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March 30, 2021

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**ATTN: Ms. Ashlynne Winton**
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**RE: 2020 Annual Monitoring Report / Performance Review, In Accordance with Nuclear Regulatory Commission Docket No. 40-8903, License No. SUA 1471, and New Mexico Environment Department DP-200 Ground Water Discharge Plan**

Mr. Linton and Ms. Winton:

Pursuant to US Nuclear Regulatory Commission License SUA-1471, Docket 40-8903, License Condition 35(E) and in accordance with the ground water discharge permit DP-200 issued by the New Mexico Environment Department, please find a below a hyperlink to the Annual Performance Report for 2020 for Homestake's Grants Reclamation Project.

https://app.box.com/s/6gglm4i2lu777w6co6a0sdot0p3u1elc

An updated groundwater monitoring plan for the GRP was approved in November 2019 (ML19217A353) and Tables 2-1 and 2-2 in the new plan outlines the water quality sampling frequency and parameters monitored. This plan was followed for the 2020 GRP monitoring.

With respect to the well monitoring requirements outlined in Table 2 in the November 2019 plan, all wells were sampled for the number of planned samples except for the following wells.
San Andres monitoring wells 806R, 955 and 991 were sampled only once instead of the planned semiannual sampling in 2020 and well 943M was sampled three times instead of the planned quarterly sampling due to COVID-19 restrictions. Well 949 was not sampled due to the lack of a sampling agreement with the owner, and Well Deep #1R was sampled only once instead of quarterly due to the well not being in operation in 2020.

Thank you for your time and attention on this matter. If you have any questions, please contact me via e-mail at bbingham@homestakeminingcoca.com or via phone at 505.290.8019.

Respectfully,

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Enclosure via hyperlink

BRB/gh

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# 2020 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 OF CALIFORNIA**
**GRANTS, NEW MEXICO**

**AND**

**HYDRO-ENGINEERING, LLC**
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# 1.0 EXECUTIVE SUMMARY AND INTRODUCTION

## 1.1 EXECUTIVE SUMMARY

Homestake Mining Company of California (HMC) manages a groundwater restoration program as defined by Nuclear Regulatory Commission (NRC) License SUA-1471, and New Mexico Environment Department (NMED), DP-200 permit. The groundwater remediation has been ongoing since 1977 and has changed dynamically through the course of over four decades.

The groundwater corrective action program (CAP) was updated and submitted to the regulatory agencies in November of 2020 (Homestake 2020). The alternatives analysis presented in that report effectively showed that future groundwater remediation at the site is in impracticable and will require institutional controls in order to be protective of human health. The report proposed that groundwater remediation continue to remain in compliance with license SUA-1471 until Alternative Concentration Limits (ACLs) were approved by NRC.

A groundwater collection area (see yellow shaded area on Figure 2.1-1, Page 2.1-15) has been established and is bounded by a down-gradient perimeter of injection/infiltration wells and trenches. Alluvial groundwater that flows beneath the tailings enters this collection area. All groundwater in the alluvial aquifer that is within the collection area is eventually captured by the collection well system. Once ACLs are 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 2020. This is a yearly reporting requirement. A similar report has been submitted to the agencies each year since 1983 (see footnote list in Section 1.2 and references in Section 9.0).

The restoration program is designed to reduce target contaminant concentrations from the groundwater by flushing the alluvial and Chinle aquifers with deep-well supplied fresh water or treated water produced from the reverse osmosis (R.O.) plant or the zeolite treatment system. A series of collection wells is used to collect the contaminated water, which is currently pumped to the R.O. plant or zeolite for treatment.

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 the San Mateo alluvial aquifer. In addition, a

second aquifer system is found within the Chinle formation underlying the San Mateo alluvium. It is comprised of three separate aquifers designated as the Upper, Middle and Lower Chinle aquifers. The Updated Corrective Action Program (CAP, Homestake 2020) and Hydro-Engineering 2003b & 2010b reports should be reviewed for details of the geologic setting and aquifer conditions on the site. Three cross sections are included that present the hydrologic setting at the Grants site and their locations are shown on Figure 1.1-1. Figure 1.1-2 presents a typical cross section which is located from within the On-Site area and extends to the south-southwest into southern Felice Acres area (see Figure 1.1-1 for location of the typical cross section also). This typical cross section shows the alluvial aquifer relative to the three Chinle aquifers and shows the Upper and Middle Chinle aquifers subcropped with the alluvium. Figure 1.1-3 presents Cross-section B-B' which shows the alluvial, Upper and Middle Chinle aquifers just south of the Large Tailings Pile (LTP) and through the Small Tailings Pile (STP). A second cross-section (D-D') that runs from Section 3 in the southwest through the LTP is presented in Figure 1.1-4. The township and range for the land sections referenced are described in Section 1.2. 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. The restoration systems were operated at reduced rates during 2020 to reduce the volume of water requiring evaporation. A mixture of R.O. product water, zeolite treated and/or fresh water pumped from deep wells is injected in a series of wells or infiltration trenches 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 groundwater is pumped and collected from a series of wells within the collection area. The collected aquifer water from On-site is pumped to the R.O. plant. The On-site collection is near the LTP and is located to the north of where Cross-section B-B' runs between wells CW-6 and CW-4. This collection would also be south of the LTP on Cross-section D-D'. Starting in 2016, the Off-site collection water was processed through the zeolite system and the treated water flows to the PTT prior to being used for injection water. Collection and injection started in the northeast portion of Section 3 with the R well field and Felice Acres with mainly the Q and Y well fields. The R well field is in the Middle

Chinle subcrop area and the collection is occurring from both the alluvial and Middle Chinle aquifers. The Q and Y well fields are completed in the alluvial and Middle Chinle aquifers, respectively, just north of the Middle Chinle subcrop area. The injection also occurs in both the alluvial and Middle Chinle aquifers. The R well field is located east of well CW-29 on Cross-section D-D' and selected wells in the well field were operated most of the last half of 2020 at reduced rates. The Q and Y wellfields also operated during this period. Saturated alluvium exists above the Middle Chinle aquifer in this location. Timing of restoration of the alluvial aquifer in the R area is important to restoration of the Middle Chinle down gradient of this area. Collection and injection started in the center portion of Section 28 in the North Off-site area with the H well field. Wells in the H well field are completed only in the alluvial aquifer and the collection is occurring from wells located west of well CW-32 on left side of Cross-section B-B'. Wells in the H well field were operated some of the last half of 2020 with the collection water treated through the zeolite system.

In the years from 1977 to the present, the combination of injection wells and the up-gradient collection system has continued the withdrawal of the contaminated groundwater plume up-gradient of the current hydraulic barrier which assists in aquifer restoration by reducing contaminant concentrations to or below site standard levels. Selenium concentrations are used to present the progress that has been made in the groundwater restoration program. Selenium was the parameter of most concern in the early years of the corrective action program. Figure 1.1-5 presents the alluvial selenium concentrations for 1976 prior to the start of the corrective action program for the Grants site. The well locations with selenium measurements in 1976 are shown on the figure. The red pattern in this figure shows where selenium concentrations were greater than 5 mg/L in 1976 in the Large and Small Tailings Pile areas. The blue pattern shows where concentrations are above 1 mg/L but less than 5 mg/L with areas On-site and in Broadview Acres. The detached zone of higher concentrations in the Broadview Acres area was caused by faster migration through the Upper Chinle aquifer that entered the alluvial aquifer in the Broadview Acres area. The cyan color shows where concentrations were between 0.32 and 1.0 mg/L in 1976. The 1988 alluvial selenium concentration patterns are presented in Figure 1.1-6 and show that selenium concentration had been restored in all of the subdivisions by 1988 (wells symbols show locations of selenium measurements in 1988). Figures 1.1-7 and 1.1-8 give the selenium patterns for 1999 and 2009, respectively, showing only a small area in the tailings area in 1999 with selenium concentrations above 5 mg/L

while no measured concentrations are above this level in 2009. The area in Section 3 with elevated selenium concentration in 1999 was restored prior to 2009. Figure 1.1-9 gives the selenium patterns for 2014 which shows slightly larger patterns in the LTP area and a smaller pattern in the L area than those in 2009. Selenium patterns for 2020 are presented in Figure 1.1-10 and show that selenium only exceeds the site standard in the tailings area and north of the L area which is located southeast of the STP.

Uranium became the most important parameter for restoration at the Grants site after significant restoration of selenium concentration and with the establishment of new uranium standards in the mid 2000's. Figure 1.1-11 presents the 1976 alluvial uranium concentrations with the red pattern showing where concentrations exceeded 10 mg/L in the area of the LTP and STP and in the western portion of Broadview Acres. Well symbols show where uranium concentrations were measured in 1976. The elevated concentrations in Broadview Acres migrated through the Upper Chinle aquifer to this area and were then conveyed to the alluvial aquifer near the Upper Chinle subcrop. This figure also shows additional area in Broadview and Murray Acres where concentrations exceeded 1.0 and 0.5 mg/L levels in 1976. The cyan color shows where concentrations exceed 0.16 mg/L in 1976. Figure 1.1-12 shows the uranium concentrations that existed in the alluvial aquifer in 1988 with concentrations of 0.16 to 0.5 mg/L still present in Broadview and Felice Acres and concentrations above 1 mg/L in the northeast portion of Murray Acres. Uranium concentrations in the On-site area near the LTP and STP were greater than 10 mg/L. The uranium concentrations in 1999 were below the site standard in all of Broadview Acres except the southern portion of the subdivision where concentrations were slightly above the site standard (see Figure 1.1-13). Well symbols are shown on this figure where uranium measurements were made in 1999. Uranium concentrations in a small area in the northeast portion of Murray Acres also exceeded the site standard in 1999, but the maximum concentration in this area was reduced to below 1.0 mg/L. Uranium concentrations in southern Felice Acres and the northeast portion of Section 3 exceeded 1 mg/L in 1999. Concentrations exceeded 0.5 mg/L in the central portion of Section 28 in the North Off-site area while the area of concentrations exceeding the site standard extended down to the west-center portion of Section 33. The 2009 uranium concentration patterns are presented in Figure 1.1-14 and show that concentrations in southern Felice Acres and the northeast portion of Section 3 have been reduced to below 0.5 mg/L. By 2009, the area of

concentrations greater than the site standard that extended into west-central portion of Section 33 was pulled back approximately one mile to the western portion of Section 28. Some increase in uranium concentrations in the Felice Acres and in Section 27 were observed in 2014 (see Figure 1.1-15) due to the reduction and ceasing of irrigation prior to 2014. The On-site area of concentrations above 0.16 mg/L is fairly similar in 2009 and 2014. The 2020 uranium concentration patterns are presented in Figure 1.1-16 and show the extent of the uranium concentration greater than 0.16 mg/L in Section 28 was reduced from 2014 to 2020. The restoration of the area in the northeast portion of Murray Acres was maintained in 2020.

The uranium concentrations for five different years are presented for the Upper Chinle aquifer in Figures 1.1-17 through 1.1-21 (see locations of well symbols on these figures which show where concentrations were measured during the year). Collection in the Upper Chinle aquifer is mainly south of the Collection ponds in or near the Upper Chinle subcrop and this area is shown on Cross-section B-B' in the area of well CW-4.

Figures 1.1-22 through 1.1-26 show a sequence of uranium concentration mapping for the Middle Chinle aquifer and the measured concentrations showed some improvement in the South Felice Acres area with no area of concentrations above 0.5 mg/L in 2020. Collection in the Middle Chinle in 2020 was mainly in the R and Y well fields in the South Off-site area and in one well west of the West Fault in the On-site collection. The hydrologic setting is shown on Cross-section D-D' where the Middle Chinle sandstone subcrops with saturated alluvium in the R well field area.

The elevated uranium concentrations in the Lower Chinle aquifer were first defined in 1996 and are presented in Figure 1.1-27. The locations where uranium concentrations were measured are shown on each of these figures with a well symbol. The collection of water for irrigation from the Lower Chinle reduced the higher concentrations in 1999 (see Figure 1.1-28) to lower levels in 2009 (see Figure 1.1-29). Figures 1.1-30 and 1.1-31 give similar maps for the Lower Chinle aquifer for 2014 and 2020.

An average of 268 gallons per minute (gpm) was pumped into the On-site alluvial treated and/or fresh-water injection systems in 2020. An additional 65 gpm of treated and/or fresh water was injected into the On-site Upper and Middle Chinle aquifer systems. An average rate of 205 gpm of R.O. product water was pumped to the PTT and mixed with zeolite treated water and/or fresh water prior to injection into the groundwater in 2020. Production of significant quantities of R.O.

product water started in July of 1999 with consistent operation from 2000 through 2020 except during equipment repair periods or during treatment plant upgrade or expansion.

In 2020, the average collection rate for the On-site alluvial aquifer was 145 gpm. No collection for re-injection of alluvial aquifer water was done in 2020. The On-Site Upper Chinle aquifer collection program consisted of pumping wells CE2, CE5, CE6, CE11, CE12, CE15 and CE19 at an average composite rate of 123 gpm in 2020. An average rates of 4.1 gpm were pumped from the LTP toe drains.

Data relating to key constituents of concern at the site have been reviewed and statistically evaluated to determine upgradient site background water quality. These background water quality levels have been accepted by NRC, EPA and NMED; the NRC and NMED have set site standards based on the background water quality and accordingly amended the Radioactive Material license and DP-200 to reflect those standards. It should be noted that these site standards are utilized throughout this report for comparison purposes in discussing restoration progress.

Observed alluvial aquifer concentrations of key constituents at the Grants site were similar to those in previous years. The only areas where sulfate, TDS and chloride concentrations exceed the alluvial site standards are an area east of Valle Verde plus the large area in close proximity to the Large and Small Tailings Piles in the Grants Project area.

Uranium concentrations exceed the alluvial site standard of 0.16 mg/L within the collection area near the tailings. The main change in the uranium concentrations in the alluvial aquifer is the decline in concentrations on the north side of Evaporation Pond No. 2 (EP2). There is also one well in northern Felice Acres and several wells in southern Felice Acres subdivision with measured uranium concentrations exceeding the site standard. Groundwater withdrawal for treatment was used to further reduce uranium levels that exceed the standard in an area southwest of Felice Acres in Section 3, in Felice Acres and in Section 28. Collection of water from the one well located in Murray Acres was not done in 2020 due to the reduction of uranium concentrations in that area to below the site standard. Uranium concentrations in the northeast portion of Section 3 and South Felice acres were reduced in 2020 in the R and Q well fields.

Selenium concentrations also exceed the relevant site standard in the collection area near the LTP and southeast of the STP. None of the sampled subdivision wells contained selenium concentrations above the site standard.

None of the subdivision wells contain molybdenum concentrations above the site standard of 0.1 mg/L. The wells exhibiting elevated molybdenum concentrations are all located near the Large and Small Tailings Piles, to the southeast of the STP, and in an area in central Section 27. Migration of this constituent has been limited due to precipitation within the alluvial aquifer.

Nitrate concentrations are compared to the alluvial site standard of 12 mg/L. An area between the LTP and STP contains nitrate concentrations above the site standard and is likely caused by tailings seepage. The nitrate standard has typically been exceeded in one well in Section 34.

All radium values in the alluvial aquifer outside of the tailings perimeter were less than the site standard. This demonstrates that radium is only a constituent of concern under the LTP.

No vanadium concentrations exceeded the alluvial site standard in 2020 except for wells in the LTP and STP. Concentrations of this constituent have been adequately restored to below the site standard except in the immediate area of the LTP and STP.

Thorium-230 levels observed in 2020 were less than the site standard except for levels in the alluvium immediately under the LTP. The mobility of this constituent has been very limited and elevated activities only occur in close proximity to the tailings. However, the analytical results for this constituent vary significantly at the low observed levels that are approaching laboratory detection limits. With the potential for erratic analytical results, slightly higher values should not be considered significant until supported by additional monitoring. The monitoring records for thorium-230 indicate that it is a minor constituent of concern at the Grants site.

Treated water and/or fresh-water injection into Upper Chinle wells CW13 and 944, (See Figure 5.1-2), east of the East Fault, continued in 2020. This injection has maintained higher water levels in the Upper Chinle aquifer east of the East Fault.

Treated water and/or fresh-water injection continued in 2020 in Upper Chinle well CW5 just north of Broadview Acres. This injection has resulted in gradient reversal within the Upper Chinle, thereby forcing groundwater from this area back to the north toward the tailings piles. Collection from Upper Chinle well CE2 was initiated in 1999 and continued through 2020. Collection in Upper Chinle wells CE5, CE6, CE11 and CE12 was started in 2006. Collection from Upper Chinle well CE7 started in late 2010 while collection in wells CE15, CE15A and CE19

started in 2017. This collection is used in conjunction with injection well CW5 to reduce contaminant concentrations in this area.

All sulfate, chloride and TDS concentrations in the Upper Chinle aquifer are below the site standards except for samples from wells near or within the footprint of the LTP for all three constituents.

Uranium concentrations exceeded the Upper Chinle site standard in 2020 in numerous wells near the LTP and Collection ponds, in one Upper Chinle well north of Broadview Acres and in the southern portion of Felice Acres. The decline in uranium concentrations to below the site standard in Upper Chinle wells, 494, CE9 and CE15A, in the Broadview and Felice Acres areas was maintained in the Upper Chinle aquifer in 2020. .

Selenium concentrations in the Upper Chinle aquifer exceed the site standard in the mixing zone near the LTP and north of the Collection ponds. The 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 site standard in several wells near the tailings and south of the Collection Ponds, and in one well north of Broadview Acres in the Upper Chinle aquifer during 2020.

All nitrate concentrations observed in 2020 for the Upper Chinle mixing zone were less than the nitrate site standard except for a small area in the LTP area. This indicates that nitrate is not a constituent of concern in this aquifer.

All vanadium, radium-226 plus radium-228 and thorium-230 results for the Upper Chinle in 2020 were less than the corresponding site standards. This is consistent with the low observed concentrations in the overlying alluvial aquifer.

The direction and rate of groundwater flow in the Middle Chinle aquifer in 2020 is very similar to that of recent years. Fresh-water injection into well CW14 started in December of 1997. Fresh-water injection into wells CW30 and CW46 started in 2004 while injection into Middle Chinle well CW77 started in 2016. The fresh water is building up a mound of groundwater in this area, which will result in a reversal of the flow of Middle Chinle water back toward the alluvial subcrop. Well CW28 was added as a supply well for fresh-water injection in 2002 but was not used during 2020.

All sulfate concentrations in the Middle Chinle are less than the site standards in 2020. All TDS concentrations in the Middle Chinle aquifer are less than the standards except for one well in Murray Acres and wells located in Broadview and Felice Acres that are above the non-mixing zone background value. Chloride concentrations in the Middle Chinle aquifer did not exceed the site standard in 2020.

Uranium concentrations in the western portion of Felice Acres are above the mixing zone site standard due to the alluvial recharge to the Middle Chinle aquifer just south of Felice Acres, but the concentrations were reduced with the collection in this area during 2020. Uranium concentrations in Middle Chinle wells 493 and CW55 declined to near or below the non-mixing zone site standard. The uranium site standard is also exceeded in a few wells west of the West Fault but the levels in these wells were reduced in 2020 with the CW62 collection.

The non-mixing zone selenium site standard is slightly exceeded in well 493 in Felice Acres (See Figure 6.3-14A). The mixing zone selenium site standard is exceeded in collection well CW62 west of the West Fault but concentrations decreased in 2020. Molybdenum concentration in collection well CW62 west of the West Fault in the Middle Chinle aquifer is above the mixing zone standard of 0.10 mg/L.

Nitrate, radium, vanadium and thorium-230 concentrations in the Middle Chinle aquifer are below levels of concern for each of the constituents.

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 site standards except in far-down-gradient areas, where natural concentrations exceed the non-mixing zone site standard. These exceedances are a result of the limited background data for the far-down-gradient areas of the Lower Chinle aquifer, and there is a naturally occurring deterioration of Lower Chinle water quality in the down-gradient direction.

The uranium site standards in the Lower Chinle aquifer are exceeded in wells in Section 3. The wells where concentrations exceed the mixing zone site standard of 0.18 mg/L are located near the subcrop of the Lower Chinle aquifer with the alluvial aquifer. Concentrations in several non-mixing zone well exceed the site standard of 0.03 mg/L.

Concentrations of selenium do not exceed the standards in the two zones for the Lower Chinle aquifer.  All molybdenum concentrations in the Lower Chinle aquifer are less than the site standard.  None of the Lower Chinle nitrate concentrations exceed site standards or levels of concern.  All radium, vanadium and thorium-230 concentrations in the Lower Chinle aquifer were at low levels in 2020.

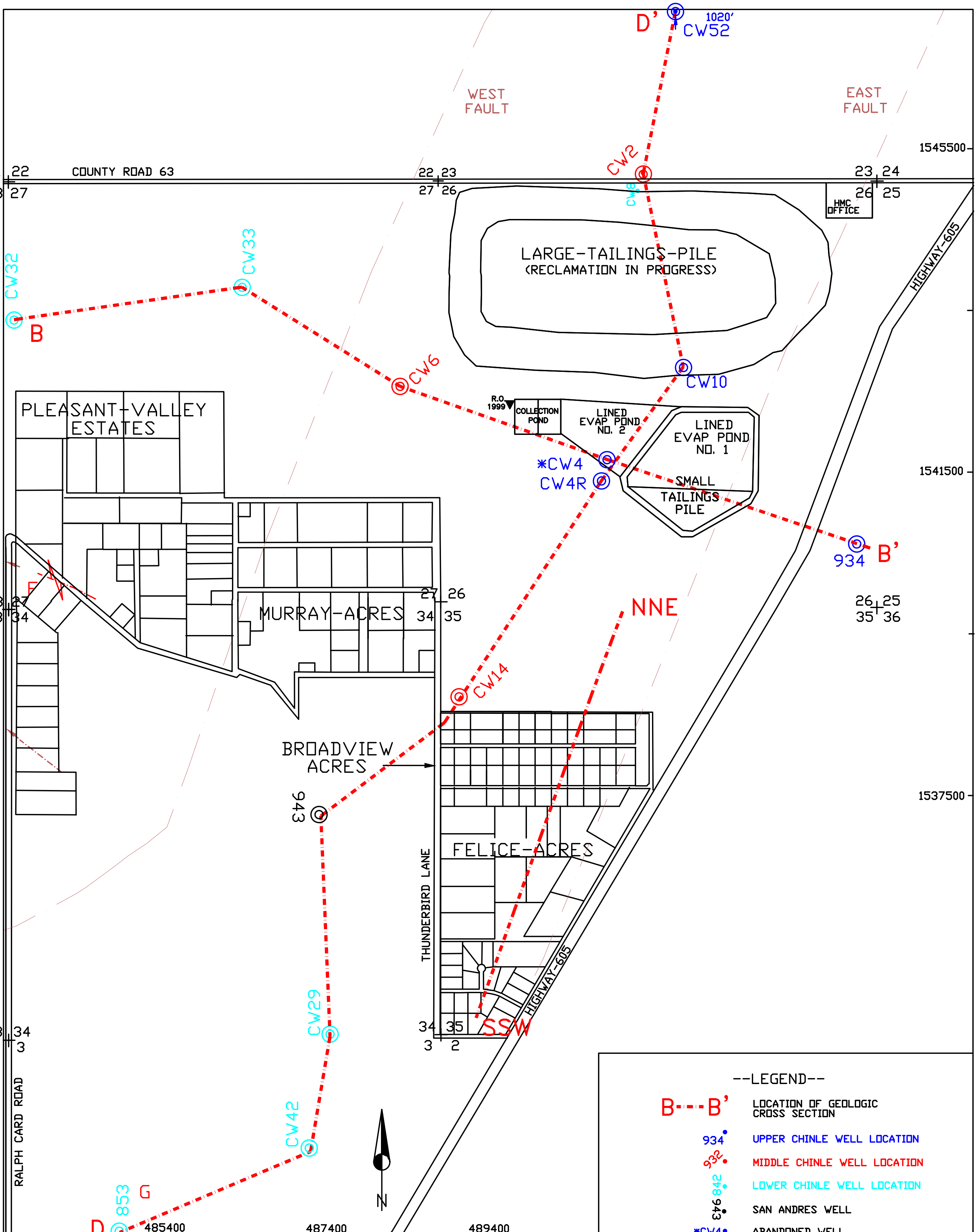


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FIGURE 1.1-1. LOCATIONS OF GEOLOGIC CROSS SECTIONS

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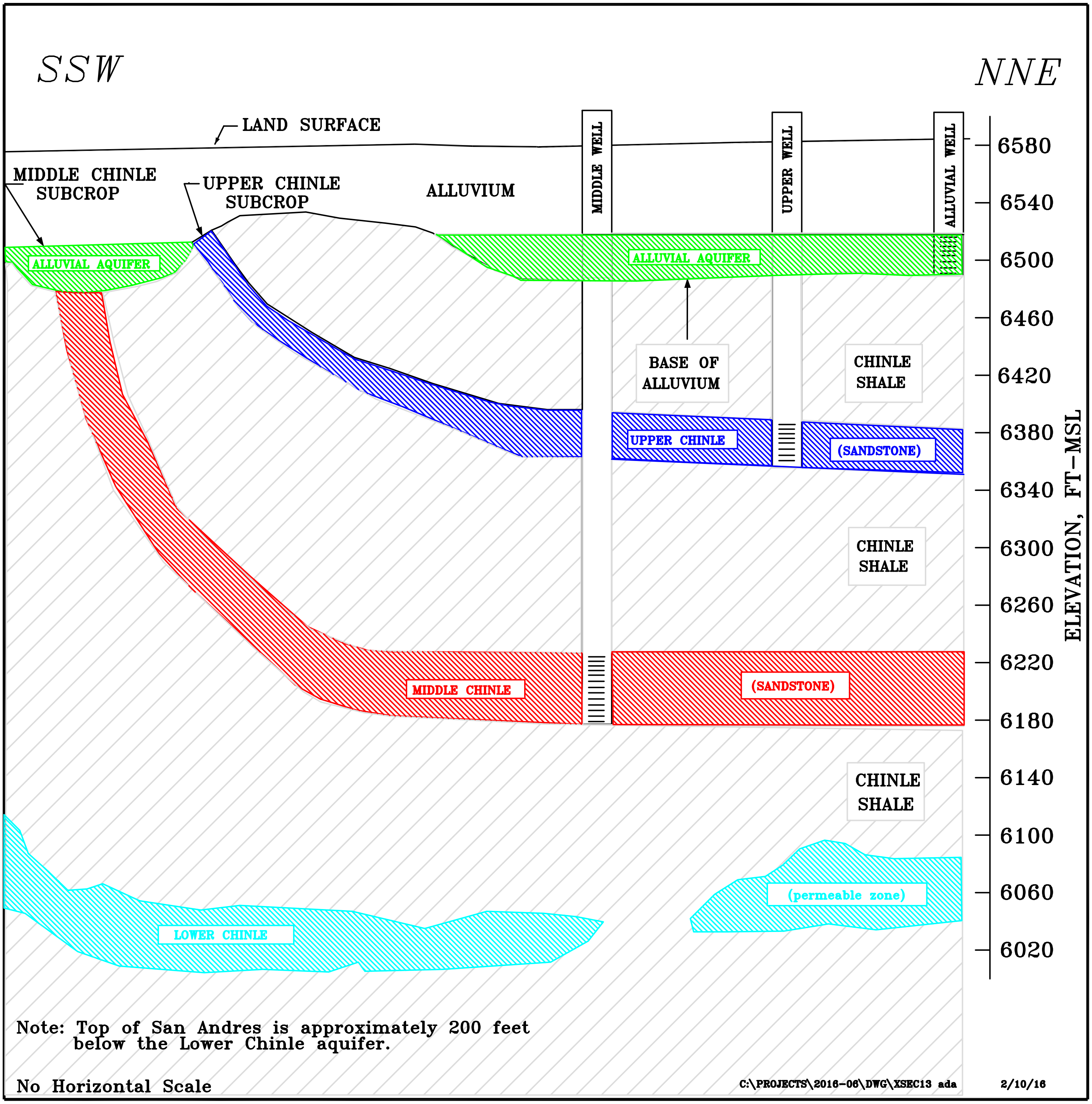
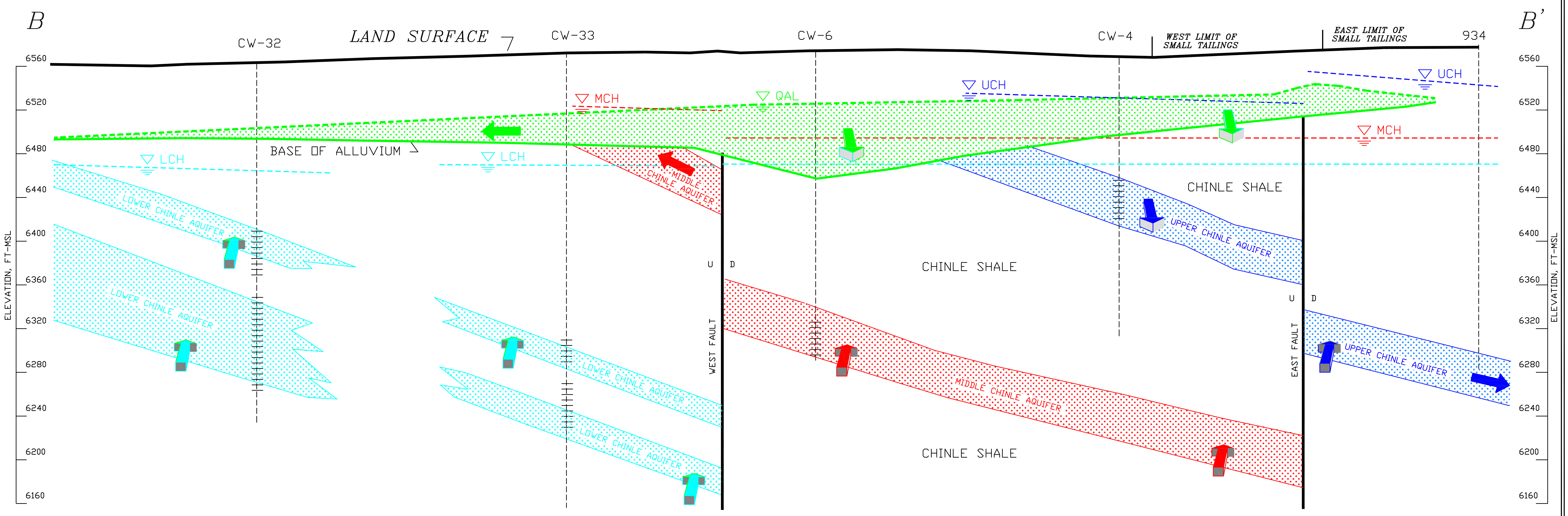



FIGURE 1.1–2. TYPICAL GEOLOGIC CROSS SECTION




LEGEND:

FLOW-DIRECTION

- INDICATES FLOW LATERALLY WITH PAGE
- INDICATES FLOW INTO PAGE
- INDICATES FLOW OUT OF PAGE

ALLUVIAL

- BASE
- QAL WATER LEVEL ELEVATION (WLE)

UPPLE CHINLE

- LIMITS OF SANDSTONE
- UCH WLE

MIDDLE CHINLE

- LIMITS OF SANDSTONE
- MCH WLE

LOWER CHINLE

- LIMITS OF AQUIFER
- LCH WLE

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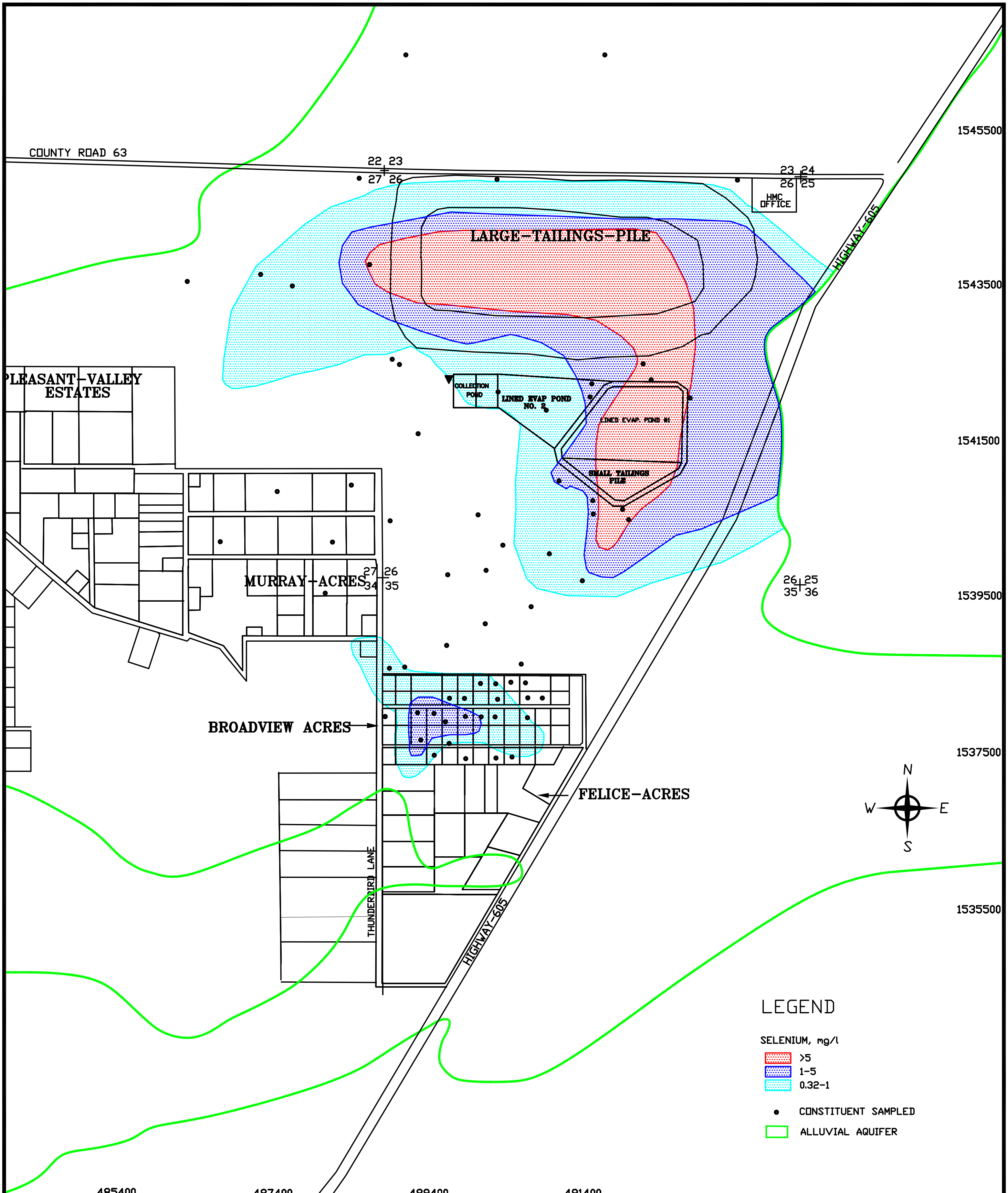
HOMESTAKE MINING COMPANY
MILAN, NEW MEXICO

*HYDRO-ENGINEERING, LLC* ~~~ DATE: 3/17/15 ~~~ SCALE: 1' = 600'

FIGURE 1.1-3. GEOLOGIC CROSS-SECTION B-B' WITH POST RESTORATION FLOW DIRECTION


FIGUIRE 1.1-4. GEOLOGIC CROSS-SECTION D-D' WITH POST RESTORATION FLOW DIRECTION




SCALE: 1"=1600'

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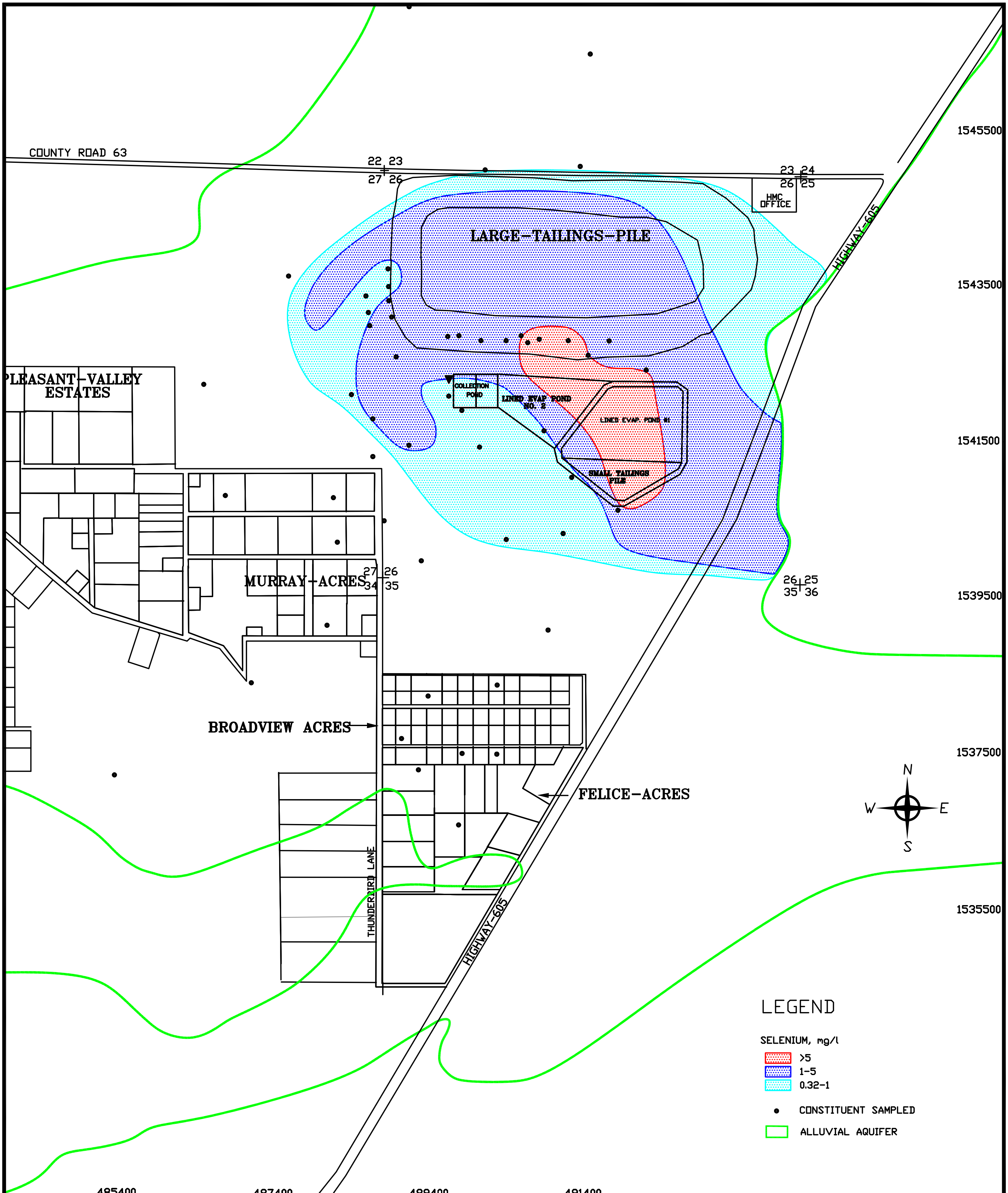
DATE: 1/30/2020

FIGURE 1.1–5. ALLUVIAL SELENIUM CONCENTRATIONS, 1976

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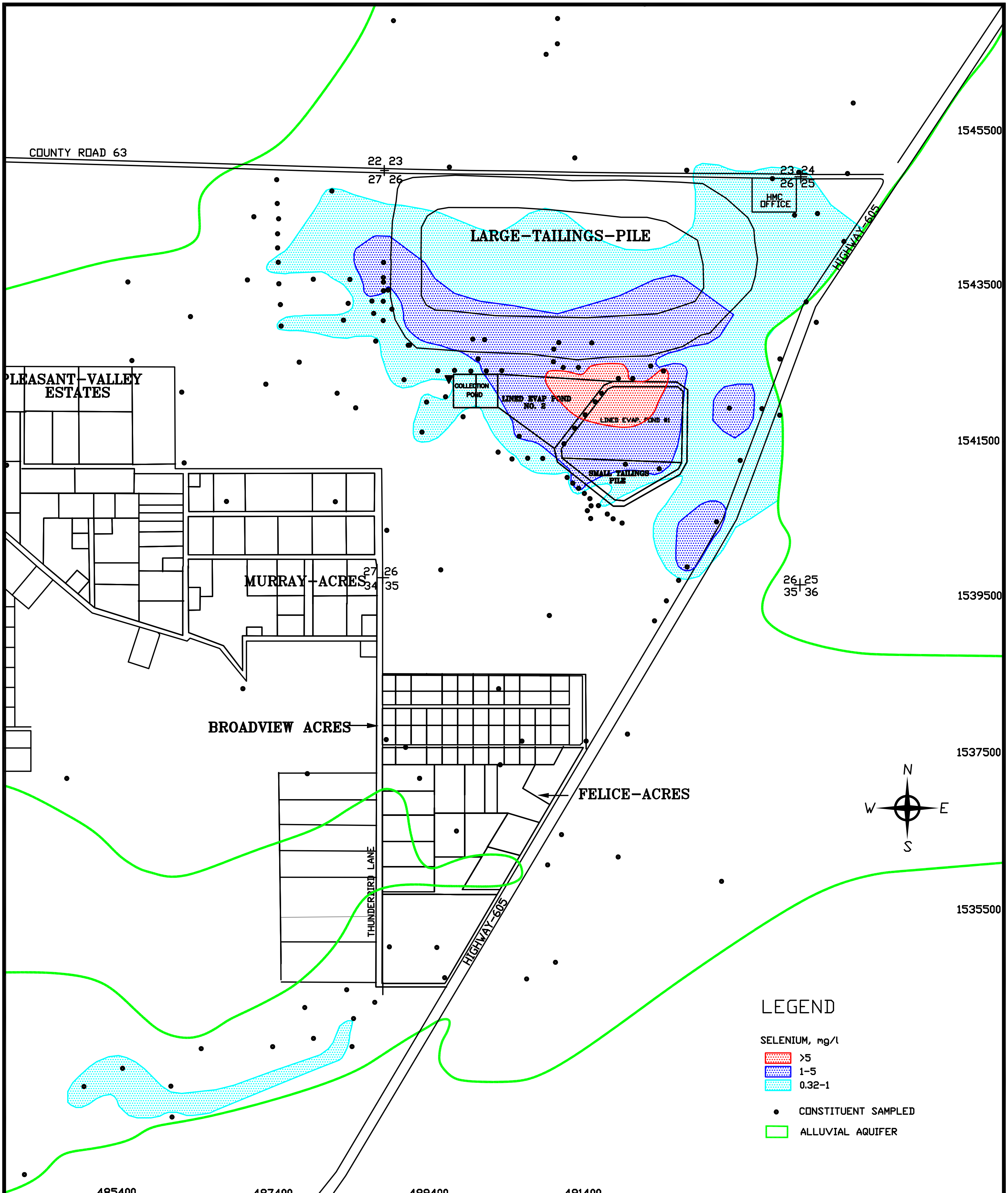
HEATMAPQAL

DATE: 1/30/2020

FIGURE 1.1-6. ALLUVIAL SELENIUM CONCENTRATIONS, 1988

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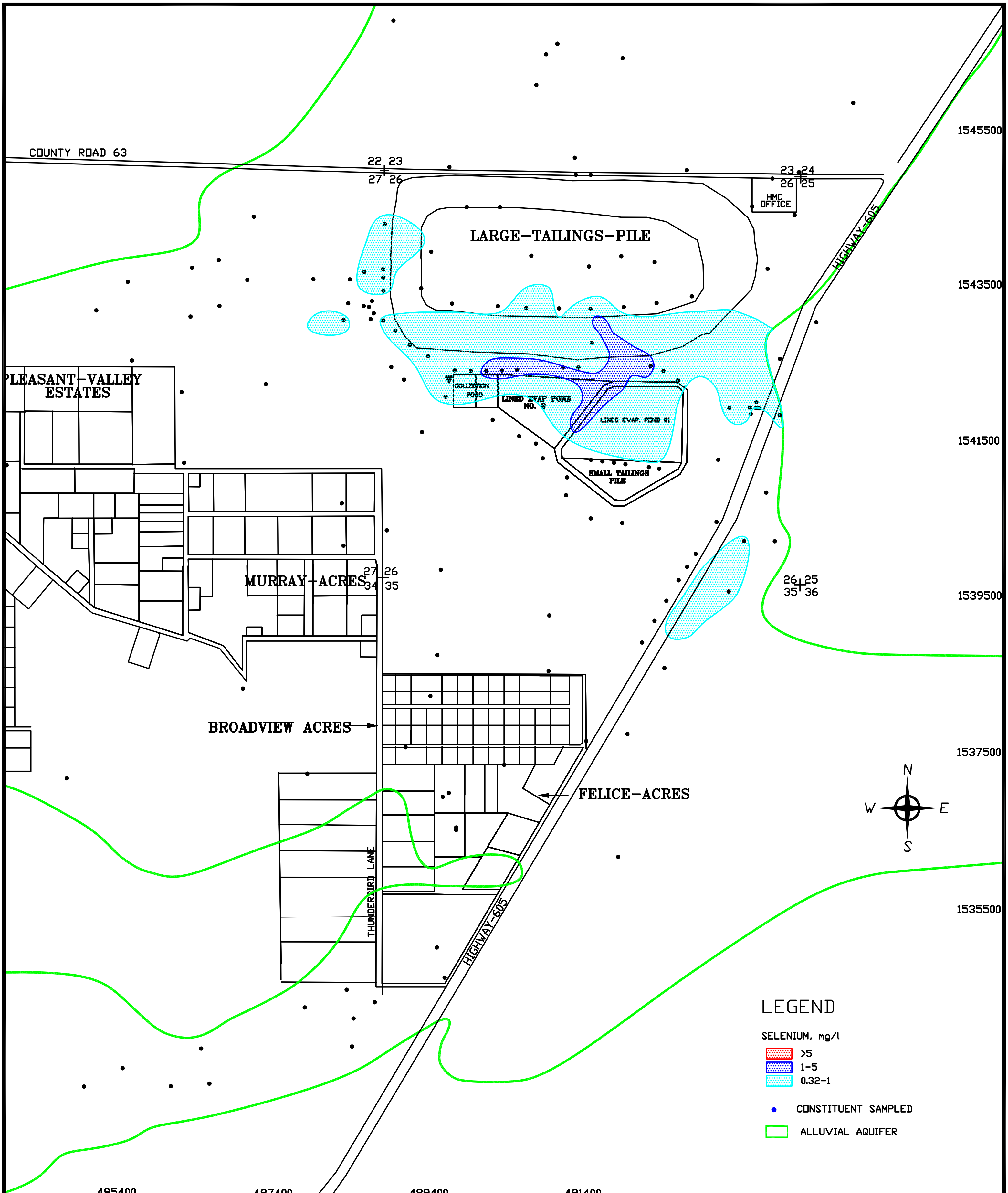
C:\PROJECTS\2020-06 HEATMAPQAL

DATE: 1/30/2020

FIGURE 1.1-7. ALLUVIAL SELENIUM CONCENTRATIONS, 1999




SCALE: 1"=1600'

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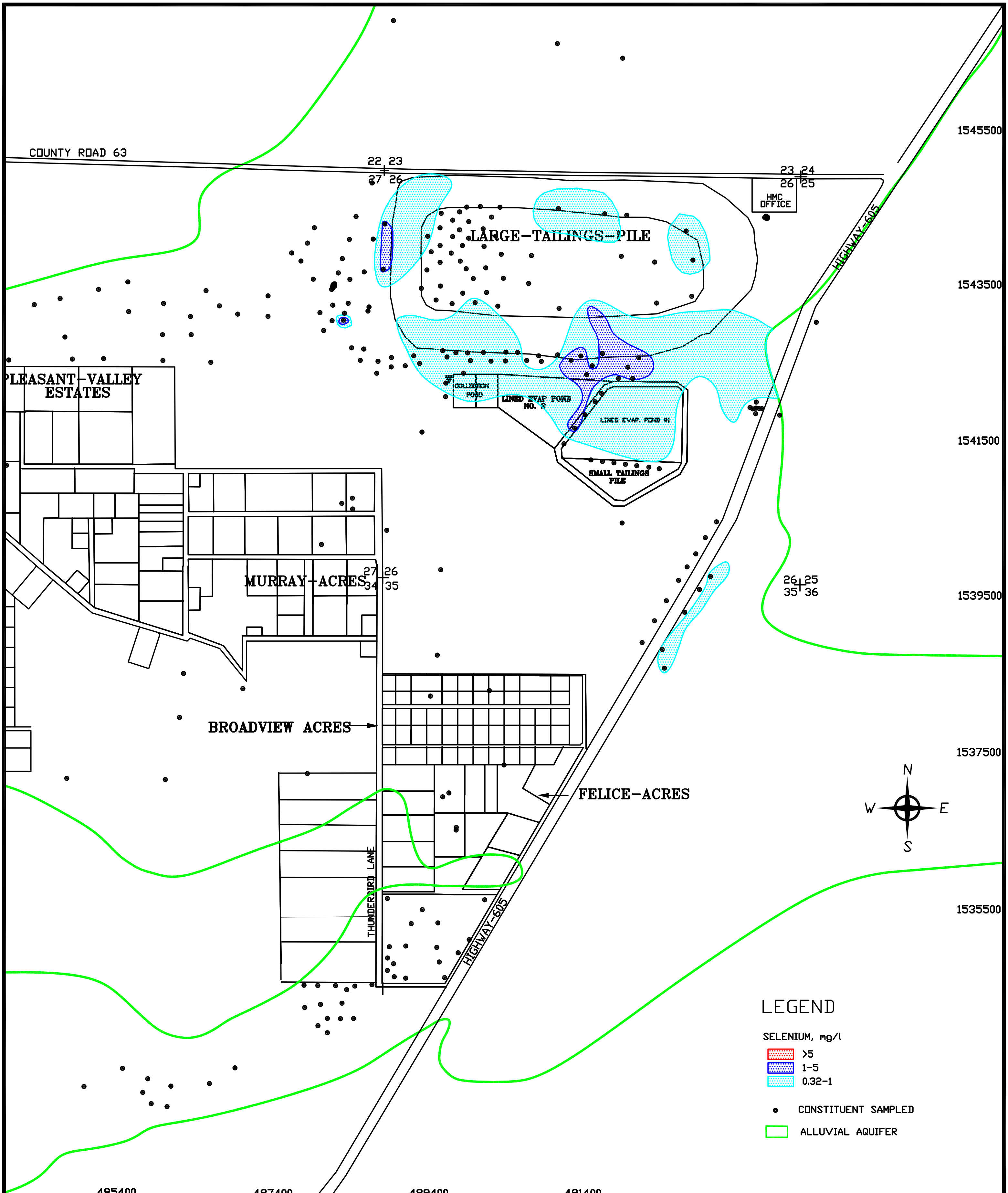
HEATMAPQAL

DATE: 1/31/2020

FIGURE 1.1-8. ALLUVIAL SELENIUM CONCENTRATIONS, 2009




SCALE: 1"=1600'

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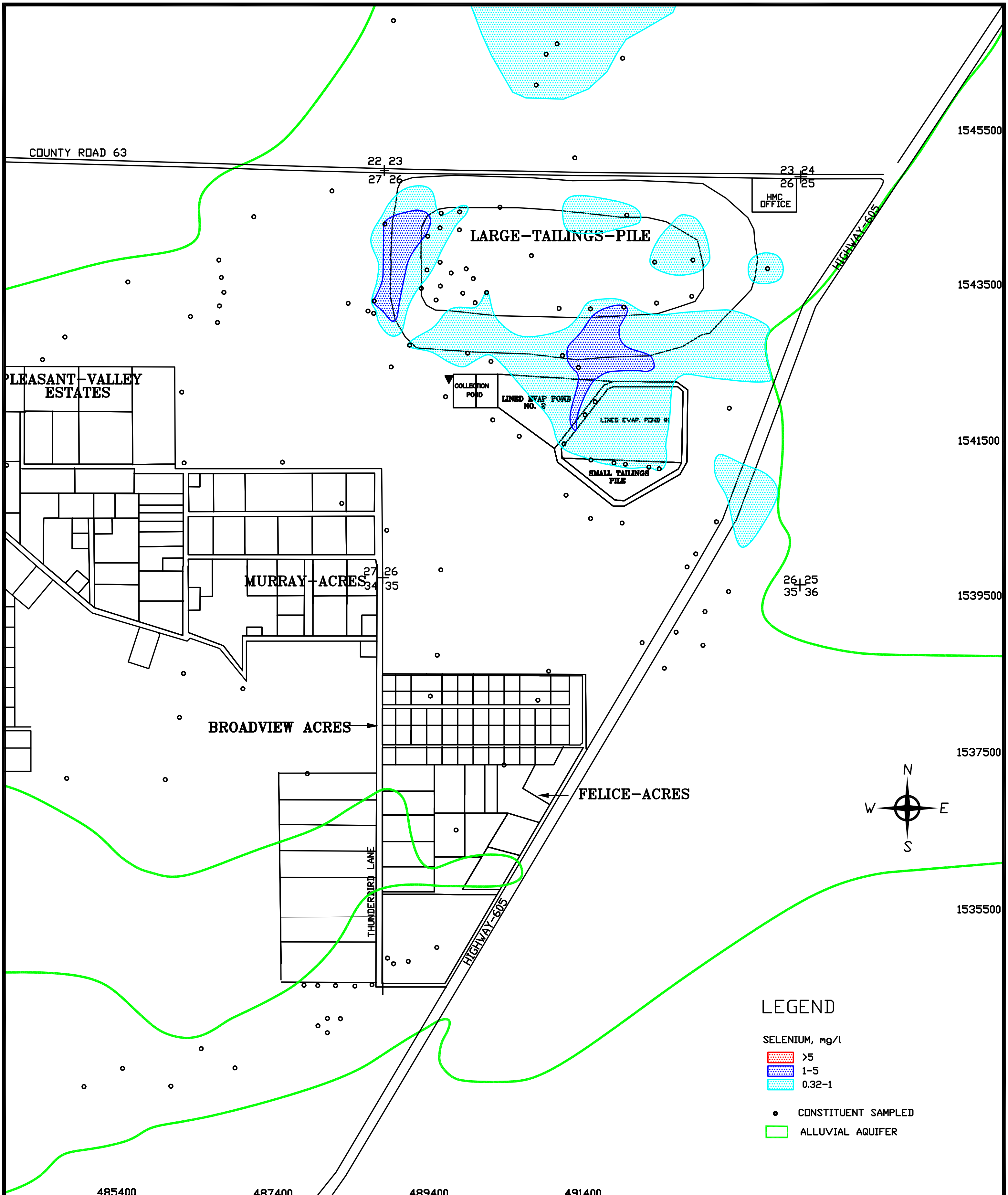
DATE: 1/31/2020

FIGURE 1.1-9. ALLUVIAL SELENIUM CONCENTRATIONS, 2014




SCALE: 1"=1600'

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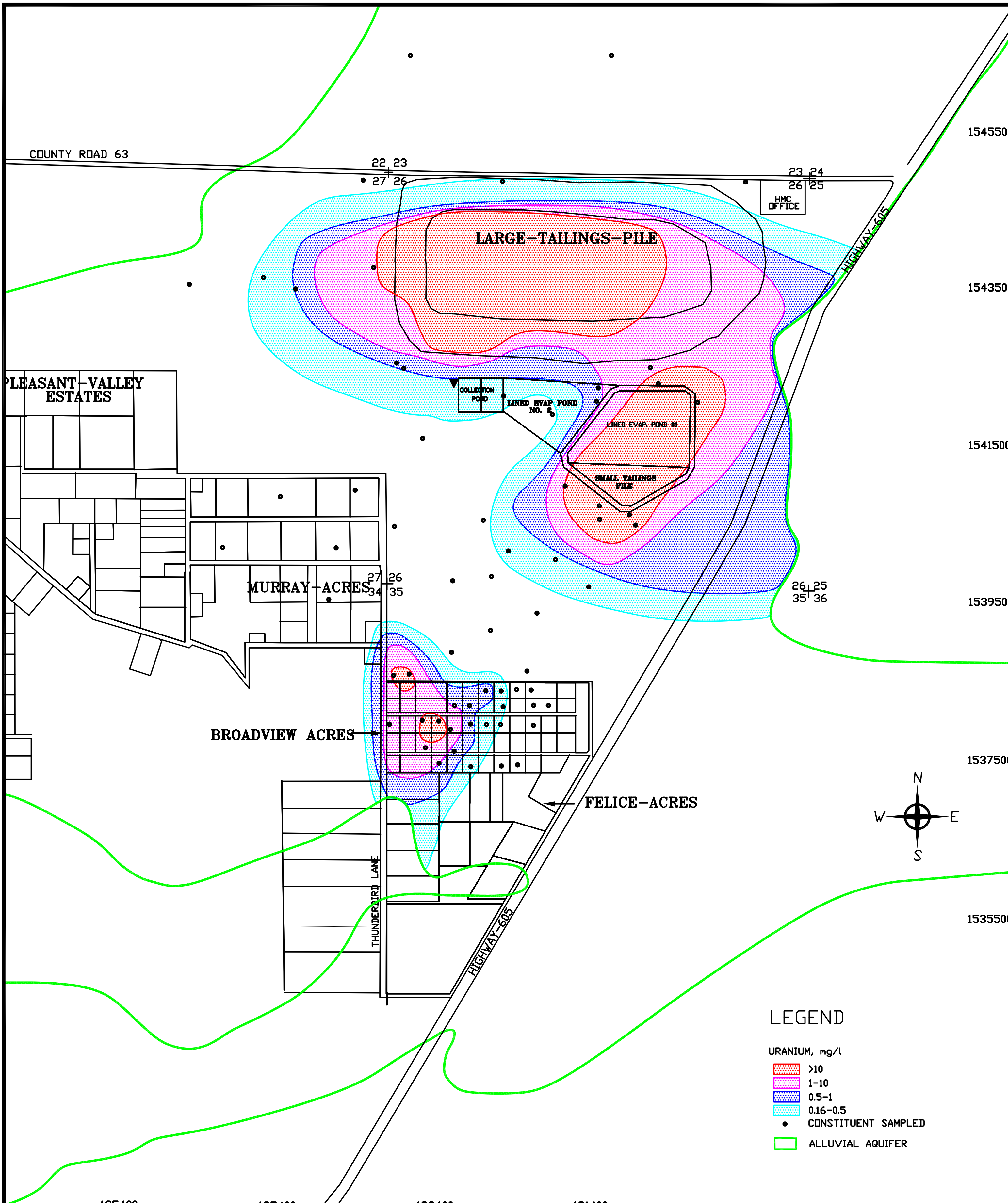
DATE: 2/25/2021

FIGURE 1.1-10. ALLUVIAL SELENIUM CONCENTRATIONS, 2020




SCALE: 1"=1600'

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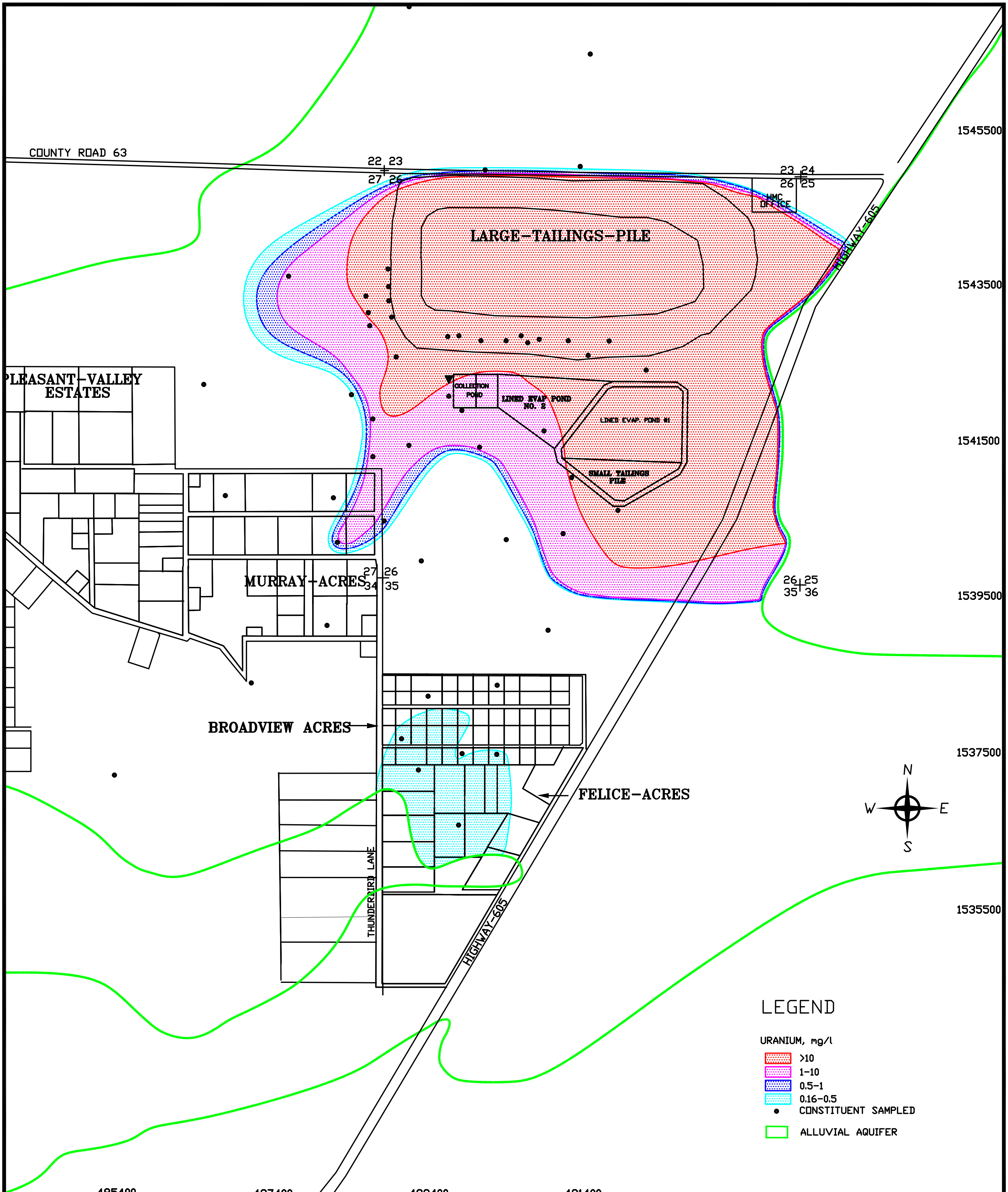
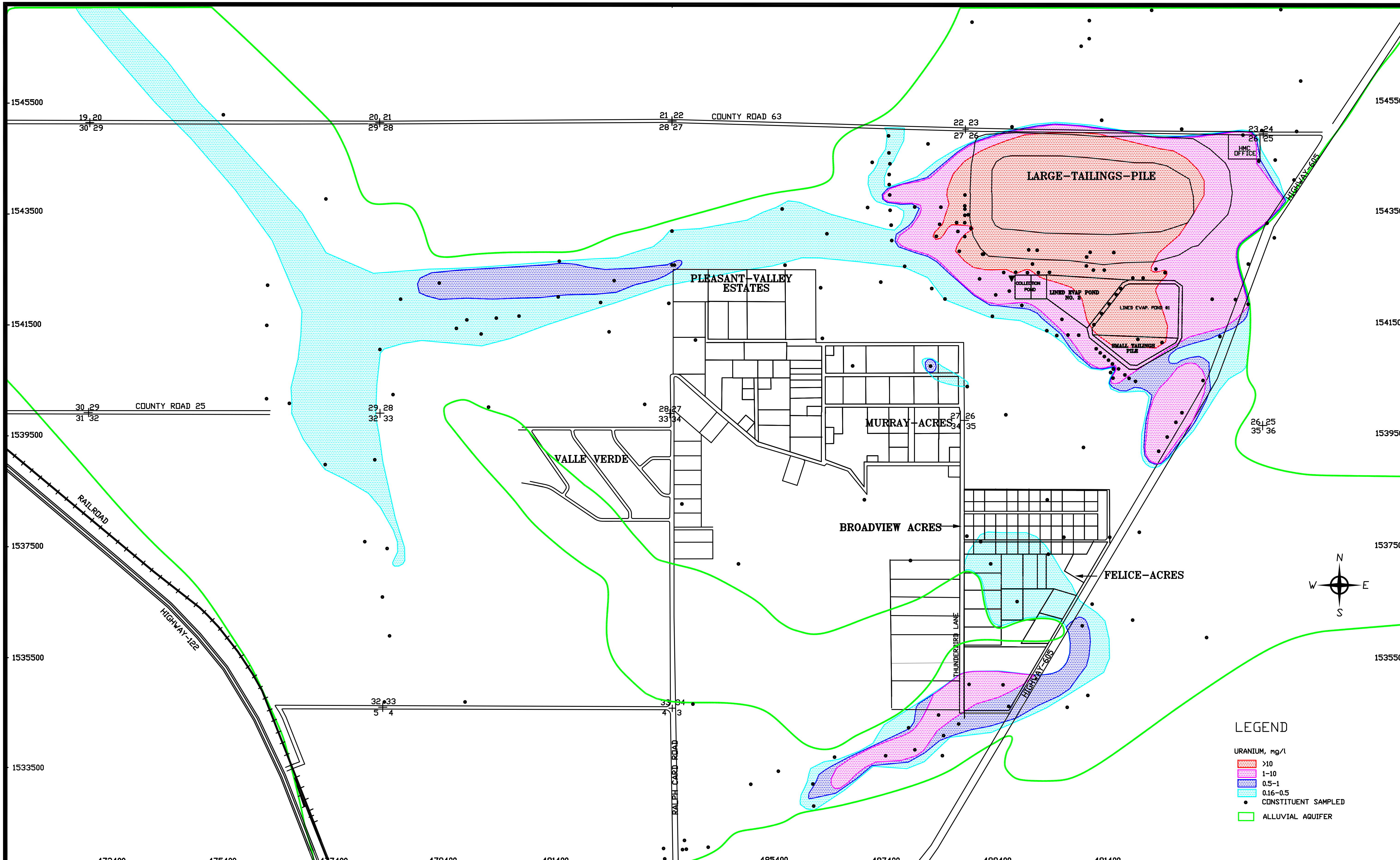
DATE: 1/31/2020

FIGURE 1.1-11. ALLUVIAL URANIUM CONCENTRATIONS, 1976




| | |
|---|---|
| SCALE: 1"=1600' | |
| C:\PROJECTS\2020-06 HEATMAPQAL | FIGURE 1.1-12. ALLUVIAL URANIUM CONCENTRATIONS, 1988 |
| DATE: 1/31/2020 | |

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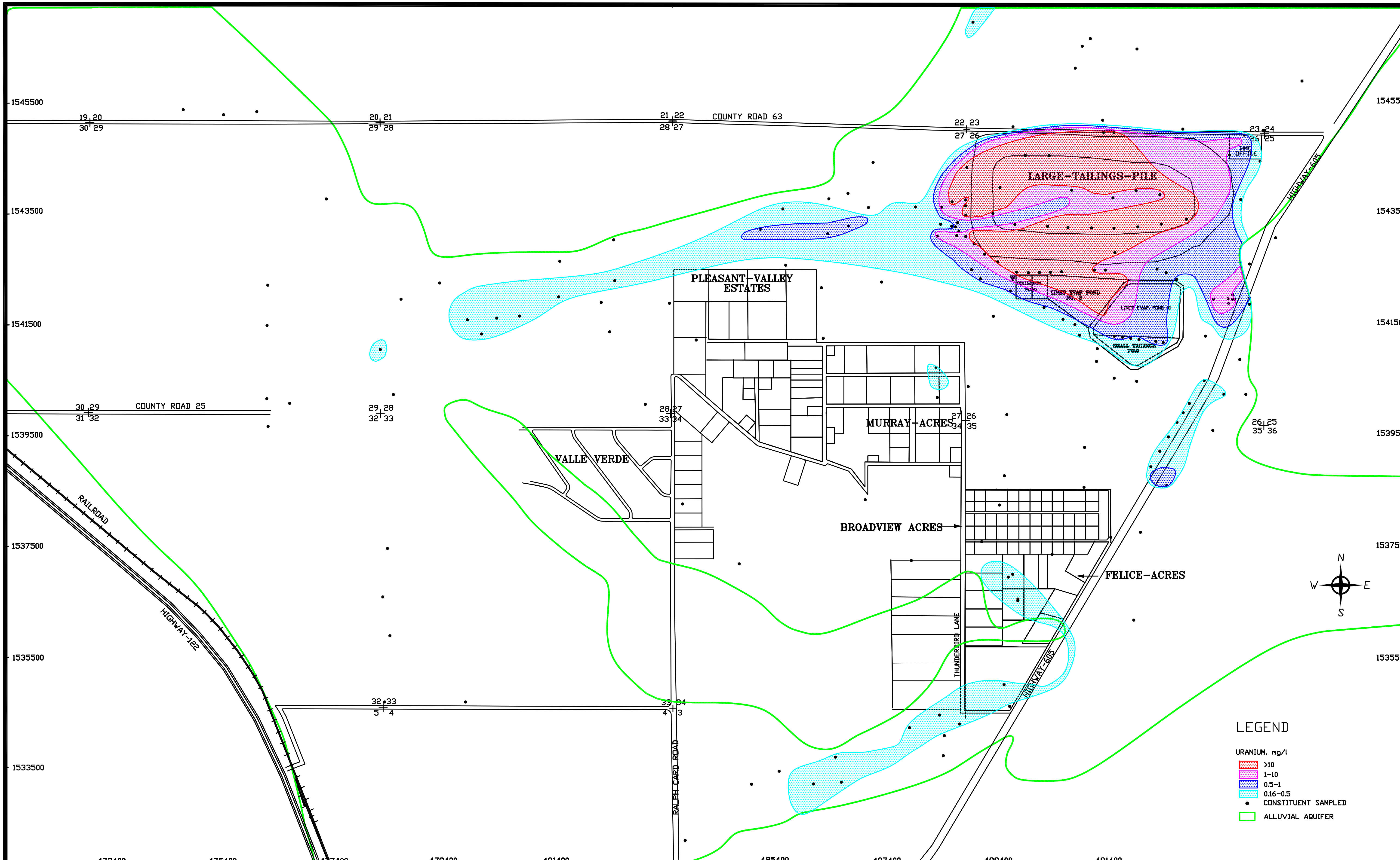
DATE: 2/28/19

FIG. 1.1-13. ALLUVIAL URANIUM CONCENTRATIONS, 1999

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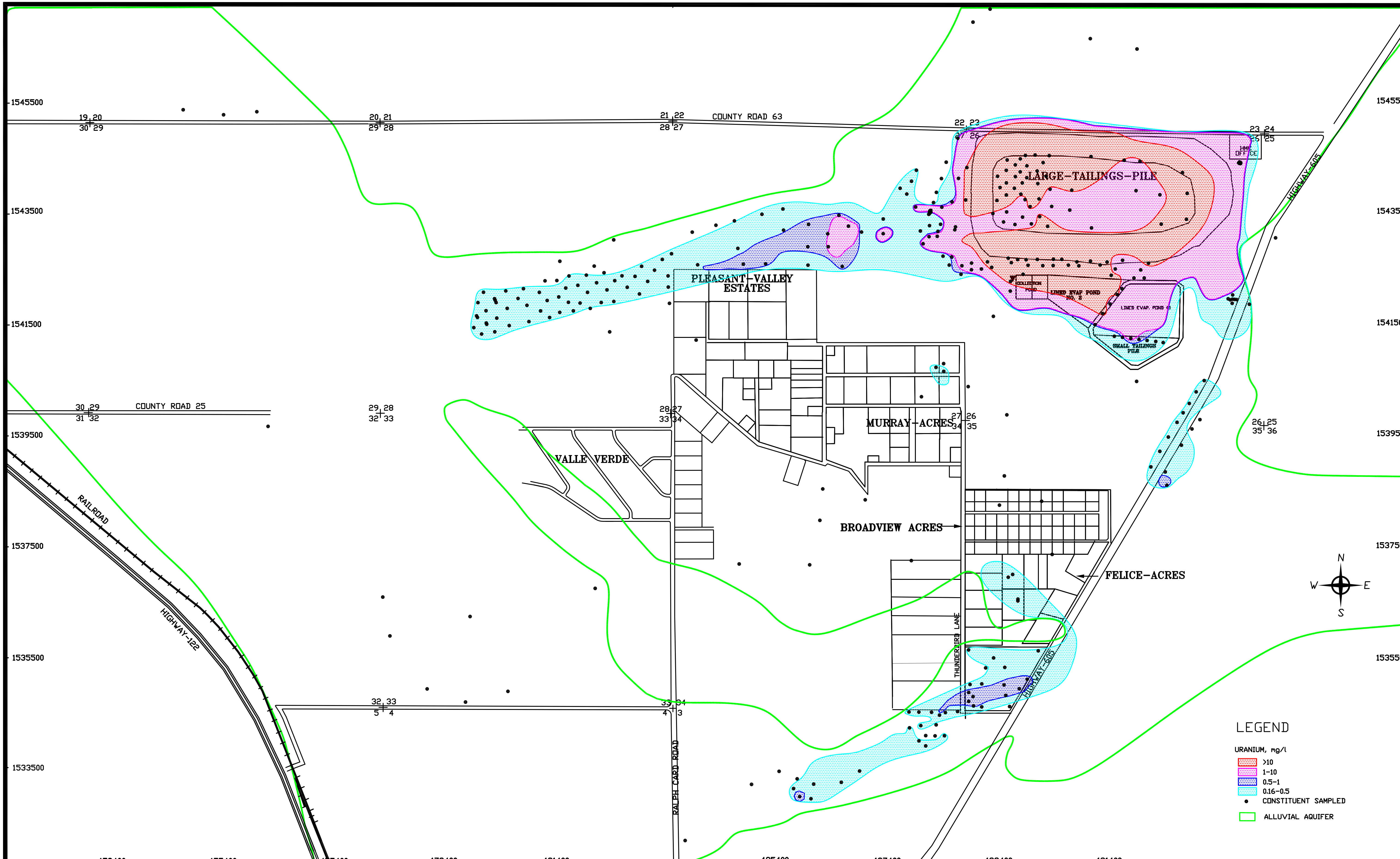
DATE: 2/28/19

FIG. 1.1-14. ALLUVIAL URANIUM CONCENTRATIONS, 2009




SCALE: 1"=1600'
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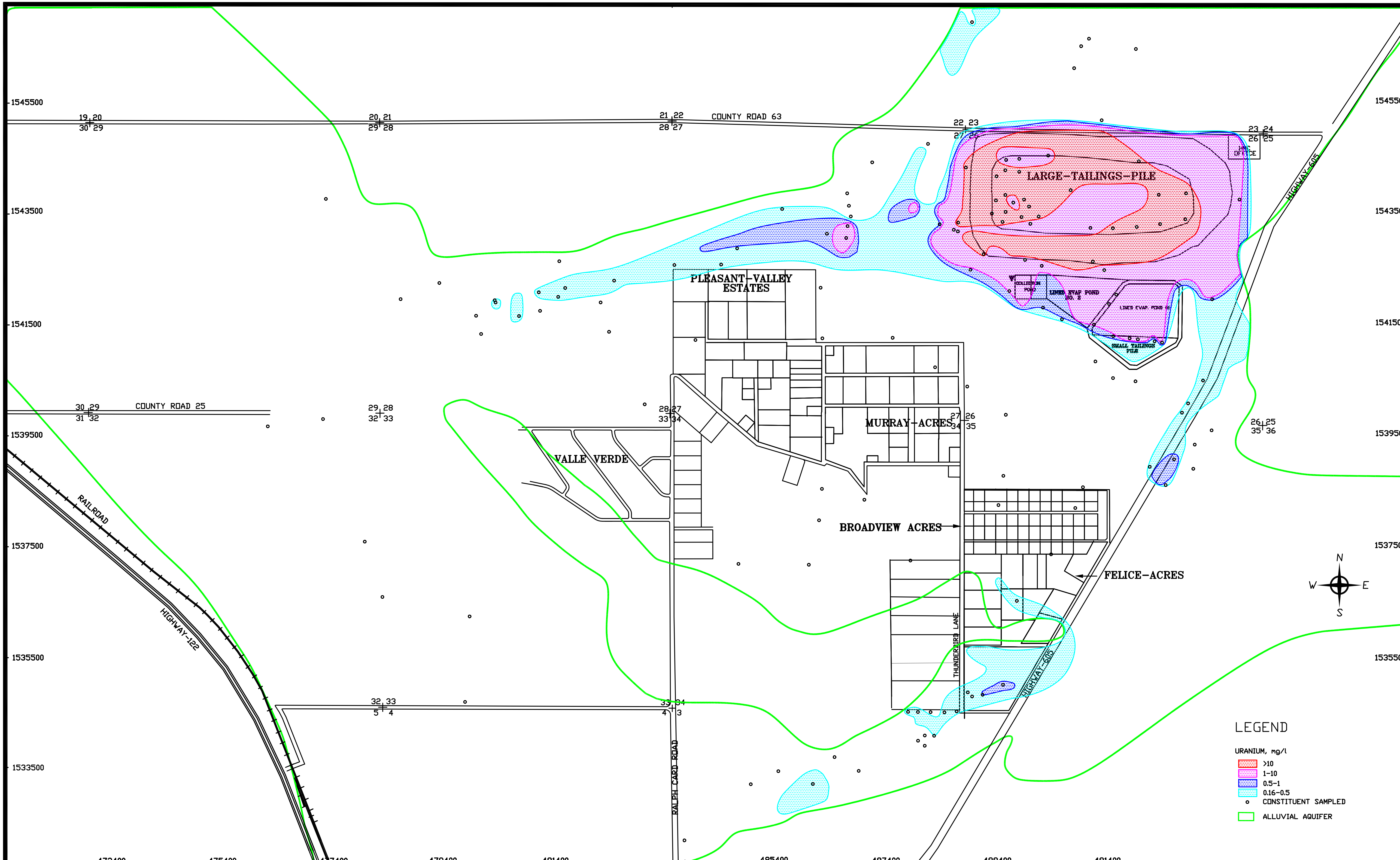
HEATMAPQAL
DATE: 2/28/19

