SECTION 7

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GROUND WATER MONITORING FOR HOMESTAKE'S GRANTS PROJECT

FIGURES

SECTION 7

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GROUND WATER MONITORING FOR HOMESTAKE'S GRANTS PROJECT

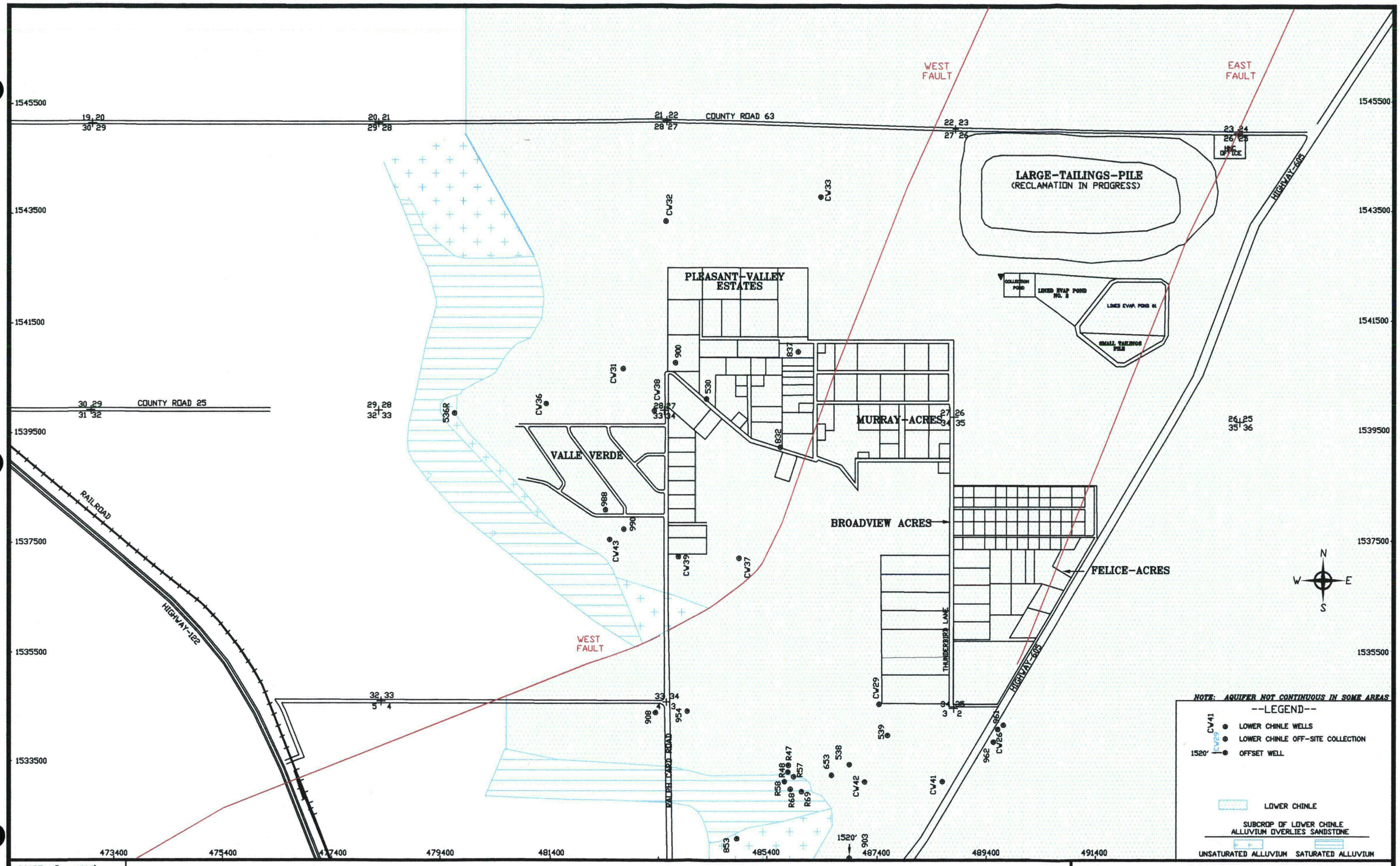
FIGURES (continued)

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 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 Lower Chinle aquifer subcrop underlying the alluvium. The cyan horizontal hatched 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. No new Lower Chinle wells were drilled in 2014. No Lower Chinle wells were used for south collection in 2014.



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DATE: 3/12/15

FIGURE 7.1-1. LIMITS OF LOWER CHINLE AQUIFER AND WELL LOCATIONS, 2014

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 2014 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 2014 were similar to the 2013 values in Section 3 but slightly higher. The highest water-level elevations in Section 3 are in or near the subcrop area of the Lower Chinle showing that the alluvial aquifer is recharging the Lower Chinle aquifer in this area. Ground water in the Lower Chinle in the area of well CW42 is mainly moving to the north toward well CW29.

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, 853, CW41 and CW42 on Figure 7.2-3. Water levels in each of these Lower Chinle wells rose in 2014. Small overall water-level decreases had been observed over the last few years in Lower Chinle wells 653, 853, CW41 and CW42 but the 2010 through 2014 water levels very gradually rose.

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 had gradually declined over the last few years in well CW31 but gradually rose in 2010 through 2014. Water levels in wells CW37 and CW43 near the subcrop area also gradually rose in 2014. Water levels in 2014 gradually declined in well CW33.

Water levels have decreased in Lower Chinle well CW32 for several years, and this trend continued at a slower rate in 2014 at a very gradual decline. 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 different than the fairly steady alluvial water levels near well CW33. 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.

WEST FAULT

EAST FAULT

COUNTY ROAD 63

COUNTY ROAD 25

LARGE-TAILINGS-PILE
(RECLAMATION IN PROGRESS)

HMC OFFICE

COLLECTION POND

LINED EVAP POND NO. 2

LINED EVAP. POND #4

SMALL TAILINGS PILE

HIGHWAY-605

PLEASANT-VALLEY ESTATES

MURRAY-ACRES

VALLE VERDE

BROADVIEW ACRES

FELICE-ACRES

THUNDERBIRD LANE

RAILROAD

HIGHWAY-122

RALPH LAPP ROAD

6465

6470

6474.79

6419.28

6467.32

6475

6480

6480.91

6485

6488.27

6490

6450

6460

6455

6465

6481.99

6473.49

6479.22

6478.19

6467.65

6460

6470

1545500

1543500

1541500

1539500

1537500

1535500

1533500

473400

475400

477400

479400

481400

485400

487400

489400

491400

19,20 / 30,29

20,21 / 29,28

21,22 / 28,27

22,23 / 27,26

23,24 / 26,25

30,29 / 31,32

29,28 / 32,33

26,25 / 35,36

32,33 / 5,4

33,34 / 3,2

27,26 / 34,35

CV32

CV33

CV31

CV36

CV38

CV43

CV39

CV37

CV29

CV41

CV26

536R

900

831

530

832

988

990

908

954

853

903

539

653

538

962

961

R47

R48

R57

R58

R68

R69

1520'

--LEGEND--

CV41 — LOWER CHINLE WELLS

1520' — OFFSET WELL

LOWER CHINLE OFF-SITE COLLECTION

6469.9 DATA

6460 CONTOUR AND LABEL

LOWER CHINLE FLOW

SUBCROP OF LOWER CHINLE ALLUVIUM OVERLIES SANDSTONE

UNSATURATED ALLUVIUM SATURATED ALLUVIUM

N

W E

S

SCALE: 1" = 1600'

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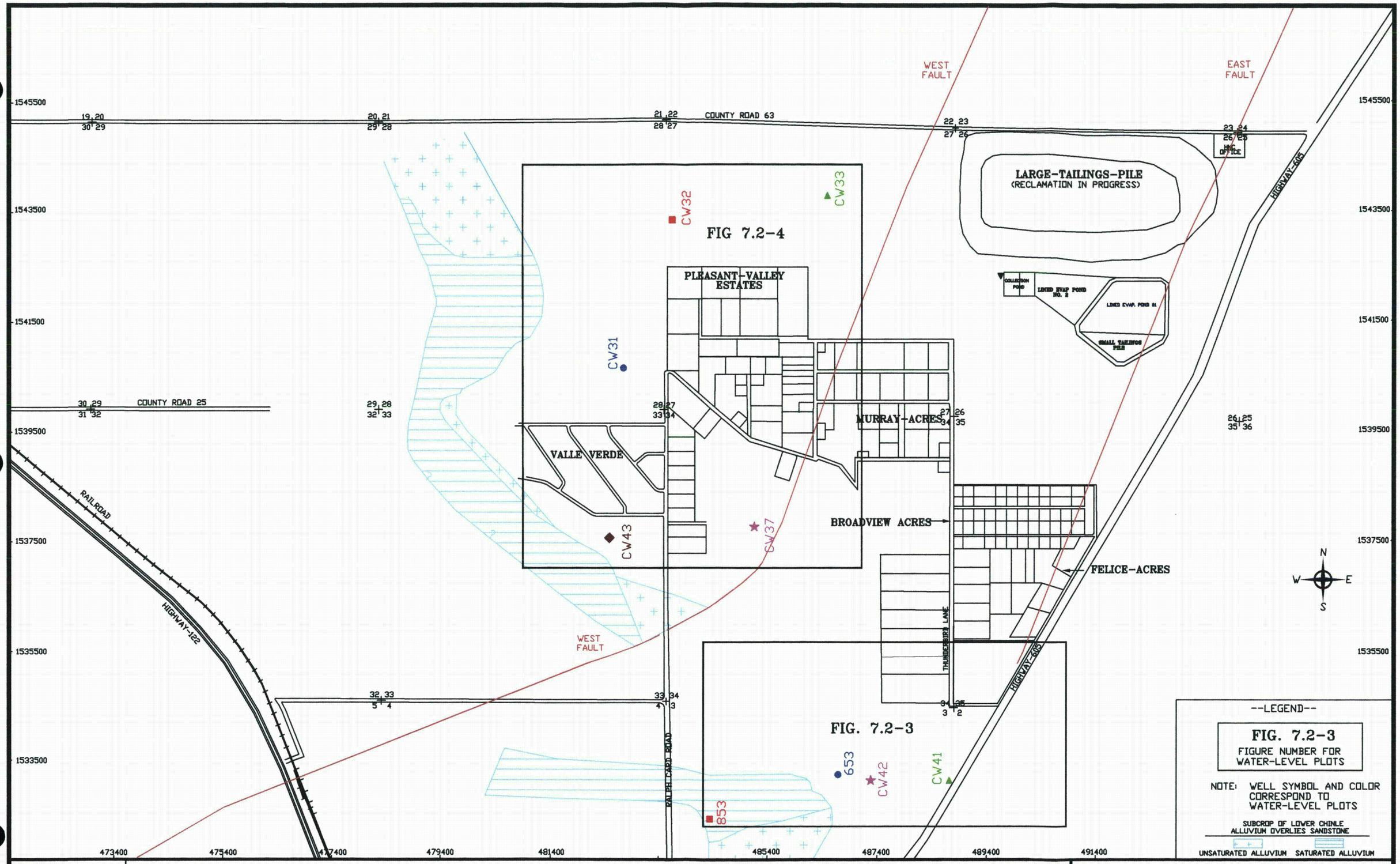
DATE: 3/12/15

