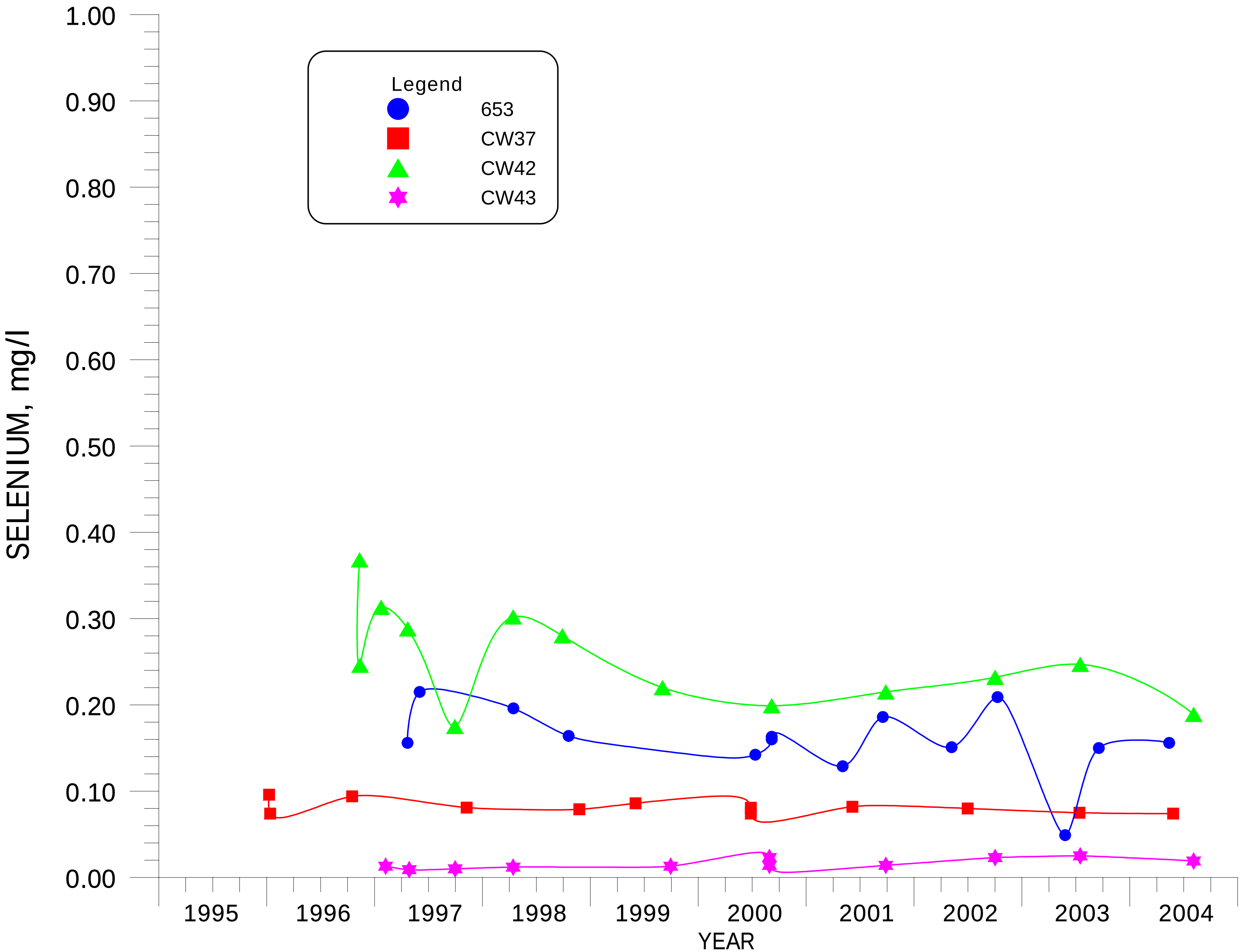


FIGURE 7.3-12. SELENIUM CONCENTRATIONS FOR MIXING ZONE WELLS 653, CW37, CW42 AND CW43.

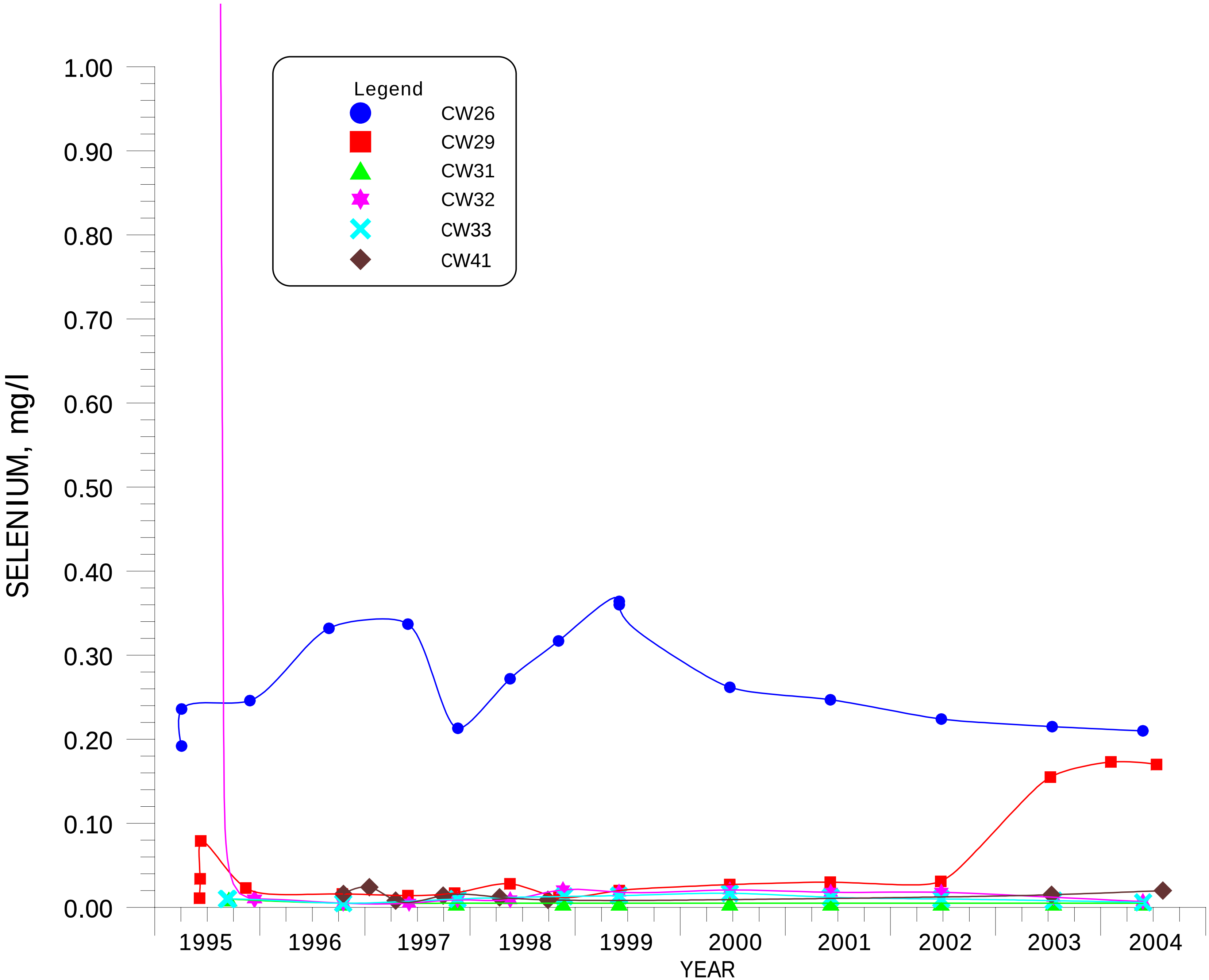


FIGURE 7.3-13. SELENIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW26, CW29, CW31, CW32, CW33 AND CW41.

SECTION 8

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

Page Number

FIGURES

TABLES

8.0 SAN ANDRES AQUIFER MONITORING

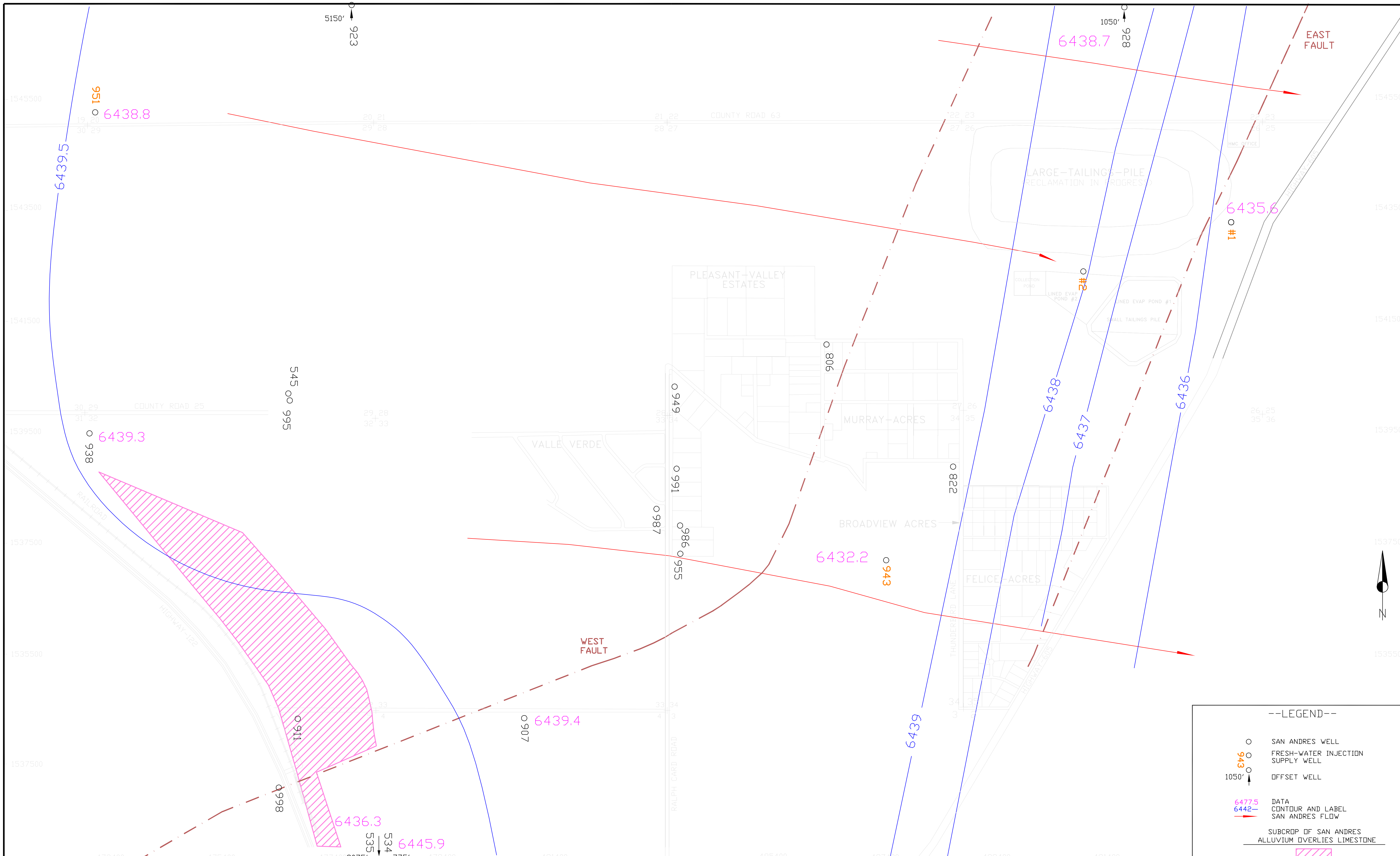
The San Andres aquifer is the most important regional aquifer in the Grants Project area. The Chinle Formation, which exists between the alluvium and the San Andres, is approximately 800 feet thick at the Homestake tailings site and is primarily a shale with a few sandstone lenses. Therefore, the alluvial aquifer and the San Andres aquifer are separated by a very thick aquitard. The difference in piezometric head between the alluvial and San Andres aquifers is in the range of 80 to 100 feet, which confirms that the flow between the two systems is restricted by the limited permeability of the Chinle Formation. The San Andres and alluvial aquifers are only in direct contact in the western portion of the area presented on Figure 8.0-1 (see magenta pattern area). With no areas of direct communication within the area where the alluvial aquifer is impacted by tailings seepage, and only very limited hydraulic communication through the Chinle shale, the San Andres aquifer is not affected by tailings seepage. The San Andres aquifer has been used as the source for fresh-water injection into the alluvium and Chinle aquifers at the Grants Project, and as a result, a monitoring program was established for the San Andres aquifer.

Table 8.0-1 presents well completion information for the San Andres wells in this area. Homestake's two deep wells within the project area are San Andres wells, #1 Deep and #2 Deep. These wells are used to supply the fresh-water injection systems within the collection area. San Andres well 951 is used as the fresh-water injection supply for the injection system in Sections 28 and 29 while San Andres well 943 is used as the fresh water injection supply for the injection system in Section 3 and Felice Acres. Figure 8.0-1 shows the locations of the San Andres wells relevant to this area. Recharge to the San Andres aquifer occurs mainly west of the area shown in the figure and in the far western portion of the figure. The structure of the San Andres aquifer dips to the east, and thus the ground water system becomes progressively deeper in the easterly direction. The water-level elevations measured during 2004 (Figure 8.0-1) show a very flat piezometric surface with the gradient being from the west-northwest to the east-southeast. The continuity of the gradient in this area indicates that the East and West faults do not significantly affect the ground water flow in the San Andres aquifer. The displacement at the faults is not large enough to completely displace the entire thickness of this aquifer system. The increase in gradient in the project area also indicates a decrease in transmissivity in the area of

the steeper gradient. The faults may cause a decrease in the transmitting ability of the San Andres aquifer in this area.

Figure 8.0-2 presents the most recent water-quality data for the San Andres aquifer. Tables B.6-1 and B.6-2 in Appendix B present the tabulation of the water-quality data for the San Andres aquifer. Figure 8.0-2 shows the 2004 data for sulfate, TDS, uranium and selenium concentrations in the San Andres aquifer. Sulfate concentrations vary from 334 mg/l to 892 mg/l in the San Andres aquifer. Sulfate concentrations are typically near 700 mg/l for Homestake #1 Deep and #2 Deep wells. TDS concentrations have varied from 919 to 2130 mg/l and generally increase in a down-gradient direction. The higher concentrations of sulfate and TDS to the east are natural and typical of a limestone aquifer where the extended contact time with the formation results in ongoing dissolution of major constituents. This increase in concentrations from the recharge area down dip is expected. Uranium concentrations were small in all of the San Andres wells monitored during 2004 with a slightly higher value of 0.08 mg/l from well 928. Selenium concentrations in the San Andres aquifer vary from less than 0.005 to 0.04 mg/l. All measured molybdenum concentrations are less than 0.03 mg/l.

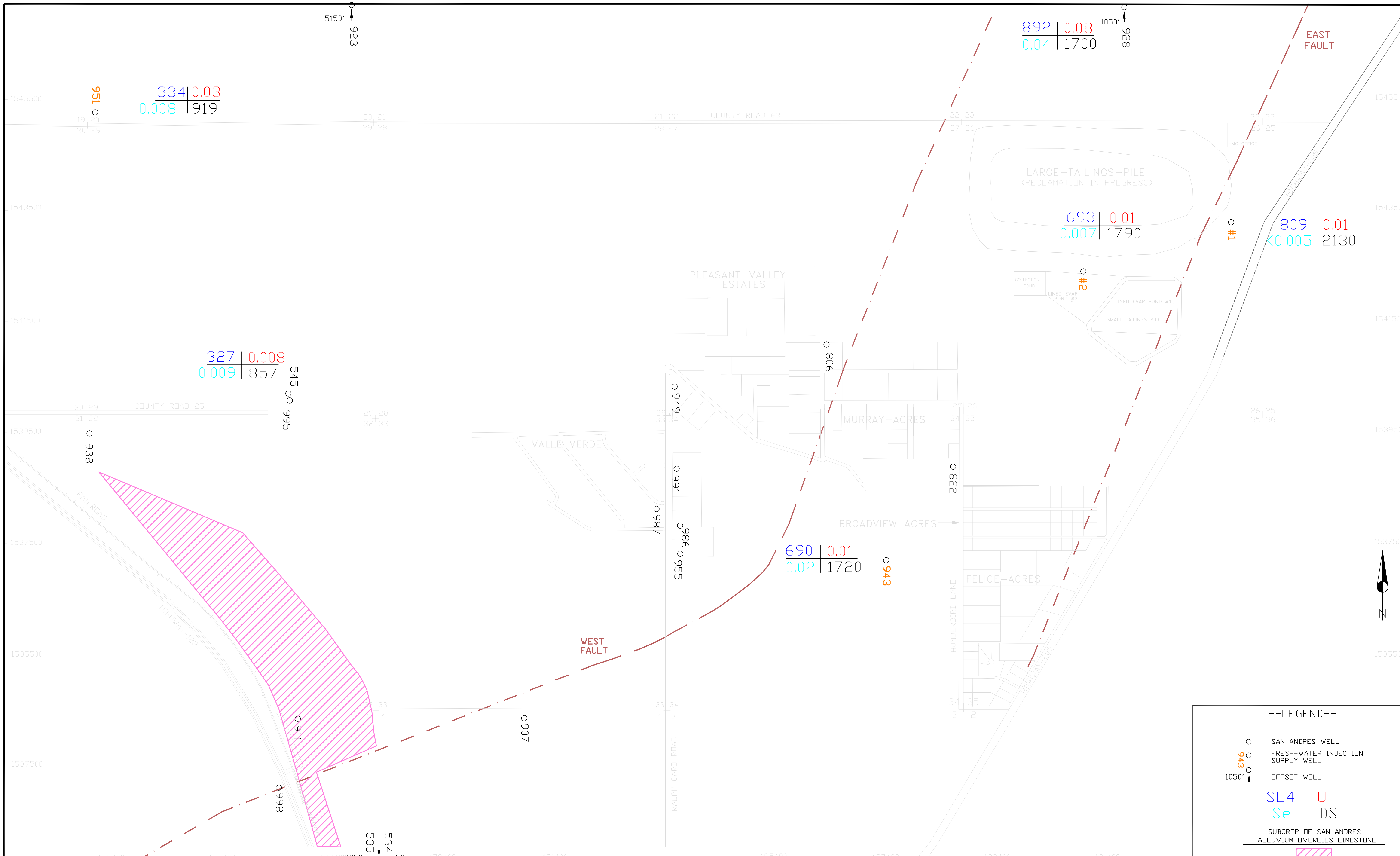
Figure 8.0-3 presents sulfate concentrations with time for Homestake's well 951 and Deep #1 and #2 wells. This data shows that sulfate concentrations in 2004 in well 951 and Homestake's #2 Deep well were similar to their historical average while a small increase in sulfate was observed in #1 Deep well.



SCALE: 1"=1600'
C:\PROJECTS\2004-06\SAN1600
DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 8.0-1. LOCATION OF SAN ANDRES WELLS AND WATER-LEVEL ELEVATION FOR THE SAN ANDRES AQUIFER, 2004, FT-MSL



SCALE: 1"=1600'
C:\PROJECTS\2004-06\SAN1600
DATE: 03/24/05

HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES
GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W

FIGURE 8.0-2. WATER QUALITY FOR THE SAN ANDRES AQUIFER, 2004, mg/l

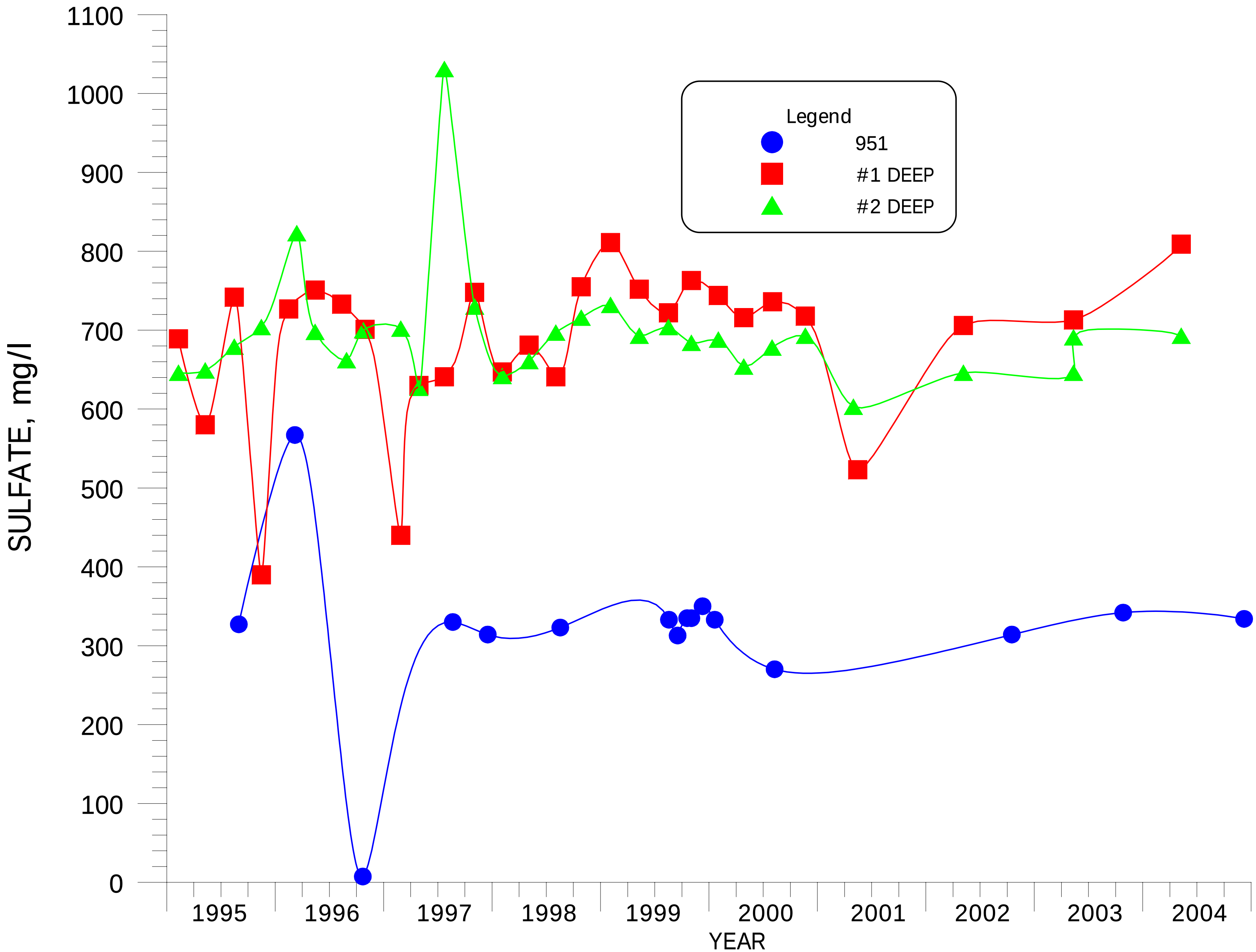


FIGURE 8.0-3. SULFATE CONCENTRATIONS FOR WELLS 951, #1 DEEP AND #2 DEEP.

TABLE 8.0-1. WELL DATA FOR THE SAN ANDRES 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 TOP OF SAN ANDRES (FT-LSD)	ELEV. TO TOP OF SAN ANDRES (FT-MSL)		CASING PERFOR-ATIONS (FT-LSD)
#1 Deep	1543307	493633	1000.0	10.0	12/20/2004	148.18	6435.58	0.0	6583.76	130	6454	A	---
										303	6281	U	---
										433	6151	M	---
										597	5987	L	---
										955	5629	S	919-999
#2 Deep	1542424	490972	870.0	---	5/13/2003	134.06	6441.60	0.0	6575.66	110	6466	A	---
										800	5776	S	-
0534	1534589	476549	1000.0	16.0	12/14/2004	106.70	6445.87	0.0	6552.57	0	6553	S	-
0535	1530100	478450	198.0	12.0	12/14/2004	103.68	6436.32	0.0	6540.00	---	---	S	-
0545	1540220	476630	---	8.0	---	---	---	---	---	---	---	S	-
0806	1541120	486320	584.0	16.0	---	---	---	0.0	6567.00	90	6477	A	---
										520	6047	S	-
0822	1538920	488630	980.0	7.0	---	---	---	0.0	6557.00	790	5767	S	790-875
0907	1534250	480800	360.0	16.0	12/14/2004	106.24	6439.36	0.0	6545.60	123	6423	A	---
										262	6284	S	295-360
0911	1534350	476800	188.0	---	---	---	---	0.0	6552.60	---	---	S	-
0918	---	---	725.0	4.0	---	---	---	0.0	6702.40	620	6082	S	635-655
0919	---	---	628.0	5.0	---	---	---	0.0	6684.00	35	6649	A	---
										356	6328	S	364-571
0923	1552400	477900	330.0	5.0	---	---	---	0.0	6622.60	60	6563	A	---
										229	6394	S	234-330
0928	1548250	491700	864.0	---	12/14/2004	158.88	6438.72	1.2	6597.60	138	6458	A	---
										801	5795	S	-
0938	1539500	473040	---	---	12/14/2004	129.53	6439.27	0.0	6568.80	95	6474	A	---
										120	6449	S	-
0943	1537222	487407	978.0	18.0	12/8/2004	123.74	6432.17	0.0	6555.91	704	5852	S	703-978
0949	1540350	483600	551.0	---	---	---	---	0.0	6562.30	112	6450	A	---
										155	6407	L	---
										460	6102	S	400-493
										460	6102	S	505-551
0951	1545500	473200	275.0	10.0	12/8/2004	134.90	6438.80	0.9	6573.70	110	6463	A	---
										227	6346	S	241-275
0955	1537300	483700	498.0	5.0	---	---	---	0.2	6550.00	40	6510	A	---
										420	6130	S	385-498
0986	1537860	483750	467.0	5.0	---	---	---	0.8	6650.00	65	6584	A	---
										85	6564	L	---
										415	6234	S	420-467
0987	1538120	483270	500.0	5.0	---	---	---	1.0	6650.00	70	6579	A	---
										385	6264	S	425-470
0991	1538880	483630	500.0	---	---	---	---	1.4	6651.00	---	---	S	-

TABLE 8.0-1. WELL DATA FOR THE SAN ANDRES 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 TOP OF SAN ANDRES (FT-LSD)	ELEV. TO TOP OF SAN ANDRES (FT-MSL)	CASING PERFOR-ATIONS (FT-LSD)
0995	1540115	476594	---	---	---	---	---	0.0	6474.00	---	---	S -
0998	1533080	476450	145.0	16.0	---	---	---	0.0	6650.00	---	---	S -

NOTE: A = Base of Alluvium
U = Upper Chinle, Top
M = Middle Chinle, Top
L = Lower Chinle, Top
S = San Andres Aquifer, Top
* = Abandoned

SECTION 9

TABLE OF CONTENTS

GROUND WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

Page Number

9.0 REFERENCES

Environmental Restoration Group, 1999a, Statistical Evaluation of Alluvial Groundwater Quality Upgradient of the Homestake Site near Grants, NM, Molybdenum, Selenium and Uranium, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Environmental Restoration Group, 1999b, Statistical Evaluation of Alluvial Groundwater Quality Upgradient of the Homestake Site near Grants, NM, Nitrate, Sulfate and Total Dissolved Solids, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Environmental Restoration Group, 2003, Grants Project, Statistical Evaluation of Chinle Aquifer Quality at the Homestake Site, Near Grants, NM, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hoffman, G.L., 1976, Groundwater Hydrology of the Alluvium, Consulting Report to Homestake Mining Company.

Hoffman, G.L., 1977, Modeling, Design and Specifications of the Collection and Injection Systems, Consulting Report to Homestake Mining Company.

Hydro-Engineering, 1981, Ground-Water Discharge Plan for Homestake's Mill near Milan, New Mexico, DP-200, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1983, Ground-Water Discharge Plan for Homestake's Mill near Milan, New Mexico, DP-200, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1983a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1983b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1983c, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Fourth Quarter 1983, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1984a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First Quarter 1984, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1984b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Second Quarter 1984, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1984c, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Third Quarter 1984, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1985a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Fourth Quarter 1984, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1985b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First Quarter 1985, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1985c, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Second Quarter 1985, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1985d, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Third Quarter 1985, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1986a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Fourth Quarter 1985, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1986b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First Quarter 1986, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1986c, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Second Quarter 1986, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1987a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Third and Fourth Quarters 1986, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1987b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First and Second Quarters 1987, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1988a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Third and Fourth Quarters 1987, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1988b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First and Second Quarters 1988, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1988c, Renewal Ground-Water Discharge Plan, DP-200 for Homestake's Mill Near Milan, New Mexico, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1989, Corrective Action Plan for Homestake's Tailings, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1990, Ground-Water Monitoring for Homestake's Mill Discharge Plan DP-200 and NRC License SUA-1471, 1989, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1991, Ground-Water Monitoring for Homestake's Mill Discharge Plan DP-200 and NRC License SUA-1471, 1990, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1992, Ground-Water Monitoring for Homestake's Mill Discharge Plan DP-200 and NRC License SUA-1471, 1991, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1993a, Ground-Water Monitoring for Homestake's Mill Discharge Plan DP-200 and NRC License SUA-1471, 1992, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1993b, Water Quality Changes in the Alluvial Aquifer Adjacent to the Homestake Tailings, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1994, Ground-Water Monitoring for Homestake’s Mill Discharge Plan DP-200 and NRC License SCA-1471, 1993, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1995, Ground-Water Monitoring for Homestake's Mill Discharge Plan DP-200 and NRC License SUA-1471, 1994, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1996. Ground-Water Monitoring for Homestake's Grants Project, NRC License SUA-1471, and Discharge Plan DP-200. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C, 1997. Ground-Water Monitoring for Homestake's Grants Project, NRC License SUA-1471, and Discharge Plan DP-200, 1996. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 1998, Ground-Water Monitoring and Performance Review for Homestake's Grants Project, NRC License SUA-1471, and Discharge Plan DP-200, 1997. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 1999, Ground-Water Monitoring and Performance Review for Homestake's Grants Project, NRC License SUA-1471, and Discharge Plan DP-200, 1998. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2000a, Ground-Water Monitoring and Performance Review for Homestake's Grants Project, NRC License SUA-1471, and Discharge Plan DP-200, 1999. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2000b, Ground-Water Hydrology at the Grants Reclamation Site, Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2001a, Ground-Water Monitoring and Performance Review for Homestake's Grants Project, NRC License SUA-1471, and Discharge Plan DP-200, 2000. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2001b, Ground-Water Hydrology and Restoration at the Grants Reclamation Site, 2001, Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2001c, Ground-Water Hydrology for Support of Background Concentrations at the Grants Reclamation Site, 2001, Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2002, Ground-Water Monitoring and Performance Review for Homestake's Grants Project, NRC License SUA-1471, and Discharge Plan DP-200, 2001. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2003a, Ground-Water Monitoring and Performance Review for Homestake's Grants Project, NRC License SUA-1471, and Discharge Plan DP-200, 2002. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2003b, Grants Reclamation Project, Background Water Quality Evaluation of the Chinle Aquifers. Consulting Report for Homestake Mining Company of California.