FIGURE 1.1-15. ALLUVIAL URANIUM CONCENTRATIONS, 2014




SCALE: 1"=1600'
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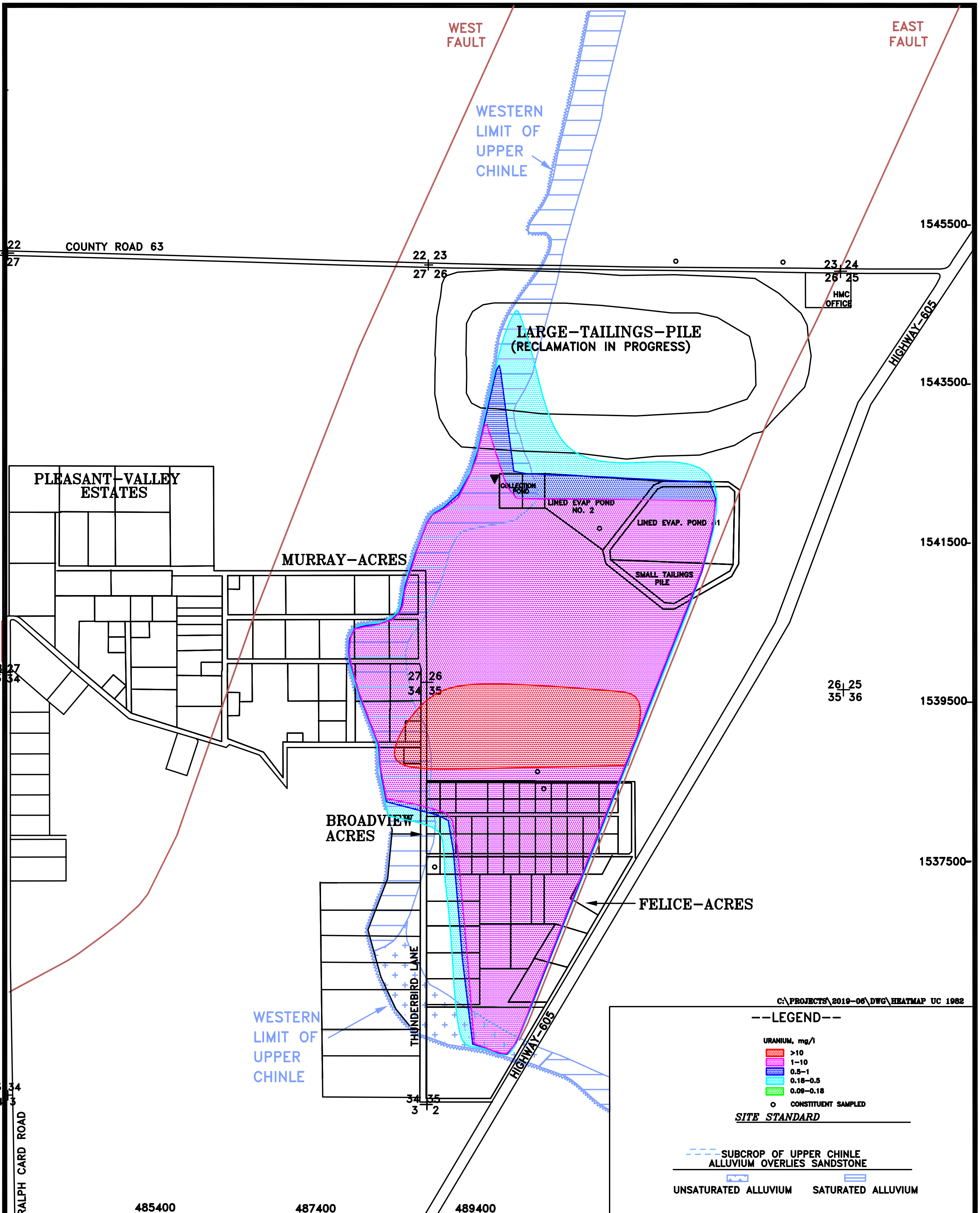
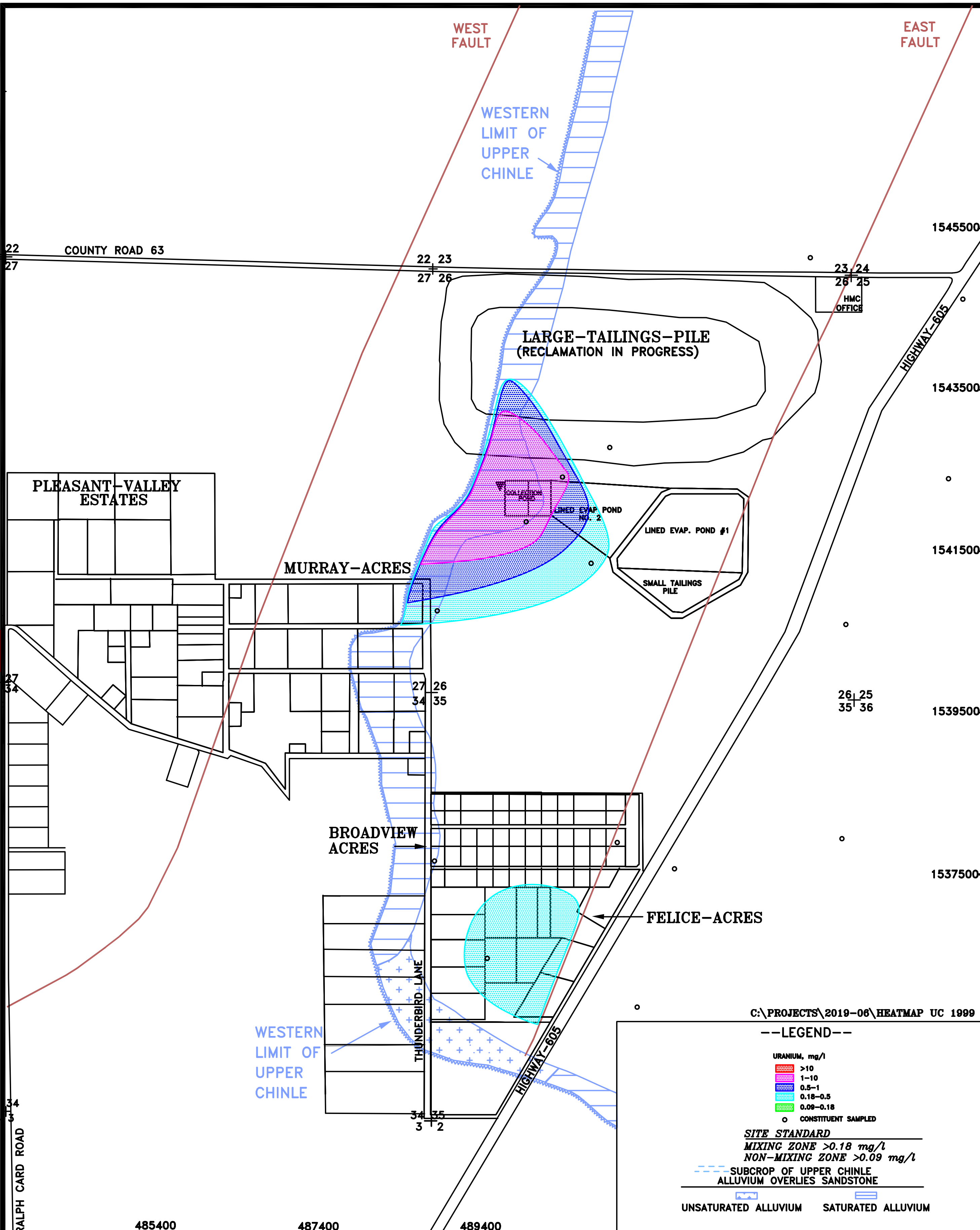
DATE: 2/25/21

FIG. 1.1-16. ALLUVIAL URANIUM CONCENTRATIONS, 2020




| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 3/1/19 |
| --- | --- |
| FIGURE 1.1-17 UPPER CHINLE URANIUM CONCENTRATIONS, 1982 | SCALE: 1"= 1600' |
| | PAGE: 1.1-27 |

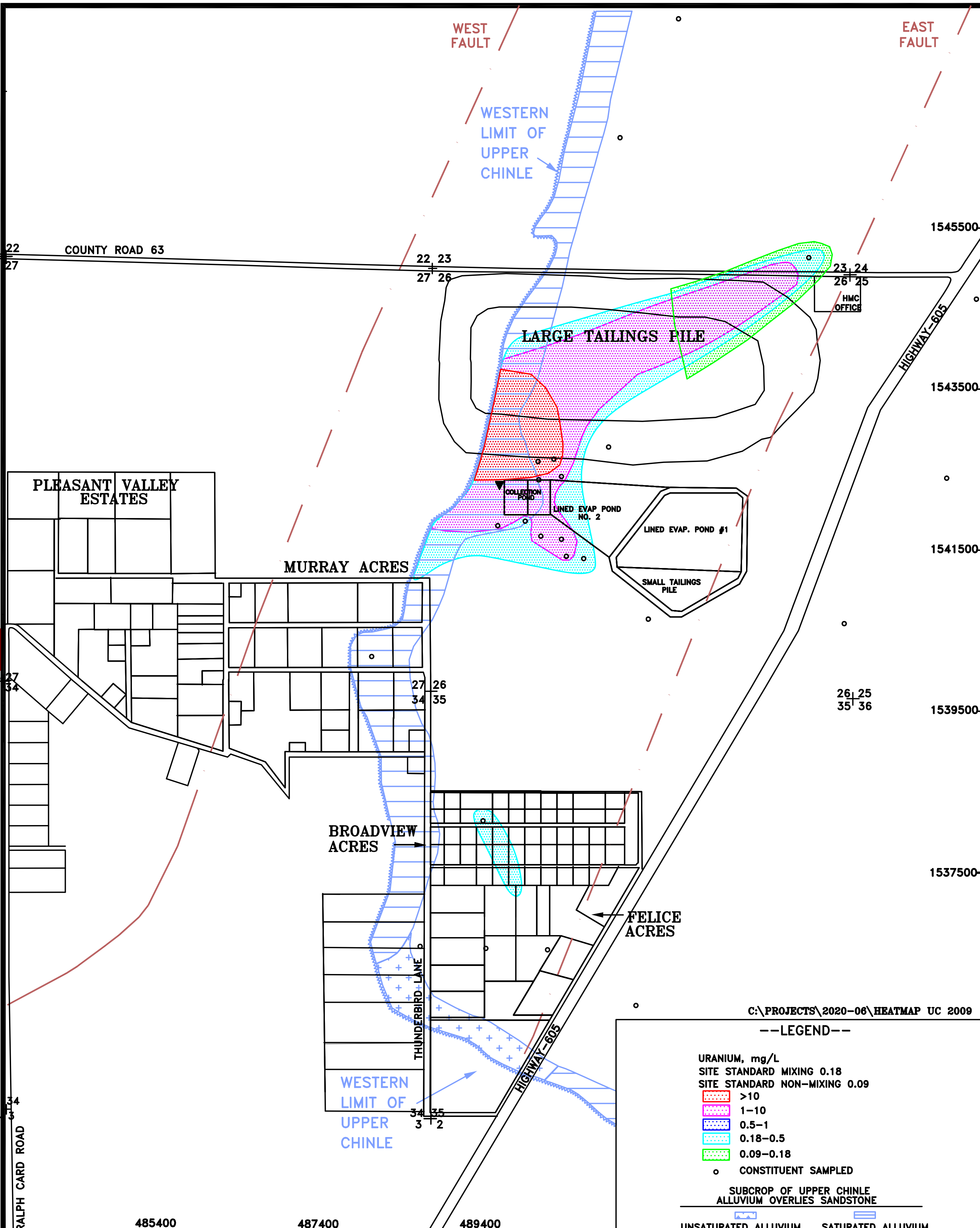



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

DATE: 3/1/19

SCALE: 1"= 1600'

FIGURE 1.1-18 UPPER CHINLE URANIUM CONCENTRATIONS, 1999

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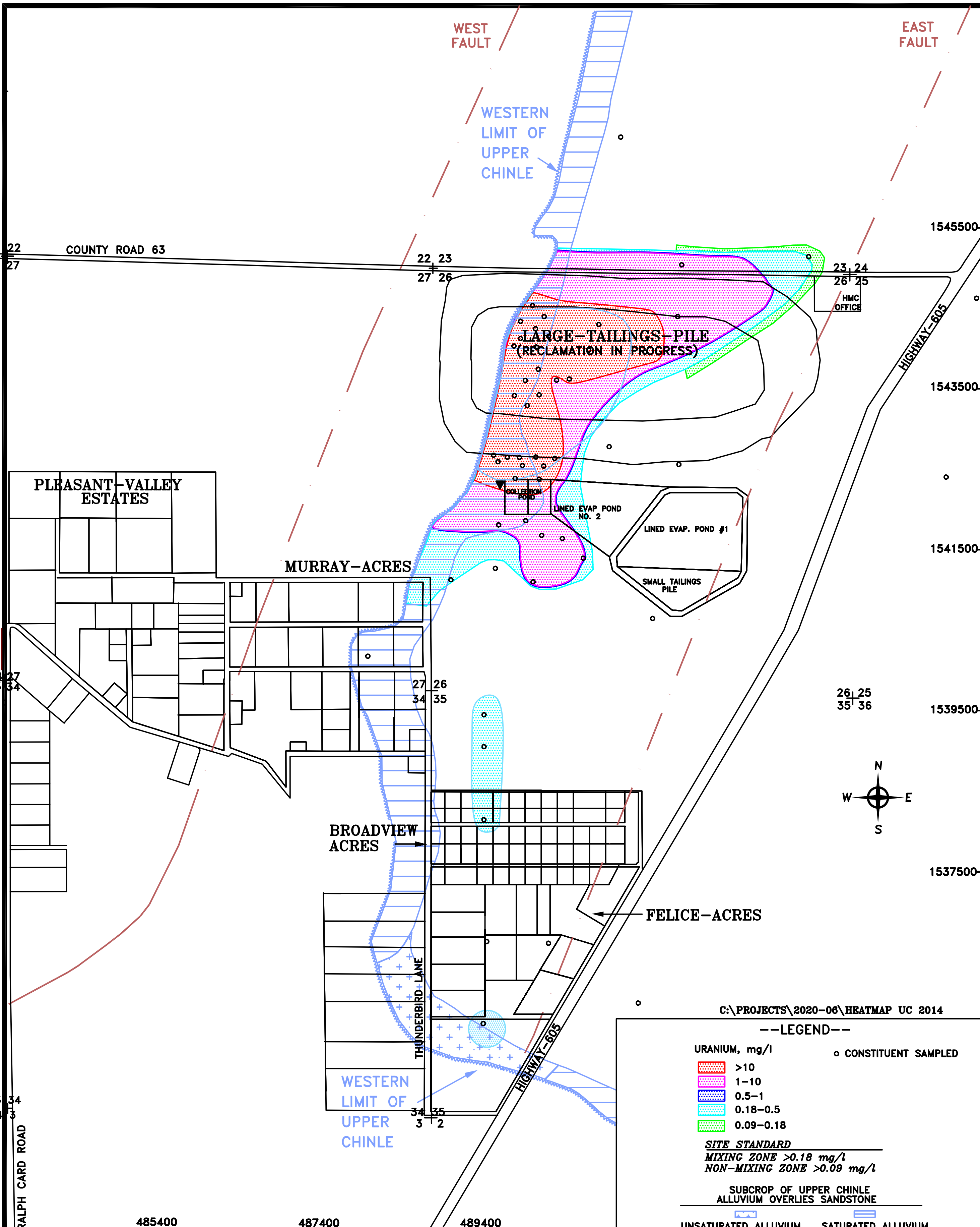
| HOMESTAKE SITE AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 1/31/2020 |
| FIGURE 1.1-19 UPPER CHINLE URANIUM CONCENTRATIONS, 2009 | SCALE: 1"= 1600' |
| | PAGE: 1.1-29 |

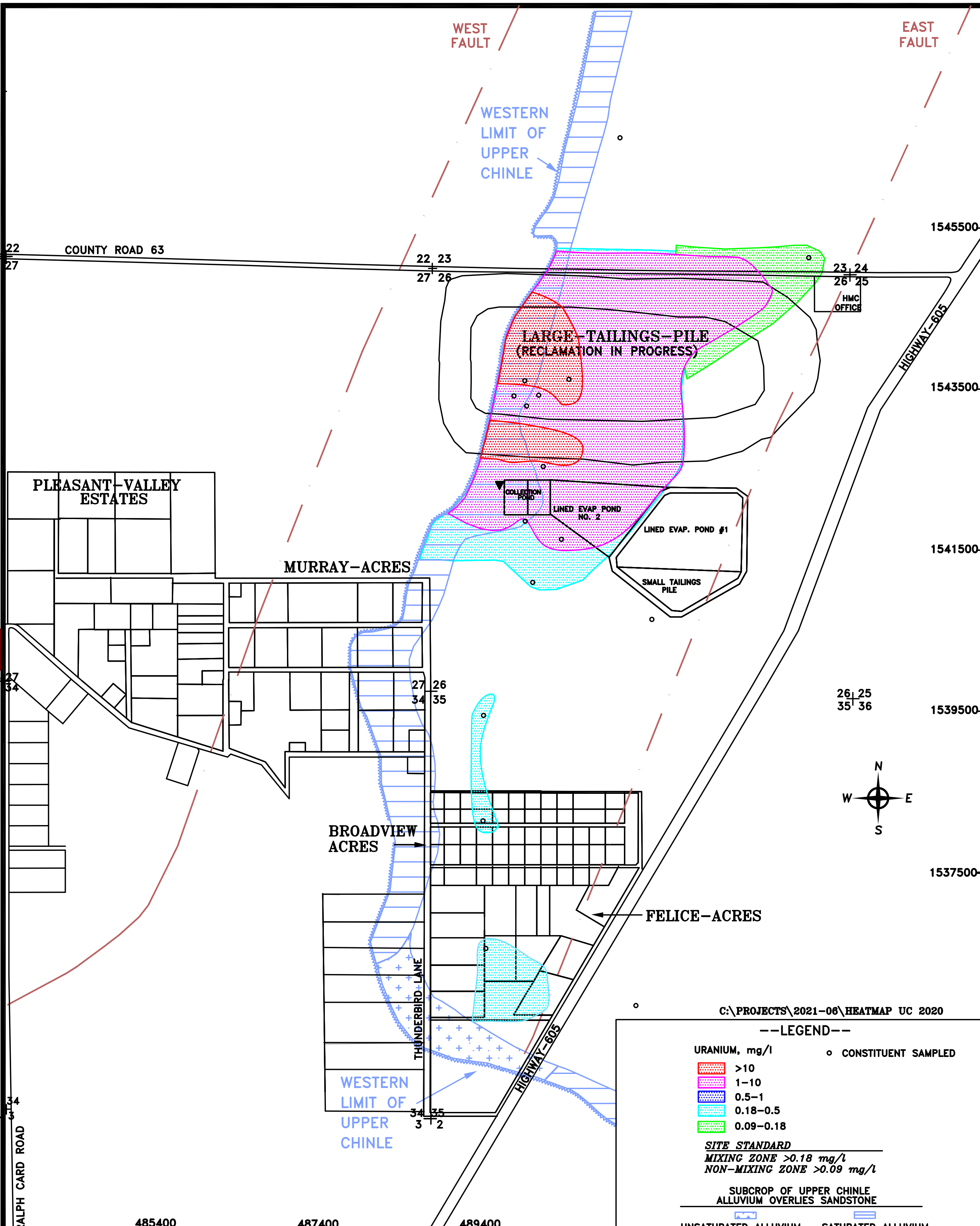



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

FIGURE 1.1-20 UPPER CHINLE URANIUM CONCENTRATIONS, 2014

DATE: 1/31/2020

SCALE: 1"= 1600'

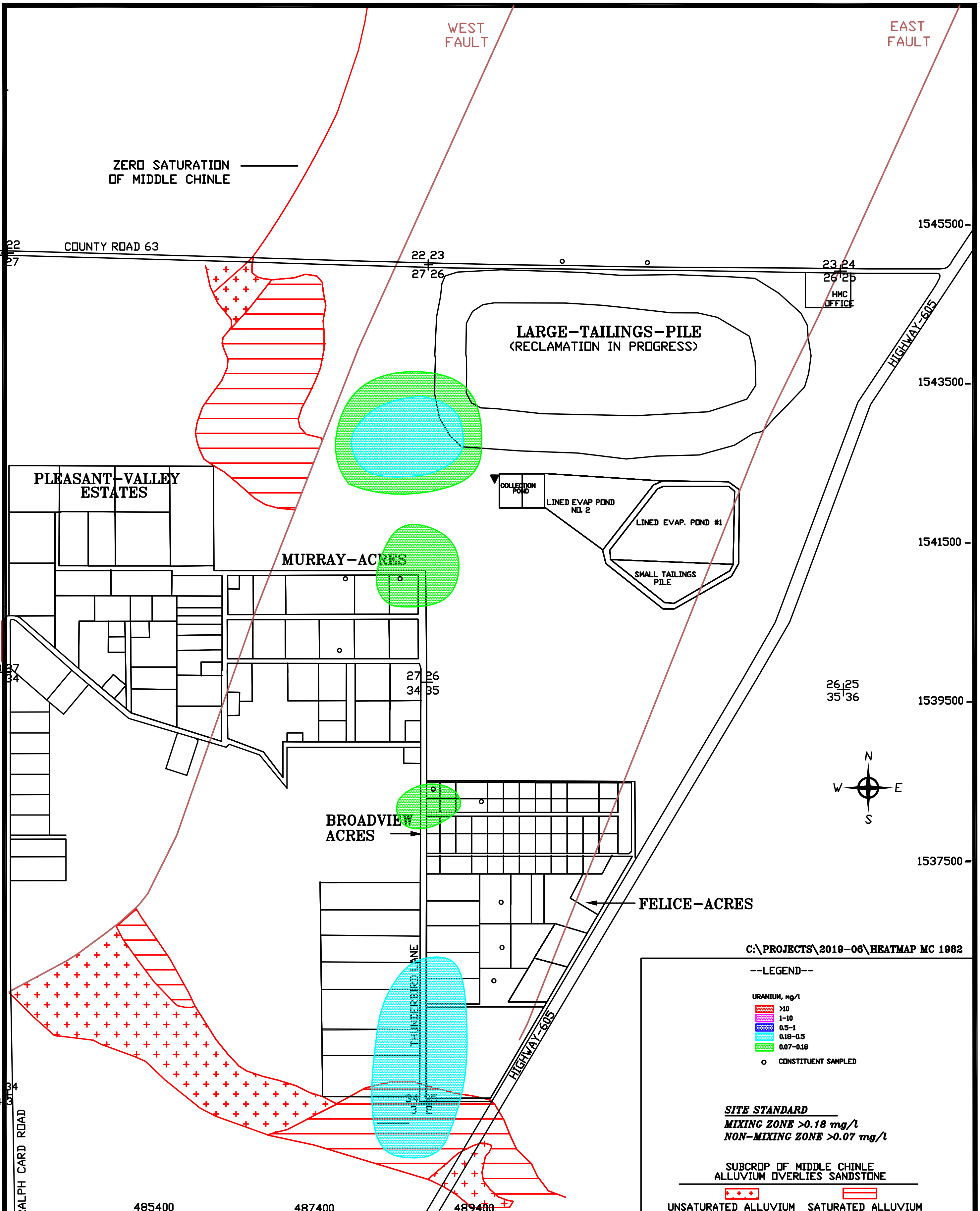



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

FIGURE 1.1-21. UPPER CHINLE URANIUM CONCENTRATIONS, 2020

DATE: 2/25/2021

SCALE: 1"= 1600'

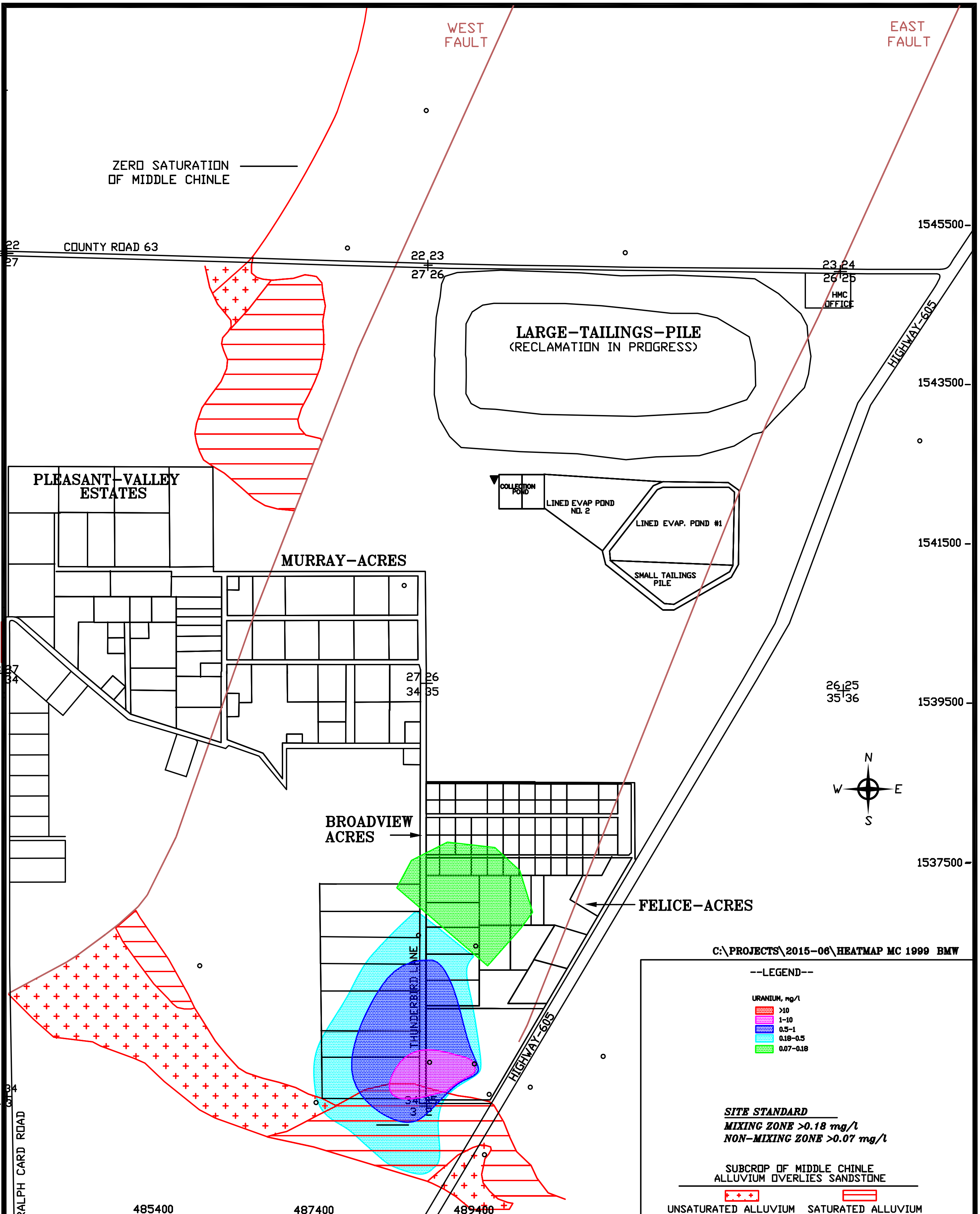



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**DATE: 3/1/19**

**SCALE: 1"= 1600'**

**FIGURE 1.1-22. MIDDLE CHINLE URANIUM CONCENTRATIONS 1982**

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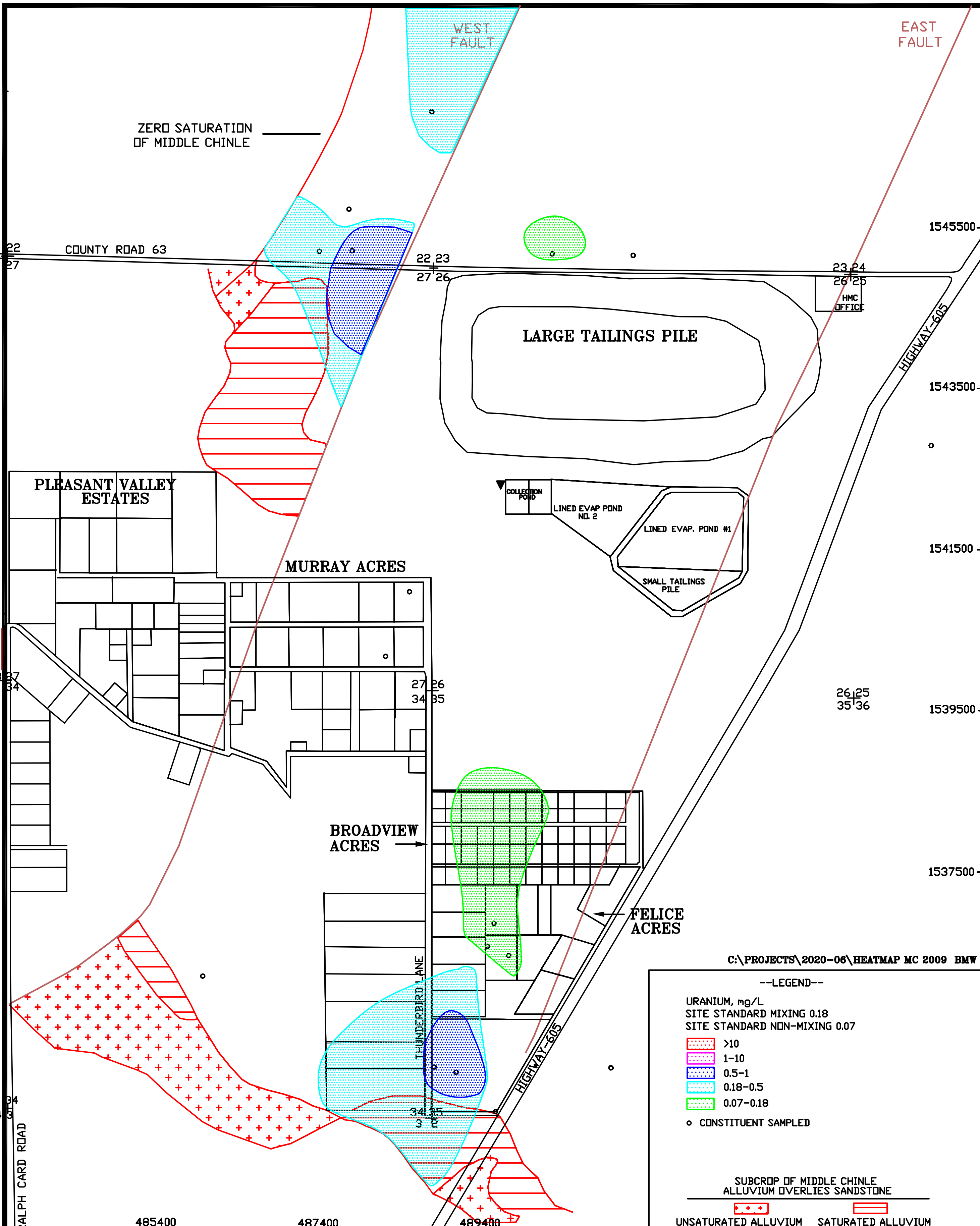
| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | **DATE: 3/1/19** |
| **FIGURE 1.1-23. MIDDLE CHINLE URANIUM CONCENTRATIONS 1999** | **SCALE: 1"= 1600'** |
| | **PAGE: 1.1-33** |

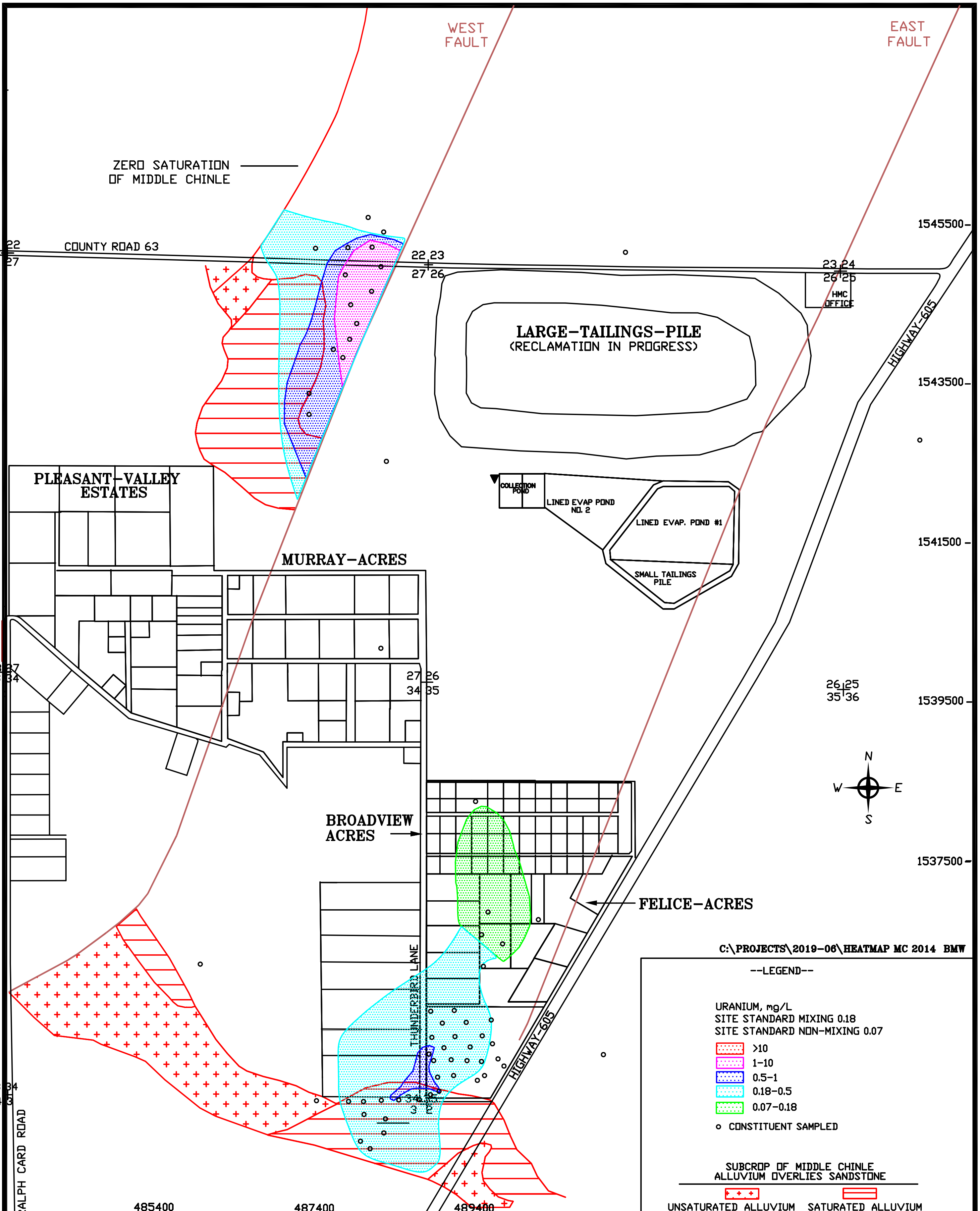



HOMESTAKE SITE AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**DATE: 3/1/19**

**SCALE: 1"= 1600'**

**FIGURE 1.1-24. MIDDLE CHINLE URANIUM CONCENTRATIONS 2009**

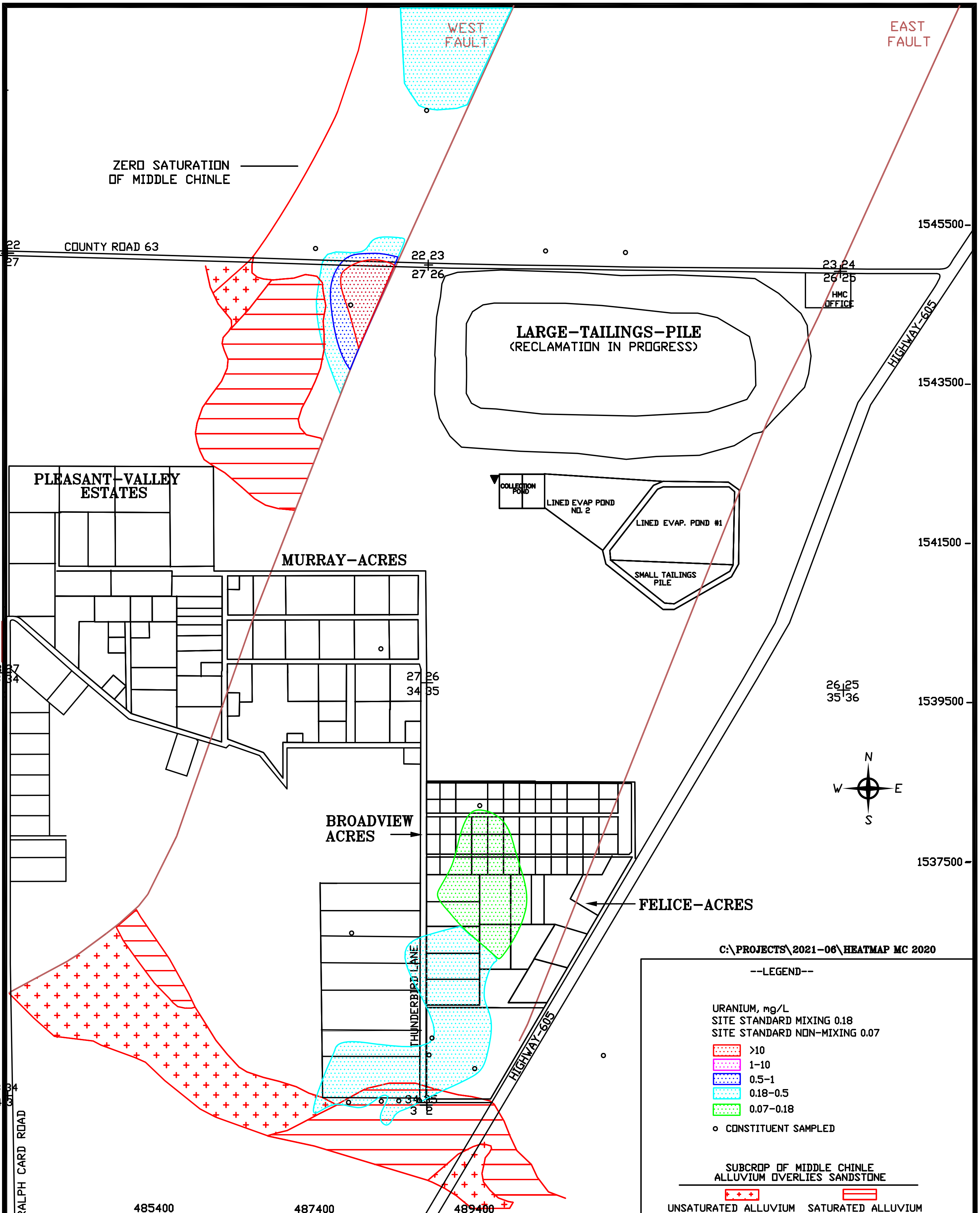



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**FIGURE 1.1-25. MIDDLE CHINLE URANIUM CONCENTRATIONS 2014**

**DATE: 3/1/19**

**SCALE: 1"= 1600'**

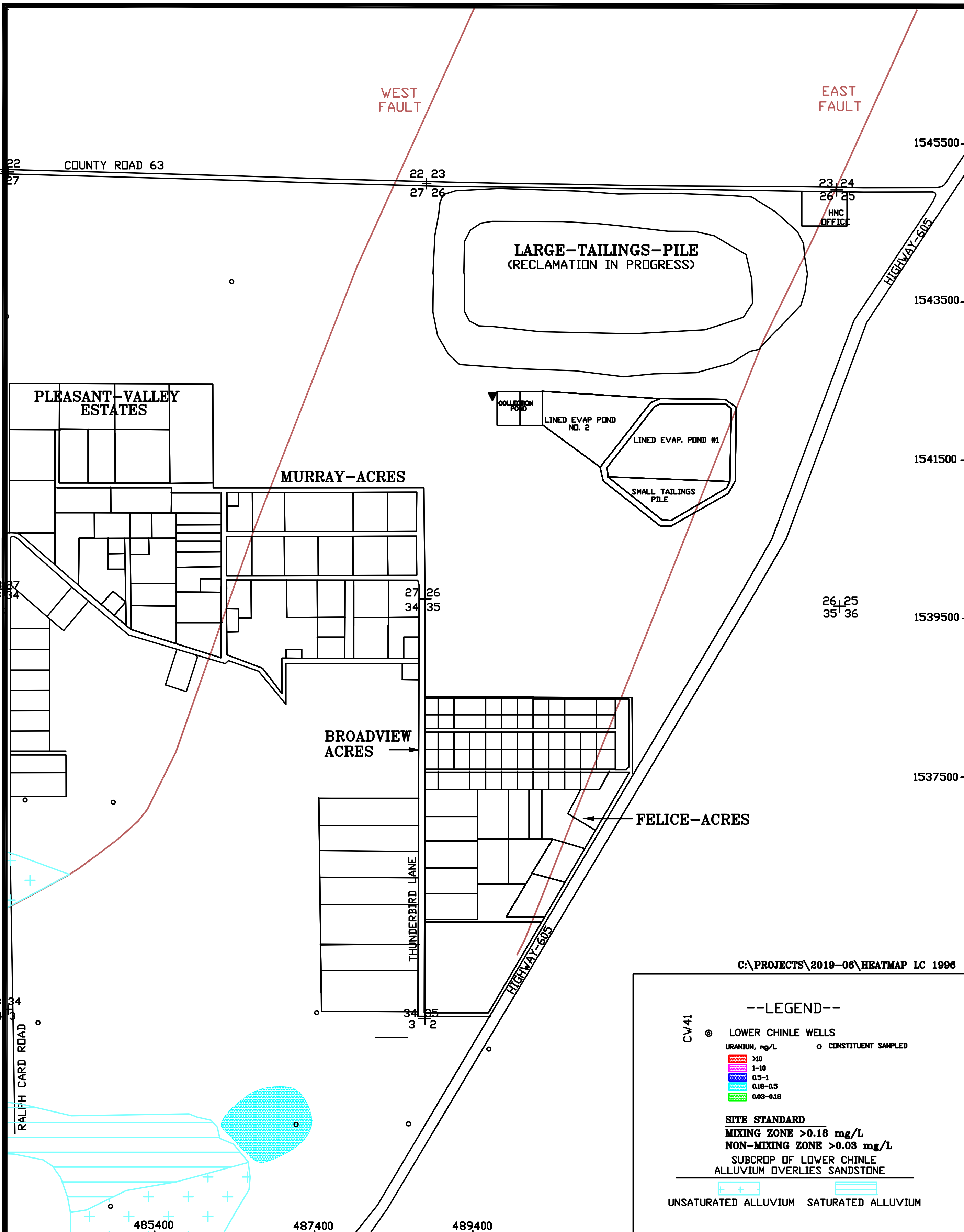



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**DATE: 2/25/2021**

**FIGURE 1.1-26. MIDDLE CHINLE URANIUM CONCENTRATIONS 2020**

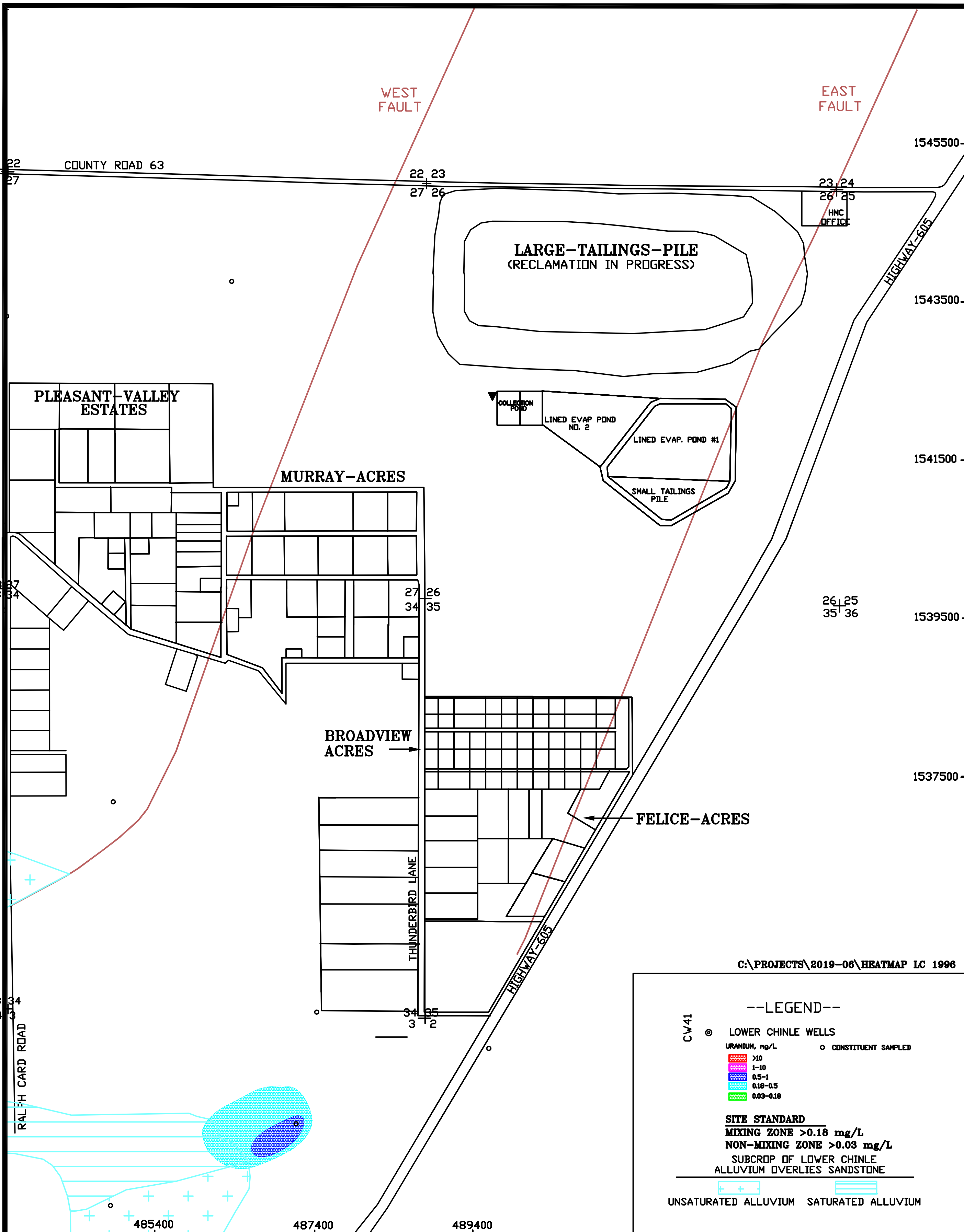
**SCALE: 1"= 1600'**




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

**FIGURE 1.1-27. LOWER CHINLE URANIUM CONCENTRATIONS 1996**

**DATE: 3/1/19**
**SCALE: 1"= 1600'**
**PAGE: 1.1-37**

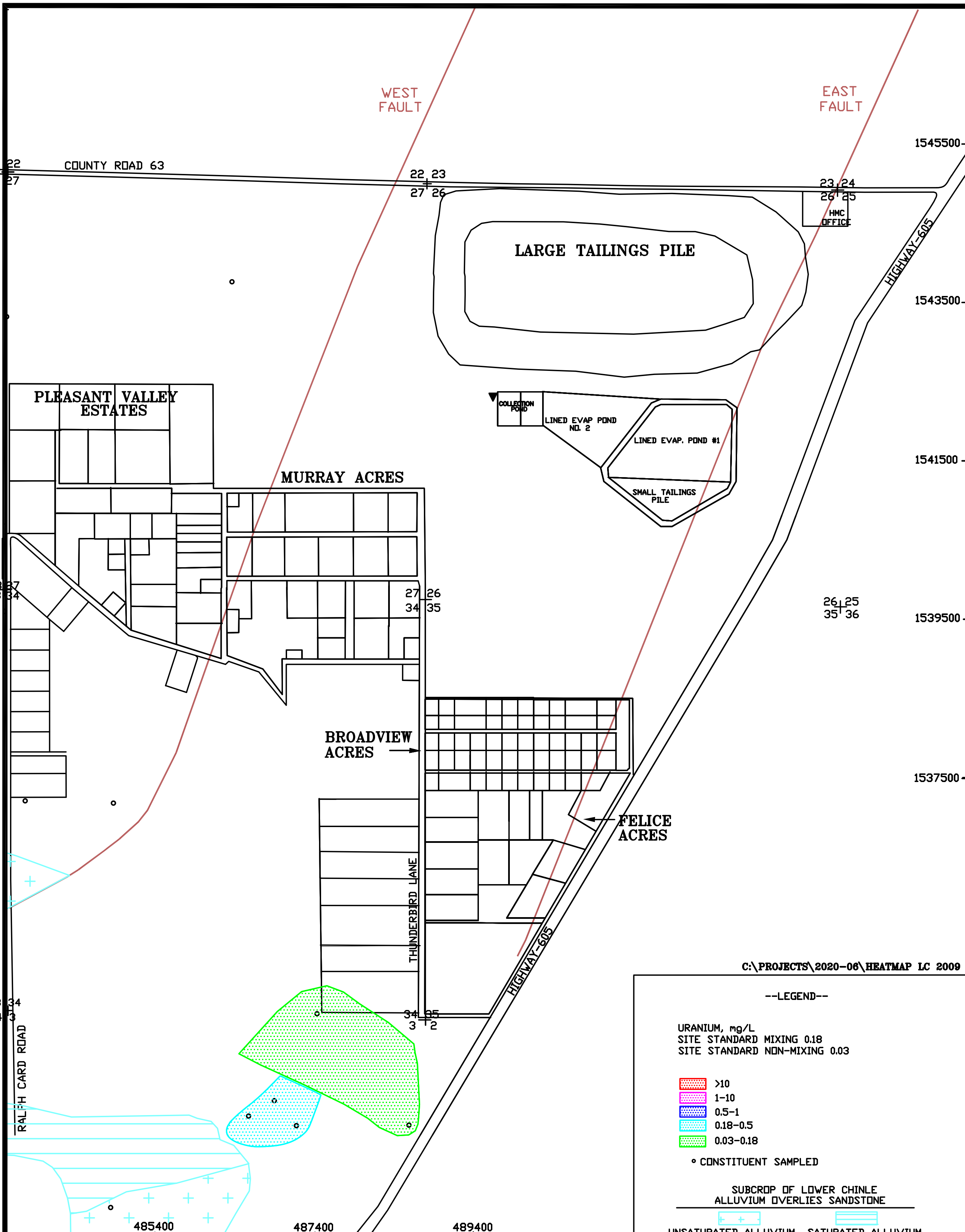



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**FIGURE 1.1-28. LOWER CHINLE URANIUM CONCENTRATIONS 1999**

**DATE:** 3/1/19

**SCALE:** 1"= 1600'

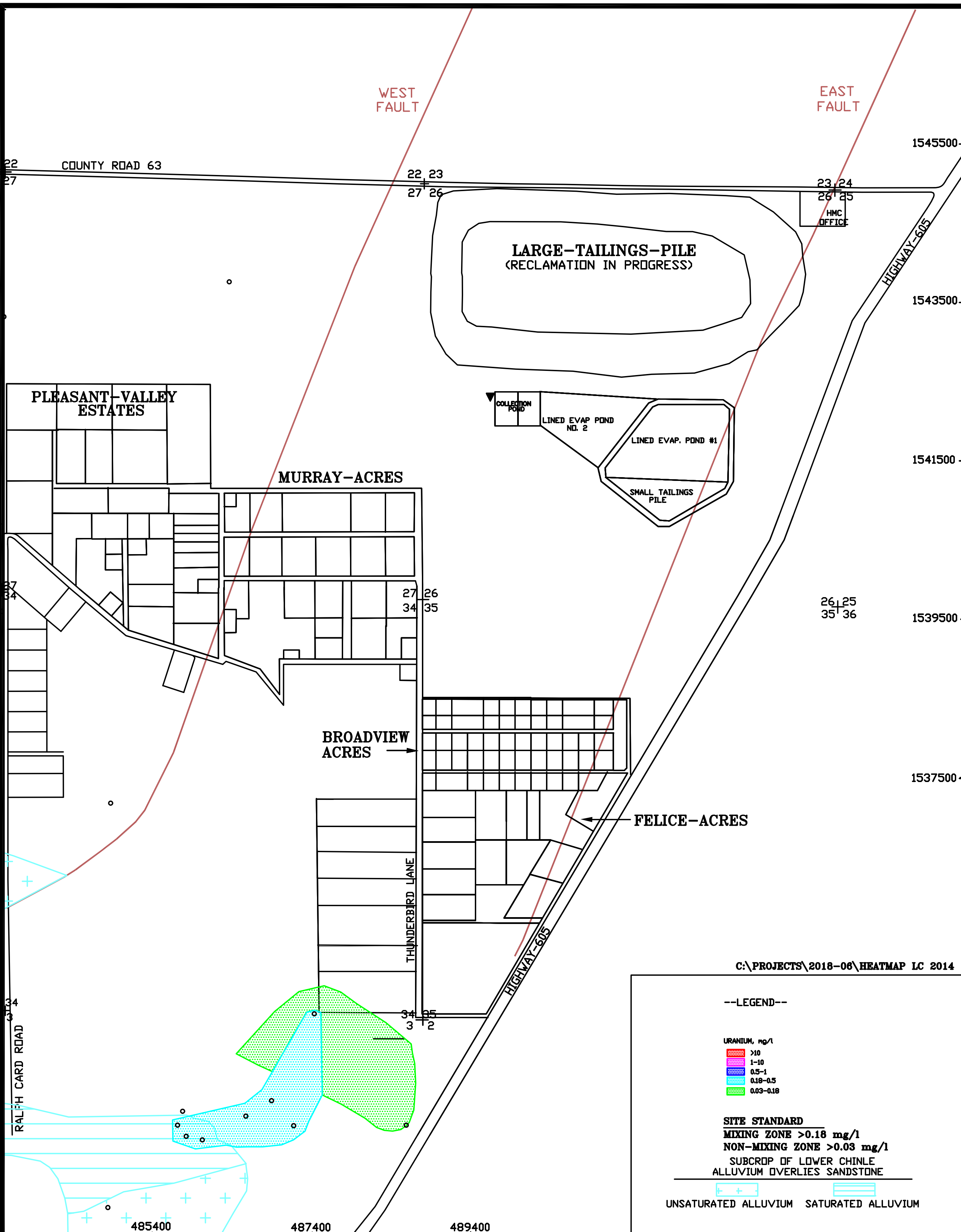



HOMESTAKE SITE AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**DATE: 3/1/19**

**SCALE: 1"= 1600'**

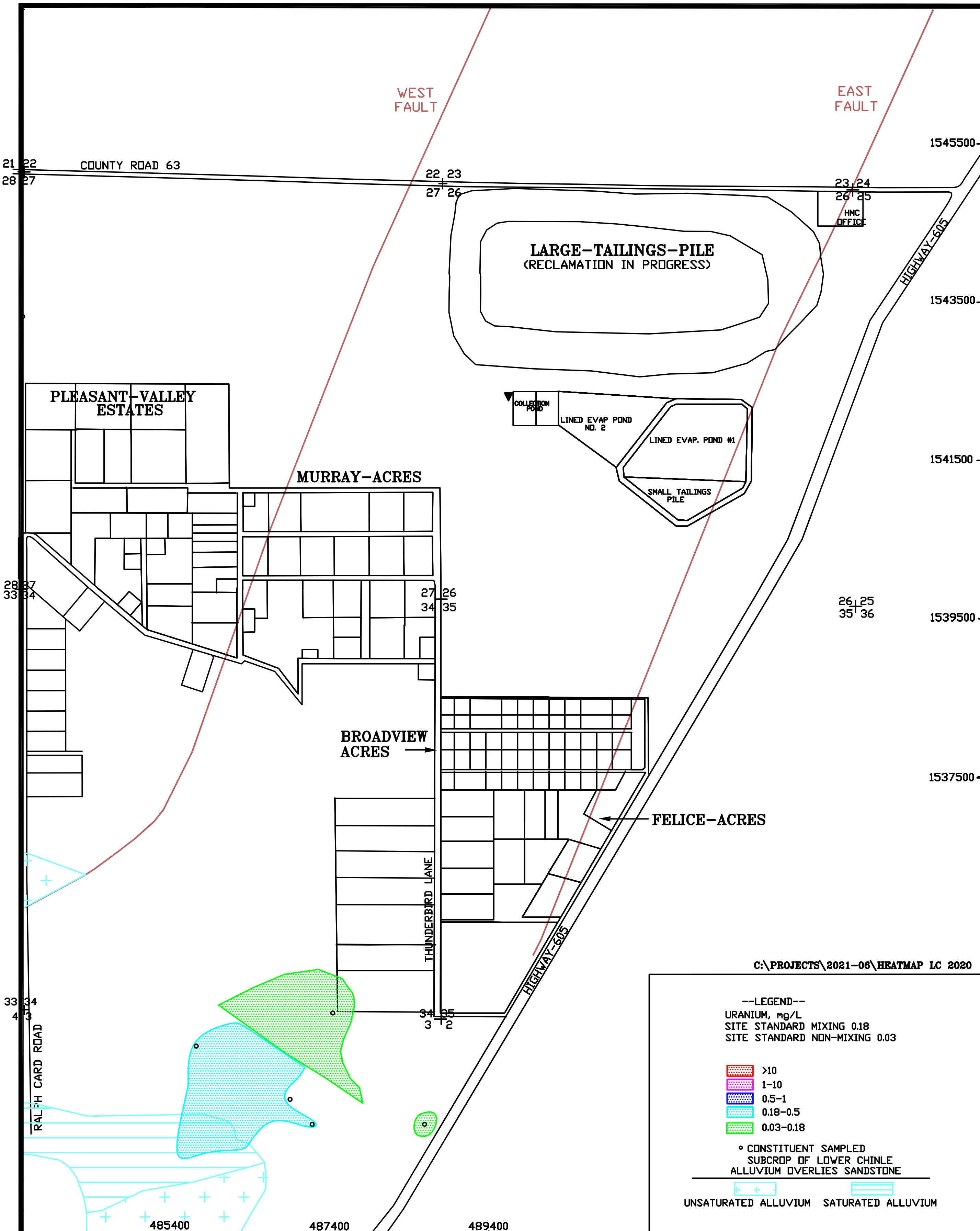
**FIGURE 1.1-29. LOWER CHINLE URANIUM CONCENTRATIONS 2009**




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

**FIGURE 1.1-30. LOWER CHINLE URANIUM CONCENTRATIONS 2014**

DATE: 3/1/19
SCALE: 1"= 1600'

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| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | **DATE: 2/25/2021** |
| **FIGURE 1.1-31. LOWER CHINLE URANIUM CONCENTRATIONS 2020** | **SCALE: 1"= 1600'** |
| | **PAGE: 1.1-41** |

## 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 2020 annual groundwater 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, Grants Reclamation Project (GRP) or Grants site, HMC deposited uranium tailings from the alkaline leach (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 initial concerns about groundwater 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. The groundwater restoration program has been divided into three areas: North Off-site, South Off-site and On-site. Figure 1.2-2 present limits of these three restoration areas.

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 many of the various figures found in this report. Land Sections 28, 33, 34 and 35 referenced in this report are located in Township 12N, Range 10W, and Section 3 referenced in this report is located in Township 11N, Range 10W.

Monitoring data for groundwater west of the project site is included in the 1995 through 2020 reports (see Appendix A for water levels and Appendix B for water quality). This area was designated the "West Area" and was so labeled on the figures in the annual reports prior to 2003. The 2003 through 2020 annual reports combine the project site and West Area figures on one 11 x 17 inch set of figures.

The annual ALARA audit, required in NRC license condition 42, is presented in Appendix C. Additionally, a report of an annual inspection of the tailings piles and pond dikes must

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, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020.

be submitted per license condition 12 and DP-200 Condition 52i and is presented in Appendix D. Appendix E provides an annual land-use survey discussion for the immediate Grants site area as required by license condition 42and was added in 2002. The annual radon flux survey report for the Large and Small Tailings Piles was presented in the Grants Semi-Annual Environmental Monitoring Report 2016 through 2020 and therefore is not presented in this report as it was prior to the 2016 report. Appendix F gives the meteorological data for the Grants site for 2020. No soil moisture data was collected in 2020 from the irrigation area instruments.

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

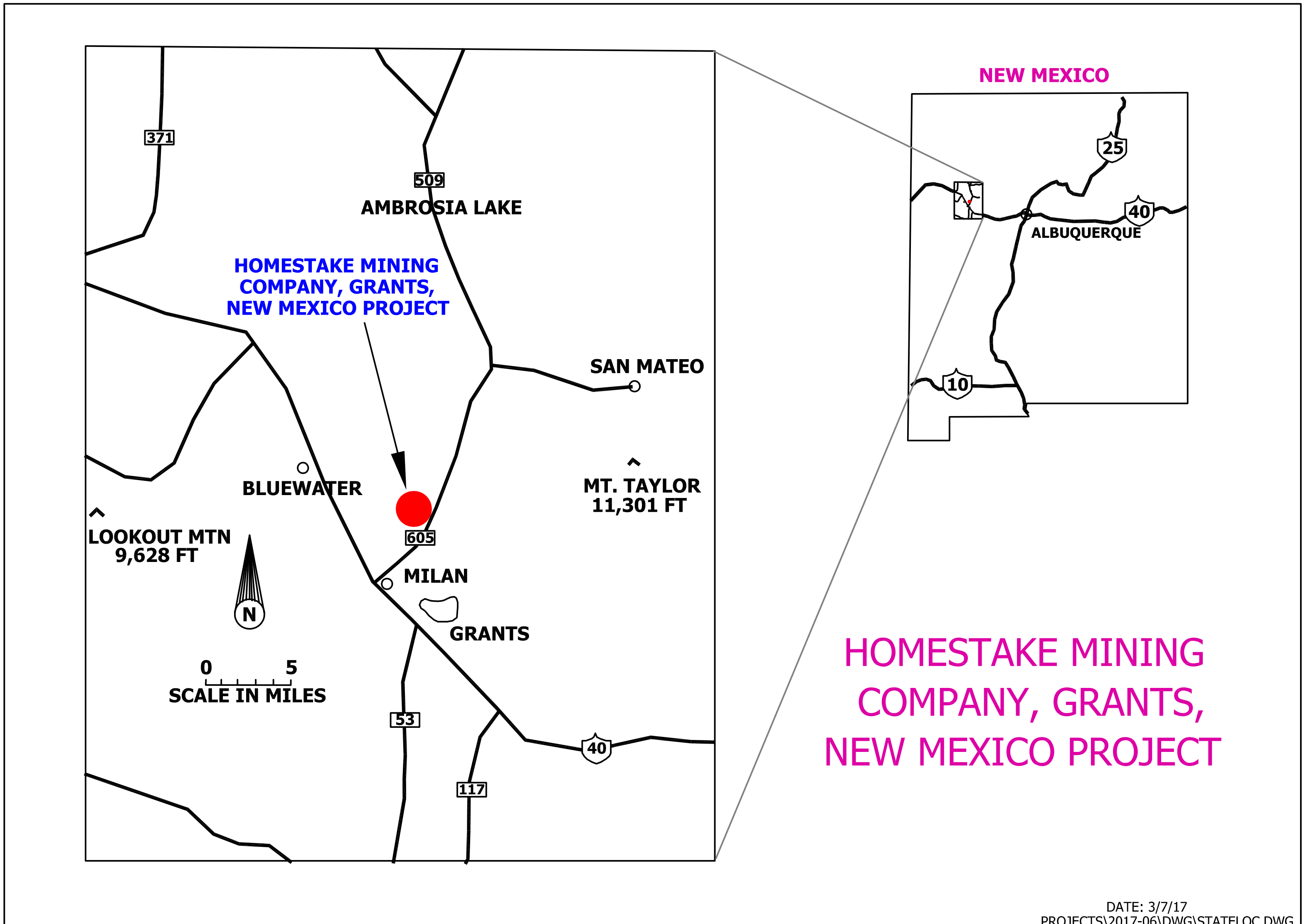
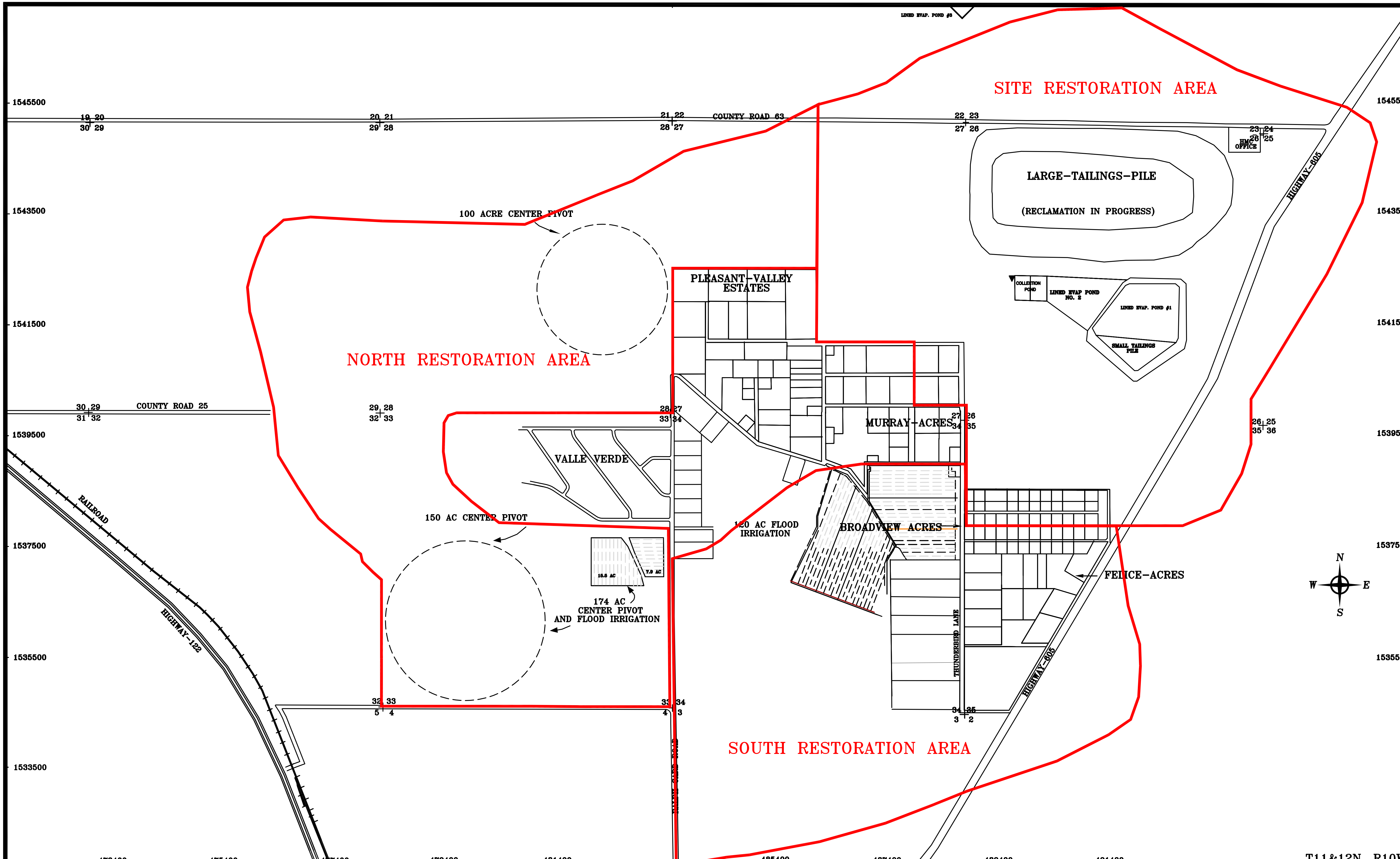



FIGURE 1.2-1. LOCATION OF THE GRANTS PROJECT

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DATE: 1/31/2020

FIGURE 1.2-2. RESTORATION AREAS DESIGNATION MAP

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**FOR HOMESTAKE'S GRANTS PROJECT**

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# 2.0 OPERATIONS

## 2.1 CURRENT OPERATIONS SUMMARY

The annual precipitation of 7.55 inches at the Grants Project site in 2020 is below normal precipitation for Grants, New Mexico. This below normal precipitation condition would be expected to cause natural water levels at the Grants site to gradually decline. Appendix F gives the meteorological data for 2020 for the Grants site including an annual wind rose plot.

The Grants Project groundwater remediation system consists of collection of contaminated groundwater near the tailings piles, collection of slightly contaminated groundwater Off-site and down-gradient injection of treated and/or fresh water. Starting in late 2015, the treated water consisted of a mixture of R.O. product, zeolite treated and fresh water that was mixed in the post treatment tank (PTT). These collection and injection systems continued to operate in 2020, along with the reverse osmosis (R.O.) plant and the zeolite treatment of Off-site water, which are used to treat and manage the majority of collected groundwater. The water treatment and injection rates for 2020 were smaller due to operational problems with the zeolite treatment and the limited evaporation capacity for disposal of R.O. brine and zeolite regeneration 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 most areas of the Grants Project restoration program. The zeolite treatment removes slightly elevated uranium concentrations from the Off-site water and the treated water is also used for injection water. Figure 2.1-1 on page 2.1-15 shows the location of the present (end of 2020) injection and collection systems along with their starting dates of operation. Water collected from the On-Site area is pumped to the R.O. plant while water collected from the Off-site area is pumped to the zeolite treatment.

The area where groundwater flow is controlled by the treated and/or 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 groundwater within the collection area converges to the collection wells.

### 2.1.1 R.O. AND ZEOLITE TREATMENT

R.O. treatment and zeolite beds are utilized to treat water at the GRP. R.O. is used to treat the On-site collected water while zeolite is used to remove the uranium from the Off-site water.

#### 2.1.1.1 R.O. PLANT

The R.O. plant utilizes a lime/caustic pre-treatment and clarification unit. The R.O. plant was switched in mid-2015 from the use of sand filters to microfiltration. Blowdown (sludge) from the pre-treatment unit discharges to the West Collection Pond with the treated water feeding the three R.O. units (two 300 gpm low-pressure R.O. units and a No. 3 600 gpm low-pressure unit). The brine from the No. 1 low-pressure unit feeds a 75-gpm high-pressure R.O. unit while the brine from all units feed a second high-pressure unit when all of units are operating. The second high-pressure unit was added in the middle of 2016. The No. 2 R.O. unit is a single stage, low pressure 300 gpm system. The No. 3 600 gpm R.O. low-pressure unit was installed in late 2015. Only one of the 300 gpm R.O. units was typically used at one time during 2020 due to limitations on brine discharge to the evaporation system. The R.O. product water from the five units is discharged to the PTT where it is mixed with zeolite treated water and/or fresh water prior to being injected into 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)<br>(2000-2020) | | | | |
|---|---|---|---|---|
| Year | Input | | Output | |
| | Collection Wells | Tailings Collection | R.O. Injection | Brine |
| 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 |

| R.O. Plant Performance (GPM) (cont'd) | | | | |
|---|---|---|---|---|
| (2000-2020) | | | | |
| Year | Input | | Output | |
| | Collection Wells | Tailings Collection | R.O. Injection | Brine |
| 2005 | 250 | 6.4 | 198 | 49 |
| 2006 | 257 | 2.1 | 184 | 48 |
| 2007 | 262 | 0 | 204 | 55 |
| 2008 | 264 | 3.1 | 194 | 60 |
| 2009 | 251 | 0.3 | 171 | 60 |
| 2010 | 240 | 0 | 166 | 59 |
| 2011 | 257 | 1.4 | 170 | 58 |
| 2012 | 267 | 0 | 182 | 50 |
| 2013 | 236 | 0 | 148 | 47 |
| 2014 | 235 | 0 | 165 | 47 |
| 2015 | 228 | 0 | 112 | 52 |
| 2016 | 584 | 8 | 449 | 141 |
| 2017 | 497 | 3 | 407 | 108 |
| 2018 | 445 | 0.5 | 350 | 85 |
| 2019 | 314 | 0 | 236 | 57 |
| 2020 | 342 | 0 | 205 | 68 |

### 2.1.1.2 ZEOLITE BEDS

The zeolite beds have been used since 2016 to remove the uranium from the Off-site collection water because uranium is the only site constituent that exceeds the site standards in this collected water. The 300Z has a design capacity of 300 gpm while the 1200Z has four trains with a total design capacity of 1200 gpm. This allows this water to be used as an input to the PTT and mixed with R.O. product water and fresh water prior to injecting it back into the groundwater. The following tabulation list the inputs to the 1200Z and 300Z treatment systems and the rates of treated and regeneration water for 2016 through 2020 and shows that the average treated water rate has varied from 26 to 267 gpm.

| Zeolite Treatment Performance (GPM) (2016-2020) | | | | |
|---|---|---|---|---|
| Year | Input | | Output | |
| | 1200 Zeolite | 300 Zeolite | Zeolite Treated Water | Regeneration |
| 2016 | 152 | 115 | 233 | 34 |
| 2017 | 247 | 56 | 253 | 50 |
| 2018 | 259 | 37 | 267 | 29 |
| 2019 | 160 | 0 | 126 | 34 |
| 2020 | 34 | 0 | 26 | 8 |

## 2.1.2 COLLECTION

The alluvial and Upper Chinle aquifer collection rates to the R.O. plant were increased in 2016 while the Middle Chinle aquifer On-site collection was started in 2016. The R.O. plant was operated at an average rate of 342 gpm during 2020, which is slightly higher than the 2019 rate.

Up-gradient alluvial aquifer collection north of County Road 63 from the P wells ceased after May of 2013. Collection water from the South and North Off-site areas was treated with the zeolite process starting in 2016 and this continued in 2020. Upper Chinle aquifer collection continued from wells CE2, CE5, CE6, CE11, CE12, CE15 and CE19 in 2020 (red X symbols located south of the collection ponds), and Upper Chinle wells CE15, CE15A and CE19 were added as input to the R.O. plant in 2017. None of the tailings sumps were input to the R.O. plant during 2020.

### 2.1.2.1 ALLUVIAL AQUIFER COLLECTION

Figure 2.1-1 shows the locations of six lines of alluvial aquifer collection wells (red x symbols). The S and D-lines are adjacent to the LTP while the B-line is between the LTP and the collection and evaporation ponds. The K and C-lines are adjacent to the Small Tailings Pile (STP). Alluvial wells M9 and MQ were added to the alluvial collection system in 2011 and continued to be used in 2020. The L-line south of the STP continued to operate in 2020 and includes collection wells 521 and 522, which are located on the east side of Highway 605 (see Figure 4.1-1 for location). The L-line collection was switched to R.O. supply at the end of July 2016 therefore stopping the collection for re-injection program. Figure 2.1-2 on page 2.1-16 graphically presents

collection rates for the eight years at the Grants Project. The On-Site alluvial collection system operated at an average rate of 145 gpm in 2020.

#### 2.1.2.2 UPPER AND MIDDLE CHINLE AQUIFER COLLECTION

Figure 2.1-2 shows the collection rate for Upper Chinle collection wells CE2, CE5, CE6, CE11, CE12, CE15 and CE19, which are located on the south and north sides of the collection ponds and just north of Broadview Acres. Collection from Upper Chinle well CE2 started in 1999 and is expected to continue for several years. Collection from wells CE5 and CE6 started in August 2006 while pumping from wells CE11 and CE12 was initiated in October of 2006. Upper Chinle wells CE15, CE15A and CE19 were initially pumped in 2017. The Upper Chinle wells were operated to supply water to the R.O. for 2020. Additionally, wells B16, B31 and B32 were pumped in 2020. These wells are dual completed in the alluvial and Upper Chinle aquifers in the subcrop area. The yearly average collection rate from the Upper Chinle was 123 gpm. Figure 2.1-2 also shows the collection rate for the Middle Chinle collection well CW62. Well CW62 was added to the On-Site collection system in May 2016 and continued in 2020. The yearly average collection rate from the Middle Chinle aquifer On-Site for 2020 was 30 gpm.

#### 2.1.2.3 OFF-SITE COLLECTION

The former irrigation systems were operated as Off-site collection from 2000 through 2012 (see Figure 2.1-1 for locations of former irrigation areas). Some of the Section 3 and 35 South Off-site and Section 28 North Off-site collection wells were operated in 2016 through 2020 to supply water for the zeolite treatment. Figure 2.1-1 shows the Off-site collection wells that were used in 2020. South collection wells Q2, Q5, Q11, Q28, Q29, R2, R3, R5 and Y13 were pumped for the zeolite treatment of this Off-site water. North Off-site collection wells 659, 890, H2A, H12 and H24 were pumped for the zeolite treatment of this Off-site water during 2020.

The cumulative volume of water applied to the former irrigation (land treatment) fields from 2000 through 2012 (blue line) and the Off-site collection for 2013 through 2020 (cyan) are presented in Figure 2.1-3 which shows that greater than 3.6 billion gallons of water have been pumped from the Off-site collection wells. Figure 2.1-3 shows a comparison between the volumes of water pumped for the Off-site collection versus the volume of water from the On-site collection treated by

the R.O. plant since 2000. The volume of Off-site collection water is more than the volume of On-site collection water for the same period.

The 2013 Irrigation Report (ERG and Hydro-Engineering LLC, 2013) presents the monitoring results through 2013 for the irrigation areas, while the groundwater monitoring results for 2020 in the irrigation areas are presented in this report. This data shows no effects on the uranium and selenium concentrations in the underlying groundwater from the HMC irrigation/land treatment program, except for possibly a small and temporary increase in uranium in the Section 34 groundwater. The uranium concentration in the area has returned to near the pre-irrigation concentration. No data were obtained from the soil moisture instruments in 2020. No soil moisture samples were collected from the lysimeters in 2020 because the early October 2017 attempt to collect samples from the lysimeters was unsuccessful.

#### 2.1.2.4 QUANTITY OF CONSTITUENTS COLLECTED FROM GROUNDWATER

Table 2.1-1 (page 2.1-21) presents the quantities of chemical constituents extracted from the On-site groundwater system, the tailings piles and the toe drains. The On-site groundwater collection system has produced an average pumping rate of 275 gpm for the entire period between 1978 and 2020. 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 2020 was computed by multiplying the average concentration of a particular constituent for each source of water (groundwater, toe drains and tailings collection) by the volume of water pumped for each groundwater source during that year. The quantities of constituents collected by aquifer and area are presented in Table 2.1-2 for 2020 with 10,900 and 18,700 pounds of uranium and molybdenum, respectively, removed from the Grants On-site groundwater in 2020. This table lists the total for the On-site and the sum of the Off-site quantities for 2018 through 2020, showing that the On-site collection of water the last three years has been approximately twice the Off-site collection volume. The mass of sulfate, molybdenum and selenium collected in the Off-site water is not tabulated because only uranium is removed in the treatment of the Off-site water.

Figure 2.1-4 presents the volume of water and the pounds of uranium removed by the On-site and Off-site collection systems from 2000 through 2020. The light blue, purple and green bars show the comparison of the water volumes for each area during each year, while the red, brown and gold

bars present the pounds of uranium removed respectively by the Off-site land treatment, Off-site collection and On-site collection. The figure shows that the volume of water collected from the Off-site wells was generally larger than the On-site collection during the irrigation period, but the mass of uranium removed by Off-site collection is small in comparison to the uranium mass removed by the On-site collection. The volume of water collected On-site has been more than the Off-site collection since 2010.

### 2.1.2.5 QUALITY OF TREATED WATER

Table 2.1-3 presents the water quality results for the Post Treatment Tank injection monitoring point, SP2 (monitors mixture of R.O. product, fresh water and zeolite treated water prior to injection). Monitoring point SP2 is the monitoring of compliant water prior to injection into the groundwater. The site standards are listed at the top of Table 2.1-3 and constituent concentrations in all SP2 water samples were less than or equal to the corresponding site standards in 2020 except for a small thorium-230 value of 0.4 pCi/L on January 28 which is thought to be a laboratory outlier. The corresponding R.O. product SP1 sample was less than 0.1 pCi/L, no zeolite treated water was being produced at this time and the deep San Andres fresh water supply does not contain thorium.