FIGURE 7.2-1 WATER LEVEL ELEVATIONS OF THE LOWER CHINLE AQUIFER, 2014, FT-MSL



SCALE: 1" = 1600'
C:\PROJECTS\2015-06\1600LOW
DATE: 3/12/15

FIGURE 7.2-2. LOCATION OF LOWER CHINLE WELLS WITH WATER-LEVEL PLOTS, 2014

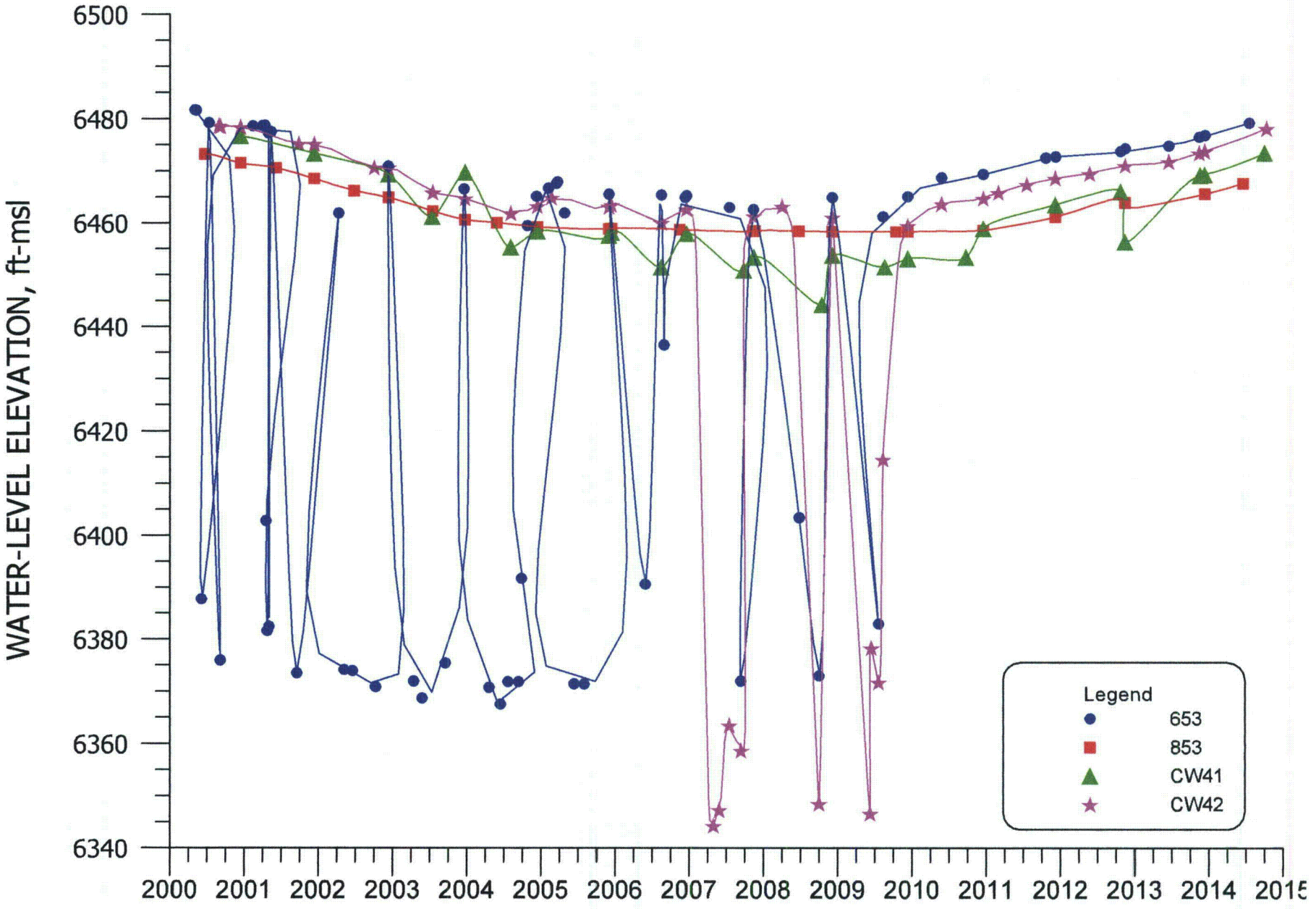


FIGURE 7.2-3. WATER-LEVEL ELEVATION FOR WELLS 653, 853, CW41, AND CW42.

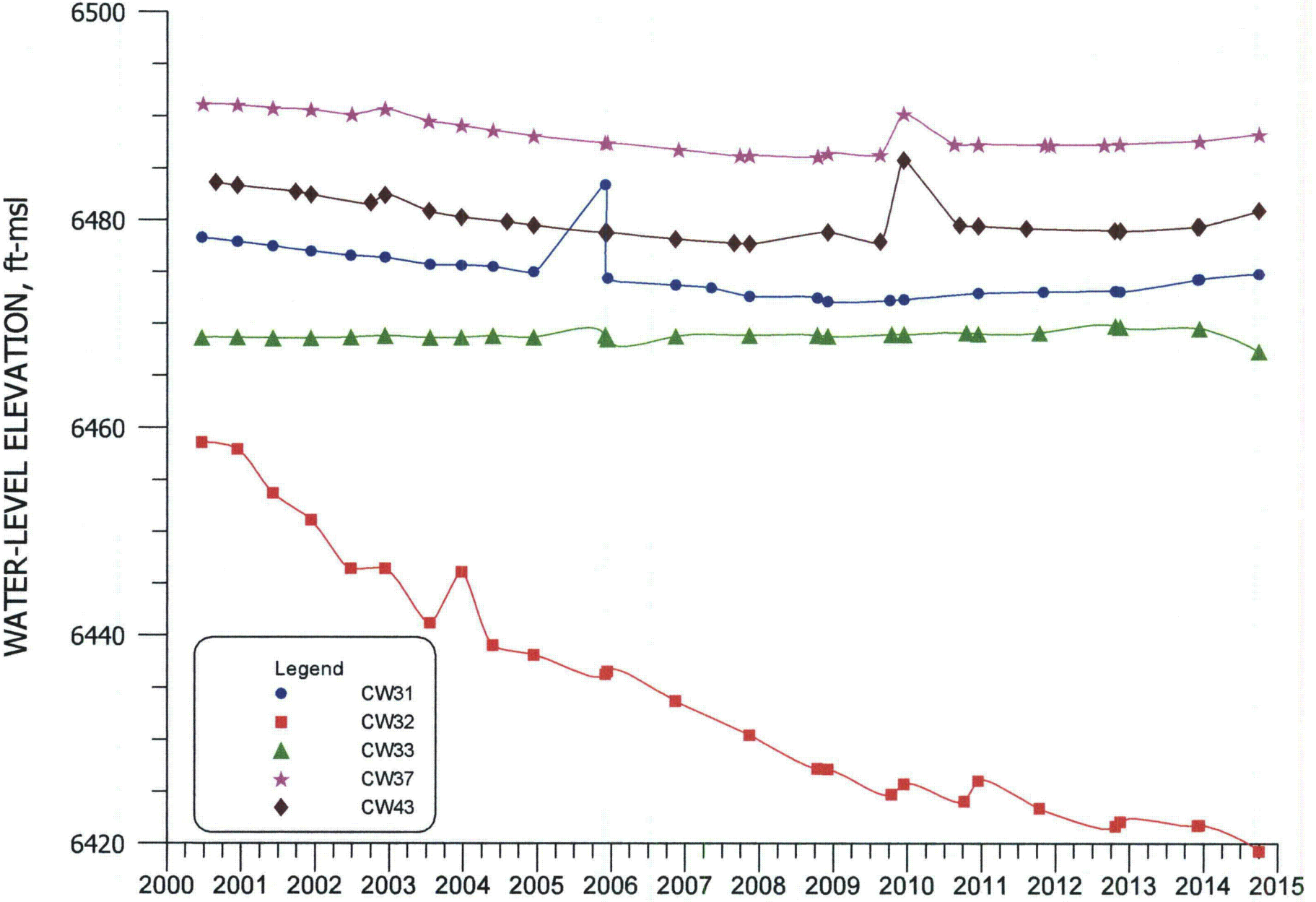


FIGURE 7.2-4. WATER-LEVEL ELEVATION FOR WELLS CW31, CW32, CW33, CW37, AND CW43.

7.3 LOWER CHINLE WATER QUALITY

Water-quality data for 2014 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 NRC standards except in far down-gradient where concentrations exceed the relevant non-mixing background value. Uranium concentrations exceed the 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 2014. 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 275 to 2140 mg/l. None of the Lower Chinle concentrations in the mixing zone (see Section 3 and Figure 3.3-3 for zone areas) exceeded the mixing-zone sulfate site standard 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 538, 653, CW42 and CW43 are grouped together on the water-quality time plots, and data for non-mixing zone wells CW29, CW31, CW32, 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 the mixing-zone site standard, showing that sulfate restoration of the Lower Chinle is not needed in the southern portion of the aquifer. Sulfate concentrations in well CW43 have increased to a level larger than other Lower Chinle wells in the area.

Sulfate concentrations plotted for Lower Chinle wells CW29, CW31, CW32, and CW41 are presented on Figure 7.3-4 (see Figure 7.3-2 for location of these wells). Sulfate concentrations were fairly steady in 2014 in these Lower Chinle wells. The data collected since mid-2003 was not available when the background level was calculated.

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 2014. All concentrations for 2014 sampled wells are less than the non-mixing zone site standard value of 4140 mg/l. 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 538, 653, CW42 and CW43. TDS concentrations in these wells have been fairly steady in 2014 except the increase observed in well CW43. The TDS in well CW43 has increased to a level that is above the remainder of the Lower Chinle aquifer wells in this area. TDS concentrations increase in well CW43 started prior to the Section 33 Flood irrigation which was initially done in 2004. All of these concentrations are below the mixing-zone site standard of 3140 mg/l.

TDS concentrations for wells CW29, CW31, CW32, and CW41 are presented on Figure 7.3-7. This figure demonstrates that, overall, TDS concentrations have remained fairly stable during 2014. 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 the value from well CW32 being near the top of the natural observed concentrations.

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 2014 continue to support this conclusion and are all less than the 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 2014. Uranium concentrations in the Lower Chinle exceeded the mixing-zone background concentration in the central portion of Section 3, and two exceeded the non-mixing zone background concentration. The highest values are in the central portion of Section 3 near the Lower Chinle subcrop area. These concentrations should gradually decrease to less than background concentrations with the restoration program planned for the Lower Chinle aquifer.

Uranium concentrations plotted versus time for Lower Chinle wells 538, 653, CW42 and CW43 are presented on Figure 7.3-9. The overall decline in uranium concentration in well 653 is due to pumping of Lower Chinle wells for the irrigation system. The uranium concentration in well CW42 was declining until 2007 and has overall been fairly steady the last seven years. Additional results with time will be needed to show when the restoration of this area is adequate. Uranium concentrations in well CW43 have remained 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 steady and higher values in well CW29 for the last seven years.

7.3.5 SELENIUM – LOWER CHINLE

Selenium concentrations in the Lower Chinle aquifer for 2014 are presented on Figure 7.3-11. None of the selenium concentrations in water from the Lower Chinle wells exceeded the site standards. The mixing and non-mixing zone site standards are 0.14 and 0.32 mg/l, respectively, for the Lower Chinle aquifer.

Figure 7.3-12 presents selenium concentration versus time plots for wells 538, 653, CW42 and CW43. The selenium concentrations in these Lower Chinle aquifer wells were steady in 2014.

Figure 7.3-13 presents selenium concentrations plotted versus time for Lower Chinle wells CW29, CW31, CW32 and CW41. Selenium concentrations measured during 2014 were consistent with the 2013 levels for each of these wells.

7.3.6 MOLYBDENUM – LOWER CHINLE

Molybdenum concentrations in water samples collected from the Lower Chinle wells in 2014 were all low at levels near the detection limit and, therefore, no areal molybdenum concentration figures or time plots were prepared. The 2014 results are consistent with historical measurements of molybdenum in the Lower Chinle aquifer. Molybdenum is not a 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 site standard of 15 mg/l for the mixing zone. Nitrate concentrations measured in 2014 are presented in Figure 7.3-14 and are all significantly below the site standard.

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 2014. Nitrate concentrations from the tailings seepage are not expected to be significant in the future and therefore the potential in the Lower Chinle aquifer does not exist due to the very limited extent of elevated concentrations in the alluvial aquifer. Establishment of a site standard for nitrate in the Lower Chinle non-mixing zone therefore has not been set.