Hydro-Engineering, L.L.C., 2004, Grants Reclamation Project, 2003 Annual Monitoring Report/Performance Review for Homestake's Grants Project Pursuant to NRC License SUA-1471 and Discharge Plan DP-200. Consulting Report for Homestake Mining Company of California.

APPENDIX A

WATER LEVELS

TABLE OF CONTENTS

GROUND-WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

APPENDIX A

Page Number

TABLE A.1-1. WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS.

WATER LEVEL ELEVATION (FT-MSL)

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
0690		
1/12/2004	33.61	6548.45
12/14/2004	34.34	6547.72
0691		
1/12/2004	43.01	6545.80
12/14/2004	42.28	6546.53
0891		
2/16/2004	29.49	6551.63
1F		
1/8/2004	44.47	6542.91
9/27/2004	44.39	6542.99
1G		
1/8/2004	42.71	6544.36
9/27/2004	42.71	6544.36
1H		
1/8/2004	55.00	6531.39
1I		
2/17/2004	36.40	6561.95
1J		
2/17/2004	34.32	6551.08
1K		
9/28/2004	34.56	6549.57
1L		
1/8/2004	25.38	6553.23
9/27/2004	25.66	6552.95
1M		
1/8/2004	20.98	6554.55
9/28/2004	22.60	6552.93
1N		
2/17/2004	33.78	6557.07
1O		
2/17/2004	43.75	6551.19
1P		
2/17/2004	34.14	6551.10
1S		
11/8/2004	37.90	6544.09
B		
1/5/2004	42.83	6528.07
1/12/2004	42.70	6528.20
1/19/2004	42.49	6528.41
1/26/2004	42.59	6528.31
2/2/2004	42.47	6528.43
2/9/2004	42.58	6528.32
2/16/2004	42.56	6528.34
2/23/2004	42.24	6528.66
3/1/2004	42.30	6528.60
3/8/2004	42.63	6528.27
3/15/2004	42.33	6528.57
3/22/2004	42.11	6528.79
3/29/2004	42.30	6528.60
4/5/2004	42.10	6528.80
4/12/2004	42.13	6528.77
4/19/2004	41.93	6528.97
4/26/2004	42.26	6528.64
5/3/2004	41.95	6528.95
5/10/2004	41.81	6529.09
5/17/2004	41.80	6529.10
5/24/2004	41.71	6529.19
5/24/2004	41.70	6529.20
6/1/2004	41.75	6529.15
6/7/2004	41.68	6529.22
6/14/2004	41.63	6529.27
6/21/2004	41.50	6529.40
6/28/2004	41.61	6529.29
7/6/2004	41.50	6529.40
7/12/2004	41.43	6529.47
7/19/2004	41.45	6529.45
7/26/2004	41.43	6529.47
8/2/2004	41.32	6529.58
8/9/2004	41.48	6529.42
8/16/2004	41.36	6529.54
8/23/2004	41.21	6529.69
8/30/2004	41.31	6529.59
9/7/2004	41.15	6529.75
9/13/2004	41.21	6529.69
9/20/2004	41.28	6529.62
9/27/2004	41.28	6529.62
10/4/2004	41.27	6529.63
10/11/2004	41.27	6529.63
10/17/2004	41.25	6529.65
10/25/2004	41.27	6529.63
11/1/2004	41.54	6529.36
11/8/2004	41.32	6529.58
11/15/2004	41.46	6529.44
11/22/2004	41.45	6529.45
11/29/2004	41.48	6529.42
12/6/2004	41.18	6529.72
12/13/2004	41.42	6529.48
12/20/2004	41.25	6529.65
12/27/2004	41.27	6529.63
B1		
12/9/2004	45.40	6526.25
B11		
9/23/2004	41.28	6536.11
B12		
3/1/2004	46.62	6526.38
12/8/2004	44.20	6528.82
B13		
3/1/2004	39.91	6528.09
12/9/2004	38.99	6531.05
BA		
1/5/2004	44.09	6527.49
1/12/2004	43.90	6527.68
1/19/2004	43.34	6528.24
1/26/2004	43.59	6527.99
2/2/2004	43.81	6527.77
2/9/2004	43.96	6527.62
2/16/2004	43.98	6527.60
2/23/2004	43.24	6528.34
3/1/2004	43.76	6527.82
3/8/2004	44.01	6527.57
3/15/2004	43.51	6528.07
3/22/2004	43.33	6528.25
3/29/2004	43.20	6528.38
4/5/2004	42.81	6528.77
4/12/2004	42.92	6528.66
4/19/2004	42.90	6528.68
4/26/2004	43.08	6528.50
5/3/2004	43.12	6528.46
5/10/2004	42.85	6528.73
5/17/2004	43.24	6528.34
5/24/2004	43.21	6528.37
6/1/2004	43.33	6528.25
6/7/2004	42.98	6528.60
6/14/2004	42.62	6528.96
6/21/2004	42.40	6529.18
6/28/2004	42.45	6529.13
7/6/2004	42.33	6529.25
7/12/2004	42.26	6529.32
7/19/2004	42.25	6529.33
7/26/2004	42.24	6529.34
8/2/2004	42.08	6529.50
8/9/2004	42.30	6529.28
8/16/2004	42.27	6529.31
8/23/2004	42.11	6529.47
8/30/2004	42.13	6529.45
9/7/2004	42.28	6529.30
9/13/2004	42.27	6529.31
9/20/2004	42.19	6529.39
9/27/2004	42.21	6529.37
10/4/2004	42.18	6529.40
10/11/2004	42.03	6529.55
10/17/2004	42.34	6529.24
10/25/2004	42.60	6528.98
11/1/2004	42.88	6528.70
11/8/2004	42.63	6528.95
11/15/2004	42.73	6528.85
11/22/2004	42.75	6528.83
11/29/2004	42.79	6528.79
12/6/2004	42.38	6529.20
12/13/2004	42.75	6528.83
12/20/2004	42.63	6528.95
12/27/2004	42.60	6528.98

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.1-1. WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

Well	Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
BC	3/24/2004	46.28	6528.33
BC	5/24/2004	45.62	6528.99
BC	12/8/2004	44.56	6530.05
BP	1/8/2004	44.49	6527.81
BP	12/14/2004	44.11	6528.19
C1	8/31/2004	34.39	6537.47
C2	8/31/2004	30.04	6534.98
C5	1/12/2004	30.41	6539.44
C5	11/9/2004	31.28	6538.57
C6	3/8/2004	54.15	6530.74
C6	6/1/2004	47.10	6537.79
C6	9/21/2004	57.71	6527.18
C7	3/8/2004	60.70	6523.74
C7	6/1/2004	48.16	6536.28
C7	9/21/2004	71.00	6513.44
C8	3/8/2004	53.30	6531.19
C8	6/1/2004	49.08	6535.41
C8	9/21/2004	47.48	6537.01
C9	3/8/2004	60.56	6523.99
C9	6/1/2004	48.70	6535.85
C9	9/21/2004	50.43	6534.12
C10	3/8/2004	69.00	6516.26
C10	6/1/2004	49.00	6536.26
C10	9/21/2004	61.30	6523.96
C11	3/8/2004	62.10	6519.28
C11	6/1/2004	42.20	6539.18
C11	9/21/2004	60.88	6520.50
C12	3/8/2004	40.62	6539.93
C12	6/1/2004	39.30	6541.25
C12	9/21/2004	41.20	6539.35
D1	5/24/2004	45.61	6525.29
DC	3/24/2004	44.17	6527.14
DC	5/24/2004	43.58	6527.73
DC	12/8/2004	42.71	6528.60
DD	5/18/2004	58.52	6534.07
DZ	1/5/2004	55.38	6535.15
DZ	1/12/2004	54.89	6535.64
DZ	1/19/2004	54.61	6535.92
DZ	1/26/2004	54.46	6536.07
DZ	2/2/2004	56.49	6534.04
DZ	2/9/2004	56.80	6533.73
DZ	2/16/2004	57.09	6533.44
DZ	2/23/2004	55.17	6535.36
DZ	3/1/2004	57.11	6533.42
DZ	3/8/2004	57.90	6532.63
DZ	3/15/2004	57.72	6532.81
DZ	3/22/2004	57.04	6533.49
DZ	3/29/2004	56.71	6533.82
DZ	4/5/2004	55.41	6535.12
DZ	4/12/2004	55.15	6535.38
DZ	4/19/2004	57.03	6533.50
DZ	4/26/2004	57.84	6532.69
DZ	5/3/2004	57.81	6532.72
DZ	5/10/2004	55.75	6534.78
DZ	5/17/2004	56.27	6534.26
DZ	5/24/2004	56.57	6533.96
DZ	5/25/2004	56.45	6534.08
DZ	6/1/2004	56.58	6533.95
DZ	6/7/2004	55.38	6535.15
DZ	6/14/2004	55.14	6535.39
DZ	6/21/2004	54.73	6535.80
DZ	6/28/2004	54.71	6535.82
DZ	7/6/2004	54.40	6536.13
DZ	7/12/2004	54.25	6536.28
DZ	7/19/2004	54.05	6536.48
DZ	7/26/2004	53.71	6536.82
DZ	8/2/2004	53.70	6536.83
DZ	8/9/2004	53.68	6536.85
DZ	8/16/2004	53.28	6537.25
DZ	8/23/2004	53.03	6537.50
DZ	8/30/2004	53.10	6537.43
DZ	9/7/2004	53.02	6537.51
DZ	9/13/2004	52.67	6537.86
DZ	9/20/2004	52.65	6537.88
DZ	9/27/2004	52.67	6537.86
DZ	10/4/2004	52.61	6537.92
DZ	10/11/2004	52.78	6537.75
DZ	10/17/2004	52.64	6537.89
DZ	10/25/2004	53.20	6537.33
DZ	11/1/2004	53.29	6537.24
DZ	11/8/2004	53.53	6537.00
DZ	11/15/2004	53.73	6536.80
DZ	11/22/2004	53.41	6537.12
DZ	11/29/2004	53.36	6537.17
DZ	12/6/2004	53.09	6537.44
DZ	12/13/2004	53.62	6536.91
DZ	12/20/2004	53.05	6537.48
DZ	12/27/2004	53.32	6537.21
F	7/7/2004	30.64	6534.18
FB	1/13/2004	35.53	6530.13
FB	10/13/2004	34.82	6530.84
G	3/3/2004	34.60	6528.49
G	12/13/2004	4.00	6559.09
GA	12/9/2004	33.00	6529.79
GF	12/9/2004	34.34	6531.67
GH	3/11/2004	32.14	6530.62
GH	12/9/2004	32.16	6530.60
GK	3/3/2004	33.40	6533.36
GK	12/9/2004	33.67	6533.09
GV	1/8/2004	48.98	6528.40
GV	3/3/2004	48.61	6528.77
GV	9/23/2004	48.73	6528.65
GV	12/9/2004	48.73	6528.65
GW1	12/9/2004	30.75	6534.52
GW2	12/9/2004	31.81	6534.27
I	5/25/2004	30.80	6536.40
K4	1/13/2004	66.11	6535.91
K4	4/13/2004	51.62	6550.40
K4	10/11/2004	65.30	6536.72
K5	1/13/2004	57.83	6543.90
K5	4/13/2004	58.10	6543.63
K5	10/11/2004	59.71	6542.02

* Drawdown Tube Pressure, # Transducer Reading

BC - K5

TABLE A.1-1. WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
K7		
1/13/2004	53.72	6547.81
4/13/2004	55.24	6546.29
10/11/2004	57.18	6544.35
K8		
1/13/2004	63.18	6537.31
4/13/2004	82.20	6518.29
10/11/2004	54.48	6546.01
K9		
1/13/2004	61.39	6538.95
4/13/2004	59.48	6540.86
10/11/2004	62.38	6537.96
K10		
1/13/2004	56.34	6544.47
4/13/2004	67.08	6533.73
10/11/2004	67.98	6532.83
K11		
1/13/2004	62.29	6538.32
4/13/2004	63.24	6537.37
10/11/2004	68.45	6532.16
KEB		
2/16/2004	18.06	6551.67
7/12/2004	19.70	6550.03
KF		
2/16/2004	23.66	6546.55
7/13/2004	24.80	6545.41
KZ		
1/5/2004	26.90	6544.82
1/12/2004	26.60	6545.12
1/19/2004	26.67	6545.05
1/26/2004	26.68	6545.04
2/2/2004	26.28	6545.44
2/9/2004	26.60	6545.12
2/16/2004	26.86	6544.86
2/16/2004	26.89	6544.83
2/23/2004	26.90	6544.82
3/1/2004	27.00	6544.72
3/8/2004	27.34	6544.38
3/15/2004	27.12	6544.60
3/22/2004	26.98	6544.74
3/29/2004	27.70	6544.02
4/5/2004	27.60	6544.12
4/12/2004	27.60	6544.12
4/19/2004	27.36	6544.36
4/26/2004	28.08	6543.64
5/3/2004	27.24	6544.48
5/10/2004	27.38	6544.34
5/17/2004	27.31	6544.41
5/24/2004	27.05	6544.67
6/1/2004	27.01	6544.71
6/7/2004	27.05	6544.67
6/14/2004	27.06	6544.66
6/21/2004	27.25	6544.47
6/28/2004	27.60	6544.12
7/6/2004	27.53	6544.19
7/12/2004	27.65	6544.07
7/12/2004	27.68	6544.04
7/19/2004	27.65	6544.07
7/26/2004	27.80	6543.92
8/2/2004	27.70	6544.02
8/9/2004	27.71	6544.01
8/16/2004	27.68	6544.04
8/23/2004	28.00	6543.72
8/30/2004	28.28	6543.44
9/7/2004	28.48	6543.24
9/13/2004	28.37	6543.35
9/20/2004	28.48	6543.24
9/27/2004	28.48	6543.24
10/4/2004	28.51	6543.21
10/11/2004	28.37	6543.35
10/17/2004	28.31	6543.41
10/25/2004	28.32	6543.40
11/1/2004	28.40	6543.32
11/8/2004	28.42	6543.30
11/15/2004	28.52	6543.20
11/22/2004	28.49	6543.23
11/29/2004	28.68	6543.04
12/6/2004	28.54	6543.18
12/13/2004	28.70	6543.02
12/20/2004	28.37	6543.35
12/27/2004	28.56	6543.16
L		
1/13/2004	49.63	6525.34
5/5/2004	47.08	6527.89
7/12/2004	46.18	6528.79
10/14/2004	46.88	6528.09
L5		
1/13/2004	39.23	6536.84
5/5/2004	39.58	6536.49
7/12/2004	39.50	6536.57
10/14/2004	38.30	6537.77
L6		
1/8/2004	22.01	6552.63
5/5/2004	22.48	6552.16
7/12/2004	22.90	6551.74
10/14/2004	23.36	6551.28
L7		
1/13/2004	42.81	6533.80
5/5/2004	43.13	6533.48
7/12/2004	44.08	6532.53
10/14/2004	40.56	6536.05
L8		
1/13/2004	44.26	6532.23
5/5/2004	45.38	6531.11
7/12/2004	48.10	6528.39
10/14/2004	46.30	6530.19
L9		
1/13/2004	43.78	6533.45
5/5/2004	44.39	6532.84
7/12/2004	46.50	6530.73
10/14/2004	46.44	6530.79
L10		
1/13/2004	46.50	6530.33
5/5/2004	40.70	6536.13
7/12/2004	41.70	6535.13
10/14/2004	47.70	6529.13
M3R		
12/15/2004	50.70	6529.56
M5		
1/12/2004	49.61	6525.73
12/9/2004	46.78	6528.56
M6		
12/8/2004	64.83	6510.21
M7		
12/8/2004	59.94	6512.91
M9		
11/8/2004	65.03	6511.78
12/8/2004	64.80	6512.01
M10		
12/8/2004	55.43	6517.93
MA		
12/8/2004	45.63	6526.59
MC		
12/8/2004	46.06	6526.00
MF		
12/8/2004	50.71	6521.57
MH		
12/8/2004	54.92	6519.00
MJ		
12/8/2004	54.16	6518.78
MK		
12/8/2004	60.05	6513.74
ML		
12/8/2004	49.34	6523.36

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.1-1. WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

Well	Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
MO	3/11/2004	65.90	6506.99
MO	10/13/2004	66.31	6506.58
MQ	1/12/2004	66.60	6507.70
MQ	10/15/2004	66.76	6507.54
MQ	12/8/2004	66.51	6507.79
MR	1/19/2004	70.19	6496.07
MR	11/10/2004	71.40	6494.86
MS	1/19/2004	63.49	6507.18
MS	11/10/2004	63.68	6506.99
MT	1/19/2004	69.94	6497.49
MT	11/10/2004	71.09	6496.34
MU	1/15/2004	44.31	6529.88
MU	3/24/2004	44.29	6529.90
MU	11/10/2004	43.26	6530.93
MU	12/8/2004	43.44	6530.75
MW	12/8/2004	64.36	6510.55
MX	1/15/2004	53.58	6515.03
MX	3/3/2004	53.71	6514.90
MX	11/9/2004	53.64	6514.97
MX	12/13/2004	53.72	6514.89
MY	1/15/2004	59.32	6514.24
MY	3/3/2004	59.28	6514.28
MY	11/9/2004	59.14	6514.42
MY	12/13/2004	59.18	6514.38
MZ	12/8/2004	67.90	6508.74
N	8/31/2004	51.10	6532.87
NA	8/31/2004	54.93	6536.05
NB	8/31/2004	50.14	6543.16
NC	8/17/2004	50.91	6534.92
ND	5/18/2004	47.48	6545.41
NE5	3/1/2004	51.64	6615.36
NW5	3/2/2004	62.32	6595.26
O	1/15/2004	47.58	6540.25
O	8/31/2004	47.31	6540.52
P	7/7/2004	55.00	6532.26
P2	2/16/2004	66.00	6523.79
P3	3/9/2004	54.58	6535.37
P3	12/21/2004	49.31	6540.64
P4	3/9/2004	50.81	6538.71
P4	12/21/2004	49.60	6539.92
PM	1/12/2004	12.33	6555.09
Q	5/18/2004	49.59	6544.23
R	5/18/2004	42.91	6561.12
S	1/12/2004	53.96	6527.21
S	12/8/2004	50.03	6531.14
S1	1/5/2004	50.19	6525.00
S1	1/12/2004	50.13	6525.06
S1	1/19/2004	50.01	6525.18
S1	1/26/2004	49.93	6525.26
S1	2/2/2004	49.78	6525.41
S1	2/9/2004	49.60	6525.59
S1	2/16/2004	49.47	6525.72
S1	2/23/2004	49.14	6526.05
S1	3/1/2004	48.98	6526.21
S1	3/8/2004	48.85	6526.34
S1	3/15/2004	48.76	6526.43
S1	3/22/2004	48.51	6526.68
S1	3/29/2004	48.40	6526.79
S1	4/5/2004	47.86	6527.33
S1	4/12/2004	47.71	6527.48
S1	4/19/2004	47.81	6527.38
S1	4/26/2004	47.96	6527.23
S1	5/3/2004	47.80	6527.39
S1	5/10/2004	47.54	6527.65
S1	5/17/2004	47.55	6527.64
S1	5/24/2004	47.61	6527.58
S1	6/1/2004	47.70	6527.49
S1	6/7/2004	47.71	6527.48
S1	6/14/2004	47.68	6527.51
S1	6/21/2004	47.61	6527.58
S1	6/28/2004	47.75	6527.44
S1	7/6/2004	47.68	6527.51
S1	7/12/2004	47.54	6527.65
S1	7/19/2004	47.58	6527.61
S1	7/26/2004	47.55	6527.64
S1	8/2/2004	47.49	6527.70
S1	8/9/2004	47.58	6527.61
S1	8/16/2004	47.61	6527.58
S1	8/23/2004	47.61	6527.58
S1	8/30/2004	47.38	6527.81
S1	9/7/2004	47.35	6527.84
S1	9/13/2004	47.22	6527.97
S1	9/20/2004	47.22	6527.97
S1	9/27/2004	47.18	6528.01
S1	10/4/2004	47.07	6528.12
S1	10/11/2004	47.08	6528.11
S1	10/17/2004	47.05	6528.14
S1	10/25/2004	46.82	6528.37
S1	11/1/2004	46.56	6528.63
S1	11/8/2004	46.34	6528.85
S1	11/15/2004	46.10	6529.09
S1	11/22/2004	45.90	6529.29
S1	11/29/2004	45.80	6529.39
S1	12/6/2004	45.53	6529.66
S1	12/13/2004	45.51	6529.68
S1	12/20/2004	45.28	6529.91
S1	12/27/2004	45.16	6530.03

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.1-1. WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

S2

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
1/5/2004	48.13	6525.59
1/12/2004	48.07	6525.65
1/13/2004	48.00	6525.72
1/19/2004	48.00	6525.72
1/26/2004	47.92	6525.80
2/2/2004	47.68	6526.04
2/9/2004	47.56	6526.16
2/16/2004	47.44	6526.28
2/23/2004	47.15	6526.57
3/1/2004	46.98	6526.74
3/8/2004	46.92	6526.80
3/15/2004	46.76	6526.96
3/22/2004	46.60	6527.12
3/29/2004	46.60	6527.12
4/5/2004	46.25	6527.47
4/12/2004	46.20	6527.52
4/19/2004	46.14	6527.58
4/26/2004	46.27	6527.45
5/3/2004	46.11	6527.61
5/10/2004	45.93	6527.79
5/17/2004	45.91	6527.81
5/24/2004	45.91	6527.81
6/1/2004	46.03	6527.69
6/7/2004	46.05	6527.67
6/14/2004	46.06	6527.66
6/21/2004	46.03	6527.69
6/28/2004	46.20	6527.52
7/6/2004	46.11	6527.61
7/8/2004	46.11	6527.61
7/12/2004	46.04	6527.68
7/19/2004	46.10	6527.62
7/26/2004	46.08	6527.64
8/2/2004	46.03	6527.69
8/9/2004	46.08	6527.64
8/16/2004	46.15	6527.57
8/23/2004	45.92	6527.80
8/30/2004	45.91	6527.81
9/7/2004	45.89	6527.83
9/13/2004	45.81	6527.91
9/20/2004	45.80	6527.92
9/27/2004	45.75	6527.97
10/4/2004	45.67	6528.05
10/11/2004	45.66	6528.06
10/17/2004	45.63	6528.09
10/25/2004	45.41	6528.31
11/1/2004	45.21	6528.51
11/8/2004	45.01	6528.71
11/15/2004	44.81	6528.91
11/22/2004	44.64	6529.08
11/29/2004	44.57	6529.15
12/6/2004	44.35	6529.37
12/8/2004	44.35	6529.37
12/13/2004	44.39	6529.33
12/20/2004	44.10	6529.62
12/27/2004	44.02	6529.70

S3

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
1/12/2004	49.82	6524.96
12/8/2004	45.76	6529.02

S4

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
3/11/2004	48.50	6526.79
3/24/2004	48.28	6527.01
7/7/2004	47.36	6527.93
12/8/2004	45.40	6529.89

S5

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
8/16/2004	53.39	6521.30
8/23/2004	53.19	6521.50
8/30/2004	53.30	6521.39
9/7/2004	53.43	6521.26
9/13/2004	53.28	6521.41
9/20/2004	53.31	6521.38
9/27/2004	53.30	6521.39
10/4/2004	53.03	6521.66
10/11/2004	53.23	6521.46
10/17/2004	52.92	6521.77
10/25/2004	51.85	6522.84
11/1/2004	51.40	6523.29
11/8/2004	51.00	6523.69
11/15/2004	50.70	6523.99
11/22/2004	50.52	6524.17
11/29/2004	50.41	6524.28
12/6/2004	50.02	6524.67
12/13/2004	50.05	6524.64
12/20/2004	49.70	6524.99
12/27/2004	49.68	6525.01

S5R

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
12/15/2004	50.31	6530.18

S11

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
1/12/2004	48.42	6529.97
3/24/2004	45.51	6532.88
10/18/2004	39.88	6538.51
12/8/2004	38.81	6539.58
12/13/2004	38.68	6539.71

S12

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
12/8/2004	50.21	6528.64

SM

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
5/19/2004	49.53	6529.21
12/8/2004	46.42	6532.32

SN

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
12/8/2004	48.07	6531.19

SO

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
1/5/2004	53.71	6525.08
1/12/2004	53.46	6525.33
1/19/2004	53.22	6525.57
1/26/2004	53.19	6525.60
2/2/2004	52.80	6525.99
2/9/2004	52.64	6526.15
2/16/2004	52.37	6526.42
2/23/2004	51.89	6526.90
3/1/2004	51.71	6527.08
3/8/2004	51.70	6527.09
3/15/2004	51.25	6527.54
3/22/2004	50.98	6527.81
3/29/2004	50.95	6527.84
4/5/2004	50.42	6528.37
4/12/2004	50.30	6528.49
4/19/2004	50.38	6528.41
4/26/2004	50.61	6528.18
5/3/2004	50.46	6528.33
5/10/2004	50.27	6528.52
5/17/2004	50.18	6528.61
5/19/2004	50.16	6528.63
5/24/2004	50.32	6528.47
6/1/2004	50.42	6528.37
6/7/2004	50.31	6528.48
6/14/2004	50.20	6528.59
6/21/2004	50.10	6528.69
6/28/2004	50.21	6528.58
7/6/2004	50.10	6528.69
7/12/2004	49.90	6528.89
7/19/2004	49.87	6528.92
7/26/2004	49.85	6528.94
8/2/2004	49.80	6528.99
8/9/2004	49.98	6528.81
8/16/2004	49.91	6528.88
8/23/2004	49.68	6529.11
8/30/2004	49.66	6529.13
9/7/2004	49.62	6529.17
9/13/2004	49.49	6529.30
9/20/2004	49.50	6529.29
9/27/2004	49.48	6529.31
10/4/2004	49.40	6529.39
10/11/2004	49.40	6529.39
10/17/2004	49.40	6529.39
10/25/2004	49.03	6529.76
11/1/2004	48.90	6529.89
11/8/2004	48.51	6530.28
11/15/2004	48.34	6530.45
11/22/2004	48.22	6530.57
11/29/2004	48.20	6530.59
12/6/2004	47.78	6531.01
12/13/2004	47.77	6531.02
12/20/2004	47.52	6531.27
12/27/2004	47.39	6531.40

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.1-1. WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

Well	Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
SP	1/5/2004	54.03	6524.63
SP	1/12/2004	53.86	6524.80
SP	1/19/2004	53.79	6524.87
SP	1/26/2004	53.66	6525.00
SP	2/2/2004	53.34	6525.32
SP	2/9/2004	53.17	6525.49
SP	2/16/2004	52.95	6525.71
SP	2/23/2004	52.53	6526.13
SP	3/1/2004	52.27	6526.39
SP	3/8/2004	52.21	6526.45
SP	3/15/2004	51.81	6526.85
SP	3/22/2004	51.54	6527.12
SP	3/29/2004	51.35	6527.31
SP	4/5/2004	50.81	6527.85
SP	4/12/2004	50.69	6527.97
SP	4/19/2004	50.90	6527.76
SP	4/26/2004	51.18	6527.48
SP	5/3/2004	51.02	6527.64
SP	5/10/2004	50.86	6527.80
SP	5/17/2004	50.80	6527.86
SP	5/24/2004	50.84	6527.82
SP	6/1/2004	50.91	6527.75
SP	6/7/2004	50.79	6527.87
SP	6/14/2004	50.66	6528.00
SP	6/21/2004	50.51	6528.15
SP	6/28/2004	50.60	6528.06
SP	7/6/2004	50.45	6528.21
SP	7/12/2004	50.32	6528.34
SP	7/19/2004	50.20	6528.46
SP	7/26/2004	50.15	6528.51
SP	8/2/2004	50.08	6528.58
SP	8/9/2004	50.25	6528.41
SP	8/16/2004	50.30	6528.36
SP	8/23/2004	50.10	6528.56
SP	8/30/2004	49.93	6528.73
SP	9/7/2004	48.88	6529.78
SP	9/13/2004	49.75	6528.91
SP	9/20/2004	49.70	6528.96
SP	9/27/2004	49.68	6528.98
SP	10/4/2004	49.60	6529.06
SP	10/11/2004	49.60	6529.06
SP	10/17/2004	49.60	6529.06
SP	10/25/2004	49.15	6529.51
SP	11/1/2004	48.95	6529.71
SP	11/8/2004	48.58	6530.08
SP	11/15/2004	48.34	6530.32
SP	11/22/2004	48.21	6530.45
SP	11/29/2004	48.10	6530.56
SP	12/6/2004	47.71	6530.95
SP	12/13/2004	47.67	6530.99
SP	12/20/2004	47.48	6531.18
SP	12/27/2004	47.25	6531.41
SW	5/19/2004	56.44	6524.85
SZ	3/24/2004	46.46	6535.01
SZ	12/8/2004	42.10	6539.37
T	2/16/2004	35.90	6543.33
T2	1/22/2004	131.28	6533.54
T2	7/12/2004	130.64	6534.18
T2	12/9/2004	128.48	6536.34
T4	1/22/2004	129.74	6528.00
T4	12/9/2004	98.13	6559.61
T5	1/22/2004	120.65	6536.68
T5	12/9/2004	123.99	6533.34
T6	3/30/2004	112.00	6546.77
T6	12/9/2004	124.15	6534.62
T7	3/30/2004	124.63	6535.04
T7	12/9/2004	123.00	6536.67
T8	6/22/2004	123.80	6537.81
T8	12/9/2004	124.00	6537.61
T9	6/22/2004	90.84	6573.11
T9	12/9/2004	98.36	6565.59
T10	6/23/2004	107.21	6552.75
T10	12/9/2004	109.75	6550.21
T11	6/23/2004	124.48	6532.33
T11	12/9/2004	124.87	6531.94
T12	6/23/2004	67.56	6589.67
T12	12/9/2004	96.50	6560.73
T17	6/24/2004	126.98	6529.93
T17	12/9/2004	125.79	6531.12
T18	1/22/2004	133.00	6532.16
T18	2/2/2004	145.25	6519.91
T18	3/1/2004	147.00	6518.16
T18	7/12/2004	145.20	6519.96
T18	12/9/2004	145.12	6520.04
T19	6/24/2004	133.50	6534.26
T19	12/9/2004	133.84	6533.92
T20	6/24/2004	134.98	6535.71
T20	12/9/2004	135.30	6535.39
T21	6/23/2004	129.59	6540.41
T21	12/9/2004	131.89	6538.11
T22	3/30/2004	102.68	6564.51
T22	12/9/2004	64.18	6603.01
T40	6/24/2004	133.70	6536.57
T40	12/9/2004	133.17	6537.10
T41	3/26/2004	126.10	6533.86
T41	12/9/2004	124.68	6535.28
TA	2/16/2004	39.68	6540.62
TA	9/22/2004	35.07	6545.23
TB	2/16/2004	37.58	6545.99
TB	9/23/2004	37.28	6546.29
W	1/12/2004	48.53	6523.61
W	3/24/2004	47.82	6524.32
W	10/18/2004	47.91	6524.23
W	12/8/2004	47.75	6524.39
WN4	3/2/2004	58.10	6604.68
WR12	12/8/2004	1.00	6567.19

* Drawdown Tube Pressure, # Transducer Reading

WATER LEVEL ELEVATION (FT-MSL)

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)	Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)	Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)	Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
	X										
2/2/2004	17.70	6553.91									
2/16/2004	17.34	6554.27									
3/1/2004	17.58	6554.03									
3/29/2004	43.76	6527.85									
4/26/2004	18.08	6553.53									
5/3/2004	18.12	6553.49									
6/1/2004	18.40	6553.21									
6/28/2004	19.20	6552.41									
7/7/2004	19.08	6552.53									
8/2/2004	19.68	6551.93									
8/30/2004	19.65	6551.96									
10/4/2004	20.48	6551.13									
10/13/2004	19.88	6551.73									
11/1/2004	20.18	6551.43									
11/29/2004	20.88	6550.73									

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.1-2. WATER LEVELS FOR THE SUBDIVISION ALLUVIAL WELLS. (cont.)