Field and weekly samples have been used to aid in the tracking of the SP2 compliant water quality. Table 2.1-3 also presents the SP2 field water quality data for 2020. This table shows that weekly samples were not collected during 2020 because the SP2 water quality during this time period was compliant.

Table 2.1-4 presents the R.O. feed water and the R.O. product (SP1) water quality for 2020 and all of the SP1 water quality analyses meet the site standards. Exceedances of site standards in the table would be highlighted in blue had they occurred.

The zeolite treated water is monitored at three locations prior to being discharged to the PTT to be mixed with the R.O. product and/or fresh water. Table 2.1-5 gives the treated zeolite water quality for these three locations. The treated water is monitored from the 300 zeolite, the 1200 zeolite for Trains 1&2 and the 1200 zeolite for Trains 3&4. Blue highlighting in Table 2.1-5 would indicate values exceeding the site standards had that occurred. The uranium, selenium, molybdenum, chloride, sulfate and TDS concentrations were below the site standard for all zeolite samples taken during 2020. None of the radium-226 plus radium-228 and thorium-230

activity and vanadium concentrations exceeded the site standards for the zeolite during 2020.

### 2.1.3 INJECTION

The treated and/or fresh-water injection systems, which aid in the reversal of the groundwater gradients back toward the collection wells, consist of lines of injection wells and infiltration lines, which are oriented generally along the east, south and west perimeter of the two tailings piles and evaporation ponds (see green circles and infiltration lines 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 infiltration 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 (S injection line) at three locations. The 2020 injection rate for this horizontal injection line is included in the On-site alluvial injection rates, and was 73 gpm for the year.

In July 2004, two 250 foot sections of injection line (EBA1 and EBA2) were added south of collection well 522 east of Highway 605 (see Figure 2.1-1 for location). The average injection rate for these two lines is estimated at 20 gpm and is included in the On-site alluvial injection rate.

A 400-foot extension to the S injection line was added on the north end of this line in 2005. Five EMA injection lines were added southwest of the Large Tailings while three ETA injection lines were added east of the Large Tailings in 2005 (see Figure 2.1-1).

#### 2.1.3.1 ON-SITE ALLUVIAL INJECTION

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. Alluvial fresh-water injection wells 523 and 524 were added to the Broadview Acres injection system in 2002 (see Figure 4.1-1).

All wells adjacent to the northeast corner and to the north and east 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, (S. Inj. Line) was added to this system on August 25, 2003. Fresh-water injection into lines ETA1, ETA2 and ETA3 started in July of 2005 but the lines were not used in 2016 through 2020. Injection into EMA1 with fresh water started in December, 2005 and continued with treated and/or fresh water in 2020.

Figure 2.1-5 (page 2.1-17) presents treated and/or fresh-water injection rates for the last eight years. An average of 155 gpm, or a total of 81 million gallons, was injected into the On-site alluvial aquifer during 2020.

### 2.1.3.2 R.O. PRODUCT

The R.O. product water mixed with fresh water was supplied to the EMA2 through EMA5 infiltration lines to the south and west of the collection ponds. Until October, 2005, 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, C3R and PM. Fresh-water injection commenced after that date for these wells. The switch to supply of R.O. product and fresh water to injection lines EMA2 through EMA5 occurred in October 2005. The supply of a mixture of treated and/or fresh water for injection was from the Post Treatment Tank from 2016 through 2020. Figure 2.1-5 shows the rates of R.O. product water produced, which averaged 205 gpm in 2020 for a total of 108 million gallons.

### 2.1.3.3 ZEOLITE TREATED WATER

The zeolite treated water is mixed with the R.O. product and fresh water in the PTT prior to use of this water for injection into the groundwater to aid the groundwater restoration program. The zeolite treated water rate for 2020 averaged 26 gpm for the year.

### 2.1.3.4 UPPER CHINLE AQUIFER INJECTION

Hydro-Engineering (2003b) and the Updated Corrective Action Program (HMC 2020) 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 and ceased in 2019. Injection into CW25 was conducted to 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 2.1-5 present monthly average injection rates into Upper Chinle wells 944, CW5 and CW13, with an overall 2020 average of 18 gpm. On-site injection into dual completed Upper Chinle wells C18 through C21 in the subcrop area was started in 2016.

#### 2.1.3.5 MIDDLE CHINLE AQUIFER INJECTION

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 7 gpm in 2020 (see Figure 2.1-5). This injection has prevented the movement of constituents further to the north and allows up-gradient collection from the well field. Injection into dual completion Middle Chinle wells M30, M31 and M36 was started in 2016.

#### 2.1.3.6 SECTIONS 28 AND 29 INJECTION

The fresh-water injection in Sections 28 and 29 was initiated in March of 2002 to impede movement of groundwater with modest contaminant concentrations in Section 28. Eight infiltration lines were added in 2005 in Sections 27 and 28 to replace the injection wells and adjust the location of this injection. Injection into lines NPV1 through NPV5 (5 of the 8 infiltration lines) was started on July 27, 2005 while injection into NPV6 was started in December 2005. Fresh water injection into alluvial wells 633 and 655 was restarted in June of 2010. Three additional fresh water infiltration lines (NPV9, NPV10, and NPV11) were added in

2011 to better contain the front of the Section 28 uranium plume. San Andres well 951 was replaced by San Andres well 951R as the fresh water supply in April of 2012. PTT water was also used to supply this injection starting in 2016 and well 951R was not used in 2020 to supply this injection. The injection rate averaged 69 gpm for 2020 with a total injected volume of 36 million gallons. Figure 2.1-5 presents the monthly injection rates into wells and infiltration lines located in Sections 28 and 29.

#### 2.1.3.7 SECTIONS 35 AND 3 INJECTION

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 (see Figure 4.1-1 for location).

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 (see Figure 2.1-1). Seven infiltration lines in Section 3 and two infiltration lines in Felice Acres were also added in 2004. Two additional infiltration lines, FA1 in central Felice Acres and WFA1 west of Felice Acres, were added in 2005. These injection wells and lines were supplied with water from the PTT in 2019. Use of San Andres well 943 as a fresh water supply well ended on May 18, 2017 except during the 943 pump test in January of 2018. No pumping from well CW28 occurred in 2020 to supply injection water for wells 848 and 868. Injection into three additional infiltration lines (FA2, RCR8, and RCR9) was started in 2011 while injection into infiltration lines FA3 and FA4 were started in 2013.

Figure 2.1-5 presents the combined monthly injection rates for Sections 34, 35 and 3 treated and/or fresh-water injection lines and wells (see brown diamond symbols on Figure 2.1-5). This injection effort is associated with the groundwater restoration of the Sections 3 and 35 areas. Water collected from wells in Sections 3 and 35 was treated in the zeolite systems. During 2020, the yearly average injection rate in Sections 34, 35 and 3 was 112 gpm.

### 2.1.4 RE-INJECTION

Alluvial water containing relatively low concentrations of contaminants had been collected and injected into areas of the alluvial aquifer near the Large Tailings Pile but this

collection water was treated through the R.O. plant starting in August 2016. Prior to R.O. treatment, this water was re-injected into areas with higher concentrations of contaminants in order to enhance restoration near the LTP. This aspect of the restoration plan at the Grants sites is referred to as the collection for re-injection program. The lower-concentration water was effective as comparatively fresh water during the initial stages of restoration, and therefore, re-injection was a beneficial use of this slightly contaminated groundwater. No collection for re-injection occurred in 2020. The monthly re-injection rates are depicted on Figure 2.1-2 as collection for re-injection use (COL/RE-INJ).

### 2.1.5 TAILINGS CONDITIONS

Tailings conditions have typically been presented in this section of the APR but is expanded and presented in Section 3 of this report. The quantities of constituents collected from the tailings is still presented in Table 2.1-1 in this section as it had been done in the past but the discussion of the collected quantities from the toe drains and dewatering wells will be discussed in Section 3.

### 2.1.6 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 and the ponds are presently used to contain water that can be recycled to the R.O. plant. The No. 1 Evaporation Pond, located on the Small Tailings Pile, began receiving water in November of 1990. Usage of the No. 2 Evaporation Pond began in March of 1996. The No.3 Evaporation pond began operation in December of 2010.

The water from the well collection system and some water from the tailings dewatering wells and toe drains have been pumped to the R.O. plant as feed water. During tailings dewatering, the majority of the extracted tailings water was discharged directly to the No. 2 Evaporation 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 or No. 3 Evaporation Ponds. The forced evaporation system has transitioned to APEX evaporators and these floating evaporators have replaced the spray evaporation system on all three evaporation ponds. A total of 47 million gallons (average rate of 90 gpm) of water was delivered to the

evaporation pond system in 2020 in addition to the 15 million gallons (average rate of 29 gpm) of natural precipitation added to the pond. The net evaporation from the evaporation system averaged 201 gpm in 2020, compared to 174 gpm in 2019 and the change in storage in the evaporation ponds in 2020 was a decline of 82 gpm.

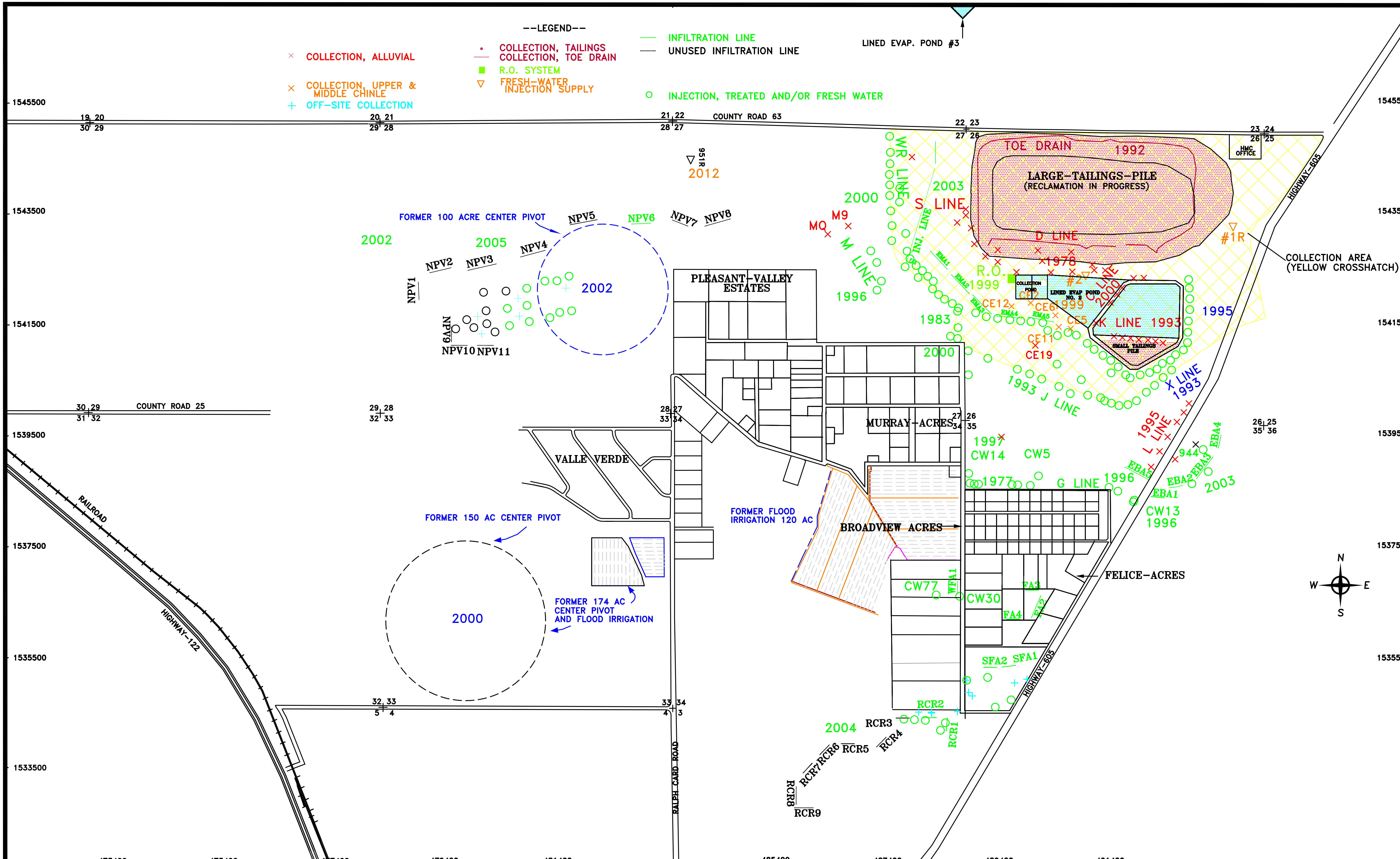
Water quality samples results collected from the No. 1, No. 2 and No. 3 Evaporation Ponds, the East Collection Pond (E COLL POND), and the West Collection Pond (W COLL POND) are presented in Tables B.3-1 and B.3-2 of Appendix B.

### 2.1.7 YEARLY OPERATIONAL RATES

A tabulation of yearly operational rates and volumes is presented below, and a summary of the yearly operational rates is also presented in Figure 2.1-6. This figure gives the average yearly rates for each aquifer on the left side and shows where the quantity of water was pumped in 2020. A rate of 5 gpm in 2020 was pumped from the LTP toe drains and discharged to the evaporation ponds. Estimated seepage based on the LTP water balance and change in saturated storage are also given for the LTP. The RO plant and zeolite inputs and discharges and the input and removal rates from the Collection Ponds rates are presented in Figure 2.1-6.

| Major Collection and Injection Flows and Volumes During 2020 | | | | | | |
|---|---|---|---|---|---|---|
| | **Injection** | | **Collection** | | **Seepage from LTP** | |
| **Aquifer System** | Rate (gpm) | Volume (gallons) | Rate (gpm) | Volume (gallons) | Rate (gpm) | Volume (gallons) |
| Alluvial | 427 | 223,820,000 | 177 | 97,780,000 | 10 | 5,240,000 |
| Upper Chinle | 49 | 25,680,000 | 123 | 64,970,000 | -- | -- |
| Middle Chinle | 38 | 19,920,000 | 40 | 20,970,000 | -- | -- |
| Lower Chinle | -- | -- | 0 | 0 | -- | -- |
| San Andres | -- | -- | 283 | 148,340,000 | -- | -- |
| Tailings | -- | -- | 5.5 | 2,880,000 | -- | -- |

| Major Treatment and Disposal Flows and Volumes During 2020 | | | | | | |
|---|---|---|---|---|---|---|
| | **Feed/Input Rate** | | **Treated Water Discharge** | | **Evap/Disposal Discharge** | |
| **Treatment/Disposal System** | Rate (gpm) | Volume (gallons) | Rate (gpm) | Volume (gallons) | Rate (gpm) | Volume (gallons) |
| Reverse Osmosis | 342 | 179,160,000 | 205 | 107,600,000 | 68 | 35,600,000 |
| Zeolite | 34 | 18,020,000 | 26 | 13,610,000 | 8 | 4,410,000 |
| Evaporation Ponds | -- | -- | -- | -- | -- | -- |
| Collection Ponds | 69 | 35,960,000 | -- | -- | -- | -- |




SCALE: 1"=1600'

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DATE: 1/15/2021

FIGURE 2.1-1. LOCATION OF PRESENT INJECTION AND COLLECTION SYSTEMS WITH START OF OPERATION DATES, 2020

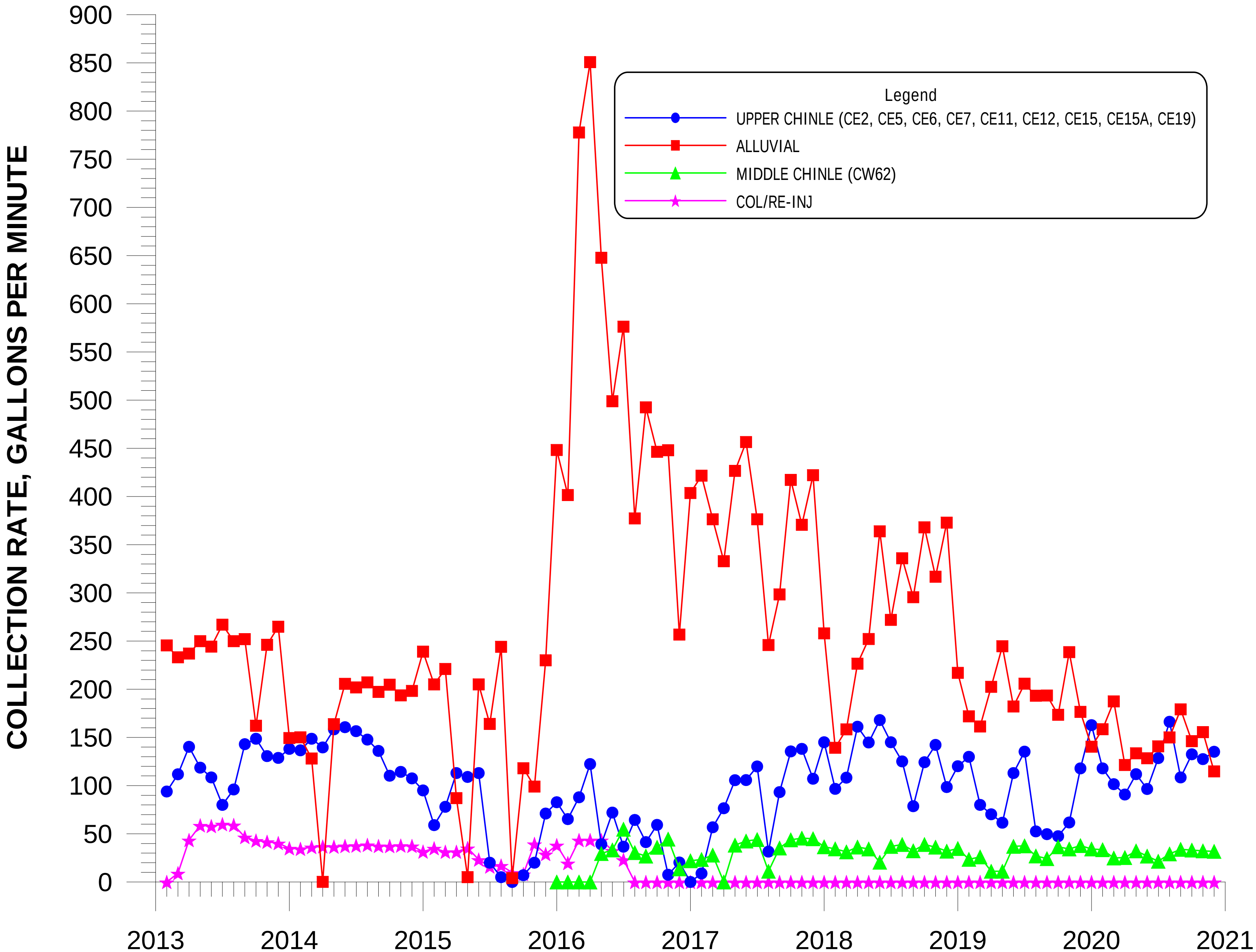


**FIGURE 2.1-2. AVERAGE MONTHLY COLLECTION RATES FOR THE ALLUVIAL AND UPPER AND MIDDLE CHINLE AQUIFERS.**

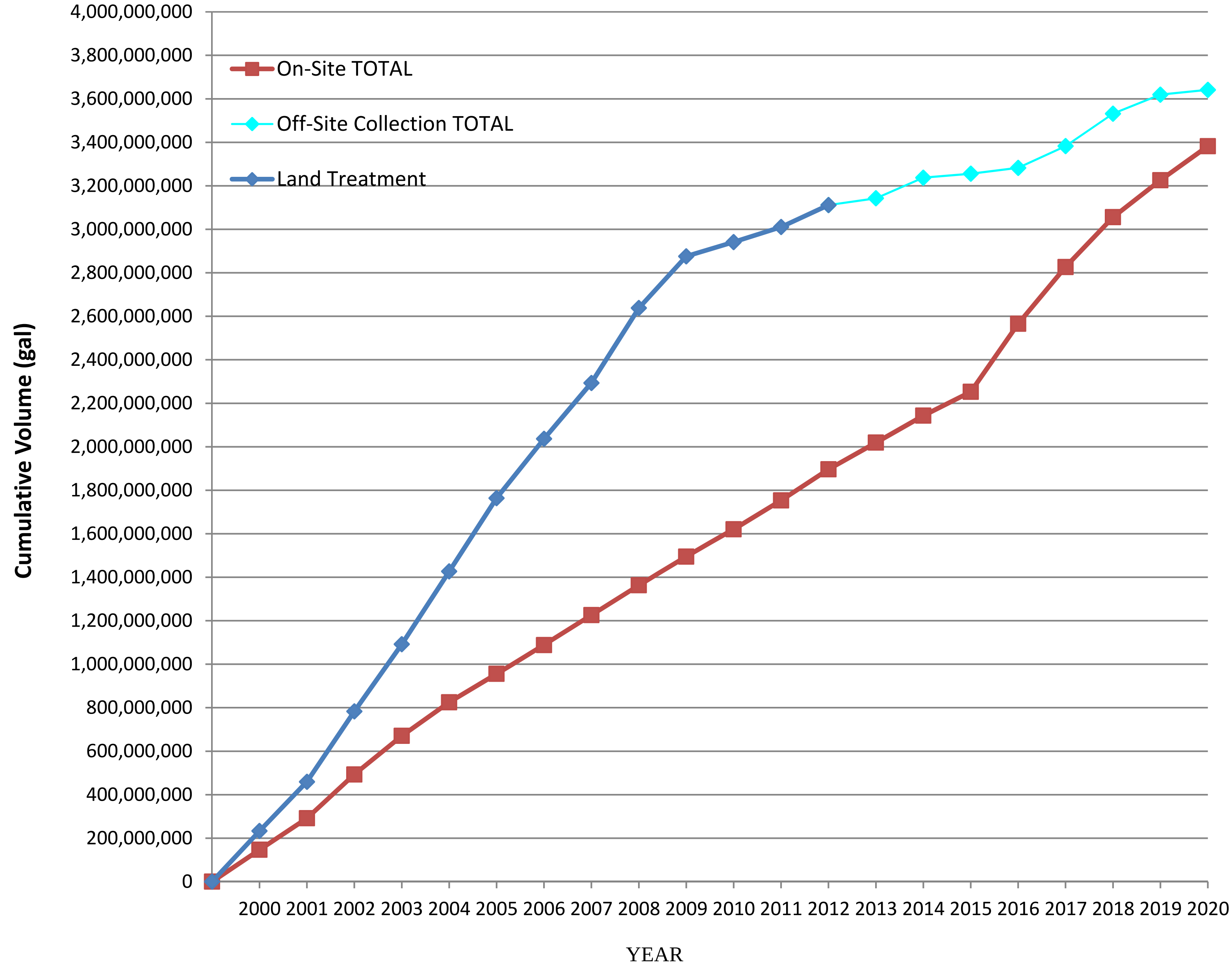


**Figure 2.1-3. Cumulative Volume of Land Treatment, On-Site and Off-Site Collection from 2000 to Present**

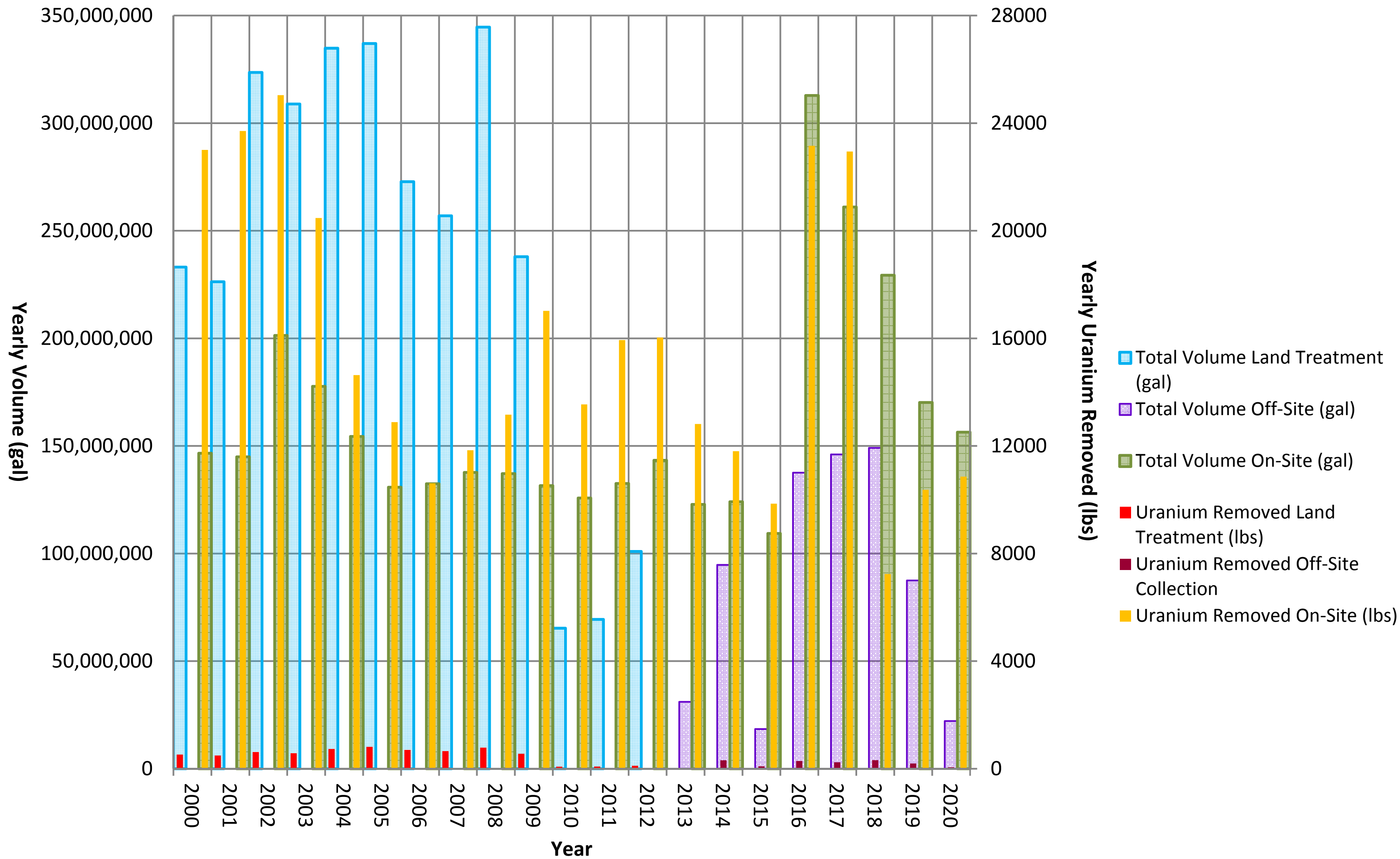


**Figure 2.1-4. Yearly Quantity of Groundwater and Uranium Removed**

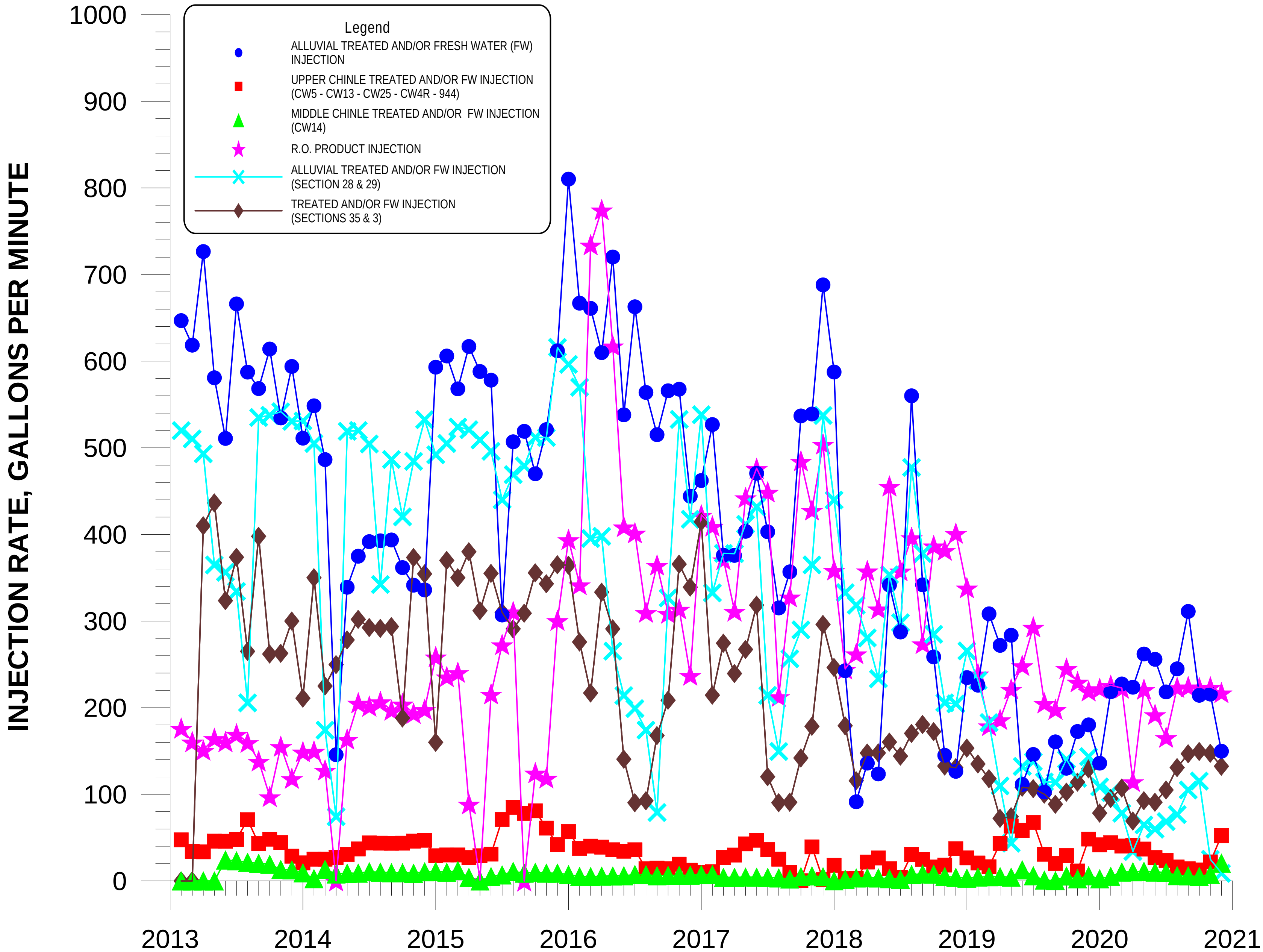


**FIGURE 2.1-5. AVERAGE MONTHLY INJECTION RATES FOR THE ALLUVIAL UPPER CHINLE AND MIDDLE CHINLE AQUIFERS.**

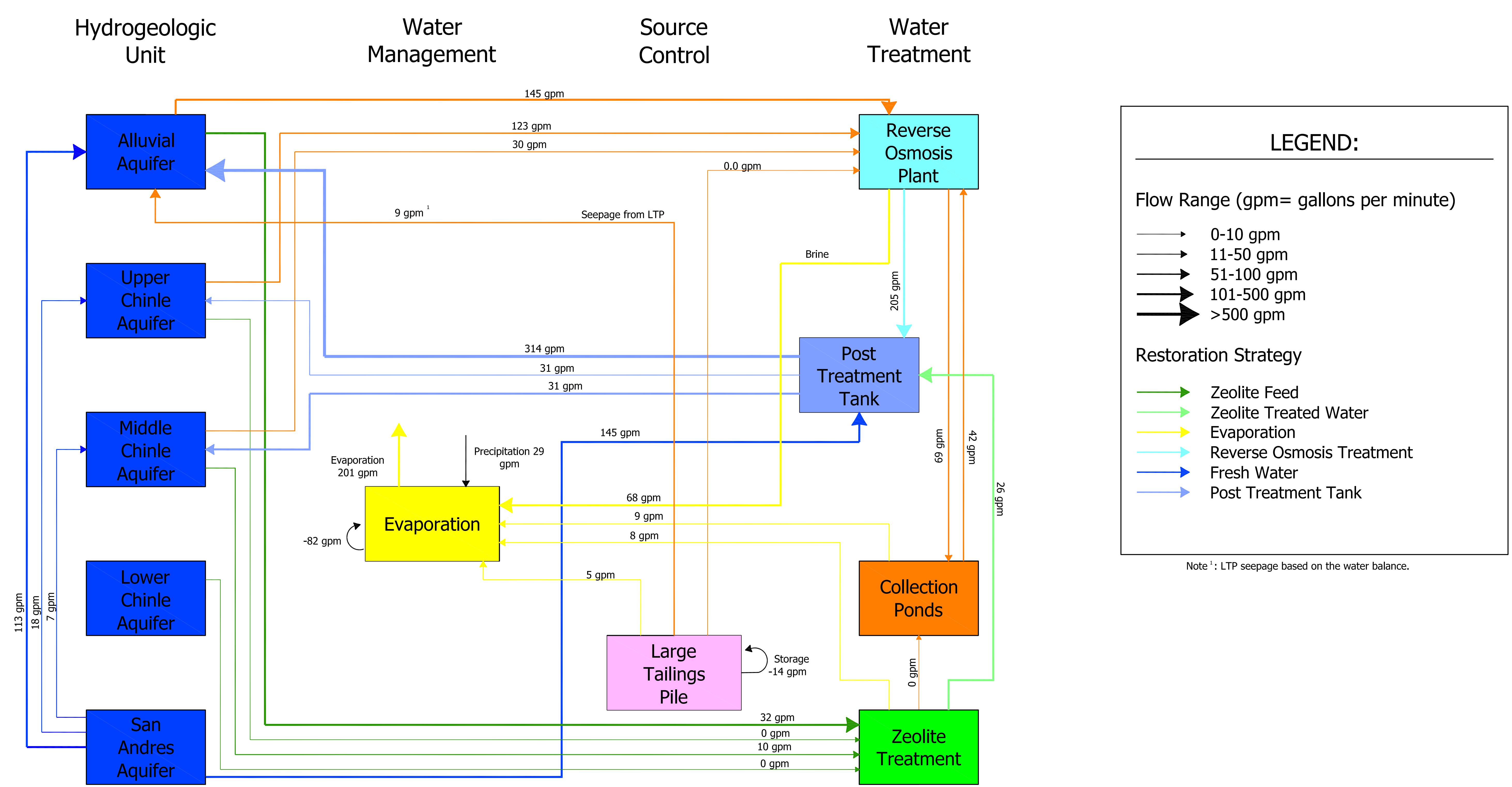


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FIG 2-1-6.DWG
DATE: 2/1/2021

FIGURE 2.1-6. 2020 MAJOR OPERATIONAL FLOWS

## TABLE 2.1-1. QUANTITIES OF CONSTITUENTS COLLECTED ON-SITE.

| YEAR | SOURCE | TOTAL VOLUME PUMPED | SULFATE (SO4) CONC. | AMT. | URANIUM (U) CONC. | AMT. | MOLYBDENUM (MO) CONC. | AMT. | SELENIUM (SE) CONC. | AMT. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (GAL) | (MG/L) | (LB) | (MG/L) | (LB) | (MG/L) | (LB) | (MG/L) | (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 |
| 2005 | G.W. | 130810679 | 2478 | 2705346 | 11.8 | 12883 | 15.5 | 16922 | 0.59 | 644 |
| 2005 | TOE | 20704320 | 8228 | 1421784 | 43.5 | 7517 | 87.5 | 15120 | 2.63 | 454 |
| 2005 | TAILS | 45685786 | 4389 | 1673497 | 18.7 | 7130 | 56.3 | 21467 | 0.18 | 69 |
| 2006 | G.W. | 132406109 | 1990 | 2199072 | 9.6 | 10609 | 14.3 | 15802 | 0.73 | 807 |
| 2006 | TOE | 20374782 | 7432 | 1263796 | 38.0 | 6462 | 76.2 | 12958 | 1.09 | 185 |
| 2006 | TAILS | 43707760 | 4278 | 1560550 | 17.6 | 6420 | 51.9 | 18932 | 0.14 | 51 |
| 2007 | G.W. | 137707200 | 2420 | 2781316 | 10.3 | 11838 | 16.7 | 19193 | 0.52 | 598 |
| 2007 | TOE | 25037779 | 6829 | 1427024 | 31.9 | 6666 | 67.3 | 14063 | 1.20 | 251 |
| 2007 | TAILS | 24561680 | 4130 | 846616 | 19.9 | 4079 | 61.1 | 12525 | 0.15 | 31 |
| 2008 | G.W. | 137145174 | 2672 | 3058408 | 11.5 | 13163 | 16.5 | 18886 | 0.61 | 698 |
| 2008 | TOE | 26140850 | 7847 | 1711992 | 31.6 | 6894 | 68.5 | 14945 | 1.58 | 345 |
| 2008 | TAILS | 5950324 | 4671 | 231968 | 16.0 | 795 | 42.8 | 2126 | 0.24 | 12 |
| 2009 | G.W. | 131564160 | 3145 | 3453318 | 15.5 | 17020 | 19.1 | 20660 | 0.85 | 933 |
| 2009 | TOE | 27238830 | 7792 | 1771396 | 35.0 | 7957 | 69.9 | 15891 | 0.81 | 184 |
| 2009 | TAILS | 29403070 | 3850 | 944782 | 13.7 | 3362 | 38.6 | 9472 | 0.24 | 59 |
| 2010 | G.W. | 125785118 | 2793 | 2932099 | 12.9 | 13542 | 16.6 | 17427 | 0.64 | 672 |
| 2010 | TOE | 18444330 | 6848 | 1054156 | 32.9 | 5065 | 52.1 | 8020 | 0.51 | 79 |
| 2010 | TAILS | 12953960 | 3018 | 326287 | 9.4 | 1016 | 33.5 | 3622 | 0.19 | 21 |
| 2011 | G.W. | 132573855 | 2908 | 3217590 | 14.4 | 15933 | 22.5 | 24895 | 1.23 | 1361 |
| 2011 | TOE | 14777020 | 6747 | 832101 | 29.9 | 3688 | 53.2 | 6561 | 0.44 | 54 |
| 2011 | TAILS | 54713150 | 2887 | 1318308 | 10.5 | 4795 | 33.5 | 15297 | 0.18 | 82 |

## TABLE 2.1-1. QUANTITIES OF CONSTITUENTS COLLECTED ON-SITE.

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2012 | G.W. | 143304728 | 3070 | 3671785 | 13.4 | 16027 | 16.8 | 20093 | 0.62 | 742 |
| 2012 | TOE | 12201316 | 6476 | 659465 | 26.8 | 2729 | 48.9 | 4980 | 0.43 | 44 |
| 2012 | TAILS | 56486600 | 2632 | 1240823 | 8.9 | 4196 | 26.2 | 12352 | 0.17 | 80 |
| 2013 | G.W. | 122813790 | 2793 | 2862836 | 12.5 | 12813 | 16.2 | 16605 | 0.73 | 748 |
| 2013 | TOE | 9211575 | 6453 | 496105 | 26.7 | 2053 | 53.3 | 4098 | 0.35 | 27 |
| 2013 | TAILS | 31489800 | 2448 | 643368 | 7.5 | 1958 | 23.6 | 6202 | 0.12 | 32 |
| 2014 | G.W. | 124070324 | 2570 | 2661212 | 11.4 | 11805 | 15.8 | 16361 | 0.63 | 652 |
| 2014 | TOE | 9427490 | 5683 | 447149 | 21.2 | 1668 | 46.0 | 3619 | 0.15 | 12 |
| 2014 | TAILS | 24487100 | 2788 | 569782 | 7.8 | 1594 | 27.1 | 5538 | 0.16 | 33 |
| 2015 | G.W. | 109360371 | 3100 | 2829437 | 10.8 | 9857 | 14.1 | 12869 | 0.83 | 758 |
| 2015 | TOE | 10222310 | 5252 | 448076 | 20.7 | 1766 | 41.2 | 3515 | 0.30 | 26 |
| 2015 | TAILS | 8644000 | 2891 | 208565 | 8.2 | 592 | 28.0 | 2020 | 0.11 | 8 |
| 2016 | G.W. | 312653024 | 2590 | 6758352 | 8.2 | 21397 | 14.5 | 37836 | 0.45 | 1174 |
| 2016 | TOE | 7553090 | 4756 | 299809 | 17.2 | 1085 | 36.7 | 2310 | 0.15 | 9 |
| 2016 | TAILS | 2678400 | 2891 | 64625 | 8.2 | 183 | 28.0 | 626 | 0.11 | 2 |
| 2017 | G.W. | 261047358 | 2104 | 4583987 | 10.5 | 22876 | 17.1 | 37256 | 0.66 | 1438 |
| 2017 | TOE | 5455170 | 3305 | 150473 | 13.9 | 633 | 26.9 | 1225 | 0.21 | 10 |
| 2017 | TAILS | 674300 | 4918 | 27677 | 14.7 | 83 | 32.5 | 183 | 0.70 | 4 |
| 2018 | G.W. | 229336854 | 1460 | 2794506 | 3.8 | 7235 | 5.5 | 10566 | 0.28 | 542 |
| 2018 | TOE | 4530130 | 4708 | 178002 | 17.5 | 662 | 36.6 | 1384 | 0.27 | 10 |
| 2019 | G.W. | 170189842 | 2185 | 3103584 | 7.3 | 10369 | 13.4 | 19033 | 0.49 | 696 |
| 2019 | TOE | 3024380 | 4959 | 125172 | 15.4 | 389 | 42.4 | 1070 | 0.20 | 5 |
| 2020 | G.W. | 156370198 | 2500 | 3262664 | 8.3 | 10858 | 14.3 | 18662 | 0.45 | 587 |
| 2020 | TOE | 2152800 | 4952 | 88974 | 16.1 | 289 | 39.7 | 713 | 0.52 | 9 |
| SUM G.W. | | 6,229,283,043 | | 188,668,296 | | 1,074,329 | | 1,321,322 | | 68,134 |
| SUM TOE | | 416,794,911 | | 29,790,427 | | 125,674 | | 266,885 | | 4,885 |
| SUM TAILS | | 493,302,302 | | 20,155,515 | | 76,460 | | 211,831 | | 725 |
| COMBINED SUM | | 7,139,380,256 | | 238,614,238 | | 1,276,463 | | 1,800,037 | | 73,743 |

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

## TABLE 2.1-2. QUANTITIES OF CONSTITUENTS COLLECTED BY AQUIFER, 2018-2020

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **ON-SITE** | | | | | | |
| 2018 | ALLUVIAL | 144,785,813 | 1772 | 2,141,062 | 5.46 | 6,593 | 8.28 | 10,005 | 0.38 | 465 |
| 2018 | UPPER CHINLE | 66,858,941 | 729 | 406,855 | 0.81 | 453 | 0.80 | 445 | 0.06 | 31 |
| 2018 | MIDDLE CHINLE | 17,692,100 | 1670 | 246,589 | 1.28 | 189 | 0.78 | 115 | 0.31 | 46 |
| 2019 | ALLUVIAL | 107,089,394 | 2848 | 2,545,237 | 10.89 | 9,730 | 20.54 | 18,355 | 0.70 | 622 |
| 2019 | UPPER CHINLE | 47,674,449 | 864 | 343,728 | 1.19 | 472 | 1.34 | 535 | 0.08 | 33 |
| 2019 | MIDDLE CHINLE | 15,426,000 | 1667 | 214,619 | 1.29 | 166 | 1.12 | 144 | 0.32 | 41 |
| 2020 | ALLUVIAL | 76,128,661 | 4258 | 2,705,144 | 16.01 | 10,173 | 28.30 | 17,981 | 0.64 | 405 |
| 2020 | UPPER CHINLE | 64,623,937 | 698 | 376,341 | 0.96 | 520 | 1.00 | 540 | 0.30 | 160 |
| 2020 | MIDDLE CHINLE | 15,617,600 | 1390 | 181,179 | 1.27 | 166 | 1.09 | 142 | 0.17 | 22 |
| | | | | **OFF-SITE** | | | | | | |
| 2018 | SOUTH ALLUVIAL | 69,828,478 | | | 0.32 | 189 | | | | |
| 2018 | SOUTH MIDDLE CHINLE | 28,432,465 | | | 0.30 | 71 | | | | |
| 2018 | SOUTH LOWER CHINLE | 0 | | | | 0 | | | | |
| 2018 | NORTH ALLUVIAL | 50,803,376 | | | 0.13 | 55 | | | | |
| 2019 | SOUTH ALLUVIAL | 44,241,529 | | | 0.31 | 113 | | | | |
| 2019 | SOUTH MIDDLE CHINLE | 16,853,311 | | | 0.28 | 39 | | | | |
| 2019 | SOUTH LOWER CHINLE | 0 | | | | 0 | | | | |
| 2019 | NORTH ALLUVIAL | 26,409,500 | | | 0.20 | 43 | | | | |
| 2020 | SOUTH ALLUVIAL | 12,744,009 | | | 0.36 | 38 | | | | |
| 2020 | SOUTH MIDDLE CHINLE | 5,058,915 | | | 0.23 | 10 | | | | |
| 2020 | SOUTH LOWER CHINLE | 0 | | | | 0 | | | | |
| 2020 | NORTH ALLUVIAL | 4,359,400 | | | 0.22 | 8 | | | | |
| SUM ON-SITE | | 555,896,895 | | 9,160,754 | | 28,462 | | 48,261 | | 1,825 |
| SUM OFF-SITE | | 258,730,983 | | | | 567 | | | | |
| COMBINED SUM | | 814,627,878 | | | | 29,029 | | | | |

Table 2.1-3 Compliant (SP2) Water Quality Data

| | | Field Parameters | | | | | Lab Data | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Point Name | Date | pH(f) (units) | Temp. (°C) | Cond. (μmhos/cm) | KPA U (mg/L) | Mo(f) (mg/L) | Cl (mg/L) | SO4 (mg/L) | TDS (mg/L) | U (mg/L) | Mo (mg/L) | Se (mg/L) |
| Site Standard | | | | | | | **250** | **1500** | **2734** | **0.16** | **0.1** | **0.32** |
| SP2 | 1/28/20 | 6.89 | 15.1 | 19.36 | 0.003 | | 81 | 260 | 703 | 0.0204 | 0.053 | 0.004 |
| | 2/25/20 | 6.67 | 11.5 | 728 | 0.007 | | 53 | 165 | 458 | 0.0066 | 0.011 | 0.002 |
| | 3/26/2020 | 6.44 | 12.57 | 2682 | 0.006 | 0.01 | 66 | 207 | 575 | 0.0043 | 0.005 | 0.002 |
| | 4/30/2020 | 7.12 | 18.6 | 1246 | | | 91 | 284 | 1060 | 0.0047 | <0.01 | <0.005 |
| | 5/28/2020 | 7.9 | 20.8 | 885.1 | | | 62 | 194 | 550 | 0.0036 | <0.03 | <0.005 |
| | 6/29/2020 | 7.45 | 23.7 | 1191 | | | 92 | 263 | 750 | 0.0106 | 0.02 | <0.005 |
| | 7/30/2020 | 7.58 | 20.1 | 1343 | | | 106 | 312 | 920 | 0.0072 | <0.01 | <0.005 |
| | 8/27/2020 | 7.49 | 22.5 | 1382 | 0.005 | 0.01 | 3 | <2 | <20 | 0.002 | <0.01 | <0.005 |
| | 9/29/2020 | 7.1 | 14.4 | 1544 | 0.009 | | 114 | 399 | 1060 | 0.007 | <0.01 | <0.005 |
| | 10/26/2020 | 8.08 | 16.3 | 1694 | 0.005 | 0.01 | 132 | 527 | 1210 | 0.011 | <0.01 | 0.013 |
| | 11/30/2020 | 7.82 | 16.3 | 1287 | 0.001 | 0.01 | 31 | 146 | 350 | 0.011 | <0.01 | <0.005 |
| | 12/29/2020 | 7.54 | 16.6 | 1322 | | | 102 | 326 | 920 | 0.007 | <0.01 | <0.005 |

Concentrations greater than site standards are in **bold**.

Table 2.1-3 Compliant (SP2) Water Quality Data (cont.)

| Sample Point Name | Date | NO3 (mg/L) | Ra226 (pCi/L) | Ra226e (pCi/L) | Ra228 (pCi/L) | Ra228e (pCi/L) | Ra226+ Ra228 | Th230 (pCi/L) | Th230e (pCi/L) | V (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Standard | | **12** | | | | | **5** | **0.3** | | **0.02** |
| SP2 | 1/28/20 | 0.8 | 0.2 | 0.1 | <1.2 | | <1.4 | **0.4** | 0.2 | <0.01 |
| | 2/25/20 | | | | | | | | | |
| | 3/26/2020 | 0.7 | 0.3 | 0.2 | <1.3 | | <1.6 | <0.08 | 0.05 | <0.01 |
| | 4/30/2020 | 1.1 | <0.2 | | 4 | 5.8 | <4.2 | <0.3 | | <0.01 |
| | 5/28/2020 | 0.5 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |
| | 6/29/2020 | 1 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |
| | 7/30/2020 | 1 | <0.2 | | <1 | 6 | <1.2 | <0.3 | | <0.02 |
| | 8/27/2020 | 0.5 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.02 |
| | 9/29/2020 | 0.7 | 0.3 | 0.1 | <1 | | <1.3 | <0.3 | | <0.01 |
| | 10/26/2020 | 1.5 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |
| | 11/30/2020 | 0.6 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |
| | 12/29/2020 | 1 | <0.2 | | <1 | | <1.2 | 0.3 | 0.200 | <0.01 |

Concentrations greater than site standards are in **bold**.

**Table 2.1-4 RO Clarifier Feed and RO SP1 Water Quality Data**

| Sample Point Name | Date | Field Parameters pH(f) (units) | Temp. (°C) | Cond. (µmhos/cm) | KPA U (mg/L) | Mo(f) (mg/L) | Lab Data Cl (mg/L) | SO4 (mg/L) | TDS (mg/L) | U (mg/L) | Mo (mg/L) | Se (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Site Standard** | | | | | | | **250** | **1500** | **2734** | **0.16** | **0.1** | **0.32** |
| RO CLAR FEED | 5/28/20 | 7.75 | 16.4 | 4960 | | | **328** | **2500** | **4960** | **8.32** | **14.3** | **0.45** |
| RO SP1 | 1/28/20 | 6.08 | 14.6 | 38.02 | 0.003 | | 3 | 3 | 20 | 0.0047 | 0.014 | <0.001 |
| | 2/25/2020 | 5.45 | 12.6 | 39.55 | 0.008 | 0.02 | 3 | 3 | 24 | 0.0061 | 0.018 | <0.001 |
| | 3/26/2020 | 5.98 | 13.7 | 34.21 | | | 3 | 1 | <10 | 0.001 | 0.007 | <0.001 |
| | 4/30/2020 | 5.6 | 18.4 | 33.21 | | | 3 | <2 | <20 | 0.001 | <0.03 | <0.005 |
| | 5/28/2020 | 6.23 | 19.9 | 101.3 | | | 11 | 15 | 70 | 0.017 | 0.09 | <0.005 |
| | 6/29/2020 | 4.91 | 23.2 | 24.14 | | | 3 | <2 | <20 | 0.001 | <0.01 | <0.005 |
| | 7/30/2020 | 5.39 | 19.6 | 26.27 | | | 3 | <2 | <20 | 0.001 | <0.01 | <0.005 |
| | 8/27/2020 | 5.46 | 23.4 | 32.88 | 0.001 | | 127 | 403 | 1070 | 0.007 | <0.01 | <0.005 |
| | 9/29/2020 | 4.93 | 13.9 | 34.42 | 0.009 | | <2 | <2 | 60 | 0.002 | <0.01 | <0.005 |
| | 10/26/2020 | 7.02 | 16.8 | 21.03 | 0.002 | | <2 | <2 | 20 | <0.0003 | <0.01 | <0.005 |
| | 11/30/2020 | 7.8 | 16.1 | 28.96 | 0.023 | 0.01 | 4 | <2 | 30 | 0.004 | <0.01 | <0.005 |
| | 12/29/2020 | 4.66 | 16.6 | 75.97 | | | 8 | 723 | 200 | 0.017 | 0.04 | <0.005 |
| LPRO #2 Product | 12/21/2020 | 6.52 | 16.8 | 58.59 | | | 6 | 9 | 40 | 0.013 | 0.040 | <0.005 |

Concentrations greater than site standards are in **bold**.

**Table 2.1-4 RO Clarifier Feed and RO SP1 Water Quality Data (cont.)**

| Sample Point Name | Date | NO3 (mg/L) | Ra226 (pCi/L) | Ra226e (pCi/L) | Ra228 (pCi/L) | Ra228e (pCi/L) | Ra226+ Ra228 | Th230 (pCi/L) | Th230e (pCi/L) | V (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site Standard** | | **12** | | | | | **5** | **0.30** | | **0.02** |
| RO CLAR FEED | 5/28/20 | 5.9 | <0.2 | | 1.4 | 2.3 | <1.6 | <.3 | | <.01 |
| RO SP1 | 1/28/20 | 0.3 | 0.2 | 0.2 | <1.3 | 0.8 | <1.5 | <0.1 | 0.07 | <0.01 |
| | 2/25/2020 | | | | | | | | | |
| | 3/26/2020 | 0.4 | <0.2 | 0.2 | <1.3 | 0.8 | <1.5 | 0.04 | 0.03 | <0.01 |
| | 4/30/2020 | 0.4 | <0.2 | | 4.3 | 4.9 | <4.5 | <0.3 | | <0.01 |
| | 5/28/2020 | 0.5 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |
| | 6/29/2020 | 0.3 | 0.2 | 0.1 | 1.9 | 2.9 | 2.1 | <0.3 | | <0.01 |
| | 7/30/2020 | 0.3 | <0.2 | | 6.9 | 6 | <7.1 | <0.3 | | <0.02 |
| | 8/27/2020 | 1 | <0.2 | | 3.4 | 2.3 | <3.6 | 0.40 | 0.10 | <0.02 |
| | 9/29/2020 | 0.4 | 0.3 | 0.1 | <1 | | <1.3 | 1.70 | 0.30 | <0.01 |
| | 10/26/2020 | 0.4 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |
| | 11/30/2020 | 0.5 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |
| | 12/29/2020 | 0.4 | <0.2 | | 1.6 | 2 | <1.8 | <0.3 | | <0.01 |
| LPRO #2 Product | 12/21/2020 | 0.3 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |

Concentrations greater than site standards are in **bold**.

**Table 2.1-5 Zeolite Treated Water Quality Data**

| Sample Point Name | Date | Field Parameters pH(f) (units) | Temp. (°C) | Cond. (μmhos | KPA U (mg/L) | Mo(f) (mg/L) | Lab Data U (mg/L) | Mo (mg/L) | Se (mg/L) | Cl (mg/L) | SO4 (mg/L) | TDS (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site Standard | | | | | | | **0.16** | **0.1** | **0.32** | **250** | **1500** | **2734** |
| 300Z | NO 2020 OPERATION | | | | | | | | | | | |
| 1200Z Trains 1&2 | NO 2020 OPERATION | | | | | | | | | | | |
| 1200Z Trains 3&4 | 9/17/20 | 5.65 | 13.8 | 2563 | 0.031 | 0 | 0.0298 | <0.01 | 0.041 | 155 | 1070 | 1920 |
| | 11/5/20 | 5.38 | 19.6 | 2340 | 0.123 | 0 | 0.139 | <0.01 | 0.034 | 152 | 976 | 1790 |

Concentrations greater than site standards are in **bold**.

**Table 2.1-5 Zeolite Treated Water Quality Data (cont.)**

| Sample Point Name | Date | NO3 (mg/L) | Ra226 (pCi/L) | Ra226e (pCi/L) | Ra228 (pCi/L) | Ra228e (pCi/L) | Ra226+ Ra228 | Th230 (pCi/L) | Th230e (pCi/L) | V (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Standard | | **12** | | | | | **5** | **0.3** | | **0.02** |
| 300Z | NO 2020 OPERATION | | | | | | | | | |
| 1200Z Trains 1&2 | NO 2020 OPERATION | | | | | | | | | |
| 1200Z Trains 3&4 | 9/17/20 | 2.3 | <0.2 | | <1 | | <1.2 | <0.3 | | <0.01 |
| | 11/5/20 | 2.2 | <0.2 | | 2.1 | 2 | <2.3 | <0.3 | | <0.01 |

Concentrations greater than site standards are in **bold**.

## 2.2 FUTURE OPERATION

Groundwater quality restoration in 2021 will continue as a combination of fresh-water, zeolite treated 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 operation of the R.O. plant in 2021 is projected to be 300 gpm to maintain hydraulic control in the vicinity of the tailings piles due to the possibility of re-lining of EP1. The operation of the zeolite treatment is also expected to be limited to a capacity of 200 gpm in 2021 due to the potential re-lining of EP1. As articulated in the 2020 Groundwater Corrective Action Program, future groundwater remediation will not yield significant progress towards compliance with established protective groundwater standards as the means for the protection of human health and will be focused upon maintaining compliance with obligations in RML SUA-1471 until the approval of Alternate Concentration Limits at a future date.

Collection from Upper Chinle wells CE2, CE5, CE6, CE11, CE12, CE15 and CE19 will continue to intercept contaminants in this aquifer in 2021. Injection into Upper Chinle wells 944, CW5 and CW13 is planned to continue to control the direction of flow in these areas of the Upper Chinle aquifer.

Collection from Middle Chinle well CW62 will continue in 2021. 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.

Off-site collection of water from Sections 3, 27, 28 and 35 will be restricted in 2021 for the potential re-lining of EP1. Operation of the South collection and injection in the northeast portion of Section 3 and South Felice Acres is planned to continue in 2021. The North Off-site operation of collection and injection is also planned to be continued in 2021. Limited treated and fresh-water injection will mainly be into injection wells on the down gradient side of the restoration area in 2021 to decrease the movement of the plumes.

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## 3.0 TAILINGS MONITORING

The tailings monitoring program includes Large Tailings Pile (LTP) wells that were monitored to define water quality and water level conditions and changes during 2020. Figure 3.1-1 shows the locations of the tailings wells for the LTP with Figures 3.1-1A and 3.1-1B showing expanded mapping of the west and east halves of the LTP, respectively. Figure 3.1-2 shows the locations of the tailings wells monitored during 2020 and shows the locations of toe drains and the sumps that are also monitored for tailings water quality. Figures 3.1-3 and 3.1-4 present volumes of water removed from the LTP by the toe drains and previous dewatering efforts. Figure 3.1-5 presents an example cross section for the LTP and illustrates the typical transition from sandy or coarser tailings deposited on the perimeter of the LTP to the slime or fine-grained tailings deposited on the interior of the LTP. The LTP was constructed by building a starter berm around the perimeter and the location of this berm is between 530 and 610 feet from the south end of the cross section shown in Figure 3.1-5. The method of tailings deposition using a cyclone resulted in the segregation of the fine-grained slimes with much lower permeability tailings on the interior of the LTP, and as indicated in Figure 3.1-2, a distinction is made between the slime and sand tailings and the wells installed in each tailings type. Cross Section A-A' in Figure 3.1-5 also shows the approximate location of the toe drain corridor and the expected potentiometric surface in the tailings.

## 3.1 TAILINGS OPERATIONS

Tailings well locations are shown on Figures 3.1-1, 3.1-1A and 3.1-1B. The tailings wells on the outslope of the LTP are shown on Figure 3.1-1 while the wells on top of the LTP are shown on Figures 3.1-1A and 3.1-1B for the west and east half of the LTP respectively. These three figures show locations for wells that have been abandoned, wells permitted to be abandoned, and wells that are planned to be preserved for monitoring of the tailings. Two hundred and fifty seven wells were abandoned in 2020.

The historical collection of water from the tailings and toe drains is presented in Figures 3.1-3 and 3.1-4. No tailings dewatering wells were operated during 2018 through 2020, while the pumping rates from the collection sumps for the toe drains continue to decline with time as shown in Figure 3.1-4. These declining toe drain collection rates reflect the diminishing

thickness of saturated tailings and also result in a reduced rate of uranium mass removal by the toe drains.

### 3.1.1 TAILINGS WELL COMPLETIONS

Table 3.1-1 presents basic information for the tailings wells located on the LTP. This table indicates well coordinates, well depth, casing diameter, water level, measuring point in feet above land surface and elevation, and casing perforation interval. Numerous wells were abandoned on the LTP in 2020, and a notation is included in Table 3.1-1 to indicate wells that have been abandoned.

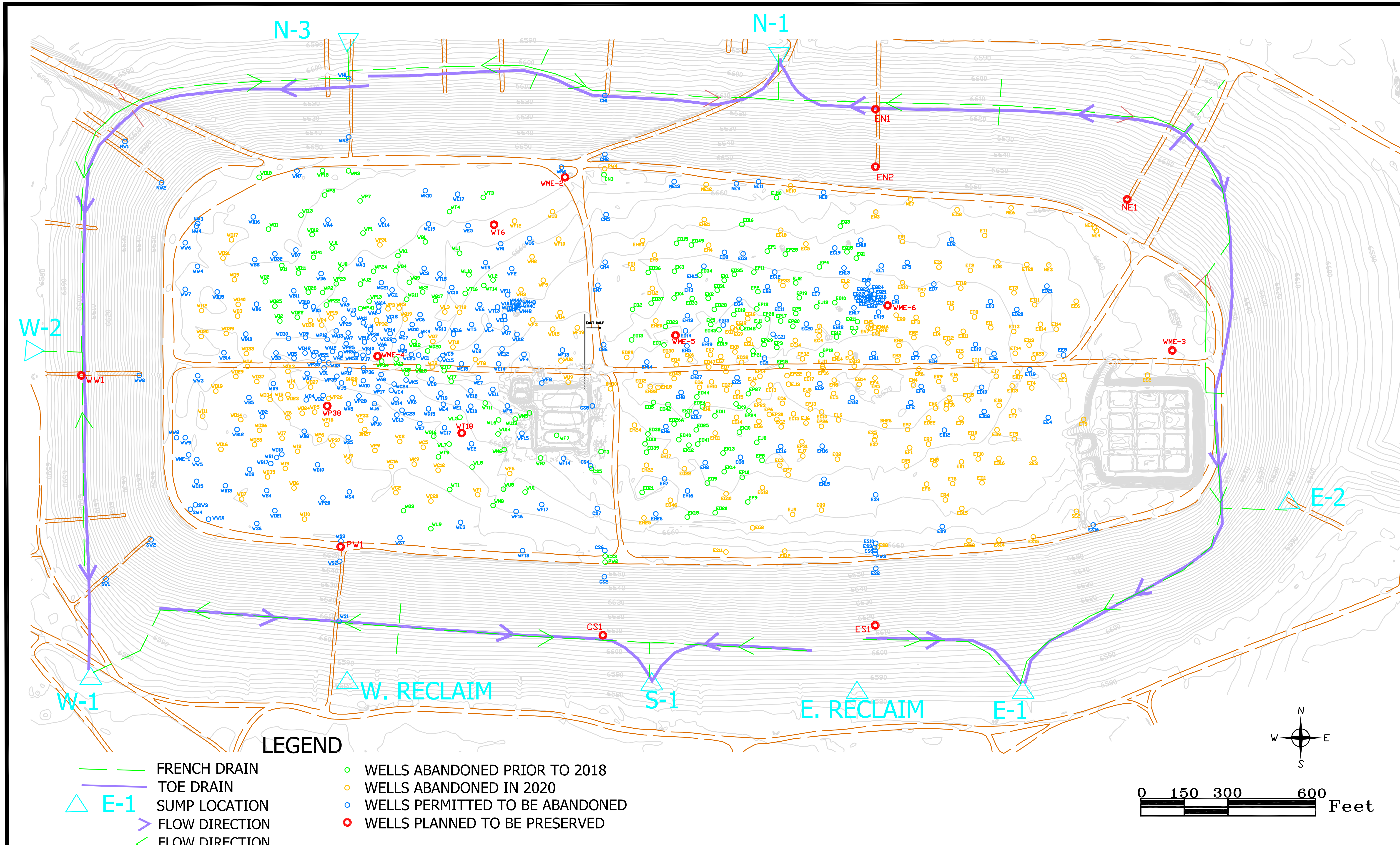



**FIGURE 3.1-1. TAILINGS WELL LOCATIONS, 2020**

HOMESTAKE MINING COMPANY
GRANTS, NEW MEXICO

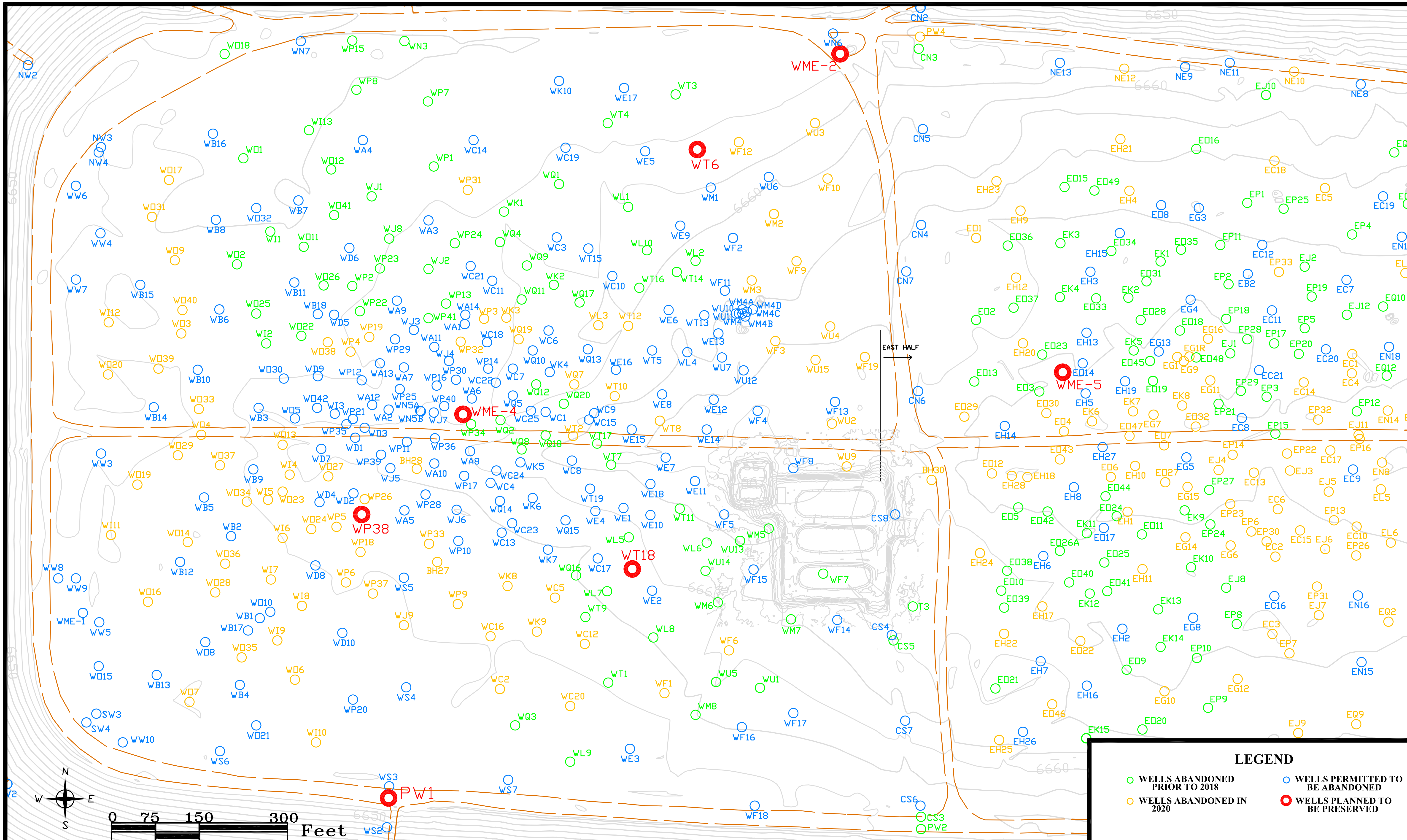



**FIGURE 3.1-1A. LOCATION OF TAILINGS WELLS IN WEST HALF OF LTP**

HOMESTAKE MINING COMPANY
GRANTS, NEW MEXICO

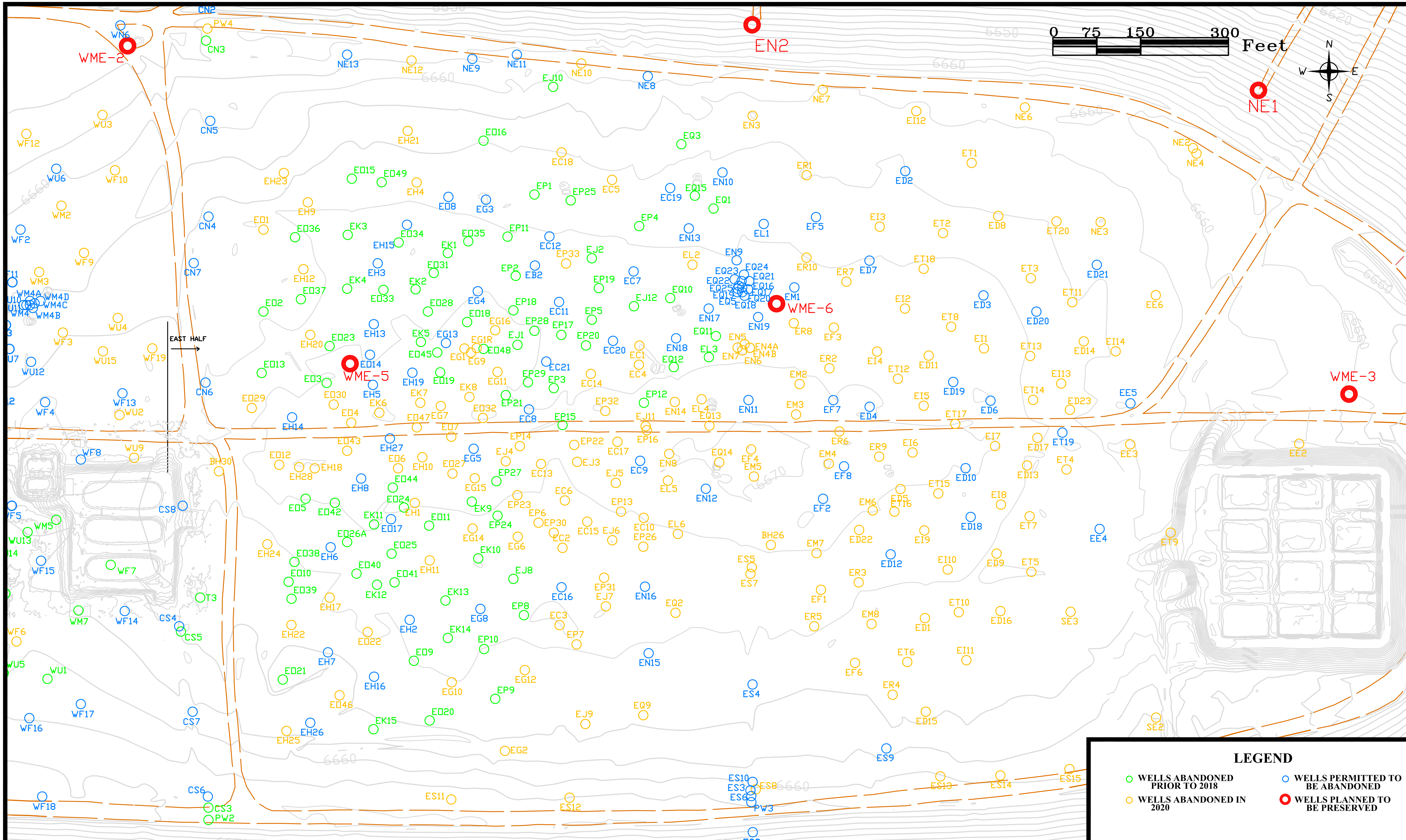
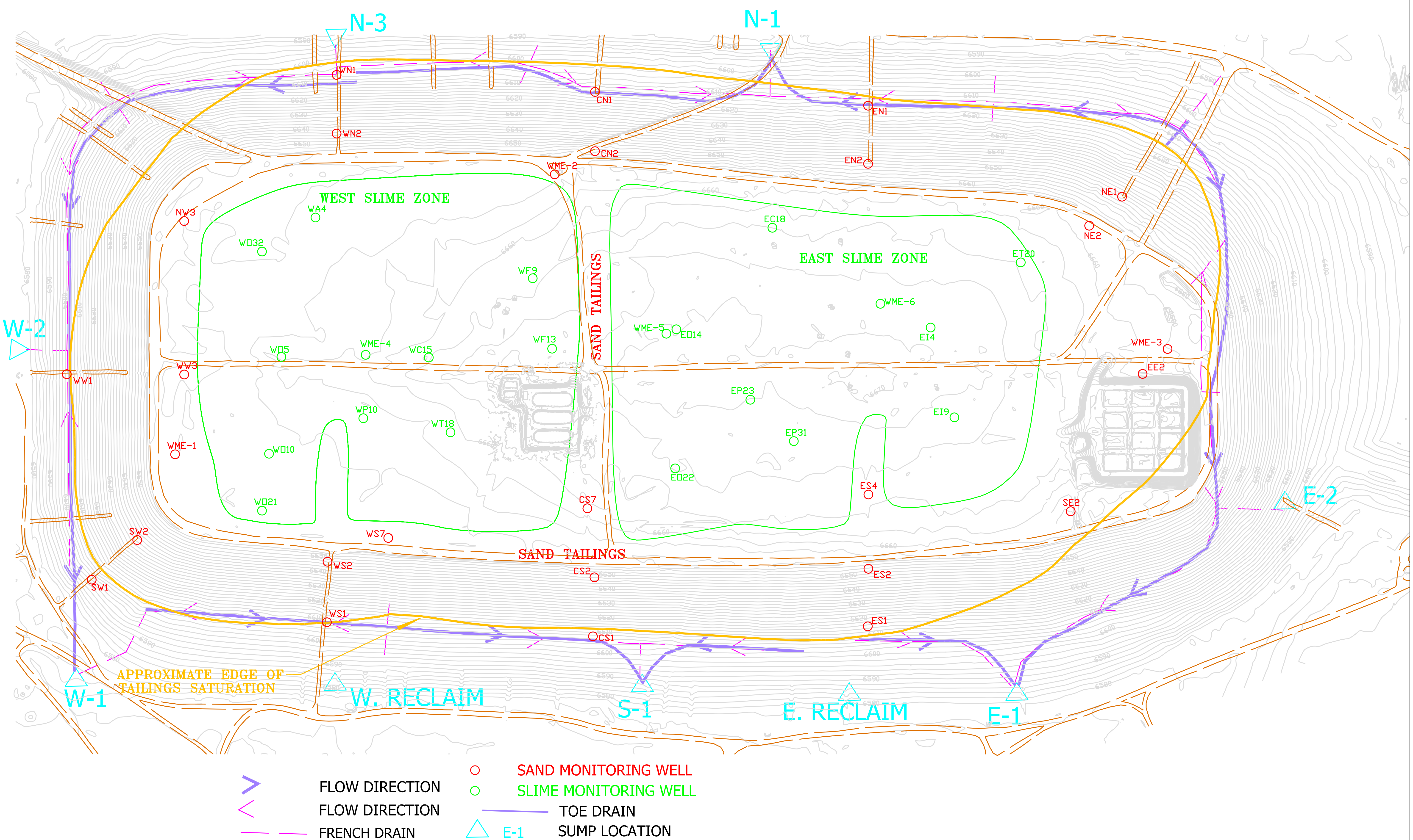



**FIGURE 3.1-1B. LOCATION OF TAILINGS WELLS IN EAST HALF OF LTP**

HOMESTAKE MINING COMPANY
GRANTS, NEW MEXICO




SCALE: 1" = 300'

C:\PROJECTS\2020-06\DWGS TAILINGS-MONITORING-2020

DATE: 11/17/2020

**FIGURE 3.1-2. TAILINGS WELLS MONITORED IN 2020**

HOMESTAKE MINING COMPANY
GRANTS, NEW MEXICO

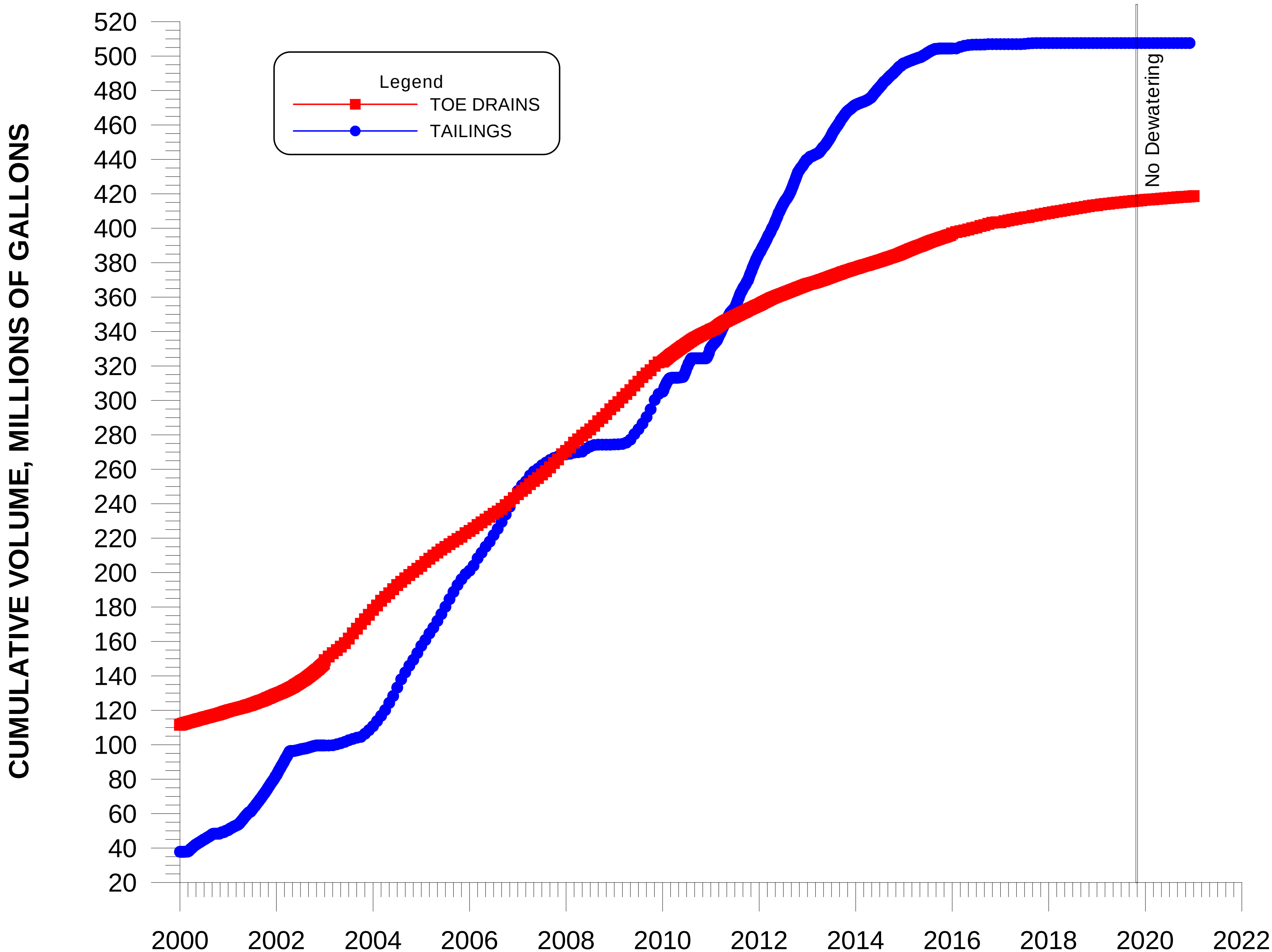



**FIGURE 3.1-3. CUMULATIVE VOLUME OF COLLECTION WATER FROM TAILINGS DEWATERING WELLS AND TOE DRAINS.**

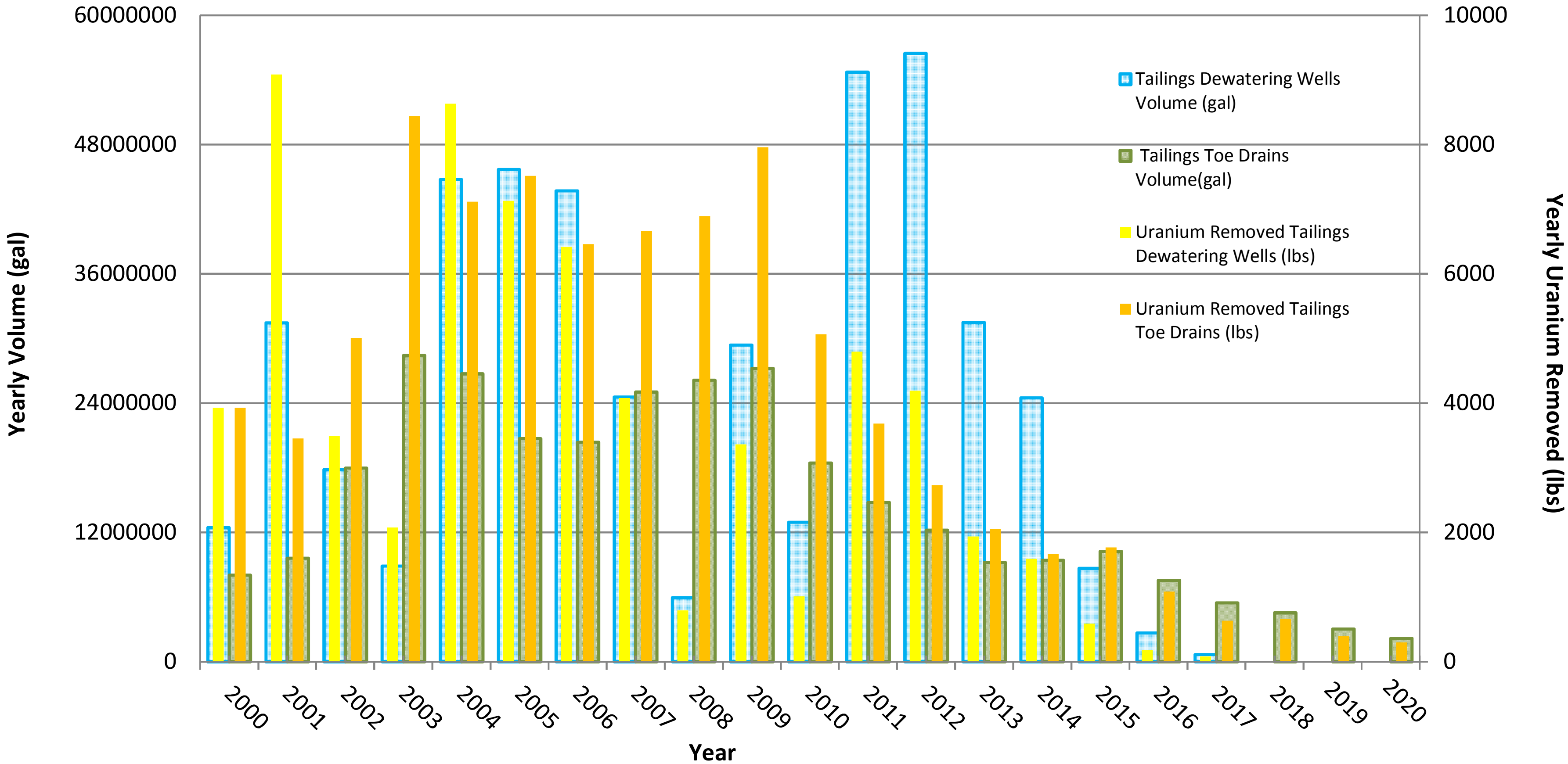
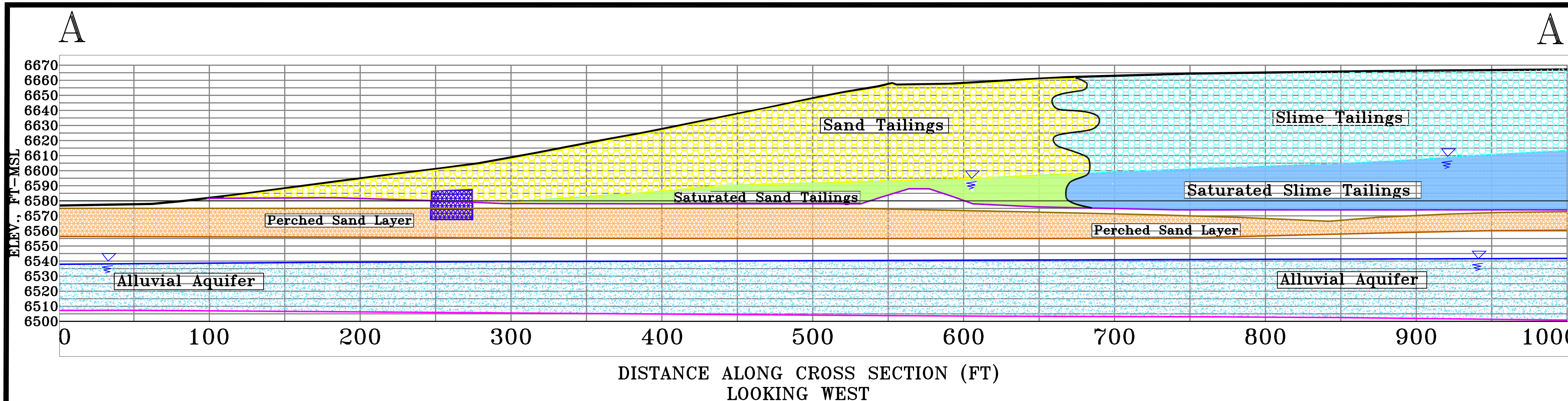
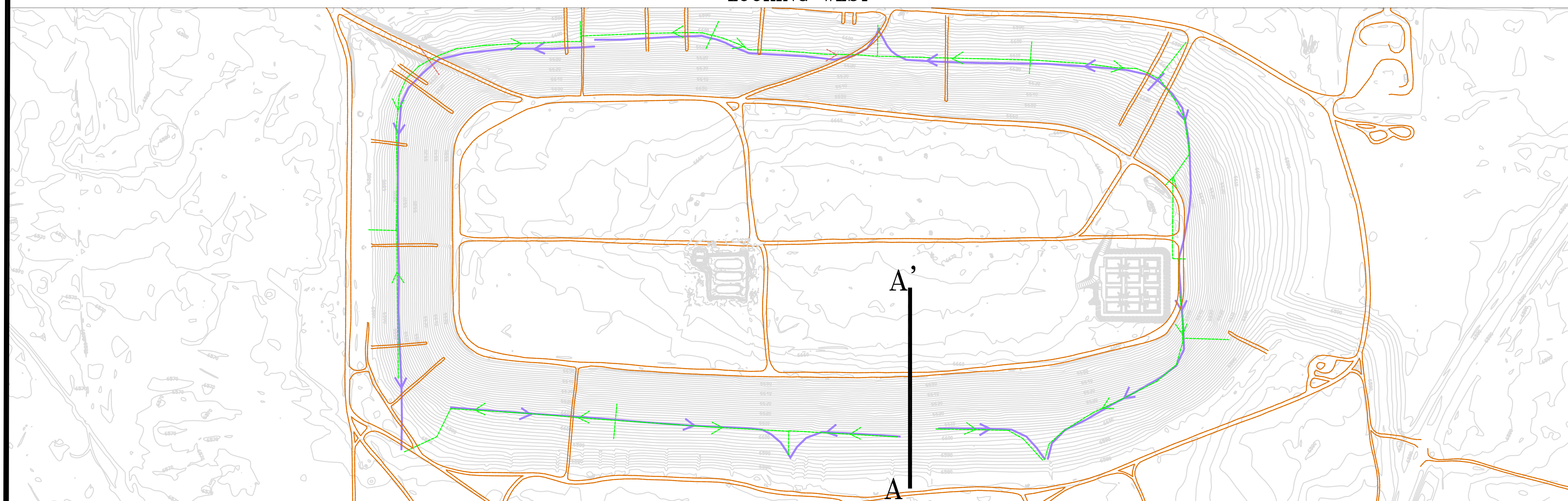



**Figure 3.1-4. Yearly Quantity of Tailings Water and Uranium Removed**




LEGEND

| | |
|---|---|
| LAND SURFACE | BASE OF ALLUVIUM |
| BASE OF TAILINGS | TAILINGS WATER-LEVEL ELEVATION |
| TOP OF PERCHED SAND | ALLUVIAL WATER-LEVEL ELEVATION |
| BASE OF PERCHED SAND | TOE DRAIN CORRIDOR |
| TOE DRAIN | FRENCH DRAIN |

| REVISIONS No. | DATE | MADE BY |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

DATE: 11-2020

DRAWN BY: TGM

**Homestake Mining Company**

Grants, New Mexico

FIGURE 3.1-5
TAILINGS CROSS SECTION A-A'

3.1-9

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE.