7.3.8 RADIUM-226 AND RADIUM-228 – LOWER CHINLE

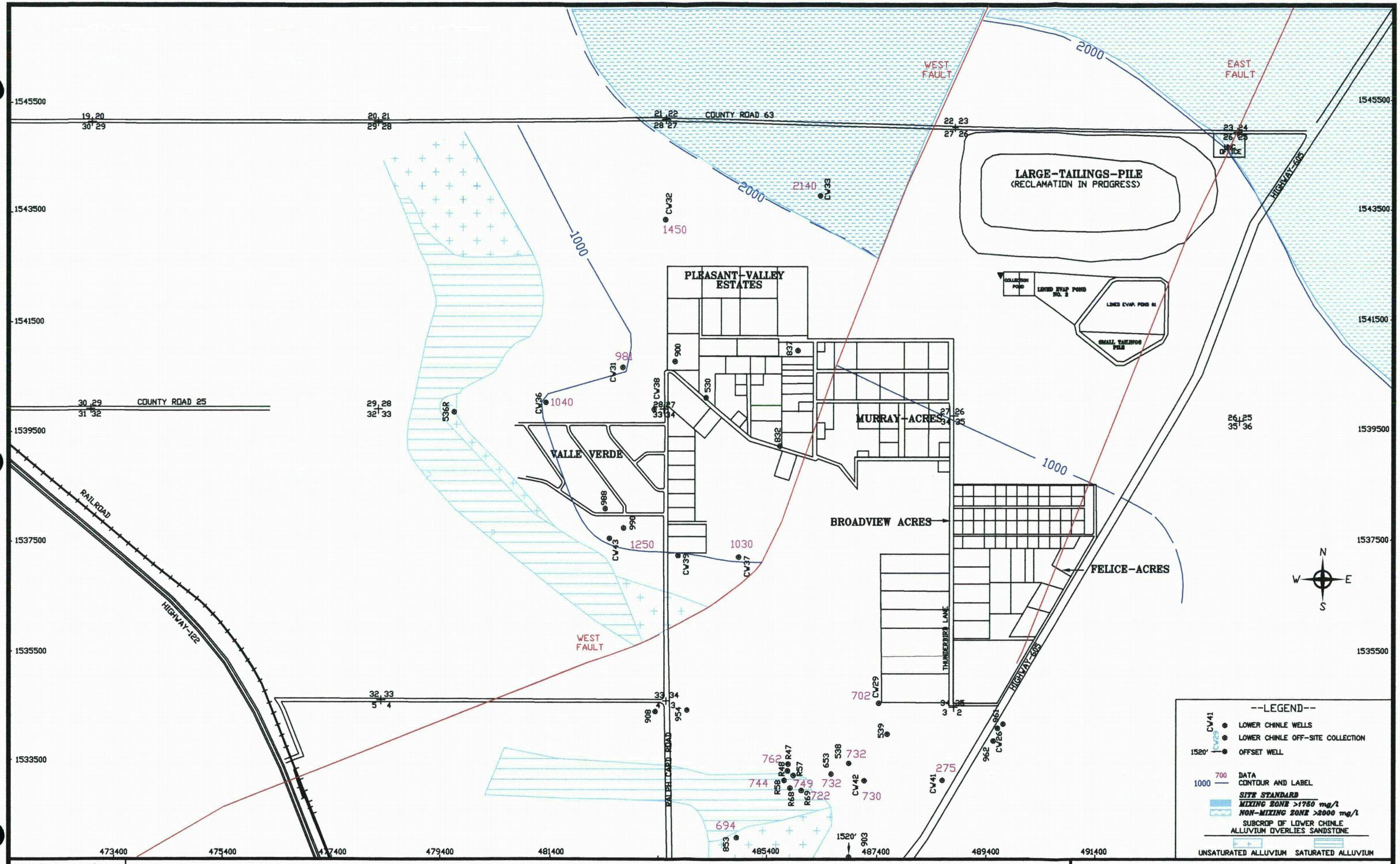
All radium concentrations have been low in past years in the Lower Chinle aquifer. Radium-226 and radium-228 are not important parameters relative to the Lower Chinle aquifer; therefore a site standard for the Lower Chinle has not been set. Radium concentrations were analyzed in all Lower Chinle wells in the 2003 update. 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.

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 for setting a site standard. The vanadium concentration data was updated in 2003 for the Lower Chinle aquifer.

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 very small. No plots of thorium-230 concentrations with time were prepared, because concentrations have historically been low.



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DATE: 3/12/15

FIGURE 7.3-1 SULFATE CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2014, mg/l

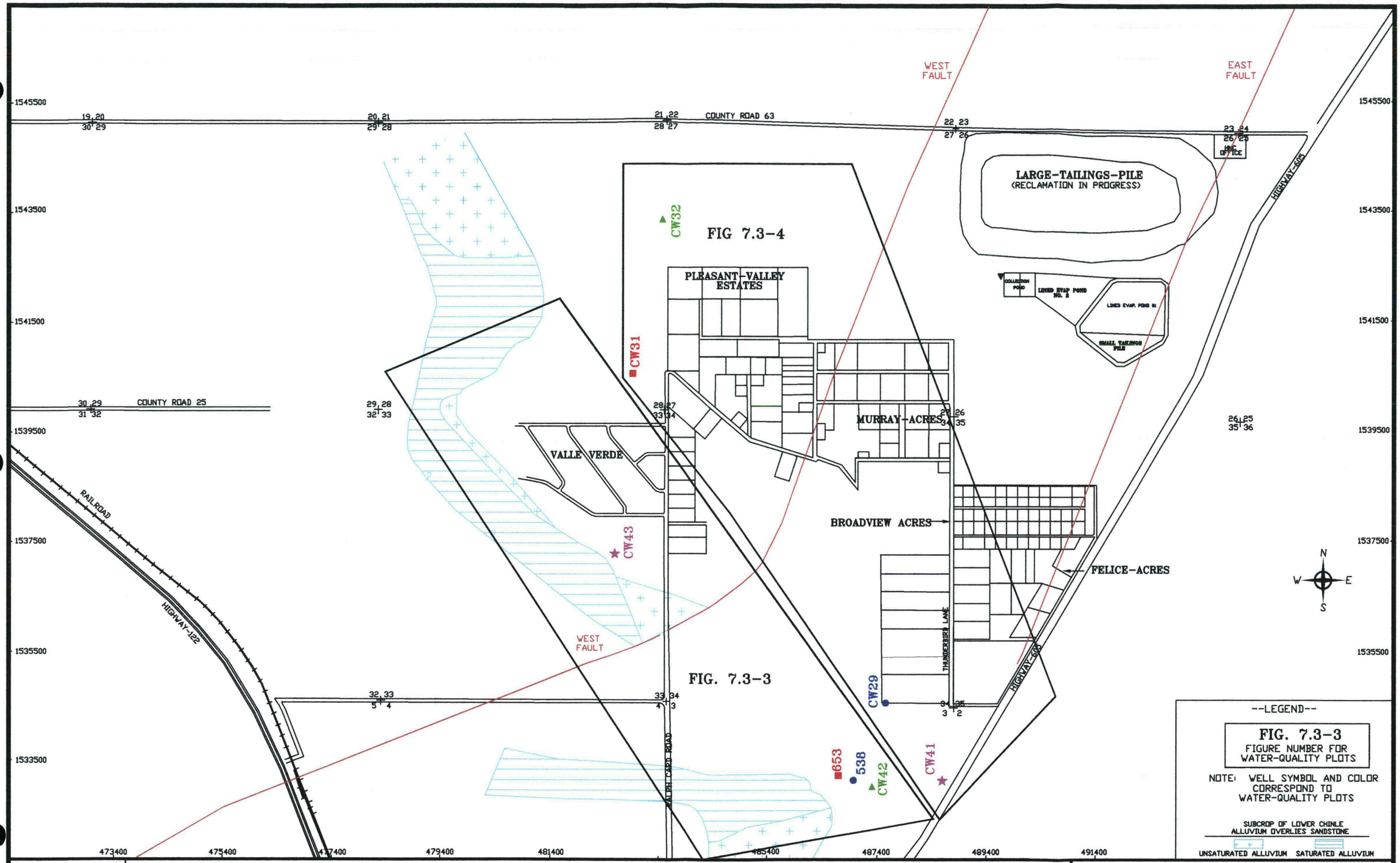

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FIGURE 7.3-2. LOCATION OF LOWER CHINLE WELLS WITH WATER-QUALITY PLOTS, 2014