WATER-LEVEL ELEVATION (FT-MSL)

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
0490		
3/3/2004	36.57	6525.85
5/20/2004	36.54	6525.88
12/20/2004	36.35	6526.07
0491		
8/23/2004	38.30	6524.32
0492		
5/20/2004	34.10	6526.58
0496		
3/3/2004	53.96	6508.56
4/17/2004	77.60	6484.92
6/16/2004	80.85	6481.67
7/22/2004	57.45	6505.07
8/17/2004	80.58	6481.94
9/13/2004	78.28	6484.24
12/10/2004	55.55	6506.97
12/20/2004	54.58	6507.94
0497		
3/3/2004	53.26	6509.36
8/17/2004	58.68	6503.94
11/8/2004	56.08	6506.54
12/10/2004	54.84	6507.78
12/20/2004	54.27	6508.35
0498		
1/19/2004	57.80	6502.20
4/20/2004	142.00	6418.00
6/16/2004	140.50	6419.50
7/23/2004	141.00	6419.00
9/13/2004	132.44	6427.56
12/10/2004	58.28	6502.31
0688		
3/3/2004	62.38	6500.24
5/20/2004	62.94	6499.68
12/20/2004	62.83	6499.79
0801		
7/15/2004	39.20	6528.53
0801R		
11/4/2004	41.01	6528.04
0844		
3/3/2004	35.28	6520.85
7/7/2004	34.57	6521.56
12/20/2004	34.60	6521.53
0845		
1/13/2004	34.70	6522.35
3/3/2004	34.68	6522.37
8/17/2004	34.66	6522.39
AW		
6/29/2004	36.50	6526.93
CW44		
3/3/2004	58.50	6502.24
7/22/2004	134.00	6426.74
12/14/2004	60.20	6500.54
SUB1		
1/15/2004	33.74	6527.26
5/4/2004	33.95	6527.05
12/20/2004	33.58	6527.42
SUB2		
1/15/2004	40.80	6526.77
5/4/2004	40.10	6527.47
SUB3		
1/15/2004	28.60	6528.47
5/4/2004	28.76	6528.31
12/20/2004	28.40	6528.67

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.1-3. WATER LEVELS FOR REGIONAL ALLUVIAL WELLS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
0520		
3/3/2004	53.54	6532.48
10/7/2004	53.21	6532.81
12/14/2004	53.26	6532.76
0521		
1/13/2004	55.89	6528.55
5/4/2004	58.36	6526.08
5/8/2004	58.78	6525.66
10/7/2004	59.88	6524.56
0522		
1/12/2004	51.65	6528.88
1/13/2004	51.90	6528.63
5/4/2004	50.38	6530.15
7/8/2004	49.71	6530.82
7/23/2004	46.27	6534.26
9/14/2004	52.05	6528.48
10/7/2004	52.64	6527.89
0538		
1/19/2004	80.40	6467.60
4/20/2004	53.00	6495.00
6/16/2004	162.30	6385.70
7/22/2004	76.20	6471.80
9/13/2004	158.00	6390.00
12/10/2004	81.98	6466.96
0539		
1/22/2004	82.26	6471.74
7/22/2004	80.33	6473.67
9/13/2004	82.36	6471.64
12/10/2004	75.60	6479.72
0540		
1/20/2004	67.81	6489.19
7/22/2004	70.02	6486.98
9/13/2004	71.42	6485.58
12/10/2004	66.28	6489.63
0541		
2/9/2004	86.10	6469.52
4/23/2004	97.45	6458.17
6/15/2004	88.61	6467.01
8/9/2004	96.50	6459.12
9/13/2004	97.80	6457.82
12/10/2004	88.71	6466.91
0631		
3/3/2004	86.90	6454.20
4/20/2004	104.90	6436.20
5/13/2004	104.88	6436.22
6/15/2004	105.90	6435.20
7/22/2004	106.30	6434.80
9/14/2004	> 107.00	< 6434.10
9/14/2004	> 106.40	< 6434.70
12/10/2004	90.61	6450.49
0632		
4/20/2004	87.63	6453.67
6/15/2004	96.20	6445.10
7/22/2004	97.80	6443.50
9/14/2004	92.60	6448.70
9/14/2004	92.60	6448.70
10/26/2004	91.42	6449.88
12/10/2004	90.05	6451.25
0633		
12/10/2004	75.00	6482.56
0634		
1/5/2004	72.18	6487.89
4/23/2004	82.03	6478.04
6/17/2004	> 89.50	< 6470.57
9/14/2004	77.87	6482.20
12/10/2004	72.75	6487.32
0636		
1/6/2004	99.08	6474.36
9/15/2004	100.38	6473.06
0637		
1/6/2004	105.07	6470.13
9/15/2004	106.48	6468.72
0638		
10/7/2004	49.87	6535.69
12/14/2004	49.45	6536.11
0639		
1/13/2004	60.00	6527.88
5/4/2004	59.48	6528.40
7/8/2004	59.20	6528.68
10/7/2004	63.00	6524.88
0640		
1/7/2004	51.65	6528.32
7/13/2004	51.50	6528.47
12/14/2004	51.25	6528.72
0644		
1/7/2004	81.02	6462.88
12/10/2004	83.83	6460.07
0646		
1/7/2004	82.49	6460.86
0647		
4/23/2004	107.40	6444.51
6/15/2004	111.22	6440.69
7/22/2004	112.25	6439.66
8/19/2004	110.70	6441.21
9/13/2004	110.95	6440.96
12/10/2004	100.20	6451.71
0648		
3/3/2004	100.65	6447.14
5/13/2004	104.34	6443.45
6/15/2004	105.33	6442.46
6/16/2004	> 107.70	< 6440.09
7/22/2004	106.15	6441.64
8/19/2004	106.42	6441.37
9/13/2004	106.78	6441.01
12/10/2004	105.50	6442.29
0649		
3/3/2004	93.66	6449.63
4/23/2004	111.90	6431.39
6/15/2004	112.50	6430.79
7/22/2004	111.00	6432.29
8/19/2004	113.04	6430.25
9/13/2004	< 114.00	> 6429.29
12/10/2004	98.10	6445.19
0650		
11/8/2004	80.00	6467.11
12/14/2004	80.14	6466.97
0652		
1/7/2004	85.11	6453.04
3/3/2004	84.99	6453.16
12/10/2004	85.75	6452.40
12/20/2004	85.66	6452.49
0653		
4/20/2004	174.20	6370.77
6/16/2004	> 177.40	< 6367.57
7/22/2004	> 173.10	< 6371.87
9/27/2004	153.18	6391.79
10/26/2004	85.46	6459.51
12/10/2004	79.76	6465.21
0654		
1/5/2004	72.21	6478.29
3/3/2004	71.88	6478.62
5/6/2004	73.11	6477.39
10/4/2004	73.41	6477.09
12/10/2004	73.80	6476.70
0657		
4/23/2004	108.72	6443.09
5/13/2004	111.13	6440.68
6/15/2004	113.50	6438.31
7/22/2004	113.30	6438.51
9/13/2004	> 127.00	< 6424.81
9/14/2004	99.90	6451.91
12/10/2004	96.80	6455.01
0658		
12/10/2004	101.92	6448.26

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.1-3. WATER LEVELS FOR REGIONAL ALLUVIAL WELLS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

Well	Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
0659	1/5/2004	72.26	6487.91
	4/23/2004	77.80	6482.37
	6/17/2004	82.48	6477.69
	9/14/2004	80.08	6480.09
	12/10/2004	72.72	6487.45
0683	1/6/2004	86.04	6470.00
	3/3/2004	85.68	6470.36
	10/4/2004	88.40	6467.64
	12/21/2004	87.76	6468.28
0684	1/6/2004	83.00	6470.28
	10/5/2004	84.79	6468.49
0685	3/3/2004	90.48	6466.09
	9/14/2004	95.89	6460.68
	12/10/2004	93.48	6463.09
0686	1/6/2004	107.26	6471.54
	9/15/2004	108.63	6470.17
0687	3/3/2004	89.71	6466.25
	4/23/2004	> 93.90	< 6462.06
	6/15/2004	> 93.90	< 6462.06
	7/22/2004	> 94.00	< 6461.96
	9/14/2004	> 94.40	< 6461.56
	12/10/2004	92.55	6463.41
0689	1/7/2004	73.34	6468.68
	7/27/2004	73.51	6468.51
0692	1/7/2004	65.73	6519.09
	7/28/2004	65.57	6519.25
0846	3/3/2004	44.40	6504.52
	7/7/2004	44.51	6504.41
	12/20/2004	44.58	6504.34
0851	8/19/2004	79.98	6466.46
0855	4/20/2004	88.40	6452.71
	4/21/2004	90.70	6450.41
	6/15/2004	96.40	6444.71
	8/19/2004	91.52	6449.59
	9/13/2004	92.33	6448.78
0861	8/30/2004	72.84	6487.01
0862	4/20/2004	77.50	6478.68
	6/16/2004	89.95	6466.23
	7/22/2004	90.80	6465.38
	8/19/2004	88.76	6467.42
	9/13/2004	89.60	6466.58
	12/10/2004	62.75	6493.43
0864	7/22/2004	79.78	6466.94
	11/17/2004	79.20	6467.52
0867	4/20/2004	77.55	6478.35
	8/19/2004	77.06	6478.84
	12/10/2004	68.45	6487.45
0869	4/20/2004	94.00	6450.49
	6/16/2004	> 94.30	< 6450.19
	7/22/2004	94.20	6450.29
	8/19/2004	95.24	6449.25
	9/13/2004	94.63	6449.86
	10/26/2004	81.00	6463.49
	12/10/2004	82.86	6461.63
0876	6/22/2004	84.30	6459.96
	11/8/2004	84.66	6459.60
	12/10/2004	83.71	6460.55
0879	12/10/2004	69.18	6475.37
0881	1/5/2004	76.13	6488.91
	4/23/2004	80.90	6484.14
	6/17/2004	85.23	6479.81
	9/14/2004	83.60	6481.44
	12/10/2004	77.00	6488.04
0882	1/5/2004	68.11	6493.05
	10/4/2004	70.64	6490.52
0883	1/5/2004	61.56	6495.57
	3/3/2004	61.59	6495.54
	10/5/2004	62.16	6494.97
	12/21/2004	62.16	6494.97
0884	1/5/2004	76.38	6489.72
	10/4/2004	82.36	6483.74
0885	1/5/2004	68.71	6495.93
	3/3/2004	68.46	6496.18
	10/4/2004	70.80	6493.84
	12/10/2004	69.38	6495.26
0886	1/5/2004	72.00	6492.55
	4/23/2004	> 81.30	< 6483.25
	6/17/2004	> 81.30	< 6483.25
	9/14/2004	> 81.30	< 6483.25
	9/14/2004	> 81.40	< 6483.15
	11/1/2004	73.96	6490.59
	11/29/2004	72.93	6491.62
	12/10/2004	73.25	6491.30
0888	1/6/2004	76.61	6480.72
	10/5/2004	78.60	6478.73
	12/10/2004	78.00	6479.33
0890	1/5/2004	74.68	6483.75
	4/23/2004	> 87.60	< 6470.83
	6/17/2004	76.77	6481.66
	9/14/2004	79.30	6479.13
	12/10/2004	74.70	6483.73
0893	1/5/2004	72.10	6491.87
	10/4/2004	75.86	6488.11
	12/10/2004	72.92	6491.05
0895	1/6/2004	80.86	6472.98
	10/4/2004	82.59	6471.25
0896	1/6/2004	81.91	6473.70
	10/4/2004	83.55	6472.06
0899	1/6/2004	95.50	6475.34
	10/4/2004	97.46	6473.38
0914	5/17/2004	40.86	6601.14
0921	5/17/2004	38.02	6585.98
0922	5/17/2004	51.74	6569.96

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.1-3. WATER LEVELS FOR REGIONAL ALLUVIAL WELLS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
0935		
5/6/2004	88.68	6469.44
10/5/2004	90.11	6468.01
0994		
3/19/2004	89.65	6465.35
4/19/2004	90.13	6464.87
5/17/2004	90.65	6464.35
6/21/2004	91.11	6463.89
7/19/2004	91.46	6463.54
8/19/2004	91.80	6463.20
10/20/2004	92.27	6462.73
0996		
4/23/2004	110.45	6442.07
6/15/2004	117.25	6435.27
7/22/2004	> 117.00	< 6435.52
9/14/2004	114.80	6437.72
12/10/2004	98.10	6454.42

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.2-1. WATER LEVELS FOR THE CHINLE AQUIFERS.

WATER LEVEL ELEVATION (FT-MSL)

Well	Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
0434	5/4/2004	36.10	6527.58
0486	8/4/2004	90.40	6468.00
0493	3/11/2004	99.48	6460.80
0493	5/20/2004	143.40	6416.88
0493	12/14/2004	104.27	6456.01
0494	3/3/2004	34.19	6525.95
0494	5/20/2004	34.16	6525.98
0494	12/14/2004	34.28	6525.86
0498	1/19/2004	57.80	6502.20
0498	4/20/2004	142.00	6418.00
0498	6/16/2004	140.50	6419.50
0498	7/23/2004	141.00	6419.00
0498	9/13/2004	132.44	6427.56
0498	12/10/2004	58.28	6502.31
0538	1/19/2004	80.40	6467.60
0538	4/20/2004	53.00	6495.00
0538	6/16/2004	162.30	6385.70
0538	7/22/2004	76.20	6471.80
0538	9/13/2004	158.00	6390.00
0538	12/10/2004	81.98	6466.96
0539	1/22/2004	82.26	6471.74
0539	7/22/2004	80.33	6473.67
0539	9/13/2004	82.36	6471.64
0539	12/10/2004	75.60	6479.72
0653	4/20/2004	174.20	6370.77
0653	6/16/2004	> 177.40	< 6367.57
0653	7/22/2004	> 173.10	< 6371.87
0653	9/27/2004	153.18	6391.79
	10/26/2004	85.46	6459.51
	12/10/2004	79.76	6465.21
0850	12/14/2004	56.73	6492.42
0853	5/27/2004	81.29	6460.09
0853	12/14/2004	82.08	6459.30
0859	5/26/2004	75.64	6477.12
0859	12/14/2004	74.84	6477.92
0929	2/2/2004	154.64	6437.93
0929	2/16/2004	154.00	6438.57
0929	3/1/2004	149.40	6443.17
0929	3/29/2004	154.19	6438.38
0929	5/3/2004	147.50	6445.07
0929	5/25/2004	125.11	6467.46
0929	6/1/2004	109.00	6483.57
0929	6/28/2004	136.33	6456.24
0929	7/21/2004	119.95	6472.62
0929	8/2/2004	119.96	6472.61
0929	8/30/2004	132.70	6459.87
0929	10/4/2004	79.63	6512.94
0929	11/1/2004	108.67	6483.90
0929	11/29/2004	103.30	6489.27
0929	12/14/2004	39.42	6553.15
0930	12/14/2004	131.55	6466.99
0931	5/25/2004	153.15	6457.41
0931	12/14/2004	58.64	6551.92
0934	2/2/2004	188.31	6397.28
0934	2/16/2004	181.03	6404.56
0934	3/1/2004	175.18	6410.41
0934	3/29/2004	179.65	6405.94
0934	5/3/2004	177.38	6408.21
	5/25/2004	153.90	6431.69
	6/1/2004	136.25	6449.34
	6/28/2004	147.46	6438.13
	8/2/2004	141.58	6444.01
	8/30/2004	143.22	6442.37
	10/4/2004	70.02	6515.57
	11/1/2004	133.40	6452.19
	11/29/2004	125.80	6459.79
0944	2/2/2004	35.05	6553.56
0944	3/1/2004	0.50	6588.11
0944	3/29/2004	15.60	6573.01
0944	5/3/2004	12.40	6576.21
0944	6/1/2004	1.00	6587.61
0944	6/28/2004	1.00	6587.61
0944	8/2/2004	2.50	6586.11
0944	8/30/2004	38.60	6550.01
0944	10/4/2004	8.00	6580.61
0944	11/1/2004	0.50	6588.11
0944	11/29/2004	2.00	6586.61
0994	3/19/2004	89.65	6465.35
0994	4/19/2004	90.13	6464.87
0994	5/17/2004	90.65	6464.35
0994	6/21/2004	91.11	6463.89
0994	7/19/2004	91.46	6463.54
0994	8/19/2004	91.80	6463.20
0994	10/20/2004	92.27	6462.73
ACW	6/29/2004	119.50	6444.30
AW	6/29/2004	36.50	6526.93
CE1	6/1/2004	51.00	6519.19
CE1	12/14/2004	49.63	6520.56
CE2	2/2/2004	62.95	6513.40
CE2	2/17/2004	62.78	6513.57
	3/1/2004	64.00	6512.35
	3/29/2004	40.98	6535.37
	5/3/2004	60.78	6515.57
	5/24/2004	71.35	6505.00
	6/1/2004	57.05	6519.30
	6/28/2004	63.95	6512.40
	8/2/2004	62.23	6514.12
	8/30/2004	64.27	6512.08
	10/4/2004	63.41	6512.94
	11/1/2004	69.33	6507.02
	11/29/2004	66.74	6509.61
CE5	5/25/2004	40.19	6528.36
CE5	12/14/2004	40.30	6528.25
CW1	2/2/2004	154.55	6430.67
CW1	2/17/2004	154.56	6430.66
CW1	3/1/2004	152.40	6432.82
CW1	3/29/2004	147.70	6437.52
CW1	5/3/2004	130.55	6454.67
CW1	5/20/2004	156.18	6429.04
CW1	6/1/2004	157.94	6427.28
CW1	6/28/2004	158.17	6427.05
CW1	8/2/2004	163.61	6421.61
CW1	8/30/2004	159.35	6425.87
CW1	10/4/2004	164.98	6420.24
CW1	11/1/2004	150.00	6435.22
CW1	11/29/2004	148.59	6436.63
CW2	2/2/2004	162.15	6423.33
CW2	2/17/2004	154.13	6431.35
CW2	3/1/2004	152.00	6433.48
CW2	3/29/2004	147.00	6438.48
CW2	5/3/2004	135.86	6449.62
CW2	5/20/2004	155.84	6429.64
CW2	6/1/2004	157.41	6428.07
CW2	6/28/2004	157.36	6428.12
CW2	8/2/2004	162.74	6422.74
CW2	8/17/2004	158.80	6426.68
CW2	8/30/2004	158.81	6426.67
CW2	10/4/2004	164.63	6420.85
CW2	11/1/2004	149.63	6435.85
CW2	11/29/2004	148.27	6437.21

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.2-1. WATER LEVELS FOR THE CHINLE AQUIFERS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

CW2-1

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
12/14/2004	61.66	6523.82

CW3

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
2/2/2004	138.40	6448.78
2/17/2004	172.92	6414.26
3/1/2004	172.82	6414.36
3/29/2004	170.23	6416.95
5/3/2004	183.08	6404.10
5/12/2004	169.92	6417.26
5/20/2004	170.20	6416.98
6/1/2004	166.70	6420.48
6/28/2004	166.27	6420.91
8/2/2004	166.10	6421.08
8/30/2004	160.05	6427.13
10/4/2004	178.38	6408.80
11/1/2004	153.98	6433.20
11/29/2004	148.81	6438.37

CW4R

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
3/1/2004	8.00	6560.73
3/29/2004	6.70	6562.03
5/3/2004	3.00	6565.73
6/1/2004	4.18	6564.55
6/28/2004	10.31	6558.42
8/2/2004	0.50	6568.23
8/30/2004	0.50	6568.23
10/4/2004	8.42	6560.31
11/29/2004	2.00	6566.73

CW5

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
2/2/2004	0.50	6568.84
3/1/2004	0.50	6568.84
3/29/2004	2.00	6567.34
6/1/2004	0.50	6568.84
8/2/2004	1.00	6568.34
8/30/2004	0.50	6568.84
10/4/2004	1.00	6568.34
11/1/2004	4.00	6565.34
11/29/2004	5.00	6564.34

CW6

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
12/14/2004	117.42	6458.22

CW9

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
6/1/2004	62.38	6529.45
12/14/2004	63.77	6528.06

CW13

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
2/2/2004	1.80	6574.90
3/1/2004	1.50	6575.20
3/29/2004	1.80	6574.90
5/3/2004	1.50	6575.20
6/1/2004	2.50	6574.20
6/28/2004	14.42	6562.28
8/2/2004	2.50	6574.20
8/30/2004	0.50	6576.20
10/4/2004	1.75	6574.95
11/1/2004	28.82	6547.88
11/29/2004	8.00	6568.70

CW14

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
2/2/2004	2.00	6564.09
3/1/2004	10.30	6555.79
3/29/2004	23.00	6543.09
5/3/2004	6.50	6559.59
6/1/2004	29.82	6536.27
6/28/2004	32.92	6533.17
8/2/2004	28.00	6538.09
8/30/2004	0.50	6565.59
10/4/2004	35.87	6530.22
11/1/2004	24.55	6541.54
11/29/2004	12.00	6554.09

CW15

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
5/26/2004	84.40	6466.92
12/14/2004	90.06	6461.26

CW17

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
6/1/2004	58.90	6530.42
12/14/2004	57.96	6531.36

CW18

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
2/2/2004	100.32	6472.33
2/17/2004	103.74	6468.91
3/1/2004	111.53	6461.12
3/29/2004	110.80	6461.85
5/3/2004	109.63	6463.02
5/26/2004	43.55	6529.10
6/1/2004	24.86	6547.79
6/28/2004	37.41	6535.24
8/2/2004	36.00	6536.65
8/30/2004	38.86	6533.79
10/4/2004	24.00	6548.65
11/1/2004	50.52	6522.13
11/29/2004	39.95	6532.70
12/14/2004	7.25	6565.40

CW24

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
7/27/2004	56.83	6531.84
12/14/2004	56.79	6531.88

CW25

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
2/2/2004	2.20	6565.00
3/1/2004	6.00	6561.20
3/29/2004	21.45	6545.75
5/3/2004	23.70	6543.50
6/1/2004	6.00	6561.20
6/28/2004	4.88	6562.32
8/2/2004	3.00	6564.20
8/30/2004	5.00	6562.20
10/4/2004	2.20	6565.00
11/1/2004	8.25	6558.95
11/29/2004	4.00	6563.20

CW26

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
5/27/2004	106.40	6455.03
12/14/2004	102.94	6458.49

CW27

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
5/27/2004	74.31	6488.57
12/14/2004	65.93	6496.95

CW28

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
2/2/2004	215.06	6356.62
2/10/2004	229.04	6342.64
3/1/2004	146.60	6425.08
3/29/2004	130.22	6441.46
5/3/2004	123.36	6448.32
5/26/2004	229.30	6342.38
6/1/2004	231.18	6340.50
6/28/2004	200.16	6371.52
8/2/2004	226.84	6344.84
8/30/2004	230.81	6340.87
9/14/2004	233.61	6338.07
10/4/2004	231.00	6340.68
11/1/2004	202.00	6369.68
11/29/2004	118.83	6452.85

CW29

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
2/2/2004	149.40	6402.82
4/20/2004	215.50	6336.72
6/2/2004	222.10	6330.12
6/16/2004	248.90	6303.32
7/13/2004	201.00	6351.22
7/22/2004	239.87	6312.35
9/13/2004	252.89	6299.33
10/26/2004	93.52	6458.70
12/14/2004	93.08	6459.14

CW30

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
6/2/2004	11.80	6546.51
7/13/2004	12.00	6546.31
12/14/2004	8.00	6550.31

CW31

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
5/27/2004	84.72	6475.54
12/14/2004	85.23	6475.03

CW32

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
5/27/2004	128.21	6439.07
12/14/2004	129.13	6438.15

CW33

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
5/27/2004	106.05	6468.84
12/14/2004	106.18	6468.71

CW35

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
6/1/2004	58.68	6532.49
12/14/2004	58.48	6532.69

CW36

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
7/28/2004	76.18	6474.91
12/14/2004	76.51	6474.58

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.2-1. WATER LEVELS FOR THE CHINLE AQUIFERS. (cont.)

WATER LEVEL ELEVATION (FT-MSL)

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
CW37		
5/27/2004	62.51	6488.66
12/14/2004	63.04	6488.13
CW39		
8/4/2004	65.22	6485.49
12/14/2004	65.90	6484.81
CW40		
5/27/2004	31.70	6547.24
12/14/2004	12.32	6566.62
CW41		
8/4/2004	100.03	6455.38
12/14/2004	96.96	6458.45
CW42		
8/4/2004	86.80	6461.98
12/14/2004	85.45	6463.33
CW43		
8/4/2004	68.94	6479.85
12/14/2004	69.30	6479.49
CW44		
3/3/2004	58.50	6502.24
7/22/2004	134.00	6426.74
12/14/2004	60.20	6500.54
CW45		
3/3/2004	55.30	6506.01
4/17/2004	170.75	6390.56
6/16/2004	168.50	6392.81
7/22/2004	177.60	6383.71
9/13/2004	178.59	6382.72
12/14/2004	58.60	6502.71
CW46		
3/3/2004	69.98	6492.28
8/17/2004	16.00	6546.26
9/13/2004	23.20	6539.06
12/14/2004	1.10	6561.16
12/20/2004	5.60	6556.66
12/20/2004	20.00	6542.26
12/20/2004	17.70	6544.56
CW50		
3/16/2004	65.13	6523.43
8/30/2004	63.61	6524.95
12/14/2004	63.74	6524.82
CW52		
3/16/2004	82.69	6509.71
8/30/2004	80.41	6511.99
12/14/2004	78.68	6513.72
CW53		
6/28/2004	28.61	6536.33
12/14/2004	4.25	6560.69
12/17/2004	3.60	6561.34
12/20/2004	3.85	6561.09
12/20/2004	3.70	6561.24
12/20/2004	3.40	6561.54
CW54		
6/22/2004	35.50	6523.05
12/14/2004	51.40	6507.15
WCW		
5/4/2004	103.14	6464.23
7/15/2004	126.00	6441.37
12/14/2004	117.96	6449.41
WR25		
7/27/2004	55.70	6530.76
12/14/2004	55.30	6531.16

* Drawdown Tube Pressure, # Transducer Reading

TABLE A.3-1. WATER LEVELS FOR THE SAN ANDRES AQUIFER.