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * BH26 | 2.0 | 1543722 | 491784 | 5.0 | 6674.33 | 98.00 | 69.60 | 6604.73 | 80-90 | 70-90 |
| * BH27 | 2.0 | 1543708 | 489997 | 3.3 | 6660.93 | 51.30 | 38.74 | 6622.19 | 56-66 | 46-66 |
| * BH28 | 2.0 | 1543867 | 489962 | 3.9 | 6665.59 | 40.00 | 21.35 | 6644.24 | 30-40 | 20-40 |
| * BH30 | 4.0 | 1543848 | 490841 | 5.6 | 6671.60 | 89.20 | 79.93 | 6591.67 | 77-87 | - |
| CN1 | 2.0 | 1544856 | 490822 | 2.2 | 6615.01 | 35.00 | 19.92 | 6595.09 | 22-32 | 5-32 |
| CN2 | 2.0 | 1544654 | 490822 | 2.8 | 6658.17 | 87.10 | 73.00 | 6585.17 | 60-80 | 5-80 |
| * CN3 | 3.0 | 1544584 | 490819 | 1.3 | 6656.72 | 90.50 | 47.90 | 6608.82 | 47-87 | 5-87 |
| CN4 | 3.0 | 1544283 | 490823 | 2.1 | 6666.22 | 96.40 | 63.63 | 6602.59 | 57-97 | 7-97 |
| CN5 | 5.0 | 1544447 | 490826 | 3.1 | 6660.02 | 113.70 | 52.10 | 6607.92 | 31-111 | 21-111 |
| CN6 | 5.0 | 1544000 | 490818 | 2.7 | 6668.04 | 116.80 | 61.19 | 6606.85 | 35-115 | 25-115 |
| CN7 | 5.0 | 1544204 | 490798 | 3.3 | 6667.88 | 116.00 | 83.00 | 6584.88 | 36-116 | - |
| CS1 | 2.0 | 1543001 | 490815 | 0.9 | 6608.30 | 34.80 | 32.70 | 6575.60 | 25-35 | 5-35 |
| CS2 | 2.0 | 1543202 | 490820 | 4.8 | 6651.98 | 78.30 | 61.70 | 6590.28 | 55-75 | 5-75 |
| * CS3 | 2.0 | 1543273 | 490823 | 2.0 | 6657.64 | 87.30 | 47.81 | 6609.83 | 67-87 | 5-87 |
| CS4 | 5.0 | 1543583 | 490773 | 3.7 | 6667.63 | 99.80 | 53.40 | 6614.23 | 61-101 | 0-101 |
| * CS5 | 2.0 | 1543574 | 490776 | 2.1 | 6666.03 | 42.70 | 43.60 | 6622.43 | 10-40 | 0-40 |
| CS6 | 5.0 | 1543292 | 490822 | 1.2 | 6657.30 | 97.70 | 45.70 | 6611.60 | 55-95 | 0-95 |
| CS7 | 5.0 | 1543437 | 490796 | 3.8 | 6664.69 | 99.90 | 71.50 | 6593.19 | 61-101 | 0-101 |
| CS8 | 5.0 | 1543789 | 490779 | 3.4 | 6668.98 | 116.00 | 58.89 | 6610.09 | 36-116 | - |
| EB2 | 5.0 | 1544200 | 491381 | 2.6 | 6672.24 | 115.70 | 70.14 | 6602.10 | 31-111 | 21-111 |
| * EC1 | 5.0 | 1544063 | 491559 | 1.0 | 6668.50 | 113.00 | 38.20 | 6630.30 | 15-110 | - |
| * EC2 | 5.0 | 1543717 | 491428 | 4.0 | 6669.78 | 110.90 | 61.18 | 6608.60 | 15-110 | - |
| * EC3 | 5.0 | 1543585 | 491423 | 4.4 | 6668.11 | 110.00 | 58.84 | 6609.27 | 15-110 | 15-110 |
| * EC4 | 5.0 | 1544030 | 491559 | 3.6 | 6670.14 | 44.20 | 94.00 | 6576.14 | 20-40 | 15-40 |
| * EC5 | 5.0 | 1544346 | 491513 | 3.1 | 6667.10 | 110.00 | 15.32 | 6651.78 | 30-110 | 20-110 |
| * EC6 | 5.0 | 1543798 | 491432 | 4.8 | 6668.69 | 115.60 | 78.28 | 6590.41 | 33-113 | 23-113 |
| EC7 | 5.0 | 1544190 | 491549 | 2.5 | 6668.92 | 115.10 | 80.80 | 6588.12 | 33-113 | 23-113 |
| EC8 | 5.0 | 1543954 | 491371 | 4.9 | 6672.41 | 116.55 | 100.60 | 6571.81 | 44-114 | 34-114 |
| EC9 | 5.0 | 1543866 | 491561 | 2.6 | 6672.25 | 116.00 | 66.60 | 6605.65 | 36-116 | 26-116 |
| * EC10 | 5.0 | 1543768 | 491567 | 3.3 | 6670.99 | 116.00 | 69.00 | 6601.99 | 36-116 | 26-116 |
| EC11 | 5.0 | 1544137 | 491422 | 3.3 | 6670.26 | 116.00 | 89.00 | 6581.26 | 36-116 | 26-116 |
| EC12 | 5.0 | 1544249 | 491406 | 3.1 | 6669.05 | 116.00 | 99.10 | 6569.95 | 36-116 | 26-116 |
| * EC13 | 5.0 | 1543860 | 491391 | 3.2 | 6670.40 | 116.00 | 40.50 | 6629.90 | 34-114 | 24-114 |
| * EC14 | 5.0 | 1544014 | 491476 | 2.0 | 6670.23 | 116.00 | 35.80 | 6634.43 | 36-116 | 26-116 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * EC15 | 5.0 | 1543762 | 491470 | 2.1 | 6669.75 | 118.00 | 92.40 | 6577.35 | 38-118 | 28-118 |
| EC16 | 5.0 | 1543650 | 491426 | 2.0 | 6668.81 | 118.00 | 64.30 | 6604.51 | 38-118 | 28-118 |
| * EC17 | 5.0 | 1543898 | 491522 | 2.9 | 6672.48 | 117.00 | 29.80 | 6642.68 | 37-117 | 27-117 |
| * EC18 | 5.0 | 1544393 | 491426 | 2.7 | 6667.28 | 120.00 | 66.20 | 6601.08 | 60-120 | 50-120 |
| EC19 | 5.0 | 1544332 | 491612 | 2.0 | 6666.79 | 120.00 | 58.60 | 6608.19 | 60-120 | 50-120 |
| EC20 | 5.0 | 1544071 | 491514 | 1.9 | 6669.17 | 120.00 | 67.00 | 6602.17 | 60-120 | - |
| EC21 | 5.0 | 1544035 | 491400 | 1.1 | 6669.02 | 120.00 | 76.50 | 6592.52 | 60-120 | - |
| * ED1 | 5.0 | 1543597 | 492047 | 4.4 | 6666.62 | 97.00 | 40.30 | 6626.32 | 15-95 | 5-95 |
| ED2 | 5.0 | 1544361 | 492014 | 5.0 | 6665.47 | 113.60 | 36.30 | 6629.17 | 30-110 | 20-110 |
| ED3 | 5.0 | 1544149 | 492147 | 2.6 | 6670.66 | 114.60 | 67.50 | 6603.16 | 32-112 | 22-112 |
| ED4 | 5.0 | 1543958 | 491953 | 3.0 | 6671.97 | 115.20 | 74.80 | 6597.17 | 33-113 | 23-113 |
| * ED5 | 5.0 | 1543818 | 492005 | 3.0 | 6671.44 | 116.20 | 81.50 | 6589.94 | 33-113 | 23-113 |
| ED6 | 5.0 | 1543969 | 492159 | 2.0 | 6670.82 | 118.15 | 84.10 | 6586.72 | 46-116 | 36-116 |
| ED7 | 5.0 | 1544208 | 491952 | 1.9 | 6668.44 | 118.55 | 67.20 | 6601.24 | 45-115 | 35-115 |
| * ED8 | 5.0 | 1544284 | 492172 | 3.4 | 6668.51 | 114.00 | 30.04 | 6638.47 | 35-115 | 25-115 |
| * ED9 | 5.0 | 1543707 | 492170 | 3.1 | 6670.49 | 115.00 | 41.70 | 6628.79 | 36-116 | 26-116 |
| ED10 | 5.0 | 1543853 | 492117 | 3.2 | 6672.16 | 116.00 | 65.50 | 6606.66 | 36-116 | 26-116 |
| * ED11 | 5.0 | 1544046 | 492054 | 3.6 | 6671.78 | 116.00 | 23.20 | 6648.58 | 36-116 | 26-116 |
| ED12 | 5.0 | 1543706 | 491989 | 3.3 | 6669.97 | 116.00 | 48.20 | 6621.77 | 36-116 | 26-116 |
| * ED13 | 5.0 | 1543858 | 492222 | 2.6 | 6669.70 | 118.00 | 42.80 | 6626.90 | 38-118 | 28-118 |
| * ED14 | 5.0 | 1544070 | 492319 | 2.3 | 6667.38 | 112.00 | 28.10 | 6639.28 | 32-112 | 22-112 |
| * ED15 | 5.0 | 1543437 | 492049 | 2.6 | 6667.42 | 114.00 | 61.40 | 6606.02 | 34-114 | 24-114 |
| * ED16 | 5.0 | 1543609 | 492176 | --- | 6669.02 | 115.00 | 39.30 | 6629.72 | 35-115 | 25-115 |
| * ED17 | 5.0 | 1543905 | 492239 | --- | 6667.89 | 115.00 | 41.90 | 6625.99 | 35-115 | 25-115 |
| ED18 | 5.0 | 1543770 | 492125 | 3.2 | 6667.19 | 120.00 | 62.90 | 6604.29 | 60-120 | 50-120 |
| ED19 | 5.0 | 1544001 | 492096 | 3.3 | 6670.86 | 120.00 | 66.50 | 6604.36 | 60-120 | 50-120 |
| ED20 | 5.0 | 1544121 | 492238 | 3.9 | 6670.42 | 116.00 | 62.10 | 6608.32 | 56-116 | 46-116 |
| ED21 | 5.0 | 1544201 | 492341 | 3.0 | 6667.67 | 120.00 | 50.10 | 6617.57 | 60-120 | 50-120 |
| * ED22 | 5.0 | 1543748 | 491935 | 2.0 | 6669.48 | 120.00 | 54.90 | 6614.58 | 60-120 | 50-120 |
| * ED23 | 5.0 | 1543953 | 492295 | 3.2 | 6669.48 | 120.00 | 79.40 | 6590.08 | 60-120 | 50-120 |
| * EE1 | 2.0 | 1543894 | 492887 | 0.0 | 6635.07 | --- | 68.95 | 6566.12 | 45-65 | 5-65 |
| * EE2 | 2.0 | 1543895 | 492687 | 2.5 | 6667.84 | 87.80 | 66.40 | 6601.44 | 55-75 | 5-75 |
| * EE3 | 2.0 | 1543894 | 492398 | 1.3 | 6665.05 | 25.60 | 24.72 | 6640.33 | 5-23 | 0-23 |
| EE4 | 5.0 | 1543749 | 492346 | 5.6 | 6669.82 | 113.00 | 84.20 | 6585.62 | 30-110 | 20-110 |
| EE5 | 5.0 | 1543964 | 492398 | 5.5 | 6668.72 | 112.70 | 69.37 | 6599.35 | 31-111 | 21-111 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * EE6 | 5.0 | 1544149 | 492442 | 4.6 | 6667.72 | 113.00 | 23.30 | 6644.42 | 31-111 | 21-111 |
| * EF1 | 5.0 | 1543645 | 491870 | 5.0 | 6671.48 | 115.10 | 54.60 | 6616.88 | 32-112 | 60-112 |
| EF2 | 5.0 | 1543801 | 491873 | 4.9 | 6672.98 | 116.00 | 88.90 | 6584.08 | 34-114 | 24-114 |
| * EF3 | 5.0 | 1544094 | 491892 | 3.4 | 6670.29 | 115.00 | 23.90 | 6646.39 | 35-115 | 25-115 |
| * EF4 | 5.0 | 1543885 | 491750 | 3.2 | 6674.58 | 116.00 | 44.10 | 6630.48 | 36-116 | 26-116 |
| EF5 | 5.0 | 1544282 | 491861 | 3.2 | 6668.82 | 116.00 | 49.60 | 6619.22 | 36-116 | 26-116 |
| * EF6 | 5.0 | 1543520 | 491928 | 3.4 | 6668.41 | 116.00 | 54.70 | 6613.71 | 36-116 | 26-116 |
| EF7 | 5.0 | 1543970 | 491891 | 2.5 | 6671.28 | 117.00 | 54.70 | 6616.58 | 37-117 | 27-117 |
| EF8 | 5.0 | 1543856 | 491909 | --- | 6671.75 | 118.00 | 83.50 | 6588.25 | 38-118 | 28-118 |
| * EG1 | 5.0 | 1544058 | 491260 | 3.1 | 6671.21 | 116.37 | 34.60 | 6636.61 | 22-112 | 20-112 |
| * EG1R | 5.0 | 1544059 | 491281 | 3.2 | 6671.11 | 115.70 | 76.78 | 6594.33 | 32-112 | 20-112 |
| * EG2 | 5.0 | 1543370 | 491330 | 2.5 | 6664.53 | 111.40 | 95.80 | 6568.73 | 30-110 | 20-110 |
| EG3 | 5.0 | 1544312 | 491297 | 1.8 | 6667.97 | 117.90 | 83.90 | 6584.07 | 45-115 | 35-115 |
| EG4 | 5.0 | 1544156 | 491283 | 5.0 | 6672.05 | 116.70 | 66.30 | 6605.75 | 44-114 | 34-114 |
| EG5 | 5.0 | 1543886 | 491276 | 3.2 | 6671.78 | 116.00 | 63.50 | 6608.28 | 36-116 | 26-116 |
| * EG6 | 5.0 | 1543736 | 491352 | 3.3 | 6669.98 | 116.00 | 85.90 | 6584.08 | 36-116 | 26-116 |
| * EG7 | 5.0 | 1543959 | 491220 | 2.9 | 6671.06 | 116.00 | 65.20 | 6605.86 | 36-116 | 26-116 |
| EG8 | 5.0 | 1543613 | 491288 | 3.5 | 6669.79 | 116.00 | 53.80 | 6615.99 | 36-116 | 26-116 |
| * EG9 | 5.0 | 1544051 | 491272 | 2.9 | 6670.08 | 112.00 | 109.11 | 6560.97 | 102-112 | 92-112 |
| * EG10 | 5.0 | 1543487 | 491239 | 2.0 | 6667.62 | 118.00 | 45.60 | 6622.02 | 38-118 | 28-118 |
| * EG11 | 5.0 | 1544018 | 491317 | 2.3 | 6670.65 | 116.00 | 32.10 | 6638.55 | 36-116 | 26-116 |
| * EG12 | 5.0 | 1543508 | 491364 | 3.2 | 6668.58 | 117.00 | 66.80 | 6601.78 | 37-117 | 27-117 |
| EG13 | 5.0 | 1544067 | 491229 | 1.5 | 6669.87 | 120.00 | 74.10 | 6595.77 | 60-120 | - |
| * EG14 | 5.0 | 1543750 | 491274 | 1.7 | 6669.27 | 120.00 | 74.60 | 6594.67 | 60-120 | - |
| * EG15 | 5.0 | 1543836 | 491278 | 2.0 | 6670.53 | 120.00 | 64.10 | 6606.43 | 60-120 | - |
| * EG16 | 5.0 | 1544089 | 491313 | --- | 6670.27 | 120.00 | 87.10 | 6583.17 | 60-120 | - |
| * EH1 | 5.0 | 1543794 | 491176 | 2.8 | 6671.13 | 116.90 | 97.80 | 6573.33 | 34-114 | 24-114 |
| EH2 | 5.0 | 1543594 | 491167 | 3.5 | 6669.72 | 114.40 | 91.30 | 6578.42 | 31-111 | 21-111 |
| EH3 | 5.0 | 1544203 | 491112 | 2.6 | 6669.98 | 115.70 | 74.30 | 6595.68 | 33-113 | 23-113 |
| * EH4 | 5.0 | 1544342 | 491179 | 5.1 | 6670.09 | 115.70 | 10.53 | 6659.56 | 32-112 | 22-112 |
| EH5 | 5.0 | 1543996 | 491104 | 2.6 | 6670.14 | 116.10 | 79.90 | 6590.24 | 44-114 | 34-114 |
| EH6 | 5.0 | 1543718 | 491032 | 5.0 | 6671.68 | 113.00 | 84.10 | 6587.58 | 43-113 | 33-113 |
| EH7 | 5.0 | 1543538 | 491027 | 3.5 | 6668.57 | 113.00 | 46.20 | 6622.37 | 43-113 | 33-113 |
| EH8 | 5.0 | 1543836 | 491084 | 3.1 | 6672.31 | 116.00 | 90.70 | 6581.61 | 36-116 | 26-116 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * EH9 | 5.0 | 1544308 | 490993 | 3.3 | 6669.53 | 116.00 | 39.90 | 6629.63 | 36-116 | 26-116 |
| * EH10 | 5.0 | 1543872 | 491189 | 3.2 | 6672.46 | 116.00 | 100.00 | 6572.46 | 36-116 | 26-116 |
| * EH11 | 5.0 | 1543696 | 491201 | 3.5 | 6670.01 | 116.00 | 40.80 | 6629.21 | 36-116 | 26-116 |
| * EH12 | 5.0 | 1544193 | 490985 | 3.3 | 6669.87 | 116.00 | 31.50 | 6638.37 | 36-116 | 26-116 |
| EH13 | 5.0 | 1544099 | 491106 | 1.8 | 6669.79 | 119.00 | 65.00 | 6604.79 | 39-119 | 29-119 |
| EH14 | 5.0 | 1543940 | 490966 | 2.3 | 6671.39 | 119.00 | 35.00 | 6636.39 | 39-119 | 29-119 |
| EH15 | 5.0 | 1544269 | 491162 | 3.0 | 6670.08 | 118.00 | 83.20 | 6586.88 | 38-118 | 28-118 |
| EH16 | 5.0 | 1543497 | 491106 | 3.1 | 6665.06 | 120.00 | 51.90 | 6613.16 | 60-120 | 50-120 |
| * EH17 | 5.0 | 1543632 | 491030 | 3.2 | 6668.83 | 120.00 | 48.20 | 6620.63 | 60-120 | 50-120 |
| * EH18 | 5.0 | 1543853 | 491005 | --- | 6672.33 | 120.00 | 41.50 | 6630.83 | 60-120 | 50-120 |
| EH19 | 5.0 | 1544016 | 491171 | 3.0 | 6671.61 | 120.00 | 63.90 | 6607.71 | 60-120 | 50-120 |
| * EH20 | 5.0 | 1544081 | 490997 | --- | 6670.11 | 120.00 | 43.30 | 6626.81 | 60-120 | 50-120 |
| * EH21 | 5.0 | 1544430 | 491163 | --- | 6666.88 | 120.00 | 57.90 | 6608.98 | 60-120 | 50-120 |
| * EH22 | 5.0 | 1543585 | 490965 | 2.0 | 6666.46 | 120.00 | 49.80 | 6616.66 | 60-120 | 50-120 |
| * EH23 | 5.0 | 1544358 | 490952 | 2.0 | 6665.81 | 120.00 | 53.40 | 6612.41 | 60-120 | 50-120 |
| * EH24 | 5.0 | 1543723 | 490924 | --- | 6667.78 | 110.00 | 62.60 | 6605.18 | 50-110 | 45-110 |
| * EH25 | 5.0 | 1543404 | 490956 | 2.4 | 6664.32 | 110.00 | 88.10 | 6576.22 | 50-110 | 45-110 |
| EH26 | 5.0 | 1543418 | 490997 | --- | 6663.00 | 120.00 | --- | --- | 60-120 | - |
| EH27 | 5.0 | 1543904 | 491133 | --- | 6671.00 | 120.00 | 93.60 | 6577.40 | 60-120 | - |
| * EH28 | 5.0 | 1543855 | 490978 | --- | 6670.00 | 120.00 | --- | --- | 60-120 | - |
| * EI1 | 2.0 | 1544058 | 492148 | 0.6 | 6668.00 | 90.00 | 3.53 | 6664.47 | 30-90 | 20-90 |
| * EI2 | 2.0 | 1544126 | 492013 | 0.5 | 6668.00 | 90.00 | 1.90 | 6666.10 | 30-90 | 20-90 |
| * EI3 | 2.0 | 1544266 | 491970 | 0.6 | 6665.00 | 90.00 | 5.21 | 6659.79 | 30-90 | 20-90 |
| * EI4 | 3.0 | 1544053 | 491965 | 0.5 | 6668.00 | 92.00 | 40.60 | 6627.40 | 32-92 | 22-92 |
| * EI5 | 3.0 | 1543960 | 492045 | 0.6 | 6670.00 | 93.00 | 1.86 | 6668.14 | 33-93 | 23-93 |
| * EI6 | 2.0 | 1543880 | 492026 | --- | 6670.00 | 90.00 | --- | --- | 30-90 | 0-20 |
| * EI7 | 2.0 | 1543891 | 492167 | --- | 6669.00 | 90.00 | --- | --- | 30-90 | 0-20 |
| * EI8 | 2.0 | 1543791 | 492177 | --- | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EI9 | 2.0 | 1543747 | 492046 | --- | 6668.00 | 90.00 | 63.90 | 6604.10 | 30-90 | 20-90 |
| * EI10 | 2.0 | 1543680 | 492086 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EI11 | 2.0 | 1543525 | 492118 | --- | 6666.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EI12 | 2.0 | 1544463 | 492032 | --- | 6663.00 | 85.00 | 2.00 | 6661.00 | 25-85 | 15-85 |
| * EI13 | 2.0 | 1543998 | 492280 | --- | 6666.00 | 90.00 | --- | --- | 30-90 | 0-30 |
| * EI14 | 2.0 | 1544053 | 492373 | --- | 6665.00 | 85.00 | --- | --- | 25-85 | 15-85 |
| * EJ1 | 2.0 | 1544064 | 491351 | 0.8 | 6668.00 | 90.00 | 1.40 | 6666.60 | 30-90 | 20-90 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * EJ2 | 4.0 | 1544212 | 491478 | 0.7 | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ3 | 2.0 | 1543864 | 491453 | --- | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ4 | 2.0 | 1543865 | 491331 | --- | 6669.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ5 | 2.0 | 1543828 | 491519 | --- | 6669.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ6 | 2.0 | 1543730 | 491513 | --- | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ7 | 2.0 | 1543617 | 491502 | --- | 6666.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ8 | 2.0 | 1543664 | 491344 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ9 | 2.0 | 1543416 | 491467 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ10 | 2.0 | 1544505 | 491412 | --- | 6661.00 | 85.00 | --- | --- | 25-85 | 15-85 |
| * EJ11 | 2.0 | 1543925 | 491570 | --- | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EJ12 | 2.0 | 1544130 | 491550 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK1 | 2.0 | 1544221 | 491232 | 0.8 | 6668.00 | 85.00 | 3.15 | 6664.85 | 25-85 | 15-85 |
| * EK2 | 4.0 | 1544159 | 491177 | 0.4 | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK3 | 4.0 | 1544252 | 491061 | 0.7 | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK4 | 4.0 | 1544160 | 491060 | 0.5 | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK5 | 4.0 | 1544069 | 491186 | 0.5 | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK6 | 4.0 | 1543948 | 491115 | 0.7 | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK7 | 4.0 | 1543965 | 491185 | 0.6 | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK8 | 4.0 | 1543975 | 491269 | 0.6 | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK9 | 2.0 | 1543796 | 491273 | --- | 6669.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK10 | 2.0 | 1543699 | 491284 | --- | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK11 | 2.0 | 1543757 | 491106 | 3.3 | 6668.00 | 90.00 | 4.10 | 6663.90 | 30-90 | 20-90 |
| * EK12 | 2.0 | 1543654 | 491111 | 3.1 | 6667.00 | 90.00 | 3.00 | 6664.00 | 30-90 | 20-90 |
| * EK13 | 2.0 | 1543627 | 491228 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK14 | 2.0 | 1543563 | 491232 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EK15 | 2.0 | 1543407 | 491105 | --- | 6663.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| EL1 | 4.0 | 1544271 | 491772 | 0.7 | 6666.00 | 87.00 | 2.70 | 6663.30 | 27-87 | 17-87 |
| * EL2 | 4.0 | 1544201 | 491650 | 0.7 | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EL3 | 4.0 | 1544043 | 491678 | 0.6 | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EL4 | 4.0 | 1543971 | 491666 | 1.0 | 6670.00 | 90.00 | 61.90 | 6608.10 | 30-90 | 20-90 |
| * EL5 | 2.0 | 1543832 | 491608 | --- | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EL6 | 2.0 | 1543741 | 491625 | --- | 6669.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| EM1 | 3.0 | 1544162 | 491824 | 0.7 | 6667.00 | 90.00 | 1.63 | 6665.37 | 30-90 | 20-90 |
| * EM2 | 3.0 | 1543997 | 491833 | 0.6 | 6670.00 | 90.00 | 2.15 | 6667.85 | 30-90 | 20-90 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * EM3 | 4.0 | 1543945 | 491827 | 0.6 | 6671.00 | 90.00 | 1.24 | 6669.76 | 30-90 | 20-90 |
| * EM4 | 2.0 | 1543861 | 491883 | --- | 6671.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EM5 | 2.0 | 1543839 | 491755 | --- | 6671.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EM6 | 2.0 | 1543781 | 491958 | --- | 6669.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EM7 | 2.0 | 1543708 | 491862 | --- | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EM8 | 2.0 | 1543587 | 491956 | --- | 6666.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| EN1 | 2.0 | 1544809 | 491752 | 4.0 | 6618.86 | 38.40 | 32.30 | 6586.56 | 25-35 | 5-35 |
| EN2 | 2.0 | 1544611 | 491752 | 2.2 | 6651.61 | 69.30 | 54.65 | 6596.96 | 50-70 | 5-70 |
| * EN3 | 3.0 | 1544456 | 491753 | 4.6 | 6667.51 | 93.20 | 62.00 | 6605.51 | 50-90 | 5-90 |
| * EN4A | 2.0 | 1544059 | 491748 | 6.8 | 6673.50 | 33.30 | 31.42 | 6642.08 | 32-52 | 22-52 |
| * EN4B | 2.0 | 1544059 | 491748 | 6.8 | 6673.51 | 96.60 | 31.31 | 6642.20 | 69-99 | 66-99 |
| * EN5 | 5.0 | 1544065 | 491739 | 5.8 | 6672.42 | 105.00 | 19.90 | 6652.52 | 15-105 | - |
| * EN6 | 2.0 | 1544055 | 491735 | 6.7 | 6673.59 | 40.00 | 18.40 | 6655.19 | 20-40 | - |
| * EN7 | 5.0 | 1544059 | 491727 | 0.6 | 6668.27 | 41.00 | 17.92 | 6650.35 | 20-40 | 15-40 |
| * EN8 | 5.0 | 1543878 | 491610 | 2.6 | 6672.87 | 113.00 | 23.80 | 6649.07 | 33-113 | 23-113 |
| EN9 | 5.0 | 1544209 | 491725 | 2.3 | 6668.50 | 116.80 | 50.50 | 6618.00 | 34-114 | 24-114 |
| EN10 | 5.0 | 1544359 | 491701 | 2.4 | 6666.34 | 114.50 | 63.00 | 6603.34 | 32-112 | 22-112 |
| EN11 | 5.0 | 1543970 | 491746 | 1.9 | 6671.46 | 118.00 | 61.30 | 6610.16 | 45-115 | 35-115 |
| EN12 | 5.0 | 1543818 | 491673 | 1.9 | 6671.34 | 116.00 | 61.90 | 6609.44 | 46-116 | 36-116 |
| EN13 | 5.0 | 1544263 | 491644 | 3.1 | 6664.14 | 116.00 | 82.50 | 6581.64 | 36-116 | 26-116 |
| * EN14 | 5.0 | 1543966 | 491620 | 3.4 | 6672.13 | 116.00 | 47.10 | 6625.03 | 36-116 | 26-116 |
| EN15 | 5.0 | 1543537 | 491575 | 3.0 | 6669.02 | 116.00 | 98.30 | 6570.72 | 36-116 | 26-116 |
| EN16 | 5.0 | 1543651 | 491569 | 2.0 | 6668.86 | 118.00 | 64.60 | 6604.26 | 38-118 | 28-118 |
| EN17 | 5.0 | 1544126 | 491678 | 1.9 | 6668.85 | 118.00 | 58.90 | 6609.95 | 38-118 | 28-118 |
| EN18 | 5.0 | 1544075 | 491622 | --- | 6670.36 | 120.00 | 72.20 | 6598.16 | 60-120 | 50-120 |
| EN19 | 5.0 | 1544112 | 491762 | --- | 6670.65 | 120.00 | 66.40 | 6604.25 | 60-120 | 50-120 |
| * EO1 | 2.0 | 1544261 | 490917 | --- | 6665.00 | 90.00 | 47.40 | 6617.60 | 30-90 | 20-90 |
| * EO2 | 2.0 | 1544121 | 490917 | --- | 6666.00 | 90.00 | 32.53 | 6633.47 | 30-90 | 20-90 |
| * EO3 | 2.0 | 1543999 | 491025 | --- | 6667.00 | 90.00 | 29.52 | 6637.48 | 30-90 | 20-90 |
| * EO4 | 2.0 | 1543931 | 491067 | --- | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EO5 | 2.0 | 1543801 | 490989 | --- | 6668.00 | 90.00 | 29.78 | 6638.22 | 30-90 | 20-90 |
| * EO6 | 2.0 | 1543853 | 491147 | --- | 6669.00 | 90.00 | 22.37 | 6646.63 | 30-90 | 20-90 |
| * EO7 | 2.0 | 1543907 | 491238 | --- | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| EO8 | 2.0 | 1544317 | 491233 | 2.0 | 6667.00 | 90.00 | 36.00 | 6631.00 | 30-90 | 20-90 |
| * EO9 | 2.0 | 1543524 | 491174 | 2.0 | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * EO10 | 2.0 | 1543659 | 490960 | --- | 6667.00 | 90.00 | 31.30 | 6635.70 | 30-90 | 20-90 |
| * EO11 | 2.0 | 1543755 | 491200 | --- | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EO12 | 2.0 | 1543859 | 490944 | --- | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EO13 | 2.0 | 1544016 | 490914 | --- | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| EO14 | 2.0 | 1544047 | 491099 | --- | 6670.00 | 90.00 | 57.20 | 6612.80 | 30-90 | 20-90 |
| * EO15 | 2.0 | 1544348 | 491068 | --- | 6666.00 | 90.00 | 27.00 | 6639.00 | 30-90 | 20-90 |
| * EO16 | 2.0 | 1544413 | 491293 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| EO17 | 2.0 | 1543766 | 491135 | --- | 6670.00 | 80.00 | 60.41 | 6609.59 | 50-80 | 40-80 |
| * EO18 | 2.0 | 1544103 | 491265 | --- | 6670.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EO19 | 2.0 | 1544017 | 491219 | --- | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EO20 | 2.0 | 1543422 | 491201 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EO21 | 2.0 | 1543492 | 490950 | --- | 6664.00 | 90.00 | 41.80 | 6622.20 | 30-90 | 20-90 |
| * EO22 | 2.0 | 1543573 | 491095 | 2.0 | 6667.00 | 90.00 | 41.30 | 6625.70 | 40-90 | 30-90 |
| * EO23 | 2.0 | 1544062 | 491030 | --- | 6670.00 | 80.00 | 41.83 | 6628.17 | 40-80 | 30-80 |
| * EO24 | 2.0 | 1543786 | 491157 | --- | 6670.00 | 80.00 | 26.87 | 6643.13 | 30-80 | 20-80 |
| * EO25 | 2.0 | 1543707 | 491136 | --- | 6669.00 | 80.00 | 32.60 | 6636.40 | 30-80 | 20-80 |
| * EO26A | 2.0 | 1543727 | 491060 | --- | 6669.00 | 80.00 | 32.15 | 6636.85 | 30-80 | 20-80 |
| * EO27 | 2.0 | 1543844 | 491240 | --- | 6669.00 | 90.00 | 38.60 | 6630.40 | 40-90 | 30-90 |
| * EO28 | 2.0 | 1544121 | 491198 | --- | 6670.00 | 90.00 | 38.60 | 6631.40 | 40-90 | 30-90 |
| * EO29 | 2.0 | 1543956 | 490897 | --- | 6669.00 | 90.00 | 50.19 | 6618.81 | 40-90 | - |
| * EO30 | 2.0 | 1543962 | 491037 | --- | 6670.00 | 90.00 | 51.13 | 6618.87 | 40-90 | - |
| * EO31 | 2.0 | 1544187 | 491208 | --- | 6668.00 | 90.00 | 51.35 | 6616.65 | 40-90 | - |
| * EO32 | 2.0 | 1543939 | 491292 | --- | 6670.00 | 90.00 | --- | --- | 40-90 | - |
| * EO33 | 2.0 | 1544158 | 491122 | --- | 6668.00 | 90.00 | 54.85 | 6613.15 | 40-90 | - |
| * EO34 | 2.0 | 1544239 | 491148 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | - |
| * EO35 | 2.0 | 1544241 | 491267 | --- | 6668.00 | 90.00 | 52.10 | 6615.90 | 40-90 | - |
| * EO36 | 2.0 | 1544248 | 490971 | --- | 6666.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| * EO37 | 2.0 | 1544142 | 490981 | --- | --- | 90.00 | --- | --- | 40-90 | 30-90 |
| * EO38 | 2.0 | 1543693 | 490970 | --- | 6666.00 | 90.00 | 44.00 | 6622.00 | 50-90 | 40-90 |
| * EO39 | 2.0 | 1543630 | 490965 | --- | 6666.00 | 90.00 | 43.00 | 6623.00 | 50-90 | 40-90 |
| * EO40 | 2.0 | 1543673 | 491076 | --- | 6667.00 | 90.00 | 44.00 | 6623.00 | 50-90 | 40-90 |
| * EO41 | 2.0 | 1543658 | 491141 | --- | 6667.00 | 90.00 | 46.00 | 6621.00 | 50-90 | 40-90 |
| * EO42 | 2.0 | 1543794 | 491039 | --- | 6669.00 | 90.00 | 47.99 | 6621.01 | 40-90 | - |
| * EO43 | 2.0 | 1543883 | 491060 | --- | 6672.00 | 90.00 | --- | --- | 40-90 | - |



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## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * EO44 | 2.0 | 1543820 | 491138 | --- | 6671.00 | 90.00 | --- | --- | 40-90 | - |
| * EO45 | 2.0 | 1544051 | 491214 | --- | 6669.00 | 90.00 | --- | --- | 40-90 | - |
| * EO46 | 2.0 | 1543465 | 491047 | --- | 6665.00 | 90.00 | 63.30 | 6601.70 | 40-90 | - |
| * EO47 | 2.0 | 1543923 | 491179 | --- | 6670.00 | 90.00 | --- | --- | - | - |
| * EO48 | 2.0 | 1544057 | 491293 | --- | 6668.00 | 90.00 | --- | --- | - | - |
| * EO49 | 2.0 | 1544342 | 491119 | --- | 6665.00 | 90.00 | 57.38 | 6607.62 | - | - |
| * EP1 | 2.0 | 1544321 | 491380 | --- | 6666.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EP2 | 2.0 | 1544182 | 491348 | --- | 6668.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EP3 | 2.0 | 1543990 | 491413 | --- | 6668.00 | 90.00 | 57.60 | 6610.40 | 30-90 | 20-90 |
| * EP4 | 2.0 | 1544267 | 491559 | --- | 6665.00 | 90.00 | 41.94 | 6623.06 | 30-90 | 20-90 |
| * EP5 | 2.0 | 1544107 | 491478 | --- | 6667.00 | 90.00 | 31.38 | 6635.62 | 30-90 | 20-90 |
| * EP6 | 2.0 | 1543760 | 491387 | --- | 6668.00 | 90.00 | 46.70 | 6621.30 | 30-90 | 20-90 |
| * EP7 | 2.0 | 1543552 | 491452 | --- | 6666.00 | 90.00 | 57.00 | 6609.00 | 30-90 | 20-90 |
| * EP8 | 2.0 | 1543602 | 491362 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EP9 | 2.0 | 1543459 | 491313 | --- | 6665.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EP10 | 2.0 | 1543544 | 491294 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EP11 | 2.0 | 1544249 | 491334 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EP12 | 2.0 | 1543965 | 491567 | --- | 6669.00 | 85.00 | 36.23 | 6632.77 | 35-85 | 25-85 |
| * EP13 | 2.0 | 1543779 | 491528 | 2.0 | 6667.00 | 90.00 | 40.23 | 6626.77 | 40-90 | 30-90 |
| * EP14 | 2.0 | 1543891 | 491355 | --- | 6669.00 | 90.00 | 40.50 | 6628.50 | 40-90 | 30-90 |
| * EP15 | 2.0 | 1543927 | 491428 | --- | 6670.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| * EP16 | 2.0 | 1543918 | 491572 | --- | 6671.00 | 90.00 | 42.90 | 6628.10 | 40-90 | 30-90 |
| * EP17 | 2.0 | 1544081 | 491426 | --- | 6668.00 | 90.00 | 34.80 | 6633.20 | 40-90 | 30-90 |
| * EP18 | 2.0 | 1544123 | 491344 | --- | 6668.00 | 90.00 | 39.70 | 6628.30 | 40-90 | - |
| * EP19 | 2.0 | 1544161 | 491490 | --- | 6667.00 | 90.00 | 58.71 | 6608.29 | 40-90 | - |
| * EP20 | 2.0 | 1544063 | 491468 | --- | 6667.00 | 90.00 | 33.27 | 6633.73 | 40-90 | - |
| * EP21 | 2.0 | 1543978 | 491331 | --- | 6669.00 | 90.00 | 39.99 | 6629.01 | - | - |
| * EP22 | 2.0 | 1543893 | 491448 | --- | 6670.00 | 90.00 | --- | --- | 40-90 | - |
| * EP23 | 2.0 | 1543807 | 491351 | --- | 6668.00 | 90.00 | 58.70 | 6609.30 | 40-90 | - |
| * EP24 | 2.0 | 1543772 | 491317 | --- | 6668.00 | 90.00 | --- | --- | 40-90 | - |
| * EP25 | 2.0 | 1544311 | 491442 | --- | 6666.00 | 90.00 | 39.80 | 6626.20 | 40-90 | - |
| * EP26 | 2.0 | 1543719 | 491566 | --- | 6668.00 | 90.00 | --- | --- | 40-90 | - |
| * EP27 | 2.0 | 1543831 | 491315 | --- | 6669.00 | 90.00 | 34.98 | 6634.02 | 40-90 | - |
| * EP28 | 2.0 | 1544088 | 491380 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | - |
| * EP29 | 2.0 | 1544000 | 491369 | --- | 6668.00 | 90.00 | --- | --- | 40-90 | - |



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## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * EP30 | 2.0 | 1543743 | 491413 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | - |
| * EP31 | 2.0 | 1543666 | 491499 | --- | 6667.00 | 90.00 | 52.90 | 6614.10 | 40-90 | - |
| * EP32 | 2.0 | 1543951 | 491501 | --- | 6669.00 | 90.00 | --- | --- | 40-90 | - |
| * EP33 | 2.0 | 1544203 | 491434 | --- | 6667.00 | 90.00 | --- | --- | - | - |
| * EQ1 | 2.0 | 1544297 | 491686 | --- | 6666.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EQ2 | 2.0 | 1543606 | 491621 | --- | 6667.00 | 90.00 | 50.57 | 6616.43 | 30-90 | 20-90 |
| * EQ3 | 2.0 | 1544407 | 491631 | --- | 6664.00 | 90.00 | 24.36 | 6639.64 | 30-90 | 20-90 |
| EQ5 | 2.0 | 1544154 | 491735 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| * EQ9 | 2.0 | 1543431 | 491566 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * EQ10 | 2.0 | 1544144 | 491612 | --- | 6667.00 | 90.00 | 51.50 | 6615.50 | 50-90 | 40-90 |
| * EQ11 | 2.0 | 1544079 | 491690 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | - |
| * EQ12 | 2.0 | 1544026 | 491618 | --- | 6668.00 | 90.00 | 42.00 | 6626.00 | 40-90 | - |
| * EQ13 | 2.0 | 1543926 | 491679 | --- | 6672.00 | 90.00 | 46.00 | 6626.00 | 40-90 | - |
| * EQ14 | 2.0 | 1543863 | 491696 | --- | 6672.00 | 90.00 | 55.44 | 6616.56 | 40-90 | - |
| * EQ15 | 2.0 | 1544319 | 491654 | --- | 6666.00 | 90.00 | 40.10 | 6625.90 | 40-90 | - |
| EQ16 | 2.0 | 1544165 | 491729 | 2.0 | 6667.00 | 95.00 | 52.65 | 6614.35 | 85-95 | 83-95 |
| EQ17 | 4.0 | 1544162 | 491735 | --- | 6667.00 | 130.00 | 125.05 | 6541.95 | 120-130 | 118-130 |
| EQ18 | 2.0 | 1544148 | 491739 | --- | 6667.00 | 95.00 | 61.79 | 6605.21 | 85-95 | 83-95 |
| EQ19 | 2.0 | 1544154 | 491727 | --- | 6667.00 | 60.00 | 44.09 | 6622.91 | 50-60 | 48-60 |
| EQ20 | 2.0 | 1544159 | 491745 | --- | 6667.00 | 60.00 | 43.89 | 6623.11 | 50-60 | 48-60 |
| EQ21 | 2.0 | 1544173 | 491747 | --- | 6667.00 | 95.00 | 62.28 | 6604.72 | 85-95 | 83-95 |
| EQ22 | 2.0 | 1544173 | 491734 | --- | 6667.00 | 60.00 | 43.90 | 6623.10 | 50-60 | 48-60 |
| EQ23 | 2.0 | 1544176 | 491722 | --- | 6667.00 | 95.00 | 63.05 | 6603.95 | 85-95 | 83-95 |
| EQ24 | 2.0 | 1544184 | 491738 | --- | 6667.00 | 60.00 | 43.91 | 6623.09 | 50-60 | 48-60 |
| EQ25 | 2.0 | 1544160 | 491727 | --- | 6667.00 | 80.00 | 49.93 | 6617.07 | 70-80 | 68-80 |
| * ER1 | 2.0 | 1544354 | 491845 | --- | 6665.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * ER2 | 2.0 | 1544024 | 491884 | --- | 6669.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * ER3 | 2.0 | 1543658 | 491934 | --- | 6667.00 | 90.00 | 35.30 | 6631.70 | 30-90 | 20-90 |
| * ER4 | 2.0 | 1543466 | 491992 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * ER5 | 2.0 | 1543583 | 491858 | --- | 6666.00 | 90.00 | 47.45 | 6618.55 | 30-90 | 20-90 |
| * ER6 | 2.0 | 1543916 | 491901 | --- | 6672.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * ER7 | 2.0 | 1544172 | 491913 | --- | 6667.00 | 90.00 | 26.50 | 6640.50 | 30-90 | 20-90 |
| * ER8 | 2.0 | 1544101 | 491823 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | - |
| * ER9 | 2.0 | 1543873 | 491969 | --- | 6670.00 | 90.00 | --- | --- | 40-90 | - |



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## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * ER10 | 2.0 | 1544213 | 491845 | --- | 6667.00 | 90.00 | 36.10 | 6630.90 | 40-90 | - |
| ES1 | 2.0 | 1543035 | 491751 | 1.3 | 6615.18 | 49.10 | 30.65 | 6584.53 | 40-50 | 5-50 |
| ES2 | 2.0 | 1543231 | 491753 | 1.9 | 6655.30 | 76.00 | 76.00 | 6579.30 | 60-80 | 5-80 |
| ES3 | 2.0 | 1543302 | 491749 | 2.4 | 6660.23 | 86.40 | 64.00 | 6596.23 | 70-90 | 5-90 |
| ES4 | 5.0 | 1543484 | 491753 | 4.4 | 6665.80 | 99.10 | 72.67 | 6593.13 | 62-102 | 0-102 |
| * ES5 | 3.0 | 1543684 | 491751 | 2.7 | 6670.59 | 96.70 | 76.51 | 6594.08 | 58-98 | 5-98 |
| ES6 | 5.0 | 1543293 | 491751 | 1.2 | 6660.00 | 97.50 | 97.50 | 6562.50 | 57-97 | 0-97 |
| * ES7 | 2.0 | 1543673 | 491749 | 2.1 | 6669.98 | 35.80 | 35.80 | 6634.18 | 10-37 | 0-37 |
| * ES8 | 2.0 | 1543304 | 491758 | 2.7 | 6659.72 | 36.20 | 34.98 | 6624.74 | 10-38 | 0-38 |
| ES9 | 5.0 | 1543374 | 491981 | 4.9 | 6663.04 | 113.70 | 58.80 | 6604.24 | 32-112 | 22-112 |
| ES10 | 2.0 | 1543317 | 491753 | --- | 6660.06 | 90.00 | 56.40 | 6603.66 | 40-90 | - |
| * ES11 | 4.5 | 1543287 | 491238 | 2.0 | 6659.00 | 120.00 | 67.00 | 6592.00 | 60-120 | 50-120 |
| * ES12 | 4.5 | 1543290 | 491440 | 2.0 | 6659.00 | 120.00 | 60.00 | 6599.00 | 60-120 | 50-120 |
| * ES13 | 4.5 | 1543326 | 492074 | 2.0 | 6661.00 | 120.00 | 72.00 | 6589.00 | 60-120 | 50-120 |
| * ES14 | 4.5 | 1543328 | 492176 | 2.0 | 6662.00 | 120.00 | 87.00 | 6575.00 | 60-120 | 50-120 |
| * ES15 | 4.5 | 1543339 | 492294 | 2.0 | 6662.00 | 120.00 | 87.00 | 6575.00 | 60-120 | 50-120 |
| ES16 | 4.5 | 1543380 | 492500 | 2.0 | 6662.00 | 120.00 | 67.00 | 6595.00 | 60-120 | 50-120 |
| * ET1 | 2.0 | 1544375 | 492127 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * ET2 | 2.0 | 1544255 | 492078 | --- | 6666.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * ET3 | 2.0 | 1544178 | 492228 | --- | 6666.00 | 90.00 | 32.10 | 6633.90 | 30-90 | 20-90 |
| * ET4 | 2.0 | 1543851 | 492289 | --- | 6666.00 | 90.00 | 33.12 | 6632.88 | 30-90 | 20-90 |
| * ET5 | 2.0 | 1543676 | 492229 | --- | 6666.00 | 90.00 | 51.58 | 6614.42 | 30-90 | 20-90 |
| * ET6 | 2.0 | 1543522 | 492017 | --- | 6665.00 | 90.00 | 41.60 | 6623.40 | 30-90 | 20-90 |
| * ET7 | 2.0 | 1543771 | 492226 | --- | 6667.00 | 90.00 | 33.00 | 6634.00 | 30-90 | 20-90 |
| * ET8 | 2.0 | 1544095 | 492092 | --- | 6668.00 | 90.00 | 25.46 | 6642.54 | 30-90 | 20-90 |
| * ET9 | 2.0 | 1543743 | 492467 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * ET10 | 2.0 | 1543607 | 492105 | --- | 6666.00 | 85.00 | 34.12 | 6631.88 | 35-85 | 25-85 |
| * ET11 | 2.0 | 1544137 | 492299 | --- | 6665.00 | 80.00 | --- | --- | 30-80 | 20-80 |
| * ET12 | 2.0 | 1544006 | 492001 | --- | 6669.00 | 90.00 | --- | --- | 40-90 | - |
| * ET13 | 2.0 | 1544045 | 492227 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | - |
| * ET14 | 2.0 | 1543970 | 492232 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | - |
| * ET15 | 2.0 | 1543810 | 492070 | --- | 6668.00 | 90.00 | --- | --- | 40-90 | - |
| * ET16 | 2.0 | 1543779 | 491995 | --- | 6668.00 | 90.00 | --- | --- | 40-90 | - |
| * ET17 | 2.0 | 1543929 | 492099 | --- | 6670.00 | 90.00 | --- | --- | 40-90 | - |
| * ET18 | 2.0 | 1544194 | 492045 | --- | 6667.00 | 90.00 | --- | --- | 40-90 | - |



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**Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)**

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| ET19 | 2.0 | 1543914 | 492282 | --- | 6666.00 | 90.00 | 90.00 | 6576.00 | 40-90 | - |
| * ET20 | 2.0 | 1544275 | 492272 | --- | 6664.00 | 90.00 | 67.60 | 6596.40 | 40-90 | - |
| NE1 | 2.0 | 1544499 | 492617 | 1.0 | 6648.82 | 67.30 | 51.43 | 6597.39 | 55-75 | 5-75 |
| * NE2 | 5.0 | 1544400 | 492505 | 0.9 | 6660.98 | 92.00 | 64.95 | 6596.03 | 51-91 | 0-91 |
| * NE3 | 3.0 | 1544274 | 492347 | 4.8 | 6667.44 | 94.30 | 56.00 | 6611.44 | 50-92 | 7-92 |
| * NE4 | 2.0 | 1544391 | 492511 | 1.8 | 6661.63 | 27.90 | 12.25 | 6649.38 | 10-30 | 0-30 |
| * NE6 | 5.0 | 1544470 | 492218 | 2.7 | 6664.10 | 113.50 | 42.50 | 6621.60 | 32-112 | 22-112 |
| * NE7 | 5.0 | 1544500 | 491873 | 2.6 | 6664.13 | 113.60 | 40.20 | 6623.93 | 31-111 | 21-111 |
| NE8 | 5.0 | 1544523 | 491574 | 4.1 | 6663.01 | 113.90 | 55.40 | 6607.61 | 32-112 | 22-112 |
| NE9 | 5.0 | 1544553 | 491274 | 2.5 | 6657.89 | 114.30 | 54.90 | 6602.99 | 32-112 | 22-112 |
| * NE10 | 4.5 | 1544545 | 491460 | 2.0 | 6660.00 | 120.00 | --- | --- | 60-120 | - |
| NE11 | 4.5 | 1544560 | 491350 | 2.0 | 6660.00 | 120.00 | 59.00 | 6601.00 | 60-120 | 50-120 |
| * NE12 | 4.5 | 1544550 | 491170 | 2.0 | 6660.00 | 120.00 | 64.10 | 6595.90 | 60-120 | 50-120 |
| NE13 | 4.5 | 1544560 | 491060 | 2.0 | 6659.00 | 120.00 | 56.50 | 6602.50 | 60-120 | 50-120 |
| NW1 | 2.0 | 1544698 | 489173 | 1.8 | 6609.59 | 33.20 | 32.82 | 6576.77 | 20-30 | 5-30 |
| NW2 | 2.0 | 1544556 | 489298 | 2.3 | 6643.72 | 94.30 | 81.35 | 6562.37 | 70-90 | 5-90 |
| NW3 | 5.0 | 1544416 | 489423 | 1.1 | 6655.01 | 93.90 | 66.30 | 6588.71 | 52-92 | 0-92 |
| NW4 | 2.0 | 1544407 | 489419 | 2.4 | 6656.15 | 33.70 | 33.70 | 6622.45 | 10-30 | 0-30 |
| PW1 | 5.0 | 1543305 | 489914 | 3.1 | 6657.34 | 91.80 | 50.50 | 6606.84 | 50-90 | 5-90 |
| * PW2 | 5.0 | 1543252 | 490823 | 3.4 | 6658.85 | 88.20 | 51.80 | 6607.05 | 45-85 | 5-85 |
| PW3 | 5.0 | 1543282 | 491751 | 3.0 | 6659.79 | 93.80 | 12.10 | 6647.69 | 55-95 | 5-95 |
| * PW4 | 5.0 | 1544605 | 490821 | 4.0 | 6658.98 | 79.70 | 52.53 | 6606.45 | 40-80 | 5-80 |
| * SE2 | 5.0 | 1543427 | 492442 | 3.7 | 6661.37 | 94.20 | 71.85 | 6589.52 | 50-90 | 0-90 |
| * SE3 | 3.0 | 1543608 | 492296 | 4.3 | 6668.70 | 95.10 | 72.69 | 6596.01 | 54-94 | 5-94 |
| SW1 | 2.0 | 1543194 | 489108 | 3.5 | 6599.83 | 32.30 | 25.60 | 6574.23 | 20-30 | 5-30 |
| SW2 | 2.0 | 1543329 | 489263 | 3.9 | 6637.87 | 52.30 | 45.10 | 6592.77 | 29-49 | 5-49 |
| SW3 | 5.0 | 1543449 | 489415 | 1.2 | 6656.00 | 84.50 | 63.02 | 6592.98 | 42-82 | 0-82 |
| SW4 | 2.0 | 1543434 | 489398 | 3.0 | 6655.82 | 38.80 | 16.82 | 6639.00 | 10-38 | 0-38 |
| * T3 | 4.0 | 1543632 | 490809 | 1.2 | 6665.68 | 56.20 | 55.70 | 6609.98 | - | - |
| WA1 | 5.0 | 1544114 | 490044 | 3.0 | 6660.37 | 112.40 | 40.90 | 6619.47 | 33-113 | 23-113 |
| WA2 | 5.0 | 1543968 | 489914 | 4.0 | 6662.52 | 115.00 | 46.80 | 6615.72 | 32-112 | 22-112 |
| WA3 | 5.0 | 1544291 | 489982 | 1.6 | 6658.32 | 114.30 | 77.60 | 6580.72 | 32-112 | 22-112 |
| WA4 | 5.0 | 1544428 | 489870 | 2.5 | 6657.10 | 115.00 | 62.20 | 6594.90 | 45-115 | 35-115 |
| WA5 | 5.0 | 1543796 | 489941 | 4.4 | 6662.28 | 115.00 | 37.00 | 6625.28 | 45-115 | 35-115 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| WA6 | 5.0 | 1543987 | 490056 | 4.0 | 6661.45 | 116.00 | 101.10 | 6560.35 | 36-116 | 26-116 |
| WA7 | 5.0 | 1544040 | 489940 | 3.1 | 6659.26 | 116.00 | 64.50 | 6594.76 | 36-116 | 26-116 |
| WA8 | 5.0 | 1543897 | 490053 | 3.0 | 6663.89 | 116.00 | 86.20 | 6577.69 | 36-116 | 26-116 |
| WA9 | 5.0 | 1544154 | 489928 | 3.1 | 6659.41 | 116.00 | 63.00 | 6596.41 | 36-116 | 26-116 |
| WA10 | 5.0 | 1543876 | 489992 | --- | 6662.92 | 118.00 | 64.10 | 6598.82 | 38-118 | 28-118 |
| WA11 | 5.0 | 1544075 | 489992 | 2.3 | 6658.29 | 117.00 | 68.50 | 6589.79 | 37-117 | 27-117 |
| WA12 | 5.0 | 1543976 | 489886 | 2.4 | 6659.46 | 110.00 | 71.70 | 6587.76 | 50-110 | 40-110 |
| WA13 | 5.0 | 1544047 | 489899 | 1.4 | 6658.14 | 120.00 | 70.10 | 6588.04 | 60-120 | - |
| WA14 | 5.0 | 1544130 | 490045 | --- | 6658.34 | 120.00 | --- | --- | 60-120 | - |
| WB1 | 5.0 | 1543612 | 489694 | 3.0 | 6658.30 | 112.00 | 50.30 | 6608.00 | 31-111 | 21-111 |
| WB2 | 5.0 | 1543752 | 489645 | 2.3 | 6657.75 | 113.00 | 68.60 | 6589.15 | 32-112 | 22-112 |
| WB3 | 5.0 | 1543971 | 489692 | 4.3 | 6657.77 | 116.20 | 30.00 | 6627.77 | 32-112 | 22-112 |
| WB4 | 5.0 | 1543498 | 489660 | 4.5 | 6659.20 | 114.60 | 88.90 | 6570.30 | 33-113 | 23-113 |
| WB5 | 5.0 | 1543818 | 489599 | 2.1 | 6657.36 | 113.00 | 88.80 | 6568.56 | 32-112 | 22-112 |
| WB6 | 5.0 | 1544139 | 489625 | 2.6 | 6657.99 | 115.70 | 21.18 | 6636.81 | 32-112 | 22-112 |
| WB7 | 5.0 | 1544325 | 489760 | 2.6 | 6657.40 | 112.00 | 86.10 | 6571.30 | 32-112 | 22-112 |
| WB8 | 5.0 | 1544292 | 489619 | 2.3 | 6654.79 | 116.00 | 82.30 | 6572.49 | 46-116 | 36-116 |
| WB9 | 5.0 | 1543866 | 489683 | 3.0 | 6659.72 | 116.00 | 63.80 | 6595.92 | 36-116 | 26-116 |
| WB10 | 5.0 | 1544036 | 489588 | 3.0 | 6657.39 | 116.00 | 82.90 | 6574.49 | 36-116 | 26-116 |
| WB11 | 5.0 | 1544185 | 489753 | 3.4 | 6659.30 | 116.00 | 65.20 | 6594.10 | 36-116 | 26-116 |
| WB12 | 5.0 | 1543708 | 489558 | 2.6 | 6657.88 | 120.00 | 96.50 | 6561.38 | 60-120 | 50-120 |
| WB13 | 5.0 | 1543515 | 489518 | 2.0 | 6657.63 | 120.00 | 95.20 | 6562.43 | 60-120 | 50-120 |
| WB14 | 5.0 | 1543972 | 489513 | 2.0 | 6656.62 | 120.00 | 65.10 | 6591.52 | 60-120 | 50-120 |
| WB15 | 5.0 | 1544181 | 489490 | 2.0 | 6656.47 | 120.00 | 55.00 | 6601.47 | 60-120 | 50-120 |
| WB16 | 5.0 | 1544439 | 489614 | 2.0 | 6655.82 | 110.00 | 91.00 | 6564.82 | 50-110 | 45-110 |
| WB17 | 5.0 | 1543591 | 489674 | 2.0 | 6658.16 | 110.00 | 59.80 | 6598.36 | 50-110 | 45-110 |
| WB18 | 5.0 | 1544131 | 489793 | 2.6 | 6658.71 | 110.00 | 42.60 | 6616.11 | 50-110 | 45-110 |
| WC1 | 5.0 | 1543964 | 490182 | 2.7 | 6664.22 | 115.00 | 79.10 | 6585.12 | 32-112 | 20-112 |
| * WC2 | 5.0 | 1543491 | 490104 | 3.6 | 6658.62 | 115.00 | 64.35 | 6594.27 | 31-111 | 21-111 |
| WC3 | 5.0 | 1544262 | 490201 | 3.1 | 6661.07 | 115.70 | 82.20 | 6578.87 | 33-113 | 23-113 |
| WC4 | 5.0 | 1543843 | 490088 | 0.4 | 6662.86 | 112.30 | 19.10 | 6643.76 | 32-112 | 22-112 |
| WC5 | 5.0 | 1543647 | 490198 | 4.9 | 6662.70 | 117.80 | 81.70 | 6581.00 | 46-116 | 36-116 |
| WC6 | 5.0 | 1544103 | 490187 | 3.2 | 6661.78 | 116.00 | 90.10 | 6571.68 | 36-116 | 26-116 |
| WC7 | 5.0 | 1544038 | 490126 | 3.2 | 6660.53 | 116.00 | 98.00 | 6562.53 | 36-116 | 26-116 |
| WC8 | 5.0 | 1543881 | 490227 | 2.9 | 6666.68 | 116.00 | 88.60 | 6578.08 | 36-116 | 26-116 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| WC9 | 5.0 | 1543962 | 490265 | 3.2 | 6664.74 | 116.00 | 22.10 | 6642.64 | 36-116 | 26-116 |
| WC10 | 5.0 | 1544196 | 490296 | 3.2 | 6662.40 | 116.00 | 102.50 | 6559.90 | 36-116 | 26-116 |
| WC11 | 5.0 | 1544188 | 490091 | 3.2 | 6661.06 | 116.00 | 82.10 | 6578.96 | 36-116 | 26-116 |
| * WC12 | 5.0 | 1543568 | 490249 | 2.9 | 6659.93 | 116.00 | 76.20 | 6583.73 | 36-116 | 26-116 |
| WC13 | 5.0 | 1543758 | 490107 | 3.5 | 6662.20 | 116.00 | 22.30 | 6639.90 | 36-116 | 26-116 |
| WC14 | 5.0 | 1544428 | 490059 | 3.4 | 6658.57 | 116.00 | 104.00 | 6554.57 | 36-116 | 26-116 |
| WC15 | 5.0 | 1543951 | 490256 | --- | 6664.06 | 76.00 | 47.40 | 6616.66 | 36-76 | 26-76 |
| * WC16 | 5.0 | 1543581 | 490088 | 2.7 | 6658.78 | 118.00 | 28.36 | 6630.42 | 38-118 | 28-118 |
| WC17 | 5.0 | 1543714 | 490271 | 1.6 | 6658.74 | 120.00 | 57.70 | 6601.04 | 31-120 | 21-120 |
| WC18 | 5.0 | 1544083 | 490082 | 2.3 | 6659.98 | 115.00 | 110.00 | 6549.98 | 35-115 | 25-115 |
| WC19 | 5.0 | 1544415 | 490216 | 2.8 | 6658.63 | 120.00 | 75.70 | 6582.93 | 60-120 | 50-120 |
| WC20 | 5.0 | 1543462 | 490224 | 3.3 | 6658.75 | 120.00 | 84.30 | 6574.45 | 60-120 | 50-120 |
| WC21 | 5.0 | 1544213 | 490054 | 2.6 | 6659.90 | 110.00 | 78.20 | 6581.70 | 50-110 | 40-110 |
| WC22 | 5.0 | 1544014 | 490097 | 2.0 | 6659.54 | 110.00 | 65.60 | 6593.94 | 50-110 | 45-110 |
| WC23 | 5.0 | 1543774 | 490125 | 2.0 | 6661.58 | 110.00 | 92.30 | 6569.28 | 50-110 | 45-110 |
| WC24 | 5.0 | 1543864 | 490098 | --- | 6655.00 | 120.00 | 85.10 | 6569.90 | 50-110 | - |
| WC25 | 5.0 | 1543966 | 490157 | --- | 6656.00 | 120.00 | 78.70 | 6577.30 | 60-120 | - |
| WD1 | 5.0 | 1543920 | 489857 | 5.1 | 6665.31 | 41.80 | 36.01 | 6629.30 | 20-40 | 15-40 |
| WD2 | 5.0 | 1543825 | 489854 | 4.0 | 6662.50 | 44.10 | 27.94 | 6634.56 | 20-40 | 10-40 |
| WD3 | 5.0 | 1543937 | 489873 | 3.2 | 6662.83 | 44.10 | 31.10 | 6631.73 | 20-40 | 10-40 |
| WD4 | 5.0 | 1543810 | 489796 | 3.6 | 6661.67 | 115.70 | 87.30 | 6574.37 | 32-112 | 22-112 |
| WD5 | 5.0 | 1544130 | 489821 | 3.0 | 6659.81 | 115.60 | 44.80 | 6615.01 | 33-113 | 23-113 |
| WD6 | 5.0 | 1544244 | 489847 | 3.1 | 6658.38 | 116.00 | 17.90 | 6640.48 | 36-116 | 26-116 |
| WD7 | 5.0 | 1543901 | 489799 | 3.2 | 6662.30 | 116.00 | 82.70 | 6579.60 | 36-116 | 26-116 |
| WD8 | 5.0 | 1543702 | 489789 | 3.0 | 6658.71 | 116.00 | 38.90 | 6619.81 | 36-116 | 26-116 |
| WD9 | 5.0 | 1544025 | 489793 | 3.2 | 6659.69 | 116.00 | 34.80 | 6624.89 | 36-116 | 26-116 |
| WD10 | 5.0 | 1543587 | 489835 | 3.3 | 6658.82 | 118.00 | 60.80 | 6598.02 | 38-118 | 28-118 |
| WE1 | 5.0 | 1543800 | 490315 | 6.2 | 6667.50 | 112.70 | 36.10 | 6631.40 | 30-110 | 20-110 |
| WE2 | 5.0 | 1543659 | 490364 | 3.5 | 6663.02 | 112.00 | 64.40 | 6598.62 | 32-112 | 22-112 |
| WE3 | 5.0 | 1543389 | 490326 | 2.1 | 6657.21 | 112.00 | 80.50 | 6576.71 | 31-111 | 21-111 |
| WE4 | 5.0 | 1543795 | 490267 | 3.0 | 6663.70 | 113.00 | 30.10 | 6633.60 | 33-113 | 23-113 |
| WE5 | 5.0 | 1544409 | 490352 | 2.5 | 6658.98 | 116.00 | 69.50 | 6589.48 | 46-116 | 36-116 |
| WE6 | 5.0 | 1544138 | 490392 | 1.9 | 6663.26 | 116.00 | 53.20 | 6610.06 | 46-116 | 36-116 |
| WE7 | 5.0 | 1543886 | 490387 | 2.1 | 6667.20 | 116.00 | 27.00 | 6640.20 | 46-116 | 36-116 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| WE8 | 5.0 | 1543994 | 490381 | 3.3 | 6666.20 | 116.00 | 89.70 | 6576.50 | 36-116 | 26-116 |
| WE9 | 5.0 | 1544282 | 490412 | 3.0 | 6661.96 | 116.00 | 60.05 | 6601.91 | 36-116 | 26-116 |
| WE10 | 5.0 | 1543788 | 490361 | 3.0 | 6664.94 | 116.00 | 40.59 | 6624.35 | 36-116 | 26-116 |
| WE11 | 5.0 | 1543846 | 490437 | 3.4 | 6667.69 | 116.00 | 28.00 | 6639.69 | 36-116 | 26-116 |
| WE12 | 5.0 | 1543985 | 490469 | 3.5 | 6667.22 | 116.00 | 54.06 | 6613.16 | 36-116 | 26-116 |
| WE13 | 5.0 | 1544098 | 490477 | 3.3 | 6666.17 | 116.00 | 32.16 | 6634.01 | 36-116 | 26-116 |
| WE14 | 5.0 | 1543934 | 490457 | 2.0 | 6668.14 | 118.00 | 62.10 | 6606.04 | 38-118 | 28-118 |
| WE15 | 5.0 | 1543934 | 490329 | 2.1 | 6665.93 | 118.00 | 83.50 | 6582.43 | 38-118 | 28-118 |
| WE16 | 5.0 | 1544036 | 490302 | --- | 6663.25 | 120.00 | 52.50 | 6610.75 | 60-120 | 50-120 |
| WE17 | 5.0 | 1544517 | 490316 | 3.3 | 6658.59 | 120.00 | 58.20 | 6600.39 | 60-120 | 50-120 |
| WE18 | 5.0 | 1543841 | 490361 | --- | 6665.39 | 120.00 | 37.70 | 6627.69 | 60-120 | - |
| * WF1 | 5.0 | 1543484 | 490385 | 0.5 | 6659.91 | 110.00 | 41.20 | 6618.71 | 31-111 | 21-111 |
| WF2 | 5.0 | 1544261 | 490502 | 3.7 | 6660.82 | 111.80 | 64.20 | 6596.62 | 28-108 | 18-108 |
| * WF3 | 5.0 | 1544085 | 490574 | 2.3 | 6666.04 | 114.50 | 33.80 | 6632.24 | 32-112 | 22-112 |
| WF4 | 5.0 | 1543966 | 490544 | 2.4 | 6668.17 | 116.00 | 36.50 | 6631.67 | 46-116 | 36-116 |
| WF5 | 5.0 | 1543789 | 490487 | 1.8 | 6665.36 | 116.00 | 83.20 | 6582.16 | 46-116 | 36-116 |
| * WF6 | 5.0 | 1543557 | 490495 | 2.2 | 6662.08 | 118.50 | 35.30 | 6626.78 | 46-116 | 36-116 |
| WF7 | 5.0 | 1543688 | 490656 | 2.9 | 6665.78 | 116.00 | 66.00 | 6599.78 | 36-116 | 26-116 |
| WF8 | 5.0 | 1543868 | 490605 | 3.2 | 6668.59 | 116.00 | 46.70 | 6621.89 | 36-116 | 26-116 |
| * WF9 | 5.0 | 1544221 | 490610 | 3.2 | 6665.70 | 116.00 | 68.50 | 6597.20 | 36-116 | 26-116 |
| * WF10 | 5.0 | 1544362 | 490663 | 3.1 | 6663.39 | 116.00 | 39.50 | 6623.89 | 36-116 | 26-116 |
| WF11 | 5.0 | 1544171 | 490488 | 2.9 | 6664.84 | 116.00 | 57.70 | 6607.14 | 36-116 | 26-116 |
| * WF12 | 5.0 | 1544425 | 490512 | 3.3 | 6655.65 | 116.00 | 39.50 | 6616.15 | 36-116 | 26-116 |
| WF13 | 5.0 | 1543981 | 490676 | 1.9 | 6667.05 | 118.00 | 72.10 | 6594.95 | 38-118 | 28-118 |
| WF14 | 5.0 | 1543609 | 490680 | 1.9 | 6664.63 | 118.00 | 40.90 | 6623.73 | 38-118 | 28-118 |
| WF15 | 5.0 | 1543695 | 490537 | 2.0 | 6663.69 | 118.00 | 33.90 | 6629.79 | 38-118 | 28-118 |
| WF16 | 5.0 | 1543426 | 490517 | --- | 6660.58 | 120.00 | 40.80 | 6619.78 | 60-120 | 50-120 |
| WF17 | 5.0 | 1543450 | 490605 | 2.0 | 6660.88 | 120.00 | 94.80 | 6566.08 | 60-120 | 55-120 |
| WF18 | 5.0 | 1543292 | 490539 | --- | 6657.48 | 110.00 | 50.10 | 6607.38 | 50-110 | 45-110 |
| * WF19 | 5.0 | 1544058 | 490727 | --- | 6666.33 | 120.00 | --- | --- | 60-120 | - |
| * WI1 | 2.0 | 1544272 | 489712 | --- | 6656.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WI2 | 2.0 | 1544081 | 489705 | --- | 6657.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WI3 | 2.0 | 1543961 | 489822 | --- | 6661.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WI4 | 2.0 | 1543857 | 489745 | --- | 6658.00 | 90.00 | 42.25 | 6615.75 | 30-90 | 20-90 |
| * WI5 | 2.0 | 1543814 | 489708 | --- | 6657.00 | 90.00 | 68.80 | 6588.20 | 30-90 | 20-90 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * WI6 | 2.0 | 1543749 | 489733 | --- | 6657.00 | 90.00 | 18.48 | 6638.52 | 30-90 | 20-90 |
| * WI7 | 2.0 | 1543678 | 489713 | --- | 6657.00 | 90.00 | 58.91 | 6598.09 | 30-90 | 20-90 |
| * WI8 | 2.0 | 1543633 | 489766 | --- | 6657.00 | 90.00 | 53.84 | 6603.16 | 30-90 | 20-90 |
| * WI9 | 2.0 | 1543574 | 489724 | --- | 6656.00 | 90.00 | 52.30 | 6603.70 | 30-90 | 20-90 |
| * WI10 | 2.0 | 1543400 | 489790 | --- | 6655.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WI11 | 2.0 | 1543754 | 489440 | --- | 6654.00 | 85.00 | --- | --- | 25-85 | 15-85 |
| * WI12 | 2.0 | 1544117 | 489436 | --- | 6654.00 | 85.00 | --- | --- | 25-85 | 15-85 |
| * WI13 | 2.0 | 1544445 | 489778 | --- | 6655.00 | 90.00 | 3.70 | 6651.30 | 30-90 | 20-90 |
| * WJ1 | 2.0 | 1544332 | 489885 | --- | 6657.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WJ2 | 2.0 | 1544208 | 489982 | --- | 6658.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WJ3 | 2.0 | 1544104 | 489957 | --- | 6658.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WJ4 | 2.0 | 1544051 | 490017 | --- | 6660.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WJ5 | 2.0 | 1543868 | 489917 | --- | 6659.00 | 90.00 | 49.99 | 6609.01 | 30-90 | 20-90 |
| WJ6 | 2.0 | 1543797 | 490030 | --- | 6659.00 | 90.00 | 40.48 | 6618.52 | 30-90 | 20-90 |
| WJ7 | 2.0 | 1543963 | 489991 | --- | 6662.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WJ8 | 2.0 | 1544260 | 489915 | --- | 6657.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WJ9 | 2.0 | 1543600 | 489940 | --- | 6657.00 | 90.00 | 34.62 | 6622.38 | 30-90 | 20-90 |
| * WK1 | 2.0 | 1544306 | 490111 | --- | 6658.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WK2 | 2.0 | 1544181 | 490196 | --- | 6660.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WK3 | 2.0 | 1544125 | 490115 | --- | 6659.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WK4 | 2.0 | 1544032 | 490189 | --- | 6661.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WK5 | 2.0 | 1543878 | 490139 | --- | 6662.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WK6 | 2.0 | 1543817 | 490160 | --- | 6661.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WK7 | 2.0 | 1543729 | 490186 | --- | 6660.00 | 90.00 | 39.88 | 6620.12 | 30-90 | 20-90 |
| * WK8 | 2.0 | 1543667 | 490117 | --- | 6653.00 | 90.00 | 50.26 | 6602.74 | 30-90 | 20-90 |
| * WK9 | 2.0 | 1543589 | 490167 | --- | 6658.00 | 90.00 | 41.03 | 6616.97 | 30-90 | 20-90 |
| WK10 | 2.0 | 1544529 | 490205 | --- | 6657.00 | 85.00 | 49.63 | 6607.37 | 25-85 | 15-85 |
| * WL1 | 2.0 | 1544314 | 490323 | --- | 6659.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WL2 | 2.0 | 1544222 | 490438 | --- | 6662.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WL3 | 2.0 | 1544112 | 490272 | --- | 6661.00 | 90.00 | --- | --- | 30-60 | 20-90 |
| WL4 | 2.0 | 1544066 | 490424 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WL5 | 2.0 | 1543750 | 490324 | --- | 6661.00 | 90.00 | 47.50 | 6613.50 | 30-90 | 20-90 |
| * WL6 | 2.0 | 1543741 | 490457 | --- | 6667.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WL7 | 2.0 | 1543658 | 490287 | --- | 6659.00 | 90.00 | --- | --- | 30-90 | 20-90 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * WL8 | 2.0 | 1543579 | 490366 | --- | 6659.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WL9 | 2.0 | 1543367 | 490224 | --- | 6655.00 | 90.00 | 45.50 | 6609.50 | 30-90 | 20-90 |
| * WL10 | 2.0 | 1544240 | 490355 | --- | 6661.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WM1 | 2.0 | 1544347 | 490464 | --- | 6660.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WM2 | 2.0 | 1544302 | 490572 | --- | 6661.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WM3 | 2.0 | 1544189 | 490534 | --- | 6661.43 | 90.00 | 33.80 | 6627.63 | 30-90 | 20-90 |
| WM4 | 2.0 | 1544132 | 490518 | --- | 6664.00 | 90.00 | 31.80 | 6632.20 | 30-90 | 20-90 |
| WM4A | 2.0 | 1544139 | 490518 | --- | --- | 90.00 | --- | --- | 40-90 | - |
| WM4B | 2.0 | 1544127 | 490523 | --- | --- | 90.00 | --- | --- | 40-90 | - |
| WM4C | 2.0 | 1544135 | 490526 | --- | --- | 90.00 | --- | --- | 40-90 | - |
| WM4D | 2.0 | 1544139 | 490536 | --- | --- | 90.00 | --- | --- | 40-90 | - |
| * WM5 | 2.0 | 1543765 | 490563 | --- | 6664.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WM6 | 2.0 | 1543639 | 490476 | --- | 6661.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WM7 | 2.0 | 1543610 | 490601 | --- | 6663.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WM8 | 2.0 | 1543447 | 490438 | --- | 6658.00 | 85.00 | --- | --- | 25-85 | 15-85 |
| WME-1 | 4.0 | 1543621 | 489392 | 1.7 | 6659.23 | 57.30 | 57.30 | 6601.93 | 51-56 | 47-56 |
| WME-2 | 4.0 | 1544575 | 490685 | 2.1 | 6661.05 | 64.60 | 61.60 | 6599.45 | 58-63 | 54-63 |
| WME-6 | 4.0 | 1544134 | 491794 | 1.9 | 6671.50 | 67.25 | 67.25 | 6604.25 | 61-66 | 57-66 |
| WME-4 | 4.0 | 1543960 | 490041 | 2.0 | 6662.31 | 67.60 | 58.40 | 6603.91 | 61-66 | 57-66 |
| WME-3 | 4.0 | 1543980 | 492772 | 2.1 | 6664.31 | 67.15 | 64.40 | 6599.91 | 66-71 | 63-71 |
| WME-5 | 4.0 | 1544032 | 491065 | 2.0 | 6672.35 | 77.32 | 77.32 | 6595.03 | 70-75 | 67-75 |
| WN1 | 2.0 | 1544914 | 489942 | 1.4 | 6606.68 | 38.50 | 21.10 | 6585.58 | 10-35 | 5-35 |
| WN2 | 2.0 | 1544714 | 489942 | 1.5 | 6644.32 | 63.30 | 55.80 | 6588.52 | 55-75 | 5-75 |
| * WN3 | 5.0 | 1544597 | 489941 | 2.3 | 6654.48 | 86.70 | 5.60 | 6648.88 | 45-85 | 0-85 |
| WN4 | 5.0 | 1543958 | 489961 | 3.0 | 6662.78 | 142.40 | 53.00 | 6609.78 | 40-100 | 33-97 |
| WN5A | 2.0 | 1543966 | 489968 | 2.8 | 6663.53 | 58.10 | 24.68 | 6638.85 | 32-52 | 27-52 |
| WN5B | 2.0 | 1543965 | 489969 | 2.7 | 6663.36 | 100.80 | 44.27 | 6619.09 | 70-100 | 68-100 |
| WN6 | 5.0 | 1544610 | 490673 | 4.5 | 6656.60 | 114.60 | 48.20 | 6608.40 | 32-112 | 22-112 |
| WN7 | 5.0 | 1544597 | 489764 | 4.0 | 6658.03 | 114.50 | 50.40 | 6607.63 | 32-112 | 22-112 |
| * WO1 | 2.0 | 1544397 | 489666 | --- | 6655.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WO2 | 2.0 | 1544216 | 489655 | --- | 6656.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WO3 | 2.0 | 1544098 | 489560 | --- | 6656.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WO4 | 2.0 | 1543925 | 489594 | --- | 6656.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WO5 | 2.0 | 1543953 | 489754 | 2.0 | 6660.00 | 90.00 | 36.70 | 6623.30 | 30-90 | 20-90 |
| * WO6 | 2.0 | 1543507 | 489754 | --- | 6656.00 | 90.00 | 43.06 | 6612.94 | 30-90 | 25-90 |
| * WO7 | 2.0 | 1543469 | 489574 | --- | 6655.00 | 90.00 | 51.44 | 6603.56 | 30-90 | 25-90 |