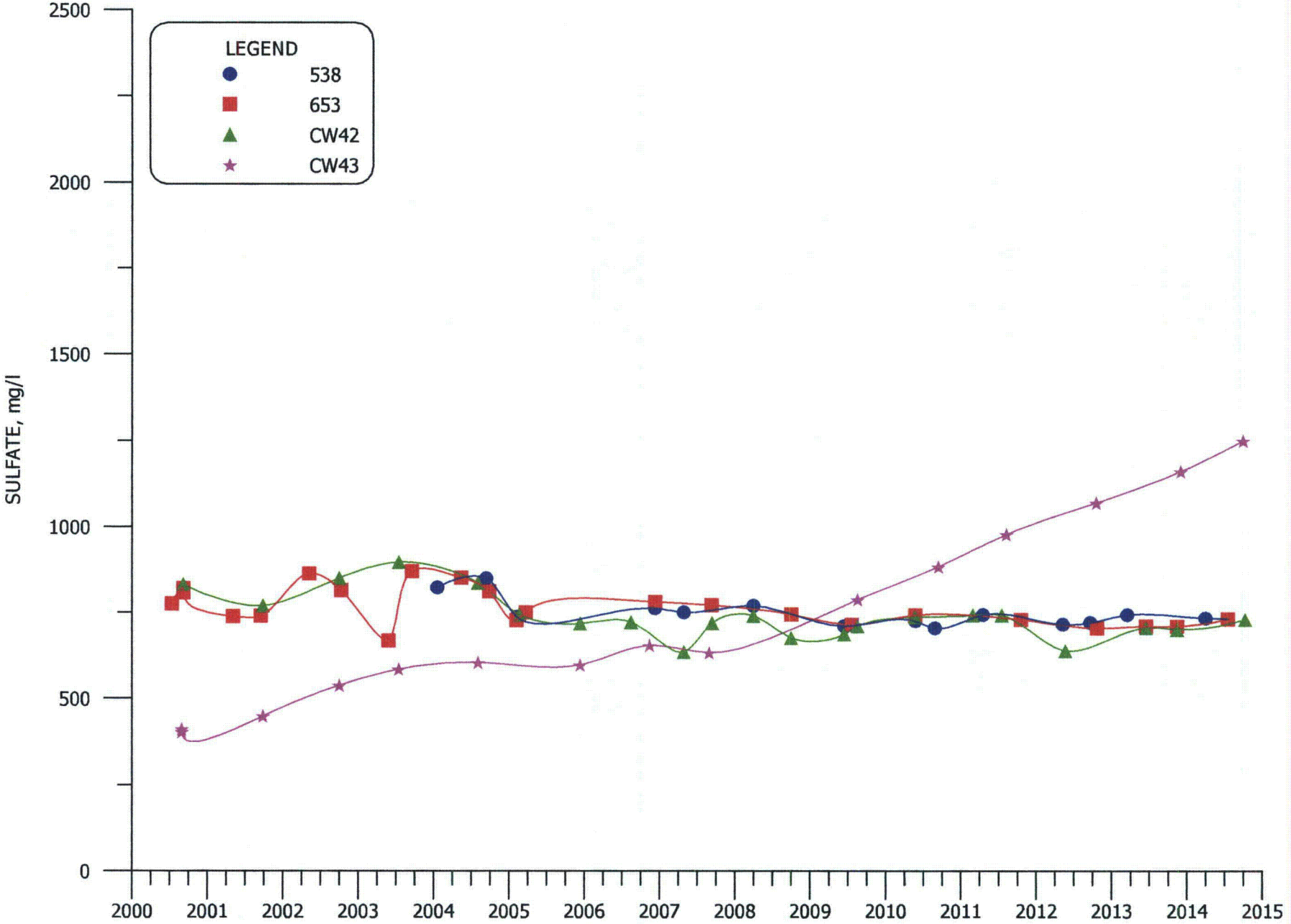


FIGURE 7.3-3. SULFATE CONCENTRATIONS FOR MIXING ZONE WELLS 538, 653, CW42, AND CW43

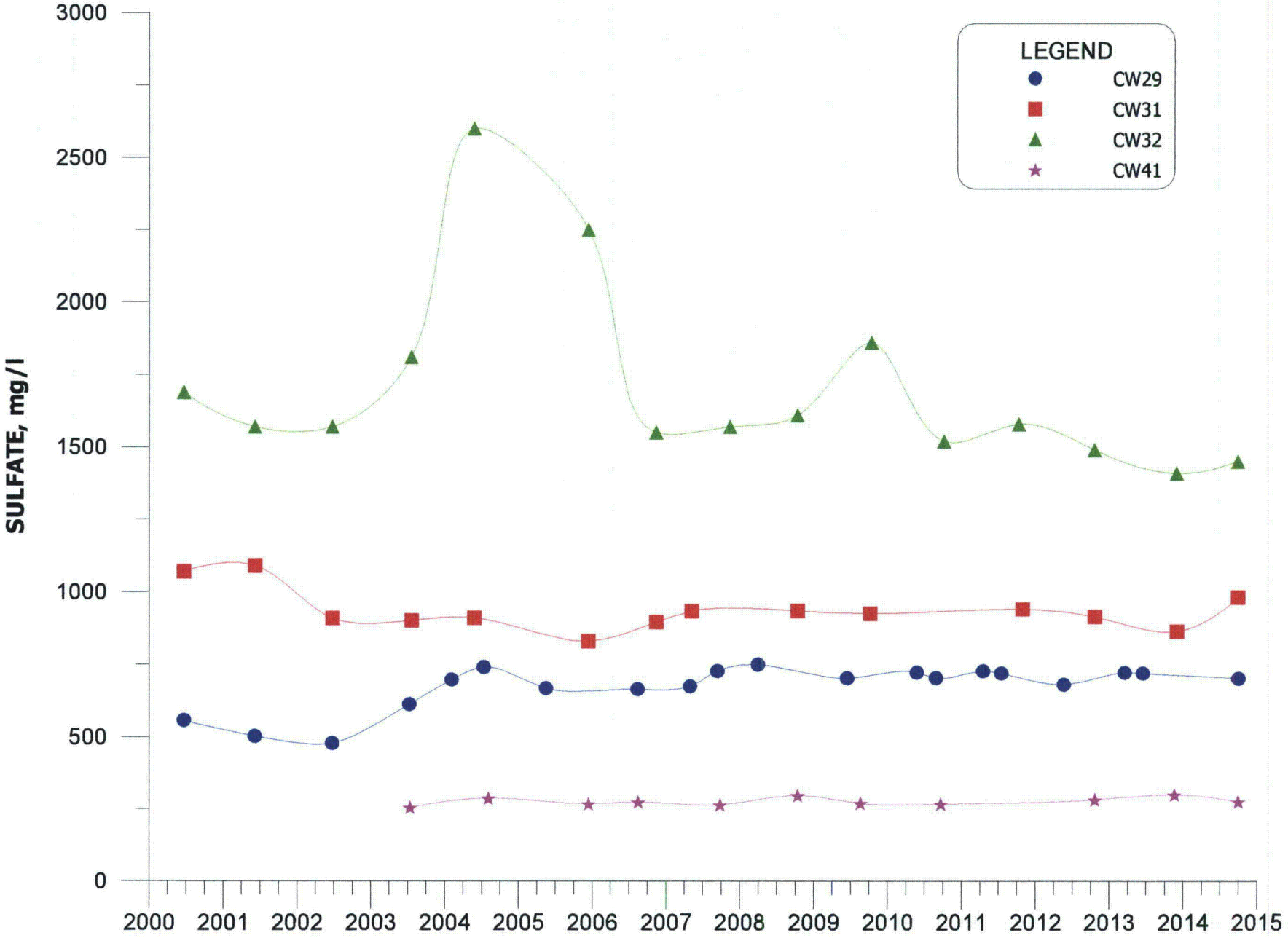
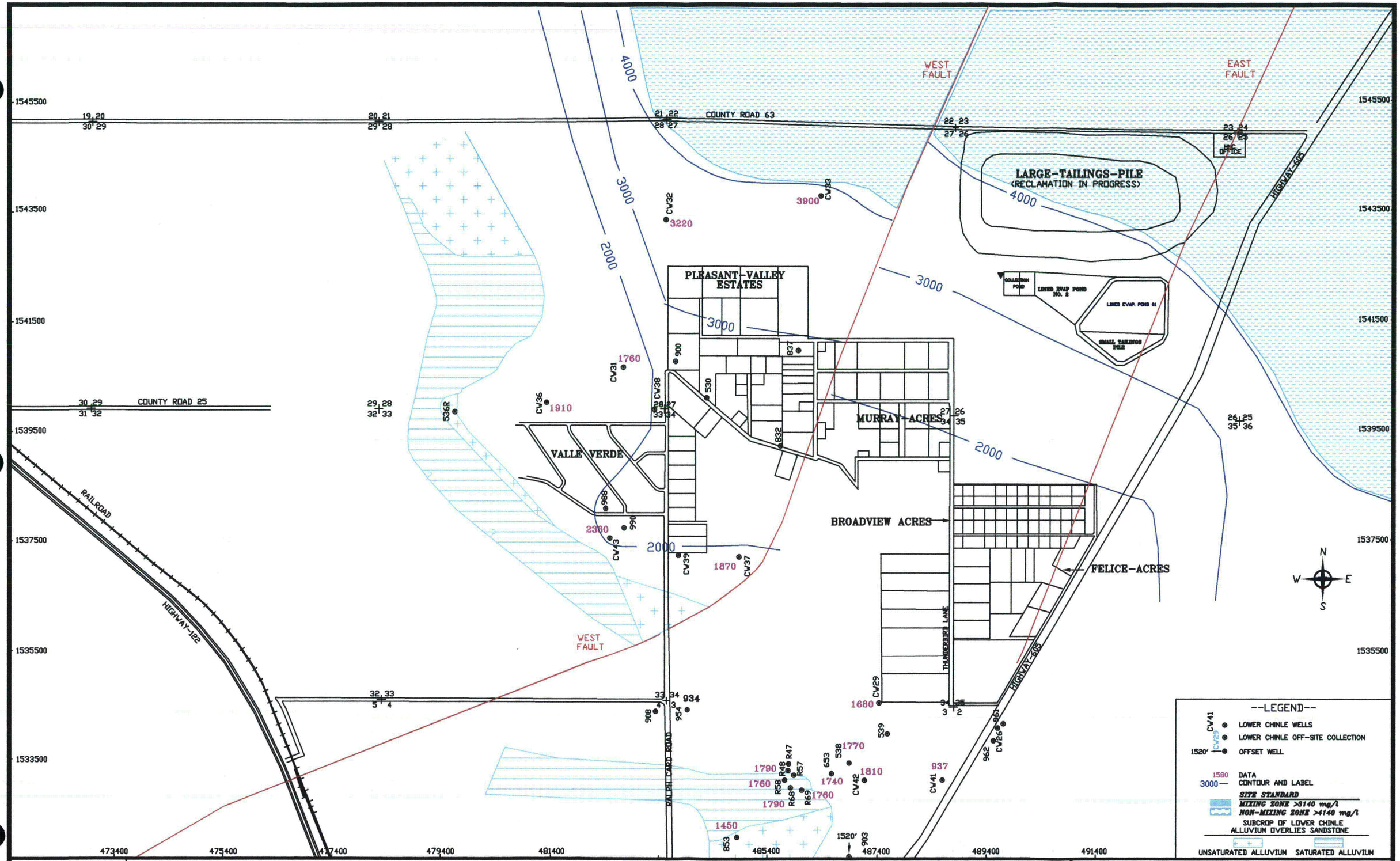


FIGURE 7.3-4. SULFATE CONCENTRATIONS FOR NON-MIXING WELLS CW29, CW31, CW32, AND CW41



SCALE: 1" = 1600'	
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DATE: 3/12/16	

FIGURE 7.3-5. TDS CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2014, mg/l