WATER LEVEL ELEVATION (FT-MSL)

Date	Water Level (ft-MP)	Water Level Elevation (ft+MSL)
#1 DEEPWELL		
12/20/2004	148.18	6435.58
0534		
12/14/2004	106.70	6445.87
0535		
12/14/2004	103.68	6436.32
0907		
3/3/2004	102.00	6443.60
12/14/2004	106.18	6439.42
12/14/2004	106.24	6439.36
0928		
3/3/2004	154.75	6442.85
12/9/2004	158.80	6438.80
12/14/2004	158.88	6438.72
0938		
3/4/2004	125.10	6443.70
12/14/2004	129.53	6439.27
0943		
3/1/2004	118.64	6437.27
3/9/2004	118.50	6437.41
3/29/2004	120.15	6435.76
5/3/2004	120.78	6435.13
6/1/2004	121.62	6434.29
6/28/2004	122.90	6433.01
7/23/2004	124.10	6431.81
8/2/2004	125.48	6430.43
8/30/2004	125.70	6430.21
10/4/2004	125.58	6430.33
11/1/2004	124.54	6431.37
11/29/2004	124.51	6431.40
12/8/2004	123.74	6432.17
0951		
2/2/2004	135.31	6438.39
3/1/2004	134.78	6438.92
3/29/2004	136.55	6437.15
5/3/2004	137.94	6435.76
6/1/2004	137.78	6435.92
6/28/2004	138.87	6434.83
8/2/2004	139.00	6434.70
8/30/2004	140.24	6433.46
10/4/2004	140.28	6433.42
11/1/2004	139.24	6434.46
11/29/2004	135.19	6438.51
12/8/2004	134.90	6438.80

* Drawdown Tube Pressure, # Transducer Reading

APPENDIX B

WATER QUALITY

TABLE OF CONTENTS

GROUND-WATER MONITORING
FOR HOMESTAKE'S GRANTS PROJECT

APPENDIX B

TABLE B.1-1. WATER QUALITY ANALYSES FOR THE TAILINGS WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
CS1	8/16/2004	ENER	---	---	---	---	---	---	236	1120	2990	* 4437	---
CS7	9/27/2004	ENER	4.20	5.00	36.8	5380	4820	393	1030	6230	16700	* 19400	0.939
ED1	9/13/2004	ENER	2.50	0.800	24.4	5090	4550	1260	592	4820	14200	* 17550	0.951
EE2	8/5/2004	ENER	---	---	---	---	---	---	912	7160	9800	* 23660	---
EG9	12/13/2004	ENER	99.1	29.1	4.40	485	413	5.00	118	837	1840	* 2597	1.03
EN12	9/13/2004	ENER	3.10	3.30	9.40	2240	1950	187	302	2090	5830	* 7770	1.09
ES1	8/16/2004	ENER	---	---	---	---	---	---	291	709	2050	* 3136	---
NE1	8/5/2004	ENER	---	---	---	---	---	---	344	888	2210	* 3344	---
NE5	3/1/2004	ENER	10.7	14.9	12.3	2180	1350	271	437	2830	6640	* 8810	0.946
NW5	3/2/2004	ENER	7.80	3.70	5.10	1170	708	340	111	1190	3140	* 4702	1.02
SE2	8/16/2004	ENER	---	---	---	---	---	---	1280	8040	18700	* 23290	---
WA3	9/1/2004	ENER	3.30	< 0.500	11.3	3710	3990	1100	402	3370	11700	* 14610	0.882
WE2	9/1/2004	ENER	8.00	0.700	11.3	3310	2940	675	492	2780	7200	* 12010	1.02
WN4	3/2/2004	ENER	7.60	7.80	13.3	3500	1870	1100	557	3830	9730	* 12920	0.944

* Signifies Specific Conductivity from HMC

TABLE B.1-2. WATER QUALITY ANALYSES FOR THE TAILINGS WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
CS1	8/16/2004	ENER	---	1.62	2.56	0.110	---	---	---	---	---
CS7	9/27/2004	ENER	9.16	19.1	64.5	0.210	< 0.100	0.800	---	---	---
ED1	9/13/2004	ENER	9.69	20.0	54.6	0.0700	1.74	215	---	---	---
EE2	8/5/2004	ENER	---	14.3	104	0.310	---	---	---	---	---
EG9	12/13/2004	ENER	7.90	1.34	1.47	< 0.0500	< 0.100	1.40	---	---	---
EN12	9/13/2004	ENER	9.23	9.64	15.5	< 0.0500	0.230	106	---	---	---
ES1	8/16/2004	ENER	---	1.26	1.39	0.258	---	---	---	---	---
NE1	8/5/2004	ENER	---	0.841	2.28	0.0480	---	---	---	---	---
NE5	3/1/2004	ENER	9.62	8.41	19.0	0.0080	< 0.100	94.9	---	---	---
NW5	3/2/2004	ENER	9.93	3.34	8.96	0.119	0.590	108	---	---	---
SE2	8/16/2004	ENER	---	30.2	63.6	0.307	---	---	---	---	---
WA3	9/1/2004	ENER	9.69	13.8	46.8	0.300	0.950	279	---	---	---
WE2	9/1/2004	ENER	9.61	10.9	32.2	0.200	2.04	55.2	---	---	---
WN4	3/2/2004	ENER	10.00	13.1	38.2	0.119	1.16	48.7	---	---	---

TABLE B.2-1. WATER QUALITY ANALYSES FOR THE TOE DRAIN SUMPS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
East 1 Sump	3/9/2004	ENER	---	---	---	---	---	---	---	12700	29400	* 31540	---
	8/2/2004	ENER	11.0	37.0	40.0	9670	8040	735	1960	12800	29100	* 32250	0.890
East 2 Sump	3/9/2004	ENER	---	---	---	---	---	---	---	12300	29800	* 32670	---
	8/2/2004	ENER	9.00	32.0	55.7	8650	7980	410	1610	11200	26500	* 29540	0.900
East Reclaim	1/21/2004	ENER	3.50	4.40	22.0	4590	3390	1180	812	5130	13700	---	0.894
	3/9/2004	ENER	---	---	---	---	---	---	---	4720	12200	* 15440	---
	8/2/2004	ENER	7.00	25.0	18.4	3560	2810	288	704	3840	9800	* 12950	1.01
	8/2/2004	HMC	---	---	---	---	---	---	---	---	---	12950	---
North 1 Sump	3/9/2004	ENER	---	---	---	---	---	---	---	9600	21900	* 24920	---
	8/2/2004	ENER	15.0	23.0	40.5	6880	5550	442	1280	9350	21400	* 24980	0.900
South 1 Sump	3/9/2004	ENER	---	---	---	---	---	---	---	3560	11800	* 11170	---
	8/2/2004	ENER	21.0	7.00	8.10	498	312	< 1.000	97.0	823	1690	* 2504	0.939
West 1 Sump	3/9/2004	ENER	---	---	---	---	---	---	---	9930	27600	* 25440	---
	8/2/2004	ENER	8.00	30.0	25.7	6780	6480	566	927	8570	20800	* 24710	0.905
West Reclaim	3/9/2004	ENER	---	---	---	---	---	---	---	6500	15900	* 18120	---
	8/2/2004	ENER	23.0	60.0	23.1	5440	3590	137	864	7280	14900	* 18420	1.02

* Signifies Specific Conductivity from HMC

TABLE B.2-2. WATER QUALITY ANALYSES FOR THE TOE DRAIN SUMPS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
East 1 Sump	3/9/2004	ENER	---	54.0	111	5.96	---	---	---	---	---
	8/2/2004	ENER	9.21	56.7	114	6.50	< 0.100	125	---	---	---
East 2 Sump	3/9/2004	ENER	---	88.6	120	0.258	---	---	---	---	---
	8/2/2004	ENER	8.96	76.2	105	0.140	1.88	9.00	---	---	---
East Reclaim	1/21/2004	ENER	9.79	22.7	53.9	0.620	0.470	99.7	< 1.000	0.160	< 0.200
	3/9/2004	ENER	---	26.2	53.6	0.715	---	---	---	---	---
	8/2/2004	ENER	9.26	16.7	34.2	0.650	0.150	42.6	---	---	---
North 1 Sump	3/9/2004	ENER	---	30.4	73.6	3.35	---	---	---	---	---
	8/2/2004	ENER	9.15	39.8	76.0	3.43	< 0.100	82.8	---	---	---
South 1 Sump	3/9/2004	ENER	---	10.3	34.4	1.57	---	---	---	---	---
	8/2/2004	ENER	8.22	2.88	4.45	0.420	2.78	1.80	---	---	---
West 1 Sump	3/9/2004	ENER	---	37.5	67.8	4.76	---	---	---	---	---
	8/2/2004	ENER	9.19	41.1	76.5	1.22	2.73	51.3	---	---	---
West Reclaim	3/9/2004	ENER	---	24.5	53.2	1.24	---	---	---	---	---
	8/2/2004	ENER	8.83	20.0	50.3	5.72	0.150	12.1	---	---	---

TABLE B.3-1. WATER QUALITY ANALYSES FOR THE LINED PONDS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
E Coll Pond	2/11/2004	ENER	---	---	---	---	---	---	1370	11800	23100	* 26560	---
	4/7/2004	ENER	---	---	---	---	---	---	1340	9330	18900	* 22440	---
	8/2/2004	ENER	---	---	---	---	---	---	1360	10300	21600	* 24640	---
	10/12/2004	ENER	---	---	---	---	---	---	1400	9280	20300	* 23080	---
Evap Pond 1	2/11/2004	ENER	20.1	719	141	20200	13700	2870	7620	23700	60400	* 61700	0.916
	4/7/2004	ENER	---	---	---	---	---	---	8320	27700	67100	* 63400	---
	8/2/2004	ENER	18.0	578	166	26600	16600	1000	7660	35500	81200	* 70000	0.960
	10/12/2004	ENER	---	---	---	---	---	---	7620	40100	91400	* 75100	---
Evap Pond 2	2/11/2004	ENER	19.5	176	34.4	7810	3340	751	1413	11800	22800	* 27630	0.975
	4/7/2004	ENER	---	---	---	---	---	---	2780	18800	36500	* 38390	---
	8/2/2004	ENER	22.0	348	80.2	15800	8210	474	3550	25200	49100	* 47490	0.928
	10/12/2004	ENER	---	---	---	---	---	---	4350	22300	48200	* 45850	---
W Coll Pond	2/11/2004	ENER	---	---	---	---	---	---	226	3080	5750	* 7860	---
	4/7/2004	ENER	---	---	---	---	---	---	483	3260	6280	* 8270	---
	8/2/2004	ENER	---	---	---	---	---	---	539	3970	8150	* 10710	---
	10/12/2004	ENER	---	---	---	---	---	---	1320	3330	7100	* 9110	---

* Signifies Specific Conductivity from HMC

TABLE B.3-2. WATER QUALITY ANALYSES FOR THE LINED PONDS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
E Coll Pond	2/11/2004	ENER	---	45.2	94.4	3.50	---	72.0	< 1.000	---	---
	4/7/2004	ENER	---	35.0	72.8	2.03	---	---	---	---	---
	8/2/2004	ENER	---	33.4	57.6	1.90	---	---	---	---	---
	10/12/2004	ENER	---	35.8	67.9	1.68	---	---	---	---	---
Evap Pond 1	2/11/2004	ENER	9.68	266	390	0.600	< 0.100	40.2	< 1.000	0.400	216
	4/7/2004	ENER	---	256	384	0.461	---	---	---	---	---
	8/2/2004	ENER	9.03	218	333	0.830	< 0.100	42.9	< 1.000	0.440	350
	10/12/2004	ENER	---	227	416	0.950	---	---	---	---	---
Evap Pond 2	2/11/2004	ENER	9.76	50.1	97.6	2.20	6.00	78.2	< 1.000	0.300	324
	4/7/2004	ENER	---	77.1	119	2.05	---	---	---	---	---
	8/2/2004	ENER	9.01	94.3	169	1.67	2.08	63.8	< 1.000	0.370	304
	10/12/2004	ENER	---	97.7	175	1.62	---	---	---	---	---
W Coll Pond	2/11/2004	ENER	---	12.2	23.3	0.630	---	5.80	< 1.000	---	---
	4/7/2004	ENER	---	11.9	23.4	0.535	---	---	---	---	---
	8/2/2004	ENER	---	12.2	24.7	0.266	---	---	---	---	---
	10/12/2004	ENER	---	11.7	23.5	0.377	---	---	---	---	---

TABLE B.4-1. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
0690	1/12/2004	ENER	---	---	---	---	---	---	---	345	1650	* 1534	---
0691	1/12/2004	ENER	---	---	---	---	---	---	---	466	1260	* 1862	---
0891	2/16/2004	ENER	---	---	---	---	---	---	146	394	1120	* 1656	---
1F	1/8/2004	ENER	---	---	---	---	---	---	274	1260	2680	* 3586	---
	9/27/2004	ENER	---	---	---	---	---	---	264	1150	2620	* 3460	---
1G	1/8/2004	ENER	---	---	---	---	---	---	337	1040	2400	* 3360	---
	9/27/2004	ENER	---	---	---	---	---	---	---	1010	2400	* 3406	---
1I	2/17/2004	ENER	---	---	---	---	---	---	809	693	2650	* 3955	---
1J	2/17/2004	ENER	---	---	---	---	---	---	1920	1560	6080	* 7910	---
1K	9/28/2004	ENER	---	---	---	---	---	---	---	744	1860	* 2660	---
1L	1/8/2004	ENER	---	---	---	---	---	---	144	409	1160	* 1742	---
1M	1/8/2004	ENER	---	---	---	---	---	---	26.0	92.0	409	* 610	---
	9/28/2004	ENER	---	---	---	---	---	---	37.0	94.0	355	* 593	---
1N	2/17/2004	ENER	---	---	---	---	---	---	404	945	2340	* 3328	---
1P	2/17/2004	ENER	---	---	---	---	---	---	894	909	3020	* 4362	---
1S	11/8/2004	ENER	---	---	---	---	---	---	990	1780	5090	* 6580	---
B	5/24/2004	ENER	---	---	---	---	---	---	200	890	2010	* 2639	---
B2	6/10/2004	ENER	324	83.0	6.00	627	685	< 1.000	310	1560	3360	---	0.961
B3	6/9/2004	ENER	264	76.0	7.00	1400	960	< 1.000	450	2700	5610	---	0.951
B4	6/10/2004	ENER	250	92.0	7.00	1770	1190	< 1.000	530	3320	6840	---	0.938
B11	9/23/2004	ENER	162	41.1	8.90	674	516	< 1.000	193	1420	2940	* 4003	0.943
B12	3/1/2004	ENER	---	---	---	---	---	---	223	865	2130	* 2818	---
B13	3/1/2004	ENER	---	---	---	---	---	---	170	635	1630	* 2005	---
BC	5/24/2004	ENER	---	---	---	---	---	---	77.0	1100	2190	* 2691	---

* Signifies Specific Conductivity from HMC

TABLE B.4-1. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
BP	1/8/2004	ENER	---	---	---	---	---	---	204	990	2130	* 2850	---
C1	8/31/2004	ENER	---	---	---	---	---	---	40.0	159	523	* 808	---
C2	8/31/2004	ENER	---	---	---	---	---	---	---	255	802	* 1184	---
C5	1/12/2004	ENER	---	---	---	---	---	---	31.0	89.0	422	* 640	---
	11/9/2004	ENER	---	---	---	---	---	---	53.0	96.0	419	* 635	---
C6	3/8/2004	ENER	---	---	---	---	---	---	79.5	617	1530	* 2241	---
	9/21/2004	ENER	46.6	10.6	2.90	324	403	< 1.000	68.0	424	1130	* 1632	0.999
C7	3/8/2004	ENER	---	---	---	---	---	---	---	2020	4470	* 5430	---
	9/21/2004	ENER	---	---	---	---	---	---	365	2210	4850	* 5930	---
C8	3/8/2004	ENER	---	---	---	---	---	---	546	1990	4630	* 5780	---
	9/21/2004	ENER	348	86.0	8.40	960	731	< 1.000	491	2010	4550	* 5870	0.981
C9	3/8/2004	ENER	---	---	---	---	---	---	---	1740	3800	* 4840	---
	9/21/2004	ENER	---	---	---	---	---	---	369	1770	3980	* 5110	---
C10	3/8/2004	ENER	---	---	---	---	---	---	328	2300	4860	* 6020	---
	9/21/2004	ENER	169	41.9	4.90	1050	684	< 1.000	305	1840	3990	* 5180	0.992
C11	3/8/2004	ENER	---	---	---	---	---	---	---	1930	4150	* 5330	---
	9/21/2004	ENER	---	---	---	---	---	---	262	1760	3950	* 5180	---
C12	3/8/2004	ENER	---	---	---	---	---	---	---	893	2250	* 3213	---
	9/21/2004	ENER	---	---	---	---	---	---	138	789	2010	* 2920	---
D1	5/24/2004	ENER	227	53.9	5.10	357	488	< 1.000	190	849	2020	* 2727	1.01
	5/24/2004	ENER	# 229	# 54.7	# 5.10	# 362	# 488	# < 1.000	# 179	# 869	# 2030	---	# 1.02
DA3	6/9/2004	ENER	220	78.0	8.00	2300	1310	< 1.000	560	3900	6980	---	0.993
DC	5/24/2004	ENER	---	---	---	---	---	---	---	1300	2640	* 3100	---
DD	5/18/2004	ENER	358	89.7	6.70	302	363	< 1.000	51.9	1500	2710	* 3195	0.997
DZ	5/25/2004	ENER	---	---	---	---	---	---	1040	5550	12600	* 15650	---

Signifies Quality Control Sample

* Signifies Specific Conductivity from HMC

TABLE B.4-1. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
F	7/7/2004	ENER	---	---	---	---	---	---	---	680	1790	* 2373	---
FB	1/13/2004	ENER	---	---	---	---	---	---	---	362	1720	* 2252	---
	10/13/2004	ENER	---	---	---	---	---	---	---	647	1730	* 2312	---
	10/13/2004	ENER	---	---	---	---	---	---	---	# 658	# 1730	---	---
GH	3/11/2004	ENER	---	---	---	---	---	---	---	553	1560	* 2095	---
GV	1/8/2004	ENER	---	---	---	---	---	---	211	678	1790	* 2443	---
	9/23/2004	ENER	---	---	---	---	---	---	187	637	1780	* 2387	---
I	5/25/2004	ENER	---	---	---	---	---	---	---	360	1070	* 1560	---
K4	1/13/2004	ENER	---	---	---	---	---	---	61.0	276	813	* 1238	---
	6/9/2004	ENER	16.0	5.00	2.00	269	332	< 1.000	78.0	292	844	---	0.942
	10/11/2004	ENER	---	---	---	---	---	---	61.0	319	885	* 1320	---
K5	1/13/2004	ENER	---	---	---	---	---	---	78.0	1330	2370	* 3202	---
	4/13/2004	ENER	---	---	---	---	---	---	79.9	1520	2660	* 3388	---
	6/9/2004	ENER	76.0	26.0	3.00	550	338	< 1.000	78.0	1100	2310	---	0.976
	10/11/2004	ENER	---	---	---	---	---	---	74.0	1220	2330	* 3079	---
K7	1/13/2004	ENER	---	---	---	---	---	---	98.0	963	1860	* 2674	---
	4/13/2004	ENER	---	---	---	---	---	---	88.8	870	1710	* 2362	---
	6/9/2004	ENER	59.0	21.0	3.00	510	336	< 1.000	97.0	1015	1960	---	0.916
	10/11/2004	ENER	---	---	---	---	---	---	81.0	793	1640	* 2308	---
K8	1/13/2004	ENER	---	---	---	---	---	---	64.0	941	1780	* 2502	---
	4/13/2004	ENER	---	---	---	---	---	---	66.3	802	1530	* 2097	---
	6/9/2004	ENER	49.0	16.0	2.00	424	313	< 1.000	64.0	738	1490	---	0.997
K9	1/13/2004	ENER	---	---	---	---	---	---	62.0	687	1440	* 2080	---
	4/13/2004	ENER	---	---	---	---	---	---	67.5	773	1570	* 2170	---
	6/9/2004	ENER	56.0	13.0	3.00	434	364	< 1.000	70.0	709	1540	---	1.00
	10/11/2004	ENER	---	---	---	---	---	---	66.0	652	1400	* 1976	---

Signifies Quality Control Sample

* Signifies Specific Conductivity from HMC

TABLE B.4-1. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
K10	4/13/2004	ENER	---	---	---	---	---	---	67.5	711	1460	* 2037	---
	6/9/2004	ENER	58.0	13.0	4.00	425	403	< 1.000	70.0	699	1560	---	0.974
	10/11/2004	ENER	---	---	---	---	---	---	71.0	792	1710	* 2434	---
K11	1/13/2004	ENER	---	---	---	---	---	---	49.0	464	1130	* 1673	---
	4/13/2004	ENER	---	---	---	---	---	---	58.5	517	1200	* 1730	---
	10/11/2004	ENER	---	---	---	---	---	---	41.0	349	960	* 1429	---
KEB	2/16/2004	ENER	---	---	---	---	---	---	---	424	908	* 1368	---
	7/12/2004	ENER	---	---	---	---	---	---	39.0	347	823	* 1236	---
KF	2/16/2004	ENER	---	---	---	---	---	---	---	96.0	340	* 578	---
	7/13/2004	ENER	---	---	---	---	---	---	26.0	85.0	335	* 511	---
KZ	2/16/2004	ENER	---	---	---	---	---	---	---	136	354	* 589	---
	7/12/2004	ENER	---	---	---	---	---	---	62.0	220	601	* 913	---
L	5/5/2004	ENER	---	---	---	---	---	---	---	440	1250	* 1818	---
	10/14/2004	ENER	---	---	---	---	---	---	131	391	1170	* 1659	---
L5	5/5/2004	ENER	---	---	---	---	---	---	---	370	988	* 1478	---
	10/14/2004	ENER	---	---	---	---	---	---	102	362	972	* 1463	---
L6	1/8/2004	ENER	---	---	---	---	---	---	83.2	224	752	* 1213	---
	5/5/2004	ENER	---	---	---	---	---	---	---	200	746	* 1136	---
	10/14/2004	ENER	---	---	---	---	---	---	62.0	181	698	* 1078	---
L7	5/5/2004	ENER	---	---	---	---	---	---	---	370	1060	* 1565	---
	10/14/2004	ENER	---	---	---	---	---	---	100.0	331	1000	* 1480	---
L8	5/5/2004	ENER	---	---	---	---	---	---	---	360	998	* 1462	---
	10/14/2004	ENER	---	---	---	---	---	---	72.0	294	910	* 1355	---
L9	5/5/2004	ENER	---	---	---	---	---	---	---	270	807	* 1213	---
	10/14/2004	ENER	---	---	---	---	---	---	86.0	288	839	* 1267	---
L10	5/5/2004	ENER	---	---	---	---	---	---	---	170	663	* 1020	---

* Signifies Specific Conductivity from HMC

TABLE B.4-1. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
L10	10/14/2004	ENER	---	---	---	---	---	---	77.0	229	764	* 1161	---
M5	1/12/2004	ENER	---	---	---	---	---	---	210	759	1930	* 2565	---
M9	6/21/2004	ENER	---	---	---	---	---	---	177	1220	2700	* 3488	---
	11/8/2004	ENER	---	---	---	---	---	---	152	1330	2870	* 3583	---
MO	3/11/2004	ENER	---	---	---	---	---	---	---	1210	2600	* 3198	---
	10/13/2004	ENER	---	---	---	---	---	---	---	1220	2650	* 3260	---
MQ	1/12/2004	ENER	---	---	---	---	---	---	203	1420	2820	* 3471	---
	10/15/2004	ENER	---	---	---	---	---	---	199	1370	2830	* 3514	---
MR	1/19/2004	ENER	---	---	---	---	---	---	191	1080	2390	* 3005	---
	11/10/2004	ENER	---	---	---	---	---	---	166	992	2390	* 2994	---
MS	1/19/2004	ENER	---	---	---	---	---	---	193	725	1880	* 2509	---
	11/10/2004	ENER	---	---	---	---	---	---	210	702	1890	* 2511	---
MT	1/19/2004	ENER	---	---	---	---	---	---	90.0	1130	2140	* 2686	---
	11/10/2004	ENER	---	---	---	---	---	---	---	1000	2030	* 2578	---
MU	1/15/2004	ENER	---	---	---	---	---	---	236	1790	3470	* 3850	---
	11/10/2004	ENER	---	---	---	---	---	---	---	1580	3380	* 3836	---
MX	1/15/2004	ENER	---	---	---	---	---	---	196	698	1850	* 2478	---
	11/9/2004	ENER	---	---	---	---	---	---	---	645	1880	* 2511	---
MY	1/15/2004	ENER	---	---	---	---	---	---	190	688	1790	* 2390	---
	11/9/2004	ENER	---	---	---	---	---	---	---	645	1820	* 2437	---
N	8/31/2004	ENER	---	---	---	---	---	---	---	1370	2380	* 2865	---
NA	8/31/2004	ENER	---	---	---	---	---	---	---	4930	10100	* 13440	---
NB	8/31/2004	ENER	---	---	---	---	---	---	---	11000	27400	* 29980	---
NC	8/17/2004	ENER	---	---	---	---	---	---	---	715	1290	* 1702	---
ND	5/18/2004	ENER	56.6	15.3	1.30	491	312	< 1.000	58.0	907	1770	* 2582	0.993

* Signifies Specific Conductivity from HMC

TABLE B.4-1. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
NE5	3/1/2004	ENER	10.7	14.9	12.3	2180	1350	271	437	2830	6640	* 8810	0.946
NW5	3/2/2004	ENER	7.80	3.70	5.10	1170	708	340	111	1190	3140	* 4702	1.02
O	1/15/2004	ENER	---	---	---	---	---	---	---	953	1930	* 2547	---
	8/31/2004	ENER	---	---	---	---	---	---	---	974	1900	* 2564	---
P	7/7/2004	ENER	256	52.8	5.60	253	242	< 1.000	73.0	1130	1940	* 2330	0.955
	7/7/2004	ENER	# 251	# 51.5	# 5.50	# 249	# 245	# < 1.000	# 67.0	# 1120	# 1950	---	# 0.948
P2	2/16/2004	ENER	297	61.7	6.80	246	239	< 1.000	67.9	1260	2210	* 2623	0.959
P3	3/9/2004	ENER	292	60.8	6.80	250	235	< 1.000	81.0	1230	2220	* 2629	0.964
Q	5/18/2004	ENER	336	64.2	7.30	257	232	< 1.000	47.0	1340	2350	* 2849	1.01
R	5/18/2004	ENER	302	51.4	4.50	266	146	< 1.000	38.2	1300	2270	* 2751	1.01
S	1/12/2004	ENER	---	---	---	---	---	---	737	10600	21800	* 24630	---
S2	1/13/2004	ENER	---	---	---	---	---	---	---	1590	3150	* 3970	---
	1/13/2004	ENER	---	---	---	---	---	---	---	# 1580	# 3170	---	---
	7/8/2004	ENER	---	---	---	---	---	---	---	1070	2370	* 3071	---
S3	1/12/2004	ENER	---	---	---	---	---	---	218	1340	2820	* 3699	---
S4	3/11/2004	ENER	---	---	---	---	---	---	---	1680	3280	* 3981	---
	7/7/2004	ENER	348	92.0	8.00	654	452	< 1.000	234	2040	3880	* 4606	0.948
S6	6/9/2004	ENER	124	40.0	6.00	2300	1790	< 1.000	328	3540	7460	---	0.976
S7	6/9/2004	ENER	74.0	79.0	12.0	4040	2720	< 1.000	690	6140	12600	---	0.970
S11	1/12/2004	ENER	---	---	---	---	---	---	220	1660	3080	* 3718	---
	10/18/2004	ENER	---	---	---	---	---	---	---	2700	5290	* 6040	---
	12/13/2004	ENER	---	---	---	---	---	---	345	2170	4390	* 5120	---
SA	6/9/2004	ENER	296	80.0	8.00	957	863	< 1.000	302	2120	4290	---	0.945
SM	5/19/2004	ENER	---	---	---	---	---	---	843	8900	15400	* 18940	---
SO	5/19/2004	ENER	---	---	---	---	---	---	390	4800	8540	* 9650	---