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## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| WO8 | 2.0 | 1543571 | 489601 | --- | 6656.00 | 90.00 | 52.10 | 6603.90 | 30-90 | 25-90 |
| * WO9 | 2.0 | 1544223 | 489549 | --- | 6655.00 | 90.00 | --- | --- | 30-90 | 25-90 |
| WO10 | 2.0 | 1543623 | 489712 | --- | 6657.00 | 80.00 | 62.25 | 6594.75 | 50-80 | 40-80 |
| * WO11 | 2.0 | 1544246 | 489769 | --- | 6656.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WO12 | 2.0 | 1544378 | 489816 | --- | 6656.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WO13 | 2.0 | 1543908 | 489733 | --- | 6658.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| * WO14 | 2.0 | 1543742 | 489571 | --- | 6655.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| WO15 | 2.0 | 1543530 | 489419 | 2.0 | 6654.00 | 90.00 | 90.00 | 6564.00 | 40-90 | 30-90 |
| * WO16 | 2.0 | 1543640 | 489503 | 2.0 | 6653.00 | 90.00 | 44.85 | 6608.15 | 40-90 | 30-90 |
| * WO17 | 2.0 | 1544360 | 489539 | 2.0 | 6653.00 | 90.00 | 49.50 | 6603.50 | 40-90 | 30-90 |
| * WO18 | 2.0 | 1544575 | 489634 | 2.0 | 6651.00 | 90.00 | 45.80 | 6605.20 | 40-90 | 30-90 |
| * WO19 | 2.0 | 1543840 | 489485 | 2.0 | 6653.00 | 90.00 | 52.80 | 6600.20 | 40-90 | 30-90 |
| * WO20 | 2.0 | 1544028 | 489435 | --- | 6653.00 | 90.00 | 58.90 | 6594.10 | 40-90 | 30-90 |
| WO21 | 2.0 | 1543429 | 489688 | 2.0 | 6653.00 | 90.00 | 61.80 | 6591.20 | 40-90 | 30-90 |
| * WO22 | 2.0 | 1544094 | 489765 | --- | 6657.00 | 90.00 | --- | --- | 40-90 | 35-90 |
| * WO23 | 2.0 | 1543828 | 489733 | --- | 6657.00 | 90.00 | --- | --- | 40-90 | 35-90 |
| * WO24 | 2.0 | 1543764 | 489782 | --- | 6657.00 | 90.00 | 37.60 | 6619.40 | 40-90 | - |
| * WO25 | 2.0 | 1544132 | 489688 | --- | 6656.00 | 90.00 | 40.21 | 6615.79 | - | - |
| * WO26 | 2.0 | 1544180 | 489803 | --- | 6657.00 | 90.00 | 45.18 | 6611.82 | - | - |
| * WO27 | 2.0 | 1543854 | 489811 | --- | 6658.00 | 90.00 | 35.73 | 6622.27 | - | - |
| * WO28 | 2.0 | 1543656 | 489618 | --- | 6655.00 | 90.00 | 48.82 | 6606.18 | 40-90 | - |
| WO29 | 2.0 | 1543890 | 489554 | --- | 6656.00 | 90.00 | --- | --- | - | - |
| WO30 | 2.0 | 1544021 | 489735 | --- | 6659.00 | 90.00 | 34.02 | 6624.98 | 40-90 | - |
| * WO31 | 2.0 | 1544297 | 489510 | --- | 6666.00 | 90.00 | 53.75 | 6612.25 | 40-90 | - |
| WO32 | 2.0 | 1544312 | 489688 | --- | 6655.00 | 90.00 | 65.10 | 6589.90 | 40-90 | - |
| * WO33 | 2.0 | 1543969 | 489590 | --- | 6656.00 | 90.00 | --- | --- | 40-90 | - |
| * WO34 | 2.0 | 1543811 | 489672 | --- | 6657.00 | 90.00 | --- | --- | 40-90 | - |
| * WO35 | 2.0 | 1543545 | 489663 | --- | 6655.00 | 90.00 | --- | --- | 40-90 | - |
| * WO36 | 2.0 | 1543705 | 489635 | --- | 6656.00 | 90.00 | --- | --- | - | - |
| * WO37 | 2.0 | 1543873 | 489626 | --- | 6657.00 | 90.00 | --- | --- | - | - |
| * WO38 | 2.0 | 1544083 | 489810 | --- | 6657.00 | 90.00 | --- | --- | - | - |
| * WO39 | 2.0 | 1544038 | 489521 | --- | 6655.00 | 90.00 | --- | --- | - | - |
| * WO40 | 2.0 | 1544138 | 489562 | --- | 6655.00 | 90.00 | --- | --- | - | - |
| * WO41 | 2.0 | 1544300 | 489821 | --- | 6656.00 | 90.00 | --- | --- | - | - |



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## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| WO42 | 2.0 | 1543971 | 489792 | --- | 6660.00 | 90.00 | --- | --- | 40-90 | - |
| * WP1 | 2.0 | 1544383 | 489991 | --- | 6657.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WP2 | 2.0 | 1544179 | 489852 | --- | 6657.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WP3 | 2.0 | 1544123 | 490077 | --- | 6659.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WP4 | 2.0 | 1544067 | 489849 | --- | 6659.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WP5 | 2.0 | 1543768 | 489825 | --- | 6658.00 | 90.00 | 58.86 | 6599.14 | 30-90 | 20-90 |
| * WP6 | 2.0 | 1543673 | 489841 | --- | 6657.00 | 90.00 | 52.53 | 6604.47 | 30-90 | 20-90 |
| * WP7 | 2.0 | 1544494 | 489981 | 2.0 | 6656.00 | 90.00 | 51.00 | 6605.00 | 30-90 | 20-90 |
| * WP8 | 2.0 | 1544514 | 489859 | --- | 6655.00 | 90.00 | 55.73 | 6599.27 | 30-90 | 20-90 |
| * WP9 | 2.0 | 1543636 | 490032 | --- | 6666.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| WP10 | 2.0 | 1543744 | 490033 | 2.0 | 6658.00 | 90.00 | 66.30 | 6591.70 | 40-90 | 30-90 |
| WP11 | 2.0 | 1543913 | 489945 | --- | 6661.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| WP12 | 2.0 | 1544018 | 489868 | --- | 6660.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| * WP13 | 2.0 | 1544149 | 490012 | --- | 6658.00 | 90.00 | 44.24 | 6613.76 | 40-90 | 30-90 |
| WP14 | 2.0 | 1544038 | 490084 | --- | 6660.00 | 90.00 | 38.20 | 6621.80 | 40-90 | 30-90 |
| * WP15 | 2.0 | 1544598 | 489852 | --- | 6655.00 | 90.00 | 60.02 | 6594.98 | 40-90 | 30-90 |
| WP16 | 2.0 | 1544009 | 489996 | --- | 6660.00 | 90.00 | 65.55 | 6594.45 | 40-90 | 35-90 |
| WP17 | 2.0 | 1543855 | 490043 | 2.0 | 6659.00 | 90.00 | 31.09 | 6627.91 | 40-90 | 35-90 |
| * WP18 | 2.0 | 1543725 | 489866 | --- | 6657.00 | 90.00 | 38.70 | 6618.30 | 40-90 | 35-90 |
| * WP19 | 2.0 | 1544092 | 489881 | 2.0 | 6657.00 | 90.00 | 40.30 | 6616.70 | 40-90 | 30-90 |
| WP20 | 2.0 | 1543473 | 489853 | 2.0 | 6658.00 | 90.00 | 25.10 | 6632.90 | 40-90 | 30-90 |
| WP21 | 2.0 | 1543952 | 489853 | 2.0 | 6661.00 | 90.00 | 23.80 | 6637.20 | 40-90 | 30-90 |
| * WP22 | 2.0 | 1544136 | 489865 | --- | 6657.00 | 90.00 | 50.60 | 6606.40 | 40-90 | - |
| * WP23 | 2.0 | 1544209 | 489899 | --- | 6657.00 | 90.00 | 45.77 | 6611.23 | 40-90 | - |
| * WP24 | 2.0 | 1544252 | 490027 | --- | 6658.00 | 90.00 | 42.36 | 6615.64 | 40-90 | - |
| WP25 | 2.0 | 1544003 | 489933 | --- | 6660.00 | 90.00 | 46.17 | 6613.83 | 40-90 | - |
| * WP26 | 2.0 | 1543815 | 489873 | --- | 6657.00 | 90.00 | 33.79 | 6623.21 | 40-90 | - |
| WP28 | 2.0 | 1543823 | 489977 | --- | 6658.00 | 90.00 | 35.20 | 6622.80 | 40-90 | - |
| WP29 | 2.0 | 1544088 | 489925 | --- | 6658.00 | 90.00 | 61.05 | 6596.95 | 40-90 | - |
| WP30 | 2.0 | 1544019 | 490029 | --- | 6660.00 | 90.00 | 34.30 | 6625.70 | 40-90 | - |
| * WP31 | 2.0 | 1544343 | 490049 | --- | 6657.00 | 90.00 | 18.15 | 6638.85 | 40-90 | - |
| * WP32 | 2.0 | 1544084 | 490037 | --- | 6659.00 | 90.00 | --- | --- | - | - |
| * WP33 | 2.0 | 1543739 | 489983 | --- | 6657.00 | 90.00 | --- | --- | 40-90 | - |
| * WP34 | 2.0 | 1543943 | 490055 | --- | 6663.00 | 90.00 | --- | --- | 40-90 | - |
| WP35 | 2.0 | 1543943 | 489842 | --- | 6660.00 | 90.00 | --- | --- | 40-90 | - |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| WP36 | 2.0 | 1543919 | 489993 | --- | 6661.00 | 90.00 | --- | --- | 40-90 | - |
| * WP37 | 2.0 | 1543654 | 489887 | --- | 6656.00 | 90.00 | --- | --- | - | - |
| WP38 | 2.0 | 1543789 | 489868 | --- | 6657.00 | 90.00 | --- | --- | 40-90 | - |
| WP39 | 2.0 | 1543891 | 489901 | --- | 6659.00 | 90.00 | --- | --- | 40-90 | - |
| WP40 | 2.0 | 1543974 | 490009 | --- | 6661.00 | 90.00 | --- | --- | 40-90 | - |
| * WP41 | 2.0 | 1544124 | 489982 | --- | 6658.00 | 90.00 | --- | --- | - | - |
| * WQ1 | 2.0 | 1544353 | 490205 | --- | 6658.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WQ2 | 2.0 | 1543950 | 490105 | --- | 6663.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WQ3 | 2.0 | 1543429 | 490130 | --- | 6655.00 | 90.00 | 46.00 | 6609.00 | 30-90 | 20-90 |
| * WQ4 | 2.0 | 1544254 | 490104 | --- | 6658.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| WQ5 | 2.0 | 1543992 | 490126 | --- | 6662.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| * WQ7 | 2.0 | 1544011 | 490231 | 2.0 | 6661.00 | 90.00 | 32.35 | 6628.65 | 40-90 | 30-90 |
| * WQ8 | 2.0 | 1543900 | 490141 | --- | 6662.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| * WQ9 | 2.0 | 1544214 | 490150 | --- | 6659.00 | 90.00 | --- | --- | 40-90 | 35-90 |
| WQ10 | 2.0 | 1544069 | 490160 | --- | 6660.00 | 90.00 | 32.95 | 6627.05 | 40-90 | - |
| * WQ11 | 2.0 | 1544156 | 490141 | --- | 6659.00 | 90.00 | 34.98 | 6624.02 | 40-90 | - |
| * WQ12 | 2.0 | 1544011 | 490166 | --- | 6661.00 | 90.00 | 51.30 | 6609.70 | 40-90 | - |
| WQ13 | 2.0 | 1544071 | 490254 | --- | 6661.00 | 90.00 | 31.54 | 6629.46 | 40-90 | - |
| WQ14 | 2.0 | 1543812 | 490104 | --- | 6660.00 | 90.00 | 30.25 | 6629.75 | 40-90 | - |
| WQ15 | 2.0 | 1543779 | 490216 | --- | 6661.00 | 90.00 | --- | --- | 40-90 | - |
| * WQ16 | 2.0 | 1543685 | 490234 | --- | 6659.00 | 90.00 | --- | --- | 40-90 | - |
| * WQ17 | 2.0 | 1544151 | 490240 | --- | 6660.00 | 90.00 | 32.45 | 6627.55 | 40-90 | - |
| * WQ18 | 2.0 | 1543924 | 490182 | --- | 6664.00 | 90.00 | --- | --- | 50-100 | - |
| * WQ19 | 2.0 | 1544088 | 490136 | --- | 6659.00 | 90.00 | --- | --- | 40-90 | - |
| * WQ20 | 2.0 | 1543978 | 490213 | --- | 6663.00 | 90.00 | --- | --- | - | - |
| WS1 | 2.0 | 1543049 | 489909 | 0.7 | 6607.11 | 36.90 | 10.78 | 6596.33 | 27-37 | 5-37 |
| WS2 | 2.0 | 1543255 | 489911 | 2.2 | 6649.44 | 77.30 | 59.60 | 6589.84 | 55-75 | 5-75 |
| WS3 | 2.0 | 1543325 | 489915 | 2.4 | 6656.62 | 79.70 | 43.10 | 6613.52 | 60-80 | 5-80 |
| WS4 | 5.0 | 1543494 | 489944 | 4.0 | 6659.57 | 89.40 | 59.13 | 6600.44 | 53-93 | 0-93 |
| WS5 | 5.0 | 1543681 | 489940 | 3.7 | 6660.58 | 90.90 | 35.60 | 6624.98 | 52-92 | 0-92 |
| WS6 | 5.0 | 1543385 | 489626 | 2.4 | 6657.23 | 113.30 | 45.70 | 6611.53 | 31-111 | 21-111 |
| WS7 | 5.0 | 1543336 | 490118 | 4.4 | 6659.12 | 114.50 | 74.20 | 6584.92 | 32-112 | 22-112 |
| * WT1 | 2.0 | 1543502 | 490289 | --- | 6667.00 | 90.00 | 47.25 | 6619.75 | 30-90 | 20-90 |
| * WT2 | 2.0 | 1543923 | 490229 | --- | 6665.00 | 90.00 | --- | --- | 30-90 | 20-90 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| * WT3 | 2.0 | 1544506 | 490404 | --- | 6657.00 | 90.00 | 60.21 | 6596.79 | 30-90 | 20-90 |
| * WT4 | 2.0 | 1544457 | 490288 | --- | 6657.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WT5 | 2.0 | 1544069 | 490364 | --- | 6663.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| WT6 | 2.0 | 1544412 | 490441 | 2.0 | 6657.00 | 90.00 | 90.00 | 6567.00 | 40-90 | 30-90 |
| * WT7 | 2.0 | 1543874 | 490294 | --- | 6664.00 | 90.00 | 31.66 | 6632.34 | 40-90 | 30-90 |
| * WT8 | 2.0 | 1543949 | 490377 | --- | 6667.00 | 90.00 | 62.03 | 6604.97 | 40-90 | 30-90 |
| * WT9 | 2.0 | 1543614 | 490250 | 2.0 | 6659.00 | 90.00 | 33.00 | 6626.00 | 40-90 | 30-90 |
| * WT10 | 2.0 | 1543991 | 490300 | 2.0 | 6663.00 | 90.00 | 29.29 | 6633.71 | 40-90 | 35-90 |
| * WT11 | 2.0 | --- | --- | --- | 6663.00 | 100.00 | 37.80 | 6625.20 | 40-90 | - |
| * WT12 | 2.0 | 1544111 | 490323 | --- | 6661.00 | 90.00 | 28.70 | 6632.30 | 40-90 | 35-90 |
| WT13 | 2.0 | 1544129 | 490453 | --- | 6663.00 | 90.00 | --- | --- | 40-90 | 35-90 |
| * WT14 | 2.0 | 1544203 | 490406 | --- | 6662.00 | 90.00 | --- | --- | 40-90 | 35-90 |
| WT15 | 2.0 | 1544243 | 490255 | --- | 6660.00 | 90.00 | 121.40 | 6538.60 | 40-90 | - |
| * WT16 | 2.0 | 1544176 | 490342 | --- | 6661.00 | 90.00 | 34.20 | 6626.80 | 40-90 | - |
| * WT17 | 2.0 | 1543910 | 490270 | --- | 6665.00 | 90.00 | 29.70 | 6635.30 | 50-100 | - |
| WT18 | 2.0 | 1543696 | 490330 | --- | 6660.00 | 90.00 | 50.20 | 6609.80 | 40-90 | - |
| WT19 | 2.0 | 1543833 | 490258 | --- | 6662.00 | 90.00 | --- | --- | 40-90 | - |
| * WU1 | 2.0 | 1543493 | 490548 | --- | 6666.00 | 90.00 | 49.97 | 6616.03 | 30-90 | 20-90 |
| * WU2 | 2.0 | 1543944 | 490671 | --- | 6667.00 | 90.00 | 37.00 | 6630.00 | 30-90 | 20-90 |
| * WU3 | 2.0 | 1544457 | 490642 | --- | 6659.00 | 90.00 | --- | --- | 30-90 | 20-90 |
| * WU4 | 2.0 | 1544110 | 490668 | 2.0 | 6664.00 | 90.00 | 36.00 | 6628.00 | 40-90 | 35-90 |
| * WU5 | 2.0 | 1543503 | 490473 | --- | 6660.00 | 90.00 | --- | --- | 40-90 | 30-90 |
| WU6 | 2.0 | 1544365 | 490563 | 2.0 | 6661.00 | 90.00 | 37.60 | 6623.40 | 40-90 | 30-90 |
| WU7 | 2.0 | 1544057 | 490483 | 0.9 | 6663.08 | 90.00 | 41.00 | 6622.08 | 30-90 | 20-90 |
| * WU9 | 2.0 | 1543871 | 490696 | 2.0 | 6666.00 | 90.00 | 41.00 | 6625.00 | 40-90 | 30-90 |
| WU10 | 2.0 | 1544132 | 490507 | 1.3 | 6663.00 | 90.00 | 35.10 | 6627.90 | 40-90 | - |
| WU11 | 2.0 | 1544132 | 490512 | 1.4 | 6663.00 | 90.00 | 35.20 | 6627.80 | 40-90 | - |
| WU12 | 2.0 | 1544035 | 490520 | 1.6 | 6663.00 | 90.00 | 34.15 | 6628.85 | 40-90 | - |
| * WU13 | 2.0 | 1543744 | 490514 | --- | 6663.00 | 90.00 | --- | --- | 40-90 | - |
| * WU14 | 2.0 | 1543693 | 490455 | --- | 6661.00 | 90.00 | --- | --- | 40-90 | - |
| * WU15 | 2.0 | 1544053 | 490643 | 2.0 | 6666.00 | 90.00 | --- | --- | 50-90 | 40-90 |
| WW1 | 2.0 | 1543894 | 489023 | 2.7 | 6603.09 | 33.00 | 25.68 | 6577.41 | 20-30 | 5-30 |
| WW2 | 2.0 | 1543894 | 489222 | 2.9 | 6643.64 | 64.90 | 64.90 | 6578.74 | 45-65 | 5-65 |
| WW3 | 3.0 | 1543893 | 489423 | 5.4 | 6659.54 | 80.50 | 51.70 | 6607.84 | 48-88 | 5-88 |
| WW4 | 5.0 | 1544269 | 489422 | 3.0 | 6657.00 | 112.00 | 40.80 | 6616.20 | 32-112 | 22-112 |



* = abandoned

## Table 3.1-1. WELL DATA FOR TAILINGS WELLS ON THE LARGE TAILINGS PILE. (cont'd.)

| WELL NAME | CASING DIAMETER (in) | NORTH. COORD. | EAST. COORD. | STICKUP (ft) | MP ELEV. (ft-msl) | TOTAL DEPTH (ft-mp) | DEPTH TO WATER (ft-mp) | WATER LEVEL ELEVATION (ft-msl) | CASING PERFORATIONS (ft-lsd) | SAND PACK (ft-lsd) |
|---|---|---|---|---|---|---|---|---|---|---|
| WW5 | 5.0 | 1543605 | 489420 | 5.0 | 6659.24 | 113.00 | 71.20 | 6588.04 | 33-113 | 23-113 |
| WW6 | 4.5 | 1544350 | 489380 | 2.0 | 6656.00 | 120.00 | 75.10 | 6580.90 | 60-120 | 50-120 |
| WW7 | 4.5 | 1544190 | 489380 | 2.0 | 6656.00 | 120.00 | 80.60 | 6575.40 | 60-120 | 50-120 |
| WW8 | 4.5 | 1543680 | 489350 | 2.0 | 6656.00 | 120.00 | 90.00 | 6566.00 | 60-120 | 50-120 |
| WW9 | 4.5 | 1543525 | 489375 | 2.0 | 6656.00 | 120.00 | 90.00 | 6566.00 | 60-120 | 50-120 |
| WW10 | 4.5 | 1543400 | 489460 | 2.0 | 6656.00 | 120.00 | 80.00 | 6576.00 | 60-120 | 50-120 |



* = abandoned

## 3.2 TAILINGS WATER LEVELS

The volume of water collected from the tailings dewatering wells (light blue bars) and the toe drains (green bars) are presented on Figure 3.1-4. Active dewatering of the LTP was discontinued after 2017. The tailings flushing injection was discontinued in mid-2015 and the tailings dewatering rates in 2016 and 2017 were approximately 5 gpm and 1.3 gpm, respectively. Because there is no recent dewatering and the tailings flushing injection was discontinued more than five years prior to this reporting, the changes in tailings water levels in 2020 are almost entirely a result of natural slime and sand tailings exchange and natural drainage from the tailings. The final cover has not been constructed on the top of the LTP and the natural recharge is greater than will occur when reclamation is complete. However, the top of the LTP has been graded and shaped to prevent significant ponding and the typical recharge is estimated at two gpm.

An overall decline in tailings water levels was observed during 2020 with the largest declines occurring along the central sand dike, in the perimeter sand dike and in the southwest quadrant of the LTP (see Table A.1-1 in Appendix A and Figure 3.2-1). This water level decline resulted in a slight reduction in the saturated footprint of the LTP area with a more pronounced reduction in the saturated footprint on the south side of the LTP. In contrast, there was an increase in the size of two water level mounds located in the slime areas in the east and west halves of the LTP. The increase in the size of the east and west mounds is attributed to some variability in water level measurements in specific wells (e.g. wells WME-5 and WME-6), and the measurement of water levels during 2020 in additional wells located specifically in water level mound areas to confirm the presence and extent of the mounds. It is unlikely that there are significant water level rises in the tailings, and the variability in water levels in some wells may indicate incomplete recovery between frequent sample cycles or errors or other anomalies in the measurements.

An analysis of the water volume change in the saturated tailings in the LTP indicates a reduction of approximately 7,356,000 gallons over 2020 which equates to a reduction rate of approximately 14 gpm. The composite discharge from the toe drains during 2020 was approximately 5 gpm. Subtracting the toe drain discharge from the water volume change leaves approximately 9 gpm of the water volume change that was discharged from the tailings as

seepage. However, there is a small rate of infiltration to the LTP that is not accounted for in the water volume change calculation, and this rate should be added to the 9 gpm water volume change to produce the effective estimated seepage rate. The present infiltration rate with interim cover on the top of the LTP has been estimated to range up to a very conservative 4 gpm with a rate of approximately 2 gpm considered more appropriate. Adding an estimated 2 gpm of infiltration to the 9 gpm seepage discharge from water storage produces an effective seepage rate of 11 gpm. However, water flow and balance calculations and estimates in Section 2 of this report do not include the estimate of infiltration through the interim cover of the LTP.

The volume of water collected from the tailings dewatering wells (light blue bars) and the toe drains (green bars) are presented on Figure 3.1-4 to show the changes in collection rate with time. This figure also shows the pounds of uranium removed with the tailings dewatering wells (red bars) and the toe drains (gold bars) for each year. Prior to mid-2015, dewatering rates ranged up to 105 gpm. With the discontinuation of flushing injection and the subsequent lowering of the potentiometric surface, potential yields from dewatering wells decreased dramatically and no further dewatering well operation is anticipated.

### 3.2.1 TAILINGS WATER LEVEL CHANGES

Numerous wells were monitored for water level change during 2020 and the water-level elevations for years 2009 through 2020 are presented Figures 3.2-2 through 3.2-7 with a general grouping by area.

Wells CN1, CN2, CS1 and CS2 are located on the north (CN1 and CN2) and south (CS1 and CS2) outslopes of the LTP roughly at the east to west midpoint of the LTP, and the measured water levels since 2009 are presented in Figure 3.2-2. A strong declining trend in water-level elevation has been occurring in all four sand tailings wells since mid-2015 although there have been some erratic measurements in wells CN2 and CS1. The abrupt water level changes in well CN2 since late 2017 may reflect the well completion to below the base of the tailings that creates contact with the underlying perched sand. Well WME-2 is located approximately 160 feet south and east of well CN2 and the higher water-level elevations presented in Figure 3.2-2 indicate the horizontal drainage from the interior tailings is likely supplying tailings water to support the water levels in the perimeter wells. The water level in

well CN2 was not honored in the contouring in Figure 3.2-1.

Wells EE2, NE1, NE2, SE2 and WME-3 are located on the eastern side of the LTP and the measured water levels since 2009 are presented in Figure 3.2-3. A declining trend in water-level elevation has been occurring in all five wells since mid-2015 or since ceasing injection into the tailings (well WME-3 was installed in 2018). Higher water-level elevations exist in the slime area to the west of these wells and the horizontal drainage from the slimes is supplying tailings water to support the water levels in the perimeter wells.

Sand tailings wells EN1, EN2, ES1 and ES2 are located on the north (EN1 and EN2) and south (ES1 and ES2) outslopes of the LTP roughly at the east to west midpoint of the eastern cell of the LTP, and well WME-6 is in the slime tailings south of well EN2. The measured water levels for the wells are presented in Figure 3.2-4. A strong declining trend in water-level elevation since 2015 has been occurring in well EN2 with a milder trend in well EN1. Water level changes in the two southern wells since 2015 have been somewhat erratic with no significant trends. The water-level elevation in the slime tailings well WME-6 is higher than that in the sand tailings wells and is relatively steady.

Sand tailings wells WN1, WN2, WS1 and WS1 are located on the north (WN1 and WN2) and south (WS1 and WS2) outslopes of the LTP roughly at the east to west midpoint of the western cell of the LTP and well WME-4 is in the slime tailings between wells WN2 and WS2. The measured water levels in the wells since 2009 are presented in Figure 3.2-5. A strong declining trend in water-level elevation since 2015 has been occurring in wells WN2 and WS2 with a slightly milder declining trend in well WN1. The water-level elevation in well WS1 has been erratic with a relatively modest decline since 2015, and the gradient reversal between wells WS1 and WS2 is not consistent with the general radially outward tailings water flow direction from the slime areas in the tailings indicated by the higher water level in well WME-4. The measured water-level elevation in well WS1 may be affected by proximity to the toe drains or west reclaim system in the LTP, and is not representative of the tailings and is not honored in the contouring in Figure 3.2-1.

Wells SW1, SW2, WW1, WW3 and WME-1 are located on the western and southwestern side of the LTP and the measured water levels since 2009 are presented in Figure 3.2-6. A relatively mild declining water-level elevation trend is occurring in all five wells since

mid-2015. A mound in the potentiometric surface occurs in the western side of the slime tailings in the western half of the LTP, and past and recent water level measurements were used in the contouring of the residual mound shown in Figure 3.2-1. The horizontal outward movement of tailings water from the slime tailings to the sand tailings on the LTP outslopes reduces the rate of water level decline in the area represented by wells SW1, SW2, and WW1. With the very small permeability of the slime tailings, there are also likely confining layers in the slimes that restrict vertical tailings water movement and cause partial or local perching of tailings water within the slime tailings.

Slime tailings wells WE9, WF2, WF9 and WF11 are located in the northeastern portion of the western slime cell of the LTP and the measured water levels since 2009 are presented in Figure 3.2-7. Only a few measurements were taken between 2011 and 2018, but there is a declining water level trend in all wells since 2011 and during 2018 and 2019, and a measurement in well WF9 indicates the trend continued through 2020. The water-level elevations in the wells have declined by approximately 24 to 33 feet since the flushing program was discontinued.

Slime tailings wells WO10, WO21, WO10 and WT18 are located in the southwestern quadrant of the LTP and the measured water levels since 2009 are presented in Figure 3.2-8. With the exception of an anomalous measurement in well WT18 in 2020, there has been a decline in water-level elevation in all four wells since flushing ended in 2015. The anomalous water-level elevation in well WT18 was not honored in the contouring in Figure 3.2-1. The rate of drainage from the slime tailings in the area represented by these wells has been greater and more consistent than other areas of LTP where slime tailings are present.

Figure 3.2-9 presents water-level elevations in wells CS7, WF13, WC15 and WO32. Well CS7 is located within the central sand dike of the LTP and well WF13 is located in approximately 150 feet west of the central sand dike (see Figure 3.2-1). Well WC15 is located approximately 550 feet west of the central sand dike of the LTP. The difference in water-level elevation and the rate of decline in water-level elevation illustrates the typical drainage conditions of the LTP. The highest water-level elevation and slowest rate of decline occurs in slime well WC15. Although well WF13 is in the slime tailings, it is close enough to the central sand dike for significant drainage to have occurred. The central sand dike appears to be an

effective lateral drainage feature through the center of the LTP because the most recent water-level elevation in well WF13 is only slightly higher than that in well CS7, which is closer to the perimeter sand dike. Well WO32 is located in the northwest corner of the tailings, but is close enough to the perimeter sand dike to have exhibited significant drainage.

Slime tailings wells EP23, EP31, ET20 and WME-5 are located in the eastern slime cell of the LTP and the measured water levels since late 2016 are presented in Figure 3.2-10. A general declining water level trend is occurring in well EP23, and wells EP31, ET20 and WME-5 show somewhat erratic measurements with no significant trends. Water levels in these four wells indicate that drainage from the central slime area of the east cell is very slow. Wells EI4, ES4, ES6 and ET19 are also located in the eastern cell of the LTP with wells ES4 and ES6 located within a sand dike and showing a declining trend in water-level elevation (see Figure 3.2-11). In contrast, the water level in well EI4 defines a mound in the slime tailings as shown on Figure 3.2-1. A decline in water-level elevation occurred in well EI4 through 2017, but recent water levels have been steady. Water-level elevation in well ET19 has been slightly erratic with no significant trend.

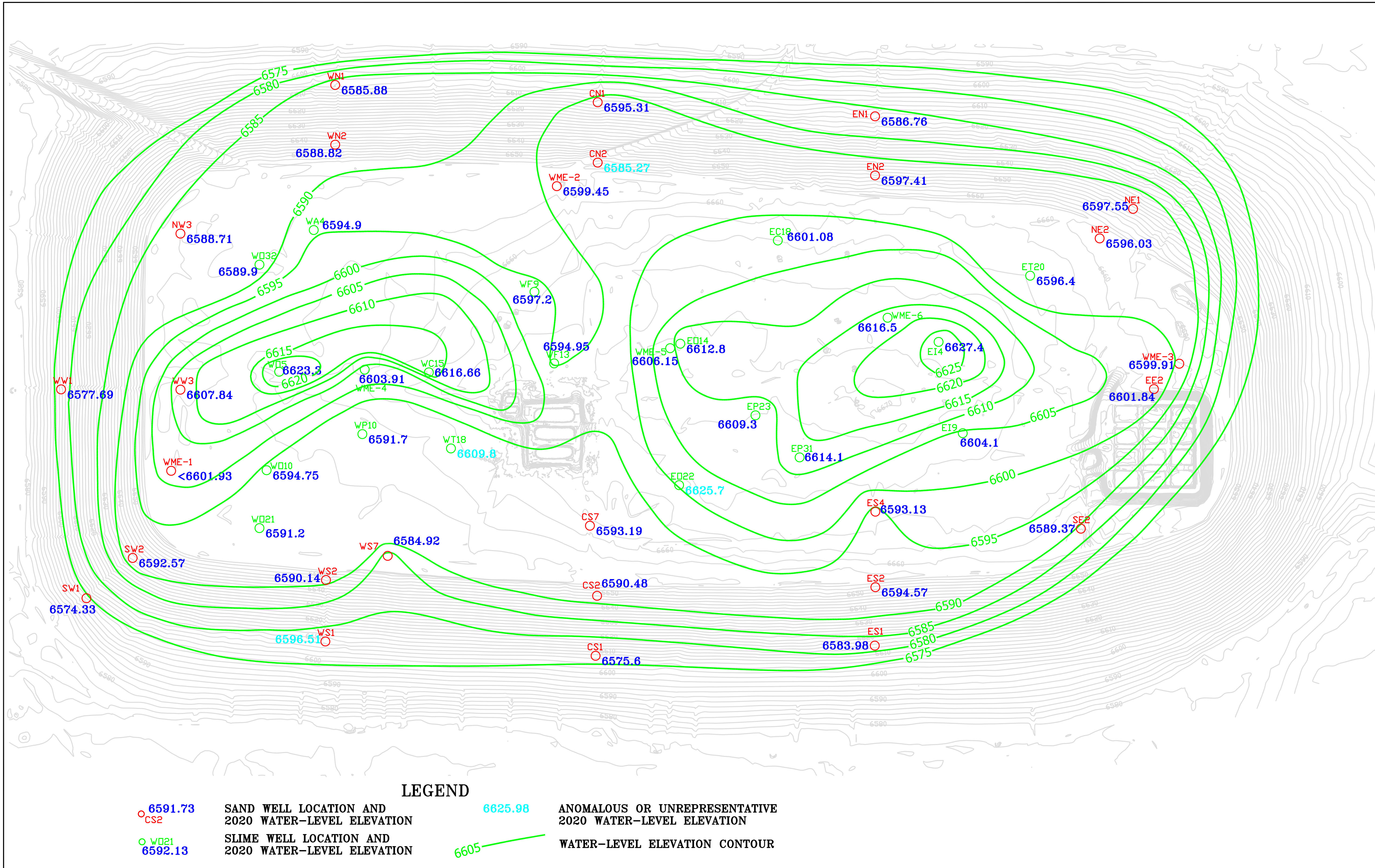


FIGURE 3.2-1. WATER-LEVEL ELEVATIONS OF THE LTP, FALL 2020, FT-MSL

HOMESTAKE MINING COMPANY
GRANTS, NEW MEXICO

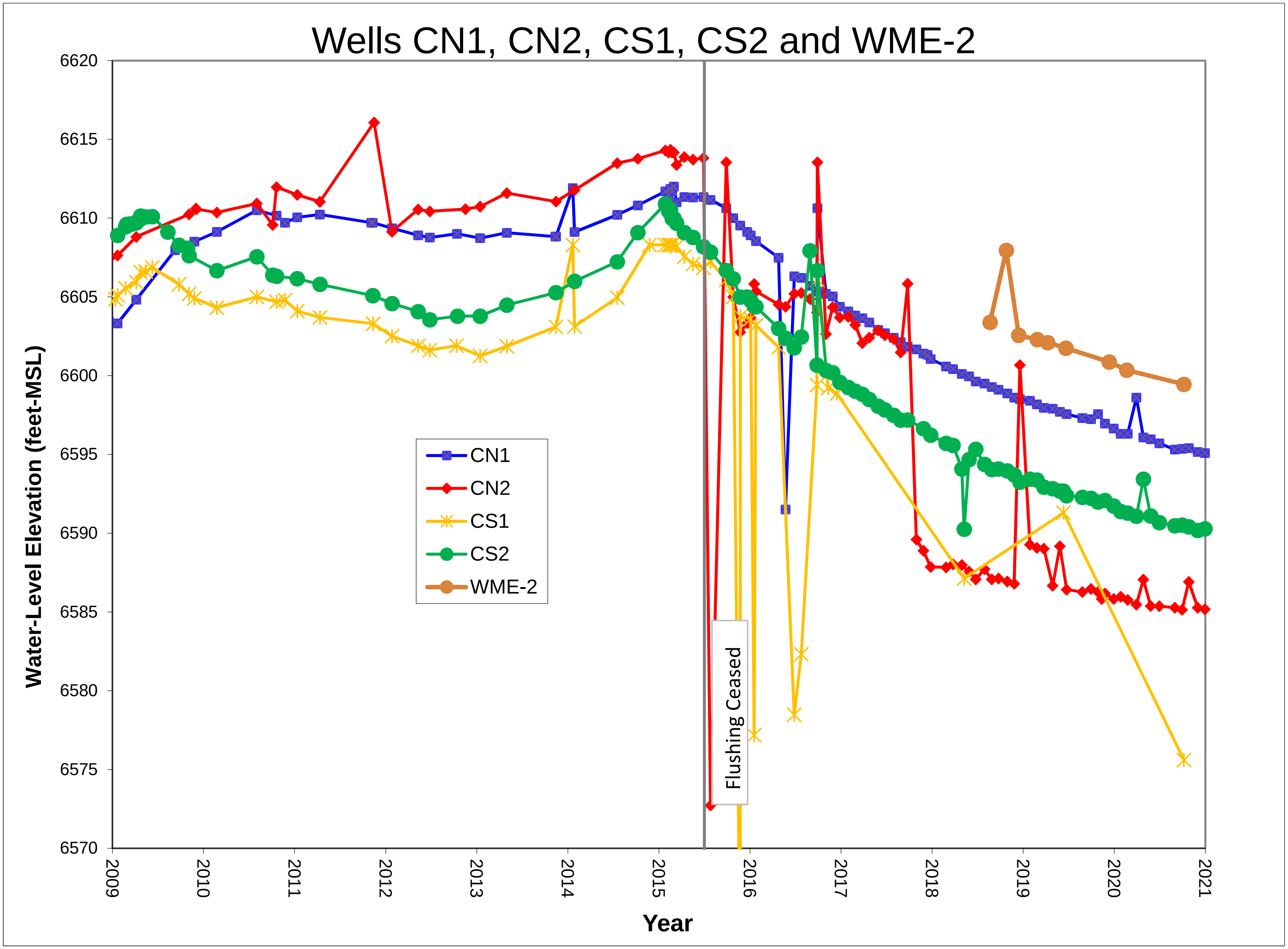


**Figure 3.2-2. Water-Level Elevation ForTailings Wells CN1, CN2, CS1, CS2 and WME-2**

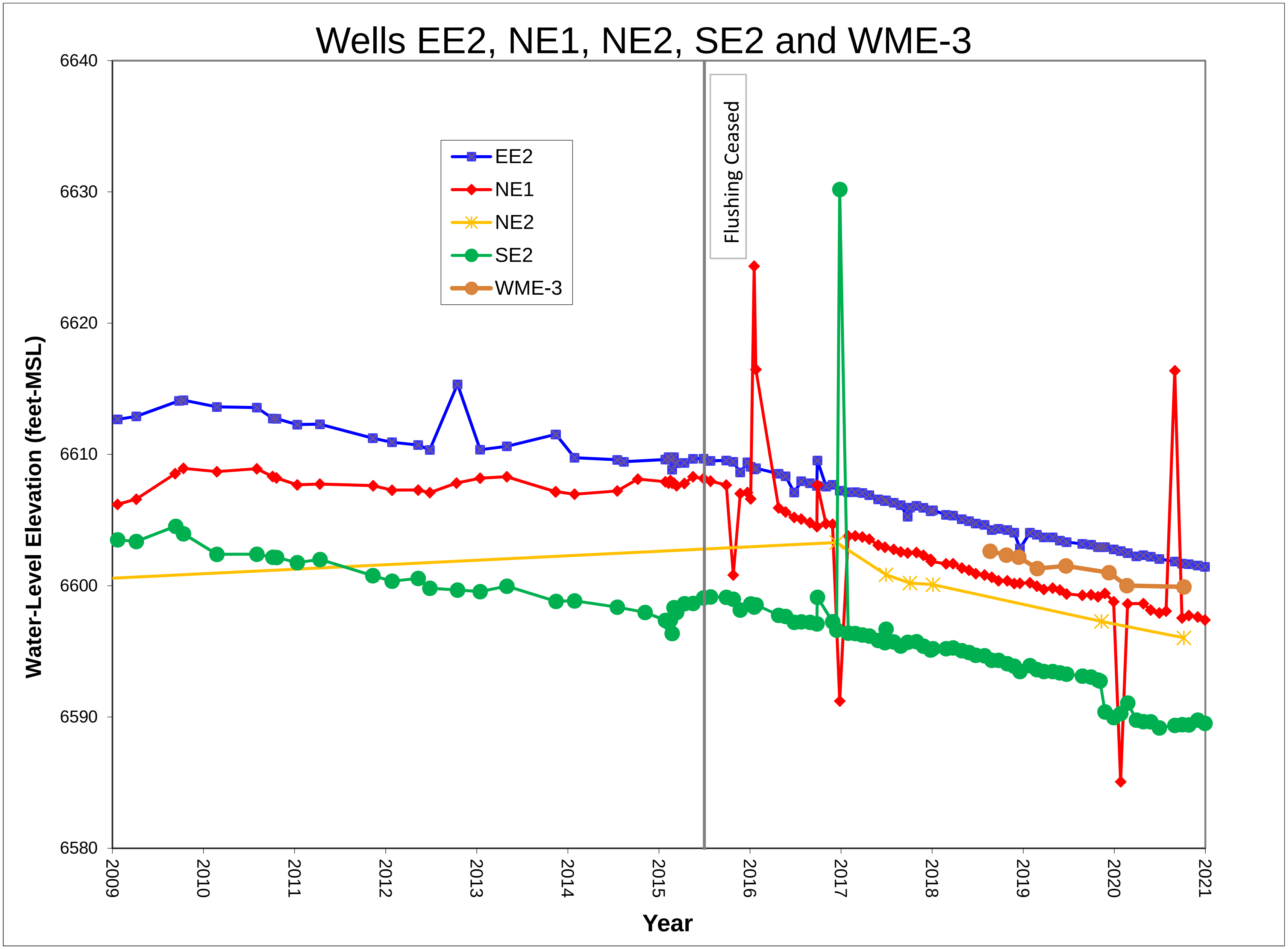


**Figure 3.2-3. Water-Level Elevation ForTailings Wells EE2, NE1, NE2, SE2 and WME-3**

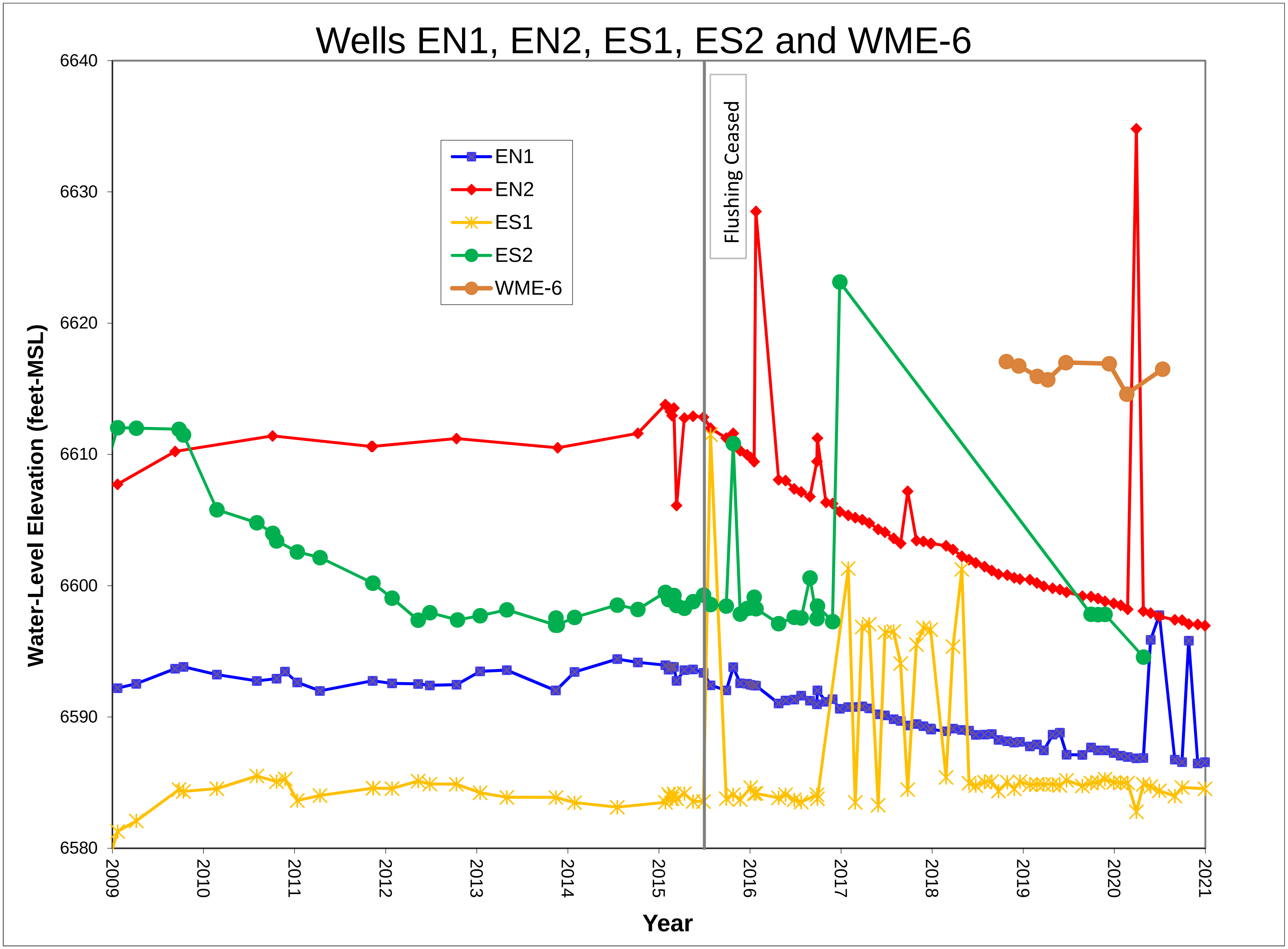


**Figure 3.2-4. Water-Level Elevation For Tailings Wells EN1, EN2, ES1, ES2 and WME-6**

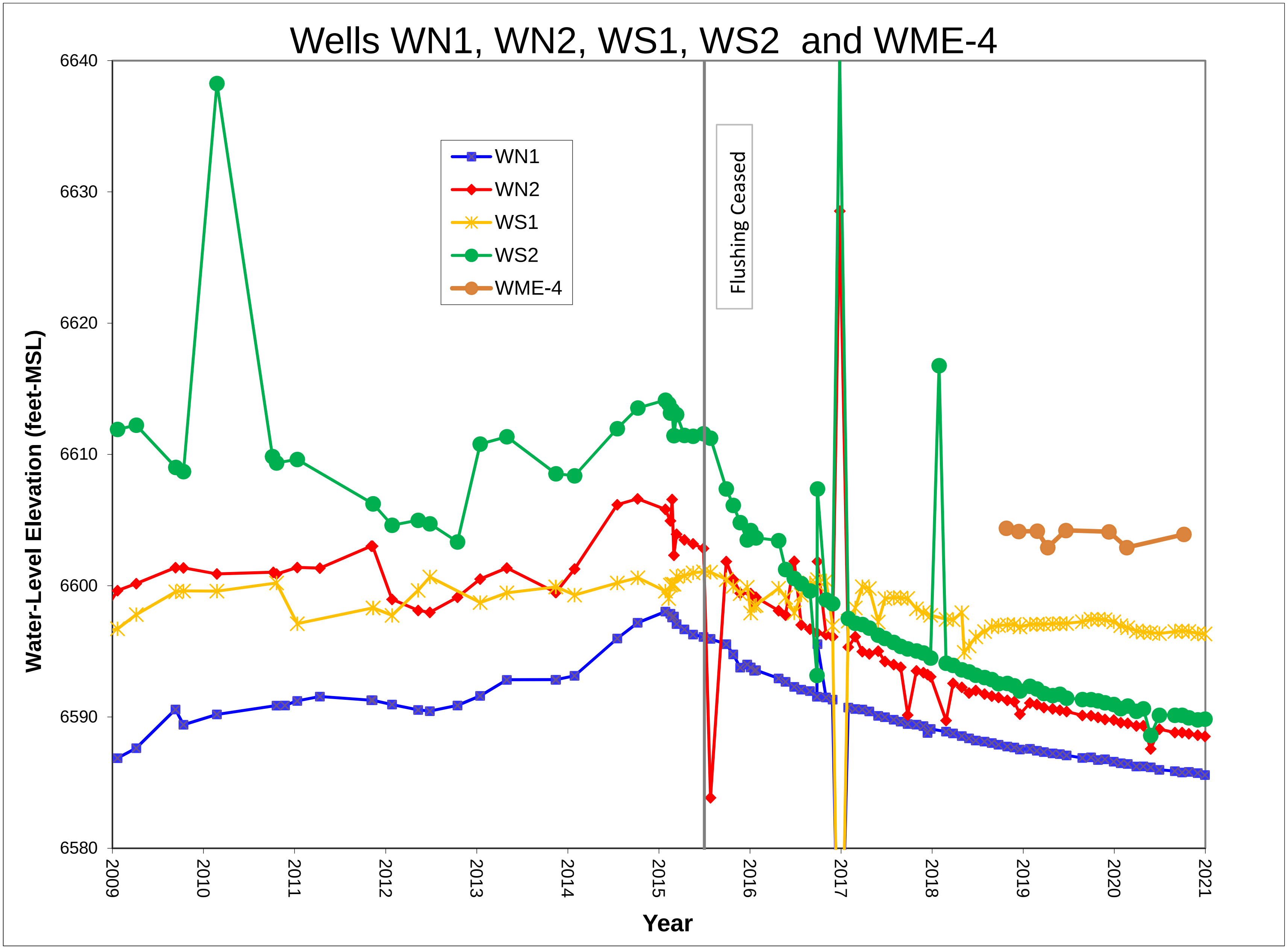


**Figure 3.2-5. Water-Level Elevation For Tailings Wells WN1, WN2, WS1, WS2 and WME-4**


**Figure 3.2-6. Water-Level Elevation For Tailings Wells SW1, SW2, WW1, WW3 and WME-1**

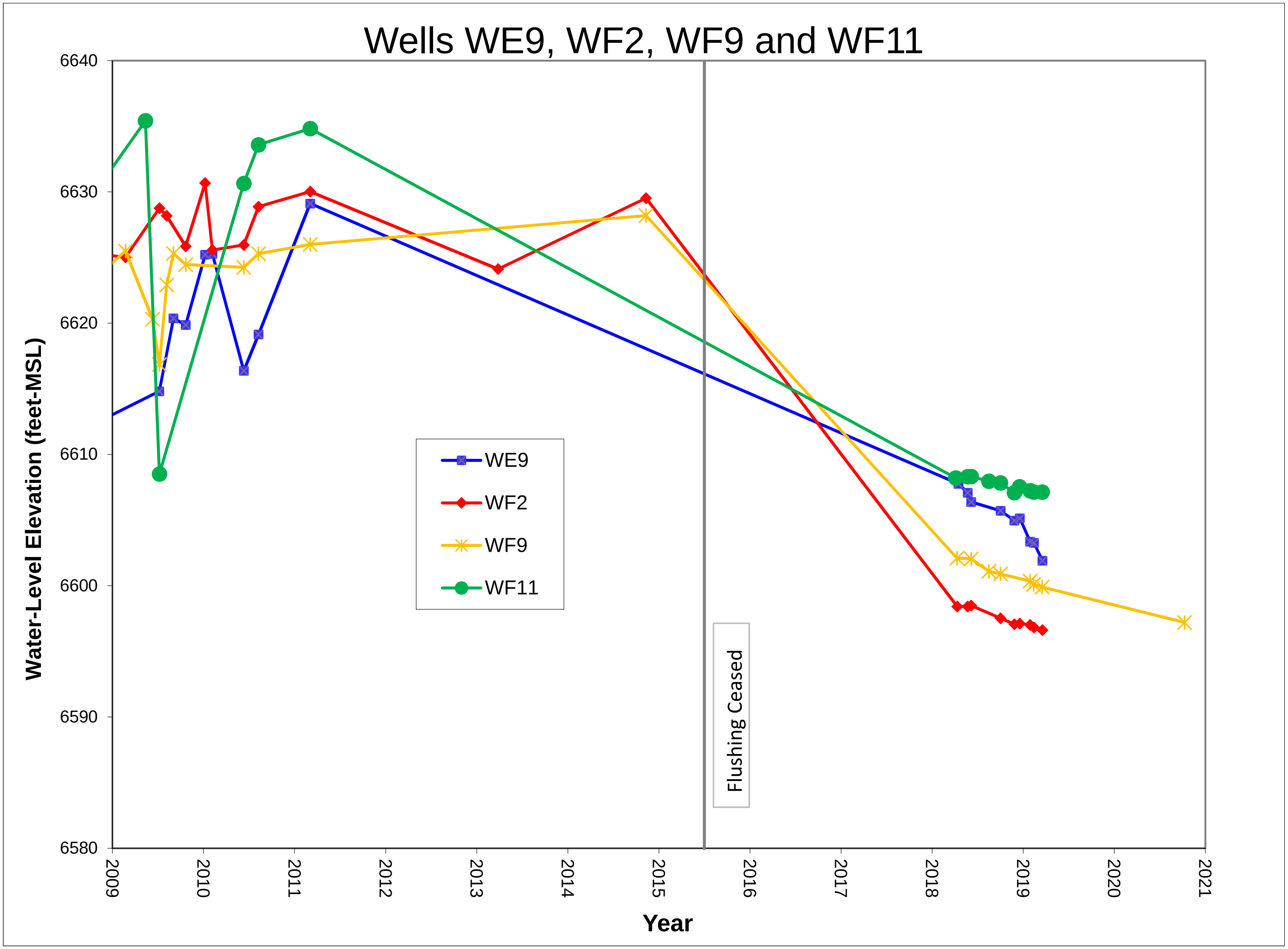


**Figure 3.2-7. Water-Level Elevation For Tailings Wells WE9, WF2, WF9 and WF11**

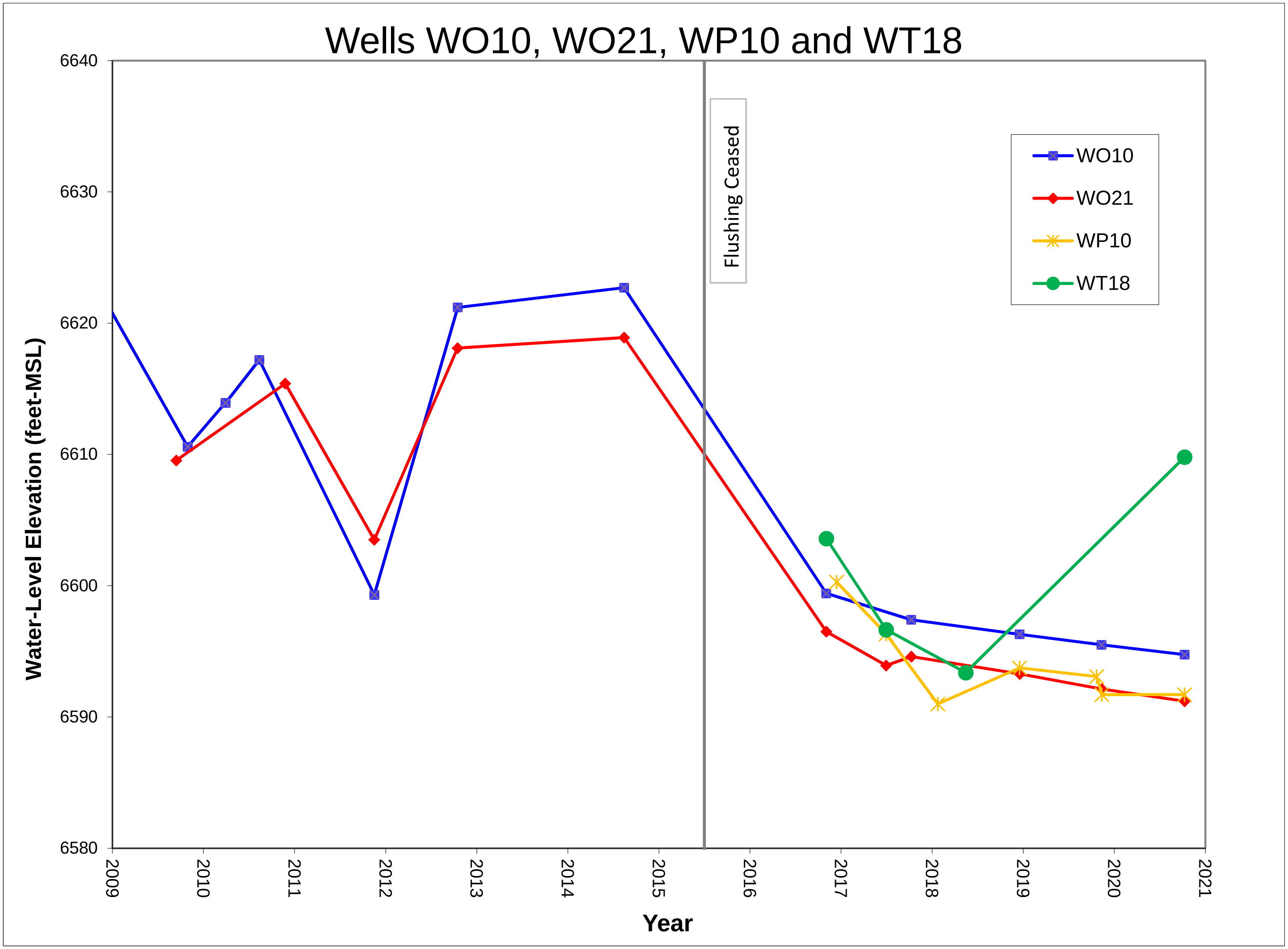


**Figure 3.2-8. Water-Level Elevation For Tailings Wells WO10, WO21, WP10 and WT18**

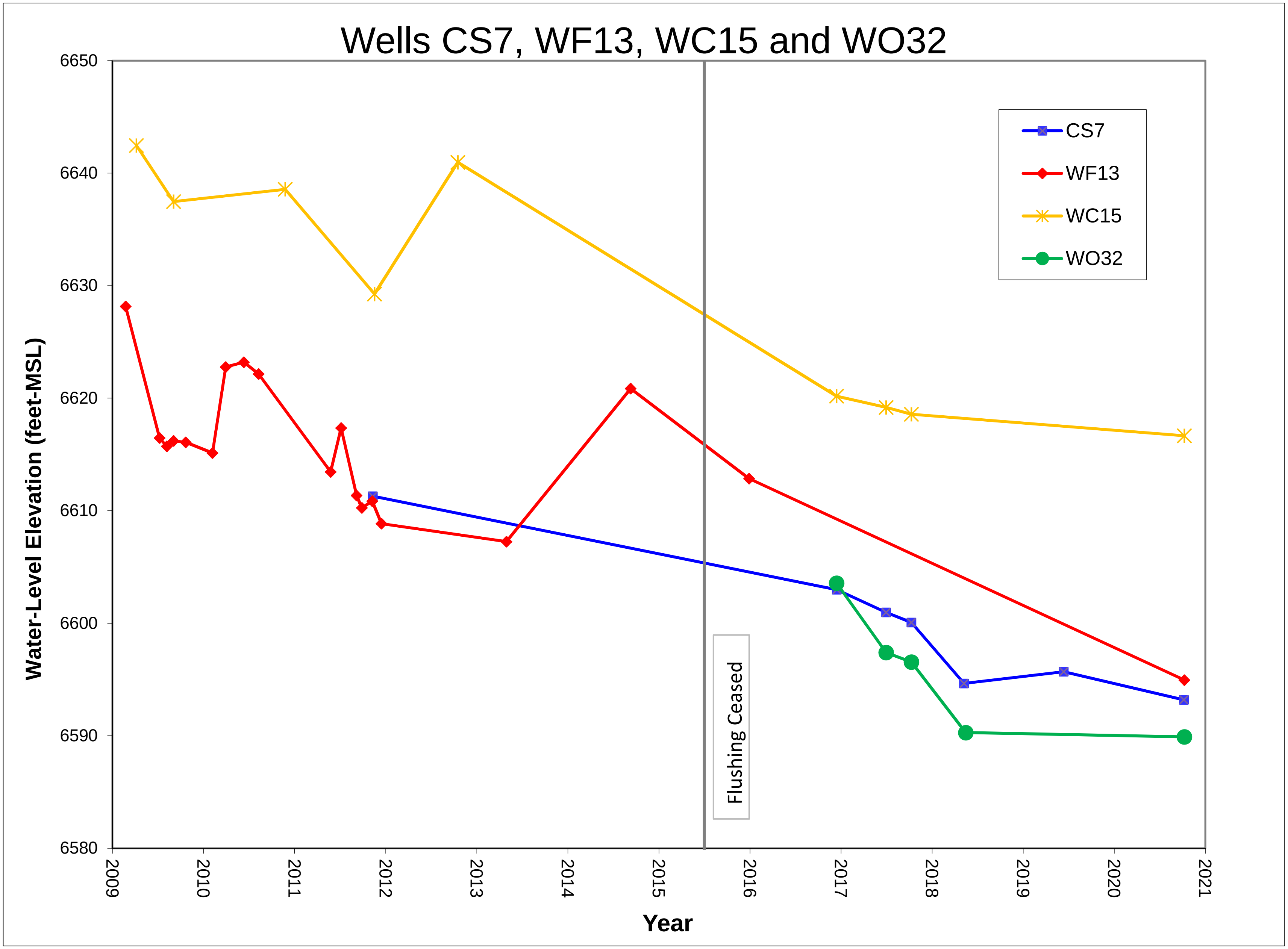


**Figure 3.2-9. Water-Level Elevation For Tailings Wells CS7, WF13, WC15 and WO32**

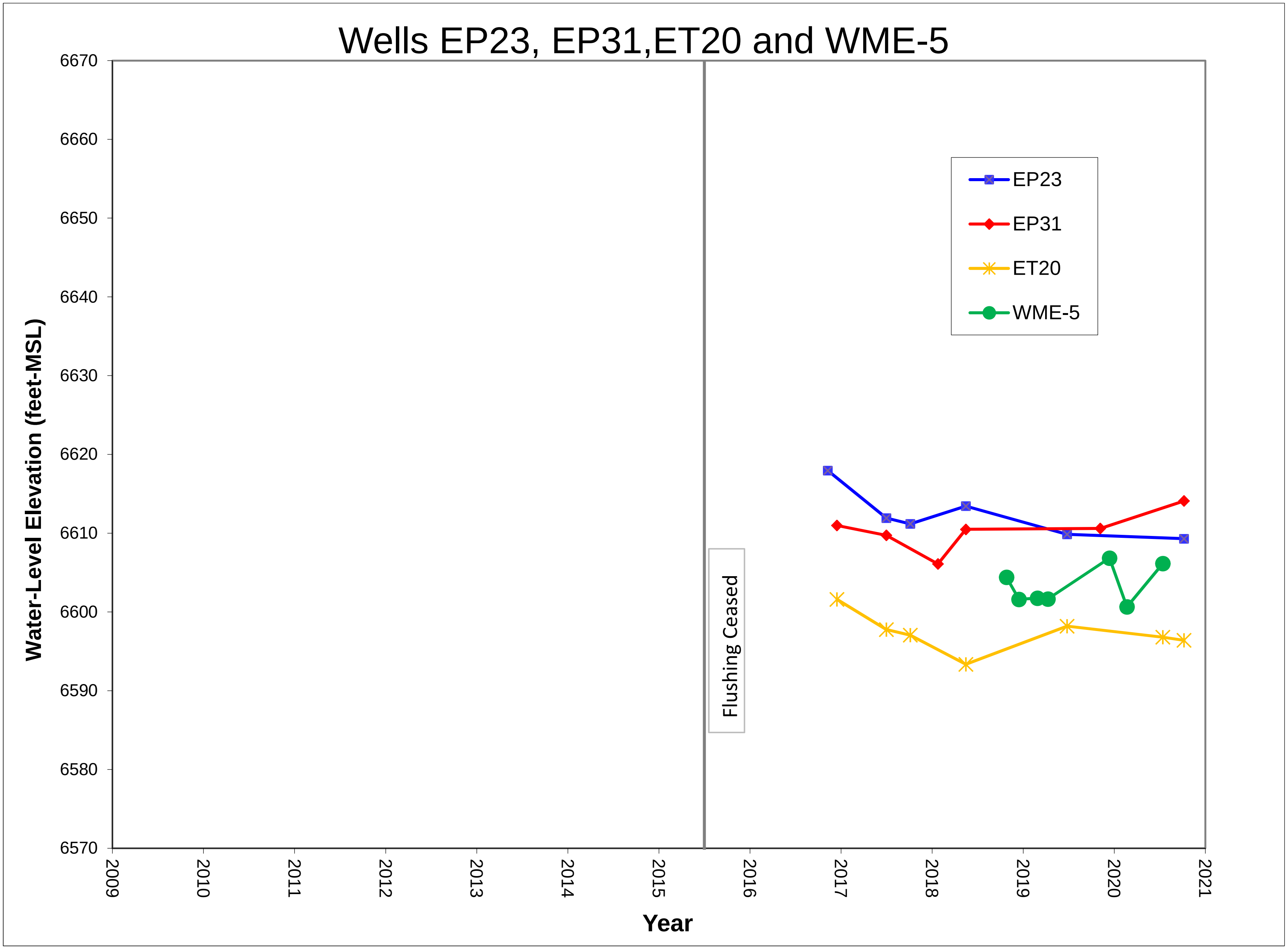


**Figure 3.2-10. Water-Level Elevation For Tailings Wells EP23, EP31, ET20 and WME-5**

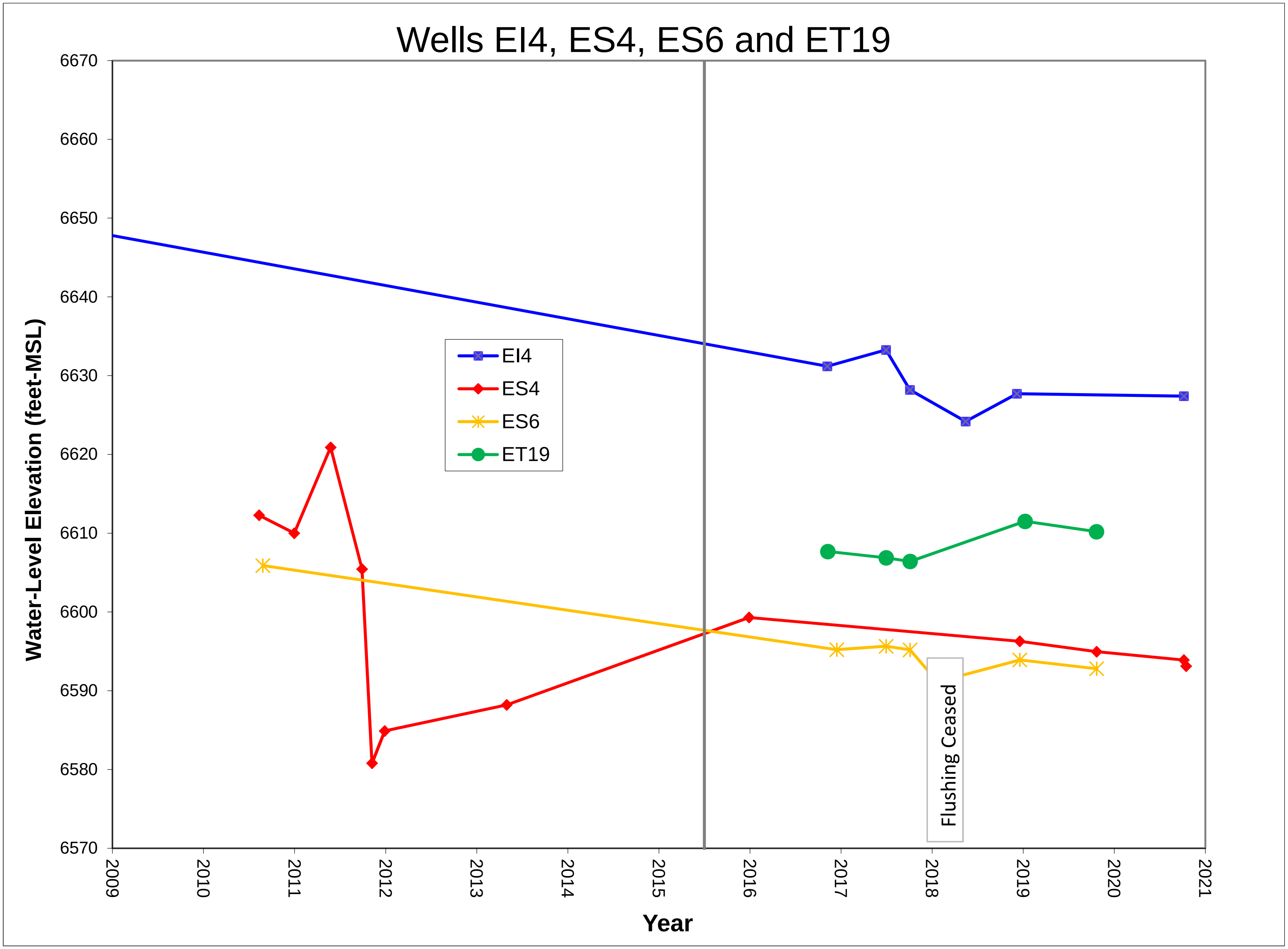


**Figure 3.2-11. Water-Level Elevation For Tailings Wells EI4, ES4, ES6 and ET19**

## 3.3 TAILINGS WATER QUALITY

Table 2.1-1 presents the quantity of constituents collected from the tailings wells since dewatering began. Tables B.1-1 and B.1-2 of Appendix B present chemical analyses of tailings well water samples collected during 2019 and 2020, with only a few samples taken in 2020. Uranium is a key water quality indicator constituent for the tailings solution. A series of five uranium concentration mapping figures are presented to convey the changes in uranium in the LTP with time. Figure 3.3-1 presents the uranium concentrations in the tailings solution in 2000 shortly after the start of the flushing program. The red pattern shows where uranium concentrations were greater than 40 mg/L, while the magenta gives the area where a uranium concentration of 30 to 40 mg/L was present. The green pattern shows the area of 20 to 30 mg/L uranium concentration and the cyan color shows where uranium concentrations were less than 10 mg/L. Figures 3.3-2, 3.3-3, 3.3-4 and 3.3-5 present the tailings solution uranium concentrations for 2008, 2015, 2018 and 2019 respectively. These figures show the decline in uranium concentrations with time during the tailings flushing program, with stabilization of the uranium concentrations and other water quality indicators after the flushing ended.