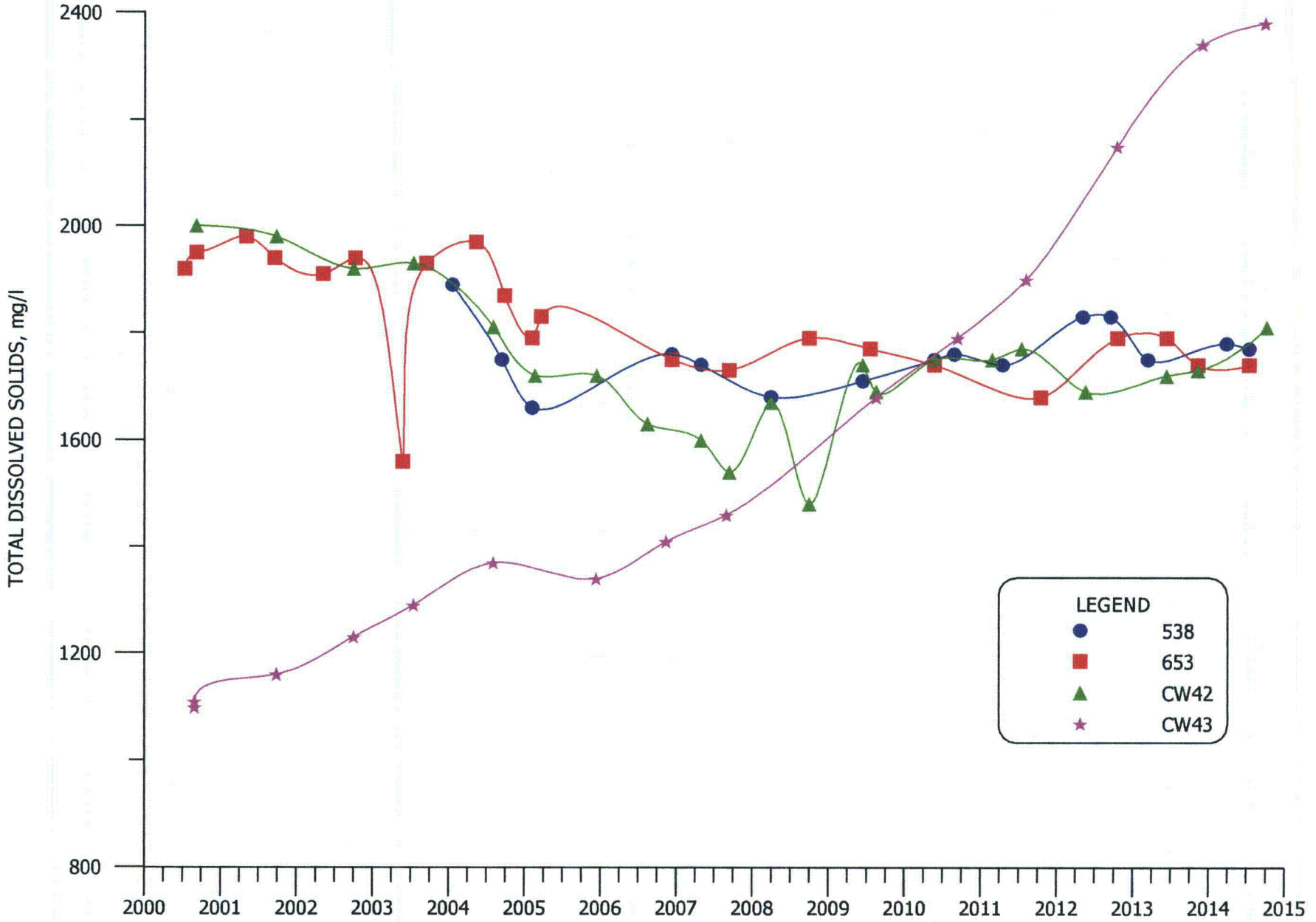


FIGURE 7.3-6. TDS CONCENTRATIONS FOR MIXING ZONE WELLS 538, 653, CW42, AND CW43

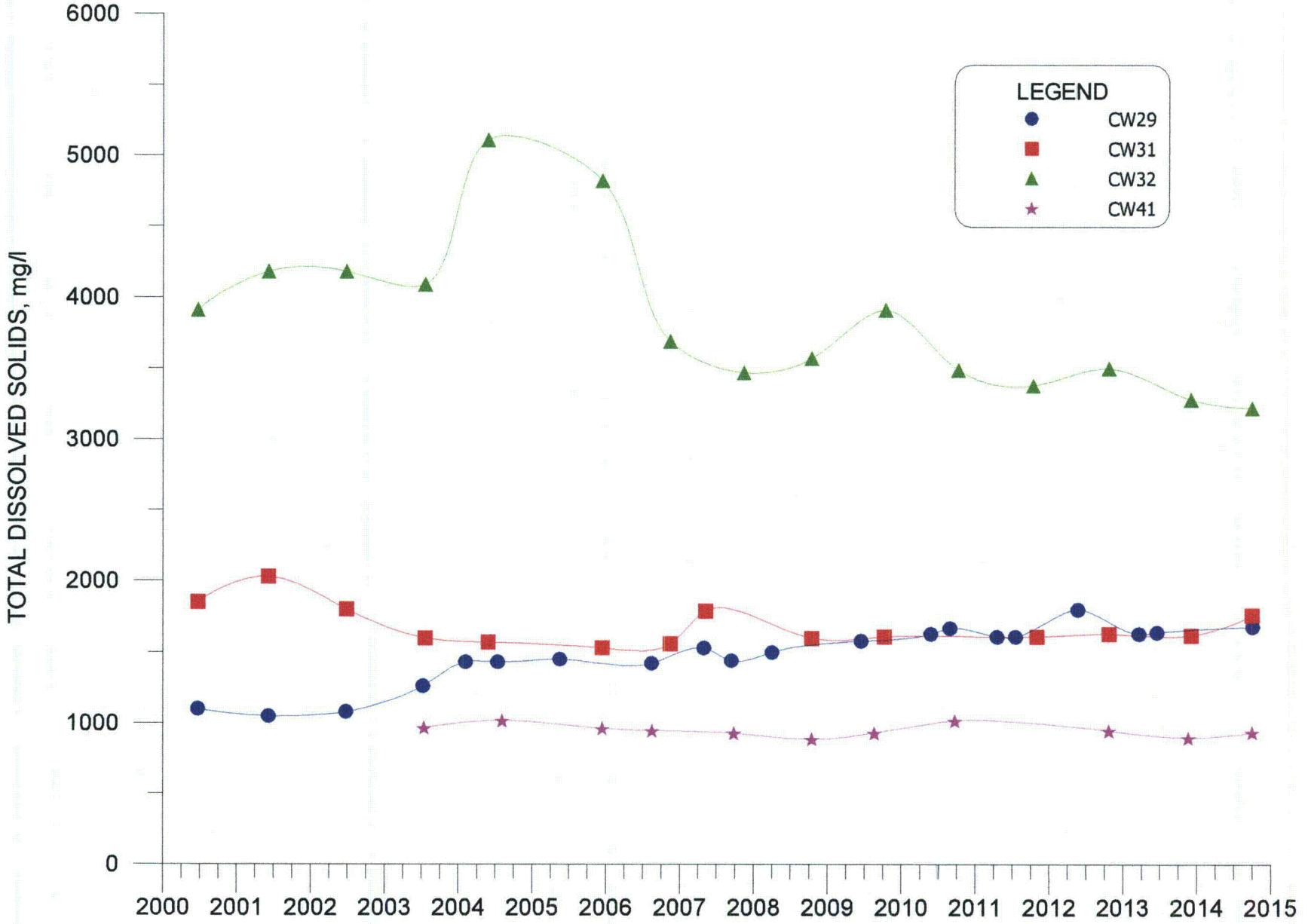
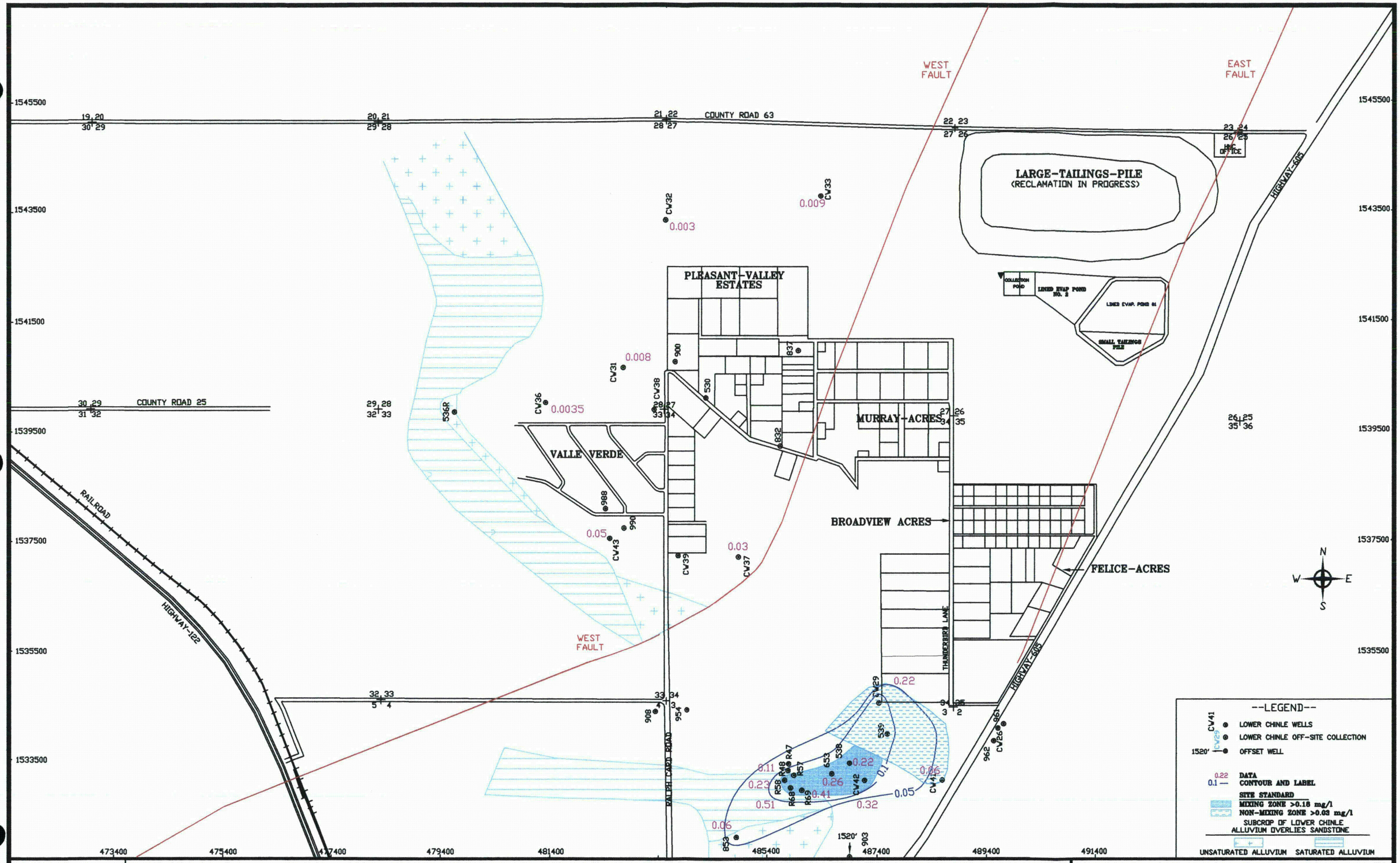


FIGURE 7.3-7. TDS CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW29, CW31, CW32, AND CW41



SCALE: 1" = 1600'
C:\PROJECTS\2015-06\1600LOW
DATE: 3/12/15

FIGURE 7.3-8. URANIUM CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2014, mg/l