Signifies Quality Control Sample

* Signifies Specific Conductivity from HMC

TABLE B.4-1. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
SQ	6/9/2004	ENER	54.0	27.0	4.00	1340	1050	12.1	240	2140	4470	---	0.918
SS	6/9/2004	ENER	266	88.0	7.00	1040	719	< 1.000	253	2440	4590	---	0.945
SUR	6/10/2004	ENER	257	76.0	6.00	1080	984	< 1.000	318	2170	4430	---	0.942
SV	6/9/2004	ENER	46.0	59.0	8.00	2980	1820	20.9	550	4750	9600	---	0.945
SW	5/19/2004	ENER	---	---	---	---	---	---	1230	8600	17200	* 20720	---
T	2/16/2004	ENER	---	---	---	---	---	---	---	727	1440	* 2193	---
	6/10/2004	ENER	47.0	13.0	3.00	352	372	< 1.000	106	539	1240	---	0.924
	9/23/2004	ENER	---	---	---	---	---	---	105	761	1630	* 2412	---
T2	1/22/2004	ENER	---	---	---	---	---	---	254	2460	5500	* 7040	---
	7/12/2004	ENER	---	---	---	---	---	---	305	2480	5210	* 6900	---
T4	1/22/2004	ENER	9.30	19.0	22.0	4890	2740	602	1070	6730	15000	* 17210	0.915
T5	1/22/2004	ENER	90.0	53.0	9.30	4130	3110	506	803	5380	13100	* 15630	0.932
T6	3/30/2004	ENER	39.7	44.7	19.7	3080	2010	42.2	612	4600	9650	* 12000	0.951
T7	3/30/2004	ENER	480	270	7.40	4100	2110	< 1.000	1010	8010	15000	* 16600	0.978
T8	6/22/2004	ENER	8.20	11.8	22.7	5010	3260	272	1160	6410	14500	* 17010	0.962
T9	6/22/2004	ENER	10.4	24.9	45.0	7390	5400	483	1580	9250	20600	* 27230	0.952
T10	6/23/2004	ENER	4.00	7.90	45.0	12000	8320	1210	2460	14400	32600	* 35580	0.960
T11	6/23/2004	ENER	62.4	130	9.50	4520	3700	< 1.000	652	6640	13600	* 15810	0.969
T12	6/23/2004	ENER	6.20	6.40	23.6	7480	5500	1180	1320	8420	19800	* 24600	0.956
T17	6/24/2004	ENER	19.0	26.5	4.10	3690	2810	105	579	4940	10900	* 13270	0.970
T18	1/22/2004	ENER	390	98.0	7.20	1610	1060	< 1.000	396	3420	6870	* 7980	0.980
	7/12/2004	ENER	---	---	---	---	---	---	448	3070	6010	* 7260	---
T19	6/24/2004	ENER	95.9	83.0	12.9	3340	1750	< 1.000	859	4880	10200	* 13046	1.02
T20	6/24/2004	ENER	27.4	77.0	9.40	3400	2270	97.0	622	4570	10000	* 12710	1.02

* Signifies Specific Conductivity from HMC

TABLE B.4-1. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (μmhos/cm)	Ion_B (ratio)
T21	6/23/2004	ENER	4.00	5.50	32.6	8640	7920	2040	1170	7960	22100	* 25390	0.952
T22	3/30/2004	ENER	7.80	10.4	19.2	6320	4020	2730	544	6480	17600	* 20760	0.901
T40	6/24/2004	ENER	8.30	19.5	15.3	4000	3570	461	663	4620	11400	* 14110	0.935
T41	3/26/2004	ENER	281	162	20.6	4160	3350	< 1.000	840	7270	14800	* 17030	0.908
TA	2/16/2004	ENER	---	---	---	---	---	---	---	369	934	* 1490	---
	6/10/2004	ENER	26.0	9.00	3.00	283	233	< 1.000	117	386	970	---	0.950
	9/22/2004	ENER	---	---	---	---	---	---	103	402	978	* 1490	---
TB	2/16/2004	ENER	---	---	---	---	---	---	---	399	950	* 1348	---
	9/23/2004	ENER	---	---	---	---	---	---	139	620	1410	* 1858	---
W	1/12/2004	ENER	---	---	---	---	---	---	181	756	1800	* 2366	---
	10/18/2004	ENER	---	---	---	---	---	---	203	687	1820	* 2450	---
WN4	3/2/2004	ENER	7.60	7.80	13.3	3500	1870	1100	557	3830	9730	* 12920	0.944
X	2/16/2004	ENER	---	---	---	---	---	---	19.7	87.7	275	* 442	---
	4/26/2004	ENER	---	---	---	---	---	---	107	282	724	* 1050	---
	4/26/2004	ENER	---	---	---	---	---	---	# 111	# 279	# 723	---	---
	7/7/2004	ENER	105	13.1	2.10	61.3	183	< 1.000	71.0	207	572	* 866	0.967
	10/13/2004	ENER	---	---	---	---	---	---	45.0	161	531	* 816	---

Signifies Quality Control Sample

* Signifies Specific Conductivity from HMC

TABLE B.4-2. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
0690	1/12/2004	ENER	---	0.356	---	0.336	---	---	---	---	---
0691	1/12/2004	ENER	---	0.0214	---	0.223	---	---	---	---	---
0891	2/16/2004	ENER	---	0.0618	0.410	0.231	---	---	---	---	---
1F	1/8/2004	ENER	---	8.99	< 0.0300	0.411	6.55	---	---	---	---
	9/27/2004	ENER	---	6.76	< 0.0300	0.347	---	---	---	---	---
1G	1/8/2004	ENER	---	0.0446	< 0.0300	0.542	14.4	---	---	---	---
	9/27/2004	ENER	---	0.0403	---	0.544	12.9	---	---	---	---
1I	2/17/2004	ENER	---	0.224	0.0500	2.21	---	---	---	---	---
1J	2/17/2004	ENER	---	61.0	13.8	15.3	---	---	---	---	---
1K	9/28/2004	ENER	---	2.39	---	0.566	2.44	---	---	---	---
1L	1/8/2004	ENER	---	0.126	0.720	0.334	1.57	---	---	---	---
1M	1/8/2004	ENER	---	0.138	0.150	0.0340	0.690	---	---	---	---
	9/28/2004	ENER	---	0.107	0.200	0.0400	---	---	---	---	---
1N	2/17/2004	ENER	---	0.103	< 0.0300	0.0540	---	---	---	---	---
1P	2/17/2004	ENER	---	0.290	< 0.0300	2.68	---	---	---	---	---
1S	11/8/2004	ENER	---	29.3	15.1	5.89	---	---	---	---	---
B	5/24/2004	ENER	---	0.366	< 0.0300	0.270	3.14	---	---	---	---
B2	6/10/2004	ENER	7.12	7.07	8.29	0.390	3.18	< 0.200	---	---	---
B3	6/9/2004	ENER	7.40	12.7	20.0	0.770	3.99	< 0.200	---	---	---
B4	6/10/2004	ENER	7.22	18.5	23.1	0.640	3.42	< 0.200	---	---	---
B11	9/23/2004	ENER	6.96	5.06	10.3	0.620	6.84	< 0.200	---	---	---
B12	3/1/2004	ENER	---	2.21	1.86	0.0220	---	---	---	---	---
B13	3/1/2004	ENER	---	0.736	0.450	0.0810	---	---	---	---	---
BC	5/24/2004	ENER	---	0.293	0.0400	0.0390	6.68	---	---	---	---

TABLE B.4-2. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
BP	1/8/2004	ENER	---	0.916	0.170	0.188	4.80	---	---	---	---
C1	8/31/2004	ENER	---	0.260	1.08	0.0180	---	---	---	---	---
C2	8/31/2004	ENER	---	0.200	---	0.0170	0.760	---	---	---	---
C5	1/12/2004	ENER	---	0.214	0.520	0.0120	0.610	---	---	---	---
	11/9/2004	ENER	---	0.150	0.470	0.0080	---	---	---	---	---
C6	3/8/2004	ENER	---	2.80	10.9	0.332	2.33	---	---	---	---
	9/21/2004	ENER	7.29	2.04	8.19	0.210	1.51	< 0.200	---	---	---
C7	3/8/2004	ENER	---	10.8	---	0.924	5.26	---	---	---	---
	9/21/2004	ENER	---	10.1	24.6	1.11	---	---	---	---	---
C8	3/8/2004	ENER	---	8.96	11.2	1.06	---	---	---	---	---
	9/21/2004	ENER	6.87	7.35	17.4	1.19	5.15	0.600	---	---	---
C9	3/8/2004	ENER	---	10.5	---	1.14	4.36	---	---	---	---
	9/21/2004	ENER	---	6.90	13.8	1.05	---	---	---	---	---
C10	3/8/2004	ENER	---	19.5	29.4	1.46	---	---	---	---	---
	9/21/2004	ENER	6.98	12.6	23.4	1.23	3.30	< 0.200	---	---	---
C11	3/8/2004	ENER	---	16.6	---	2.08	6.34	---	---	---	---
	9/21/2004	ENER	---	15.7	20.5	2.06	---	---	---	---	---
C12	3/8/2004	ENER	---	6.55	---	0.862	5.11	---	---	---	---
	9/21/2004	ENER	---	5.17	10.6	0.903	---	---	---	---	---
D1	5/24/2004	ENER	7.18	1.18	0.830	0.158	3.31	< 0.200	< 1.000	< 0.0100	< 0.200
	5/24/2004	ENER	# 7.19	# 1.21	# 0.860	# 0.158	# 3.26	# < 0.200	# < 1.000	# < 0.0100	# < 0.200
DA3	6/9/2004	ENER	7.48	16.0	28.0	0.650	4.46	< 0.200	---	---	---
DC	5/24/2004	ENER	---	0.0590	< 0.0300	0.121	9.22	---	---	---	---
DD	5/18/2004	ENER	7.71	0.174	< 0.0300	0.0300	3.74	0.300	---	---	---
DZ	5/25/2004	ENER	---	22.8	43.9	1.60	---	---	---	---	---

Signifies Quality Control Sample

TABLE B.4-2. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
F	7/7/2004	ENER	---	0.0842	< 0.0300	0.0080	2.15	---	---	---	---
FB	1/13/2004	ENER	---	0.122	0.0400	0.0510	---	---	---	---	---
	10/13/2004	ENER	---	0.118	< 0.0300	0.0160	2.10	---	---	---	---
	10/13/2004	ENER	---	# 0.119	# < 0.0300	# 0.0170	# 2.09	---	---	---	---
GH	3/11/2004	ENER	---	0.0654	< 0.0300	0.0100	---	---	---	---	---
GV	1/8/2004	ENER	---	0.0288	< 0.0300	0.0120	2.03	---	---	---	---
	9/23/2004	ENER	---	0.0296	< 0.0300	0.0210	---	---	---	---	---
I	5/25/2004	ENER	---	0.0637	< 0.0300	0.0130	1.45	---	---	---	---
K4	1/13/2004	ENER	---	1.14	3.68	0.533	---	---	---	---	---
	6/9/2004	ENER	8.11	0.930	3.57	0.550	1.31	< 0.200	---	---	---
	10/11/2004	ENER	---	1.26	3.99	0.800	---	---	---	---	---
K5	1/13/2004	ENER	---	0.576	5.80	0.0800	---	---	---	---	---
	4/13/2004	ENER	---	0.229	6.15	0.0550	---	---	---	---	---
	6/9/2004	ENER	7.56	0.440	5.99	0.0900	1.43	< 0.200	---	---	---
	10/11/2004	ENER	---	0.549	6.31	0.0720	---	---	---	---	---
K7	1/13/2004	ENER	---	1.44	7.50	0.380	---	---	---	---	---
	4/13/2004	ENER	---	1.91	8.02	0.451	---	---	---	---	---
	6/9/2004	ENER	7.46	1.88	9.79	0.440	2.30	< 0.200	---	---	---
	10/11/2004	ENER	---	2.07	8.00	0.320	---	---	---	---	---
K8	1/13/2004	ENER	---	1.11	8.10	0.242	---	---	---	---	---
	4/13/2004	ENER	---	1.06	6.64	0.278	---	---	---	---	---
	6/9/2004	ENER	7.50	0.890	6.88	0.320	1.27	< 0.200	---	---	---
K9	1/13/2004	ENER	---	1.51	9.02	0.116	---	---	---	---	---
	4/13/2004	ENER	---	1.61	8.23	0.122	---	---	---	---	---
	6/9/2004	ENER	7.65	1.18	8.10	0.130	1.53	< 0.200	---	---	---
	10/11/2004	ENER	---	1.24	7.15	0.0970	---	---	---	---	---

Signifies Quality Control Sample

TABLE B.4-2. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
K10	4/13/2004	ENER	---	1.78	7.52	0.129	---	---	---	---	---
	6/9/2004	ENER	7.56	1.60	8.10	0.170	1.52	< 0.200	---	---	---
	10/11/2004	ENER	---	2.14	8.64	0.135	---	---	---	---	---
K11	1/13/2004	ENER	---	1.59	6.18	0.0830	---	---	---	---	---
	4/13/2004	ENER	---	1.51	5.52	0.0970	---	---	---	---	---
	10/11/2004	ENER	---	1.19	5.26	0.0670	---	---	---	---	---
KEB	2/16/2004	ENER	---	0.0862	---	0.0190	0.990	---	---	---	---
	7/12/2004	ENER	---	0.0608	0.180	0.0180	---	---	---	---	---
KF	2/16/2004	ENER	---	0.0703	---	0.0080	0.900	---	---	---	---
	7/13/2004	ENER	---	0.0426	0.260	< 0.0050	---	---	---	---	---
KZ	2/16/2004	ENER	---	0.0563	---	0.0050	0.600	---	---	---	---
	7/12/2004	ENER	---	0.0940	0.0600	< 0.0050	---	---	---	---	---
L	5/5/2004	ENER	---	0.769	---	0.0340	1.42	---	---	---	---
	10/14/2004	ENER	---	0.691	1.51	0.0320	---	---	---	---	---
L5	5/5/2004	ENER	---	0.435	---	0.300	1.33	---	---	---	---
	10/14/2004	ENER	---	0.308	1.33	0.246	---	---	---	---	---
L6	1/8/2004	ENER	---	0.287	0.920	0.156	0.890	---	---	---	---
	5/5/2004	ENER	---	0.384	---	0.118	0.710	---	---	---	---
	10/14/2004	ENER	---	0.251	0.930	0.107	---	---	---	---	---
L7	5/5/2004	ENER	---	0.450	---	0.264	1.33	---	---	---	---
	10/14/2004	ENER	---	0.371	1.47	0.256	---	---	---	---	---
L8	5/5/2004	ENER	---	0.388	---	0.118	1.23	---	---	---	---
	10/14/2004	ENER	---	0.168	0.720	0.0720	---	---	---	---	---
L9	5/5/2004	ENER	---	0.317	---	0.0560	1.15	---	---	---	---
	10/14/2004	ENER	---	0.274	1.19	0.0630	---	---	---	---	---
L10	5/5/2004	ENER	---	0.395	---	0.0200	0.850	---	---	---	---

TABLE B.4-2. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
L10	10/14/2004	ENER	---	0.349	1.84	0.0180	---	---	---	---	---
M5	1/12/2004	ENER	---	1.32	1.70	0.0430	2.38	---	---	---	---
M9	6/21/2004	ENER	---	4.52	3.41	0.0530	< 0.100	---	---	---	---
	11/8/2004	ENER	---	4.20	3.78	0.300	---	---	---	---	---
MO	3/11/2004	ENER	---	0.401	< 0.0300	0.0650	---	---	---	---	---
	10/13/2004	ENER	---	0.410	< 0.0300	0.0730	17.1	---	---	---	---
MQ	1/12/2004	ENER	---	2.61	0.970	0.341	7.65	---	---	---	---
	10/15/2004	ENER	---	2.52	1.10	0.332	---	---	---	---	---
MR	1/19/2004	ENER	---	0.530	0.0500	0.131	7.42	---	---	---	---
	11/10/2004	ENER	---	0.546	0.0500	0.107	---	---	---	---	---
MS	1/19/2004	ENER	---	0.0582	< 0.0300	0.0480	2.12	---	---	---	---
	11/10/2004	ENER	---	0.0610	< 0.0300	0.0490	---	---	---	---	---
MT	1/19/2004	ENER	---	0.133	< 0.0300	0.207	11.2	---	---	---	---
	11/10/2004	ENER	---	0.120	< 0.0300	0.166	9.90	---	---	---	---
MU	1/15/2004	ENER	---	0.0974	< 0.0300	0.0580	23.7	---	---	---	---
	11/10/2004	ENER	---	0.107	< 0.0300	0.0420	17.8	---	---	---	---
MX	1/15/2004	ENER	---	0.0272	< 0.0300	0.0120	1.56	---	---	---	---
	11/9/2004	ENER	---	0.0299	< 0.0300	0.0110	1.40	---	---	---	---
MY	1/15/2004	ENER	---	0.0188	< 0.0300	0.0140	0.170	---	---	---	---
	11/9/2004	ENER	---	0.0201	< 0.0300	0.0220	0.400	---	---	---	---
N	8/31/2004	ENER	---	0.113	0.0800	0.0940	11.9	---	---	---	---
NA	8/31/2004	ENER	---	21.4	53.3	0.190	2.73	---	---	---	---
NB	8/31/2004	ENER	---	16.4	127	0.120	1.39	---	---	---	---
NC	8/17/2004	ENER	---	0.0146	< 0.0300	0.0760	3.97	---	---	---	---
ND	5/18/2004	ENER	8.01	0.0275	< 0.0300	0.128	1.39	0.700	---	---	---

TABLE B.4-2. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
NE5	3/1/2004	ENER	9.62	8.41	19.0	0.0080	< 0.100	94.9	---	---	---
NW5	3/2/2004	ENER	9.93	3.34	8.96	0.119	0.590	108	---	---	---
O	1/15/2004	ENER	---	0.0307	---	0.245	---	---	---	---	---
	8/31/2004	ENER	---	0.0295	< 0.0300	0.228	7.45	---	---	---	---
P	7/7/2004	ENER	7.06	0.0325	< 0.0300	0.180	7.22	0.500	---	---	---
	7/7/2004	ENER	# 7.14	# 0.0322	# < 0.0300	# 0.180	# 7.22	# 0.600	---	---	---
P2	2/16/2004	ENER	7.18	0.0401	< 0.0300	0.243	11.3	< 0.200	---	---	---
P3	3/9/2004	ENER	7.45	0.0398	< 0.0300	0.237	11.0	< 0.200	---	---	---
Q	5/18/2004	ENER	7.76	0.0528	< 0.0300	0.256	9.72	0.900	---	---	---
R	5/18/2004	ENER	7.83	0.0198	< 0.0300	0.499	16.4	0.700	---	---	---
S	1/12/2004	ENER	---	58.3	91.5	2.88	5.26	---	---	---	---
S2	1/13/2004	ENER	---	7.87	8.04	0.452	---	---	---	---	---
	1/13/2004	ENER	---	# 7.71	# 8.02	# 0.445	---	---	---	---	---
	7/8/2004	ENER	---	2.10	3.78	0.214	3.94	---	---	---	---
S3	1/12/2004	ENER	---	6.45	0.900	< 0.0050	1.95	---	---	---	---
S4	3/11/2004	ENER	---	5.72	6.86	0.680	---	---	---	---	---
	7/7/2004	ENER	7.00	5.35	7.62	1.06	10.5	1.70	< 1.000	< 0.0100	0.300
S6	6/9/2004	ENER	7.82	14.5	29.9	0.710	4.38	< 0.200	---	---	---
S7	6/9/2004	ENER	8.21	29.9	38.1	1.79	8.44	< 0.200	---	---	---
S11	1/12/2004	ENER	---	0.0851	0.120	0.692	32.2	---	---	---	---
	10/18/2004	ENER	---	8.43	7.32	0.711	12.9	---	---	---	---
	12/13/2004	ENER	---	5.75	4.62	0.537	---	---	---	---	---
SA	6/9/2004	ENER	7.19	8.57	10.6	0.280	4.04	< 0.200	---	---	---
SM	5/19/2004	ENER	---	52.2	31.8	1.70	22.1	---	---	---	---
SO	5/19/2004	ENER	---	32.6	20.5	1.90	21.9	---	---	---	---

Signifies Quality Control Sample

TABLE B.4-2. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
SQ	6/9/2004	ENER	8.31	9.38	19.2	0.660	3.79	0.900	---	---	---
SS	6/9/2004	ENER	7.37	10.2	13.8	1.06	8.47	< 0.200	---	---	---
SUR	6/10/2004	ENER	7.40	9.30	12.3	0.330	4.81	0.500	---	---	---
SV	6/9/2004	ENER	8.31	23.3	38.6	1.78	6.35	2.20	---	---	---
SW	5/19/2004	ENER	---	38.2	66.7	3.20	6.71	---	---	---	---
T	2/16/2004	ENER	---	1.47	---	1.20	2.14	---	---	---	---
	6/10/2004	ENER	7.51	1.60	3.62	1.23	2.84	< 0.200	---	---	---
	9/23/2004	ENER	---	1.72	3.15	0.963	---	---	---	---	---
T2	1/22/2004	ENER	---	11.3	26.7	0.315	3.99	---	---	---	---
	7/12/2004	ENER	---	11.6	25.9	0.300	---	---	---	---	---
T4	1/22/2004	ENER	9.59	18.4	42.6	0.130	2.77	18.1	< 1.000	< 0.0100	< 0.200
T5	1/22/2004	ENER	9.46	28.9	42.2	0.783	2.60	9.30	< 1.000	0.140	< 0.200
T6	3/30/2004	ENER	8.57	27.4	28.3	0.892	1.89	103	< 1.000	0.300	2.60
T7	3/30/2004	ENER	7.13	48.3	49.0	1.49	20.0	5.80	< 1.000	0.0300	< 0.200
T8	6/22/2004	ENER	9.17	18.9	42.4	0.0900	3.20	97.9	< 1.000	0.0300	26.0
T9	6/22/2004	ENER	9.20	22.9	67.9	0.0200	< 0.100	178	< 1.000	0.180	566
T10	6/23/2004	ENER	9.41	52.1	124	0.120	2.40	287	< 1.000	0.330	837
T11	6/23/2004	ENER	8.15	27.1	67.7	0.100	2.50	9.50	< 1.000	0.0200	0.300
T12	6/23/2004	ENER	9.58	36.0	75.6	0.140	1.30	170	< 1.000	0.0200	909
T17	6/24/2004	ENER	8.82	19.7	39.9	0.440	4.90	8.90	< 1.000	0.0200	2.40
T18	1/22/2004	ENER	8.14	18.5	20.6	0.532	6.61	5.80	< 1.000	0.0200	< 0.200
	7/12/2004	ENER	---	16.7	16.2	0.636	---	---	---	---	---
T19	6/24/2004	ENER	8.08	20.1	33.3	0.697	3.62	5.80	< 1.000	< 0.0100	0.200
T20	6/24/2004	ENER	8.62	20.6	41.1	0.714	3.94	8.30	< 1.000	0.0200	< 0.200

TABLE B.4-2. WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
T21	6/23/2004	ENER	9.66	37.3	93.6	0.140	< 0.100	345	< 1.000	0.0600	331
T22	3/30/2004	ENER	10.1	30.7	128	0.190	4.18	44.7	< 1.000	2.05	108
T40	6/24/2004	ENER	9.36	18.4	51.8	0.120	0.800	32.6	< 1.000	0.0900	1.20
T41	3/26/2004	ENER	7.63	30.0	62.4	0.475	9.50	289	3.00	< 0.0100	15.4
TA	2/16/2004	ENER	---	0.676	---	0.783	2.62	---	---	---	---
	6/10/2004	ENER	7.29	0.614	1.45	0.840	5.80	< 0.200	---	---	---
	9/22/2004	ENER	---	0.502	0.770	0.566	---	---	---	---	---
TB	2/16/2004	ENER	---	0.452	---	0.487	1.76	---	---	---	---
	9/23/2004	ENER	---	0.618	0.320	0.593	---	---	---	---	---
W	1/12/2004	ENER	---	0.0594	< 0.0300	0.0480	1.65	---	---	---	---
	10/18/2004	ENER	---	0.0521	< 0.0300	0.0770	---	---	---	---	---
WN4	3/2/2004	ENER	10.00	13.1	38.2	0.119	1.16	48.7	---	---	---
X	2/16/2004	ENER	---	0.0177	0.270	< 0.0050	---	< 0.200	< 1.000	---	---
	4/26/2004	ENER	---	0.0351	0.0900	< 0.0050	---	---	---	---	---
	4/26/2004	ENER	---	# 0.0372	# 0.0900	# < 0.0050	---	---	---	---	---
	7/7/2004	ENER	7.10	0.0671	0.0700	< 0.0050	0.950	< 0.200	< 1.000	< 0.0100	0.400
	10/13/2004	ENER	---	0.0820	0.0600	< 0.0050	---	---	---	---	---

Signifies Quality Control Sample

B.4-3 WATER QUALITY ANALYSES FOR THE SUBDIVISION ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
0446	6/1/2004	ENER	---	---	---	---	---	---	---	680	1410	* 2080	---
0490	5/20/2004	ENER	232	64.9	6.50	280	537	< 1.000	202	699	1850	* 2547	1.01
0491	8/23/2004	ENER	---	---	---	---	---	---	---	779	1880	* 2536	---
0492	5/20/2004	ENER	225	61.0	4.70	305	422	< 1.000	175	822	1890	* 2558	1.02
0496	8/17/2004	ENER	---	---	---	---	---	---	---	662	1590	* 2129	---
0497	8/17/2004	ENER	---	---	---	---	---	---	---	793	1920	* 2581	---
	11/8/2004	ENER	---	---	---	---	---	---	176	713	1920	* 2607	---
0498	1/19/2004	ENER	199	51.0	7.00	298	447	< 1.000	181	730	1830	* 2418	0.986
	9/13/2004	ENER	---	---	---	---	---	---	206	745	1750	* 2378	---
0688	5/20/2004	ENER	259	55.5	6.20	276	543	< 1.000	189	742	1850	* 2559	0.998
0801R	11/4/2004	ENER	238	61.7	8.40	250	516	< 1.000	160	641	1780	* 2399	1.06
0802	11/11/2004	ENER	250	60.8	4.40	294	546	< 1.000	173	703	1900	* 2524	1.07
0844	7/7/2004	ENER	---	---	---	---	---	---	---	1270	2640	* 3330	---
0845	1/13/2004	ENER	---	---	---	---	---	---	226	967	2170	* 2779	---
	8/17/2004	ENER	---	---	---	---	---	---	245	1040	2210	* 2876	---
AW	6/29/2004	ENER	221	61.3	7.90	264	395	< 1.000	205	743	1770	* 2382	1.000
CW44	7/22/2004	ENER	---	---	---	---	---	---	---	767	2070	* 2630	---
SUB1	1/15/2004	ENER	---	---	---	---	---	---	182	868	2040	* 2666	---
	5/4/2004	ENER	242	67.4	5.30	301	493	< 1.000	194	899	2070	* 2627	0.955
SUB2	1/15/2004	ENER	---	---	---	---	---	---	205	708	1930	* 2492	---
	5/4/2004	ENER	232	67.1	5.20	253	555	< 1.000	210	723	1870	* 2506	0.938
SUB3	1/15/2004	ENER	---	---	---	---	---	---	163	1490	2760	* 3330	---
	5/4/2004	ENER	263	74.9	5.60	442	280	< 1.000	175	1530	2710	* 3345	0.933

* Signifies Specific Conductivity from HMC

B.4-4 WATER QUALITY ANALYSES FOR THE SUBDIVISION ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
0446	6/1/2004	ENER	---	0.0003	< 0.0300	< 0.0050	< 0.100	---	---	---	---
0490	5/20/2004	ENER	7.67	0.324	0.120	0.0250	1.78	< 0.200	< 1.000	< 0.0100	< 0.200
0491	8/23/2004	ENER	---	0.860	0.0800	0.0190	1.67	---	---	---	---
0492	5/20/2004	ENER	7.96	0.213	< 0.0300	0.0380	2.15	< 0.200	< 1.000	< 0.0100	< 0.200
0496	8/17/2004	ENER	---	0.173	---	0.0630	1.87	---	---	---	---
0497	8/17/2004	ENER	---	1.46	< 0.0300	0.0480	1.76	---	---	---	---
	11/8/2004	ENER	---	1.35	< 0.0300	0.0430	---	---	---	---	---
0498	1/19/2004	ENER	7.87	0.714	< 0.0300	0.0750	1.68	< 0.200	< 1.000	< 0.0100	< 0.200
	9/13/2004	ENER	---	0.824	< 0.0300	0.0680	---	---	---	---	---
0688	5/20/2004	ENER	7.83	0.0561	< 0.0300	0.0120	1.28	< 0.200	< 1.000	< 0.0100	< 0.200
0801R	11/4/2004	ENER	7.45	0.0604	< 0.0300	0.0060	1.70	< 0.200	4.00	< 0.0100	< 0.200
0802	11/11/2004	ENER	7.47	0.823	< 0.0300	0.0230	2.00	< 0.200	< 1.000	< 0.0100	< 0.200
0844	7/7/2004	ENER	---	0.0771	< 0.0300	0.0560	6.42	---	---	---	---
0845	1/13/2004	ENER	---	0.0604	< 0.0300	0.0360	8.05	---	---	---	---
	8/17/2004	ENER	---	0.0638	< 0.0300	0.0580	---	---	---	---	---
AW	6/29/2004	ENER	7.72	0.169	0.110	0.0460	3.07	< 0.200	< 1.000	< 0.0100	< 0.200
CW44	7/22/2004	ENER	---	0.797	< 0.0300	0.0600	2.03	---	---	---	---
SUB1	1/15/2004	ENER	---	0.148	< 0.0300	0.0260	3.34	---	---	---	---
	5/4/2004	ENER	7.85	0.183	< 0.0300	0.0210	3.58	< 0.200	< 1.000	< 0.0100	0.300
SUB2	1/15/2004	ENER	---	0.0887	< 0.0300	0.0150	2.27	---	---	---	---
	5/4/2004	ENER	7.81	0.0847	< 0.0300	0.0140	2.01	< 0.200	< 1.000	< 0.0100	0.300
SUB3	1/15/2004	ENER	---	0.0275	< 0.0300	0.0190	1.98	---	---	---	---
	5/4/2004	ENER	7.89	0.0266	< 0.0300	0.0150	1.91	< 0.200	< 1.000	< 0.0100	0.300