Figures 3.3-4 and 3.3-5 show that uranium concentrations in the tailings solution exhibited very little change between 2018 and 2019, and the water quality stabilization is also illustrated in graphs of uranium, molybdenum and selenium concentration over time for selected tailings wells and toe drain sumps shown in Figures 3.3-6 through 3.3-15. Table 3.3-1 presents estimated average uranium, molybdenum and selenium concentrations for the water in the saturated portion of the LTP. Because the constituent concentrations in the tailings solution are stable, the 2019 uranium, molybdenum and selenium concentration contours were used in calculation of the average constituent concentrations, along with the 2020 saturated thickness in the LTP. The average constituent concentrations are calculated using concentration contours and mapping of the saturated thickness in the LTP. Surface modeling software (QUICKSURF) is used to multiply the constituent concentration surface by the saturated thickness distribution over the LTP and that product is then divided by the saturated volume in the LTP to determine the average concentration.

### 3.3.1 URANIUM CONCENTRATION MAPPING

Figures 3.3-1 through 3.3-5 were developed using measured uranium concentrations in samples from tailings wells in conjunction with operational configurations for the flushing injection and tailings dewatering wells. As an example, the generally circular areas of lower concentration shown in Figure 3.3-1 are located at operating injection wells or groups of injection wells. Figures 3.3-2 and 3.3-3 show the expansion of these areas of the LTP that have been flushed with the injection water. The injection wells were not sampled during the operation of the flushing program but each injection well had an area of influence and these areas gradually merged with the flushing progress as shown in Figures 3.3-2, 3.3-3 and 3.3-4.

Following the cessation of injection in mid-2015, there was redistribution and exchange of resident water within the LTP and Figure 3.3-5 presents the tailings solution uranium concentration for the tailings in 2019. Because there has been no active injection since mid-2015, the decay of the mounds in the potentiometric surface around injection wells and the associated redistribution of tailings solution allows representative samples to be collected from the former injection wells as well as former dewatering wells and monitoring wells. The pattern of uranium concentrations shown in Figure 3.3-4 and Figure 3.3-5 reflects this redistribution. The saturated footprint of the LTP has been reduced significantly since 2015 (see Figure 3.3-3) and there was a reduction on the south side of the LTP from 2019 to 2020 as shown by the 2020 saturated boundary delineation on Figure 3.3-5.

### 3.3.2 SAND TAILINGS WATER QUALITY

A series of graphs presenting uranium, molybdenum and selenium concentration over time were developed for selected wells in the LTP. For the sand tailings, these graphs are presented in Figures 3.3-6 through 3.3-10 with concentration data for two wells included on each graph. The grouping of wells for each graph is based on general location and the nature of the tailings in the area of the well. The uranium concentrations for the two wells are shown with blue or cyan lines and symbols, and the molybdenum concentrations are shown with red or orange lines and symbols. The selenium concentrations are typically much smaller than uranium concentrations and are plotted with dark and light green lines with the scale on the right-hand axis as shown on the series of graphs.

Figure 3.3-6 presents uranium, molybdenum and selenium concentration over time for wells CS1 and CS2. These wells are located at the south end of the central sand dike in the LTP (see Figure 3.1-2). Since approximately 2016, there have been no trends in constituent concentrations and this reflects the post-flushing water quality stabilization.

Figures 3.3-7 and 3.3-8 present uranium, molybdenum and selenium concentration over time for well pairs located eastern side of the LTP (see Figure 3.1-2). Figure 3.3-7 shows that, since 2018, constituent concentrations have been relatively steady except for a declining trend in uranium concentration in well ES6. Very little change in the uranium, molybdenum and selenium concentration has occurred in samples from well ES4 from 2014 through 2020. Similarly, Figure 3.3-8 shows generally steady selenium and uranium concentrations since 2018 in wells EE2 and SE2. The molybdenum concentration in well SE2 had a slight declining trend while the molybdenum concentration in well EE2 has shown typical sample variability since 2016.

Figure 3.3-9 shows relatively steady uranium, selenium and molybdenum concentration in well wells WW3 and WME-1 since late 2016. Although minor sample variability occurred, there were no trends in constituent concentrations. Wells WW3 and WME-1 are located on the western side of the LTP. Figure 3.3-10 presents constituent concentrations for sand tailings wells WME-3 and SW3, which are located at the east end and southwest corner of the LTP respectively. Measured constituent concentration changes after mid-2018 are very small, with very little change between 2019 and 2020 samples for well WME-3.

### 3.3.3 TOE DRAIN DISCHARGE WATER QUALITY

The toe drain system around the perimeter of the LTP collects tailings water draining from the tailings and possibly tailings seepage water in the perched sand layer and discharges the impacted water to sumps. Figures 3.3-11 and 3.3-12 present uranium, molybdenum and selenium concentration over time for the East 1 and West 1 sumps, and the North 1 and South 1 sumps respectively. The constituent concentrations for the four sumps have declined significantly from levels that were present prior to the flushing program. The discharge rates to the sumps have also declined as the drainage from the LTP continues and the saturated footprint shrinks. Since 2016, the uranium concentration in the discharge from the sumps has stabilized or

has a declining trend. With the exception of erratic concentration changes in the West 1 sump discharge, the molybdenum concentration in the sumps has typically stabilized or shown a gradual decline since 2016. The selenium concentration in the toe drain discharge has declined since 1996, but exhibited a dramatic increase shortly after flushing injection began followed by a declining trend through the end of flushing (see Figures 3.3-11 and 3.3-12).

### 3.3.4 SLIME TAILINGS WATER QUALITY

Monitoring wells WO10 and WO21 are located in the southwest portion of the slime tailings area in the west cell of the LTP and the constituent concentrations in well WO10 showed a significant decline through 2014 reflecting the flushing progress (see Figure 3.3-13). Between 2018 and 2019, there was a slight increase in constituent concentrations in well WO10. The changes in constituent concentrations in well WO21 were relatively minor between 2009 and 2019. Figure 3.3-14 illustrates a dramatic contrast between constituent concentration in former injection well WP10 and monitoring well WME-4. Only a few samples were taken from each well and the constituent concentrations in well WP10 are relatively low indicating successful flushing of the slime tailings in the area (see Figure 3.3-14). In contrast, the uranium and molybdenum concentrations in well WME-4 are roughly an order of magnitude greater than those in well WP10. This large disparity in constituent concentration in wells that are less than 200 feet apart may indicate that the flushing injection water did not reach well WME-4, or possibly that the smaller completion interval of well WME-4 is within a layer that was not affected by flushing. However, the water quality results do not indicate any change in constituent concentrations other than typical sample variability.

Figure 3.3-15 presents constituent concentrations for slime tailings wells WME-5 and WME-6 which are located in the eastern slime area of the LTP. The wells were first sampled in late 2018 and the constituent concentrations have been relatively stable with the exception of a decrease in selenium concentration and an increase in molybdenum concentration in well WME-5 from the earliest samples. The constituent concentrations in both wells are indicative of areas that were partially flushed during the tailings flushing program, and the constituent concentrations are relatively stable.

### 3.3.5 AVERAGE TAILINGS COC CONCENTRATION ESTIMATES

Table 3.3-1 presents estimated uranium, molybdenum and selenium concentrations for the tailings water in the saturated portion of the LTP. These estimated average concentrations were calculated using mapping of uranium, molybdenum and selenium concentrations in the LTP for 2019 along with the potentiometric surface shown in Figure 3.2-1. As described previously, the use of 2019 constituent concentrations in the calculation is considered appropriate because the water quality in the residual tailings solution is relatively stable. The estimation of average uranium concentration began in 2006 and estimation of average molybdenum concentration began in 2010. The average selenium concentrations in the saturated tailings are relatively small and calculation of the average concentration began in 2018. The estimated average uranium and molybdenum concentrations decreased dramatically during active flushing of the LTP, but recent changes have been modest. A slight increase in average concentrations between 2017 and 2018 and between 2016 and 2015 (see Table 3.3-1) is likely reflective of the interpretation of constituent concentration contours for differing water sample distributions over the LTP rather than an actual increase in constituent concentrations. With the cessation of tailings flushing and the expectation of no future dewatering, the future changes in the average uranium and molybdenum concentrations in the LTP are expected to be very small. However, the seepage rates from the sand tailings are larger than those from the slime tailings so there is some potential for minor average constituent concentration changes resulting from differing rates of seepage. This is supported by the changes in estimated drainable water volume presented in Table 3.3-1 with the majority of the year-to-year water volume reduction since 2016 occurring in the sand tailings.

### 3.3.6 GENERAL TAILINGS WATER QUALITY STABILITY

The water quality in the LTP has been relatively stable with minor declining trends in some areas for the past two or more years based on sampling of wells and the discharge from toe drains. The flushing injection that occurred prior to mid-2015 had the potential to cause significant changes in water quality in areas of the tailings, and the flushing program produced dramatic changes in constituent concentrations as illustrated in Figures 3.3-8, 3.3-11, 3.3-12, and 3.3-13. After the end of flushing injection, the redistribution of injection water within the LTP

also had the potential for causing less dramatic water quality changes within the LTP until the water level mounds around injection wells decayed. Following this redistribution and equilibration, the tailings water quality as reflected in uranium, molybdenum and selenium concentrations has been relatively stable in the LTP since at least 2018. Occasional erratic results occur for a single constituent, but the majority of constituent concentrations presented in Figures 3.3-6 through 3.3-14 exhibit general stability with only typical sample variability since the flushing injection water was redistributed and equilibrated within the LTP after cessation of injection. Although it has been posited that geochemical changes or mobile/immobile water exchanges within the tailings could produce a rebound in constituent concentrations, the data collected suggests that recent changes are not significant.

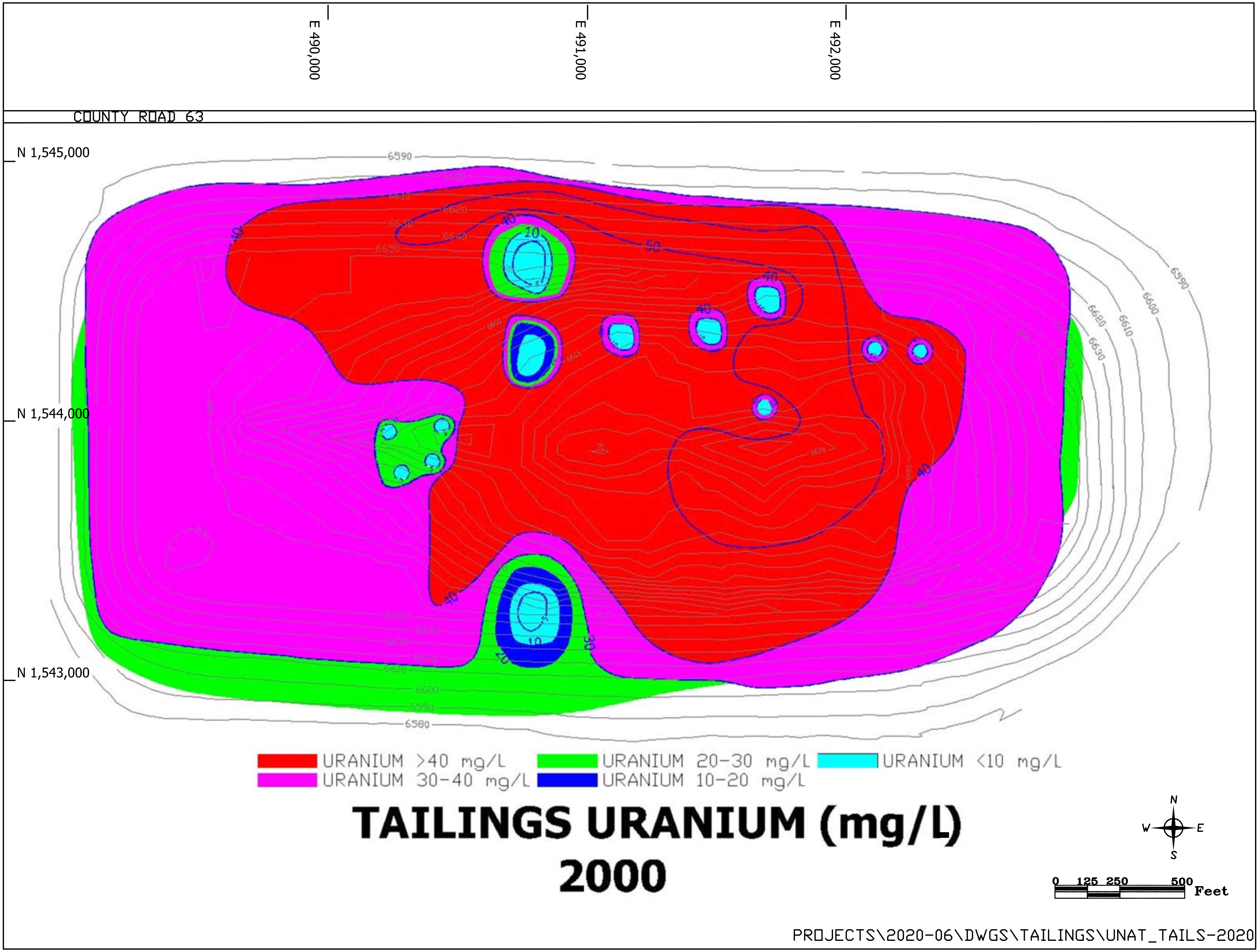


FIGURE 3.3-1. TAILINGS SOLUTION URANIUM CONCENTRATION, 2000

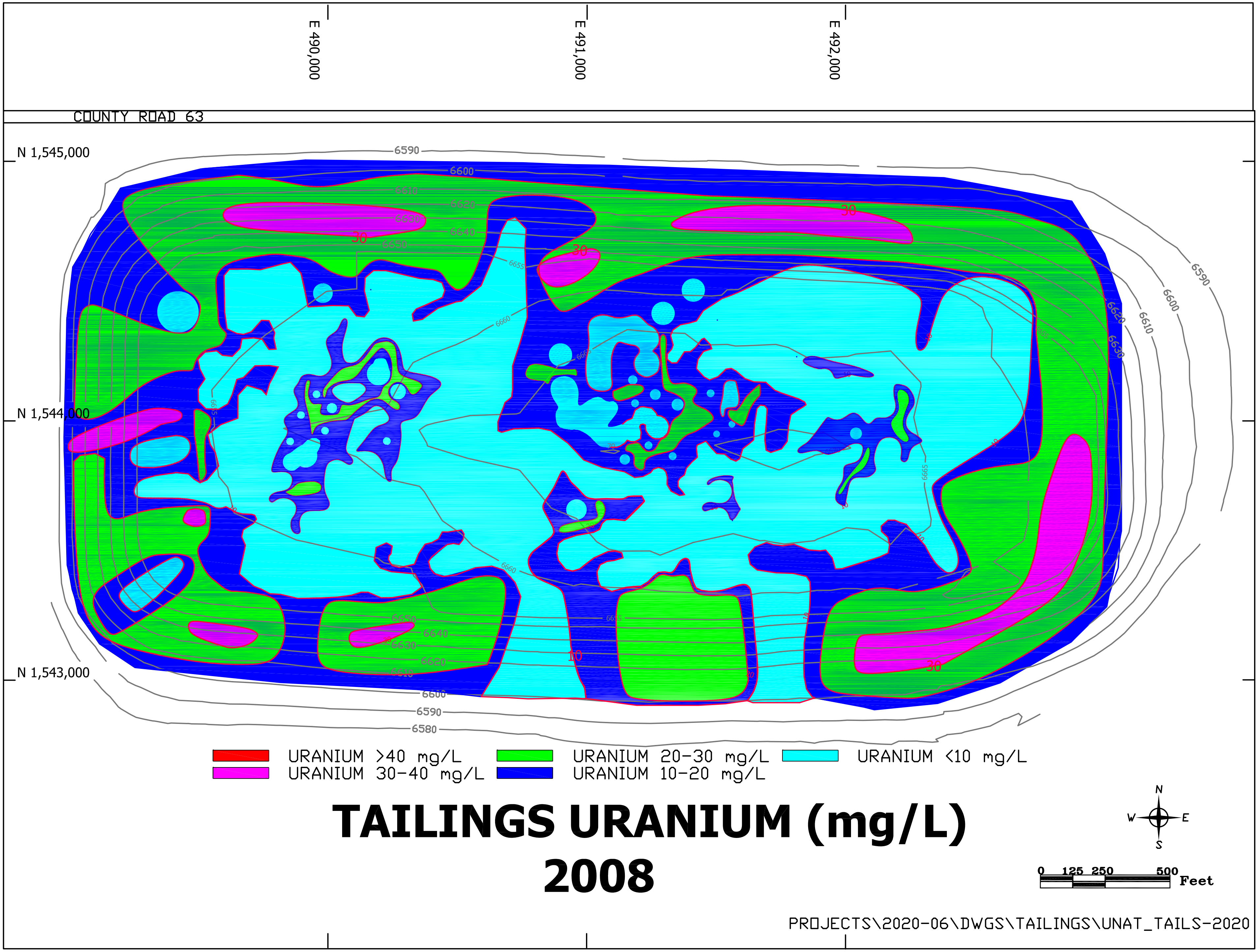


FIGURE 3.3-2. TAILINGS SOLUTION URANIUM CONCENTRATION, 2008

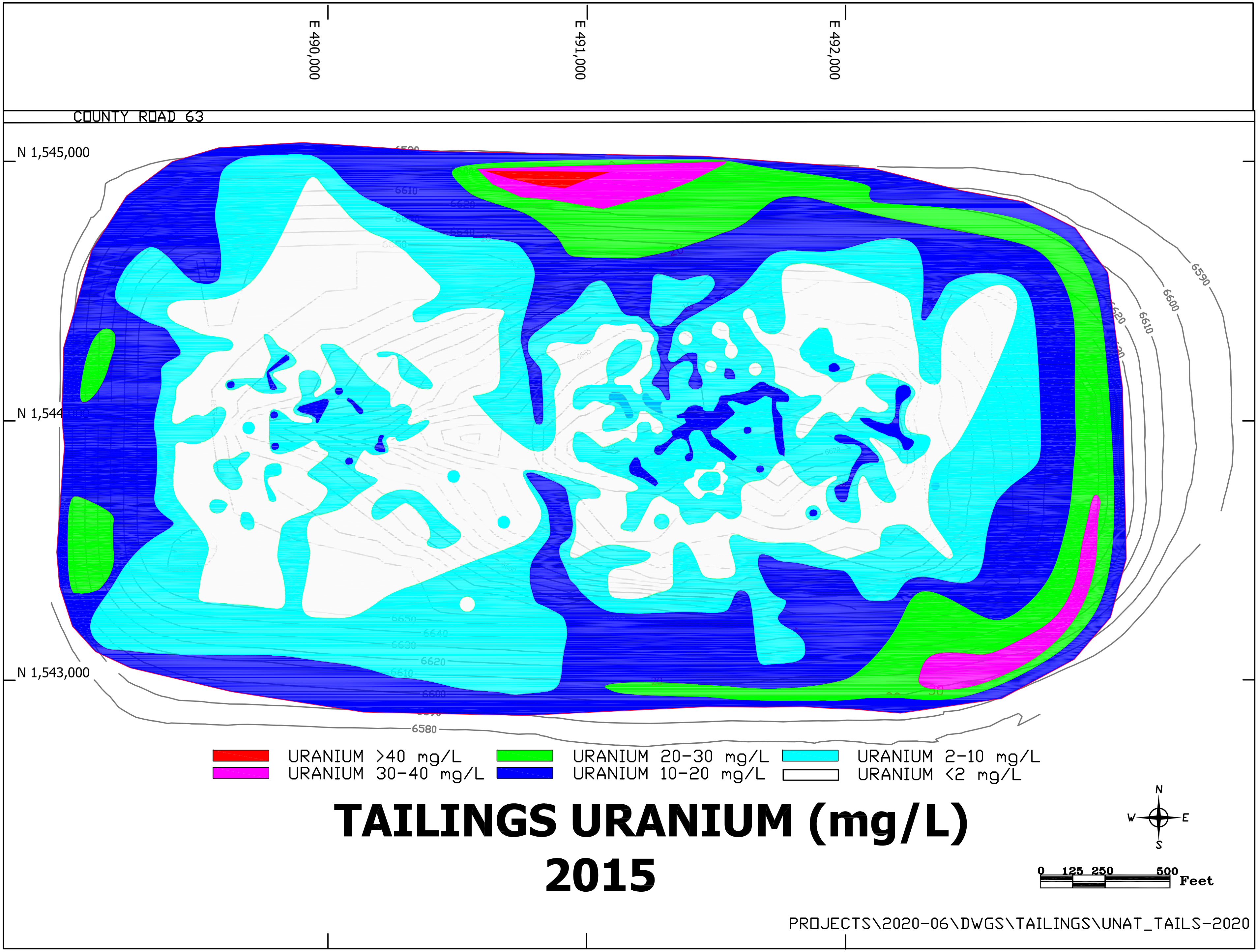


FIGURE 3.3-3. TAILINGS SOLUTION URANIUM CONCENTRATION, 2015

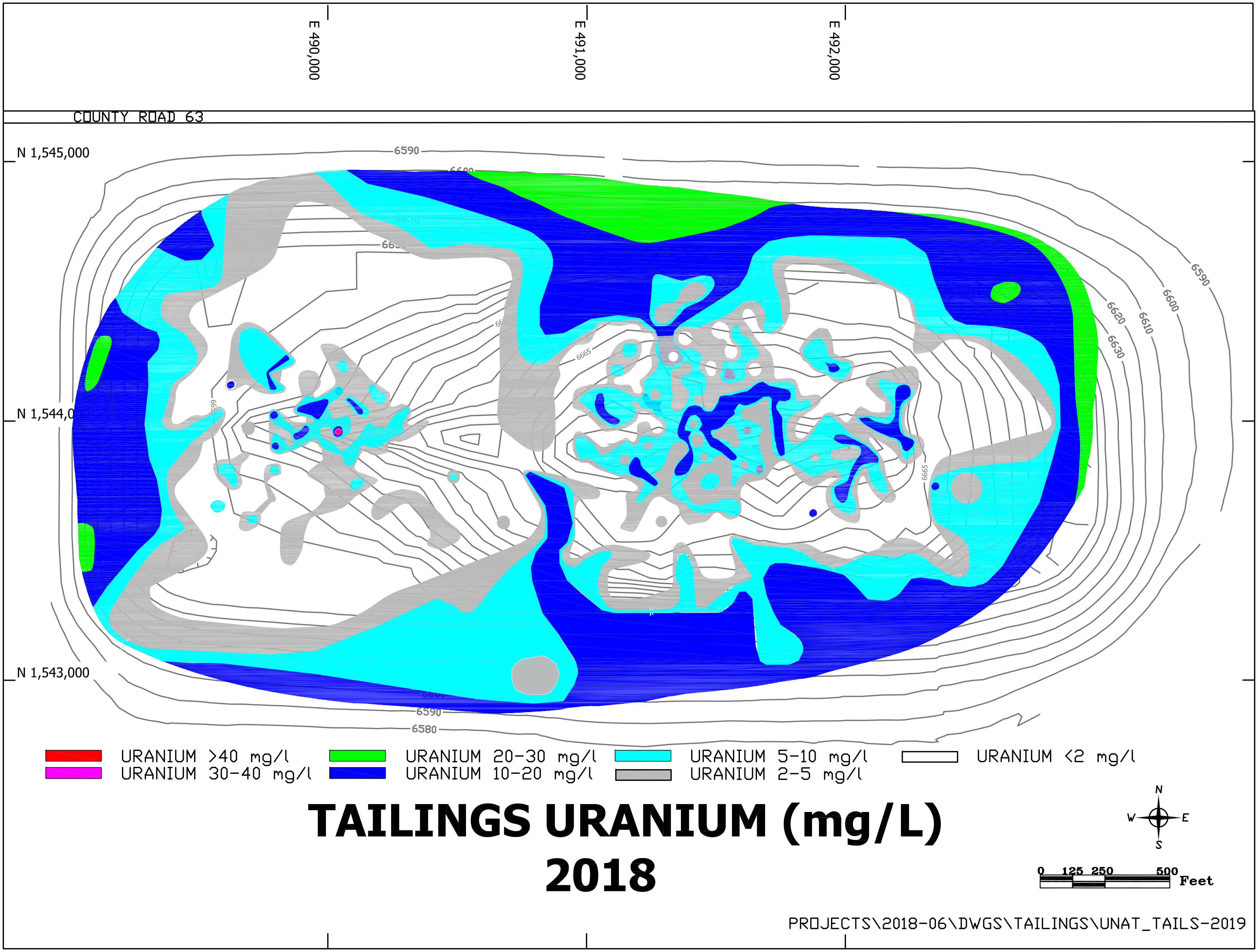


FIGURE 3.3-4. TAILINGS SOLUTION URANIUM CONCENTRATION, 2018

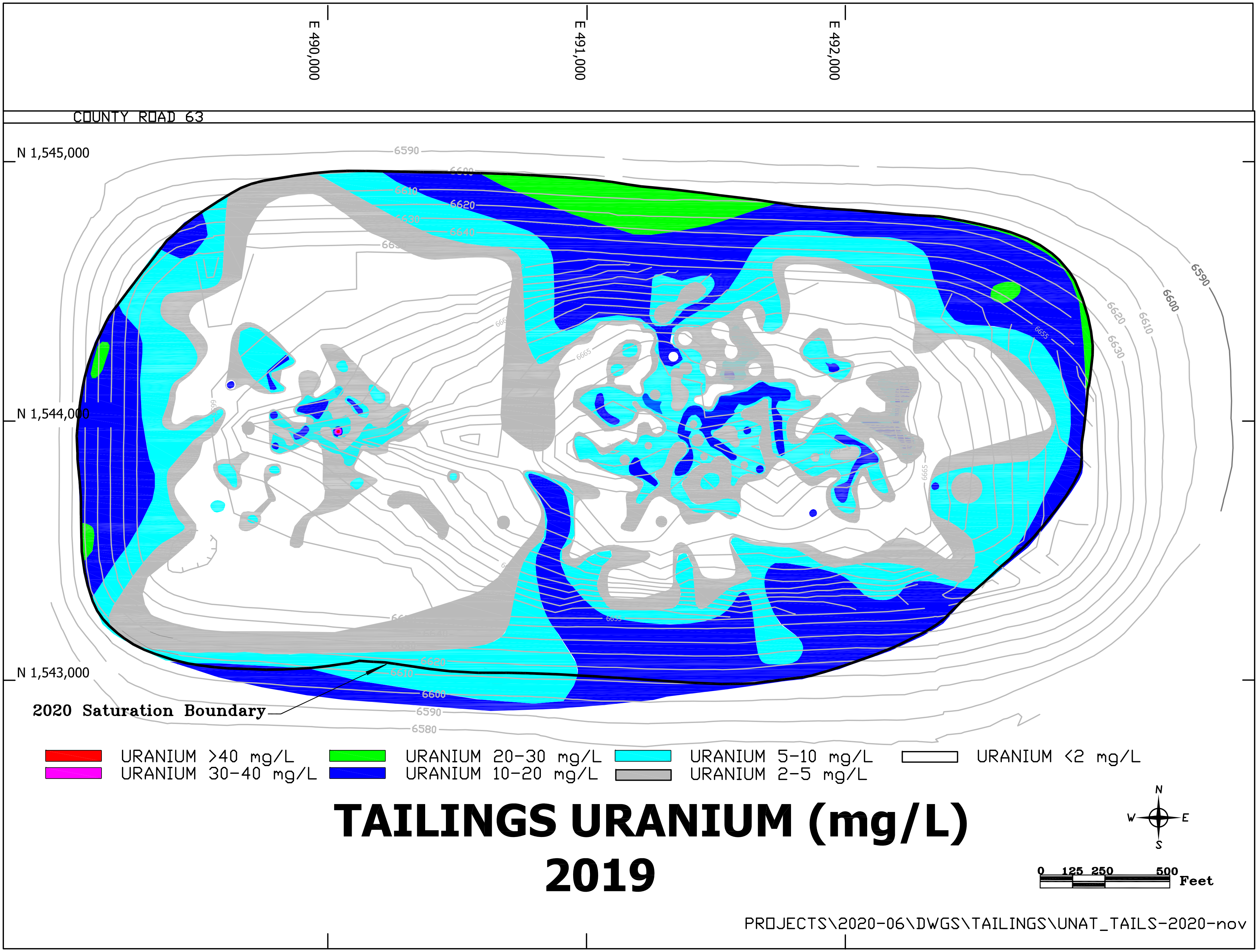


FIGURE 3.3-5. TAILINGS SOLUTION URANIUM CONCENTRATION, 2019

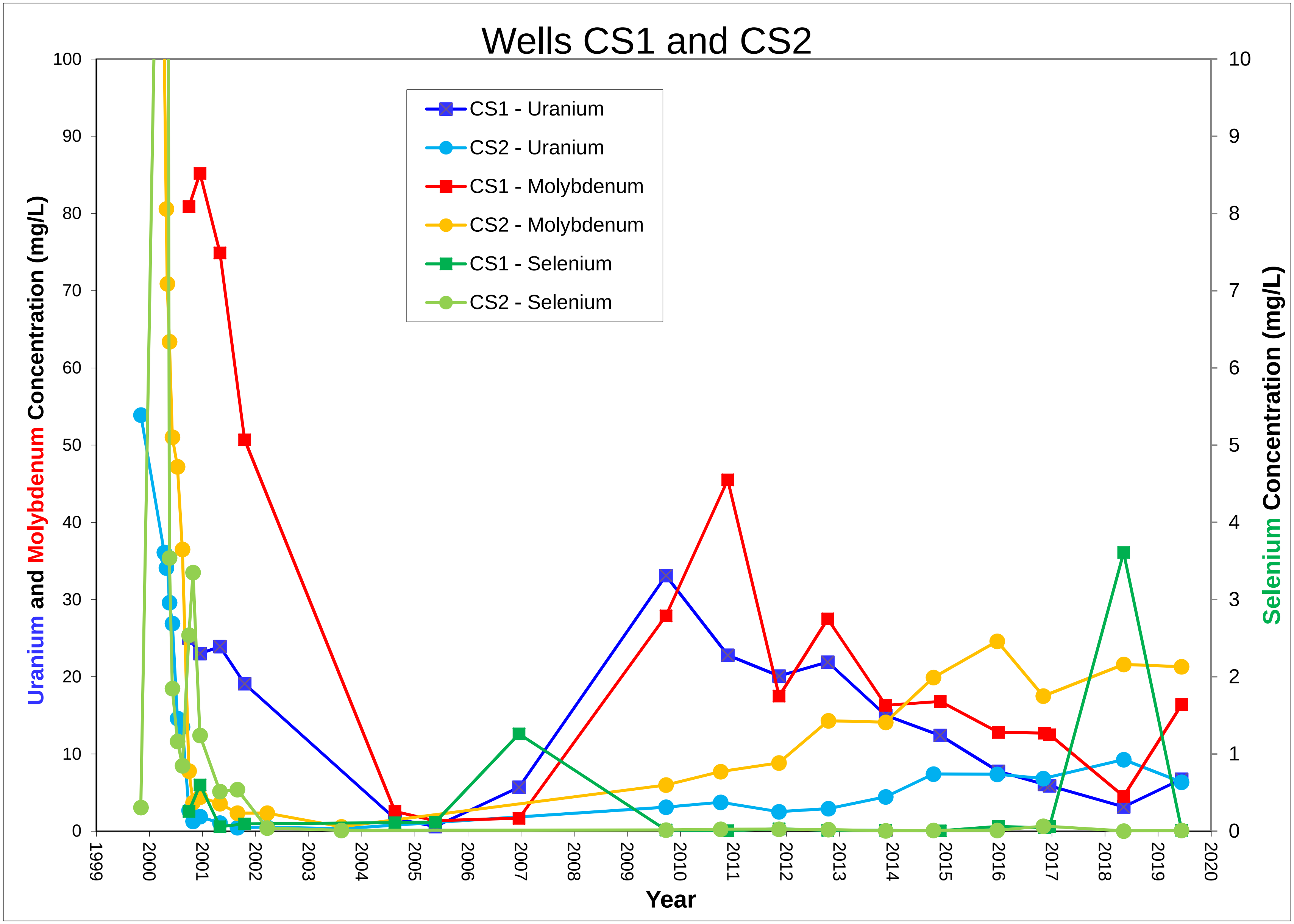


**Figure 3.3-6. Uranium, Molybdenum and Selenium Concentrations for Sand Tailings Wells CS1 and CS2**

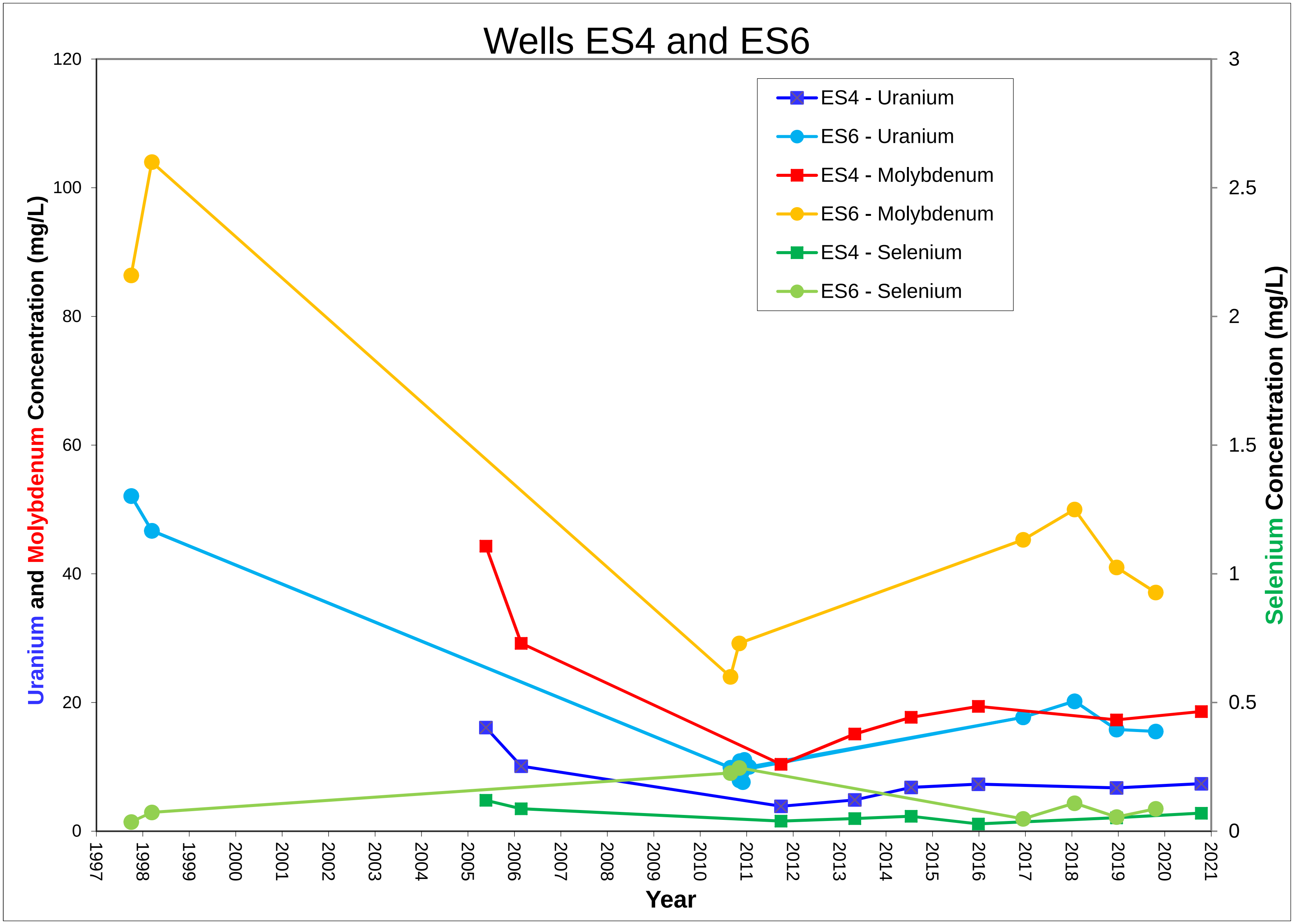


**Figure 3.3-7. Uranium, Molybdenum and Selenium Concentrations for Sand Tailings Wells ES4 and ES6**

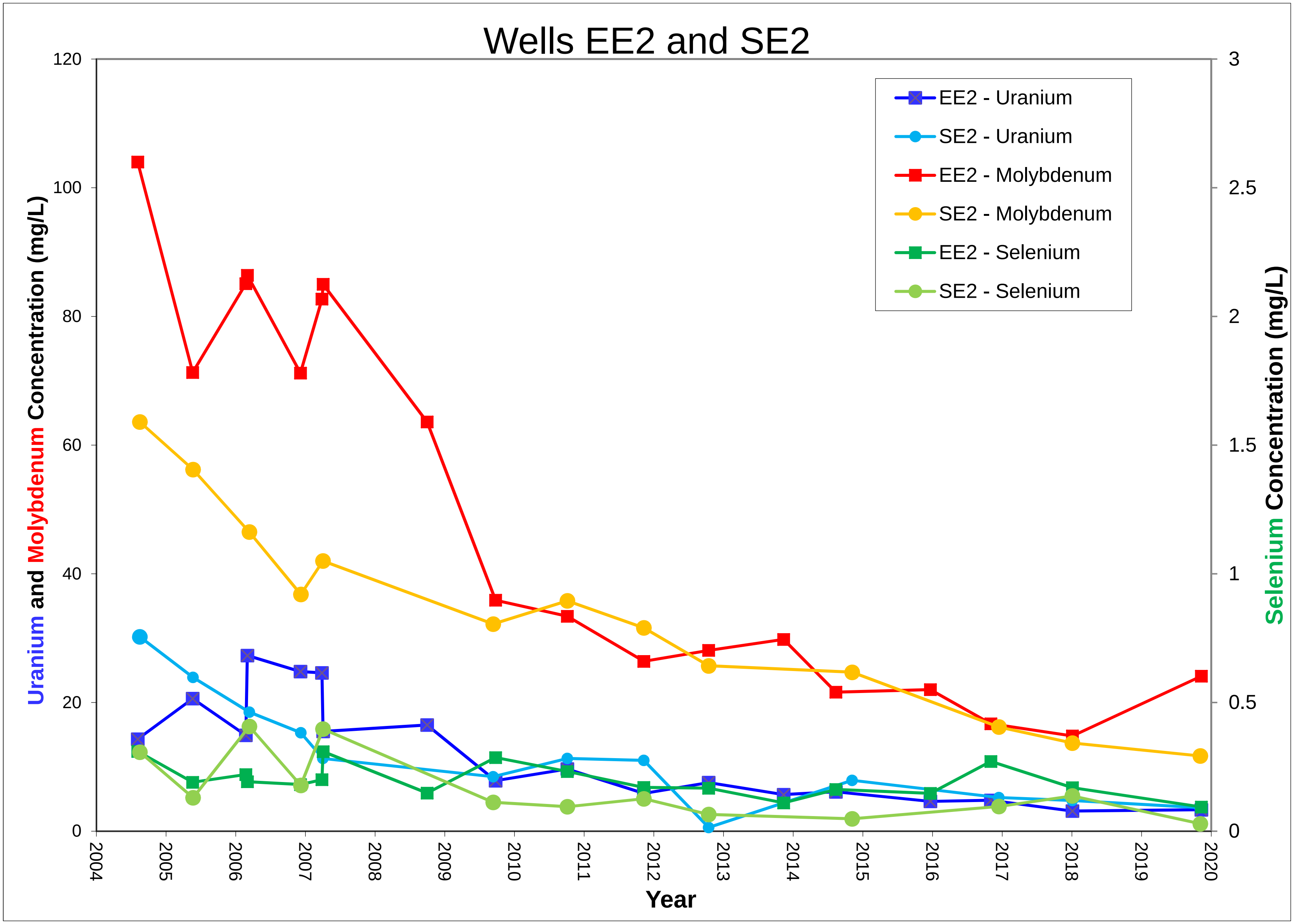


**Figure 3.3-8. Uranium, Molybdenum and Selenium Concentrations for Sand Tailings Wells EE2 and SE2**

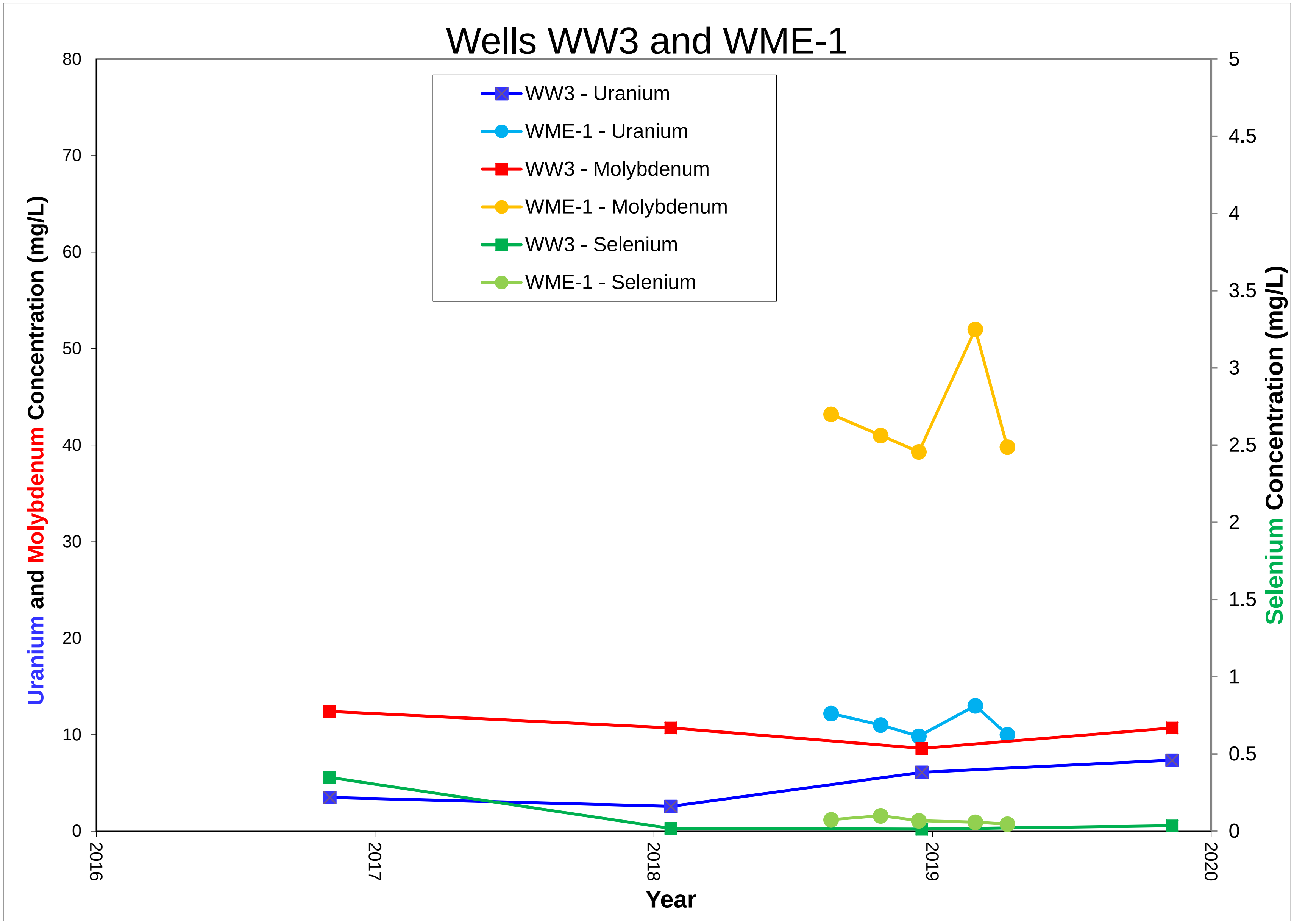


**Figure 3.3-9. Uranium, Molybdenum and Selenium Concentrations for Sand Tailings Wells WW3 and WME-1**

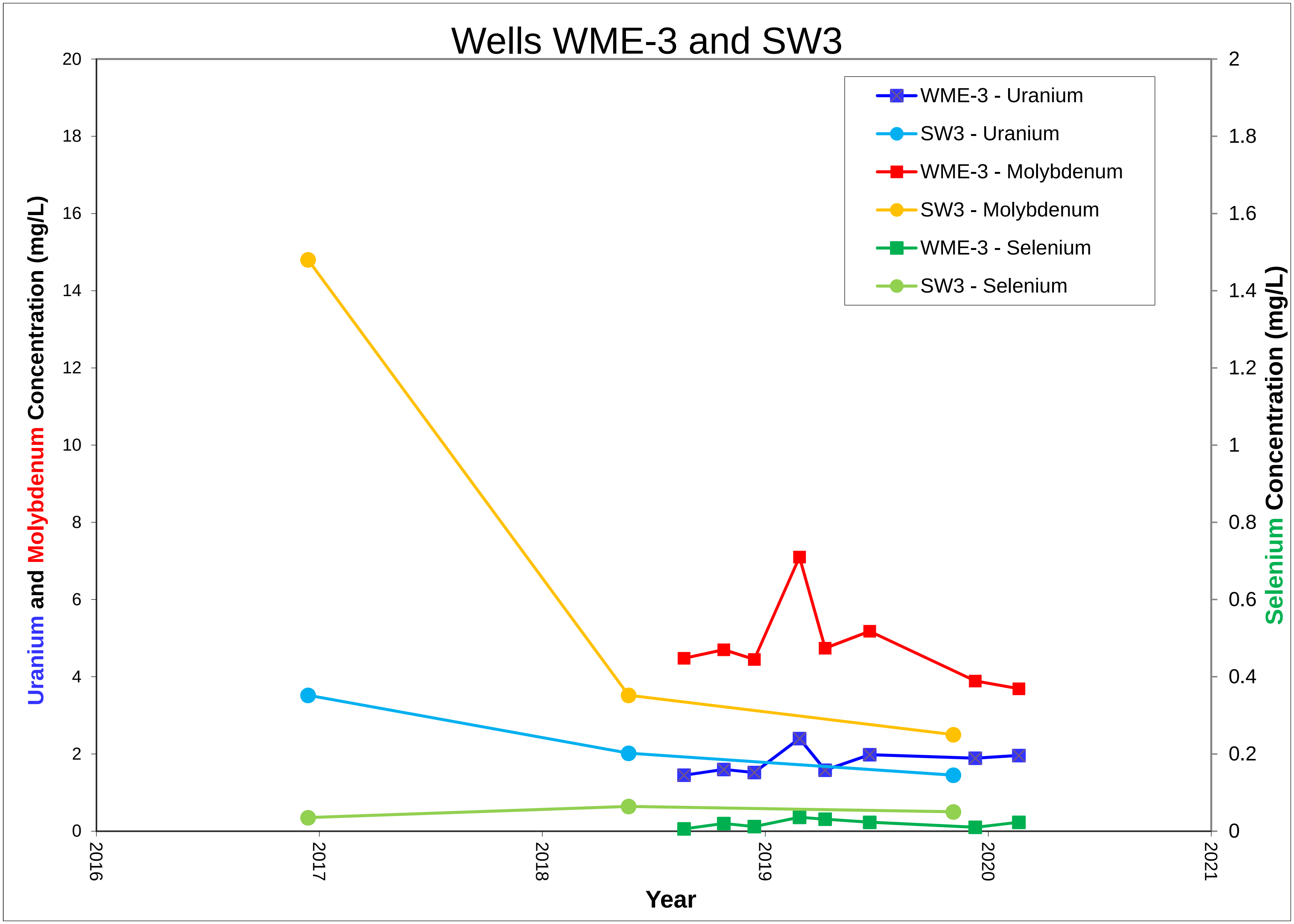


**Figure 3.3-10. Uranium, Molybdenum and Selenium Concentrations for Sand Tailings Wells WME-3 and SW3**

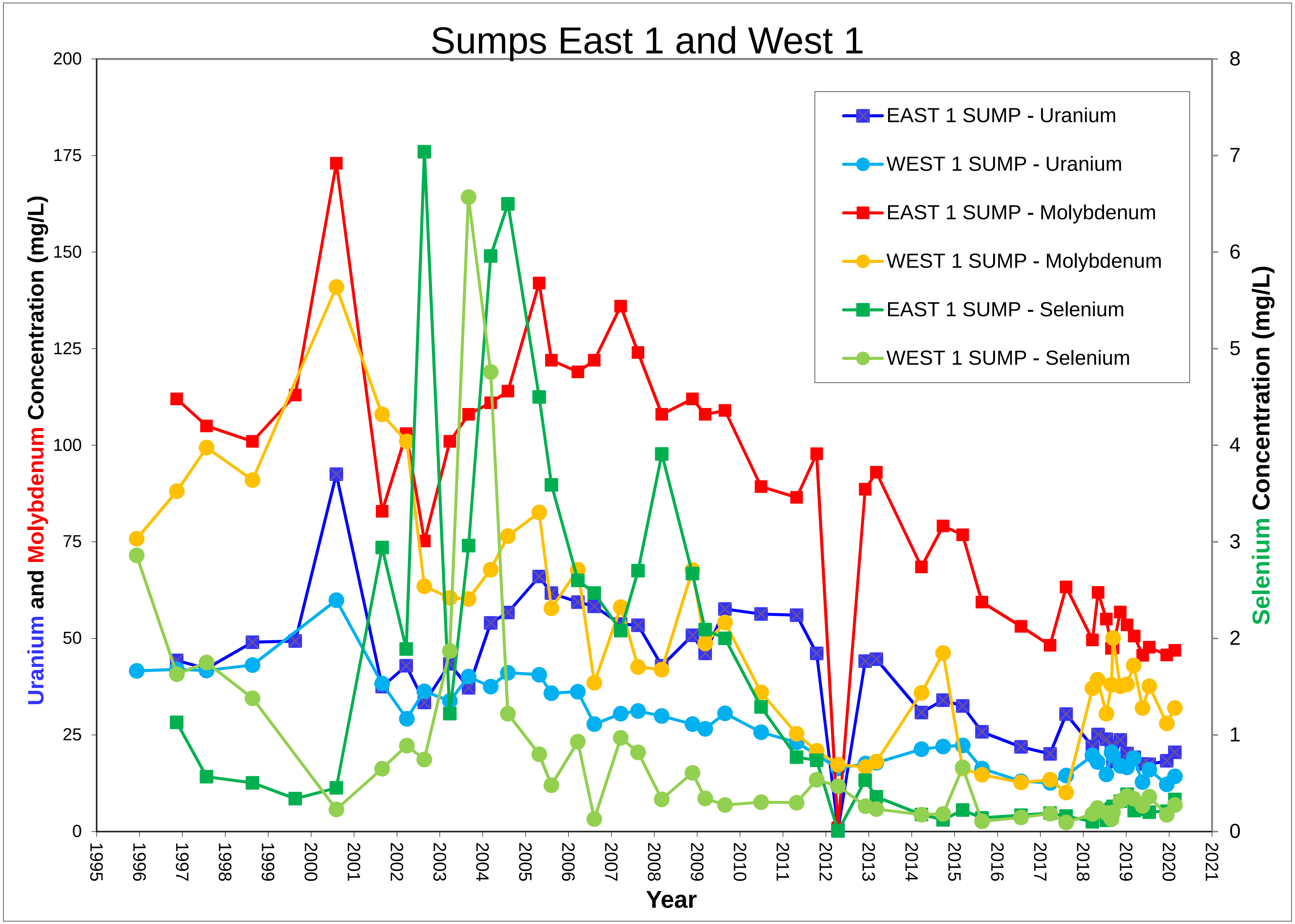


**Figure 3.3-11. Uranium, Molybdenum and Selenium Concentrations for East 1 and West 1 Sumps**

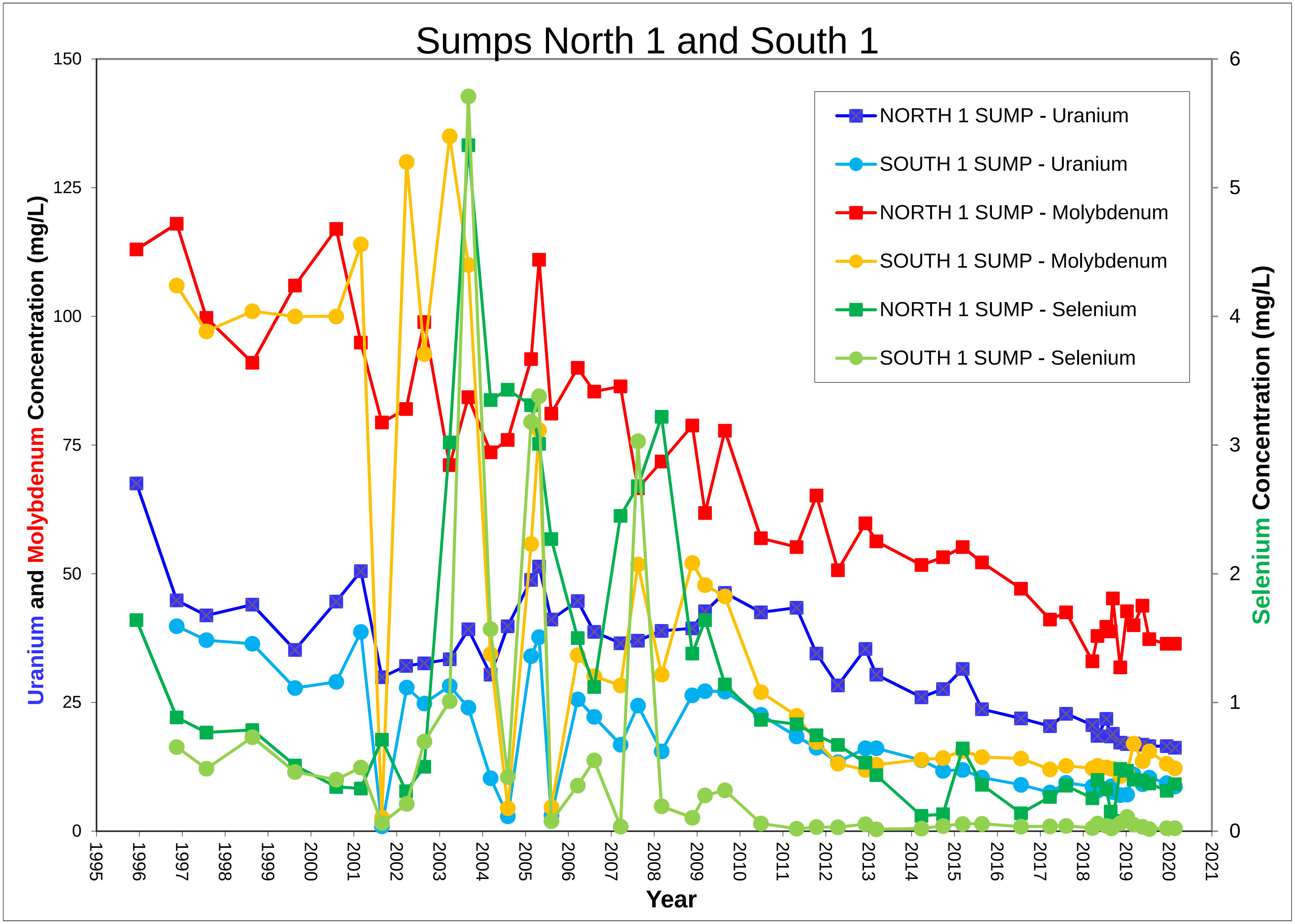


**Figure 3.3-12. Uranium, Molybdenum and Selenium Concentrations for North 1 and South 1 Sumps**

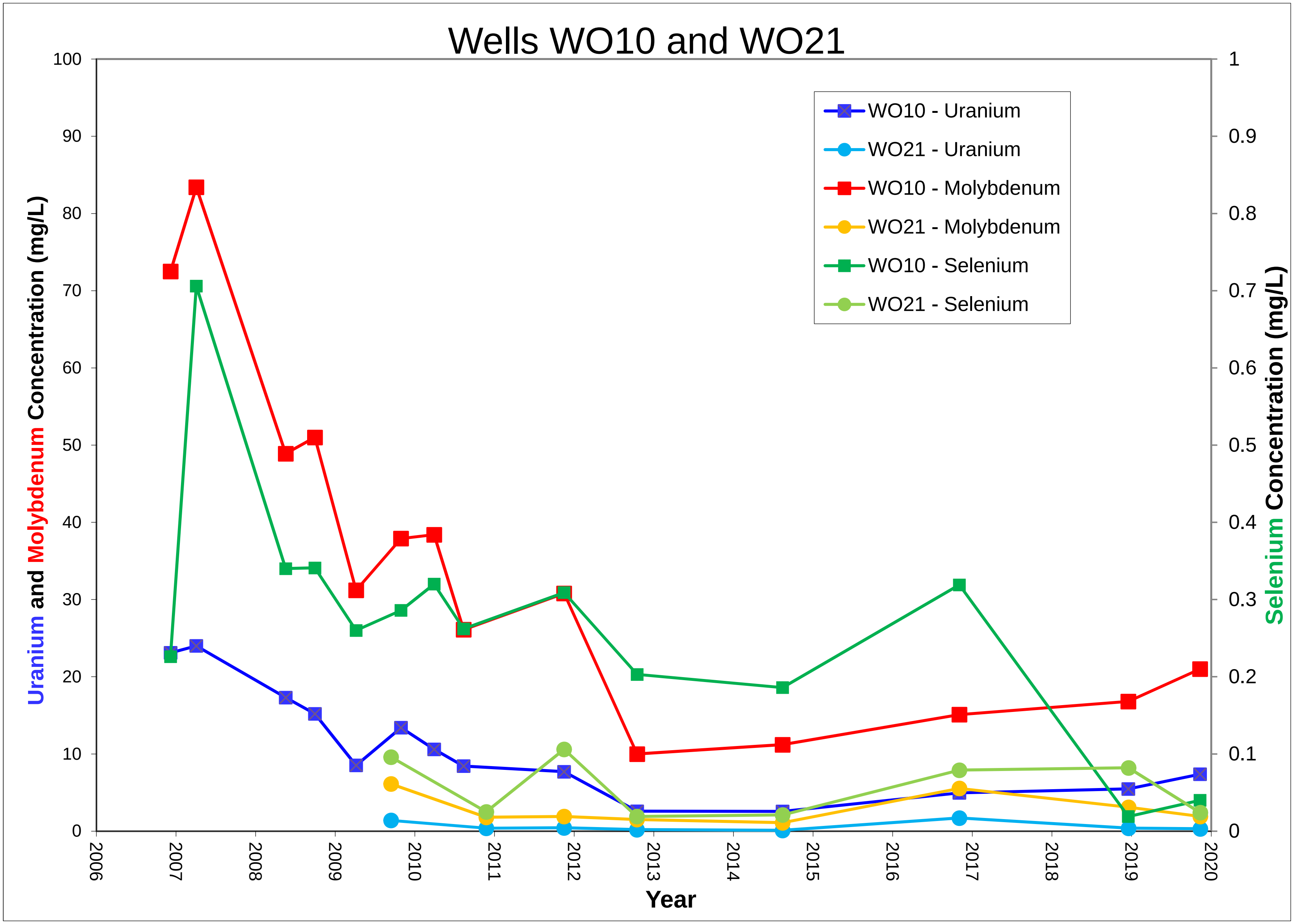


**Figure 3.3-13. Uranium, Molybdenum and Selenium Concentrations for Slime Tailings Wells WO10 and WO21**

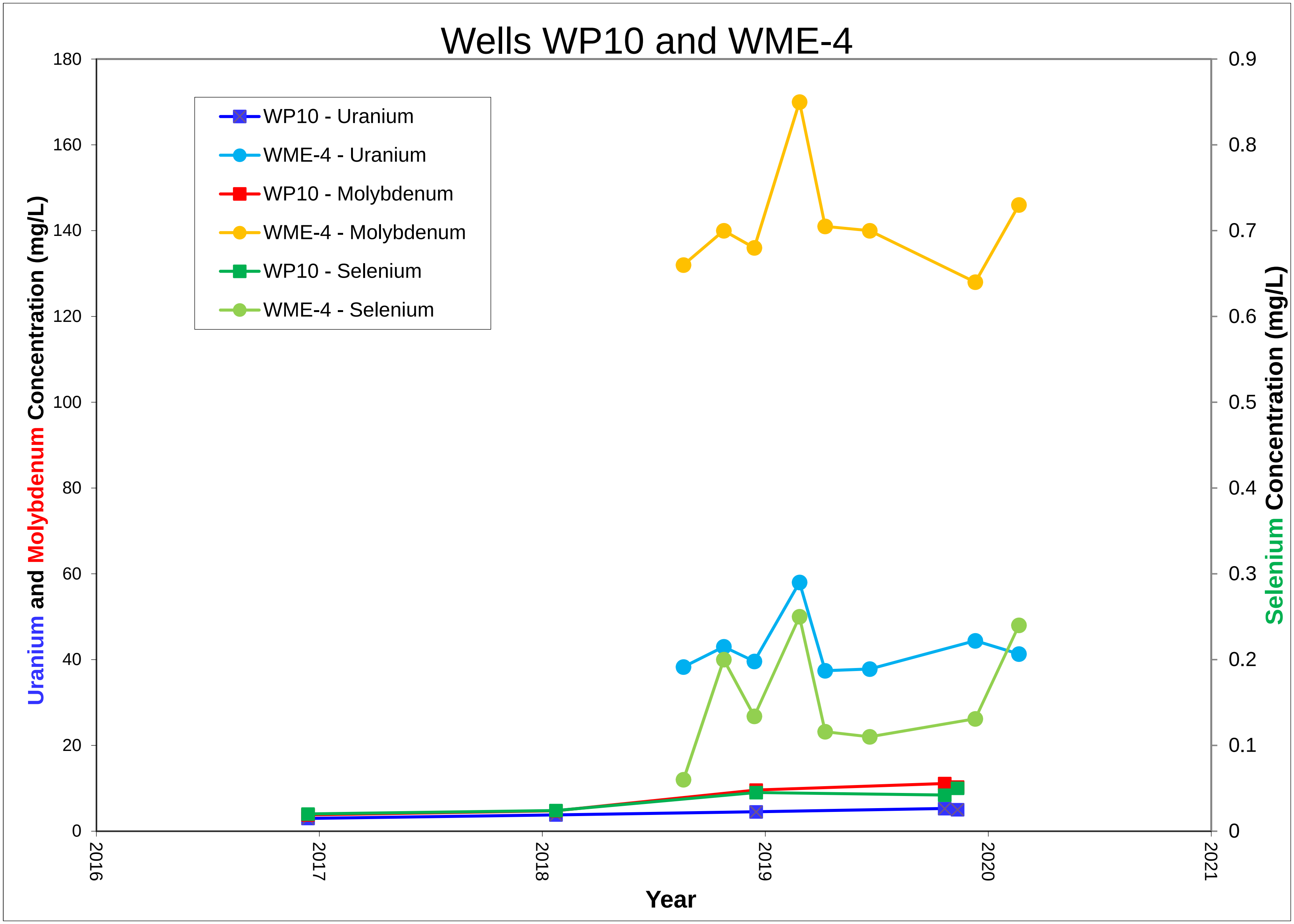


**Figure 3.3-14. Uranium, Molybdenum and Selenium Concentrations for Slime Tailings Wells WP10 and WME-4**

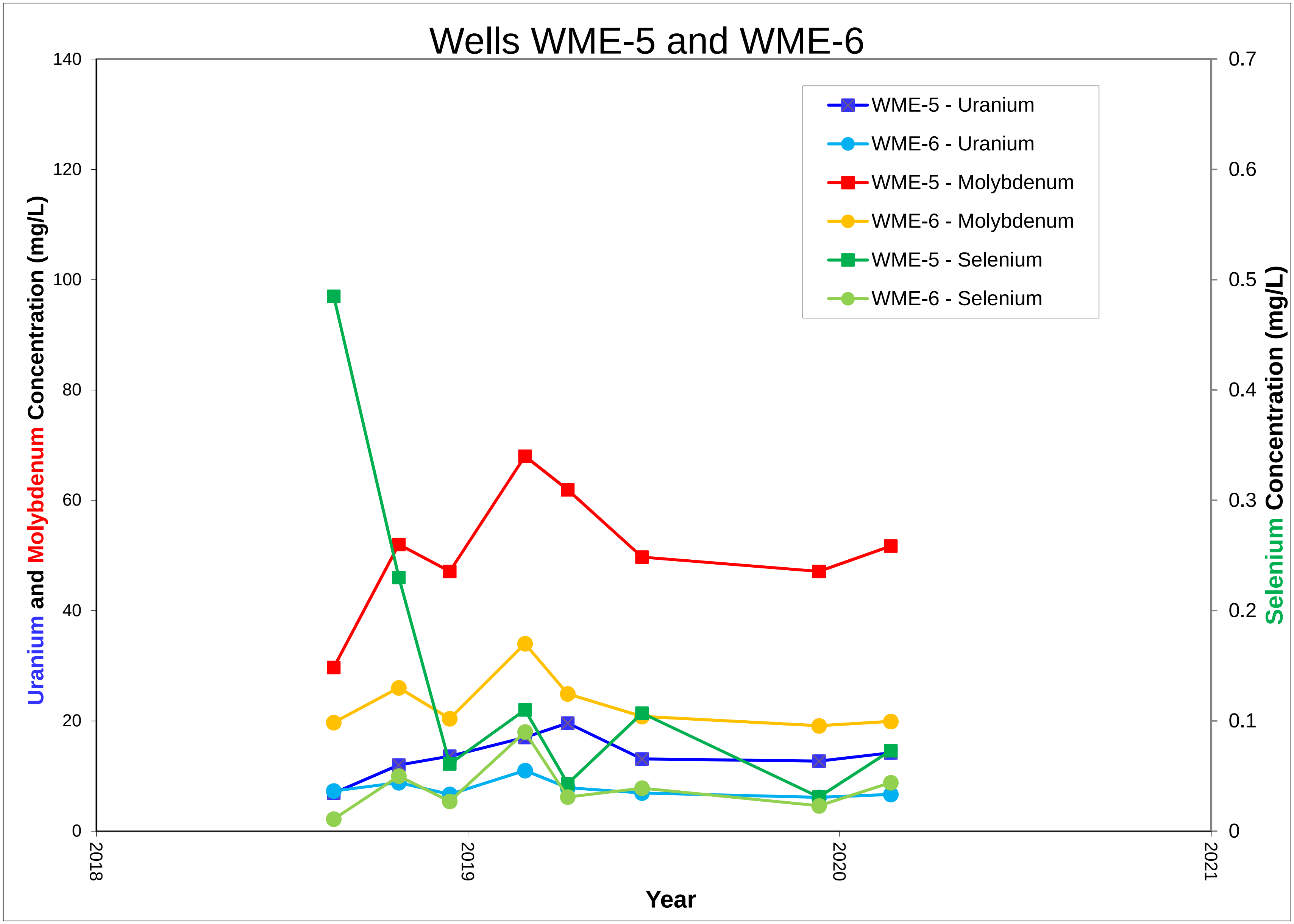


**Figure 3.3-15. Uranium, Molybdenum and Selenium Concentrations for Slime Tailings Wells WME-5 and WME-6**

**TABLE 3.3-1. ESTIMATED AVERAGE URANIUM, MOLYBDENUM AND SELENIUM CONCENTRATIONS FOR THE LTP**

| Area | Saturated Volume (cubic feet) | Drainable Water Volume (gallons) | Unat * Saturated Volume (mg/L * cubic feet) | Average Unat Conc. (mg/L) | Moly * Saturated Volume (mg/L * cubic feet) | Average Moly Conc. (mg/L) | Se * Saturated Volume (mg/L * cubic feet) | Average Se Conc. (mg/L) |
|---|---|---|---|---|---|---|---|---|
| **2006 - Estimate** | | | | | | | | |
| Sand | 77,157,018 | 80,798,829 | 1,335,000,000 | 17.30 | | | | |
| Slimes | 139,758,190 | 83,631,301 | 1,329,600,000 | 9.51 | | | | |
| Total | 216,915,208 | 164,430,130 | 2,664,600,000 | 12.28 | | | | |
| **2007** | | | | | | | | |
| Sand | 77,157,018 | 80,798,829 | 1,249,100,000 | 16.19 | | | | |
| Slimes | 139,758,190 | 83,631,301 | 1,287,800,000 | 9.21 | | | | |
| Total | 216,915,208 | 164,430,130 | 2,536,900,000 | 11.70 | | | | |
| **2008** | | | | | | | | |
| Sand | 94,922,795 | 99,403,151 | 1,413,800,000 | 14.89 | | | | |
| Slimes | 153,286,550 | 91,726,672 | 920,905,576 | 6.01 | | | | |
| Total | 248,209,345 | 191,129,822 | 2,334,705,576 | 9.41 | | | | |
| **2009** | | | | | | | | |
| Sand | 102,218,044 | 107,042,736 | 1,346,200,000 | 13.17 | | | | |
| Slimes | 152,943,835 | 91,521,591 | 810,147,132 | 5.30 | | | | |
| Total | 255,161,879 | 198,564,327 | 2,156,347,132 | 8.45 | | | | |
| **2010** | | | | | | | | |
| Sand | 102,740,335 | 107,589,679 | 1,286,700,000 | 12.52 | 2,897,000,000 | 28.20 | | |
| Slimes | 145,865,021 | 87,285,629 | 718,350,126 | 4.92 | 1,608,100,000 | 11.02 | | |
| Total | 248,605,356 | 194,875,307 | 2,005,050,126 | 8.07 | 4,505,100,000 | 18.12 | | |
| **2011** | | | | | | | | |
| Sand | 107,638,906 | 112,719,462 | 1,147,300,000 | 10.66 | 2,548,600,000 | 23.68 | | |
| Slimes | 144,830,473 | 86,666,555 | 641,596,854 | 4.43 | 1,577,800,000 | 10.89 | | |
| Total | 252,469,379 | 199,386,017 | 1,788,896,854 | 7.09 | 4,126,400,000 | 16.34 | | |
| **2012** | | | | | | | | |
| Sand | 106,011,831 | 111,015,589 | 1,100,000,000 | 10.38 | 2,368,500,000 | 22.34 | | |
| Slimes | 144,790,994 | 86,642,931 | 541,074,539 | 3.74 | 1,472,400,000 | 10.17 | | |
| Total | 250,802,825 | 197,658,520 | 1,641,074,539 | 6.54 | 3,840,900,000 | 15.31 | | |
| **2013** | | | | | | | | |
| Sand | 106,226,948 | 111,240,860 | 972,629,548 | 9.16 | 2,299,700,000 | 21.65 | | |
| Slimes | 144,852,116 | 86,679,506 | 514,455,035 | 3.55 | 1,459,800,000 | 10.08 | | |
| Total | 251,079,064 | 197,920,366 | 1,487,084,583 | 5.92 | 3,759,500,000 | 14.97 | | |
| **2014** | | | | | | | | |
| Sand | 111,406,209 | 116,664,582 | 991,820,057 | 8.90 | 2,439,700,000 | 21.90 | | |
| Slimes | 149,395,092 | 89,398,023 | 490,956,792 | 3.29 | 1,461,900,000 | 9.79 | | |
| Total | 260,801,301 | 206,062,605 | 1,482,776,849 | 5.69 | 3,901,600,000 | 14.96 | | |
| **2015** | | | | | | | | |
| Sand | 101,569,653 | 106,363,741 | 835,649,839 | 8.23 | 2,154,600,000 | 21.21 | | |
| Slimes | 143,921,106 | 86,122,390 | 476,402,234 | 3.31 | 1,417,000,000 | 9.85 | | |
| Total | 245,490,759 | 192,486,130 | 1,312,052,073 | 5.34 | 3,571,600,000 | 14.55 | | |
| **2016** | | | | | | | | |
| Sand | 76,083,797 | 79,674,952 | 670,422,842 | 8.81 | 1,662,000,000 | 21.84 | | |
| Slimes | 90,918,919 | 54,405,881 | 298,542,406 | 3.28 | 858,781,569 | 9.45 | | |
| Total | 167,002,716 | 134,080,833 | 968,965,248 | 5.80 | 2,520,781,569 | 15.09 | | |
| **2017** | | | | | | | | |
| Sand | 69,004,696 | 72,261,718 | 535,171,616 | 7.76 | 1,245,100,000 | 18.04 | | |
| Slimes | 87,007,632 | 52,065,367 | 283,993,784 | 3.26 | 821,451,955 | 9.44 | | |
| Total | 156,012,328 | 124,327,085 | 819,165,400 | 5.25 | 2,066,551,955 | 13.25 | | |
| **2018** | | | | | | | | |
| Sand | 59,534,566 | 62,344,598 | 453,383,206 | 7.62 | 1,104,200,000 | 18.55 | 12,407,796 | 0.21 |
| Slimes | 78,245,048 | 46,821,837 | 279,020,346 | 3.57 | 734,892,138 | 9.39 | 4,290,629 | 0.05 |
| Total | 137,779,614 | 109,166,434 | 732,403,552 | 5.32 | 1,839,092,138 | 13.35 | 16,698,425 | 0.12 |
| **2019** | | | | | | | | |
| Sand | 51,301,159 | 53,722,574 | 375,095,530 | 7.31 | 887,410,054 | 17.30 | 6,807,448 | 0.13 |
| Slimes | 74,614,665 | 44,649,416 | 274,488,652 | 3.68 | 743,999,446 | 9.97 | 3,822,215 | 0.05 |
| Total | 125,915,824 | 98,371,989 | 649,584,182 | 5.16 | 1,631,409,500 | 12.96 | 10,629,663 | 0.08 |
| **2020** | | | | | | | | |
| Sand | 45,709,159 | 47,866,631 | 336,921,023 | 7.37 | 806,965,660 | 17.65 | 6,465,602 | 0.14 |
| Slimes | 72,108,445 | 43,149,693 | 267,857,410 | 3.71 | 725,088,804 | 10.06 | 3,666,969 | 0.05 |
| Total | 117,817,604 | 91,016,325 | 604,778,433 | 5.13 | 1,532,054,464 | 13.00 | 10,132,571 | 0.09 |

Note: Calculation of average uranium, molybdenum and selenium concentrations in 2020 was based on iso-concentration mapping using 2019 samples.

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## 4.0 ALLUVIAL AQUIFER MONITORING

This section presents 2020 monitoring results for the alluvial aquifer. The alluvial aquifer immediately underlies the Grants Project site and is therefore the most important groundwater system at the Grants Project site. The section describing well completions is presented first, and is followed by several report sections presenting water-level and water-quality information. Three additional alluvial maps have been added to present the well information in areas where data is too dense for the initial 1" = 1600' map. The scale of the additional maps is 1" = 500'. The locations of the additional maps are shown on the 1600 scale map (Figure 4.1-1) and they are the On-site (OS, Figure 4.1-1A), South Off-site (SOS, Figure 4.1-1B) and North Off-site (NOS, Figure 4.1-1C). OS, SOS and NOS have been added to these figure titles. The boundaries of the restoration areas are presented on Figure 1.2-2. The edges of the OS, SOS and NOS maps are not set the same as the restoration boundaries.

## 4.1 ALLUVIAL WELL COMPLETIONS

No new alluvial wells were drilled and no new additional infiltration lines were installed during 2020. Operational status and other characteristics of the new and previously installed alluvial wells and infiltration lines are discussed in this section. Figure 4.1-1 shows the locations of the alluvial wells near the Homestake Grants Project with the operational status for each well and infiltration line for 2020. Figure 4.1-1A shows the wells in the OS area while Figures 4.1-1B and 4.1-1C show the SOS and NOS area wells respectively. Wells labeled in black were used only for monitoring and black labeled infiltration lines were not used in 2020. Figure 4.1-1 is plotted at a scale of 1" = 1600' while the other figures are plotted at a scale of 1" = 500'. Alluvial wells 914, 920, 921, 922, 950, DD3, DD4, DD6 and DD7 are located outside, and north of, the area presented on Figure 4.1-1. These up-gradient wells are shown on Figure 4.3-1 in the alluvial water quality section.

The injection and collection wells that were active in 2020 are labeled with different colors on Figures 4.1-1, 4.1-1A, 4.1-1B and 4.1-1C so active wells can be distinguished from monitoring wells. Figures 4.1-1B and 4.1-1C also show the wells used for the Off-site collection during 2020. Figure 4.1-1B shows that South collection alluvial wells Q2, Q5, Q11, Q28, Q29, R2, R3 and R5 were pumped in 2020. Figure 4.1-1C shows that North collection alluvial wells 659, 890, H2A, H12 and H24 were pumped in 2020. This water was pumped to the zeolite for

treatment during 2020 but collection rate was limited due to the restrictions on water discharged to the evaporation ponds. Table 4.1-1 presents basic well data for alluvial wells located on the Grants Project that have been used to define the alluvial groundwater 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.