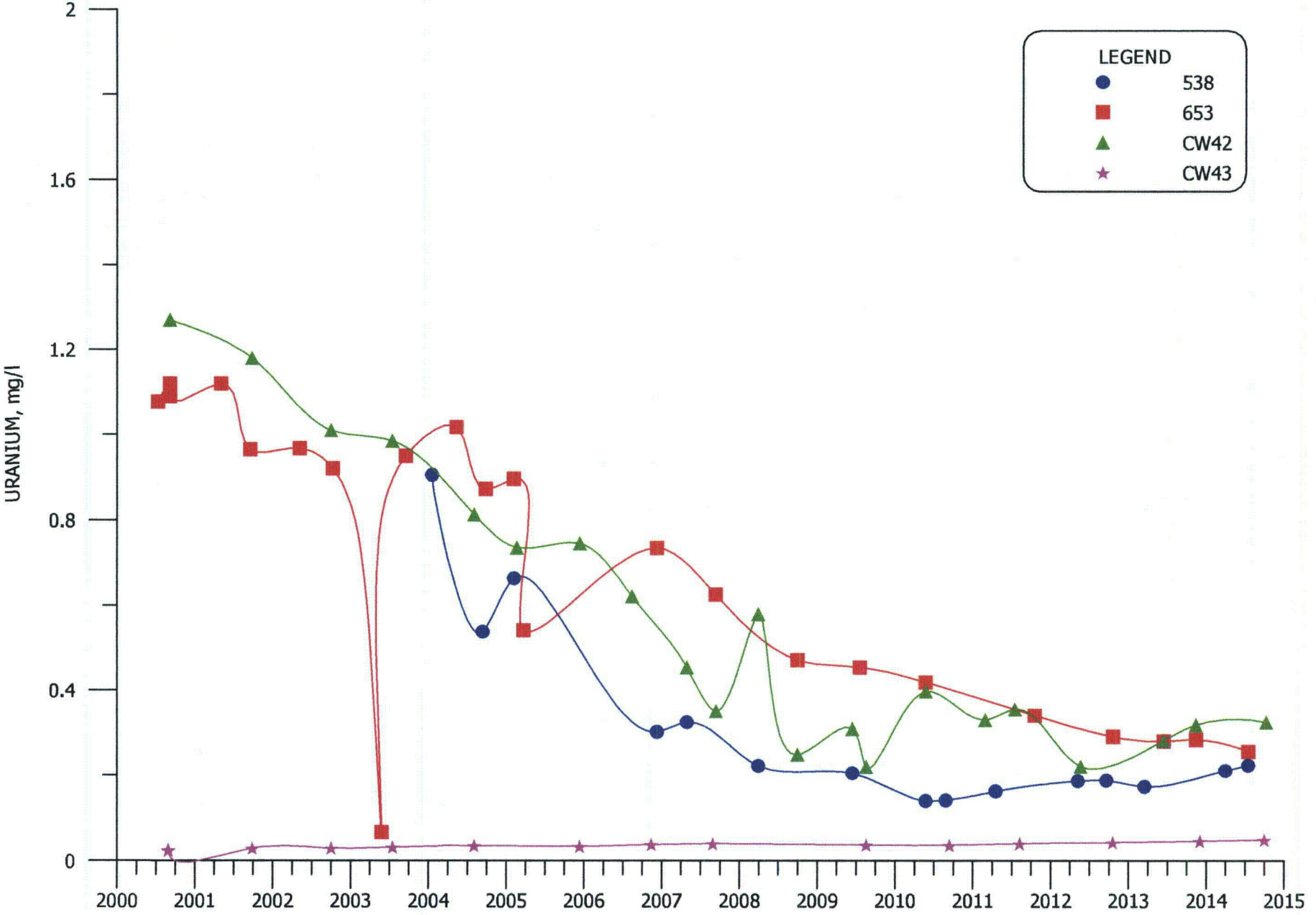


FIGURE 7.3-9. URANIUM CONCENTRATIONS FOR MIXING ZONE WELLS 538, 653, CW42, AND CW43

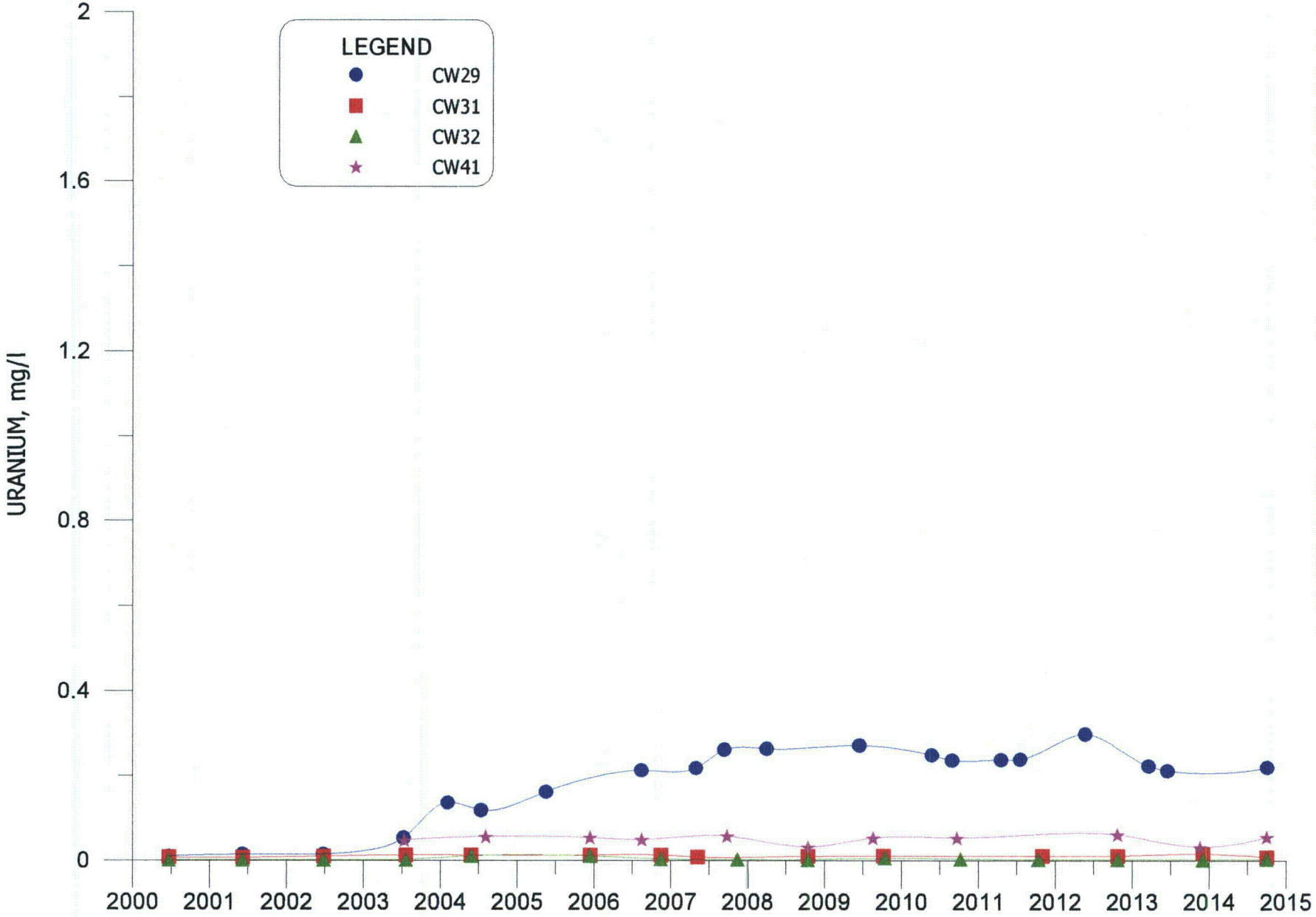
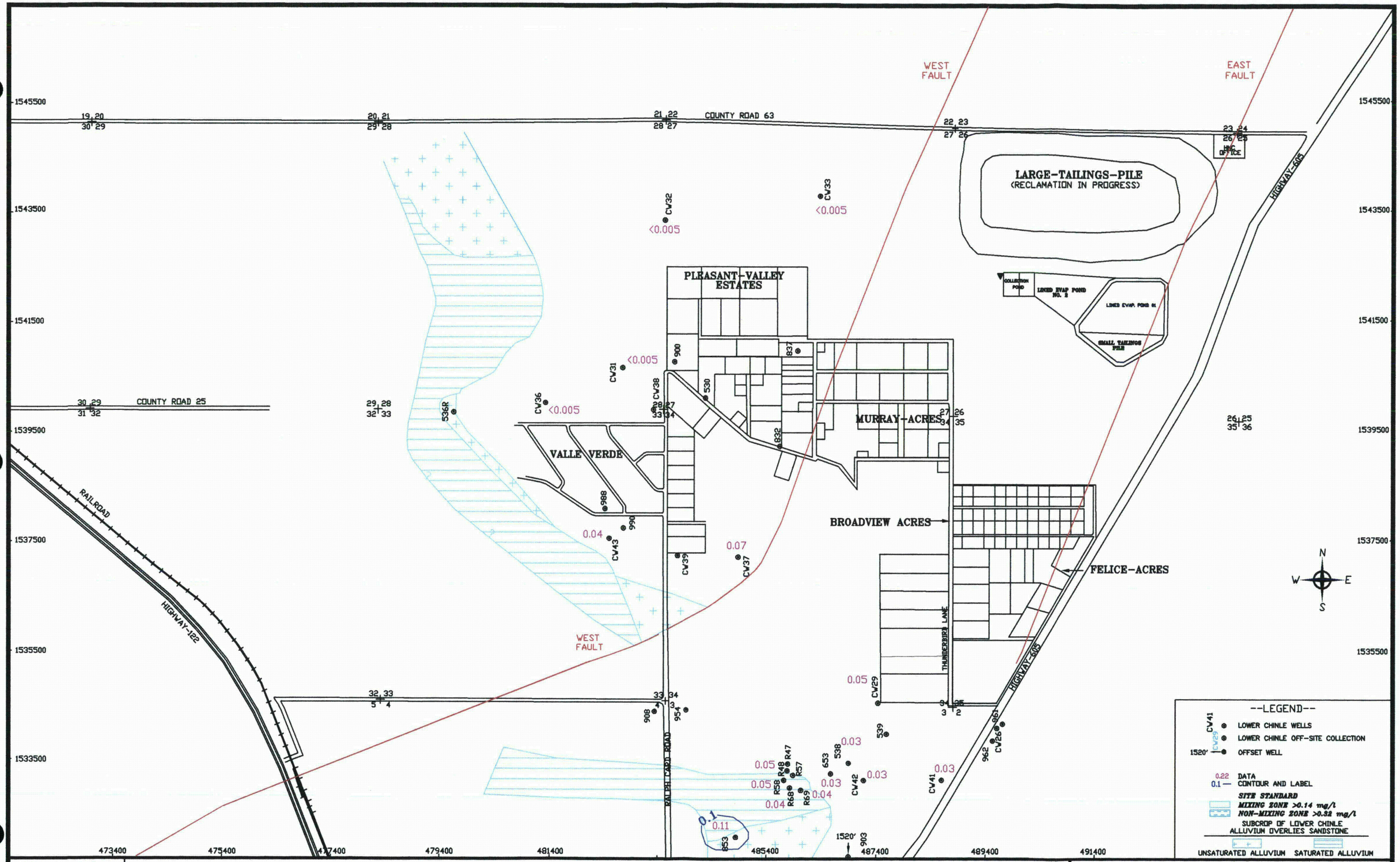


FIGURE 7.3-10. URANIUM CONCENTRATIONS FOR NON-MIXING WELLS CW29, CW31, CW32, AND CW41



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DATE: 3/12/15

FIGURE 7.3-11. SELENIUM CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2014, mg/l