TABLE B.4-5. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
0520	10/7/2004	ENER	---	---	---	---	---	---	---	835	1890	* 2609	---
0521	10/7/2004	ENER	---	---	---	---	---	---	137	545	1400	* 2040	---
0522	1/12/2004	ENER	---	---	---	---	---	---	---	637	1650	* 2330	---
	5/4/2004	ENER	---	---	---	---	---	---	---	575	1560	* 2233	---
	10/7/2004	ENER	---	---	---	---	---	---	---	614	1620	* 2314	---
0531	5/6/2004	ENER	---	---	---	---	---	---	142	670	1580	* 2154	---
	10/5/2004	ENER	---	---	---	---	---	---	---	614	1530	* 2014	---
0532	3/11/2004	ENER	78.5	30.1	2.50	31.6	251	< 1.000	17.9	151	505	* 744	1.00
0538	1/19/2004	ENER	188	53.0	6.60	323	409	< 1.000	161	823	1890	* 2473	0.984
	9/13/2004	ENER	---	---	---	---	---	---	176	850	1750	* 2325	---
0539	1/22/2004	ENER	150	35.0	6.30	326	301	< 1.000	136	775	1680	* 2408	0.991
	9/13/2004	ENER	---	---	---	---	---	---	203	943	1930	* 2506	---
0540	1/20/2004	ENER	184	49.0	6.30	310	387	< 1.000	171	783	1820	* 2400	0.977
	9/13/2004	ENER	---	---	---	---	---	---	193	808	1720	* 2336	---
0541	2/9/2004	ENER	174	48.5	6.50	118	379	< 1.000	84.0	462	1140	* 1530	0.986
	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	1920	---
	9/13/2004	ENER	---	---	---	---	---	---	129	614	1360	* 1775	---
0631	5/13/2004	ENER	---	---	---	---	---	---	---	867	1650	* 2163	---
	9/14/2004	ENER	---	---	---	---	---	---	---	847	1580	* 2122	---
0632	9/14/2004	ENER	157	36.0	6.70	322	220	< 1.000	137	887	1710	* 2268	0.962
0634	1/5/2004	ENER	---	---	---	---	---	---	200	872	2000	* 2654	---
	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	2740	---
	9/14/2004	ENER	---	---	---	---	---	---	---	831	1890	* 2504	---
0636	1/6/2004	ENER	---	---	---	---	---	---	156	441	1160	* 1652	---
	9/15/2004	ENER	---	---	---	---	---	---	---	436	1130	* 1607	---
0637	1/6/2004	ENER	---	---	---	---	---	---	217	495	1360	* 1950	---

* Signifies Specific Conductivity from HMC

TABLE B.4-5. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
0637	9/15/2004	ENER	---	---	---	---	---	---	---	483	1340	* 1922	---
0638	10/7/2004	ENER	---	---	---	---	---	---	238	795	1820	* 2589	---
0639	10/7/2004	ENER	---	---	---	---	---	---	208	893	2070	* 2821	---
0640	1/7/2004	ENER	---	---	---	---	---	---	199	685	1730	* 2378	---
	7/13/2004	ENER	---	---	---	---	---	---	204	663	1700	* 2352	---
0644	1/7/2004	ENER	---	---	---	---	---	---	175	1000	1900	* 2544	---
	6/22/2004	ENER	---	---	---	---	---	---	167	989	1970	---	---
0646	1/7/2004	ENER	---	---	---	---	---	---	147	993	1790	* 2364	---
	11/8/2004	ENER	---	---	---	---	---	---	---	897	1870	---	---
0647	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	2010	---
	8/19/2004	ENER	---	---	---	---	---	---	96.0	611	1330	* 1784	---
0648	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	1600	---
	5/13/2004	ENER	141	33.4	5.00	168	329	< 1.000	69.6	540	1160	* 1580	0.924
	8/19/2004	ENER	---	---	---	---	---	---	---	510	1110	* 1532	---
0649	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	1510	---
	8/19/2004	ENER	126	30.3	4.40	164	343	< 1.000	54.0	477	1010	* 1439	0.937
0650	11/8/2004	ENER	---	---	---	---	---	---	---	601	1380	* 1889	---
0652	1/7/2004	ENER	---	---	---	---	---	---	63.6	623	1150	* 1598	---
0653	5/13/2004	ENER	---	---	---	---	---	---	---	852	1970	* 2595	---
	9/27/2004	ENER	---	---	---	---	---	---	---	812	1870	* 2516	---
0654	1/5/2004	ENER	---	---	---	---	---	---	168	806	1840	* 2425	---
	5/6/2004	ENER	---	---	---	---	---	---	179	933	2110	* 2672	---
	10/4/2004	ENER	---	---	---	---	---	---	70.0	365	991	* 1378	---
0657	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	2160	---
	5/13/2004	ENER	---	---	---	---	---	---	---	700	1640	* 2147	---
	9/14/2004	ENER	---	---	---	---	---	---	---	595	1430	* 1914	---

* Signifies Specific Conductivity from HMC

TABLE B.4-5. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
0658	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	1740	---
	9/14/2004	ENER	---	---	---	---	---	---	74.0	616	1240	* 1668	---
0659	1/5/2004	ENER	---	---	---	---	---	---	211	859	1990	* 2617	---
	9/14/2004	ENER	267	71.9	8.80	288	459	< 1.000	196	983	2070	* 2690	0.953
0683	1/6/2004	ENER	---	---	---	---	---	---	61.2	190	606	* 893	---
	10/4/2004	ENER	---	---	---	---	---	---	---	305	827	* 1146	---
0684	1/6/2004	ENER	---	---	---	---	---	---	150	717	1540	* 2070	---
	10/5/2004	ENER	---	---	---	---	---	---	---	675	1680	* 2171	---
0685	9/14/2004	ENER	---	---	---	---	---	---	153	721	1680	* 2258	---
0686	1/6/2004	ENER	---	---	---	---	---	---	178	475	1250	* 1800	---
	9/15/2004	ENER	---	---	---	---	---	---	---	473	1240	* 1763	---
0687	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	2040	---
	9/14/2004	ENER	---	---	---	---	---	---	---	641	1480	* 1968	---
0689	1/7/2004	ENER	---	---	---	---	---	---	31.5	228	672	* 1007	---
	7/27/2004	ENER	---	---	---	---	---	---	---	246	767	* 1043	---
0692	1/7/2004	ENER	---	---	---	---	---	---	195	656	1570	* 2200	---
	7/28/2004	ENER	---	---	---	---	---	---	196	662	1650	* 2244	---
0846	7/7/2004	ENER	391	99.4	6.90	470	339	< 1.000	226	1810	3400	* 3953	0.973
0851	8/19/2004	ENER	---	---	---	---	---	---	---	1010	1750	* 2257	---
0855	8/19/2004	ENER	---	---	---	---	---	---	---	863	1680	* 2269	---
0861	8/30/2004	ENER	---	---	---	---	---	---	196	939	1820	* 2418	---
0862	8/19/2004	ENER	---	---	---	---	---	---	219	847	1950	* 2609	---
0864	11/17/2004	HMC	---	---	---	---	---	---	---	---	---	2430	---
0867	8/19/2004	ENER	---	---	---	---	---	---	---	533	1240	* 1820	---
0869	8/19/2004	ENER	---	---	---	---	---	---	205	960	1910	* 2523	---

* Signifies Specific Conductivity from HMC

TABLE B.4-5. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
0881	1/5/2004	ENER	---	---	---	---	---	---	207	856	2010	* 2656	---
	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	2710	---
	9/14/2004	ENER	---	---	---	---	---	---	---	897	2070	* 2738	---
0882	1/5/2004	ENER	---	---	---	---	---	---	158	898	1760	* 2292	---
	10/4/2004	ENER	---	---	---	---	---	---	122	854	1750	* 2272	---
0883	1/5/2004	ENER	---	---	---	---	---	---	201	980	2000	* 2668	---
	10/5/2004	ENER	---	---	---	---	---	---	196	925	2120	* 2755	---
0884	1/5/2004	ENER	---	---	---	---	---	---	189	1250	2460	* 3116	---
	10/4/2004	ENER	---	---	---	---	---	---	---	1130	2280	* 2997	---
0885	1/5/2004	ENER	---	---	---	---	---	---	205	750	1820	* 2454	---
	10/4/2004	ENER	---	---	---	---	---	---	190	724	1840	* 2502	---
0886	1/5/2004	ENER	---	---	---	---	---	---	210	1190	2440	* 3086	---
	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	3080	---
	9/14/2004	ENER	---	---	---	---	---	---	---	1090	2360	* 2996	---
0888	1/6/2004	ENER	---	---	---	---	---	---	203	1140	2400	* 3036	---
	10/5/2004	ENER	---	---	---	---	---	---	---	1080	2430	* 3070	---
0890	1/5/2004	ENER	---	---	---	---	---	---	199	839	1930	* 2563	---
	4/23/2004	HMC	---	---	---	---	---	---	---	---	---	2520	---
	9/14/2004	ENER	---	---	---	---	---	---	173	818	1860	* 2464	---
0893	1/5/2004	ENER	---	---	---	---	---	---	205	769	1800	* 2421	---
	10/4/2004	ENER	---	---	---	---	---	---	176	748	1840	* 2481	---
0895	1/6/2004	ENER	---	---	---	---	---	---	163	841	1740	* 2280	---
	10/4/2004	ENER	---	---	---	---	---	---	126	757	1870	* 2214	---
0896	1/6/2004	ENER	---	---	---	---	---	---	206	975	1890	* 2442	---
	10/4/2004	ENER	---	---	---	---	---	---	---	880	1910	* 2455	---
0899	1/6/2004	ENER	---	---	---	---	---	---	87.2	445	1070	* 1503	---

* Signifies Specific Conductivity from HMC

TABLE B.4-5. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
0899	10/4/2004	ENER	---	---	---	---	---	---	---	421	1080	* 1521	---
0910	5/18/2004	ENER	---	---	---	---	---	---	---	390	948	* 1321	---
0914	5/17/2004	ENER	96.1	22.4	2.50	309	20.3	< 1.000	78.4	857	1470	* 2110	0.986
0920	2/16/2004	ENER	---	---	---	---	---	---	---	1600	2720	* 3018	---
	2/16/2004	ENER	---	---	---	---	---	---	---	# 1610	# 2720	---	---
	8/17/2004	ENER	---	---	---	---	---	---	---	1600	2740	* 3046	---
0921	5/17/2004	ENER	376	72.1	8.90	310	224	< 1.000	63.5	1560	2740	* 3235	1.01
0922	5/17/2004	ENER	2.70	< 1.000	1.50	363	341	30.4	66.2	398	1080	* 1751	0.958
0935	5/6/2004	ENER	---	---	---	---	---	---	122	644	1520	* 1986	---
	10/5/2004	ENER	---	---	---	---	---	---	---	526	1300	* 1760	---
0942	8/17/2004	ENER	---	---	---	---	---	---	---	981	2070	* 2677	---
0947	1/7/2004	ENER	---	---	---	---	---	---	216	704	1790	* 2443	---
	7/28/2004	ENER	---	---	---	---	---	---	---	708	1870	* 2503	---
0950	5/17/2004	ENER	45.9	8.60	1.70	515	260	< 1.000	124	837	1780	* 2679	1.01
0994	3/19/2004	ENER	---	---	---	---	---	---	---	203	613	* 868	---
	10/20/2004	ENER	---	---	---	---	---	---	56.0	292	863	* 1166	---
0996	9/14/2004	ENER	---	---	---	---	---	---	119	646	1530	* 2030	---
0999	3/11/2004	ENER	107	33.7	3.20	45.4	279	< 1.000	25.3	232	666	* 946	1.00

Signifies Quality Control Sample

* Signifies Specific Conductivity from HMC

TABLE B.4-6. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
0520	10/7/2004	ENER	---	1.42	4.42	0.190	1.68	---	---	---	---
0521	10/7/2004	ENER	---	1.23	3.12	0.182	---	---	---	---	---
0522	1/12/2004	ENER	---	1.41	---	0.0660	---	---	---	---	---
	5/4/2004	ENER	---	1.41	1.07	0.0300	---	---	---	---	---
	10/7/2004	ENER	---	1.34	---	0.0650	2.03	---	---	---	---
0531	5/6/2004	ENER	---	0.113	< 0.0300	0.0310	---	---	---	---	---
	10/5/2004	ENER	---	0.122	< 0.0300	0.0260	3.19	---	---	---	---
0532	3/11/2004	ENER	7.57	0.0048	< 0.0300	0.0080	2.71	0.800	---	---	---
0538	1/19/2004	ENER	7.95	0.906	< 0.0300	0.129	2.34	< 0.200	< 1.000	< 0.0100	< 0.200
	9/13/2004	ENER	---	0.538	< 0.0300	0.157	---	---	---	---	---
0539	1/22/2004	ENER	8.02	0.0838	< 0.0300	0.0790	3.27	0.800	< 1.000	< 0.0100	< 0.200
	9/13/2004	ENER	---	0.137	< 0.0300	0.0540	---	---	---	---	---
0540	1/20/2004	ENER	8.00	1.09	< 0.0300	0.129	1.82	0.400	< 1.000	< 0.0100	< 0.200
	9/13/2004	ENER	---	0.756	< 0.0300	0.0720	---	---	---	---	---
0541	2/9/2004	ENER	7.18	0.0619	< 0.0300	0.0140	2.90	0.700	< 1.000	< 0.0100	0.500
	9/13/2004	ENER	---	0.0550	< 0.0300	0.0320	---	---	---	---	---
0631	5/13/2004	ENER	---	0.0290	< 0.0300	0.213	---	---	---	---	---
	9/14/2004	ENER	---	0.0253	---	0.202	2.01	---	---	---	---
0632	9/14/2004	ENER	7.35	0.0299	< 0.0300	0.267	2.47	0.400	< 1.000	< 0.0100	< 0.200
0634	1/5/2004	ENER	---	0.223	< 0.0300	0.0520	3.54	---	---	---	---
	9/14/2004	ENER	---	0.154	---	0.0470	3.03	---	---	---	---
0636	1/6/2004	ENER	---	0.0688	< 0.0300	0.0150	8.73	---	---	---	---
	9/15/2004	ENER	---	0.0574	---	0.0180	7.67	---	---	---	---
0637	1/6/2004	ENER	---	0.117	< 0.0300	0.0120	12.8	---	---	---	---
	9/15/2004	ENER	---	0.106	---	0.0150	12.1	---	---	---	---

TABLE B.4-6. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
0638	10/7/2004	ENER	---	0.0202	0.0800	1.33	---	---	---	---	---
0639	10/7/2004	ENER	---	1.70	4.56	1.000	---	---	---	---	---
0640	1/7/2004	ENER	---	0.0274	< 0.0300	0.0210	1.99	---	---	---	---
	7/13/2004	ENER	---	0.0295	< 0.0300	0.0250	---	---	---	---	---
0644	1/7/2004	ENER	---	0.0342	< 0.0300	0.226	3.74	---	---	---	---
	6/22/2004	ENER	---	0.0445	< 0.0300	0.244	3.80	---	---	---	---
0646	1/7/2004	ENER	---	0.0165	< 0.0300	0.297	3.06	---	---	---	---
	11/8/2004	ENER	---	0.0228	---	0.305	3.30	---	---	---	---
0647	8/19/2004	ENER	---	0.0376	< 0.0300	0.0390	---	---	---	---	---
0648	5/13/2004	ENER	7.58	0.0157	< 0.0300	0.0310	2.33	< 0.200	< 1.000	< 0.0100	< 0.200
	8/19/2004	ENER	---	0.0135	---	0.0240	2.01	---	---	---	---
0649	8/19/2004	ENER	7.66	0.0160	< 0.0300	0.0170	2.23	< 0.200	< 1.000	< 0.0100	< 0.200
0650	11/8/2004	ENER	---	0.0310	---	0.0330	3.60	---	---	---	---
0652	1/7/2004	ENER	---	0.0247	< 0.0300	0.0190	0.810	---	---	---	---
0653	5/13/2004	ENER	---	1.02	< 0.0300	0.156	---	---	---	---	---
	9/27/2004	ENER	---	0.873	---	0.156	1.92	---	---	---	---
0654	1/5/2004	ENER	---	0.250	< 0.0300	0.0570	4.62	---	---	---	---
	5/6/2004	ENER	---	0.298	< 0.0300	0.0760	---	---	---	---	---
	10/4/2004	ENER	---	0.0442	< 0.0300	0.0080	---	---	---	---	---
0657	5/13/2004	ENER	---	0.0498	< 0.0300	0.0500	---	---	---	---	---
	9/14/2004	ENER	---	0.0680	---	0.0390	4.49	---	---	---	---
0658	9/14/2004	ENER	---	0.0111	< 0.0300	0.0350	---	---	---	---	---
0659	1/5/2004	ENER	---	0.216	< 0.0300	0.0470	3.28	---	---	---	---
	9/14/2004	ENER	7.19	0.186	< 0.0300	0.0540	3.27	< 0.200	< 1.000	< 0.0100	< 0.200
0683	1/6/2004	ENER	---	0.0033	< 0.0300	0.0120	3.26	---	---	---	---

TABLE B.4-6. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
0683	10/4/2004	ENER	---	0.0036	---	0.0150	2.88	---	---	---	---
0684	1/6/2004	ENER	---	0.0492	< 0.0300	0.0200	0.960	---	---	---	---
	10/5/2004	ENER	---	0.0486	---	0.0360	2.02	---	---	---	---
0685	9/14/2004	ENER	---	0.101	< 0.0300	0.0370	---	---	---	---	---
0686	1/6/2004	ENER	---	0.0608	< 0.0300	0.0150	10.4	---	---	---	---
	9/15/2004	ENER	---	0.0541	< 0.0300	0.0150	9.77	---	---	---	---
0687	9/14/2004	ENER	---	0.0983	---	0.0440	4.79	---	---	---	---
0689	1/7/2004	ENER	---	0.0059	< 0.0300	< 0.0050	1.78	---	---	---	---
	7/27/2004	ENER	---	0.0107	---	0.0070	2.05	---	---	---	---
0692	1/7/2004	ENER	---	0.0495	< 0.0300	0.0100	1.51	---	---	---	---
	7/28/2004	ENER	---	0.0596	< 0.0300	0.0150	1.50	---	---	---	---
0846	7/7/2004	ENER	7.02	0.0626	< 0.0300	0.0810	15.5	1.70	< 1.000	< 0.0100	0.400
0851	8/19/2004	ENER	---	0.0408	---	0.149	3.01	---	---	---	---
0855	8/19/2004	ENER	---	0.0432	---	0.261	2.85	---	---	---	---
0861	8/30/2004	ENER	---	0.260	< 0.0300	0.214	---	---	---	---	---
0862	8/19/2004	ENER	---	0.832	< 0.0300	0.0690	---	---	---	---	---
0867	8/19/2004	ENER	---	0.0270	---	0.137	3.63	---	---	---	---
0869	8/19/2004	ENER	---	0.431	< 0.0300	0.180	---	---	---	---	---
0881	1/5/2004	ENER	---	0.227	< 0.0300	0.0490	3.66	---	---	---	---
	9/14/2004	ENER	---	0.214	---	0.0540	3.26	---	---	---	---
0882	1/5/2004	ENER	---	0.0223	< 0.0300	< 0.0050	< 0.100	---	---	---	---
	10/4/2004	ENER	---	0.0205	< 0.0300	< 0.0050	---	---	---	---	---
0883	1/5/2004	ENER	---	0.0280	< 0.0300	0.0470	3.64	---	---	---	---
	10/5/2004	ENER	---	0.0290	< 0.0300	0.0530	---	---	---	---	---
0884	1/5/2004	ENER	---	0.474	< 0.0300	0.172	12.2	---	---	---	---

TABLE B.4-6. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
0884	10/4/2004	ENER	---	0.174	---	0.204	11.6	---	---	---	---
0885	1/5/2004	ENER	---	0.0700	< 0.0300	0.0200	1.67	---	---	---	---
	10/4/2004	ENER	---	0.0667	< 0.0300	0.0230	---	---	---	---	---
0886	1/5/2004	ENER	---	0.542	0.0400	0.130	9.26	---	---	---	---
	9/14/2004	ENER	---	0.493	---	0.104	7.02	---	---	---	---
0888	1/6/2004	ENER	---	0.564	< 0.0300	0.121	7.60	---	---	---	---
	10/5/2004	ENER	---	0.485	---	0.115	8.31	---	---	---	---
0890	1/5/2004	ENER	---	0.161	< 0.0300	0.0420	2.90	---	---	---	---
	9/14/2004	ENER	---	0.145	< 0.0300	0.0430	---	---	---	---	---
0893	1/5/2004	ENER	---	0.0750	< 0.0300	0.0160	1.49	---	---	---	---
	10/4/2004	ENER	---	0.0699	< 0.0300	0.0240	---	---	---	---	---
0895	1/6/2004	ENER	---	0.0934	< 0.0300	0.0690	6.43	---	---	---	---
	10/4/2004	ENER	---	0.0707	< 0.0300	0.0460	---	---	---	---	---
0896	1/6/2004	ENER	---	0.0384	< 0.0300	0.0820	4.60	---	---	---	---
	10/4/2004	ENER	---	0.0353	---	0.0780	5.43	---	---	---	---
0899	1/6/2004	ENER	---	0.0749	< 0.0300	0.0240	5.00	---	---	---	---
	10/4/2004	ENER	---	0.0509	---	0.0330	5.97	---	---	---	---
0910	5/18/2004	ENER	---	0.0099	< 0.0100	0.0160	3.60	---	---	---	---
0914	5/17/2004	ENER	7.25	0.0008	< 0.0300	< 0.0050	< 0.100	0.600	---	---	---
0920	2/16/2004	ENER	---	0.206	< 0.0300	0.431	---	---	---	---	---
	2/16/2004	ENER	---	# 0.205	# < 0.0300	# 0.435	---	---	---	---	---
	8/17/2004	ENER	---	0.198	< 0.0300	0.427	13.6	---	---	---	---
0921	5/17/2004	ENER	7.74	0.210	< 0.0300	0.606	17.2	0.200	---	---	---
0922	5/17/2004	ENER	9.20	0.0041	0.0500	< 0.0050	< 0.100	0.200	---	---	---
0935	5/6/2004	ENER	---	0.137	< 0.0300	0.0510	---	---	---	---	---

Signifies Quality Control Sample

TABLE B.4-6. WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
0935	10/5/2004	ENER	---	0.0891	< 0.0300	0.0340	5.23	---	---	---	---
0942	8/17/2004	ENER	---	0.0584	< 0.0300	0.0340	5.26	---	---	---	---
0947	1/7/2004	ENER	---	0.0679	< 0.0300	0.0090	1.45	---	---	---	---
	7/28/2004	ENER	---	0.0740	< 0.0300	0.0110	1.49	---	---	---	---
0950	5/17/2004	ENER	8.08	0.116	< 0.0300	0.291	8.74	0.200	---	---	---
0994	3/19/2004	ENER	---	0.0051	---	0.0060	2.86	---	---	---	---
	10/20/2004	ENER	---	0.0055	< 0.0300	0.0170	---	---	---	---	---
0996	9/14/2004	ENER	---	0.0454	< 0.0300	0.0440	---	---	---	---	---
0999	3/11/2004	ENER	7.54	0.0048	< 0.0300	0.0120	3.36	0.300	---	---	---

TABLE B.5-1. WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
0434	5/4/2004	ENER	---	---	---	---	---	---	---	689	1730	* 2343	---
0446	6/1/2004	ENER	---	---	---	---	---	---	---	680	1410	* 2080	---
0486	8/4/2004	ENER	134	36.0	4.80	473	446	< 1.000	137	870	1930	* 2706	1.03
0493	3/11/2004	ENER	---	---	---	---	---	---	---	733	1570	* 2224	---
	3/11/2004	ENER	---	---	---	---	---	---	---	# 723	# 1560	---	---
	5/20/2004	ENER	12.1	3.80	2.30	470	314	< 1.000	117	707	1560	* 2350	0.923
0494	5/20/2004	ENER	234	64.8	6.80	270	510	< 1.000	192	700	1790	* 2485	1.02
0498	1/19/2004	ENER	199	51.0	7.00	298	447	< 1.000	181	730	1830	* 2418	0.986
	9/13/2004	ENER	---	---	---	---	---	---	206	745	1750	* 2378	---
0538	1/19/2004	ENER	188	53.0	6.60	323	409	< 1.000	161	823	1890	* 2473	0.984
	9/13/2004	ENER	---	---	---	---	---	---	176	850	1750	* 2325	---
0539	1/22/2004	ENER	150	35.0	6.30	326	301	< 1.000	136	775	1680	* 2408	0.991
	9/13/2004	ENER	---	---	---	---	---	---	203	943	1930	* 2506	---
0653	5/13/2004	ENER	---	---	---	---	---	---	---	852	1970	* 2595	---
	9/27/2004	ENER	---	---	---	---	---	---	---	812	1870	* 2516	---
0853	5/27/2004	ENER	---	---	---	---	---	---	---	660	1370	* 1914	---
0859	5/26/2004	ENER	---	---	---	---	---	---	---	920	1940	* 2827	---
0929	2/16/2004	ENER	---	---	---	---	---	---	139	704	1710	* 2605	---
	5/25/2004	ENER	11.0	2.00	1.000	620	624	< 1.000	220	650	1920	* 2917	0.924
0930	5/25/2004	ENER	---	---	---	---	---	---	---	410	998	* 1554	---
0931	5/25/2004	ENER	---	---	---	---	---	---	---	600	1610	* 2665	---
0934	2/16/2004	ENER	---	---	---	---	---	---	223	690	1890	* 2902	---
	5/25/2004	ENER	11.0	2.00	1.000	620	623	< 1.000	240	650	1910	* 2886	0.907
0994	3/19/2004	ENER	---	---	---	---	---	---	---	203	613	* 868	---
	10/20/2004	ENER	---	---	---	---	---	---	56.0	292	863	* 1166	---

Signifies Quality Control Sample

* Signifies Specific Conductivity from HMC

TABLE B.5-1. WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
AW	6/29/2004	ENER	221	61.3	7.90	264	395	< 1.000	205	743	1770	* 2382	1.000
CE1	6/1/2004	ENER	---	---	---	---	---	---	---	387	1270	* 1852	---
CE2	2/17/2004	ENER	---	---	---	---	---	---	151	570	1430	* 2074	---
	5/24/2004	ENER	120	32.0	4.00	280	449	< 1.000	120	490	1300	* 1910	0.996
CE5	5/25/2004	ENER	---	---	---	---	---	---	---	750	1820	* 2480	---
CW1	2/17/2004	ENER	---	---	---	---	---	---	51.3	675	1320	* 2047	---
	5/20/2004	ENER	7.00	1.000	2.00	470	362	< 1.000	57.0	650	1340	* 2112	0.992
CW2	2/17/2004	ENER	---	---	---	---	---	---	55.7	453	984	* 1586	---
	5/20/2004	ENER	5.00	1.000	1.000	360	326	< 1.000	59.0	430	1040	* 1661	1.00
	8/17/2004	ENER	---	---	---	---	---	---	---	476	1060	* 1621	---
	8/17/2004	ENER	---	---	---	---	---	---	---	# 460	# 1030	---	---
CW3	2/17/2004	ENER	---	---	---	---	---	---	155	1130	2220	* 3017	---
	5/12/2004	ENER	178	48.5	4.20	482	480	< 1.000	187	1150	2370	* 3219	0.915
	5/20/2004	ENER	175	46.0	4.00	480	473	< 1.000	159	1100	2360	* 3140	0.952
CW9	6/1/2004	ENER	---	---	---	---	---	---	---	270	615	* 950	---
CW15	5/26/2004	ENER	---	---	---	---	---	---	---	1200	2100	* 2794	---
CW17	6/1/2004	ENER	---	---	---	---	---	---	---	1800	3170	* 3546	---
CW18	2/17/2004	ENER	---	---	---	---	---	---	212	712	1810	* 2709	---
	5/26/2004	ENER	55.0	12.0	4.00	550	618	< 1.000	200	700	1870	* 2779	0.914
CW24	7/27/2004	ENER	---	---	---	---	---	---	---	1730	3200	* 3566	---
CW26	5/27/2004	ENER	---	---	---	---	---	---	---	700	1480	* 2115	---
CW27	5/27/2004	ENER	---	---	---	---	---	---	---	740	1570	* 2168	---
CW28	2/10/2004	ENER	---	---	---	---	---	---	92.3	441	1040	* 1646	---
	5/26/2004	ENER	6.00	1.000	1.000	370	283	< 1.000	96.0	460	1080	* 1678	0.973
CW29	2/5/2004	ENER	---	---	---	---	---	---	108	698	1430	* 2070	---