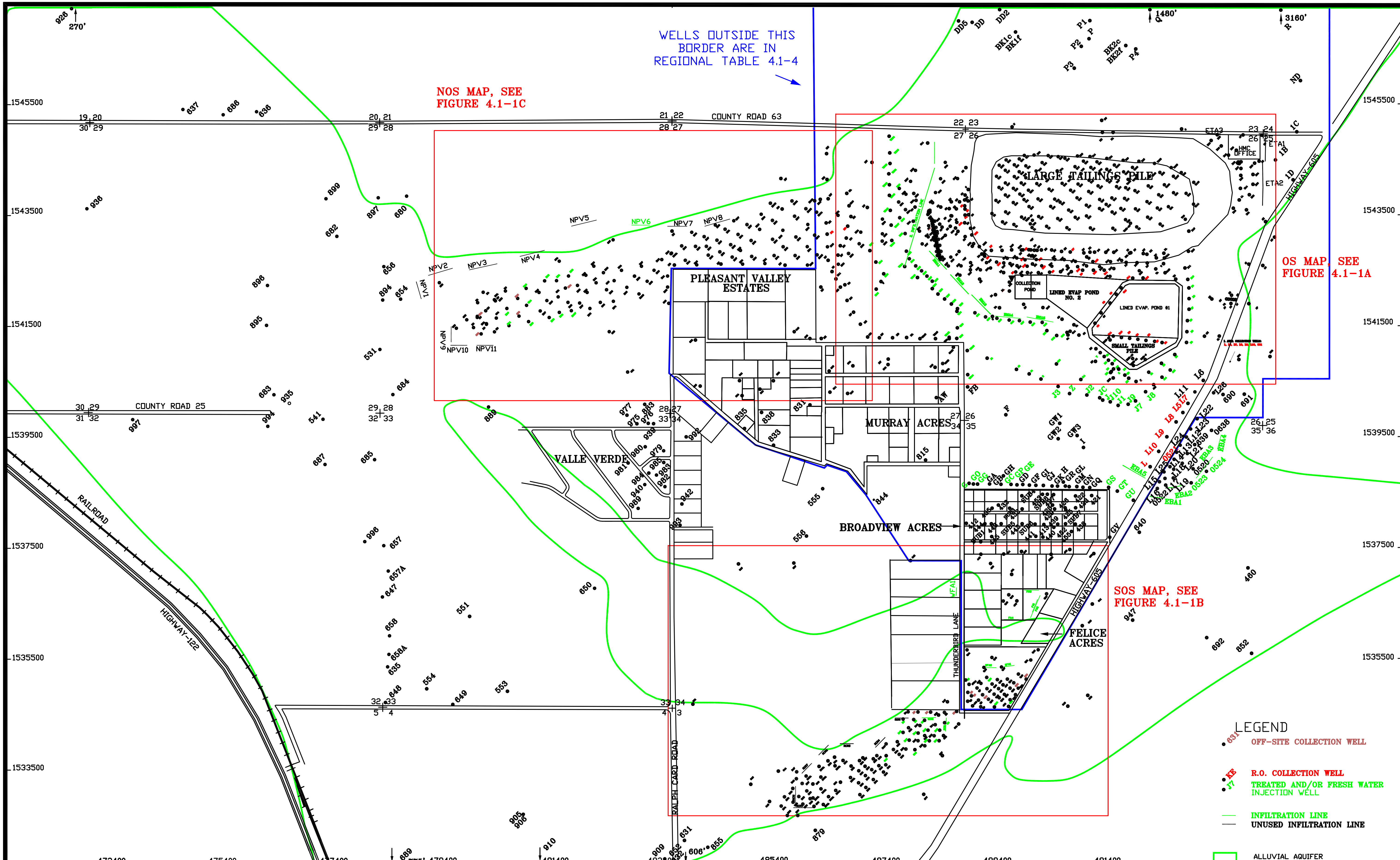
Table 4.1-2 presents the same type of basic well data for alluvial wells in the Broadview and Felice Acres subdivisions. These two subdivisions are located just south of the Homestake property. Figure 4.1-1 shows the locations of the subdivision wells. Table 4.1-3 presents similar basic data for alluvial 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 delineated with a heavy blue boundary line on Figure 4.1-1 are considered to be regional wells; data for these wells are presented in this table. The wells are listed in numerical or alphabetical order based on their well names.

The elevation of the base of the alluvium has been used in determining required depths for alluvial wells. This elevation is the same as the elevation of the top of the Chinle Formation except in the far western portion of the area. Figure 4.1-2 presents the base of the alluvium with data points used to define these elevation contours. The deepest portion of the San Mateo alluvium exists in the western portion of the LTP and extends to the west central portion of Section 28 where the San Mateo alluvium joins the Rio San Jose alluvium. An additional San Mateo channel exists in Section 3 that joins the Rio San Jose alluvium in Section 4. The mapping of the base of the alluvium was adjusted in the area near the northeast corner of the LTP due to additional drilling in this area.

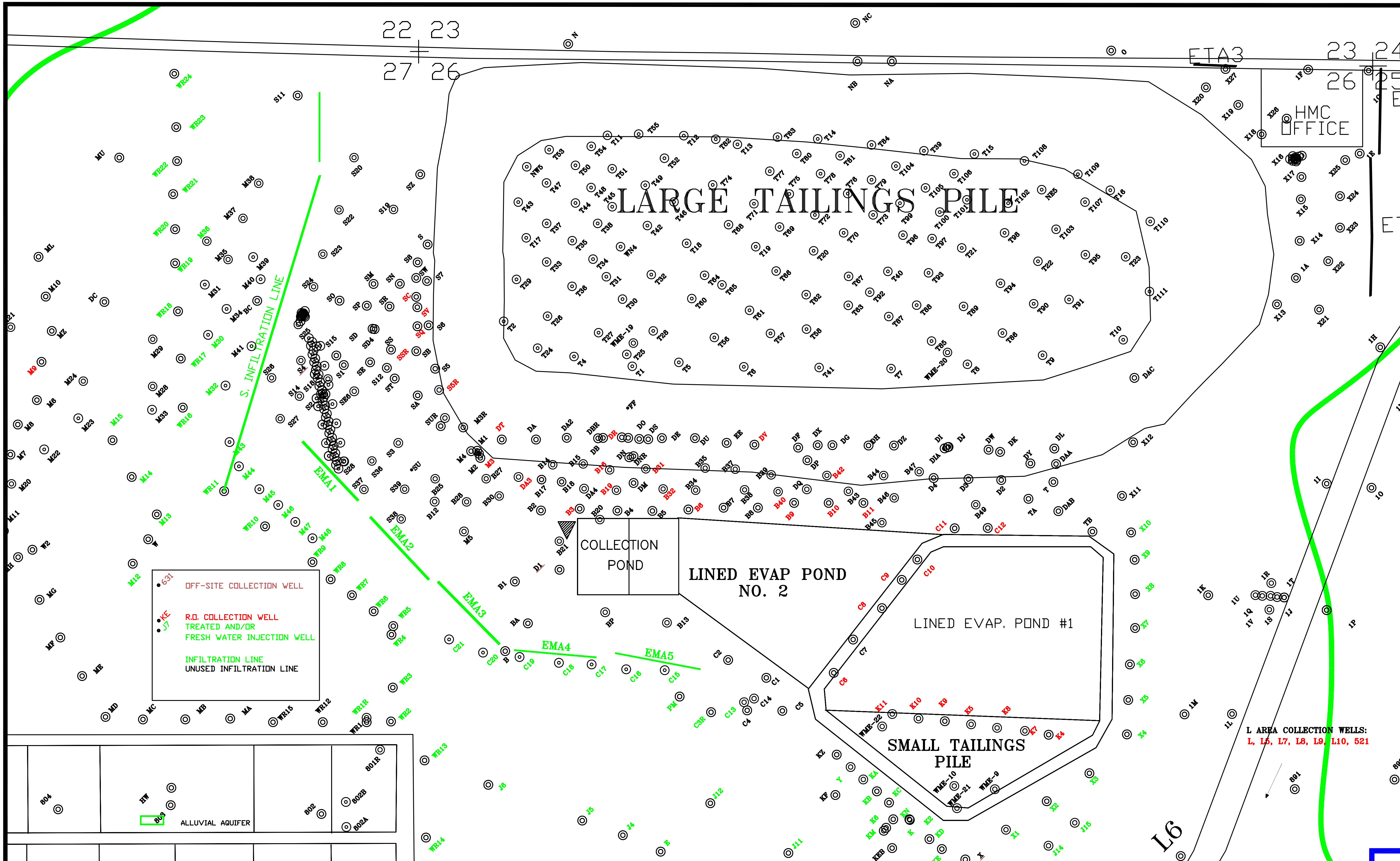
The green line in Figures 4.1-1 and 4.1-2 shows the limits of the alluvial aquifer with alluvial saturation existing inside these limits where the base of the alluvium is lower than the water-level elevation. The 2014 alluvial water-level elevation was used in drawing the aquifer limits. The aquifer limits were updated with the 2014 water-level elevations because additional wells changed the interpretation of the limits of the alluvial aquifer in South Felice Acres area.

The base elevation of the alluvium rises on the western side of Figure 4.1-2 and results in the western limit of the alluvial aquifer as shown on the west side of this figure. The alluvial aquifer extends to the south of this figure in Sections 4 and 5 of Township 11N, Range 10W.



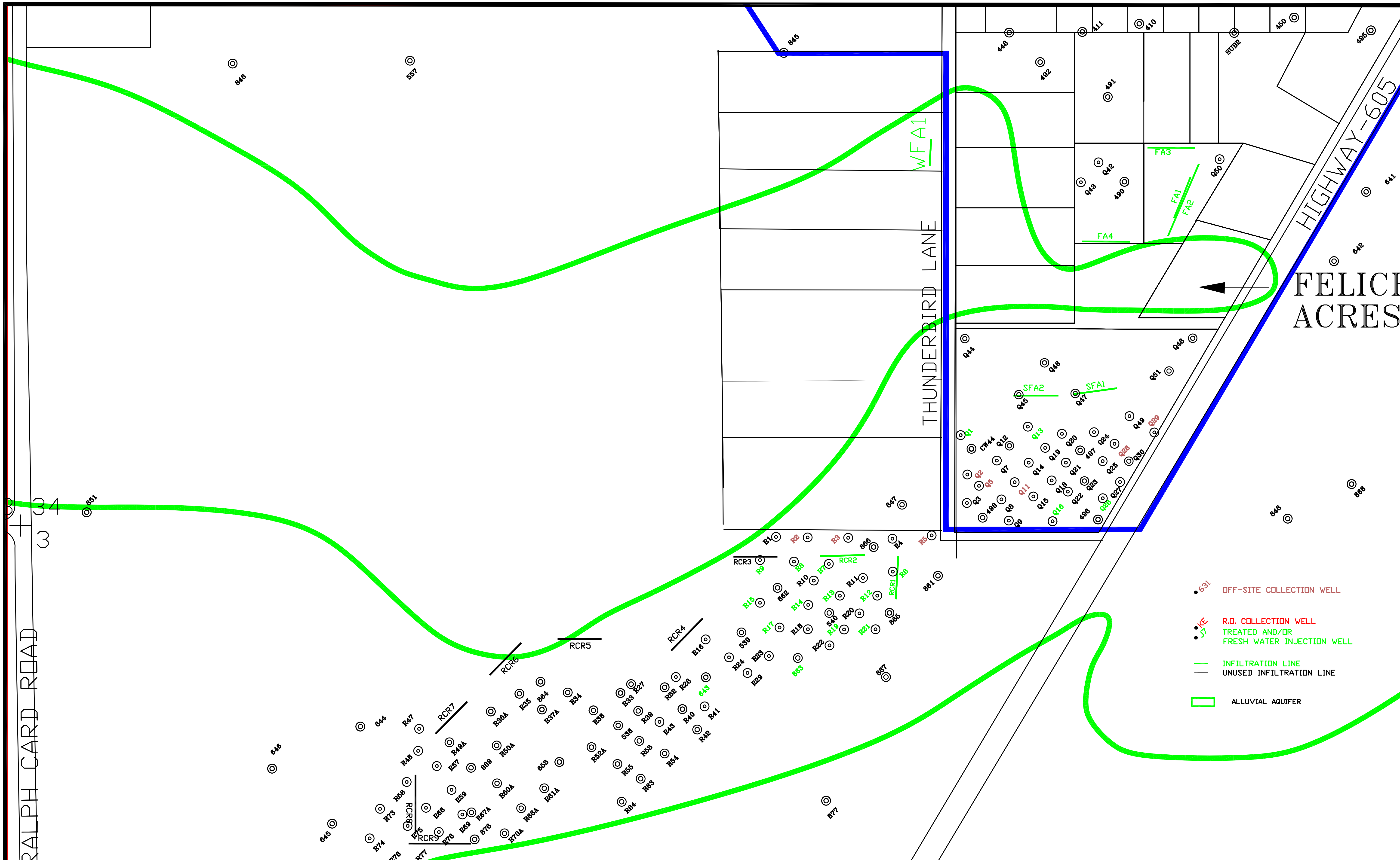

SCALE: 1"=1600'
C:\PROJECTS\2021-06 1600QAL20
DATE: 1/12/2021

FIGURE 4.1-1 ALLUVIAL WELL LOCATIONS, 2020



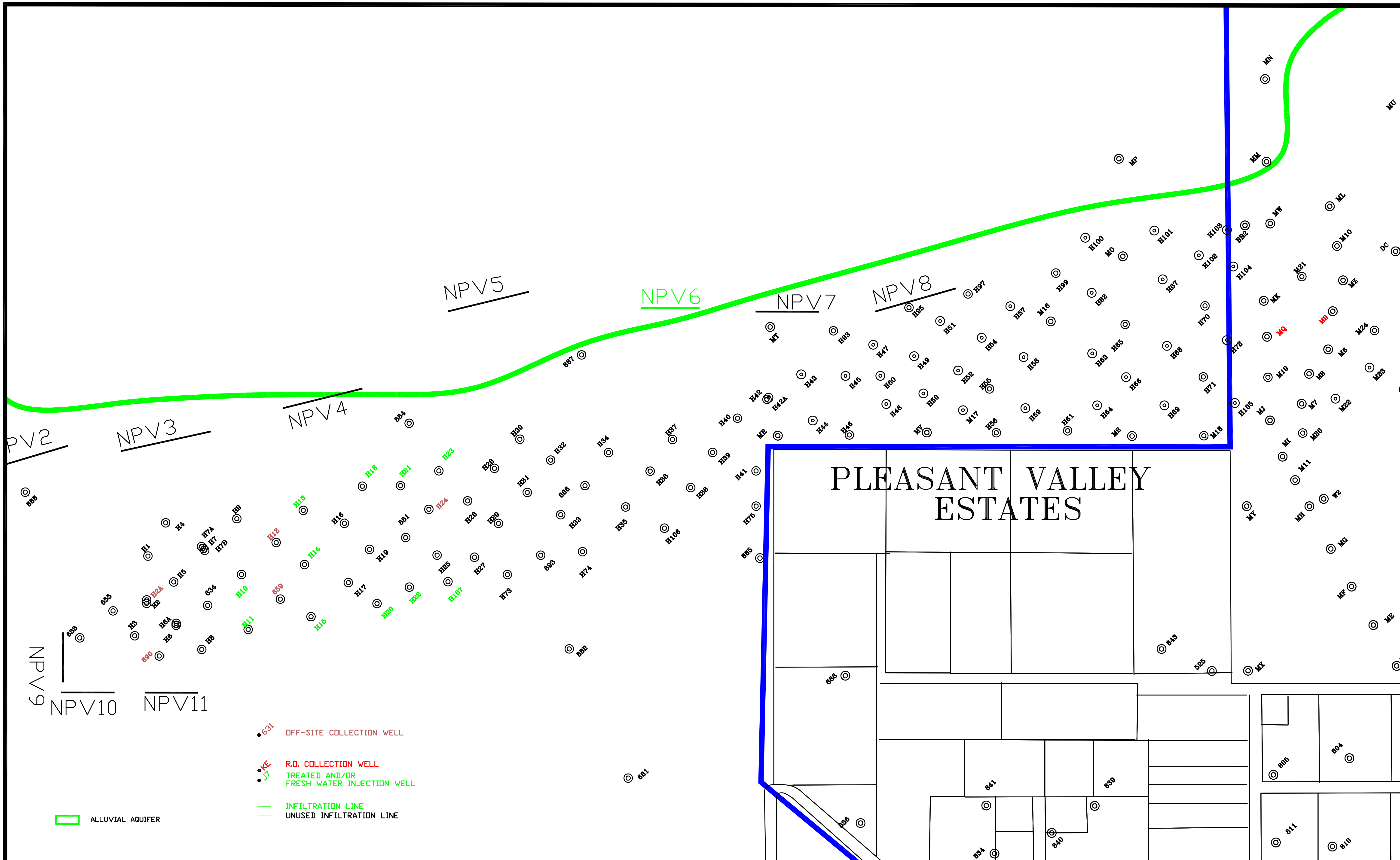

SCALE: 1"=500'
C:\PROJECTS\2021-06 1600QAL20
DATE: 1/8/2021

FIGURE 4.1-1A. ALLUVIAL WELL LOCATIONS, OS, 2020




SCALE: 1"=500'
C:\PROJECTS\ 2021-06 1600QAL20
DATE: 1/8/2021

FIGURE 4.1-1B. ALLUVIAL WELL LOCATIONS, SOS, 2020




SCALE: 1"=500'
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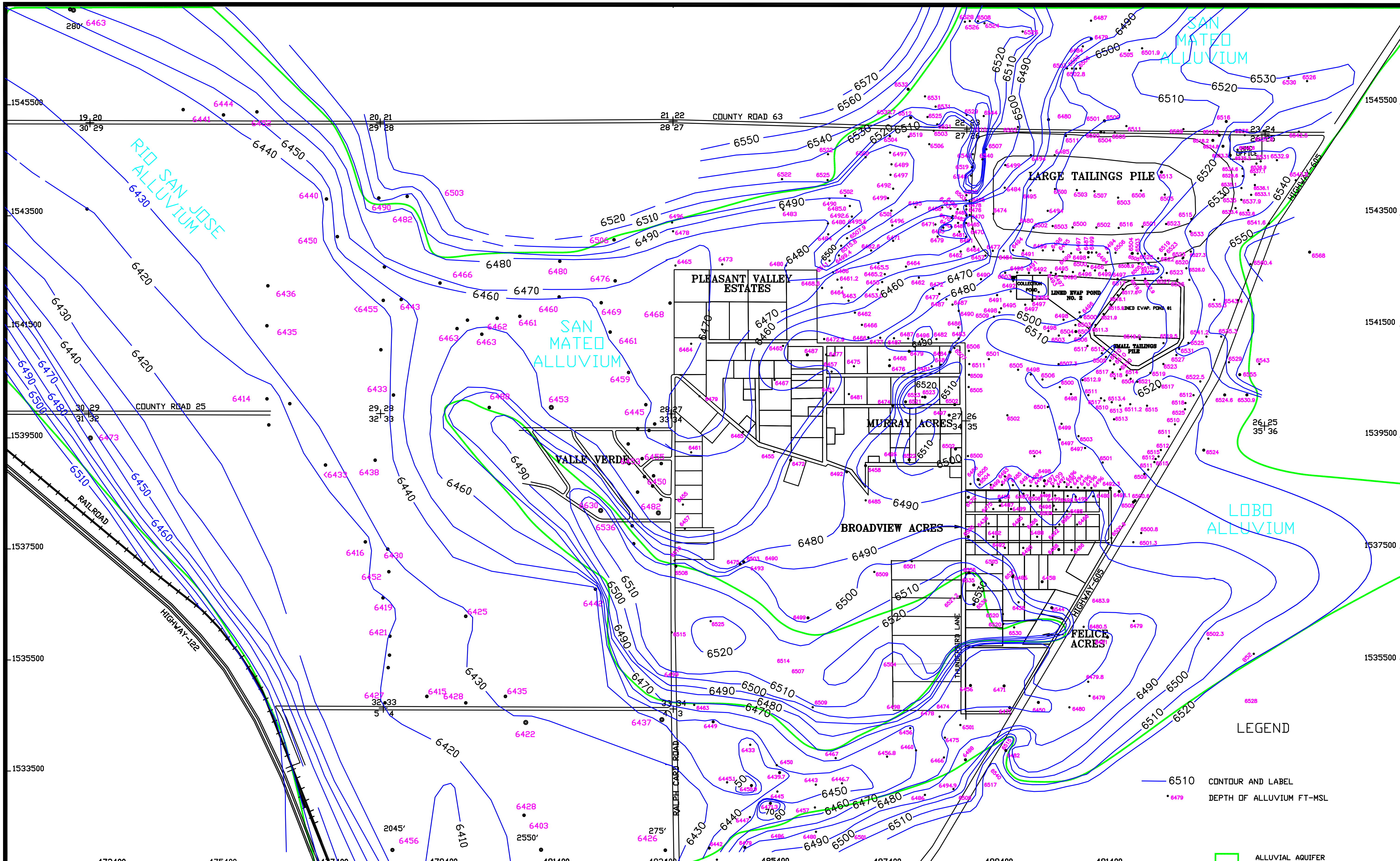
16000AL20
DATE: 1/11/2021

FIGURE 4.1-1C. ALLUVIAL WELL LOCATIONS, NOS, 2020




SCALE: 1"=1600'
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1600QAL20
DATE: 3/19/2021

FIGURE 4.1-2 ELEVATION OF BASE OF THE ALLUVIUM, FT-MSL

## 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 | 11/11/2020 | 42.10 | 6539.96 | 2.5 | 6582.06 | 55 | 6524.6 A | 25-65 | 15.4 |
| 0691 | 1540276 | 493860 | 66.0 | 5.0 | 11/11/2020 | 47.18 | 6541.63 | 2.9 | 6588.81 | 55 | 6530.9 A | 26-66 | 10.7 |
| 0891 | 1540904 | 493751 | 54.0 | 5.0 | 3/27/2019 | 36.81 | 6544.31 | 2.1 | 6581.12 | 50 | 6529.0 A | 24-54 | 15.3 |
| 0892 | 1540954 | 494317 | 50.0 | 5.0 | 11/11/2020 | 43.65 | 6543.56 | 2.0 | 6587.21 | 42 | 6543.2 A | 30-50 | 0.3 |
| 1A | 1543790 | 493768 | 61.0 | 5.0 | 4/9/2020 | 37.91 | 6547.52 | 2.9 | 6585.43 | 47 | 6535.5 A | 39-51 | 12.0 |
| 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 | 11/20/2020 | 37.32 | 6550.67 | 2.5 | 6587.99 | 43 | 6542.5 A | 34-54 | 8.2 |
| 1D | 1544142 | 494752 | 42.9 | 5.0 | 12/3/2005 | 26.42 | 6559.55 | 2.2 | 6585.97 | 40 | 6543.8 A | 22-42 | 15.8 |
| 1E | 1544481 | 494116 | 51.4 | 5.0 | 9/19/2017 | 35.00 | 6549.31 | 2.1 | 6584.31 | 43 | 6539.2 A | 34-54 | 10.1 |
| 1F | 1544952 | 493831 | 61.8 | 5.0 | 9/30/2019 | 38.97 | 6548.41 | 1.8 | 6587.38 | 54 | 6531.6 A | 30-60 | 16.8 |
| 1G | 1545034 | 494170 | 57.5 | 5.0 | 11/14/2012 | 39.28 | 6547.79 | 2.3 | 6587.07 | 48 | 6536.8 A | 35-55 | 11.0 |
| 1H | 1543388 | 494233 | 55.4 | 5.0 | 11/20/2020 | 55.40 | 6530.99 | 1.8 | 6586.39 | 43 | 6541.6 A | 25-55 | 0.0 |
| 1I | 1542627 | 493928 | 49.8 | 5.0 | 11/20/2020 | 34.40 | 6563.95 | 1.3 | 6598.35 | 35 | 6562.1 A | 27-47 | 1.8 |
| 1J | 1541986 | 493695 | 50.3 | 5.0 | 12/16/2019 | 40.50 | 6544.90 | 1.8 | 6585.40 | 40 | 6543.6 A | 30-50 | 1.3 |
| 1K | 1541992 | 493275 | 55.6 | 5.0 | 4/9/2020 | 43.38 | 6540.75 | 1.0 | 6584.13 | 47 | 6536.1 A | 30-55 | 4.6 |
| 1L | 1541256 | 493416 | 53.4 | 5.0 | 11/4/2008 | 27.46 | 6551.15 | 3.1 | 6578.61 | 40 | 6535.5 A | 35-55 | 15.6 |
| 1M | 1541327 | 493133 | 43.1 | 5.0 | 2/19/2019 | 31.62 | 6543.91 | 1.3 | 6575.53 | 33 | 6541.2 A | 25-54 | 2.7 |
| 1N | 1543100 | 494396 | 45.6 | 5.0 | 11/11/2020 | 32.33 | 6558.52 | 2.4 | 6590.85 | 25 | 6563.5 A | 15-44 | 0.0 |
| 1O | 1542592 | 494175 | 44.0 | 5.0 | 11/11/2020 | 43.95 | 6550.99 | 0.8 | 6594.94 | 29 | 6565.1 A | 14-34 | 0.0 |
| 1P | 1541902 | 493924 | 52.8 | 5.0 | 11/11/2020 | 41.10 | 6544.14 | 2.6 | 6585.24 | 35 | 6547.6 A | 20-40 | 0.0 |
| 1Q | 1541993 | 493619 | 56.0 | 5.0 | 1/16/2017 | 33.05 | 6550.06 | 1.9 | 6583.11 | 56 | 6525.2 A | 36-56 | 24.9 |
| 1R | 1542071 | 493623 | 56.0 | 5.0 | 1/16/2017 | 34.50 | 6551.49 | 1.3 | 6585.99 | 56 | 6528.7 A | 36-56 | 22.8 |
| 1S | 1541920 | 493614 | 56.0 | 5.0 | 4/17/2012 | 35.80 | 6546.19 | 1.5 | 6581.99 | 56 | 6524.5 A | 36-56 | 21.7 |
| 1T | 1541990 | 493656 | 56.0 | 5.0 | 1/16/2017 | 32.88 | 6552.03 | 1.7 | 6584.91 | 56 | 6527.2 A | 36-56 | 24.8 |
| 1U | 1542001 | 493542 | 44.2 | 4.0 | 1/14/2020 | 41.65 | 6544.57 | 3.2 | 6586.22 | --- | --- A | - | --- |
| 1V | 1541982 | 493579 | 61.4 | 5.0 | 1/16/2017 | 33.20 | 6551.74 | 1.7 | 6584.94 | --- | --- 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 | 12/28/2020 | 40.36 | 6530.54 | 2.4 | 6570.90 | 60 | 6508.5 A | 49-69 | 22.0 |
| B1 | 1542071 | 489370 | 90.9 | 5.0 | 11/20/2020 | 41.35 | 6530.30 | 0.6 | 6571.65 | 82 | 6489.1 A | 62-82 | 41.3 |
| B2 | 1542475 | 489515 | 83.0 | 5.0 | 10/17/2006 | 42.08 | 6532.17 | 2.0 | 6574.25 | 72 | 6500.3 A | 55-75 | 31.9 |
| B3 | 1542480 | 489731 | 87.0 | 5.0 | 5/1/2017 | 87.30 | 6486.99 | 2.6 | 6574.29 | 77 | 6494.7 A | 58-78 | 0.0 |
| B4 | 1542471 | 489942 | 88.8 | 5.0 | 11/1/2019 | 58.24 | 6516.42 | 7.4 | 6574.66 | 82 | 6485.3 A | 63-83 | 31.2 |
| B5 | 1542474 | 490141 | 91.0 | 5.0 | 5/1/2017 | 56.67 | 6516.79 | 1.4 | 6573.46 | 81 | 6491.1 A | 62-82 | 25.7 |
| B6 | 1542478 | 490341 | 90.0 | 5.0 | 4/27/2018 | 62.74 | 6514.95 | 2.0 | 6577.69 | 80 | 6495.7 A | 63-83 | 19.3 |
| B7 | 1542488 | 490540 | 87.0 | 5.0 | 12/9/2019 | 44.74 | 6529.66 | 2.2 | 6574.40 | 77 | 6495.2 A | 53-78 | 34.5 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B8 | 1542488 | 490734 | 87.0 | 5.0 | 12/9/2019 | 46.52 | 6529.23 | 2.3 | 6575.75 | 77 | 6496.5 A | 53-78 | 32.8 |
| B9 | 1542514 | 490935 | 86.0 | 5.0 | 4/10/2018 | 47.61 | 6528.56 | 2.2 | 6576.17 | 76 | 6498.0 A | 51-78 | 30.6 |
| B10 | 1542517 | 491133 | 84.8 | 5.0 | 7/14/2008 | 48.91 | 6527.86 | 2.3 | 6576.77 | 75 | 6499.5 A | 51-78 | 28.4 |
| B11 | 1542517 | 491329 | 84.9 | 5.0 | 3/2/2020 | 46.10 | 6531.29 | 2.2 | 6577.39 | 77 | 6498.2 A | 42-80 | 33.1 |
| B12 | 1542524 | 488915 | 100.0 | 5.0 | 11/25/2020 | 41.47 | 6531.55 | 2.2 | 6573.02 | 91 | 6479.8 A | 30-100 | 51.7 |
| B13 | 1541841 | 490223 | 80.0 | 5.0 | 11/20/2020 | 37.70 | 6532.34 | 3.1 | 6570.04 | 72 | 6494.9 A | 30-80 | 37.4 |
| B14 | 1542733 | 489579 | 120.0 | 4.5 | 4/22/2014 | 34.46 | 6541.19 | 2.0 | 6575.65 | 68 | 6505.7 A | 60-120 | 35.5 |
| B15 | 1542708 | 489749 | 120.0 | 4.5 | 10/28/2019 | 46.20 | 6530.11 | 2.0 | 6576.31 | 72 | 6502.3 A | 60-120 | 27.8 |
| B16 | 1542705 | 489900 | 120.0 | 4.5 | 10/28/2019 | 60.75 | 6514.62 | 2.0 | 6575.37 | 83 | 6490.4 A | 60-120 | 24.3 |
| B17 | 1542659 | 489493 | 95.0 | 4.5 | 10/28/2019 | 42.80 | 6531.51 | 2.0 | 6574.31 | --- | --- A | 55-95 | --- |
| B18 | 1542652 | 489634 | 120.0 | 4.5 | 10/28/2019 | 45.60 | 6530.53 | 2.0 | 6576.13 | 70 | 6504.1 A | 60-120 | 26.4 |
| B19 | 1542605 | 489936 | 120.0 | 4.5 | 9/11/2014 | 39.79 | 6534.22 | 2.0 | 6574.01 | 90 | 6482.0 A | 60-120 | 52.2 |
| B20 | 1542444 | 489847 | 120.0 | 4.5 | 10/9/2014 | 40.11 | 6534.33 | 2.0 | 6574.44 | 90 | 6482.4 A | 60-120 | 51.9 |
| B21 | 1542315 | 489619 | 80.0 | 4.5 | 9/11/2014 | 38.45 | 6535.57 | 2.0 | 6574.02 | 80 | 6492.0 A | 50-80 | 43.5 |
| B25 | 1542644 | 488917 | 90.0 | 4.5 | 9/8/2014 | 35.77 | 6537.90 | 2.0 | 6573.67 | 90 | 6481.7 A | 50-90 | 56.2 |
| B26 | 1542819 | 488938 | 110.0 | 4.5 | --- | --- | --- | 1.3 | 6574.25 | --- | --- A | 50-110 | --- |
| B27 | 1542667 | 489204 | 90.0 | 4.5 | 9/8/2014 | 36.57 | 6537.47 | 2.0 | 6574.04 | 90 | 6482.0 A | 50-90 | 55.4 |
| B28 | 1542538 | 489095 | 90.0 | 4.5 | 9/8/2014 | 36.43 | 6537.55 | 2.0 | 6573.98 | 80 | 6492.0 A | 50-90 | 45.6 |
| B30 | 1542568 | 489281 | 90.0 | 4.5 | 9/5/2014 | 35.38 | 6539.35 | 2.0 | 6574.73 | 90 | 6482.7 A | 50-90 | 56.6 |
| B31 | 1542710 | 490103 | 120.0 | 4.5 | 10/28/2019 | 59.40 | 6516.56 | 2.0 | 6575.96 | 83 | 6491.0 A | 60-100 | 25.6 |
| B32 | 1542598 | 490201 | 120.0 | 4.5 | 10/28/2019 | 46.10 | 6529.29 | 2.0 | 6575.39 | 93 | 6480.4 A | 60-120 | 48.9 |
| B33 | 1542709 | 490269 | 85.0 | 4.5 | --- | --- | --- | 2.4 | 6575.46 | --- | --- A | 45-85 | --- |
| B34 | 1542601 | 490388 | 90.0 | 4.5 | 9/5/2014 | 37.12 | 6538.57 | 2.0 | 6575.69 | 90 | 6483.7 A | 50-90 | 54.9 |
| B35 | 1542714 | 490393 | 90.0 | 4.5 | 4/17/2018 | 39.70 | 6537.16 | 2.0 | 6576.86 | 90 | 6484.9 A | 50-90 | 52.3 |
| B36 | 1542668 | 490467 | 85.0 | 4.5 | --- | --- | --- | 2.0 | 6576.44 | --- | --- A | 40-85 | --- |
| B37 | 1542711 | 490543 | 80.0 | 4.5 | 9/11/2014 | 35.60 | 6540.73 | 2.0 | 6576.33 | 80 | 6494.3 A | 40-80 | 46.4 |
| B38 | 1542607 | 490662 | 80.0 | 4.5 | 5/2/2017 | 69.37 | 6506.30 | 2.0 | 6575.67 | 80 | 6493.7 A | 40-80 | 12.6 |
| B39 | 1542667 | 490816 | 80.0 | 4.5 | 9/10/2014 | 37.49 | 6539.11 | 2.0 | 6576.60 | 80 | 6494.6 A | 40-80 | 44.5 |
| B40 | 1542595 | 490850 | 80.0 | 4.5 | 4/10/2018 | 42.73 | 6533.16 | 2.0 | 6575.89 | 80 | 6493.9 A | 40-80 | 39.3 |
| B41 | 1542656 | 490998 | 85.0 | 4.5 | --- | --- | --- | 1.8 | 6578.13 | --- | --- A | 40-85 | --- |
| B42 | 1542679 | 491060 | 80.0 | 4.5 | 4/10/2018 | 42.10 | 6536.87 | 2.0 | 6578.97 | 80 | 6497.0 A | 40-80 | 39.9 |
| B43 | 1542610 | 491235 | 80.0 | 4.5 | 9/5/2014 | 35.49 | 6541.47 | 2.0 | 6576.96 | 80 | 6495.0 A | 40-80 | 46.5 |
| B44 | 1542665 | 491360 | 80.0 | 4.5 | 4/10/2018 | 40.08 | 6538.52 | 2.0 | 6578.60 | 80 | 6496.6 A | 40-80 | 41.9 |
| B45 | 1542423 | 491434 | 80.0 | 4.5 | 10/9/2014 | 35.31 | 6541.61 | 2.0 | 6576.92 | 80 | 6494.9 A | 40-80 | 46.7 |
| B46 | 1542539 | 491507 | 80.0 | 4.5 | 9/10/2014 | 37.87 | 6541.39 | 2.0 | 6579.26 | 80 | 6497.3 A | 40-80 | 44.1 |
| B47 | 1542695 | 491639 | 80.0 | 4.5 | 9/8/2014 | 35.51 | 6543.45 | 2.0 | 6578.96 | 80 | 6497.0 A | 40-80 | 46.5 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B48 | 1542395 | 491633 | 80.0 | 4.5 | --- | --- | --- | 2.0 | 6579.68 | --- | --- A | 40-80 | --- |
| B49 | 1542521 | 491966 | 80.0 | 4.5 | 9/10/2014 | 34.86 | 6545.00 | 2.0 | 6579.86 | 80 | 6497.9 A | 40-80 | 47.1 |
| BA | 1541835 | 489440 | 86.0 | 5.0 | 12/28/2020 | 41.55 | 6530.03 | 1.7 | 6571.58 | 76 | 6493.9 A | 64-78 | 36.2 |
| 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 | 11/23/2020 | 39.89 | 6534.72 | 2.6 | 6574.61 | 75 | 6497.0 A | 63-83 | 37.7 |
| BK1c | 1546812 | 489728 | 52.0 | --- | 6/10/2019 | 44.25 | 6539.75 | 0.0 | 6584.00 | --- | --- A | 47-52 | --- |
| BK1f | 1546834 | 489743 | 57.0 | --- | 6/10/2019 | 44.79 | 6539.21 | 0.0 | 6584.00 | --- | --- A | 52-57 | --- |
| BK2c | 1546567 | 491717 | 83.5 | --- | 6/10/2019 | 40.29 | 6551.71 | 0.0 | 6592.00 | --- | --- A | 58.5-63. | --- |
| BK2f | 1546553 | 491732 | 79.0 | --- | 6/10/2019 | 40.06 | 6551.94 | 0.0 | 6592.00 | --- | --- A | 74-79 | --- |
| BP | 1541882 | 489841 | 85.4 | 4.0 | 12/13/2019 | 43.00 | 6529.30 | 3.0 | 6572.30 | 75 | 6494.3 A | 40-85 | 35.0 |
| * 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 | 3/26/2020 | 38.54 | 6533.32 | 0.8 | 6571.86 | 67 | 6504.1 A | 41-68 | 29.3 |
| C2 | 1541630 | 490566 | 76.0 | 5.0 | 3/26/2020 | 35.11 | 6529.91 | 0.9 | 6565.02 | 66 | 6498.1 A | 42-67 | 31.8 |
| * 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 | 3/27/2019 | 34.82 | 6535.03 | 0.8 | 6569.85 | 62 | 6507.1 A | 43-63 | 28.0 |
| C6 | 1541533 | 491142 | 80.8 | 5.0 | 3/26/2020 | 78.36 | 6506.53 | 1.6 | 6584.89 | 72 | 6511.3 A | 34-74 | 0.0 |
| C7 | 1541734 | 491280 | 72.4 | 5.0 | 3/26/2020 | 53.85 | 6530.59 | 1.5 | 6584.44 | 61 | 6521.9 A | 25-65 | 8.7 |
| C8 | 1541906 | 491415 | 78.1 | 5.0 | 3/26/2020 | 50.13 | 6534.36 | 1.6 | 6584.49 | 67 | 6515.9 A | 31-71 | 18.5 |
| C9 | 1542075 | 491545 | 77.0 | 5.0 | 3/26/2020 | 57.28 | 6527.27 | 1.5 | 6584.55 | 65 | 6518.1 A | 27-67 | 9.2 |
| C10 | 1542182 | 491629 | 71.6 | 5.0 | 3/26/2020 | 62.67 | 6522.59 | 2.7 | 6585.26 | 65 | 6517.6 A | 30-70 | 5.0 |
| C11 | 1542376 | 491844 | 68.2 | 5.0 | 11/5/2019 | 43.08 | 6538.30 | 2.4 | 6581.38 | 60 | 6519.0 A | 35-65 | 19.3 |
| C12 | 1542375 | 492029 | 63.5 | 5.0 | 11/1/2019 | 25.26 | 6555.29 | 2.6 | 6580.55 | 55 | 6523.0 A | 34-64 | 32.3 |
| C13 | 1541394 | 490655 | 63.0 | 5.0 | 11/9/2005 | 30.00 | 6540.01 | 2.0 | 6570.01 | 63 | 6505.0 A | 36-70 | 35.0 |
| C14 | 1541413 | 490713 | 63.0 | 5.0 | 11/9/2005 | 29.95 | 6539.74 | 2.0 | 6569.69 | 63 | 6504.7 A | 36-70 | 35.0 |
| C15 | 1541574 | 490209 | 70.0 | 4.5 | --- | --- | --- | 0.5 | 6570.62 | 70 | 6500.1 A | 30-70 | --- |
| C16 | 1541579 | 489993 | 70.0 | 4.5 | --- | --- | --- | 0.5 | 6570.39 | 70 | 6499.9 A | 30-70 | --- |
| C17 | 1541607 | 489798 | 70.0 | 4.5 | --- | --- | --- | 0.5 | 6570.74 | 70 | 6500.2 A | 30-70 | --- |
| C18 | 1541616 | 489614 | 120.0 | 4.5 | 10/28/2019 | 10.40 | 6560.70 | 0.5 | 6571.10 | 60 | 6510.6 A | 40-120 | 50.1 |
| C19 | 1541648 | 489392 | 120.0 | 4.5 | 10/28/2019 | 18.60 | 6551.31 | 0.5 | 6569.91 | 80 | 6489.4 A | 40-120 | 61.9 |
| C20 | 1541673 | 489187 | 110.0 | 4.5 | 10/28/2019 | 17.20 | 6552.96 | 0.5 | 6570.16 | 70 | 6499.7 A | 50-110 | 53.3 |
| C21 | 1541747 | 488996 | 100.0 | 4.5 | 10/28/2019 | 26.24 | 6545.75 | 0.5 | 6571.99 | 90 | 6481.5 A | 40-100 | 64.3 |
| * D | 1542127 | 490118 | 89.7 | 4.0 | 7/5/2011 | 37.10 | 6535.79 | 0.8 | 6572.89 | 90 | 6482.1 A | 71-91 | 53.7 |
| D1 | 1542140 | 489615 | 89.4 | 4.0 | 7/22/2020 | 46.20 | 6524.70 | 1.0 | 6570.90 | 80 | 6489.9 A | 58-90 | 34.8 |
| D2 | 1542641 | 492107 | 70.0 | 5.0 | 6/18/2014 | 46.20 | 6533.97 | 3.0 | 6580.17 | 62 | 6515.2 A | 40-70 | 18.7 |

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 4/5/2018 | 39.12 | 6535.24 | 2.6 | 6574.36 | 72 | 6499.8 A | 30-81 | 35.4 |
| 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 | 11/23/2020 | 42.43 | 6528.88 | 2.7 | 6571.31 | --- | --- A | 45-65 | --- |
| DD | 1546989 | 488943 | 78.5 | 4.0 | 10/12/2020 | 49.70 | 6542.89 | 1.9 | 6592.59 | 83 | 6507.7 A | 40-80 | 35.2 |
| DD2 | 1547439 | 489251 | 94.3 | 5.0 | 10/7/2020 | 46.50 | 6546.78 | 2.0 | 6593.28 | 80 | 6511.3 A | 50-90 | 35.5 |
| DD3 | 1548273 | 489592 | 69.9 | 4.0 | 10/23/2019 | 48.65 | 6552.29 | 3.6 | 6600.94 | 67 | 6530.3 A | 40-70 | 22.0 |
| DD4 | 1547675 | 489466 | 81.5 | 4.0 | 10/23/2019 | 48.15 | 6551.28 | 3.8 | 6599.43 | 80 | 6515.6 A | 42-82 | 35.7 |
| DD5 | 1547013 | 488704 | 68.0 | 4.0 | 10/23/2019 | 50.45 | 6544.90 | 3.6 | 6595.35 | 65 | 6526.8 A | 58-68 | 18.1 |
| DD6 | 1547340 | 488377 | 35.0 | 4.0 | 6/13/2019 | 35.00 | 6560.81 | 3.2 | 6595.81 | 35 | 6557.6 A | 25-35 | 3.2 |
| DD7 | 1547606 | 488129 | 24.2 | 4.0 | 6/13/2019 | 24.20 | 6572.63 | 4.1 | 6596.83 | 20 | 6572.8 A | 14-24 | 0.0 |
| 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 | 6/11/2015 | 40.77 | 6535.66 | 2.2 | 6576.43 | --- | --- A | - | --- |
| DR | 1542884 | 489966 | 87.8 | 5.0 | 6/11/2015 | 55.75 | 6535.08 | 2.7 | 6590.83 | 85 | 6503.1 A | 65-85 | 32.0 |
| DS | 1542876 | 490118 | 87.0 | 5.0 | 8/2/1999 | 65.22 | 6523.59 | 0.9 | 6588.81 | 77 | 6510.9 A | 62-77 | 12.7 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT | 1542871 | 489293 | 72.3 | 5.0 | 12/28/2020 | 48.62 | 6535.19 | 2.7 | 6583.81 | 99 | 6482.1 A | 59-99 | 53.1 |
| 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 | 8/28/2006 | 54.64 | 6530.96 | 2.9 | 6585.60 | 77 | 6505.7 A | 60-80 | 25.3 |
| 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 | 12/28/2020 | 54.82 | 6535.71 | 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 |
| EW-1 | 1543400 | 488270 | 95.0 | 4.0 | --- | --- | --- | --- | 6577.04 | --- | --- A | 50-90 | --- |
| EW-2 | 1543288 | 488294 | 94.0 | 4.0 | --- | --- | --- | --- | 6576.75 | --- | --- A | 49-89 | --- |
| EW-3 | 1543180 | 488316 | 95.0 | 4.0 | --- | --- | --- | --- | 6576.58 | --- | --- A | 50-90 | --- |
| EW-4 | 1543072 | 488339 | 95.0 | 4.0 | --- | --- | --- | --- | 6575.81 | --- | --- A | 50-90 | --- |
| EW-5 | 1542963 | 488361 | 95.0 | 4.0 | --- | --- | --- | --- | 6575.63 | --- | --- A | 50-90 | --- |
| EW-6 | 1542855 | 488383 | 95.0 | 4.0 | --- | --- | --- | --- | 6575.58 | --- | --- A | 50-90 | --- |
| EW-7 | 1542749 | 488405 | 95.0 | 4.0 | --- | --- | --- | --- | 6576.05 | --- | --- A | 50-90 | --- |
| F | 1539908 | 489554 | 63.8 | 4.0 | 11/20/2020 | 37.21 | 6527.61 | 1.2 | 6564.82 | 62 | 6501.6 A | 45-65 | 26.0 |
| FB | 1540417 | 488857 | 62.0 | 4.0 | 9/23/2020 | 38.50 | 6527.16 | 2.0 | 6565.66 | 58 | 6505.7 A | 43-58 | 21.5 |
| * 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 | 11/20/2020 | 38.72 | 6524.07 | 1.8 | 6562.79 | 62 | 6499.0 A | 45-65 | 25.1 |
| 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 | 11/20/2020 | 40.13 | 6525.88 | 1.8 | 6566.01 | 67 | 6497.2 A | 50-120 | 28.7 |
| 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 |
| GH | 1538807 | 489509 | 69.2 | 4.0 | 9/15/2020 | 37.70 | 6525.06 | 1.3 | 6562.76 | 67 | 6494.5 A | 55-65 | 30.6 |
| 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 | 9/18/2018 | 37.37 | 6529.39 | 2.4 | 6566.76 | 67 | 6497.4 A | 50-120 | 32.0 |
| 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 | 3/2/2020 | 40.00 | 6527.97 | 1.8 | 6567.97 | 70 | 6496.2 A | 50-120 | 31.8 |
| 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 |

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GQ | 1538599 | 491067 | 70.0 | 4.0 | 12/13/2010 | 1.40 | 6566.76 | 0.9 | 6568.16 | 71 | 6496.3 A | 50-70 | 70.5 |
| GR | 1538619 | 490619 | 85.0 | 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 | 11/20/2020 | 52.79 | 6524.59 | 2.5 | 6577.38 | 74 | 6500.9 A | 62-82 | 23.7 |
| GW1 | 1539755 | 490530 | 73.0 | 5.0 | 11/20/2020 | 38.49 | 6526.78 | 1.0 | 6565.27 | 65 | 6499.3 A | 48-73 | 27.5 |
| GW2 | 1539471 | 490497 | 75.0 | 5.0 | 11/20/2020 | 38.95 | 6527.13 | 1.0 | 6566.08 | 68 | 6497.1 A | 47-75 | 30.0 |
| 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 | 11/20/2020 | 38.82 | 6528.38 | 1.6 | 6567.20 | 68 | 6497.6 A | 52-72 | 30.8 |
| IW-1D | 1543443 | 488206 | 85.0 | 4.0 | --- | --- | --- | --- | 6574.57 | --- | --- A | 60-80 | --- |
| IW-1S | 1543422 | 488225 | 63.0 | | | | | | 6573.45 | --- | --- A | 38-58 | --- |
| IW-2S | 1543373 | 488232 | 59.0 | 4.0 | --- | --- | --- | --- | 6573.93 | --- | --- A | 34-54 | --- |
| IW-2D | 1543401 | 488218 | 83.0 | | | | | | 6573.79 | --- | --- A | 58-78 | --- |
| IW-3S | 1543329 | 488242 | 59.0 | 4.0 | --- | --- | --- | --- | 6574.08 | --- | --- A | 34-54 | --- |
| IW-3D | 1543352 | 488226 | 79.0 | | | | | | 6574.66 | --- | --- A | 54-74 | --- |
| IW-4S | 1543286 | 488251 | 66.0 | 4.0 | --- | --- | --- | --- | 6573.55 | --- | --- A | 41-61 | --- |
| IW-4D | 1543309 | 488236 | 86.0 | | | | | | 6574.11 | --- | --- A | 61-81 | --- |
| IW-5S | 1543239 | 488261 | 64.0 | 4.0 | --- | --- | --- | --- | 6574.90 | --- | --- A | 39-59 | --- |
| IW-5D | 1543264 | 488245 | 90.0 | | | | | | 6574.85 | --- | --- A | 65-85 | --- |
| IW-6S | 1543195 | 488270 | 62.0 | 4.0 | --- | --- | --- | --- | 6574.43 | --- | --- A | 37-57 | --- |
| IW-6D | 1543218 | 488255 | 84.5 | | | | | | 6574.27 | --- | --- A | 59.5-79. | --- |
| IW-7S | 1543151 | 488280 | 60.0 | 4.0 | --- | --- | --- | --- | 6574.94 | --- | --- A | 35-55 | --- |
| IW-7D | 1543174 | 488265 | 82.0 | | | | | | 6574.02 | --- | --- A | 57-77 | --- |
| IW-8S | 1543110 | 488289 | 58.0 | 4.0 | --- | --- | --- | --- | 6574.20 | --- | --- A | 33-53 | --- |
| IW-8D | 1543129 | 488274 | 80.0 | | | | | | 6574.53 | --- | --- A | 55-75 | --- |
| IW-9S | 1543064 | 488298 | 58.0 | 4.0 | --- | --- | --- | --- | 6573.36 | --- | --- A | 33-53 | --- |
| IW-9D | 1543088 | 488283 | 77.0 | | | | | | 6574.23 | --- | --- A | 52-72 | --- |
| IW-10S | 1543018 | 488307 | 58.0 | 4.0 | --- | --- | --- | --- | 6573.72 | --- | --- A | 33-53 | --- |
| IW-10D | 1543043 | 488292 | 81.0 | | | | | | 6573.46 | --- | --- A | 56-76 | --- |
| IW-11S | 1542974 | 488317 | 60.0 | 4.0 | --- | --- | --- | --- | 6573.56 | --- | --- A | 35-55 | --- |
| IW-11D | 1542998 | 488302 | 78.0 | | | | | | 6574.14 | --- | --- A | 53-73 | --- |
| IW-12S | 1542929 | 488327 | 65.0 | 4.0 | --- | --- | --- | --- | 6574.11 | --- | --- A | 40-60 | --- |
| IW-12D | 1542953 | 488312 | 85.0 | | | | | | 6573.76 | --- | --- A | 60-80 | --- |
| IW-13S | 1542883 | 488337 | 65.0 | 4.0 | --- | --- | --- | --- | 6573.36 | --- | --- A | 40-60 | --- |
| IW-13D | 1542908 | 488321 | 84.0 | | | | | | 6573.43 | --- | --- A | 59-79 | --- |
| IW-14S | 1542839 | 488346 | 69.0 | 4.0 | --- | --- | --- | --- | 6573.10 | --- | --- A | 44-64 | --- |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IW-14D | 1542863 | 488330 | 90.0 | 4.0 | --- | --- | --- | --- | 6573.04 | --- | --- A | 65-85 | --- |
| IW-15D | 1542818 | 488340 | 87.0 | 4.0 | --- | --- | --- | --- | 6573.22 | --- | --- A | 62-82 | --- |
| IW-15S | 1542796 | 488355 | 67.0 | | | | | | 6573.76 | --- | --- A | 42-62 | --- |
| IW-16S | 1542752 | 488365 | 67.0 | 4.0 | --- | --- | --- | --- | 6573.94 | --- | --- A | 42-62 | --- |
| IW-16D | 1542775 | 488350 | 89.0 | | | | | | 6573.98 | --- | --- A | 64-84 | --- |
| IW-17S | 1542709 | 488373 | 69.0 | 4.0 | --- | --- | --- | --- | 6573.48 | --- | --- A | 44-64 | --- |
| IW-17D | 1542731 | 488359 | 97.0 | | | | | | 6573.69 | --- | --- A | 72-92 | --- |
| 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 | 54 | 6513.4 A | 36-66 | 39.5 |
| 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 |
| K2 | 1540736 | 491587 | 58.9 | 4.0 | 7/15/2005 | 19.40 | 6552.81 | 2.5 | 6572.21 | 58 | 6511.7 A | 46-56 | 41.1 |
| K3 | 1540744 | 491571 | 56.7 | 2.0 | 7/15/2005 | 19.20 | 6551.47 | 1.3 | 6570.67 | --- | --- A | 53-58 | --- |
| K4 | 1541211 | 492371 | 86.2 | 5.0 | 3/9/2020 | 58.75 | 6543.27 | 2.5 | 6602.02 | 80 | 6519.5 A | 65-85 | 23.8 |
| K5 | 1541269 | 491935 | 86.4 | 5.0 | 3/5/2020 | 76.05 | 6525.68 | 2.8 | 6601.73 | 80 | 6518.9 A | 55-85 | 6.7 |
| 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 | 3/10/2020 | 61.50 | 6540.03 | 2.0 | 6601.53 | 79 | 6520.5 A | 56-86 | 19.5 |
| K8 | 1541250 | 492081 | 86.0 | 5.0 | 11/5/2019 | 79.97 | 6520.52 | 2.0 | 6600.49 | 78 | 6520.5 A | 66-86 | 0.0 |
| K9 | 1541287 | 491787 | 86.0 | 5.0 | 2/27/2020 | 64.45 | 6535.89 | 2.0 | 6600.34 | 79 | 6519.3 A | 56-86 | 16.6 |
| K10 | 1541305 | 491638 | 87.0 | 5.0 | 11/5/2019 | 62.88 | 6537.93 | 2.0 | 6600.81 | 81 | 6517.8 A | 47-87 | 20.1 |
| K11 | 1541325 | 491490 | 84.0 | 5.0 | 3/8/2020 | 65.85 | 6534.76 | 2.0 | 6600.61 | 78 | 6520.6 A | 64-84 | 14.2 |
| 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 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 3/8/2020 | 42.10 | 6527.63 | 1.5 | 6569.73 | 50 | 6518.2 A | 40-60 | 9.4 |
| KF | 1540870 | 491169 | 63.5 | 5.0 | 3/10/2020 | 34.80 | 6535.41 | 2.2 | 6570.21 | 50 | 6518.0 A | 30-60 | 17.4 |
| 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 | 12/28/2020 | 35.60 | 6536.12 | 1.2 | 6571.72 | --- | --- A | - | --- |
| L | 1538970 | 492150 | 67.0 | 4.0 | 4/9/2020 | 45.37 | 6529.60 | 0.8 | 6574.97 | 59 | 6515.2 A | 46-66 | 14.4 |
| L5 | 1539946 | 492730 | 60.2 | 5.0 | 4/9/2020 | 41.64 | 6534.43 | 1.3 | 6576.07 | 50 | 6524.8 A | 25-55 | 9.7 |
| L6 | 1540526 | 493110 | 51.1 | 5.0 | 10/14/2020 | 33.64 | 6541.00 | 2.1 | 6574.64 | 50 | 6522.5 A | 25-55 | 18.5 |
| L7 | 1540113 | 492842 | 67.8 | 5.0 | 10/14/2020 | 41.41 | 6535.20 | 2.3 | 6576.61 | 62 | 6512.3 A | 36-66 | 22.9 |
| L8 | 1539773 | 492621 | 73.9 | 5.0 | 4/5/2018 | 57.62 | 6518.87 | 2.1 | 6576.49 | 65 | 6509.4 A | 32-72 | 9.5 |
| L9 | 1539509 | 492463 | 74.9 | 5.0 | 12/17/2019 | 29.80 | 6547.43 | 2.2 | 6577.23 | 64 | 6511.0 A | 43-73 | 36.4 |
| L10 | 1539250 | 492310 | 74.2 | 5.0 | 4/5/2018 | 48.68 | 6528.15 | 2.0 | 6576.83 | 63 | 6511.8 A | 53-73 | 16.3 |
| L11 | 1540323 | 492965 | 70.0 | 4.5 | 4/24/2017 | 32.77 | 6543.28 | 2.0 | 6576.05 | 70 | 6504.1 A | 30-70 | 39.2 |
| L12 | 1539507 | 492810 | 75.0 | 4.5 | 5/16/2017 | 50.61 | 6536.33 | 2.0 | 6586.94 | 70 | 6514.9 A | 55-75 | 21.4 |
| L13 | 1539233 | 492633 | 75.0 | 4.5 | 5/19/2017 | 51.61 | 6533.80 | 2.0 | 6585.41 | 75 | 6508.4 A | 35-75 | 25.4 |
| L14 | 1538972 | 492514 | 75.0 | 4.5 | 5/19/2017 | 47.26 | 6533.58 | 2.0 | 6580.84 | 60 | 6518.8 A | 35-75 | 14.7 |
| L15 | 1538701 | 492324 | 75.0 | 4.5 | 4/24/2017 | 45.25 | 6533.15 | 2.0 | 6578.40 | 70 | 6506.4 A | 35-75 | 26.8 |
| L16 | 1538579 | 492286 | 75.0 | 4.5 | 5/16/2017 | 46.83 | 6532.67 | 2.0 | 6579.50 | 70 | 6507.5 A | 35-75 | 25.2 |
| L17 | 1538761 | 492424 | 75.0 | 4.5 | --- | --- | --- | 2.0 | 6578.52 | 70 | 6506.5 A | 35-75 | --- |
| L18 | 1538927 | 492582 | 75.0 | 4.5 | --- | --- | --- | 2.0 | 6582.32 | 70 | 6510.3 A | 35-75 | --- |
| L19 | 1538768 | 492575 | 75.0 | 4.5 | 4/24/2017 | 47.25 | 6533.80 | 2.0 | 6581.05 | 70 | 6509.1 A | 35-75 | 24.8 |
| L20 | 1539033 | 492736 | 75.0 | 4.5 | 4/24/2017 | 49.68 | 6534.96 | 2.0 | 6584.64 | 70 | 6512.6 A | 35-75 | 22.3 |
| L21 | 1539211 | 492827 | 75.0 | 4.5 | --- | --- | --- | 2.0 | 6586.62 | 70 | 6514.6 A | 55-75 | --- |
| L22 | 1539822 | 493033 | 70.0 | 4.5 | 4/9/2014 | 45.86 | 6542.69 | 2.0 | 6588.55 | 70 | 6516.6 A | 30-70 | 26.1 |
| L23 | 1539654 | 492890 | 70.0 | 4.5 | 5/16/2017 | 53.23 | 6536.03 | 2.0 | 6589.26 | 70 | 6517.3 A | 30-70 | 18.8 |
| L24 | 1539361 | 492700 | 70.0 | 4.5 | 4/24/2017 | 53.31 | 6534.76 | 2.0 | 6588.07 | 70 | 6516.1 A | 30-70 | 18.7 |
| L25 | 1538880 | 492409 | 70.0 | 4.5 | 4/24/2017 | 46.07 | 6533.47 | 2.0 | 6579.54 | 70 | 6507.5 A | 30-70 | 25.9 |
| L26 | 1540306 | 493302 | 60.0 | 4.5 | 4/25/2017 | 35.12 | 6544.55 | 2.0 | 6579.67 | --- | --- A | 20-60 | --- |
| 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 | 4/29/2020 | 59.96 | 6516.14 | 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 |

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 11/20/2020 | 44.12 | 6531.22 | 3.2 | 6575.34 | 84 | 6488.1 A | 60-90 | 43.1 |
| M6 | 1543097 | 486674 | 110.0 | 5.0 | 11/23/2020 | 62.93 | 6512.11 | 2.2 | 6575.04 | 65 | 6507.9 A | 60-110 | 4.2 |
| M7 | 1542790 | 486523 | 83.0 | 5.0 | 11/23/2020 | 58.43 | 6514.42 | 2.4 | 6572.85 | 71 | 6499.4 A | 63-83 | 15.0 |
| 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 | 11/23/2020 | 66.37 | 6510.44 | 3.5 | 6576.81 | 78 | 6495.3 A | 63-103 | 15.1 |
| M10 | 1543677 | 486723 | 88.0 | 5.0 | 11/23/2020 | 64.10 | 6509.26 | 2.3 | 6573.36 | 86 | 6485.1 A | 58-88 | 24.2 |
| 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 |
| M19 | 1542940 | 486334 | 100.0 | 4.5 | 10/1/2018 | 65.45 | 6510.68 | 2.0 | 6576.13 | 97 | 6477.1 A | 60-100 | 33.6 |
| M20 | 1542584 | 486588 | 100.0 | 4.5 | 4/23/2014 | 49.64 | 6525.90 | 2.0 | 6575.54 | 100 | 6473.5 A | 60-100 | 52.4 |
| M21 | 1543508 | 486526 | 100.0 | 4.5 | 4/23/2014 | 57.74 | 6516.98 | 2.0 | 6574.72 | 80 | 6492.7 A | 60-100 | 24.3 |
| M22 | 1542817 | 486716 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6575.43 | 100 | 6473.4 A | 60-100 | --- |
| M23 | 1542992 | 486908 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6575.97 | 100 | 6474.0 A | 60-100 | --- |
| M24 | 1543204 | 486935 | 120.0 | 4.5 | 4/23/2014 | 43.23 | 6531.47 | 2.0 | 6574.70 | 65 | 6507.7 A | 60-120 | 23.8 |
| M28 | 1543175 | 487326 | 120.0 | 4.5 | 4/23/2014 | 42.11 | 6536.65 | 2.0 | 6578.76 | 69 | 6507.8 A | 60-120 | 28.9 |
| M29 | 1543440 | 487326 | 120.0 | 4.5 | 4/23/2014 | 36.92 | 6535.95 | 2.0 | 6572.87 | 61 | 6509.9 A | 60-120 | 26.1 |
| M30 | 1543462 | 487639 | 110.0 | 4.5 | 9/30/2019 | 36.00 | 6538.91 | 2.0 | 6574.91 | 80 | 6492.9 A | 80-110 | 46.0 |
| M31 | 1543745 | 487620 | 120.0 | 4.5 | 10/28/2019 | 40.40 | 6535.53 | 2.0 | 6575.93 | 80 | 6493.9 A | 70-120 | 41.6 |
| M32 | 1543176 | 487737 | 110.0 | 4.5 | --- | --- | --- | 2.0 | 6573.35 | 80 | 6491.4 A | 50-110 | --- |
| M33 | 1543040 | 487323 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6577.71 | 100 | 6475.7 A | 50-110 | --- |
| M34 | 1543608 | 487743 | 120.0 | 4.5 | --- | --- | --- | 2.0 | 6574.55 | 66 | 6506.6 A | 60-120 | --- |
| M35 | 1543889 | 487750 | 120.0 | 4.5 | 4/15/2014 | 35.13 | 6539.59 | 2.0 | 6574.72 | 71 | 6501.7 A | 60-120 | 37.9 |
| M36 | 1543993 | 487631 | 120.0 | 4.5 | 4/15/2014 | 36.56 | 6538.88 | 2.0 | 6575.44 | 72 | 6501.4 A | 60-120 | 37.4 |
| M37 | 1544120 | 487835 | 120.0 | 4.5 | 4/15/2014 | 38.37 | 6537.07 | 2.0 | 6575.44 | 73 | 6500.4 A | 60-120 | 36.6 |
| M38 | 1544319 | 487923 | 120.0 | 4.5 | 4/15/2014 | 37.91 | 6541.71 | 2.0 | 6579.62 | 79 | 6498.6 A | 60-120 | 43.1 |
| M39 | 1543950 | 488087 | 80.0 | 4.5 | --- | --- | --- | 2.0 | 6574.58 | 60 | 6512.6 A | 40-80 | --- |
| M40 | 1543775 | 487934 | 80.0 | 4.5 | --- | --- | --- | 2.0 | 6574.52 | 60 | 6512.5 A | 40-80 | --- |
| M41 | 1543398 | 487883 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6573.73 | 60 | 6511.7 A | 40-100 | --- |
| M43 | 1542858 | 487759 | 110.0 | 4.5 | --- | --- | --- | 2.0 | 6572.10 | 80 | 6490.1 A | 50-110 | --- |
| M44 | 1542722 | 487812 | 110.0 | 4.5 | --- | --- | --- | 2.0 | 6571.74 | 110 | 6459.7 A | 50-110 | --- |
| M45 | 1542593 | 487927 | 110.0 | 4.5 | --- | --- | --- | 2.0 | 6572.20 | 110 | 6460.2 A | 50-110 | --- |
| M46 | 1542504 | 488033 | 110.0 | 4.5 | --- | --- | --- | 2.0 | 6572.60 | 110 | 6460.6 A | 50-110 | --- |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M47 | 1542409 | 488130 | 110.0 | 4.5 | --- | --- | --- | 2.0 | 6571.88 | 110 | 6459.9 A | 50-110 | --- |
| M48 | 1542317 | 488226 | 110.0 | 4.5 | --- | --- | --- | 2.0 | 6572.83 | 100 | 6470.8 A | 50-110 | --- |
| MA | 1541290 | 487767 | 85.0 | 4.0 | 11/23/2020 | 44.90 | 6527.32 | 1.0 | 6572.22 | 85 | 6486.2 A | 70-85 | 41.1 |
| MB | 1541296 | 487512 | 90.0 | 4.0 | 3/3/2020 | 45.15 | 6526.91 | 1.0 | 6572.06 | 85 | 6486.1 A | 60-90 | 40.8 |
| MC | 1541304 | 487264 | 100.0 | 4.0 | 11/23/2020 | 46.45 | 6525.61 | 1.0 | 6572.06 | 95 | 6476.1 A | 70-100 | 49.5 |
| 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 | 11/23/2020 | 49.11 | 6523.17 | 1.0 | 6572.28 | 110 | 6461.3 A | 90-110 | 61.9 |
| 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 | 11/23/2020 | 53.40 | 6520.52 | 1.0 | 6573.92 | 110 | 6462.9 A | 90-110 | 57.6 |
| 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 | 11/23/2020 | 54.30 | 6518.64 | 1.8 | 6572.94 | 60 | 6511.1 A | 40-60 | 7.5 |
| MK | 1543373 | 486324 | 57.0 | 4.5 | 12/5/2011 | 59.75 | 6514.04 | 1.5 | 6573.79 | 92 | 6480.3 A | - | 33.8 |
| ML | 1543902 | 486691 | 76.0 | 5.0 | 11/23/2020 | 55.11 | 6517.59 | 2.3 | 6572.70 | 80 | 6490.4 A | 56-76 | 27.2 |
| 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 | 11/23/2020 | 63.92 | 6513.64 | 1.9 | 6577.56 | 42 | 6533.7 A | 23-63 | 0.0 |
| MQ | 1543173 | 486326 | 98.0 | 5.0 | 3/3/2020 | 64.60 | 6509.70 | 1.6 | 6574.30 | 88 | 6484.7 A | 58-98 | 25.0 |
| MU | 1544461 | 487143 | 80.0 | 5.0 | 11/23/2020 | 45.01 | 6529.18 | 1.5 | 6574.19 | 72 | 6500.7 A | 50-80 | 28.5 |
| MW | 1543802 | 486346 | 85.0 | 5.0 | 11/23/2020 | 64.80 | 6510.11 | 1.9 | 6574.91 | 83 | 6490.0 A | 35-85 | 20.1 |
| MX | 1541287 | 486244 | 103.0 | 5.0 | 8/19/2020 | 52.25 | 6516.36 | 1.7 | 6568.61 | 94 | 6472.9 A | 63-103 | 43.5 |
| MY | 1542200 | 486213 | 112.0 | 5.0 | 10/14/2020 | 57.72 | 6515.84 | 3.0 | 6573.56 | 102 | 6468.6 A | 72-112 | 47.3 |
| MZ | 1543485 | 486757 | 92.0 | 5.0 | 11/23/2020 | 66.92 | 6509.72 | 3.0 | 6576.64 | 84 | 6489.6 A | 60-92 | 20.1 |
| N | 1545101 | 489665 | 92.0 | 4.0 | 8/29/2019 | 41.60 | 6542.37 | 0.9 | 6583.97 | 80 | 6503.1 A | 54-94 | 39.3 |
| NA | 1545000 | 491488 | 91.4 | 5.0 | 8/29/2019 | 46.02 | 6544.96 | 1.1 | 6590.98 | 80 | 6509.9 A | 50-90 | 35.1 |
| NB | 1545000 | 491296 | 96.4 | 5.0 | 8/29/2019 | 48.45 | 6544.85 | 3.5 | 6593.30 | 80 | 6509.8 A | 50-90 | 35.0 |
| NC | 1545220 | 491282 | 95.0 | 4.0 | 11/11/2020 | 41.97 | 6543.86 | 0.8 | 6585.83 | 85 | 6500.0 A | 65-95 | 43.8 |
| ND | 1545927 | 494872 | 70.0 | 4.0 | 11/11/2020 | 40.40 | 6552.49 | 1.1 | 6592.89 | 65 | 6526.8 A | 50-70 | 25.7 |
| NE5 | 1544279 | 492332 | 156.8 | 5.0 | 6/30/2017 | 76.71 | 6590.29 | 3.2 | 6667.00 | 150 | --- T | 50-110 | --- |
| | | | | | | | | | | 150 | 6513.8 A | 135-155 | 76.5 |
| NW5 | 1544408 | 489433 | 149.8 | 5.0 | 5/29/2007 | 42.72 | 6614.86 | 2.7 | 6657.58 | 155 | --- T | 39-79 | --- |
| | | | | | | | | | | 155 | 6499.9 A | 119-159 | 115.0 |
| O | 1545060 | 492725 | 69.9 | 4.0 | 8/28/2019 | 40.48 | 6547.35 | 1.3 | 6587.83 | 77 | 6509.5 A | 40-70 | 37.8 |
| P | 1546691 | 491058 | 109.1 | 4.0 | 11/17/2020 | 40.33 | 6546.93 | 1.7 | 6587.26 | 107 | 6478.6 A | 82-112 | 68.4 |
| P1 | 1547017 | 491060 | 105.0 | 6.0 | 11/11/2020 | 40.32 | 6552.15 | 0.8 | 6592.47 | 105 | 6486.7 A | 60-105 | 65.5 |
| P2 | 1546555 | 490912 | 105.0 | 6.0 | 3/16/2020 | 42.40 | 6547.39 | 0.9 | 6589.79 | 105 | 6483.9 A | 60-105 | 63.5 |
| P3 | 1546159 | 490785 | 95.0 | 5.0 | 3/11/2020 | 42.60 | 6547.35 | 2.2 | 6589.95 | 85 | 6502.8 A | 55-95 | 44.6 |

## 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 | | | 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) | | | | | | |
| P4 | 1546504 | 491899 | 92.0 | 5.0 | 3/16/2020 | 39.10 | 6550.42 | 3.6 | 6589.52 | 84 | 6501.9 A | 52-92 | 48.5 |
| PM | 1541426 | 490292 | 81.9 | 4.0 | 1/12/2004 | 12.33 | 6555.09 | 1.8 | 6567.42 | --- | --- A | - | --- |
| PMW-1S | 1543104 | 488249 | 58.0 | 2.0 | --- | --- | --- | --- | 6575.81 | --- | --- A | 43-53 | --- |
| PMW-3S | 1542781 | 488318 | 73.0 | | | | | | 6575.07 | --- | --- A | 58-68 | --- |
| PMW-3D | 1542780 | | 92.0 | | | | | | 6575.05 | --- | --- A | 77-87 | --- |
| PMW-2D | 1542957 | 488282 | 76.0 | | | | | | 6575.35 | --- | --- A | 61-71 | --- |
| PMW-1D | 1543104 | 488249 | 73.0 | | | | | | 6575.81 | --- | --- A | 58-68 | --- |
| PMW-2S | 1542957 | 488282 | 61.0 | | | | | | 6575.31 | --- | --- A | 46-56 | --- |
| Q | 1548693 | 492153 | 98.3 | 4.0 | 5/13/2020 | 41.78 | 6552.04 | 2.3 | 6593.82 | 100 | 6491.5 A | 72-102 | 60.5 |
| R | 1550372 | 494514 | 85.0 | 4.0 | 3/17/2020 | 39.60 | 6564.43 | 0.3 | 6604.03 | 95 | 6508.7 A | 60-90 | 55.7 |
| S | 1543871 | 488816 | 72.2 | 4.0 | 11/23/2020 | 46.10 | 6535.07 | 2.0 | 6581.17 | 75 | 6504.2 A | 52-72 | 30.9 |
| S1 | 1543288 | 488401 | 85.0 | 2.0 | 12/28/2020 | 41.53 | 6533.66 | 5.3 | 6575.19 | 85 | 6484.9 A | 60-85 | 48.8 |
| S2 | 1543127 | 488299 | 100.0 | 3.0 | 12/28/2020 | 41.44 | 6532.28 | 2.0 | 6573.72 | 100 | 6471.7 A | 90-100 | 60.6 |
| S3 | 1542857 | 488714 | 122.6 | 5.0 | 11/23/2020 | 40.93 | 6533.85 | 6.2 | 6574.78 | 116 | 6452.6 A | 80-120 | 81.3 |
| S4 | 1543344 | 488359 | 112.4 | 5.0 | 11/23/2020 | 42.45 | 6532.84 | 2.3 | 6575.29 | 108 | 6465.0 A | 50-110 | 67.8 |
| S5 | 1543269 | 488923 | 115.0 | 5.0 | 12/28/2020 | 46.21 | 6528.48 | 1.0 | 6574.69 | 105 | 6468.7 A | 54-106 | 59.8 |
| S5R | 1543150 | 488938 | 115.0 | 5.0 | 11/14/2019 | 49.10 | 6531.39 | 1.9 | 6580.49 | 109 | 6469.6 A | 55-115 | 61.8 |
| 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 | 11/23/2020 | 43.16 | 6535.23 | 1.9 | 6578.39 | 70 | 6506.5 A | 48-78 | 28.7 |
| S12 | 1543297 | 488628 | 93.0 | 5.0 | 1/29/2020 | 46.05 | 6532.80 | 2.1 | 6578.85 | 80 | 6496.7 A | 53-93 | 36.1 |
| S14 | 1543120 | 488152 | 90.0 | 4.5 | 1/3/2018 | 38.80 | 6536.60 | 2.0 | 6575.40 | 90 | 6483.4 A | 50-90 | 53.2 |
| S15 | 1543320 | 488160 | 90.0 | 4.5 | 4/17/2014 | 33.68 | 6541.48 | 2.0 | 6575.16 | 90 | 6483.2 A | 50-90 | 58.3 |
| S18 | 1543216 | 488312 | 100.0 | 4.5 | 4/22/2014 | 32.73 | 6541.55 | 2.0 | 6574.28 | 100 | 6472.3 A | 60-100 | 69.3 |
| S19 | 1544172 | 488682 | 80.0 | 4.5 | 11/23/2020 | 42.93 | 6535.04 | 2.0 | 6577.97 | 55 | 6521.0 A | 40-80 | 14.1 |
| S20 | 1544463 | 488461 | 80.0 | 4.5 | 4/16/2014 | 30.59 | 6547.76 | 2.0 | 6578.35 | 80 | 6496.4 A | 40-80 | 51.4 |
| S21 | 1544896 | 488670 | 80.0 | 4.5 | 11/23/2020 | 41.92 | 6538.36 | 2.0 | 6580.28 | 46 | 6532.3 A | 40-80 | 6.1 |
| S22 | 1544169 | 488375 | 80.0 | 4.5 | 4/16/2014 | 30.29 | 6546.30 | 2.0 | 6576.59 | 80 | 6494.6 A | 40-80 | 51.7 |
| S23 | 1543920 | 488284 | 80.0 | 4.5 | 4/17/2014 | 31.07 | 6545.63 | 2.0 | 6576.70 | 80 | 6494.7 A | 40-80 | 50.9 |
| S24 | 1543735 | 488232 | 80.0 | 4.5 | 4/17/2014 | 31.89 | 6544.00 | 2.0 | 6575.89 | 80 | 6493.9 A | 40-80 | 50.1 |
| | | | | | | | | | | 80 | 6493.9 A | 40-80 | 50.1 |
| S25 | 1543524 | 488146 | 80.0 | 4.5 | 4/17/2014 | 33.26 | 6542.46 | 2.0 | 6575.72 | 80 | 6493.7 A | 40-80 | 48.7 |
| S26 | 1543224 | 487996 | 100.0 | 4.5 | 4/22/2014 | 32.37 | 6540.61 | 2.0 | 6572.98 | 100 | 6471.0 A | 60-100 | 69.6 |
| S27 | 1542993 | 488044 | 100.0 | 4.5 | 4/22/2014 | 32.68 | 6540.64 | 2.0 | 6573.32 | 100 | 6471.3 A | 60-100 | 69.3 |
| S28 | 1542769 | 488403 | 90.0 | 4.5 | 9/11/2014 | 34.77 | 6538.04 | 2.0 | 6572.81 | 90 | 6480.8 A | 50-90 | 57.2 |
| S32 | 1543815 | 488445 | 80.0 | 4.5 | --- | --- | --- | 2.0 | 6575.93 | --- | --- A | 40-80 | --- |