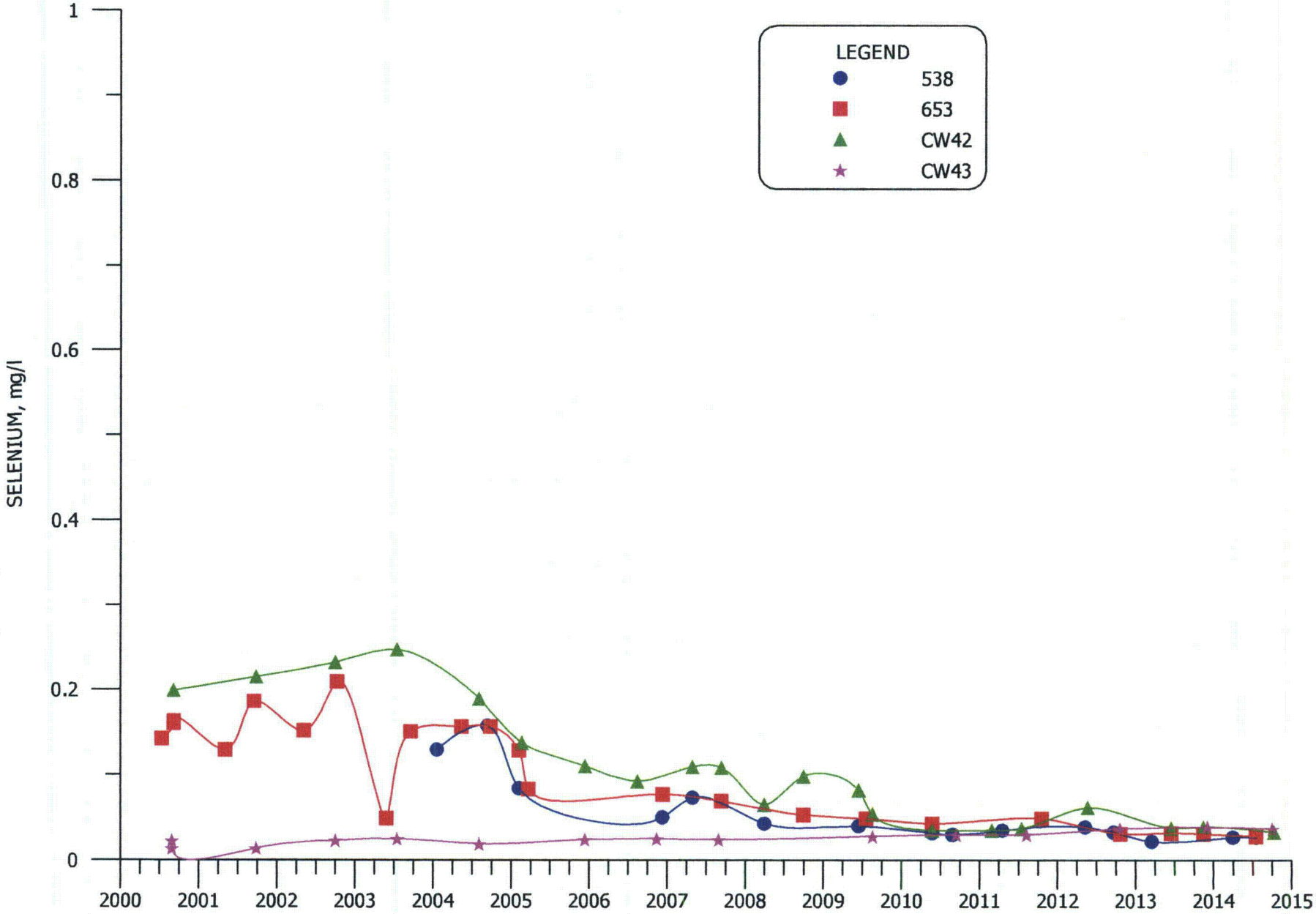

FIGURE 7.3-12. SELENIUM CONCENTRATIONS FOR MIXING ZONE WELLS 538, 653, CW42, AND CW43

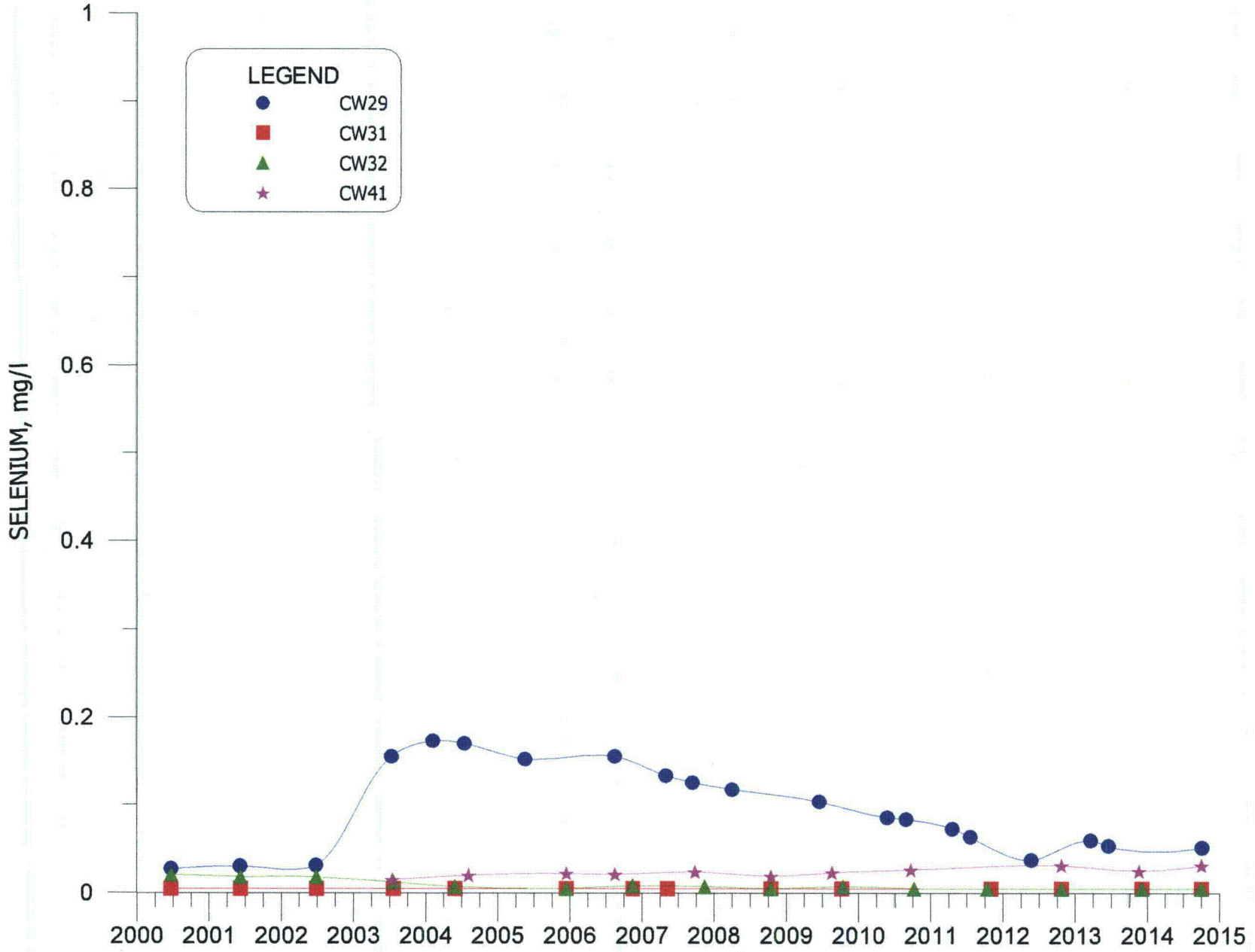

FIGURE 7.3-13. SELENIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW29, CW31, CW32, AND CW41

WEST FAULT

EAST FAULT

COUNTY ROAD 63

COUNTY ROAD 25

LARGE-TAILINGS-PILE
(RECLAMATION IN PROGRESS)

HMC OFFICE

COLLECTION POND

LINED EVAP POND NO. 2

LINED EVAP. POND #4

SMALL TAILINGS PILE

HIGHWAY-605

PLEASANT-VALLEY ESTATES

VALLE VERDE

MURRAY-ACRES

BROADVIEW ACRES

FELICE-ACRES

THUNDERBIRD LANE

RALPH LADD ROAD

RAILROAD

HIGHWAY-122

CV32 <0.1

CV33 0.1

CV31 <0.1

CV36 <0.1

CV38

CV43 7.3

CV39

CV37 5.6

CV29 3.2

CV42 3.0

CV41 4.7

CV28

CV26

536R

900

837

530

832

988

990

908

954

539

653

538 3.9

R48 R47 R58 R57 R68 R69

853 4.5

903 1520'

962 961

N W E S

--LEGEND--

CV41 LOWER CHINLE WELLS

CV28 LOWER CHINLE OFF-SITE COLLECTION

1520' OFFSET WELL

2.1 —10 DATA CONTOUR AND LABEL

SITE STANDARD MIXING ZONE >15 mg/l

SUBCROP OF LOWER CHINLE ALLUVIUM OVERLIES SANDSTONE

UNSATURATED ALLUVIUM SATURATED ALLUVIUM

1545500 1543500 1541500 1539500 1537500 1535500 1533500

473400 475400 477400 479400 481400 485400 487400 489400 491400

SCALE: 1" = 1600'

C:\PROJECTS\2015-06\1600LOW

DATE: 3/12/15

FIGURE 7.3-14. NITRATE CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2014, mg/l

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GROUND WATER MONITORING FOR HOMESTAKE'S GRANTS PROJECT

8.0 SAN ANDRES AQUIFER MONITORING

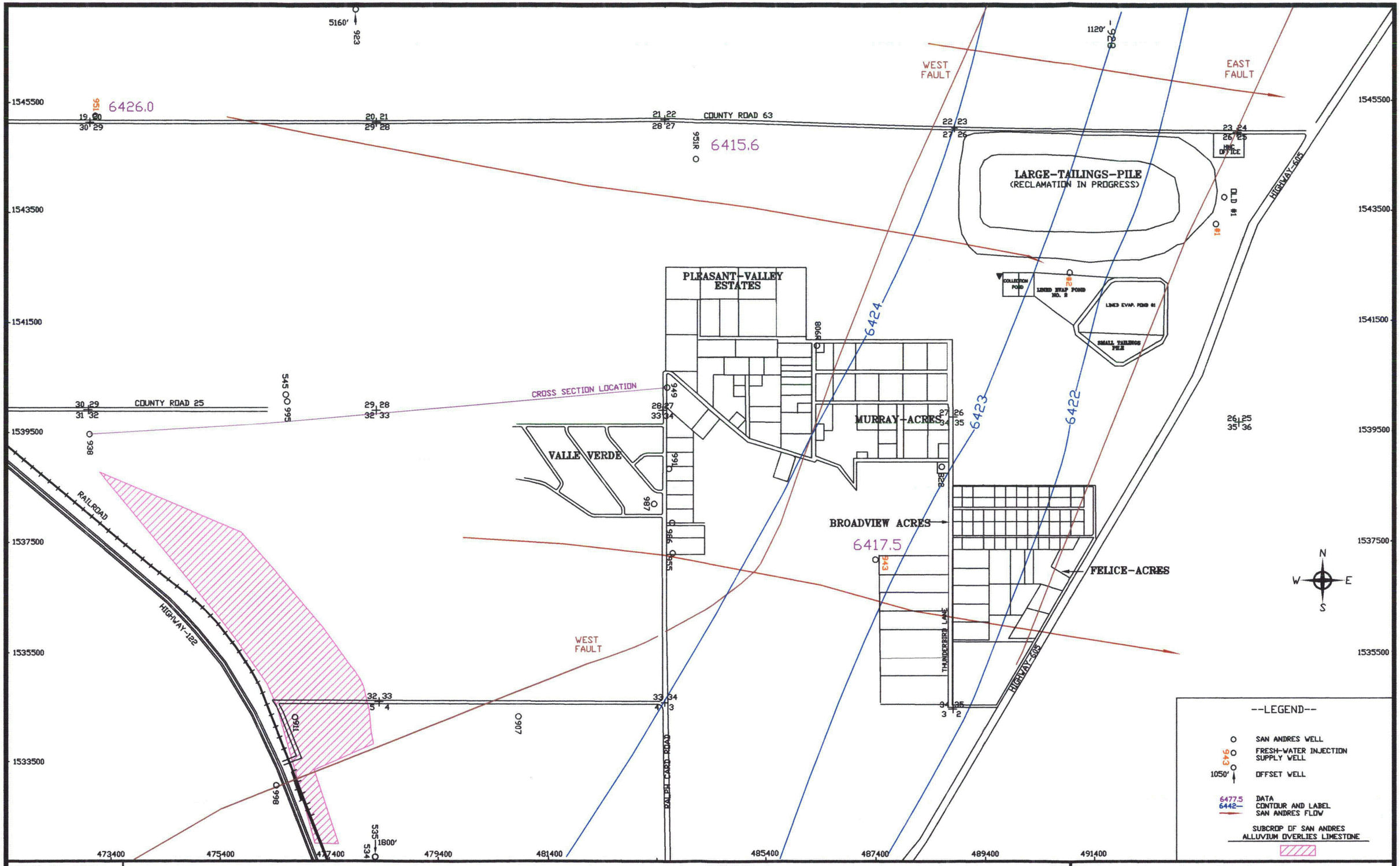
The San Andres aquifer is the most important regional aquifer in the Grants Project area. The Chinle Formation, which exists between the alluvium and the San Andres, is approximately 800 feet thick at the Homestake tailings site and is primarily a shale with a few sandstone lenses. Therefore, the alluvial 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 the Homestake 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 around the collection area. San Andres well 951 was used as the fresh-water injection supply for the injection system in Sections 28 and 29 through March of 2012. Replacement well 951R was used starting in July of 2012, while San Andres well 943 was used as the fresh water injection supply for the injection system in Sections 3 and 34 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. Figure 8.0-2 shows a cross-section from the west at San Andres well 938 to the east at San Andres well 949 (see Figure 8.0-1 for location of cross section). This cross section shows the dip of the San Andres and the thickness of Chinle shale between the alluvium and the top of the San Andres.

The water-level elevations measured during 2014 (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 8.0-3 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 8.0-3 shows the 2014 data for sulfate, TDS, uranium and selenium concentrations in the San Andres aquifer. Sulfate concentrations vary from 356 mg/l to 745 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 896 to 1970 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 2014 with the largest value from well 951R of 0.08 mg/l. This uranium value may be an outlier and needs to be confirmed before giving it much significance. Selenium concentrations in the San Andres aquifer vary from <0.005 to 0.021 mg/l. All measured molybdenum concentrations are less than 0.03 mg/l.

Figure 8.0-4 presents sulfate concentrations with time for Homestake's wells 943, 951, 951R, Deep #1 and #2 wells. This data shows that sulfate concentrations in 2014 for these San Andres wells were similar to their historical average since injection water supply has occurred. Updated concentrations for well 951 were obtained from the DOE.

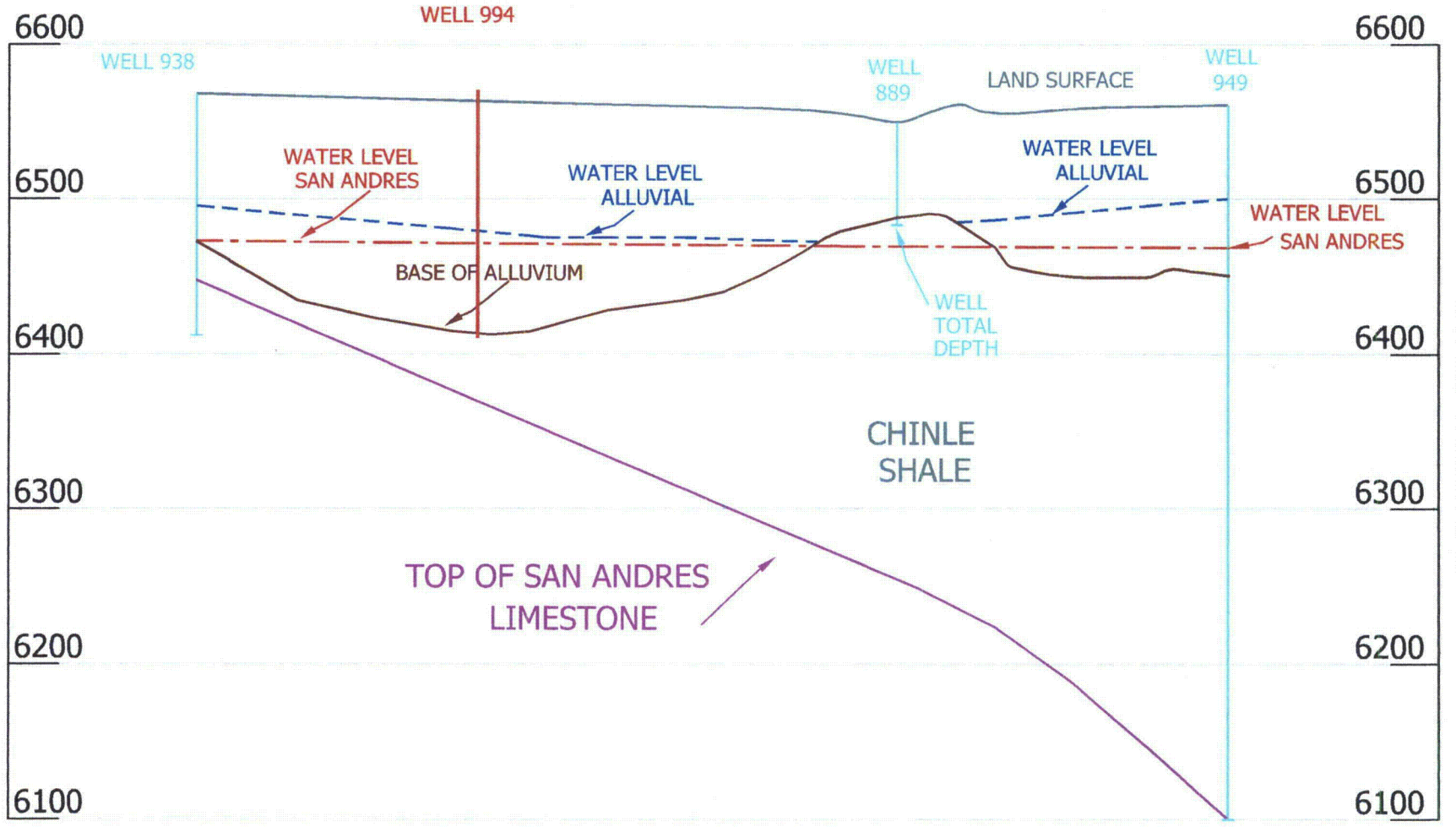


SCALE: 1" = 1600'

C:\PROJECTS\2015-06\1600SAN bmw

DATE: 3/13/2015

FIGURE 8.0-1. LOCATION OF SAN ANDRES WELLS AND WATER-LEVEL ELEVATION FOR THE SAN ANDRES AQUIFER, 2014, FT-MSL



NOTE: X-SECTION BASED ON LOGS FROM WELLS 938, 889, AND 949.