Signifies Quality Control Sample

* Signifies Specific Conductivity from HMC

TABLE B.5-1. WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
CW29	7/13/2004	ENER	115	30.5	5.50	323	243	< 1.000	127	741	1430	* 2040	0.975
CW31	5/27/2004	ENER	---	---	---	---	---	---	---	910	1570	* 2108	---
CW32	5/27/2004	ENER	---	---	---	---	---	---	---	2600	5110	* 6530	---
CW33	5/27/2004	ENER	---	---	---	---	---	---	---	2200	4070	* 5580	---
CW35	6/1/2004	ENER	---	---	---	---	---	---	---	1300	2460	* 2955	---
CW36	7/28/2004	ENER	---	---	---	---	---	---	---	1020	1860	* 2508	---
CW37	5/27/2004	ENER	---	---	---	---	---	---	---	1000	1920	* 2480	---
CW39	8/4/2004	ENER	---	---	---	---	---	---	---	934	1770	* 2278	---
CW40	5/27/2004	ENER	---	---	---	---	---	---	---	700	1930	* 2864	---
CW41	8/4/2004	ENER	---	---	---	---	---	---	---	287	1020	* 1578	---
CW42	8/4/2004	ENER	---	---	---	---	---	---	---	836	1810	* 2384	---
CW43	8/4/2004	ENER	---	---	---	---	---	---	---	604	1370	* 1844	---
CW44	7/22/2004	ENER	---	---	---	---	---	---	---	767	2070	* 2630	---
CW45	4/17/2004	HMC	---	---	---	---	---	---	---	---	---	2560	---
	7/22/2004	ENER	---	---	---	---	---	---	---	744	1950	* 2465	---
CW50	3/16/2004	ENER	198	52.7	4.20	258	348	< 1.000	62.1	943	1760	* 2257	0.942
	8/30/2004	ENER	---	---	---	---	---	---	---	959	1760	* 2279	---
CW52	3/16/2004	ENER	35.1	6.50	2.10	459	930	< 1.000	33.4	350	1440	* 2088	0.949
	8/30/2004	ENER	---	---	---	---	---	---	---	571	1410	* 2086	---
CW53	6/28/2004	ENER	59.2	15.0	3.30	484	446	< 1.000	129	784	1740	* 2518	0.928
CW54	6/22/2004	ENER	128	33.9	6.40	540	468	< 1.000	232	936	2240	* 3050	0.973
WCW	7/15/2004	ENER	---	---	---	---	---	---	---	675	1570	* 2319	---
WR25	7/27/2004	ENER	---	---	---	---	---	---	---	1990	3750	* 4020	---

* Signifies Specific Conductivity from HMC

TABLE B.5-2. WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
0434	5/4/2004	ENER	---	0.176	0.0700	0.0260	2.01	---	---	---	---
0446	6/1/2004	ENER	---	0.0003	< 0.0300	< 0.0050	< 0.100	---	---	---	---
0486	8/4/2004	ENER	7.41	0.843	< 0.0300	0.108	2.54	< 0.200	< 1.000	< 0.0100	< 0.200
0493	3/11/2004	ENER	---	0.133	< 0.0300	0.190	---	---	---	---	---
	3/11/2004	ENER	---	# 0.126	# < 0.0300	# 0.184	---	---	---	---	---
	5/20/2004	ENER	8.27	0.151	< 0.0300	0.196	1.86	< 0.200	< 1.000	< 0.0100	< 0.200
0494	5/20/2004	ENER	7.82	0.248	0.0800	0.0240	1.98	< 0.200	< 1.000	< 0.0100	< 0.200
0498	1/19/2004	ENER	7.87	0.714	< 0.0300	0.0750	1.68	< 0.200	< 1.000	< 0.0100	< 0.200
	9/13/2004	ENER	---	0.824	< 0.0300	0.0680	---	---	---	---	---
0538	1/19/2004	ENER	7.95	0.906	< 0.0300	0.129	2.34	< 0.200	< 1.000	< 0.0100	< 0.200
	9/13/2004	ENER	---	0.538	< 0.0300	0.157	---	---	---	---	---
0539	1/22/2004	ENER	8.02	0.0838	< 0.0300	0.0790	3.27	0.800	< 1.000	< 0.0100	< 0.200
	9/13/2004	ENER	---	0.137	< 0.0300	0.0540	---	---	---	---	---
0653	5/13/2004	ENER	---	1.02	< 0.0300	0.156	---	---	---	---	---
	9/27/2004	ENER	---	0.873	---	0.156	1.92	---	---	---	---
0853	5/27/2004	ENER	---	0.0254	< 0.0300	0.132	2.06	---	---	---	---
0859	5/26/2004	ENER	---	0.130	< 0.0300	0.110	2.85	---	---	---	---
0929	2/16/2004	ENER	---	0.0390	< 0.0300	0.0130	---	---	---	---	---
	5/25/2004	ENER	7.94	0.0468	< 0.0300	0.0130	1.68	< 0.200	---	---	---
0930	5/25/2004	ENER	---	0.0043	< 0.0300	< 0.0050	< 0.100	---	---	---	---
0931	5/25/2004	ENER	---	0.0010	< 0.0300	< 0.0050	< 0.100	---	---	---	---
0934	2/16/2004	ENER	---	0.0498	< 0.0300	0.0140	---	---	---	---	---
	5/25/2004	ENER	7.97	0.0479	< 0.0300	0.0120	1.69	< 0.200	---	---	---
0994	3/19/2004	ENER	---	0.0051	---	0.0060	2.86	---	---	---	---
	10/20/2004	ENER	---	0.0055	< 0.0300	0.0170	---	---	---	---	---

Signifies Quality Control Sample

TABLE B.5-2. WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
AW	6/29/2004	ENER	7.72	0.169	0.110	0.0460	3.07	< 0.200	< 1.000	< 0.0100	< 0.200
CE1	6/1/2004	ENER	---	1.16	2.35	0.0130	0.110	---	---	---	---
CE2	2/17/2004	ENER	---	0.555	0.460	0.0430	---	---	---	---	---
	5/24/2004	ENER	7.38	0.440	0.400	0.0480	1.89	< 0.200	---	---	---
CE5	5/25/2004	ENER	---	0.402	0.140	0.0590	2.13	---	---	---	---
CW1	2/17/2004	ENER	---	0.0560	< 0.0300	0.0270	---	---	---	---	---
	5/20/2004	ENER	8.06	0.0594	< 0.0300	0.0320	0.900	< 0.200	---	---	---
CW2	2/17/2004	ENER	---	0.0198	< 0.0300	0.0320	---	---	---	---	---
	5/20/2004	ENER	8.21	0.0332	< 0.0300	0.0290	0.470	< 0.200	---	---	---
	8/17/2004	ENER	---	0.0249	< 0.0300	0.0290	---	---	---	---	---
	8/17/2004	ENER	---	# 0.0251	# < 0.0300	# 0.0290	---	---	---	---	---
CW3	2/17/2004	ENER	---	2.63	2.28	0.0730	---	---	---	---	---
	5/12/2004	ENER	7.92	3.16	2.42	0.0940	0.740	< 0.200	< 1.000	0.0400	< 0.200
	5/20/2004	ENER	7.49	2.81	2.32	0.102	0.710	< 0.200	---	---	---
CW9	6/1/2004	ENER	---	0.0075	< 0.0300	< 0.0060	< 0.100	---	---	---	---
CW15	5/26/2004	ENER	---	0.0273	< 0.0300	0.0510	6.08	---	---	---	---
CW17	6/1/2004	ENER	---	0.134	< 0.0300	0.0540	10.5	---	---	---	---
CW18	2/17/2004	ENER	---	0.0417	< 0.0300	0.0200	---	---	---	---	---
	5/26/2004	ENER	7.48	0.0546	< 0.0300	< 0.0500	2.12	< 0.200	---	---	---
CW24	7/27/2004	ENER	---	0.145	< 0.0300	0.0370	9.63	---	---	---	---
CW26	5/27/2004	ENER	---	0.0234	< 0.0300	0.210	2.21	---	---	---	---
CW27	5/27/2004	ENER	---	0.0228	< 0.0300	0.230	2.22	---	---	---	---
CW28	2/10/2004	ENER	---	0.0156	< 0.0300	0.107	---	---	---	---	---
	5/26/2004	ENER	8.21	0.0152	< 0.0300	0.120	0.730	< 0.200	---	---	---
CW29	2/5/2004	ENER	---	0.135	< 0.0300	0.173	---	---	---	---	---

Signifies Quality Control Sample

TABLE B.5-2. WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
CW29	7/13/2004	ENER	7.54	0.117	< 0.0300	0.170	2.21	< 0.200	---	---	---
CW31	5/27/2004	ENER	---	0.0130	< 0.0300	< 0.0050	< 0.100	---	---	---	---
CW32	5/27/2004	ENER	---	0.0111	< 0.0300	0.0070	< 0.100	---	---	---	---
CW33	5/27/2004	ENER	---	0.0127	< 0.0300	0.0060	< 0.100	---	---	---	---
CW35	6/1/2004	ENER	---	0.189	< 0.0300	0.0560	5.89	---	---	---	---
CW36	7/28/2004	ENER	---	0.0030	< 0.0300	< 0.0050	< 0.100	---	---	---	---
CW37	5/27/2004	ENER	---	0.0292	< 0.0300	0.0740	5.57	---	---	---	---
CW39	8/4/2004	ENER	---	0.0339	< 0.0300	0.0450	4.54	---	---	---	---
CW40	5/27/2004	ENER	---	0.0150	< 0.0300	< 0.0100	2.05	---	---	---	---
CW41	8/4/2004	ENER	---	0.0566	< 0.0300	0.0200	7.39	---	---	---	---
CW42	8/4/2004	ENER	---	0.813	< 0.0300	0.189	2.21	---	---	---	---
CW43	8/4/2004	ENER	---	0.0364	< 0.0300	0.0190	2.65	---	---	---	---
CW44	7/22/2004	ENER	---	0.797	< 0.0300	0.0600	2.03	---	---	---	---
CW45	7/22/2004	ENER	---	0.984	< 0.0300	0.107	1.85	---	---	---	---
CW50	3/16/2004	ENER	7.42	0.0413	< 0.0300	< 0.0050	< 0.100	< 0.200	< 1.000	< 0.0100	< 0.200
	8/30/2004	ENER	---	0.0397	< 0.0300	< 0.0050	< 0.100	---	---	---	---
CW52	3/16/2004	ENER	7.69	0.0126	< 0.0300	< 0.0050	< 0.100	0.500	< 1.000	< 0.0100	< 0.200
	8/30/2004	ENER	---	0.0108	< 0.0300	< 0.0050	< 0.100	---	---	---	---
CW53	6/28/2004	ENER	7.76	0.303	< 0.0300	0.0730	0.540	0.700	< 1.000	< 0.0100	< 0.200
CW54	6/22/2004	ENER	7.58	0.0719	< 0.0300	0.0060	< 0.100	1.30	< 1.000	< 0.0100	< 0.200
WCW	7/15/2004	ENER	---	0.0114	< 0.0300	< 0.0050	< 0.100	---	---	---	---
WR25	7/27/2004	ENER	---	0.267	< 0.0300	0.0350	10.8	---	---	---	---

TABLE B.6-1. WATER QUALITY ANALYSES FOR THE SAN ANDRES AQUIFER. (cont.)

Ca THROUGH ION_BAL

Sample Point Name	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.) (µmhos/cm)	Ion_B (ratio)
#1 Deepwell	5/10/2004	ENER	244	82.8	14.5	313	---	---	267	809	2130	* 2851	---
#2 Deepwell	5/10/2004	ENER	218	73.5	12.3	230	---	---	211	693	1790	* 2449	---
0545	5/6/2004	ENER	155	43.4	2.50	56.5	423	< 1.000	34.2	327	857	* 1178	0.938
0928	12/9/2004	ENER	---	---	---	---	---	---	---	892	1700	* 2359	---
0943	3/9/2004	ENER	166	52.9	8.80	314	391	< 1.000	188	793	1830	* 2505	0.939
	12/8/2004	ENER	---	---	---	---	---	---	---	690	1720	* 2315	---
0951	12/8/2004	ENER	---	---	---	---	---	---	---	334	919	* 1288	---

* Signifies Specific Conductivity from HMC

TABLE B.6-2. WATER QUALITY ANALYSES FOR THE SAN ANDRES AQUIFER. (cont.)

pH THROUGH Th-230

Sample Point Name	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
#1 Deepwell	5/10/2004	ENER	7.37	0.0088	< 0.0300	< 0.0050	0.390	0.700	---	---	---
#2 Deepwell	5/10/2004	ENER	7.53	0.0109	< 0.0300	0.0070	2.61	< 0.200	---	---	---
0545	5/6/2004	ENER	7.36	0.0080	< 0.0300	0.0090	3.94	< 0.200	< 1.000	< 0.0100	< 0.200
0928	12/9/2004	ENER	---	0.0822	---	0.0350	---	---	---	---	---
0943	3/9/2004	ENER	7.43	0.0180	< 0.0300	0.0290	5.25	0.300	---	---	---
	12/8/2004	ENER	---	0.0136	---	0.0200	---	---	---	---	---
0951	12/8/2004	ENER	---	0.0272	---	0.0080	---	---	---	---	---

APPENDIX C

ANNUAL ALARA AUDIT

Annual ALARA Audit

December 16, 2004

Grants Operations
Homestake Mining Company
P. O. Box 98
Grants, New Mexico 87020

Prepared by:

Kenneth R. Baker
Environmental Restoration Group, Inc.
8809 Washington NE, Suite 150
Albuquerque, NM 87113

1.0 Introduction

On December 16, 2004, Kenneth R. Baker conducted the 2004 Annual ALARA Audit for the Grants Uranium Mill site. The audit was conducted in accordance with the United States Nuclear Regulatory Commission (NRC) Regulatory Guide 8.31, "Information Relevant to Ensuring That Occupational Exposure at Uranium Mills Will Be As Low As Reasonably Achievable." Other applicable references included USNRC Materials License Number SUA-1471 issued to Homestake Mining Company, and USNRC Regulatory Guides 8.10, 8.22, and 8.30.

The following topics were covered in the audit:

Follow up on prior ALARA audit
ALARA policy
Radiation exposures
Bioassay results
Environmental monitoring
Self audits
ALARA planning activities
Worker training
Radiation safety meetings
Radiation surveys
Overexposures
Health physics staff
Procedures, Data Collection, and Management

All mill buildings have been removed and the off-pile tailings cleanup was completed in 1995. The side slopes of the main tailings pile and the mill yard area have a permanent radon barrier and an erosion protection cover. An interim cover is being maintained on the top of the large tailings pile and that portion of the small tailings pile that is not covered by the evaporation pond.

Activities at the site during 2004 include the operation of a reverse osmosis (RO) unit that supports the groundwater restoration program, drilling additional wells on the Large Tailing Pile, operating and maintaining the dewatering system for the large tailings pile, and maintaining the groundwater restoration system. The groundwater restoration consists of pumping the groundwater collection wells, operating the evaporation ponds, injecting clean water into the contaminated aquifer, and operating the RO plant. A new transformer building was constructed between the Large Tailings Pile and Small Tailings Pile. Although located in the radiological restricted area, this area is uncontaminated and thus was not done under a radiation work permit. Additional cover was also placed on a small portion of the Large Tailings Pile in 2004 to restore cover thickness that had been reduced due to wind erosion.

The primary potential radiation exposure results from maintaining the pumps, valves, and piping associated with the tailings dewatering and groundwater collection systems,

operating the RO plant, drilling new wells on the tailings pile, and maintaining the spray system on the evaporation ponds.

2. Discussion

The audit process involved scoping the audit, gathering relevant information, review of information, interviewing appropriate personnel, and writing the report. The reviews are briefly summarized below.

2.1 Follow-up on Previous Audit Recommendations

The last NRC audit occurred on April 3, 2003. No findings were made.

The last ALARA audit was conducted on November 4, 2003 by Nels Johnson CHP. A recommendation was made at that time to document low airborne particulate concentrations by taking periodic air samples whenever an RWP is required, specifically while performing invasive work on top of the pile. An alternative to monitoring workers was to install a high volume air sampler on top of the Large Tailings Pile. Installation of a high volume air sampler was done so this recommendation is considered closed.

Another previous recommendation was to make working level (WL) measurements in the RO building to confirm that the WL is low. WL measurements were made in 2002 and shown to be very low relative to the radon levels. HMC has installed exhaust fans that vent the building prior to entry and in 2003, installed an exhaust fan that runs continuously. This should reduce the WL to even lower values. This auditor reviewed the measured radon concentrations and believes that HMC has performed adequate measurements to demonstrate that exposure to radon and progeny, under the current work conditions, is insignificant. Therefore the recommendation is considered closed.

A recommendation that remains open was to perform an annual leak test on sources. While this is not a regulatory requirement, it is good practice. This recommendation remains open.

Recommendations for conducting clean area surveys and apply additional cover to areas with high exposure rates on the top of the Large Tailings Pile have been closed.

2.2 ALARA Policy

The corporate ALARA policy statement is included in Standard Operating Procedure HP-6, revised October 14, 2003. This policy statement commits management and personnel to be continually vigilant for means to reduce exposures. This policy has been implemented as evidenced by discussions with HMC management and staff, and by the incorporation of ALARA principles in worker training and preparation of radiation work permits.

2.3 Radiation Exposures

2.3.1 External Exposures

Dosimetry data for the fourth quarter 2003 and first three quarters 2004 were reviewed. An average of 12 OSL badges were issued each quarter, with a minimum reportable dose equivalent of 1 mrem. The maximum deep dose equivalent for the fourth quarter of 2003 was reported as 9 mrem. The maximum deep dose equivalents for the first three quarters

of 2004 were 11, 13, and 8 mrem, respectively. The maximum year-to-date dose equivalent for CY 2003 was reported as 38 mrem. All shallow and eye dose equivalents were similar to the deep doses. One dosimeter was assigned as an area monitor in the RO building. The cumulative dose equivalent for CY 2003 for this location was reported as 3 mrem. CY2004 exposures should be similar in magnitude.

Dosimeters are also emplaced at each of the perimeter hi-volume air particulate sampling stations. These OSL dosimeters are exchanged semi-annually. A review of the reported results indicated exposure rates comparable or less than that at the background location.

These low exposures reflect the effort that management and the workers have expended in maintaining exposures ALARA as well as the low radiation work environment.

2.3.2 Internal Exposures from Long-Lived Particulate Sources

HMC does not routinely require airborne particulate monitoring since there are no dry exposed tailings. Invasive activities normally involve the use of water to suppress any dust that may be generated.

HMC has a "spot check program" where the most exposed individual working under an RWP will be monitored for a day, normally one per month. RWP-1-2004 was issued in CY-2004 and "spot checks" were performed for surface contamination. No personal air sampler data were collected during these "spot checks".

A high volume air particulate sampler was installed on top of the pile and continuous samples were taken. Data for the first three quarters indicate near background concentrations of uranium, Ra-226, and Th-230. Net concentrations were a small fraction of 1 percent of the respective DACs. This is a good indication that the average airborne particulate concentrations during work activities on top of the pile are very low.

2.3.3 Internal Exposure from Radon

The radon concentrations at seven locations on the site perimeter near the tailings pile are monitored by a semi-annual exchange of track-etch detectors. Six-month average concentrations for the last half 2003 and first half year 2004 ranged from less than that at the background location to 1.3 pCi/g above that at the background location. This is considered a very low exposure.

HMC has been aware that the RO building presents a source of concern for radon exposure. Water from production wells is exposed to the atmosphere in the RO building and dissolved radon will emanate into the building atmosphere. Ventilation fans in the building are operated twice daily prior to shift entry to exhaust this radiation source, and an additional exhaust fan operating continuously was added to the building sump in 2003 to reduce radon concentrations further. Two track-etch detectors were placed in the work areas and read monthly during 2003, where monthly averages ranged from 4.5 to 14.5 pCi/l. This was a significant decrease from the levels measured in 2001 and 2002 prior to full installation of the existing building exhaust system. After review of the data, HMC went to a semiannual exchange of the track-etch detectors. The average radon

concentrations in the building for the last half of the 2003 year was 11.6 pCi/l, and 9.1 pCi/l during the first half of 2004. These concentrations are significantly less than that measured during the first half of 2002 (21 pCi/l) and in the year 2001 (47 pCi/l). This reduction in concentration is likely due to the aforementioned increased ventilation in the RO building.

HMC records the occupancy time employees are in the RO building. WL measurements conducted in the area showed very low radon daughter concentrations compared to the radon concentrations. In addition, occupancy times for workers are normally a few hours per week. Thus radiation exposures under these occupancy periods are very low.

HMC has made a considerable effort in reducing radiation exposure to workers in the RO building. This is clearly a demonstration of the company's commitment to ALARA.

2.4 Bioassay Results

Procedures call for a semi-annual routine urine-sampling schedule for HMC employees. Contractor employees are sampled at the beginning and end of short-term projects. Year to date, 12 shipments of bioassay samples were sent to an offsite laboratory for total uranium analysis. These 12 shipments contained 62 individual samples, including a blank and spike with each shipment. The vendor laboratory is required to have a lower limit of detection (LLD) of 5 μg/l for uranium. Any measured value of 15 μg/l must be investigated and appropriate mitigation measures taken. Persons with urine samples exceeding 35 μg/l must be placed on work restrictions to limit further intakes of uranium.

All results were below the LLD of 5 μg/l of uranium, except for the spikes. HMC obtained a uranium solution from the vendor laboratory and spikes one blank urine sample in each shipment with either 15 or 30 pCi/l. The laboratory estimates for all spiked samples were within 30% of the known amount, which is the allowable tolerance. The results for the bioassay program support the conclusion that the worker uptake of uranium is low.

2.5 Self Audits

The RPA requires that the technicians (Venable/Vigil) prepare a monthly ALARA report. The report consists of radiation protection data reflective of the operations as well as an accounting of the major activities for the month. Any problems encountered are also presented. After reviewing several of the reports, the auditor concluded that the reports provide the RPA with adequate detail to assure that exposures are being maintained ALARA.

2.6 ALARA Planning Activities

HMC conducts all invasive work (involving tailings) under a radiation work permit (RWP). Only one RWP was prepared in 2004 for drilling additional wells on the Large Tailings Pile. When contract laborers are used, spot checks are conducted to assure that the requirements are appropriate and being followed. These spot checks include frisking working personnel and equipment to determine the levels of contamination, performing

exposure rate measurements in the work area, and possibly taking air samples. Spot check records of personnel were maintained.

2.7 Worker Training

All radiation workers receive formal classroom radiation safety training. Workers must pass a written examination. Annual refresher training is required and generally is a repeat of the course material given initially. Kenneth Baker conducted the last annual training on November 18, 2004. The Radiation Protection Administrator (RPA) or Adrian Venable normally gives the contractor training. Use of videotapes and an examination developed for HMC by a consultant is incorporated into the contractor employee training.

2.8 Radiation Surveys

A review of the instrument maintenance and calibration records was made. All instruments in use had been calibrated. A calibration schedule is prepared for use in tracking calibrations. The records were found in good order.

Clean area surveys are no longer required per license condition but HMC conducted two surveys within the office and work bays during 2004. Seventeen locations were monitored where the removable alpha contamination measured 1-24 dpm/100 cm^2. These levels are considered acceptable for clean areas.

The file containing release surveys was reviewed. On a few occasions, total beta measurements exceeded the 250 dpm/100 cm^2 action level requiring a smear to be taken and analyzed. While the maximum was less than 500 dpm/100 cm^2 and the limit for removable is 1,000 dpm/100 cm^2, the data indicate that the items released met the release limits. However, standard operating procedure (SOP) HP-4 required that the smear be taken and analyzed. A further investigation revealed that HMC does not have a SOP or equipment for accurately counting smears for beta activity. The only currently available method would be to use a ratemeter and GM Pancake probe to estimate the activity on the smear. This led to a recommendation for purchase of equipment and development of a SOP for counting smears for beta activity.

HMC is committed to assuring that adequate clean cover exists on top of the large impoundment to control the tailings, and to reduce exposure rates to workers. Annual radon flux measurements are made on the top of the Large and Small Tailings piles. Exposure rate measurements are made at each of these approximately 100 locations. The data are used to assess the integrity of the cover thickness. Approximately 2-3 acres were compacted and additional compacted cover applied as a result of excessive radon emissions and gamma exposure rates. Smaller areas were covered in areas impacted by well-drilling operations. HMC is considering additional cover work in the future.

2.9 Health Physics Staff
The current health physics staff consists of:

Alan D. Cox, Radiation Protection Administrator
Adrian Venable, Senior Health Physics Technician
Joe Vigil, Site Supervisor and Senior Environmental Technician

A review of the education and experience of the staff indicated that all meet or exceed the requirements of NRC Regulatory Guide 8.31 for working in uranium mills.

2.10 Overexposures
No personnel were overexposed to date during this audit period.

2.11 Procedures, Data Collection, and Management
The HMC Environmental Procedures Manual was reviewed, specifically EM-1 through – EM-4, and HP-1 through HP-16. All procedures appeared current as evidenced by recent signature by the RPA (12/13/2004) indicating reviews of these procedures. No procedures are currently under revision or preparation. Radiation dosimetry, bioassay, environmental monitoring, worker training, instrument maintenance, and other related radiation safety files maintained by Mr. Venable appeared to be complete and well organized. All important data were quickly retrievable and understandable.

3.0 Recommendations

The radiation protection program is effective in reducing exposures to as low as reasonably achievable. Results from external and internal dosimetry monitoring programs demonstrate that the doses received by the HMC staff and contractors are very low and well within the limits allowed by regulations. Also, HMC management and staff are continuing to take additional measures to assure that the ALARA policy is implemented. This auditor, however, offers the following recommendations to enhance the overall radiation safety program:

1. Perform an annual leak test on radioactive sources in routine service (continued from prior audit)
2. Procure equipment for accurately counting beta activity on smears and develop an associated SOP.

APPENDIX D

INSPECTION OF TAILINGS PILES AND PONDS

RECEIVED NOV 2 2 2004

KLEINFELDER
An employee owned company

November 17, 2004
Project No. 16977
File No. ALB04LT001

Mr. Al Cox
Homestake Mining Company of California
P.O. Box 98
Grants, NM 87020

SUBJECT: **REPORT OF 2004 ANNUAL INSPECTION OF TAILING PILES AND PONDS**
HOMESTAKE GRANTS PROJECT
GRANTS, NEW MEXICO

Dear Mr. Cox:

In response to your request, the undersigned performed the annual visual inspection of the tailing piles and evaporation ponds at the Homestake Grants Project located at Grants, New Mexico. This report addresses the observations and findings of the requested inspection, which was performed on October 4, 2004, as well as assessment of Homestake's records of settlement and piezometer measurements, sump discharges, and reinjection rates.

OBSERVATIONS

The undersigned, Dr. Alan Kuhn of Kleinfelder, Inc., performed a visual inspection of the tops and outslopes of both tailing impoundments and of the dikes, slopes, and liners of both evaporation ponds. The weather on October 4 was partly sunny, breezy, and temperatures were in the low 70s.

The outslopes of both tailing impoundments appear to be stable and are free of any visible signs of mass movement.

The surface of the large impoundment remains in good condition. Top surfaces are slightly rilled in some locations but sediment is largely contained by the berm around the top edge of the outslopes. Routine maintenance has been adequate when performed periodically to fill in rills that form due to concentrated runoff. The outslopes of the large impoundment are covered with final riprap, and the riprap cover is in good condition. Extensive volunteer vegetation has developed on these slopes but does not compromise the riprap.

The outslopes of the small tailings pile are slightly rilled on the east side and more deeply rilled (6" to 2') on the southwest and southeast sides. Earthwork including blading has been completed on the north outslope. The east inslope, on which the liner was repaired two years ago, remains in good condition and protected from wave run-up by the floating pipe energy dissipater. All other liner and earthen surfaces on the small pile/evaporation pond #1 appear to be in good condition. Evaporation Pond #1 had about 4-5 feet of freeboard, well above the 2.0-foot minimum.

KLEINFELDER 8300 Jefferson NE, Suite B, Albuquerque, NM 87113 (505) 344-7373 (505) 344-1711 fax

Evaporation pond #2 was well below maximum pond level, with about eight feet of freeboard and a substantial area of exposed liner. The liner appeared to be in good condition. Mr. Cox reported that no leakage above operating limits has been detected in the leak detection sumps.

A total of about 203 gpm of combined tailing drainage/collection water and collection well field discharge is being delivered to the evaporation ponds. Of this amount, about 130 gpm comes from the tailing pile. This discharge is substantially more than the average of the past 10 years (about 30 gpm) and is attributable to the pile-flushing program in which about 300 gpm of water is being injected into the pile to flush contaminants. Injection rates into the tailings have been greatly increased over the past year, and collection rates have increased, as well. The difference between the water injected (300 gpm) and that collected (about 130 gpm) represents water that is either going into pore water storage or is draining but not being captured by the collection wells and drains in the impoundment.

According to piezometer measurement plots covering the past 10 years, supplied by George Hoffman, the phreatic surface in the large impoundment has risen substantially since the pile flushing injection began. Using the 1996 piezometric levels as a baseline for reference, the phreatic surface in the tailings has increased as much as 34 feet (at CS3) and is within 15 feet of the slope surface at CS1 (middle of south outslope). The 1996 levels were used in the last stability analysis, which found factors of safety against mass movements of outslopes well above the minimums required (1.5 static, 1.0 pseudostatic). It was beyond the scope of this inspection to perform numerical slope stability analyses; the increases in piezometric levels and the general rise in the phreatic surface since the last stability analyses are identified here for the purpose of alerting Homestake to reduction in factors of safety that result from the increases in phreatic surface. The large impoundment no longer holds ponded water and is no longer under the jurisdiction of the New Mexico State Engineer, so there is no regulatory basis for limiting phreatic levels or factors of safety during pre-closure remedial actions like pile flushing. Nevertheless, it is in Homestake's interest to avoid increasing the phreatic surface to levels that could produce seeps in the outslopes or trigger slope mass movement. It is unlikely that the recent higher levels have caused the factors of safety to drop below 1.5 static and 1.0 pseudostatic; however, the rates of injection and resulting increases in piezometers levels should be monitored closely through the remaining pile flushing program.