FIGURE 8.0-2. SAN ANDRES CROSS-SECTION ALONG THE NORTHERN BORDER OF SECTIONS 32 AND 33

DATE: 03/13/15

HORIZONTAL SCALE: 1" = 1600'

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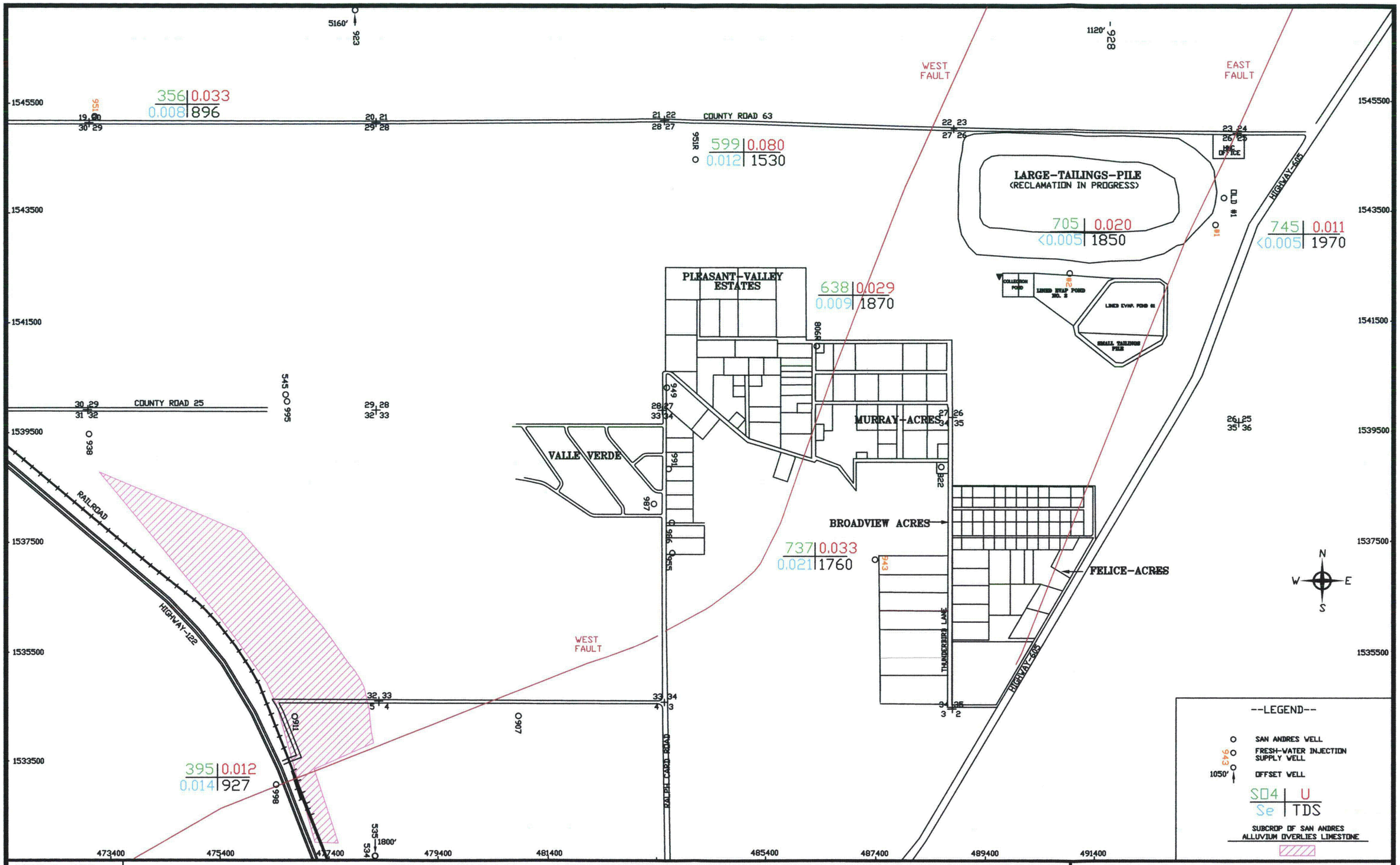

SCALE: 1" = 1600'

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DATE: 3/13/2015

FIGURE 8.0-3. LOCATION OF SAN ANDRES WELLS AND WATER QUALITY DATA FOR THE SAN ANDRES AQUIFER 2014, mg/l

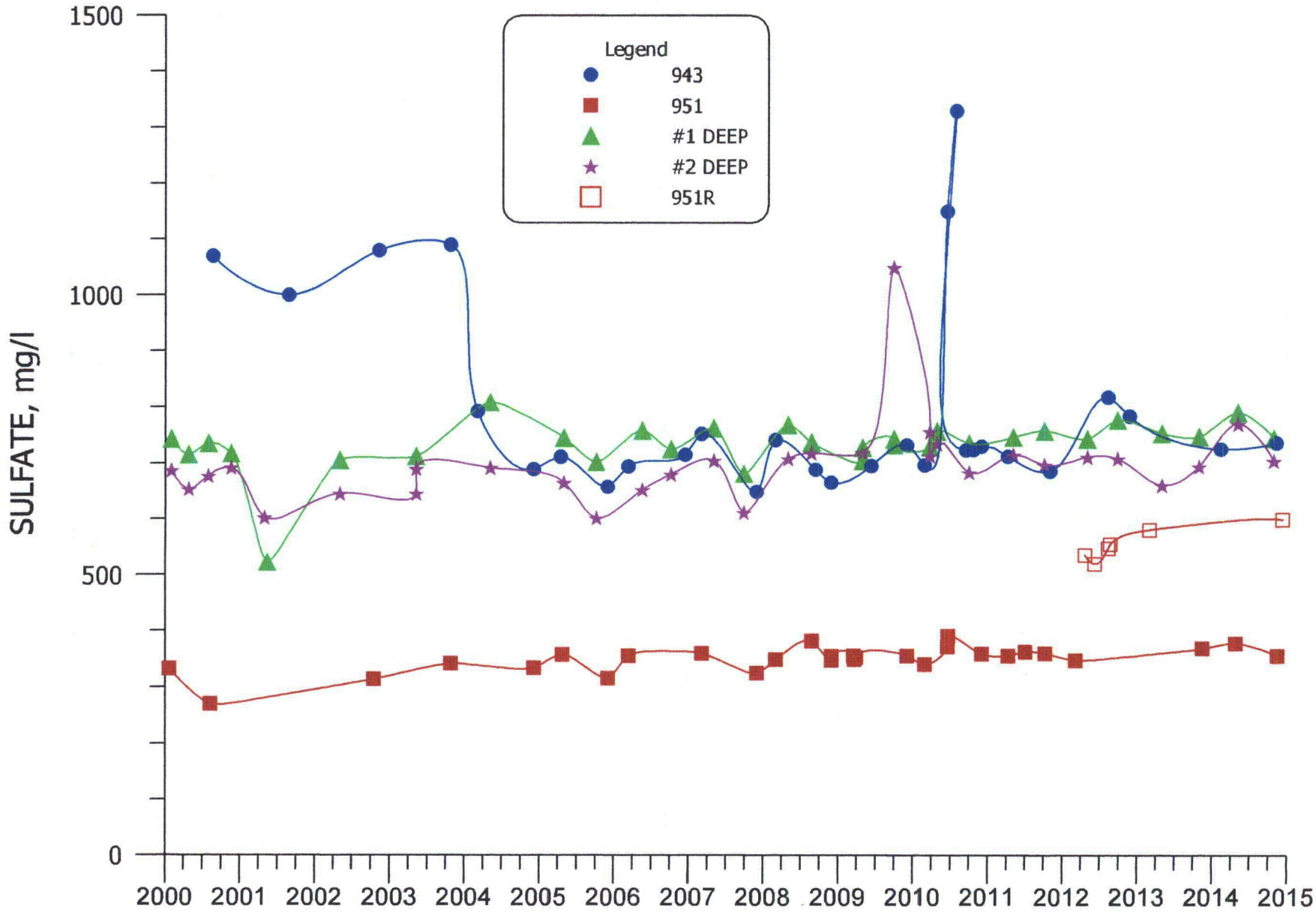

FIGURE 8.0-4. SULFATE CONCENTRATIONS FOR WELLS 943, 951, 951R, #1 DEEP, AND #2 DEEP.

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 Dee	1543307	493633	1000.0	10.0	12/12/2007	99.0800	6484.68	0.0	6583.76	130	6454	A ---
										303	6281	U ---
										433	6151	M ---
										597	5987	L ---
										955	5629	S 919-999
#2 Dee	1542424	490972	870.0	---	11/4/2013	207.110	6368.55	0.0	6575.66	110	6466	A ---
										800	5776	S -
0806R	1541177	486264	600.0	16.0	4/13/2011	148.600	6417.79	1.0	6566.39	---	---	S 504-600
0534	1534589	476549	1000.0	16.0	12/16/2010	120.010	6432.56	0.0	6552.57	---	---	S -
0535	1530100	478450	198.0	12.0	12/17/2010	117.849	6422.15	0.0	6540.00	---	---	S -
0545	1540200	476600	0.0	8.0	---	---	---	---	6560.00	---	---	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	2/13/2008	135.600	6421.40	0.0	6557.00	790	5767	S 790-875
0907	1534250	480800	360.0	16.0	12/11/2013	121.75	6423.85	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	---	12/11/2013	129.75	6467.85	1.2	6597.60	138	6458	A ---
										801	5795	S -
0938	1539500	473040	---	---	12/11/2013	147.649	6421.15	0.0	6568.80	95	6474	A ---
										120	6449	S -
0943	1537222	487407	978.0	18.0	12/29/2014	138.449	6417.46	0.0	6555.91	704	5852	S 703-978
0949	1540350	483600	551.0	6.0	2/13/2008	130.600	6431.70	0.0	6562.30	112	6450	A ---
										460	6102	S 505-551
0951	1545500	473200	275.0	10.0	3/26/2012	147.699	6426.00	0.9	6573.70	110	6463	A ---
										227	6346	S 241-275
0951R	1544500	484100	525.0	8.0	12/29/2014	161.199	6415.58	1.0	6576.78	420	6156	S 420-525
0955	1537338	483699	498.0	5.0	11/3/1995	78.0500	6471.95	0.2	6550.00	40	6510	A ---
										420	6130	S 385-498
0986	1537894	483690	467.0	5.0	8/23/2008	124	6526.00	0.8	6650.00	65	6584	A ---
										85	6564	L ---
										415	6234	S 420-467
0987	1538226	483357	500.0	5.0	11/3/1995	54.4799	6595.52	1.0	6650.00	70	6579	A ---
										385	6264	S 425-470

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			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)	
					DATE	DEPTH (FT-MP)	ELEV. (FT-MSL)						
0991	1538873	483630	500.0	---	8/26/2008	126.819	6524.18	1.4	6651.00	---	---	S	-
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
L = Lower Chinle
S = San Andres Aquifer
r = Reported
* = Abandoned

SECTION 9

TABLE OF CONTENTS

GROUND WATER MONITORING FOR HOMESTAKE'S GRANTS PROJECT

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