The settlement-point survey conducted on 11/24/03 is the most recent that is available and the same that was reviewed for 2003 inspection report. In its annual report of settlement dated 12/22/03, MFG noted that settlement has been nominal since 1999, indicating that the radon barrier can be constructed after pore water extraction is completed and the associated wells and piping have been removed. The settlement rates have reduced to minimal values, indicating that primary settlements have been achieved under the present load conditions. The total maximum settlement to date in the west cell is about 11 feet, the value that in 1996 the undersigned had estimated would represent the likely maximum potential settlement.

The measured settlements in the west cell are larger than those of the east cell not because of thicker slimes (the east cell was actually about 10 feet deeper than the west) but because the west cell remained active until mill shutdown in 1990, giving it several years less time to dewater and consolidate than the east cell. Therefore, much more of the east pond potential settlement had already occurred before settlement measurements began in 1993. Although some additional

settlement should be expected when final pore water extraction occurs, it will probably be a small fraction of that already achieved in the west cell; additional settlement in the east cell should be even less.

CONCLUSIONS

The foregoing observations indicate that the surfaces of tailing impoundments (piles) and the evaporation ponds are in good condition and are being maintained within the operating limits of the NRC license and the respective facility designs. For the duration of the injection program, dewatering will be interrupted and perhaps even reversed, and little if any additional consolidation and settlement of the slimes should be expected. When dewatering resumes, settlement over slime-rich areas will also resume, although the amount of additional settlement should be relatively small.

Considering the substantial rise in the phreatic surface resulting from pile flushing and the associated reduction in factors of safety, we recommend that injection rates be adjusted so that no additional increases in piezometer levels in the outslopes occur. If these levels increase or injection rates are expected to increase, we recommend updating the stability analyses for the north and south outslopes. Otherwise, no corrective actions in impoundment or pond operations are required other than to redress the small impoundment (#1 evaporation pond) south and east outslopes to fill in the erosion rills.

LIMITATIONS

The recommendations contained in this report are based on Dr. Kuhn's field visit, evaluation of information generated by others and obtained from Homestake, and his understanding of the inspected facilities. If any conditions are encountered at this site which are significantly different than those described in this report, Kleinfelder should be immediately notified so that we may make any necessary revisions to findings or recommendations contained in this report.

This report was prepared in accordance with generally accepted standards of practice at the time the report was written. No warranty, express or implied, is made. It is the Client's responsibility to see that all parties to the project are made aware of this report in its entirety. The information contained in this report should be used at the Owner's and Contractor's option and risk.

We appreciate the opportunity to work with you on this project. If you have any questions or need additional information, please contact this office.

Respectfully submitted,
KLEINFELDER, INC.

Alan K. Kuhn, Ph.D., P.E., R.G.
Senior Principal Consultant

AK/llj

KLEINFELDER 8300 Jefferson NE, Suite B, Albuquerque, NM 87113 (505) 344-7373 (505) 344-1711 fax

Appendix E:

Grants Reclamation Project
Land Use Review / Survey

TABLE OF CONTENTS

GRANTS RECLAMATION PROJECT
LAND USE REVIEW / SURVEY

APPENDIX E

FIGURES

TABLES

Grants Reclamation Project

Land Use Review / Survey

Annual Report No. 3 – CY2004

1.0 Background

As part of Amendment 34 to the Grants Reclamation Project Radioactive Materials License – SUA-1471-Docket 40-8903 approved June 19, 2002, License Condition (LC) 42 was amended to require submittal of a land use survey with the License annual report to NRC. This report is the third annual land use review / survey pursuant to (LC) 42.

The general focus of the land use survey is to document and summarize the current land uses and any identified changes to land use in proximity to the Grants Reclamation Project, in particular those areas that are proximal to the tailings pile areas undergoing reclamation and closure and immediate surrounding areas where ongoing ground-water restoration continues.

2.0 2004 – Land Use – Homestake Properties

Homestake Mining Company of California (HMC) owns and controls a sizeable land area in and around the Grants Reclamation project. Over the last number of years, additional lands have been acquired as opportunity has arisen and acquisition of such lands are deemed appropriate in relation to ongoing ground-water remediation and restoration activities and final reclamation / closure of the site.

Much of the HMC lands held in the area that are not in immediate proximity to the tailings pile complex have been, and are continuing to be, utilized for livestock grazing on a lessor/lessee tenant arrangement. Most of the current land area within the present Site Boundary has been excluded from livestock grazing and other land use except those areas that are not directly related to the ongoing ground-water restoration activities. As such, livestock grazing is not currently allowed in the immediate tailings pile areas, evaporation pond areas, or the office/maintenance shop locations. These areas have been livestock fenced to exclude grazing; certain small areas in the southern and western portions of land within the Site Boundary are, however, utilized for livestock grazing.

A number of small lot and small acreage parcels [e.g. residential lot(s)] held by HMC in the general area of the reclamation site are idle and not under a current land use activity.

The other significant land use activity situated on HMC-held lands in the area includes land irrigation utilized for crop production. Water used for irrigation is an integral part of the ongoing ground-water restoration and cleanup program for the project. Prior to 2002, HMC had 270 acres of land under irrigation consisting of a two-field flood irrigation area comprising 120 acres and a center pivot spray irrigation area comprising 150 acres. During 2002, an additional center pivot irrigation system was commissioned that comprises 60 acres. In 2003, an additional 24 acres of flood irrigation was added to the irrigation system in Section 33.

For the 2004, total HMC lands under crop irrigation totaled 354 acres situated in Sections 28, 33 and 34 (see project location Figure 2.1-1 in report Section 2.1 of this annual report for location of the four areas under present irrigation).

3.0 2004 – Land Use – Pleasant Valley Estates, Murray Acres, Broadview Acres and Felice Acres Residential Subdivisions

Aside from the land uses on HMC land in the Grants Reclamation Project area described in the previous section above, the other major land use immediately proximal to the Site consists of residential development located in the Pleasant Valley Estates, Murray Acres, Broadview Acres and Felice Acres Residential subdivisions. By way of background, HMC provided these subdivision areas with a potable water supply system as an extension of the Village of Milan water supply in the mid-1980's. The Village of Milan water supply extension to these areas was provided at that time to address a concern over the quality of ground-water used for domestic purposes in these nearby and adjacent subdivision areas.

An assessment of current land use in the four subdivision areas was undertaken in late February 2005 to ascertain present uses, occupancy and status for the various lots within the subdivisions. Over the years, permanent residential homes, modular homes and mobile homes have been established in the subdivision areas, and immediate adjacent areas, as would typify a rural residential neighborhood. A number of lots remain vacant, or are utilized for uses such as horse barns, corrals, equipment storage, etc. In some cases, dwellings are present on several lots throughout the subdivisions but are currently vacant or have been permanently abandoned and in various states of disrepair.

The primary issue of concern in the subdivision areas is to determine whether current occupied dwellings are utilizing water service from the Village of Milan system for potable water consumption and not private wells, particularly private domestic wells that are completed into the underlying shallow alluvial aquifer.

The survey conducted in late February 2005 consisted of first obtaining the records and customer database from the Village of Milan water district. This information was reviewed to prepare a separate residential customer database for the four subdivisions that would reflect the lot number, customer, water meter customer ID number and whether the customer utilized Milan water during 2004. See Tables E-1 through E-4 for 2004 database information.

A lot-by-lot reconnaissance was made in each of the subdivisions to determine whether each lot was occupied or vacant, contained a residence(s), and which residences are currently occupied. This information was then checked against the database to determine whether each occupied residence is supplied and metered through the Village of Milan water supply system. Results of this reconnaissance effort are summarized on the subdivision plat maps; see attached Figures E-1 through E-4.

Field review of the four subdivision areas, along with follow-up inquiries as required to confirm the status of water use at each property, indicates that at present all known and identified occupied residential sites in the immediate four subdivisions are on metered water service with the Village of Milan.

4.0 Conclusion

The review of land use for HMC properties and the four residential subdivision areas to the immediate south and west of the Grants Reclamation Project site indicates that present land uses in the area do not present a new or increased concern in relation to the underlying ground-water quality and related project remediation / restoration activities. Residential domestic potable water supplies in the subdivisions are currently being supplied by the Village of Milan water supply and there are no known or identified cases for 2004 where it is suspected that domestic water supply is being obtained from private alluvial well sources.

This land use survey / review is completed on an annual basis to meet annual reporting requirements under the NRC License. This will help in assuring that land use activities in the immediate area surrounding the Grants project are regularly reviewed and assist in determining that those uses do not present a new concern with local ground-water usage until project ground-water restoration activities are completed.

FIGURE E-1 BROADVIEW ACRES LAND USE STATUS AND WATER USE

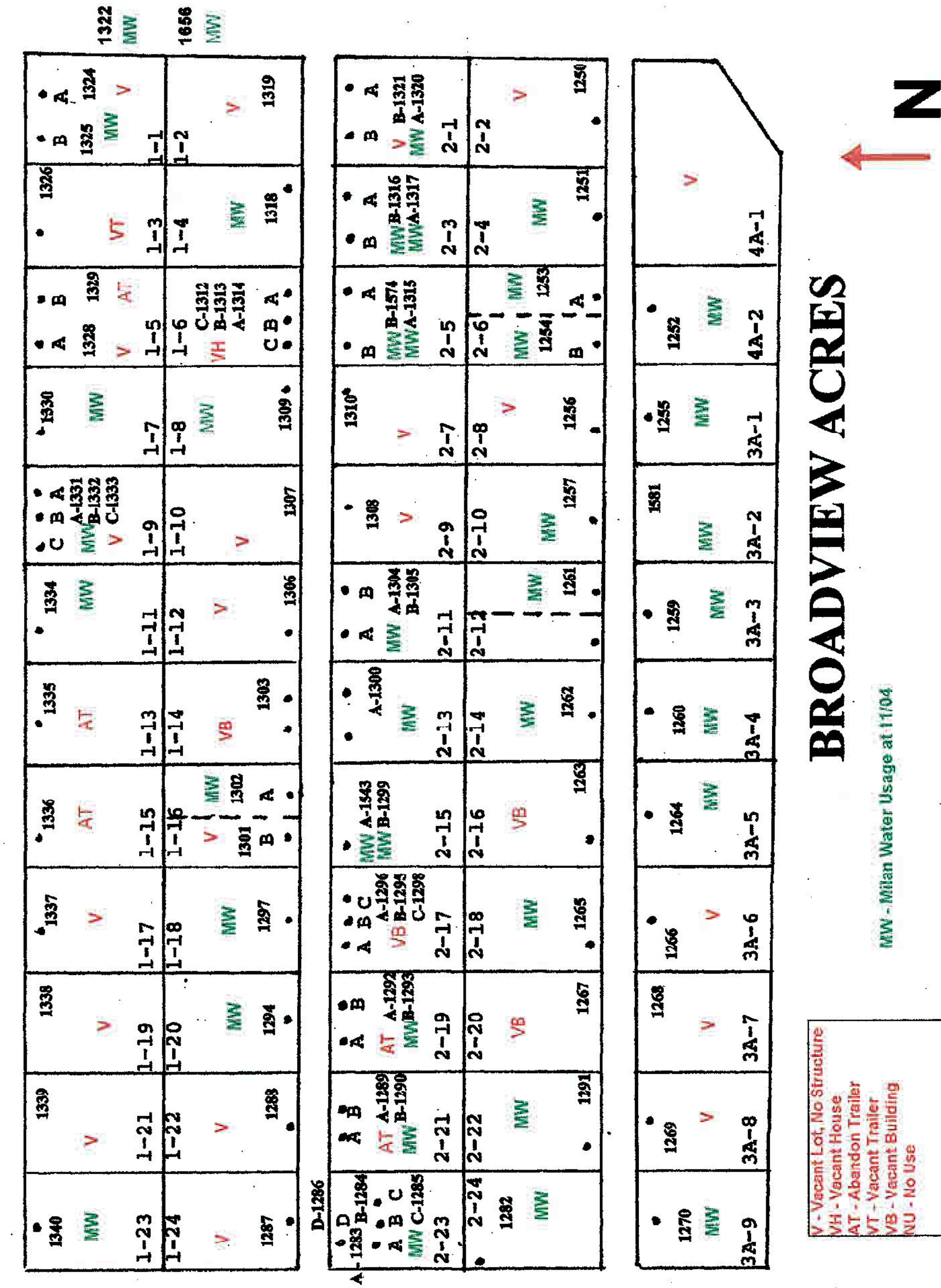


FIGURE E-2 FELICE ACRES LAND USE STATUS AND WATER USE

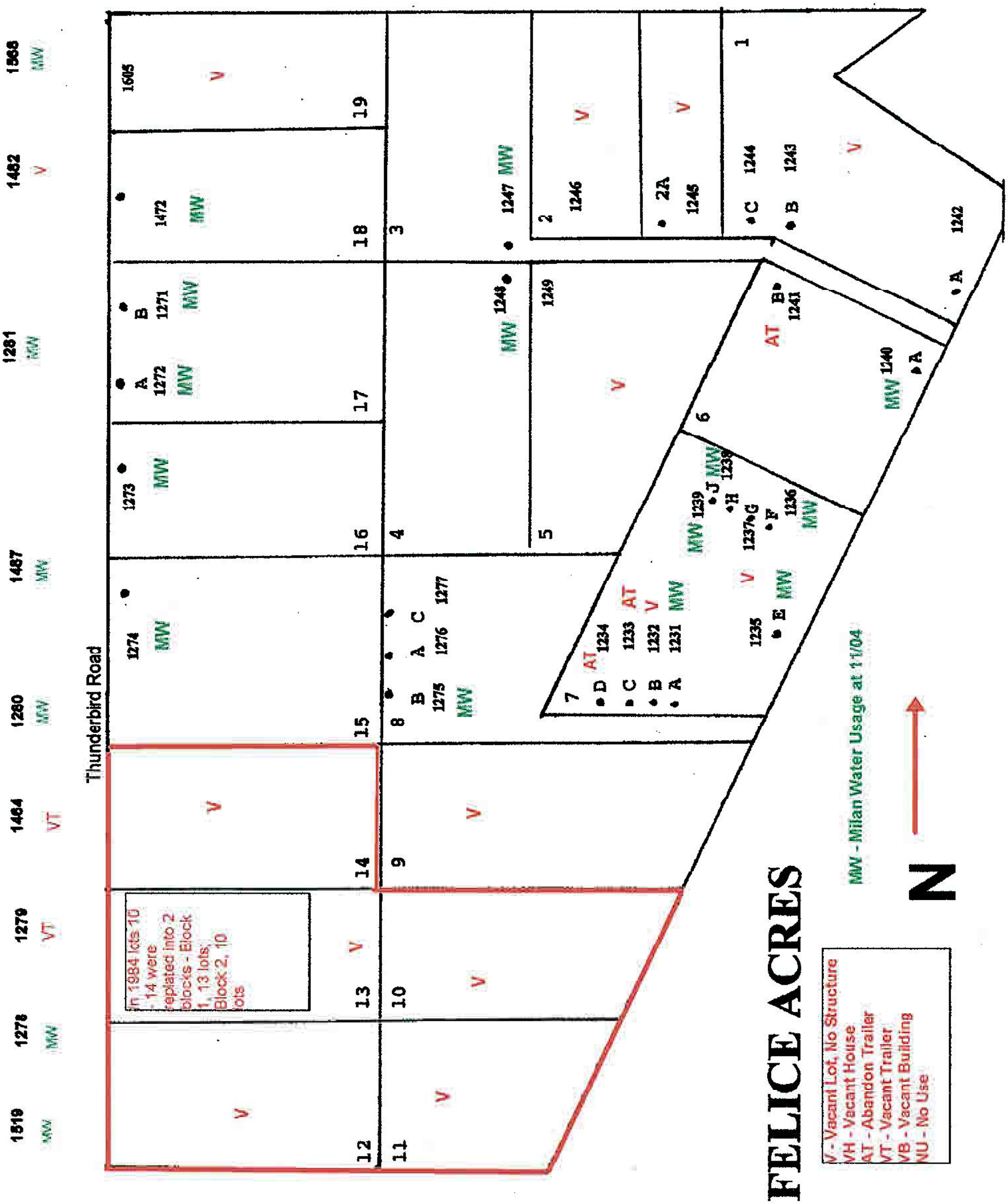


FIGURE E-3 MURRAY ACRES LAND USE STATUS AND WATER USE

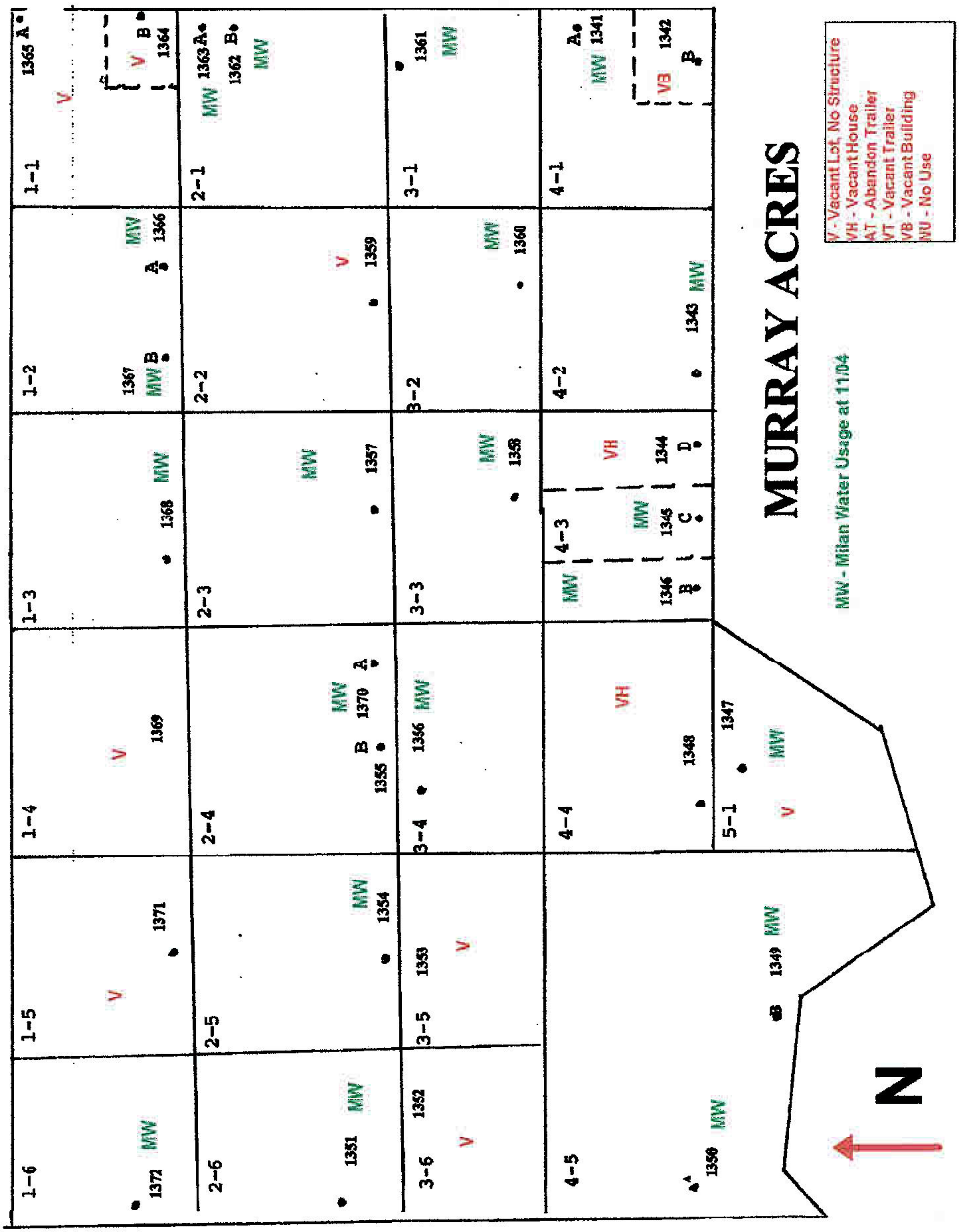


FIGURE E-4 PLEASANT VALLEY ACRES LAND USE STATUS AND WATER USE

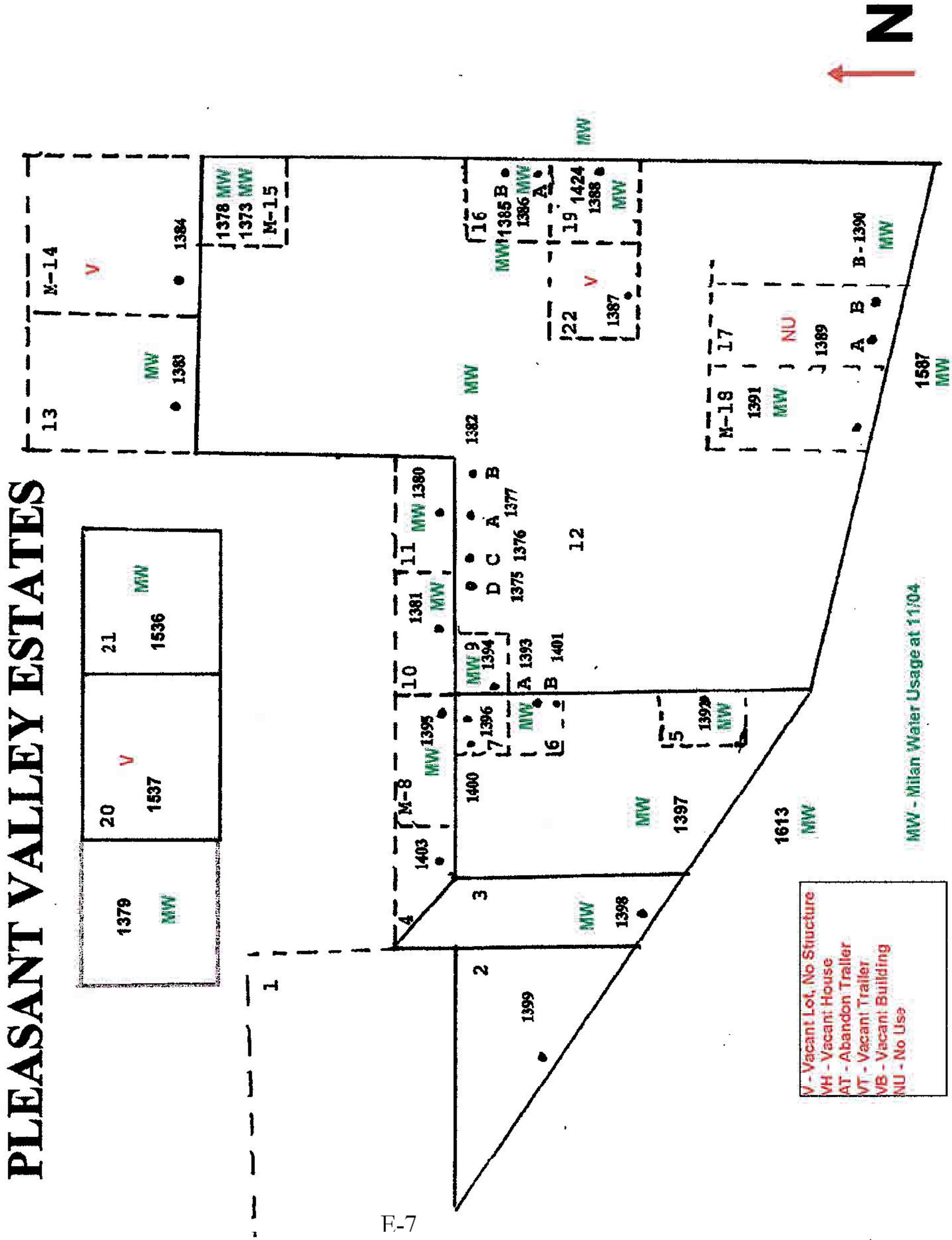


TABLE E-1 WATER USE OF MILAN WATER IN BROADVIEW ACRES

SUBDIVISION LOT / BLOCK	CUSTOMER NUMBER SITE ID	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2003 WATER USAGE	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2004 WATER USAGE
2-2	1250		
2-4	1251	X	X
4A-2	1252	X	X
2-6A	1253	X	X
2-6B	1254	X	X
3A-1	1255	X	X
2-8	1256		
2-10	1257	X	X
3A-3	1259	X	X
3A-4	1260	X	X
2-12	1261		X
2-14	1262	X	X
2-16	1263		
3A-5	1264	X	X
2-18	1265	X	X
3A-6	1266		
2-20	1267		
3A-7	1268		
3A-8	1269		
3A-9	1270		X
2-24	1282	X	X
2-23A	1283		
2-23B	1284		
2-23C	1285	X	X
2-23D	1286		
1-24	1287		
1-22	1288		
2-21A	1289		
2-21B	1290	X	X
2-22	1291	X	X
2-19A	1292		
2-19B	1293	X	X
1-20	1294	X	X
2-17B	1295		
2-17A	1296		
1-18	1297	X	X
2-17C	1298		
2-15B	1299	X	X
2-13A	1300	X	X
1-16B	1301		

TABLE E-1 WATER USE OF MILAN WATER IN BROADVIEW ACRES

SUBDIVISION LOT / BLOCK	CUSTOMER NUMBER SITE ID	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2003 WATER USAGE	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2004 WATER USAGE
1-16A	1302	X	X
1-14	1303		
2-11A	1304	X	X
2-11B	1305		
1-12	1306		
1-10	1307		
2-9	1308		
1-8	1309		X
2-7	1310		
1-6C	1312		
1-6B	1313		
1-6A	1314		
2-5A	1315	X	X
2-3A	1316	X	X
2-3B	1317	X	X
1-4	1318	X	X
1-2	1319		
2-1A	1320	X	X
2-1B	1321		
1-1A	1324		
1-1B	1325	X	X
1-3	1326		
1-5A	1328		
1-5B	1329		
1-7	1330	X	X
1-9A	1331		
1-9B	1332	X	
1-9C	1333	X	
1-11	1334	X	X
1-13	1335		
1-15	1336		
1-17	1337		
1-19	1338		
1-21	1339		
1-23	1340	X	X
2-15A	1543	X	X
2-5B	1574	X	X
3A-2	1581	X	X
4A-1	no meter		

TABLE E-1 WATER USE OF MILAN WATER IN BROADVIEW ACRES

SUBDIVISION LOT / BLOCK	CUSTOMER NUMBER SITE ID	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2003 WATER USAGE	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2004 WATER USAGE
EAST OF BROADVIEW ACRES			
	1322	X	X
	1656	X	X

TABLE E-2 WATER USE OF MILAN WATER IN FELICE ACRES

SUBDIVISION LOT / BLOCK	CUSTOMER NUMBER SITE ID	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2003 WATER USAGE	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2004 WATER USAGE
7A	1231	X	X
7B	1232		
7C	1233		
7D	1234	X	X
7E	1235	X	X
7F	1236	X	X
7G	1237	X	
7H	1238	X	X
7J	1239	X	X
6A	1240	X	X
6B	1241	X	
1A	1242		
1B	1243		
1C	1244		
2A	1245		
2	1246		
3	1247	X	X
4	1248	X	X
5	1249		
17B	1271	X	X
17A	1272	X	X
16	1273	X	X
15	1274	X	X
8B	1275	X	X
8A	1276		
8C	1277		
18	1472	X	X
19	1605		
9			
10			
11			
12			
13			
14			

PROPERTY WEST OF FELICE ACRES			
	1278	X	X
	1279	X	
	1280	X	X
	1281	X	X

TABLE E-2 WATER USE OF MILAN WATER IN FELICE ACRES

SUBDIVISION LOT / BLOCK	CUSTOMER NUMBER SITE ID	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2003 WATER USAGE	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2004 WATER USAGE
	1464		
	1482		
	1487	X	X
	1519	X	X
	1568	X	X

TABLE E-3 WATER USE OF MILAN WATER IN MURRAY ACRES

SUBDIVISION LOT / BLOCK	CUSTOMER NUMBER SITE ID	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2003 WATER USAGE	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2004 WATER USAGE
4-1A	1341	X	X
4-1B	1342		
4-2	1343	X	X
4-3D	1344		
4-3C	1345	X	X
4-3B	1346	X	X
5-1	1347	X	X
4-4	1348		
4-5B	1349	X	X
4-5A	1350	X	X
2-6	1351	X	X
3-6	1352		
3-5	1353		
2-5	1354	X	X
2-4B	1355		
3-4	1356	X	X
2-3	1357	X	X
3-3	1358	X	X
2-2	1359	X	
3-2	1360	X	X
3-1	1361	X	X
2-1B	1362	X	X
2-1A	1363	X	X
1-1B	1364		
1-1A	1365		
1-2A	1366	X	X
1-2B	1367	X	X
1-3	1368	X	X
1-4	1369		
2-4A	1370	X	X
1-5	1371		
1-6	1372	X	X

TABLE E-4 WATER USE OF MILAN WATER IN PLEASANT VALLEY ESTATES

SUBDIVISION LOT / BLOCK	CUSTOMER NUMBER SITE ID	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2003 WATER USAGE	VILLAGE OF MILAN WATER SUPPLY SYSTEM 2004 WATER USAGE
M-15B	1373	X	X
M-15A	1378	X	X
12D	1375		
12C	1376		
12A	1377		
	1379		X
11	1380	X	X
10	1381	X	X
12B	1382	X	X
13	1383	X	X
M-14	1384		
16B	1385	X	X
16A	1386	X	X
22	1387		
19	1388	X	X
17A	1389		
17B	1390	X	X
M-18	1391	X	X
5	1392	X	X
6A	1393	X	X
9	1394	X	X
M-8	1395	X	X
7	1396		
1	1397	X	X
3	1398	X	X
2	1399		
7	1400		
6B	1401		
4	1403		
	1424	X	X
21	1536	X	X
20	1537		

PROPERTY SOUTH OF PLEASANT VALLEY ESTATES			
	1587	X	X
	1613	X	X