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S33 | 1543951 | 488570 | 80.0 | 4.5 | --- | --- | --- | 2.0 | 6576.24 | --- | --- A | 40-80 | --- |
| S34 | 1543064 | 488657 | 115.0 | 4.5 | --- | --- | --- | 2.0 | 6575.92 | --- | --- A | 55-115 | --- |
| S36 | 1542755 | 488559 | 90.0 | 4.5 | 4/22/2014 | 34.86 | 6540.77 | 2.0 | 6575.63 | 90 | 6483.6 A | 50-90 | 57.1 |
| S37 | 1542609 | 488516 | 90.0 | 4.5 | 9/11/2014 | 34.24 | 6538.05 | 2.0 | 6572.29 | 90 | 6480.3 A | 50-90 | 57.8 |
| S38 | 1542443 | 488727 | 90.0 | 4.5 | 9/11/2014 | 34.90 | 6538.06 | 2.0 | 6572.96 | 90 | 6481.0 A | 50-90 | 57.1 |
| S39 | 1542596 | 488744 | 90.0 | 4.5 | 4/8/2014 | 34.02 | 6540.41 | 2.0 | 6574.43 | 90 | 6482.4 A | 50-90 | 58.0 |
| S40 | 1542934 | 488778 | 115.0 | 4.5 | --- | --- | --- | 2.0 | 6575.73 | --- | --- A | 55-115 | --- |
| SA | 1543122 | 488811 | 123.7 | 5.0 | 12/28/2020 | 47.77 | 6532.54 | 1.0 | 6580.31 | 115 | 6464.3 A | 100-130 | 68.2 |
| SB | 1543371 | 488811 | 125.0 | 5.0 | 3/17/2020 | 49.05 | 6532.04 | 0.9 | 6581.09 | 115 | 6465.2 A | 100-130 | 66.9 |
| 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 | 2/23/2009 | 41.50 | 6536.81 | 0.6 | 6578.31 | 107 | 6470.7 A | 50-110 | 66.1 |
| SD4 | 1543497 | 488556 | 95.0 | 5.0 | 2/23/2009 | 46.17 | 6532.60 | 1.1 | 6578.77 | 95 | 6482.7 A | 45-95 | 49.9 |
| SDR-2D | 1543585 | 488165 | 95.0 | 2.0 | --- | --- | --- | --- | 6574.67 | --- | --- A | 75-95 | --- |
| SDR-4S | 1543570 | 488179 | 70.0 | | | | | | 6574.32 | --- | --- A | 55-70 | --- |
| SDR-4D | | | 95.0 | | | | | | 6574.39 | --- | --- A | 55-70 | --- |
| SDR-3S | 1543583 | 488176 | 70.0 | | | | | | 6574.23 | --- | --- A | 55-70 | --- |
| SDR-2S | 1543585 | 488165 | | | | | | | 6574.67 | --- | --- A | 55-70 | --- |
| SDR-1S | 1543571 | 488169 | | | | | | | 6574.22 | --- | --- A | 55-70 | --- |
| SDR-3D | 1543583 | 488176 | 95.0 | | | | | | 6574.24 | --- | --- A | 75-95 | --- |
| SE | 1543301 | 488550 | 111.8 | 5.0 | 10/4/2017 | 65.80 | 6512.19 | 0.5 | 6577.99 | 88 | 6489.5 A | 50-90 | 22.7 |
| SE4 | 1543308 | 488560 | 105.3 | 2.0 | 2/23/2009 | 45.78 | 6532.22 | --- | 6578.00 | --- | --- A | - | --- |
| SE6 | 1543244 | 488615 | 92.0 | 5.0 | 1/29/2020 | 41.70 | 6537.21 | 2.3 | 6578.91 | --- | --- A | - | --- |
| SIW-D | 1543575 | 488174 | 95.0 | 2.0 | --- | --- | --- | --- | 6573.40 | --- | --- A | 75-95 | --- |
| SIW-S | 1543578 | 488169 | 75.0 | 2.0 | --- | --- | --- | --- | 6573.54 | --- | --- A | 55-75 | --- |
| SM | 1543748 | 488566 | 86.0 | 5.0 | 12/28/2020 | 44.93 | 6533.81 | 0.7 | 6578.74 | --- | --- A | - | --- |
| SMW-5D | 1543539 | 488159 | 95.0 | 2.0 | --- | --- | --- | --- | 6574.29 | --- | --- A | 75-95 | --- |
| SMW-5S | 1543538 | | 70.0 | | | | | | 6574.31 | --- | --- A | 55-70 | --- |
| SMW-4S | 1543570 | 488179 | | | | | | | 6574.33 | --- | --- A | 55-70 | --- |
| SMW-4D | | | 95.0 | | | | | | | --- | --- A | 75-95 | --- |
| SMW-3S | 1543565 | 488161 | 70.0 | | | | | | 6574.52 | --- | --- A | 55-70 | --- |
| SMW-3D | | | 95.0 | | | | | | 6574.51 | --- | --- A | 75-95 | --- |
| SMW-2 | 1543564 | 488184 | 85.0 | | | | | | 6574.23 | --- | --- A | 65-85 | --- |
| SMW-1 | 1543570 | 488164 | | | | | | | 6574.39 | --- | --- A | 65-85 | --- |
| SMW-6 | 1543596 | 488183 | | | | | | | 6574.32 | --- | --- A | 65-85 | --- |
| SN | 1543752 | 488716 | 67.5 | 4.0 | 12/28/2020 | 44.53 | 6534.73 | 1.1 | 6579.26 | --- | --- A | - | --- |
| SO | 1543652 | 488381 | 92.3 | 5.0 | 12/28/2020 | 45.53 | 6533.26 | 0.6 | 6578.79 | --- | --- A | - | --- |
| SP | 1543630 | 488531 | 94.4 | 4.0 | 12/28/2020 | 45.27 | 6533.39 | 2.0 | 6578.66 | --- | --- A | - | --- |
| SQ | 1543507 | 488814 | 95.0 | 5.0 | 6/11/2015 | 42.25 | 6536.95 | 0.9 | 6579.20 | 95 | 6483.3 A | 55-95 | 53.7 |
| SR | 1543611 | 488669 | 95.0 | 5.0 | 9/21/2007 | 47.54 | 6531.65 | 0.8 | 6579.19 | 95 | 6483.4 A | 50-90 | 48.3 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SS | 1543374 | 488666 | 101.0 | 5.0 | 12/28/2020 | 47.38 | 6531.00 | 1.2 | 6578.38 | 90 | 6487.2 A | 51-101 | 43.8 |
| SSR | 1543374 | 488694 | 110.0 | 5.0 | 3/17/2020 | 47.60 | 6531.37 | 1.7 | 6578.97 | --- | --- A | - | --- |
| ST | 1543215 | 488688 | 97.0 | 5.0 | 12/28/2020 | 47.12 | 6532.19 | 2.2 | 6579.31 | 96 | 6481.1 A | 55-97 | 51.1 |
| * 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 | 12/9/2019 | 47.23 | 6533.49 | 2.6 | 6580.72 | 106 | 6472.1 A | 35-115 | 61.4 |
| SV | 1543676 | 488813 | 78.2 | 6.0 | 3/17/2020 | 46.70 | 6532.55 | 1.7 | 6579.25 | 100 | 6477.6 A | 55-105 | 55.0 |
| SW | 1543783 | 488812 | 81.9 | 6.0 | 6/11/2019 | 45.70 | 6535.59 | 2.9 | 6581.29 | 75 | 6503.4 A | 35-80 | 32.2 |
| SX | 1544510 | 489025 | 45.0 | 5.0 | --- | --- | --- | 1.0 | 6581.49 | 40 | 6540.5 A | 20-40 | --- |
| SZ | 1544367 | 488833 | 62.6 | 5.0 | 11/23/2020 | 43.91 | 6537.56 | 2.2 | 6581.47 | 60 | 6519.3 A | 40-70 | 18.3 |
| T | 1542536 | 492260 | 70.2 | 4.0 | 12/10/2019 | 39.10 | 6540.13 | 2.4 | 6579.23 | 68 | 6508.8 A | 61-71 | 31.3 |
| T1 | 1543285 | 490027 | 171.0 | 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 | 6/24/2020 | 98.00 | 6566.82 | 1.6 | 6664.82 | 180 | 6483.2 A | 100-186 | 83.6 |
| T4 | 1543340 | 489699 | 205.0 | 5.0 | 7/27/2015 | 114.60 | 6543.14 | 2.9 | 6657.74 | 175 | 6479.8 A | 145-205 | 63.3 |
| T5 | 1543307 | 490289 | 182.0 | 5.0 | 7/27/2015 | 113.65 | 6543.68 | 3.1 | 6657.33 | 151 | 6503.2 A | 122-182 | 40.4 |
| T6 | 1543282 | 490655 | 160.0 | 5.0 | 5/18/2015 | 112.94 | 6545.83 | 2.9 | 6658.77 | 156 | 6499.9 A | 130-160 | 46.0 |
| T7 | 1543272 | 491484 | 160.0 | 5.0 | 3/25/2020 | 121.10 | 6538.57 | 2.0 | 6659.67 | 142 | 6515.7 A | 130-160 | 22.9 |
| T8 | 1543296 | 491914 | 162.0 | 5.0 | 3/25/2020 | 122.12 | 6539.49 | 2.6 | 6661.61 | 158 | 6501.0 A | 132-162 | 38.5 |
| T9 | 1543347 | 492337 | 141.0 | 5.0 | 3/26/2020 | 121.07 | 6542.88 | 3.3 | 6663.95 | 138 | 6522.7 A | 121-141 | 20.2 |
| T10 | 1543434 | 492791 | 148.0 | 5.0 | 3/25/2020 | 104.61 | 6555.35 | 2.3 | 6659.96 | 142 | 6515.7 A | 108-148 | 39.7 |
| T11 | 1544585 | 489887 | 193.0 | 5.0 | 3/29/2017 | 114.42 | 6542.39 | 2.7 | 6656.81 | 160 | 6494.1 A | 113-193 | 48.3 |
| T12 | 1544583 | 490317 | 200.0 | 5.0 | 3/25/2020 | 106.14 | 6551.09 | 2.5 | 6657.23 | 170 | 6484.7 A | 120-200 | 66.4 |
| T13 | 1544534 | 490619 | 160.0 | 5.0 | --- | --- | --- | --- | 6657.37 | 160 | --- A | 120-160 | --- |
| T14 | 1544565 | 491071 | 155.0 | 5.0 | 11/25/2014 | 112.64 | 6547.49 | --- | 6660.13 | 155 | --- A | 125-155 | --- |
| T15 | 1544480 | 491953 | 150.0 | 5.0 | 3/25/2020 | 120.91 | 6544.38 | --- | 6665.29 | 150 | --- A | 120-150 | --- |
| T16 | 1544276 | 492718 | 140.0 | 5.0 | 3/12/2018 | 113.56 | 6546.42 | 2.0 | 6659.98 | 132 | 6526.0 A | 120-140 | 20.4 |
| T17 | 1544008 | 489430 | 183.0 | 5.0 | 5/14/2015 | 110.83 | 6546.08 | 2.6 | 6656.91 | 170 | 6484.3 A | 143-183 | 61.8 |
| T18 | 1543977 | 490333 | 195.0 | 5.0 | 5/15/2015 | 117.78 | 6547.38 | 2.9 | 6665.16 | 162 | 6500.3 A | 115-195 | 47.1 |
| T19 | 1543958 | 490722 | 167.0 | 5.0 | 6/24/2020 | 128.20 | 6539.56 | 2.5 | 6667.76 | 162 | 6503.3 A | 137-167 | 36.3 |
| T20 | 1543935 | 491048 | 170.0 | 5.0 | 12/11/2018 | 130.86 | 6539.83 | 1.5 | 6670.69 | 162 | 6507.2 A | 140-170 | 32.6 |
| T21 | 1543951 | 491882 | 170.0 | 5.0 | 3/8/2018 | 127.99 | 6542.01 | 1.3 | 6670.00 | 163 | 6505.7 A | 140-170 | 36.3 |
| T22 | 1543876 | 492311 | 165.0 | 5.0 | 3/17/2020 | 124.10 | 6543.09 | 2.1 | 6667.19 | 160 | 6505.1 A | 120-165 | 38.0 |
| T23 | 1543901 | 492805 | 140.0 | 5.0 | 6/25/2020 | 113.00 | 6548.11 | --- | 6661.11 | 140 | --- A | 120-140 | --- |
| T24 | 1543387 | 489494 | 200.0 | 4.5 | 1/14/2020 | 122.60 | 6534.43 | 2.0 | 6657.03 | --- | --- A | 140-200 | --- |
| T25 | 1543352 | 489996 | 200.0 | 4.5 | 1/14/2020 | 122.80 | 6534.54 | 2.0 | 6657.34 | --- | --- A | 140-200 | --- |
| T26 | 1543567 | 489550 | 200.0 | 4.5 | 1/15/2020 | 121.90 | 6534.76 | 2.0 | 6656.66 | --- | --- A | 140-200 | --- |
| T27 | 1543474 | 489837 | 200.0 | 4.5 | 1/15/2020 | 121.80 | 6535.34 | 2.0 | 6657.14 | --- | --- A | 140-200 | --- |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T28 | 1543484 | 490145 | 200.0 | 4.5 | 1/15/2020 | 121.75 | 6536.96 | 2.0 | 6658.71 | --- | --- A | 140-200 | --- |
| T29 | 1543774 | 489375 | 200.0 | 4.5 | 1/15/2020 | 119.20 | 6537.51 | 2.0 | 6656.71 | --- | --- A | 140-200 | --- |
| T30 | 1543663 | 489972 | 200.0 | 4.5 | 1/16/2020 | 123.00 | 6536.62 | 2.0 | 6659.62 | --- | --- A | 140-200 | --- |
| T31 | 1543789 | 489881 | 200.0 | 4.5 | 1/15/2020 | 122.10 | 6536.93 | 2.0 | 6659.03 | --- | --- A | 140-200 | --- |
| T32 | 1543801 | 490134 | 200.0 | 4.5 | 10/28/2019 | 123.70 | 6537.91 | 2.0 | 6661.61 | --- | --- A | 140-200 | --- |
| T33 | 1543872 | 489545 | 200.0 | 4.5 | 1/28/2020 | 79.45 | 6576.34 | 2.0 | 6655.79 | --- | --- A | 140-200 | --- |
| T34 | 1543888 | 489806 | 200.0 | 4.5 | 8/12/2014 | 115.45 | 6544.94 | 2.0 | 6660.39 | --- | --- A | 140-200 | --- |
| T35 | 1543992 | 489689 | 200.0 | 4.5 | --- | --- | --- | 2.0 | 6659.33 | --- | --- A | 140-200 | --- |
| T36 | 1543735 | 489688 | 170.0 | 5.0 | 1/28/2020 | 119.30 | 6536.14 | 2.0 | 6655.44 | 170 | 6483.4 A | 130-170 | 52.7 |
| T37 | 1544089 | 489545 | 200.0 | 4.5 | 3/30/2017 | 116.13 | 6540.39 | 2.0 | 6656.52 | --- | --- A | 140-200 | --- |
| T38 | 1544089 | 489832 | 200.0 | 4.5 | --- | --- | --- | 2.0 | 6658.46 | --- | --- A | 140-200 | --- |
| T39 | 1544498 | 491669 | 150.0 | 5.0 | 3/12/2018 | 120.00 | 6545.31 | --- | 6665.31 | 150 | --- A | 120-150 | --- |
| T40 | 1543819 | 491466 | 170.0 | 5.0 | 3/8/2018 | 130.18 | 6540.09 | 2.3 | 6670.27 | 165 | 6503.0 A | 140-170 | 37.1 |
| T41 | 1543278 | 491079 | 160.0 | 5.0 | 6/24/2020 | 102.95 | 6557.01 | 3.2 | 6659.96 | 155 | 6501.8 A | 130-160 | 55.3 |
| T42 | 1544077 | 490112 | 200.0 | 4.5 | 6/5/2014 | 113.69 | 6546.32 | 2.0 | 6660.01 | --- | --- A | 140-200 | --- |
| T43 | 1544209 | 489385 | 180.0 | 4.5 | 1/28/2020 | 119.85 | 6537.67 | 2.0 | 6657.52 | --- | --- A | 120-180 | --- |
| T44 | 1544204 | 489707 | --- | 4.5 | 6/2/2014 | 110.76 | 6546.55 | 2.0 | 6657.31 | --- | --- A | - | --- |
| T45 | 1544183 | 489914 | 200.0 | 4.5 | 10/28/2019 | 118.40 | 6539.66 | 2.0 | 6658.06 | --- | --- A | 140-200 | --- |
| T46 | 1544210 | 490262 | 200.0 | 4.5 | 6/3/2014 | 114.24 | 6546.41 | 2.0 | 6660.65 | --- | --- A | 140-200 | --- |
| T47 | 1544317 | 489544 | 180.0 | 4.5 | 1/29/2020 | 118.75 | 6538.46 | 2.0 | 6657.21 | --- | --- A | 120-180 | --- |
| T48 | 1544291 | 489795 | 180.0 | 4.5 | 1/28/2020 | 119.50 | 6538.06 | 2.0 | 6657.56 | --- | --- A | 120-180 | --- |
| T49 | 1544304 | 490100 | 200.0 | 4.5 | 6/3/2014 | 111.80 | 6546.59 | 2.0 | 6658.39 | --- | --- A | 140-200 | --- |
| T50 | 1544416 | 489707 | 200.0 | 4.5 | 3/30/2017 | 114.88 | 6541.62 | 2.0 | 6656.50 | --- | --- A | 140-200 | --- |
| T51 | 1544397 | 489914 | 200.0 | 4.5 | 3/14/2018 | 121.18 | 6536.16 | 2.0 | 6657.34 | --- | --- A | 140-200 | --- |
| T52 | 1544456 | 490208 | 200.0 | 4.5 | 6/3/2014 | 109.87 | 6548.13 | 2.0 | 6658.00 | --- | --- A | 140-200 | --- |
| T53 | 1544504 | 489559 | 175.0 | 4.5 | 1/28/2020 | 121.50 | 6535.48 | 2.0 | 6656.98 | --- | --- A | 115-175 | --- |
| T54 | 1544523 | 489796 | 200.0 | 4.5 | 6/24/2020 | 123.80 | 6533.30 | 2.0 | 6657.10 | --- | --- A | 140-200 | --- |
| T55 | 1544592 | 490063 | 195.0 | 4.5 | 6/3/2014 | 110.87 | 6546.79 | 2.0 | 6657.66 | --- | --- A | 135-195 | --- |
| T56 | 1543447 | 490489 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6661.39 | 180 | 6479.4 A | 140-180 | --- |
| T57 | 1543470 | 490805 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6666.15 | 160 | 6504.2 A | 120-160 | --- |
| T58 | 1543494 | 491008 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6666.59 | 160 | 6504.6 A | 120-160 | --- |
| T59 | 1543426 | 491247 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6668.00 | 160 | 6506.0 A | 120-160 | --- |
| T60 | 1543666 | 490362 | 200.0 | 4.5 | 8/8/2014 | 116.76 | 6545.10 | 2.0 | 6661.86 | --- | --- A | 140-200 | --- |
| T61 | 1543600 | 490687 | 160.0 | 4.5 | 8/13/2014 | 108.93 | 6559.92 | 2.0 | 6668.85 | --- | --- A | 100-160 | --- |
| T62 | 1543688 | 491006 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6668.34 | 180 | 6486.3 A | 140-180 | --- |
| T63 | 1543628 | 491243 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6669.54 | 180 | 6487.5 A | 140-180 | --- |

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T64 | 1543797 | 490434 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6665.29 | 180 | 6483.3 A | 140-180 | --- |
| T65 | 1543743 | 490532 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6664.86 | 180 | 6482.9 A | 140-180 | --- |
| T66 | 1543821 | 490837 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6669.08 | 180 | 6487.1 A | 140-180 | --- |
| T67 | 1543791 | 491245 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6670.75 | 180 | 6488.8 A | 140-180 | --- |
| T68 | 1544082 | 490569 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6666.45 | 180 | 6484.5 A | 140-180 | --- |
| T69 | 1544069 | 490856 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6668.52 | 180 | 6486.5 A | 140-180 | --- |
| T70 | 1544036 | 491217 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6670.67 | 160 | 6508.7 A | 120-160 | --- |
| T71 | 1544200 | 490712 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6667.54 | 160 | 6505.5 A | 120-160 | --- |
| T72 | 1544137 | 491055 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6670.03 | 160 | 6508.0 A | 120-160 | --- |
| T73 | 1544137 | 491383 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6669.85 | 160 | 6507.9 A | 120-160 | --- |
| T74 | 1544306 | 490480 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6662.57 | 160 | 6500.6 A | 120-160 | --- |
| T75 | 1544255 | 490911 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6669.55 | 160 | 6507.6 A | 120-160 | --- |
| T76 | 1544257 | 491240 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6669.33 | 160 | 6507.3 A | 120-160 | --- |
| T77 | 1544383 | 490801 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6664.51 | 160 | 6502.5 A | 120-160 | --- |
| T78 | 1544369 | 491087 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6667.13 | 160 | 6505.1 A | 120-160 | --- |
| T79 | 1544335 | 491374 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6668.27 | 160 | 6506.3 A | 120-160 | --- |
| T80 | 1544482 | 490953 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6663.14 | 160 | 6501.1 A | 120-160 | --- |
| T81 | 1544470 | 491197 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6664.98 | 160 | 6503.0 A | 120-160 | --- |
| T82 | 1544563 | 490497 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6657.66 | 160 | 6495.7 A | 120-160 | --- |
| T83 | 1544575 | 490845 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6660.72 | 160 | 6498.7 A | 120-160 | --- |
| T84 | 1544531 | 491374 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6662.09 | 160 | 6500.1 A | 120-160 | --- |
| T85 | 1543427 | 491712 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6667.09 | 160 | 6505.1 A | 120-160 | --- |
| T86 | 1543472 | 492111 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6668.52 | 160 | 6506.5 A | 120-160 | --- |
| T87 | 1543565 | 491471 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6668.18 | 160 | 6506.2 A | 120-160 | --- |
| T88 | 1543629 | 491628 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6670.12 | 160 | 6508.1 A | 120-160 | --- |
| T89 | 1543622 | 491892 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6669.63 | 160 | 6507.6 A | 120-160 | --- |
| T90 | 1543637 | 492287 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6669.67 | 160 | 6507.7 A | 120-160 | --- |
| T91 | 1543661 | 492486 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6666.41 | 160 | 6504.4 A | 120-160 | --- |
| T92 | 1543702 | 491364 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6670.13 | 160 | 6508.1 A | 120-160 | --- |
| T93 | 1543811 | 491695 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6671.90 | 160 | 6509.9 A | 120-160 | --- |
| T94 | 1543752 | 492100 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6670.22 | 160 | 6508.2 A | 120-160 | --- |
| T95 | 1543913 | 492578 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6664.51 | 160 | 6502.5 A | 120-160 | --- |
| T96 | 1544023 | 491551 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6670.17 | 160 | 6508.2 A | 120-160 | --- |
| T97 | 1544004 | 491715 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6671.69 | 160 | 6509.7 A | 120-160 | --- |
| T98 | 1544036 | 492123 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6671.69 | 160 | 6509.7 A | 120-160 | --- |
| T99 | 1544203 | 491534 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6669.25 | 160 | 6507.3 A | 120-160 | --- |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T100 | 1544153 | 491758 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6669.13 | 160 | 6507.1 A | 120-160 | --- |
| T101 | 1544222 | 491911 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6668.43 | 160 | 6506.4 A | 120-160 | --- |
| T102 | 1544203 | 492143 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6669.85 | 160 | 6507.9 A | 120-160 | --- |
| T103 | 1544056 | 492413 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6666.69 | 160 | 6504.7 A | 120-160 | --- |
| T104 | 1544412 | 491511 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6666.09 | 160 | 6504.1 A | 120-160 | --- |
| T105 | 1544289 | 491678 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6668.99 | 160 | 6507.0 A | 120-160 | --- |
| T106 | 1544369 | 491838 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6667.00 | 160 | 6505.0 A | 120-160 | --- |
| T107 | 1544209 | 492576 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6662.80 | 160 | 6500.8 A | 120-160 | --- |
| T108 | 1544441 | 492235 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6664.75 | 160 | 6502.8 A | 120-160 | --- |
| T109 | 1544366 | 492536 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6662.90 | 160 | 6500.9 A | 120-160 | --- |
| T110 | 1544100 | 492943 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6660.29 | 160 | 6498.3 A | 120-160 | --- |
| T111 | 1543706 | 492939 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6660.29 | 160 | 6498.3 A | 120-160 | --- |
| TA | 1542471 | 492426 | 62.4 | 5.0 | 12/10/2019 | 39.39 | 6540.91 | 2.4 | 6580.30 | 55 | 6522.9 A | 35-65 | 18.0 |
| TB | 1542351 | 492616 | 64.4 | 5.0 | 9/26/2017 | 39.20 | 6544.37 | 1.9 | 6583.57 | 55 | 6526.7 A | 35-65 | 17.7 |
| TDR-2D | 1543240 | 488239 | 85.0 | 2.0 | --- | --- | --- | --- | 6576.28 | --- | --- A | 70-80 | --- |
| TDR-5S | 1542852 | 488302 | 59.0 | | | | | | 6574.71 | --- | --- A | 44-54 | --- |
| TDR-5D | | 488303 | 87.0 | | | | | | | --- | --- A | 62-82 | --- |
| TDR-4S | 1543060 | 488258 | 60.5 | | | | | | 6575.12 | --- | --- A | 45.5-55. | --- |
| TDR-4D | | 488259 | 75.5 | | | | | | | --- | --- A | 60.5-70. | --- |
| TDR-3S | 1543130 | 488284 | 59.0 | | | | | | 6576.15 | --- | --- A | 44-54 | --- |
| TDR-2S | 1543240 | 488240 | 67.0 | | | | | | 6576.07 | --- | --- A | 52-62 | --- |
| TDR-1S | 1543397 | 488249 | 59.0 | | | | | | 6576.86 | --- | --- A | 44-54 | --- |
| TDR-1D | | | 83.0 | | | | | | | --- | --- A | 68-78 | --- |
| TDR-3D | 1543130 | 488284 | 74.0 | | | | | | 6576.16 | --- | --- A | 59-69 | --- |
| W | 1542302 | 487297 | 99.3 | 4.0 | 12/6/2018 | 44.00 | 6528.14 | 0.3 | 6572.14 | 117 | 6454.8 A | 58-118 | 73.3 |
| W2 | 1542251 | 486654 | 79.1 | 4.0 | 3/2/1998 | 56.21 | 6515.29 | 0.9 | 6571.50 | --- | --- A | - | --- |
| WME-9 | 1540825 | 492081 | 73.2 | --- | 12/13/2019 | 57.38 | 6543.44 | 2.0 | 6600.82 | --- | --- A | - | --- |
| WME-18 | 1544138 | 489665 | 154.0 | 4.0 | --- | --- | --- | 2.6 | 6659.12 | --- | --- A | 149-154 | --- |
| WME-19 | 1543415 | 490033 | 138.0 | | | | | 1.9 | 6659.43 | --- | --- A | 133-138 | --- |
| WME-10 | 1540988 | 491910 | 76.7 | | 12/13/2019 | 60.54 | 6542.29 | 2.0 | 6602.83 | --- | --- A | - | --- |
| WME-20 | 1543363 | 491802 | 154.0 | 4.0 | --- | --- | --- | 3.1 | 6665.08 | --- | --- A | 149-154 | --- |
| WME-21 | 1540798 | 491855 | 72.0 | | | | | 2.7 | 6600.15 | --- | --- A | 67-72 | --- |
| WME-22 | 1541258 | 491434 | 74.0 | | | | | 2.9 | 6603.44 | --- | --- A | 69-74 | --- |
| WN4 | 1543958 | 489961 | 142.4 | 5.0 | 7/6/2011 | 53.00 | 6609.78 | 3.0 | 6662.78 | 165 | --- T | 40-100 | --- |
| | | | | | | | | | | 165 | 6494.8 A | 50-190 | 115.0 |
| 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 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 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 | 11/10/2008 | 26.40 | 6546.20 | 0.4 | 6572.60 | 100 | 6472.2 A | 50-100 | 74.0 |
| 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 | 11/23/2020 | 29.45 | 6538.74 | 1.1 | 6568.19 | 85 | 6482.1 A | 55-85 | 56.6 |
| 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 | 10/12/2020 | 33.10 | 6538.51 | 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 | 4/16/2012 | 39.61 | 6547.33 | 2.5 | 6586.94 | 51 | 6533.4 A | 16-56 | 13.9 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 4/16/2012 | 38.22 | 6546.57 | 2.3 | 6584.79 | 47 | 6535.5 A | 22-47 | 11.1 |
| 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 | 12/11/2019 | 37.85 | 6548.23 | 2.9 | 6586.08 | 49 | 6534.2 A | 37-57 | 14.0 |
| X19 | 1544753 | 493437 | 63.0 | 5.0 | 11/17/2006 | 32.46 | 6552.74 | 4.2 | 6585.20 | 56 | 6525.1 A | 33-63 | 27.7 |
| X20 | 1544855 | 493256 | 71.0 | 5.0 | 4/16/2012 | 38.54 | 6547.19 | 5.0 | 6585.73 | 64 | 6516.8 A | 31-71 | 30.4 |
| 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 | 11/17/2006 | 39.75 | 6545.55 | 6.0 | 6585.30 | 64 | 6515.4 A | 31-71 | 30.2 |
| 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 |
| XDR-1 | 1544450 | 493758 | 45.0 | 2.0 | --- | --- | --- | --- | 6585.28 | --- | --- A | 35-45 | --- |
| XDR-2 | 1544459 | | | | | | | | 6585.44 | --- | --- A | 35-45 | --- |
| XDR-3 | 1544456 | 493767 | | | | | | | 6585.37 | --- | --- A | 35-45 | --- |
| XDR-4 | 1544447 | | | | | | | | 6585.41 | --- | --- A | 35-45 | --- |
| XIW | 1544453 | 493762 | 45.0 | 4.0 | --- | --- | --- | --- | 6583.09 | --- | --- A | 35-45 | --- |
| XMW-6 | 1544465 | 493778 | 45.0 | 3.0 | --- | --- | --- | --- | 6585.57 | --- | --- A | 35-45 | --- |
| XMW-5 | 1544468 | 493746 | | 2.0 | | | | | 6585.31 | --- | --- A | 35-45 | --- |
| XMW-4 | 1544438 | 493764 | | | | | | | 6585.39 | --- | --- A | 35-45 | --- |
| XMW-3 | 1544442 | 493746 | | | | | | | 6585.21 | --- | --- A | 35-45 | --- |
| XMW-1 | 1544452 | | | | | | | | 6585.26 | --- | --- A | 35-45 | --- |
| XMW-2 | 1544451 | 493731 | | | | | | | 6585.57 | --- | --- A | 35-45 | --- |
| 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 |
| | | | | | | | | | | 68 | 6500.6 A | 60-70 | 63.6 |

Note: A = Alluvial Aquifer
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 | 1537459 | 489882 | 105.0 | 6.0 | 6/27/2019 | 38.00 | 6521.66 | 0.0 | 6559.66 | 75 | 6484.7 A | 90-105 | 37.0 |
| 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 | 1537925 | 490234 | --- | --- | 4/27/1994 | 35.25 | 6530.75 | 0.0 | 6566.00 | --- | --- A | - | --- |
| 0421 | 1538450 | 491100 | 88.0 | 5.0 | 7/11/2019 | 43.20 | 6528.80 | 0.9 | 6572.00 | 92 | 6479.1 A | 72-102 | 49.7 |
| 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 | 1538227 | 490806 | --- | --- | --- | --- | --- | 0.0 | 6570.00 | --- | --- A | - | --- |
| 0425 | 1538188 | 490631 | 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 | 9/20/2012 | 33.61 | 6536.39 | 0.0 | 6570.00 | 81 | 6489.0 A | 62-120 | 47.4 |
| 0428 | 1538277 | 490391 | 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 | - | --- |
| | | | | | | | | | | 72 | 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 |
| | | | | | | | | | | 60 | 6450.0 U | 125-130 | 83.0 |
| 0432 | 1538210 | 489840 | --- | --- | --- | --- | --- | 0.0 | 6565.00 | --- | --- A | - | --- |
| 0433 | 1538220 | 489620 | 90.0 | 4.0 | 5/2/1997 | 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 | 1537933 | 490801 | 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 | 4.0 | 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 | 1537830 | 488960 | 110.0 | 6.0 | 9/8/1983 | 41.28 | 6518.72 | 0.0 | 6560.00 | 60 | 6500.0 U | 60-95 | 18.7 |
| | | | | | | | | | | 60 | 6500.0 A | 60-95 | 18.7 |
| 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 |
| | | | | | | | | | | 80 | 6430.0 U | 120-142 | 96.8 |
| 0448 | 1537400 | 489100 | --- | --- | --- | --- | --- | 0.0 | 6561.00 | --- | --- A | - | --- |
| 0450 | 1537448 | 490763 | --- | 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 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0453 | 1538471 | 490297 | 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 | - | --- |
| 0455 | 1537804 | 490737 | 0.0 | --- | --- | --- | --- | --- | --- | --- | --- A | - | --- |
| 0456 | 1538240 | 490060 | 300.0 | 5.0 | --- | --- | --- | --- | 6559.00 | --- | --- A | - | --- |
| SUB1 | 1537620 | 489100 | --- | 4.0 | 4/30/2013 | 32.28 | 6528.72 | 0.0 | 6561.00 | --- | --- A | - | --- |
| SUB2 | 1537392 | 490370 | --- | 4.0 | 7/20/2020 | 42.90 | 6524.67 | 0.0 | 6567.57 | --- | --- A | - | --- |
| SUB3 | 1538280 | 489420 | 84.0 | 6.0 | 5/12/2020 | 40.03 | 6517.04 | 0.0 | 6557.07 | 72 | 6485.1 A | 56-72 | 32.0 |
| 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** | | | | | | | |
| 0482 | 1536981 | 489579 | 260.0 | 5.0 | 5/14/2014 | 46.60 | 6516.06 | 0.0 | 6562.66 | 80 | 6482.7 A | 220-260 | 33.4 |
| | | | | | | | | | | 80 | 6352.7 M | 220-260 | 163.4 |
| 0483 | 1536586 | 489753 | 280.0 | 5.0 | 4/29/2019 | 41.45 | 6521.21 | 0.0 | 6562.66 | 40 | 6522.7 A | - | 0.0 |
| | | | | | | | | | | 40 | 6497.7 U | - | 23.5 |
| | | | | | | | | | | 40 | 6326.7 M | 270-300 | 194.5 |
| 0490 | 1536553 | 489752 | 63.0 | 4.0 | 6/3/2019 | 45.15 | 6517.27 | 0.0 | 6562.42 | 75 | 6487.4 A | 20-80 | 29.8 |
| 0491 | 1537031 | 489658 | 63.0 | 4.0 | 9/18/2014 | 36.87 | 6525.75 | 0.0 | 6562.62 | 40 | 6522.6 A | 30-63 | 3.1 |
| 0492 | 1537220 | 489280 | 60.0 | 4.0 | 3/15/2011 | 29.00 | 6531.68 | 1.2 | 6560.68 | 55 | 6504.5 A | 40-60 | 27.2 |
| 0495 | 1537402 | 491135 | --- | --- | --- | --- | --- | 0.0 | 6571.00 | --- | --- A | - | --- |
| 0496 | 1534650 | 489603 | 93.0 | 5.0 | 3/25/2019 | 52.04 | 6510.48 | 1.6 | 6562.52 | 86 | 6474.9 A | 53-93 | 35.6 |
| 0497 | 1535039 | 489503 | 94.0 | 5.0 | 11/25/2020 | 49.80 | 6512.82 | 2.0 | 6562.62 | 89 | 6471.6 A | 64-94 | 41.2 |
| 0498 | 1534661 | 488953 | 150.0 | 6.0 | 4/9/2019 | 54.23 | 6506.36 | 2.0 | 6560.59 | 80 | 6478.6 M | 130-150 | 27.8 |
| | | | | | | | | | | 80 | 6478.6 A | 70-110 | 27.8 |
| CW44 | 1535048 | 488891 | 208.0 | 6.0 | 3/25/2019 | 55.51 | 6505.23 | 2.5 | 6560.74 | 94 | 6464.2 A | - | 41.0 |
| | | | | | | | | | | 94 | 6428.2 M | 69-208 | 77.0 |
| Q1 | 1535125 | 488830 | 106.0 | 4.5 | 3/25/2019 | 41.32 | 6520.29 | 2.0 | 6561.61 | 106 | 6453.6 A | 70-110 | 66.7 |
| Q2 | 1534903 | 488867 | 97.0 | 4.5 | 10/29/2020 | 72.10 | 6489.58 | 2.0 | 6561.68 | 97 | 6462.7 A | 60-100 | 26.9 |
| Q3 | 1534743 | 488865 | 108.0 | 4.5 | 4/15/2019 | 53.07 | 6506.67 | 2.0 | 6559.74 | 108 | 6449.7 A | 60-100 | 56.9 |
| Q5 | 1534829 | 488945 | 100.0 | 4.5 | 5/6/2020 | 51.91 | 6509.57 | 2.8 | 6561.48 | --- | --- A | 60-100 | --- |
| Q7 | 1534981 | 489034 | 100.0 | 4.5 | 3/25/2019 | 54.05 | 6507.12 | 1.3 | 6561.17 | 100 | 6459.9 A | 60-100 | 47.3 |
| Q8 | 1534762 | 489059 | 100.0 | 4.5 | 11/25/2020 | 50.08 | 6510.72 | 2.0 | 6560.80 | 100 | 6458.8 A | 60-100 | 51.9 |
| Q9 | 1534643 | 489101 | 100.0 | 4.5 | 8/26/2019 | 53.51 | 6507.82 | 2.0 | 6561.33 | 100 | 6459.3 A | 60-100 | 48.5 |
| Q11 | 1534859 | 489134 | 100.0 | 4.5 | 10/29/2020 | 53.55 | 6507.47 | 2.1 | 6561.02 | 100 | 6458.9 A | 60-100 | 48.6 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q12 | 1535058 | 489102 | 102.0 | 4.5 | 8/26/2019 | 53.90 | 6507.22 | 2.0 | 6561.12 | --- | --- | A | 60-100 | --- |
| Q13 | 1535173 | 489208 | 100.0 | 4.5 | 3/25/2019 | 40.02 | 6522.12 | 2.0 | 6562.14 | 100 | 6460.1 | A | 60-100 | 62.0 |
| Q14 | 1534969 | 489213 | 100.0 | 4.5 | 3/25/2019 | 33.06 | 6528.91 | 1.7 | 6561.97 | 100 | 6460.3 | A | 60-100 | 68.6 |
| Q15 | 1534779 | 489239 | 100.0 | 4.5 | 6/24/2019 | 54.25 | 6508.00 | 2.1 | 6562.25 | 100 | 6460.2 | A | 60-100 | 47.9 |
| Q16 | 1534639 | 489347 | 102.0 | 4.5 | 3/25/2019 | 54.86 | 6508.42 | 2.0 | 6563.28 | 97 | 6464.3 | A | 60-100 | 44.1 |
| Q18 | 1534869 | 489342 | 100.0 | 4.5 | 6/24/2019 | 49.15 | 6512.54 | 1.3 | 6561.69 | 100 | 6460.4 | A | 60-100 | 52.1 |
| Q19 | 1535053 | 489306 | 100.0 | 4.5 | 8/23/2019 | 53.42 | 6508.75 | 1.9 | 6562.17 | 100 | 6460.3 | A | 60-100 | 48.5 |
| Q20 | 1535132 | 489400 | 100.0 | 4.5 | 5/8/2015 | 50.85 | 6511.96 | 2.2 | 6562.81 | 100 | 6460.6 | A | 60-100 | 51.4 |
| Q21 | 1534970 | 489422 | 100.0 | 4.5 | 6/24/2019 | 52.30 | 6510.79 | 2.3 | 6563.09 | 100 | 6460.8 | A | 60-100 | 50.0 |
| Q22 | 1534806 | 489433 | 100.0 | 4.5 | 6/24/2019 | 52.25 | 6510.54 | 2.9 | 6562.79 | 100 | 6459.9 | A | 60-100 | 50.7 |
| Q23 | 1534851 | 489534 | 100.0 | 4.5 | 11/25/2020 | 62.45 | 6501.81 | 2.0 | 6564.26 | --- | --- | A | 60-100 | --- |
| Q24 | 1535141 | 489581 | 100.0 | 4.5 | 5/11/2015 | 50.55 | 6513.50 | 2.0 | 6564.05 | 100 | 6462.1 | A | 60-100 | 51.5 |
| Q25 | 1534978 | 489629 | 100.0 | 4.5 | 6/24/2019 | 51.35 | 6513.16 | 2.5 | 6564.51 | 100 | 6462.0 | A | 60-100 | 51.2 |
| Q26 | 1534769 | 489630 | 100.0 | 4.5 | 6/24/2019 | 52.40 | 6512.43 | --- | 6564.83 | 100 | --- | A | 60-100 | --- |
| Q27 | 1534861 | 489727 | 100.0 | 4.5 | 8/23/2019 | 54.20 | 6510.68 | 2.4 | 6564.88 | 100 | 6462.5 | A | 60-100 | 48.2 |
| Q28 | 1535076 | 489696 | 100.0 | 4.5 | 8/27/2019 | 52.54 | 6511.40 | 2.2 | 6563.94 | 100 | 6461.7 | A | 60-100 | 49.7 |
| Q29 | 1535140 | 489920 | 89.0 | 4.5 | 11/25/2020 | 51.70 | 6514.76 | 2.0 | 6566.46 | 89 | 6475.5 | A | 60-100 | 39.3 |
| Q30 | 1534970 | 489778 | 100.0 | 4.5 | 8/27/2019 | 53.75 | 6512.38 | 2.0 | 6566.13 | --- | --- | A | 60-100 | --- |
| Q42 | 1536662 | 489606 | 80.0 | 4.5 | 6/5/2019 | 40.98 | 6523.50 | 1.6 | 6564.48 | 61 | 6501.9 | U | 40-80 | 21.6 |
| | | | | | | | | | | 61 | 6501.9 | A | 40-80 | 21.6 |
| Q43 | 1536550 | 489507 | 80.0 | 4.5 | 6/5/2019 | 39.70 | 6523.49 | 1.8 | 6563.19 | 80 | 6481.4 | A | 40-80 | 42.1 |
| Q44 | 1535671 | 488864 | 110.0 | 4.5 | 11/25/2020 | 51.53 | 6509.80 | 2.0 | 6561.33 | --- | --- | A | 70-110 | --- |
| Q45 | 1535346 | 489172 | 110.0 | 4.5 | 12/1/2014 | 56.14 | 6506.21 | 2.0 | 6562.35 | --- | --- | A | 70-110 | --- |
| Q46 | 1535526 | 489315 | 110.0 | 4.5 | 6/5/2019 | 51.10 | 6510.60 | 2.0 | 6561.70 | --- | --- | A | 70-110 | --- |
| Q47 | 1535356 | 489516 | 110.0 | 4.5 | 6/4/2019 | 52.22 | 6508.94 | 2.0 | 6561.16 | --- | --- | A | 70-110 | --- |
| Q48 | 1535653 | 490120 | 105.0 | 4.5 | 11/25/2020 | 51.22 | 6516.62 | 2.0 | 6567.84 | 73 | 6492.8 | A | 65-105 | 23.8 |
| | | | | | | | | | | 73 | 6492.8 | U | 65-105 | 23.8 |
| Q49 | 1535232 | 489780 | 100.0 | 4.5 | 6/4/2019 | 51.25 | 6513.46 | 1.7 | 6564.71 | --- | --- | A | 60-100 | --- |
| Q50 | 1536680 | 490288 | 85.0 | 4.5 | 6/6/2019 | 44.97 | 6523.96 | 2.0 | 6568.93 | 43 | 6523.9 | A | 45-85 | 0.0 |
| | | | | | | | | | | 43 | 6505.9 | U | 45-85 | 18.0 |
| Q51 | 1535486 | 490003 | 76.0 | 4.0 | --- | --- | --- | 2.5 | 6500.00 | --- | --- | A | 46-76 | --- |

Note: A = Alluvial Aquifer
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 DATE | WATER LEVEL DEPTH (FT-MP) | WATER LEVEL ELEV. (FT-MSL) | MP ABOVE LSD (FT) | MP ELEV. (FT-MSL) | DEPTH TO BASE OF ALLUVIUM (FT-LSD) | ELEV. TO BASE OF ALLUVIUM (FT-MSL) | CASING PERFOR-ATIONS (FT-LSD) | SATURATED THICKNESS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Murray** | | | | | | | |
| * 0801 | 1541020 | 488600 | 100.0 | 4.0 | 7/15/2004 | 39.20 | 6528.53 | 0.0 | 6567.73 | 85 | 6482.7 A | 80-100 | 45.8 |
| 0801R | 1541096 | 488431 | 90.0 | 5.0 | 11/4/2004 | 41.01 | 6528.04 | 3.0 | 6569.05 | 82 | 6484.1 A | 60-90 | 44.0 |
| 0802 | 1540765 | 488277 | 98.0 | 6.0 | 8/18/2020 | 41.40 | 6521.32 | 2.0 | 6562.72 | 81 | 6479.7 A | 75-81 | 41.6 |
| 0803 | 1540800 | 487430 | --- | 6.0 | 9/19/1983 | 84.86 | 6476.14 | 0.0 | 6561.00 | 85 | --- C | 85-180 | --- |
| | | | | | | | | | | 85 | 6476.0 A | 85-180 | 0.1 |
| 0804 | 1540790 | 486790 | 137.0 | 6.0 | 2/19/2013 | 42.20 | 6519.80 | 0.0 | 6562.00 | 85 | 6477.0 A | 125-136 | 42.8 |
| 0805 | 1540818 | 486241 | 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 | 486694 | 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 | --- | 4.0 | 5/22/1991 | 29.14 | 6526.12 | 0.0 | 6555.26 | --- | --- A | - | --- |
| 0844 | 1538376 | 487002 | 75.0 | 4.0 | 11/20/2020 | 39.04 | 6517.09 | 1.2 | 6556.13 | 70 | 6484.9 A | 35-75 | 32.2 |
| 0845 | 1537280 | 487833 | 65.0 | 4.0 | 11/20/2020 | 37.43 | 6519.62 | 1.7 | 6557.05 | 55 | 6500.4 A | 45-65 | 19.3 |
| 802A | 1540691 | 488417 | 90.0 | 4.5 | 4/7/2014 | 35.64 | 6533.08 | 2.0 | 6568.72 | 82 | 6484.7 A | 50-90 | 48.4 |
| 802B | 1540833 | 488415 | 90.0 | 4.5 | 4/7/2014 | 34.46 | 6533.68 | 2.0 | 6568.14 | 58 | 6508.1 U | - | 25.5 |
| | | | | | | | | | | 58 | 6508.1 A | 50-90 | 25.5 |
| AW | 1540235 | 488015 | 156.0 | 6.0 | 11/11/2020 | 38.40 | 6525.03 | 0.1 | 6563.43 | 63 | 6500.3 A | - | 24.7 |
| | | | | | | | | | | 63 | 6463.3 U | 66-155 | 61.7 |
| HW | 1540920 | 487435 | 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 | 1541283 | 486020 | --- | 4.5 | 6/27/2019 | 53.45 | 6516.55 | --- | 6570.00 | --- | --- A | - | --- |
| 0688 | 1541257 | 483955 | 105.0 | 5.0 | 11/20/2020 | 60.88 | 6501.74 | 2.9 | 6562.62 | 95 | 6464.7 A | 65-105 | 37.0 |
| 0831 | 1540090 | 486030 | --- | --- | 9/6/1983 | 54.95 | 6506.05 | 0.0 | 6561.00 | --- | --- A | - | --- |
| 0833 | 1539335 | 485445 | 110.0 | 6.0 | 12/10/1996 | 46.61 | 6511.39 | 0.0 | 6558.00 | 103 | 6455.0 A | 60-90 | 56.4 |
| 0834 | 1540259 | 484847 | 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 | 1540422 | 484035 | 90.0 | 4.0 | --- | --- | --- | 0.0 | 6558.00 | 80 | 6478.0 A | 65-80 | --- |
| 0838 | 1539948 | 485142 | 100.0 | --- | 7/22/1995 | 49.03 | 6513.97 | 0.0 | 6563.00 | --- | --- A | - | --- |
| 0839 | 1540519 | 485354 | 100.0 | 5.0 | 12/19/1994 | 50.00 | 6510.00 | 0.0 | 6560.00 | 94 | 6466.0 A | 80-96 | 44.0 |
| 0840 | 1540367 | 485112 | 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 | 1541411 | 485738 | 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
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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0460 | 1537148 | 493921 | 114.2 | 5.0 | 7/12/2019 | 68.10 | 6526.90 | --- | 6595.00 | --- | --- A | - | --- |
| 0520 | 1538934 | 492935 | 75.0 | 5.0 | 11/11/2020 | 55.38 | 6530.64 | 0.3 | 6586.02 | 68 | 6517.7 A | 35-75 | 12.9 |
| 0521 | 1539104 | 492588 | 75.0 | 5.0 | 3/18/2020 | 54.25 | 6530.19 | 2.5 | 6584.44 | 65 | 6516.9 A | 35-75 | 13.3 |
| 0522 | 1538640 | 492437 | 77.0 | 5.0 | 3/18/2020 | 52.60 | 6527.93 | 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 | --- | --- | 5/9/2019 | 83.05 | 6470.74 | 2.0 | 6553.79 | --- | --- A | - | --- |
| * 0533 | --- | --- | 195.0 | --- | --- | --- | --- | 0.0 | 6520.00 | --- | --- A | - | --- |
| 0538 | 1533486 | 486899 | 170.0 | 6.0 | 3/4/2020 | 67.80 | 6481.14 | 2.0 | 6548.94 | 95 | 6451.9 A | 50-90 | 29.2 |
| | | | | | | | | | | 95 | 6413.9 L | 130-170 | 67.2 |
| 0539 | 1534014 | 487596 | 210.0 | 6.0 | 11/20/2020 | 210.00 | 6345.32 | 2.0 | 6555.32 | 100 | 6453.3 A | 50-70 | 0.0 |
| | | | | | | | | | | 100 | 6453.3 A | 80-100 | 0.0 |
| | | | | | | | | | | 100 | 6378.3 L | 170-210 | 0.0 |
| 0540 | 1534125 | 488091 | 90.0 | 6.0 | 11/20/2020 | 57.08 | 6498.83 | 2.7 | 6555.91 | 80 | 6473.2 A | 30-90 | 25.6 |
| 0541 | 1539831 | 477236 | 120.0 | 5.0 | 11/25/2020 | 91.80 | 6463.82 | 2.0 | 6555.62 | 112 | 6441.6 A | 78-118 | 22.2 |
| 0551 | 1536272 | 479881 | 135.0 | 5.0 | 11/20/2020 | 99.48 | 6447.82 | 2.1 | 6547.30 | 115 | 6430.2 A | 95-135 | 17.6 |
| 0553 | 1534923 | 480563 | 130.0 | 5.0 | 11/20/2020 | 104.44 | 6443.04 | 2.0 | 6547.48 | 128 | 6417.5 A | 90-125 | 25.6 |
| 0554 | 1534967 | 479107 | 140.0 | 5.0 | 11/20/2020 | 140.00 | 6407.17 | 1.9 | 6547.17 | 118 | 6427.3 A | 90-125 | 0.0 |
| 0555 | 1538572 | 486236 | 100.0 | 5.0 | 2/4/2020 | 42.40 | 6514.74 | 2.5 | 6557.14 | 100 | 6454.6 A | 60-90 | 60.1 |
| 0556 | 1538006 | 486184 | 100.0 | 5.0 | 2/4/2020 | 42.90 | 6513.12 | 2.4 | 6556.02 | 95 | 6458.6 A | 60-90 | 54.5 |
| 0557 | 1537204 | 486000 | 65.0 | 5.0 | 2/5/2020 | 43.00 | 6510.77 | 2.5 | 6553.77 | 55 | 6496.3 A | 45-65 | 14.5 |
| 0631 | 1532234 | 483756 | 118.0 | 6.0 | 11/20/2020 | 84.39 | 6456.71 | 2.2 | 6541.10 | 109 | 6429.9 A | 58-118 | 26.8 |
| 0632 | 1531850 | 483767 | 110.0 | 6.0 | 11/20/2020 | 83.20 | 6458.10 | 1.4 | 6541.30 | 102 | 6437.9 A | 70-110 | 20.2 |
| 0633 | 1541467 | 479642 | 83.0 | 8.0 | 2/25/2019 | 72.63 | 6484.93 | 0.0 | 6557.56 | 95 | 6462.6 A | 11-83 | 22.4 |
| 0634 | 1541652 | 480362 | 103.0 | 4.5 | 11/25/2020 | 70.48 | 6489.59 | 2.8 | 6560.07 | 95 | 6462.3 A | 80-100 | 27.3 |
| 0635 | 1535363 | 478401 | 63.0 | 12.0 | --- | --- | --- | --- | 6546.25 | --- | --- A | 4-63 | --- |
| 0636 | 1545374 | 476038 | 123.0 | 4.5 | 12/18/2014 | 101.75 | 6471.69 | 2.3 | 6573.44 | 119 | 6452.1 A | 103-123 | 19.6 |
| 0637 | 1545409 | 474710 | 124.0 | 4.5 | 9/30/2019 | 112.29 | 6462.91 | 2.5 | 6575.20 | 118 | 6454.7 A | 104-124 | 8.2 |
| 0638 | 1539628 | 493265 | 75.0 | 5.0 | 11/11/2020 | 52.10 | 6533.46 | 0.0 | 6585.56 | 65 | 6520.6 A | 35-75 | 12.9 |
| 0639 | 1539370 | 492961 | 80.0 | 5.0 | 7/15/2020 | 57.20 | 6530.68 | 2.5 | 6587.88 | 71 | 6514.4 A | 35-80 | 16.3 |
| 0640 | 1537790 | 491961 | 84.0 | 5.0 | 11/11/2020 | 47.70 | 6532.27 | 2.2 | 6579.97 | 77 | 6500.8 A | 64-84 | 31.5 |
| 0641 | 1536494 | 491110 | 95.0 | 5.0 | 6/30/2015 | 48.35 | 6525.01 | 2.5 | 6573.36 | 87 | 6483.9 A | 65-95 | 41.2 |
| 0642 | 1536104 | 490932 | 95.0 | 5.0 | 6/30/2015 | 48.80 | 6523.08 | 2.4 | 6571.88 | 89 | 6480.5 A | 65-95 | 42.6 |
| 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 | 11/20/2020 | 70.85 | 6473.05 | 2.0 | 6543.90 | 102 | 6439.9 A | 55-110 | 33.2 |
| 0645 | 1532924 | 485282 | 80.0 | 5.0 | 4/15/2010 | 74.40 | 6469.39 | 2.5 | 6543.79 | 70 | 6471.3 A | 60-80 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0646 | 1533246 | 484953 | 100.0 | 5.0 | 11/20/2020 | 74.15 | 6469.20 | 1.5 | 6543.35 | 91 | 6450.9 A | 60-100 | 18.3 |
| 0647 | 1536623 | 478308 | 140.0 | 4.5 | 11/20/2020 | 105.33 | 6446.58 | 1.4 | 6551.91 | 132 | 6418.5 A | 80-140 | 28.1 |
| 0648 | 1534730 | 478343 | 120.0 | 4.5 | 11/20/2020 | 120.00 | 6427.79 | 2.0 | 6547.79 | 120 | 6425.8 A | 80-120 | 2.0 |
| 0649 | 1534730 | 479798 | 124.0 | 4.5 | 11/20/2020 | 103.11 | 6440.18 | 0.3 | 6543.29 | 115 | 6428.0 A | 84-124 | 12.2 |
| 0650 | 1536779 | 482135 | 109.0 | 4.5 | 11/11/2020 | 82.15 | 6464.96 | 2.2 | 6547.11 | 103 | 6441.9 A | 89-109 | 23.0 |
| 0652 | 1531170 | 483779 | 88.0 | 5.0 | 11/20/2020 | 84.60 | 6453.55 | 1.5 | 6538.15 | 79 | 6457.7 A | 60-88 | 0.0 |
| 0653 | 1533283 | 486570 | 206.0 | 6.0 | 11/20/2020 | 65.93 | 6479.04 | 1.6 | 6544.97 | 97 | 6446.4 A | 69-206 | 32.7 |
| | | | | | | | | | | 97 | 6408.4 L | - | 70.7 |
| 0654 | 1541994 | 478636 | 120.0 | 4.5 | 11/25/2020 | 74.64 | 6475.86 | 1.4 | 6550.50 | 106 | 6443.1 A | 60-120 | 32.8 |
| 0655 | 1541620 | 479830 | 96.0 | 8.0 | 10/28/2019 | 73.00 | 6485.18 | --- | 6558.18 | 88 | --- A | 21-84 | --- |
| 0656 | 1542578 | 478333 | 88.0 | 8.0 | 12/26/2018 | 88.00 | 6466.07 | --- | 6554.07 | 88 | --- A | 6-88 | --- |
| 0657 | 1537497 | 478392 | 128.0 | 6.0 | 11/20/2020 | 100.52 | 6451.29 | 2.2 | 6551.81 | 120 | 6429.6 A | 87-128 | 21.7 |
| 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 | 11/20/2020 | 107.61 | 6442.57 | 0.4 | 6550.18 | 129 | 6420.8 A | 89-130 | 21.8 |
| 0659 | 1541689 | 480772 | 101.0 | 4.5 | 11/25/2020 | 70.35 | 6489.82 | 2.0 | 6560.17 | 97 | 6461.2 A | 61-101 | 28.7 |
| 0680 | 1543850 | 478746 | 80.0 | 4.5 | 11/25/2020 | 73.10 | 6485.77 | 2.0 | 6558.87 | 75 | 6481.9 A | 50-80 | 3.9 |
| 0681 | 1540676 | 482734 | 117.0 | 6.0 | 11/11/2020 | 64.80 | 6495.72 | 2.1 | 6560.52 | 111 | 6447.4 A | 67-117 | 48.3 |
| 0682 | 1543125 | 477489 | 94.0 | 4.0 | 10/20/2010 | 79.60 | 6474.37 | 2.8 | 6553.97 | 102 | 6449.2 A | 54-94 | 25.2 |
| 0683 | 1540198 | 476217 | 120.0 | 6.0 | 4/16/2019 | 90.31 | 6465.73 | 2.0 | 6556.04 | 140 | 6414.0 A | 80-120 | 51.7 |
| 0684 | 1540273 | 478499 | 143.0 | 6.0 | 5/6/2019 | 86.25 | 6467.03 | 2.0 | 6553.28 | 118 | 6433.3 A | 83-143 | 33.8 |
| 0685 | 1539098 | 478170 | 100.0 | 4.5 | 11/25/2020 | 97.50 | 6459.07 | 1.7 | 6556.57 | 116 | 6438.9 A | 60-100 | 20.2 |
| 0686 | 1545319 | 475438 | 115.0 | 4.5 | 9/30/2019 | 114.12 | 6464.68 | 1.8 | 6578.80 | 136 | 6441.0 A | 75-115 | 23.7 |
| 0687 | 1539011 | 477276 | 102.0 | 6.0 | 11/25/2020 | 102.00 | 6453.96 | 2.2 | 6555.96 | 120 | 6433.8 A | 62-102 | 20.2 |
| 0689 | 1530024 | 478478 | 80.0 | 4.5 | 11/24/2008 | 83.65 | 6458.37 | 2.6 | 6542.02 | 75 | 6464.4 A | 60-80 | 0.0 |
| 0692 | 1535892 | 493175 | 90.0 | 5.0 | 7/25/2018 | 63.42 | 6521.40 | 2.5 | 6584.82 | 80 | 6502.3 A | 58-90 | 19.1 |
| 0846 | 1537219 | 484730 | 75.0 | 4.0 | 11/20/2020 | 44.23 | 6504.69 | 0.8 | 6548.92 | 65 | 6483.1 A | 40-65 | 21.6 |
| 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 | 2/28/2007 | 60.78 | 6511.71 | 2.7 | 6572.49 | 91 | 6478.8 A | 52-92 | 32.9 |
| 0851 | 1534692 | 483909 | 91.0 | 5.0 | 11/11/2020 | 82.50 | 6463.94 | 3.3 | 6546.44 | 80 | 6463.1 A | 41-91 | 0.8 |
| 0852 | 1535610 | 493989 | 74.0 | 5.0 | 11/11/2020 | 69.95 | 6520.19 | 2.5 | 6590.14 | 70 | 6517.7 A | 54-74 | 2.5 |
| 0855 | 1532111 | 484184 | 105.0 | 5.0 | 11/20/2020 | 82.99 | 6458.12 | 2.1 | 6541.11 | 97 | 6442.0 A | 70-105 | 16.1 |
| 0861 | 1534332 | 488702 | 100.0 | 5.0 | 9/21/2010 | 66.96 | 6492.89 | 2.3 | 6559.85 | 65 | 6492.6 A | 50-100 | 0.3 |
| 0862 | 1534265 | 487800 | 110.0 | 5.0 | 11/20/2020 | 52.63 | 6503.55 | 3.3 | 6556.18 | 97 | 6455.9 A | 63-103 | 47.6 |
| 0863 | 1533867 | 487912 | 110.0 | 5.0 | 4/29/2019 | 63.10 | 6493.46 | 2.5 | 6556.56 | 94 | 6460.1 A | 63-103 | 33.4 |
| 0864 | 1533735 | 486464 | 95.0 | 5.0 | 4/30/2020 | 67.60 | 6479.12 | 1.9 | 6546.72 | 78 | 6466.9 A | 44-84 | 12.3 |
| 0865 | 1534123 | 488429 | 97.0 | 5.0 | 4/29/2019 | 61.10 | 6495.68 | 2.2 | 6556.78 | 88 | 6466.6 A | 37-97 | 29.1 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0866 | 1534494 | 488340 | 120.0 | 5.0 | 11/12/2019 | 59.01 | 6499.11 | 1.8 | 6558.12 | 80 | 6476.3 A | 33-113 | 22.8 |
| 0867 | 1533762 | 488409 | 88.0 | 5.0 | 11/20/2020 | 58.98 | 6496.92 | 2.0 | 6555.90 | 86 | 6467.9 A | 48-88 | 29.0 |
| 0868 | 1534848 | 491033 | 103.0 | 5.0 | 6/30/2015 | 56.11 | 6518.63 | 2.2 | 6574.74 | 94 | 6478.5 A | 53-103 | 40.1 |
| 0869 | 1533251 | 486073 | 94.0 | 5.0 | 11/20/2020 | 68.50 | 6475.99 | 1.7 | 6544.49 | 99 | 6443.8 A | 44-94 | 32.2 |
| * 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 |
| * 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 | 11/20/2020 | 95.00 | 6449.26 | 1.9 | 6544.26 | 85 | 6457.4 A | 58-88 | 0.0 |
| 0877 | 1533068 | 488067 | 70.0 | 5.0 | 11/20/2020 | 62.56 | 6490.52 | 1.9 | 6553.08 | 65 | 6486.2 A | 58-68 | 4.3 |
| 0879 | 1532401 | 486104 | 70.0 | 5.0 | 11/20/2020 | 67.64 | 6476.91 | 2.2 | 6544.55 | 62 | 6480.4 A | 48-68 | 0.0 |
| 0881 | 1542034 | 481478 | 96.0 | 4.5 | 11/25/2020 | 73.73 | 6491.31 | 2.0 | 6565.04 | 103 | 6460.0 A | 76-96 | 31.3 |
| 0882 | 1541404 | 482396 | 110.0 | 4.5 | 2/5/2020 | 64.90 | 6496.26 | 2.0 | 6561.16 | 98 | 6461.2 A | 70-110 | 35.0 |
| 0883 | 1540097 | 483039 | 100.0 | 5.0 | 2/5/2020 | 59.85 | 6497.28 | 1.9 | 6557.13 | 96 | 6459.3 A | 60-90 | 38.0 |
| 0884 | 1542677 | 481498 | 90.0 | 5.0 | 2/6/2020 | 72.35 | 6493.75 | 1.0 | 6566.10 | 85 | 6480.2 A | 58-88 | 13.6 |
| 0885 | 1541919 | 483474 | 100.0 | 5.0 | 11/25/2020 | 66.50 | 6498.14 | 1.5 | 6564.64 | 95 | 6468.1 A | 70-100 | 30.0 |
| 0886 | 1542327 | 482487 | 90.0 | 5.0 | 11/25/2020 | 69.93 | 6494.62 | 1.5 | 6564.55 | 87 | 6476.1 A | 60-90 | 18.6 |
| 0887 | 1543063 | 482469 | 67.0 | 5.0 | 11/25/2020 | 61.80 | 6505.93 | 1.5 | 6567.73 | 60 | 6506.2 A | 42-67 | 0.0 |
| 0888 | 1542285 | 479335 | 105.0 | 5.0 | 11/25/2020 | 77.90 | 6479.43 | 1.1 | 6557.33 | 90 | 6466.2 A | 75-105 | 13.2 |
| 0889 | 1540047 | 480222 | 65.0 | 5.0 | 12/18/2019 | 66.00 | 6483.63 | 1.5 | 6549.63 | 60 | 6488.2 A | 35-65 | 0.0 |
| 0890 | 1541365 | 480088 | 101.0 | 5.0 | 10/20/2020 | 74.81 | 6483.62 | 1.7 | 6558.43 | 93 | 6463.7 A | 81-101 | 19.9 |
| 0893 | 1541934 | 482244 | 98.0 | 4.5 | 11/25/2020 | 70.02 | 6493.95 | 2.1 | 6563.97 | 93 | 6468.9 A | 78-98 | 25.1 |
| 0894 | 1541976 | 478317 | 78.0 | 4.5 | 10/20/2010 | 77.41 | 6476.88 | 3.0 | 6554.29 | 97 | 6454.3 A | 58-78 | 22.6 |
| 0895 | 1541521 | 476222 | 104.0 | 5.0 | 10/3/2017 | 83.20 | 6470.64 | 2.4 | 6553.84 | 116 | 6435.4 A | 61-101 | 35.2 |
| 0896 | 1542246 | 476237 | 113.0 | 5.0 | 10/3/2017 | 84.60 | 6471.01 | 2.0 | 6555.61 | 117 | 6436.6 A | 73-113 | 34.4 |
| 0897 | 1543819 | 478237 | 93.0 | 4.0 | 11/25/2020 | 79.25 | 6483.00 | 2.0 | 6562.25 | 70 | 6490.3 A | 63-93 | 0.0 |
| 0899 | 1543801 | 477288 | 110.0 | 4.0 | 1/9/2020 | 101.60 | 6469.24 | 2.0 | 6570.84 | 120 | 6448.8 A | 70-110 | 20.4 |
| 0905 | 1532700 | 480850 | 120.0 | 5.0 | 5/9/2012 | 102.00 | 6443.00 | 0.0 | 6545.00 | 120 | 6425.0 A | 100-120 | 18.0 |
| 0906 | 1532900 | 480450 | --- | --- | 8/29/1995 | 74.65 | 6462.75 | 0.0 | 6537.40 | --- | --- A | - | --- |
| 0909 | 1531900 | 483400 | 140.0 | 4.0 | 5/12/2015 | 84.49 | 6454.41 | 0.0 | 6538.90 | 112 | 6426.9 A | 80-135 | 27.5 |
| | | | | | | | | | | 112 | 6426.9 L | 80-135 | 27.5 |
| 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 | - | --- |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0914 | 1555500 | 500850 | --- | 6.0 | 2/20/2019 | 48.25 | 6593.75 | 1.4 | 6642.00 | --- | --- A | - | --- |
| 0915 | 1552650 | 499650 | 100.0 | 4.0 | 6/19/2006 | 30.00 | 6595.00 | 0.0 | 6625.00 | 70 | 6555.0 A | 55-85 | 40.0 |
| 0916 | 1552350 | 499600 | 160.0 | 4.0 | 5/7/2009 | 36.63 | 6588.37 | 0.0 | 6625.00 | --- | --- A | 45-70 | --- |
| 0917 | 1542200 | 514600 | --- | --- | --- | --- | --- | 0.0 | 6800.00 | --- | --- A | - | --- |
| 0920 | 1555800 | 496900 | --- | 7.0 | 10/6/2016 | 6.98 | 6620.62 | 0.7 | 6627.60 | --- | --- A | - | --- |
| 0921 | 1555400 | 495800 | --- | 5.0 | 2/10/2020 | 41.70 | 6582.30 | 1.9 | 6624.00 | --- | --- A | - | --- |
| 0922 | 1555200 | 492500 | --- | 6.0 | 2/12/2019 | 49.51 | 6572.19 | 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 | 5/7/2019 | 92.10 | 6466.02 | 2.6 | 6558.12 | 125 | 6430.5 A | 95-132 | 35.5 |
| 0936 | 1543621 | 472978 | 160.0 | 5.0 | --- | --- | --- | 0.0 | 6573.38 | 160 | 6413.4 A | 100-160 | --- |
| 0939 | 1539751 | 483202 | 97.0 | 8.0 | 7/25/1996 | 59.31 | 6497.69 | 2.3 | 6557.00 | --- | --- A | - | --- |
| 0940 | 1538651 | 483040 | 70.0 | --- | 7/24/1996 | 57.30 | 6495.70 | 8.8 | 6553.00 | --- | --- A | - | --- |
| 0942 | 1538306 | 483703 | 100.0 | 6.0 | --- | --- | --- | 0.0 | 6550.20 | 95 | 6455.2 A | 85-95 | --- |
| 0947 | 1536206 | 491841 | 100.0 | 4.0 | 7/19/2018 | 53.02 | 6522.16 | 0.0 | 6575.18 | 95 | 6480.2 A | 70-100 | 42.0 |
| 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 | 1539753 | 482896 | --- | --- | --- | --- | --- | 0.0 | 6556.00 | --- | --- A | - | --- |
| 0976 | 1539751 | 483100 | 115.0 | --- | --- | --- | --- | 0.0 | 0.00 | --- | --- A | - | --- |
| 0977 | 1539900 | 482720 | --- | --- | 12/9/1995 | 61.47 | 6495.53 | 1.0 | 6557.00 | --- | --- A | - | --- |
| 0979 | 1539255 | 483375 | 105.0 | 5.0 | 7/10/2002 | 57.56 | 6593.44 | 0.0 | 6651.00 | 100 | 6551.0 A | 90-100 | 42.4 |
| 0980 | 1539330 | 483050 | --- | --- | 11/8/1995 | 57.70 | 6497.30 | 0.0 | 6555.00 | --- | --- A | - | --- |
| 0981 | 1539035 | 482734 | --- | --- | --- | --- | --- | 0.0 | 6554.00 | --- | --- A | - | --- |
| 0982 | 1538610 | 483400 | 110.0 | 5.0 | --- | --- | --- | 0.0 | 6651.00 | 105 | 6546.0 A | 90-105 | --- |
| 0983 | 1538817 | 483246 | --- | --- | --- | --- | --- | 0.0 | 6552.00 | --- | --- A | - | --- |
| 0984 | 1538860 | 483110 | 103.0 | 5.0 | --- | --- | --- | 0.0 | 6651.00 | 98 | 6553.0 A | 88-98 | --- |
| 0985 | 1539048 | 483380 | 115.0 | 5.0 | 7/18/1996 | 58.75 | 6592.25 | 0.0 | 6651.00 | 102 | 6549.0 A | 90-110 | 43.3 |
| 0989 | 1538220 | 482920 | --- | --- | 11/2/1995 | 58.10 | 6494.90 | 1.0 | 6553.00 | --- | --- A | - | --- |
| 0992 | 1539510 | 483790 | 100.0 | 5.0 | --- | --- | --- | 0.0 | 6652.00 | 95 | 6557.0 A | 85-95 | --- |
| 0993 | 1537920 | 483677 | 102.0 | 5.0 | --- | --- | --- | 0.0 | 6650.00 | 98 | 6552.0 A | 85-98 | --- |
| 0994 | 1539700 | 476240 | 144.0 | 6.0 | 10/6/2020 | 92.10 | 6462.90 | 0.0 | 6555.00 | --- | --- A | 95-110 | --- |
| 0996 | 1537621 | 477989 | 138.0 | 5.0 | 1/9/2020 | 80.20 | 6472.32 | 1.7 | 6552.52 | 136 | 6414.8 A | 126-136 | 57.5 |
| 0997 | 1539821 | 473807 | --- | --- | 3/12/1996 | 76.90 | 6491.40 | 0.0 | 6568.30 | --- | --- A | - | --- |
| 1012 | --- | --- | --- | 6.0 | --- | --- | --- | 0.0 | 0.00 | --- | --- A | - | --- |
| 1013 | --- | --- | --- | 4.0 | --- | --- | --- | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1014 | --- | --- | --- | 9.0 | --- | --- | --- | 0.0 | 0.00 | --- | --- A | - | --- |
| 1015 | --- | --- | --- | 6.0 | --- | --- | --- | 0.0 | 0.00 | --- | --- A | - | --- |
| 1018 | --- | --- | --- | 5.0 | --- | --- | --- | 0.0 | 0.00 | --- | --- A | - | --- |
| 1020 | --- | --- | --- | 5.0 | 1/18/1996 | 15.17 | -15.17 | 0.0 | 0.00 | --- | --- A | - | --- |
| 1021 | --- | --- | --- | --- | 1/18/1996 | 18.00 | -18.00 | 0.0 | 0.00 | --- | --- A | - | --- |
| H1 | 1541931 | 480022 | 98.0 | 4.5 | 10/28/2019 | 75.45 | 6483.80 | 2.0 | 6559.25 | 98 | 6459.3 A | 78-98 | 24.6 |
| H2 | 1541665 | 480014 | 100.0 | 4.5 | 5/5/2015 | 71.81 | 6489.02 | 2.0 | 6560.83 | 100 | 6458.8 A | 80-100 | 30.2 |
| H2A | 1541694 | 479997 | 88.0 | 4.5 | 3/2/2020 | 52.45 | 6507.42 | 2.0 | 6559.87 | 88 | 6469.9 A | 66-88 | 37.5 |
| H3 | 1541482 | 479947 | 92.0 | 4.5 | 10/28/2019 | 74.45 | 6482.65 | 2.0 | 6557.10 | 92 | 6463.1 A | 72-92 | 19.6 |
| H4 | 1542118 | 480122 | 99.0 | 4.5 | 10/28/2019 | 72.80 | 6484.80 | 2.0 | 6557.60 | 99 | 6456.6 A | 79-99 | 28.2 |
| H5 | 1541786 | 480167 | 99.0 | 4.5 | 10/28/2019 | 73.45 | 6484.99 | 2.0 | 6558.44 | 99 | 6457.4 A | 79-99 | 27.6 |
| H6 | 1541541 | 480181 | 99.0 | 4.5 | 5/5/2015 | 65.36 | 6494.62 | 2.0 | 6559.98 | 99 | 6459.0 A | 79-99 | 35.6 |
| H6A | 1541564 | 480172 | 100.0 | 4.5 | 10/28/2019 | 70.40 | 6487.17 | 2.0 | 6557.57 | 100 | 6455.6 A | 80-100 | 31.6 |
| H7 | 1541974 | 480333 | 102.0 | 4.5 | 10/20/2020 | 72.21 | 6487.33 | 2.0 | 6559.54 | 102 | 6455.5 A | 82-102 | 31.8 |
| H7A | 1542002 | 480322 | 100.0 | 4.5 | 11/25/2020 | 71.83 | 6487.26 | 2.0 | 6559.09 | 100 | 6457.1 A | 80-100 | 30.2 |
| H7B | 1541933 | 480350 | 98.0 | 4.5 | 10/20/2020 | 70.78 | 6488.60 | 2.0 | 6559.38 | 98 | 6459.4 A | 78-98 | 29.2 |
| H8 | 1541405 | 480325 | 95.0 | 4.5 | 5/5/2015 | 64.85 | 6493.26 | 2.0 | 6558.11 | 95 | 6461.1 A | 75-95 | 32.2 |
| H9 | 1542143 | 480524 | 97.0 | 4.5 | 10/28/2019 | 70.15 | 6490.47 | 2.0 | 6560.62 | 97 | 6461.6 A | 77-97 | 28.8 |
| H10 | 1541828 | 480550 | 100.0 | 4.5 | 10/28/2019 | 67.60 | 6490.96 | 2.0 | 6558.56 | 100 | 6456.6 A | 80-100 | 34.4 |
| H11 | 1541517 | 480586 | 97.0 | 4.5 | 10/28/2019 | 68.60 | 6490.82 | 2.0 | 6559.42 | 97 | 6460.4 A | 77-97 | 30.4 |
| H12 | 1542007 | 480744 | 100.0 | 4.5 | 10/28/2019 | 71.40 | 6492.22 | 2.0 | 6563.62 | 100 | 6461.6 A | 80-100 | 30.6 |
| H13 | 1542183 | 480842 | 100.0 | 4.5 | 5/28/2019 | 70.40 | 6492.02 | 2.0 | 6562.42 | 100 | 6460.4 A | 80-100 | 31.6 |
| H14 | 1541884 | 480906 | 100.0 | 4.5 | 3/25/2019 | 37.66 | 6521.19 | 2.0 | 6558.85 | 100 | 6456.9 A | 80-100 | 64.3 |
| H15 | 1541590 | 480941 | 97.0 | 4.5 | 10/28/2019 | 67.75 | 6492.66 | 2.0 | 6560.41 | 97 | 6461.4 A | 77-97 | 31.3 |
| H16 | 1542116 | 481129 | 92.0 | 4.5 | 10/20/2020 | 66.20 | 6491.78 | 2.0 | 6557.98 | 92 | 6464.0 A | 72-92 | 27.8 |
| H17 | 1541782 | 481151 | 99.0 | 4.5 | 10/20/2020 | 71.81 | 6491.55 | 2.0 | 6563.36 | 99 | 6462.4 A | 79-99 | 29.2 |
| H18 | 1542325 | 481231 | 93.0 | 4.5 | 2/25/2019 | 14.71 | 6546.06 | 2.0 | 6560.77 | 93 | 6465.8 A | 73-93 | 80.3 |
| H19 | 1541970 | 481270 | 91.0 | 4.5 | 10/28/2019 | 69.25 | 6493.29 | 2.0 | 6562.54 | 91 | 6469.5 A | 71-91 | 23.8 |
| H20 | 1541664 | 481314 | 86.0 | 4.5 | 10/28/2019 | 63.60 | 6494.08 | 2.0 | 6557.68 | 86 | 6469.7 A | 66-86 | 24.4 |
| H21 | 1542330 | 481444 | 95.0 | 4.5 | 10/28/2019 | 70.20 | 6494.20 | 2.0 | 6564.40 | 95 | 6467.4 A | 75-95 | 26.8 |
| H22 | 1541756 | 481496 | 94.0 | 4.5 | 10/28/2019 | 67.20 | 6494.33 | 2.0 | 6561.53 | 94 | 6465.5 A | 74-94 | 28.8 |
| H23 | 1542412 | 481663 | 95.0 | 4.5 | 10/28/2019 | 70.10 | 6494.86 | 2.0 | 6564.96 | 95 | 6468.0 A | 75-95 | 26.9 |
| H24 | 1542195 | 481605 | 100.0 | 4.5 | 10/20/2020 | 73.53 | 6492.34 | 2.0 | 6565.87 | 100 | 6463.9 A | 80-100 | 28.5 |
| H25 | 1541937 | 481652 | 100.0 | 4.5 | 10/28/2019 | 70.10 | 6494.69 | 2.0 | 6564.79 | 100 | 6462.8 A | 80-100 | 31.9 |
| H26 | 1542244 | 481823 | 98.0 | 4.5 | 7/29/2019 | 71.70 | 6495.11 | 2.0 | 6566.81 | 98 | 6466.8 A | 78-98 | 28.3 |
| H27 | 1541924 | 481863 | 96.0 | 4.5 | 10/28/2019 | 70.20 | 6495.05 | 2.0 | 6565.25 | 96 | 6467.3 A | 76-96 | 27.8 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H28 | 1542427 | 481976 | 97.0 | 4.5 | 3/28/2017 | 68.22 | 6497.16 | 2.0 | 6565.38 | 97 | 6466.4 A | 77-97 | 30.8 |
| H29 | 1542117 | 481997 | 100.0 | 4.5 | 3/28/2017 | 65.41 | 6496.59 | 2.0 | 6562.00 | 100 | 6460.0 A | 80-100 | 36.6 |
| H30 | 1542590 | 482118 | 92.0 | 4.5 | 4/28/2014 | 68.00 | 6497.80 | 2.0 | 6565.80 | 92 | 6471.8 A | 72-92 | 26.0 |
| H31 | 1542290 | 482160 | 95.0 | 4.5 | 8/28/2019 | 69.33 | 6495.73 | 2.0 | 6565.06 | 95 | 6468.1 A | 75-95 | 27.7 |
| H32 | 1542470 | 482295 | 98.0 | 4.5 | 3/28/2017 | 67.82 | 6497.29 | 2.0 | 6565.11 | 98 | 6465.1 A | 78-98 | 32.2 |
| H33 | 1542162 | 482347 | 98.0 | 4.5 | 3/28/2017 | 68.60 | 6497.48 | 2.0 | 6566.08 | 98 | 6466.1 A | 78-98 | 31.4 |
| H34 | 1542415 | 482618 | 96.0 | 4.5 | 3/29/2017 | 67.85 | 6498.34 | 2.0 | 6566.19 | 96 | 6468.2 A | 76-96 | 30.2 |
| H35 | 1542209 | 482713 | 97.0 | 4.5 | 3/29/2017 | 67.70 | 6497.23 | 2.0 | 6564.93 | 97 | 6465.9 A | 77-97 | 31.3 |
| H36 | 1542405 | 482853 | 100.0 | 4.5 | 8/28/2019 | 52.11 | 6507.85 | 2.0 | 6559.96 | 100 | 6458.0 A | 80-100 | 49.9 |
| H37 | 1542586 | 482972 | 96.0 | 4.5 | 3/29/2017 | 61.71 | 6498.85 | 2.0 | 6560.56 | 96 | 6462.6 A | 76-96 | 36.3 |
| H38 | 1542314 | 483081 | 93.0 | 4.5 | 3/29/2017 | 63.31 | 6499.18 | 2.0 | 6562.49 | 93 | 6467.5 A | 73-93 | 31.7 |
| H39 | 1542517 | 483204 | 100.0 | 4.5 | 7/2/2014 | 62.00 | 6504.03 | 2.0 | 6566.03 | 100 | 6464.0 A | 80-100 | 40.0 |
| H40 | 1542710 | 483345 | 98.0 | 4.5 | 7/10/2014 | 51.00 | 6514.57 | 2.0 | 6565.57 | 98 | 6465.6 A | 78-98 | 49.0 |
| H41 | 1542414 | 483448 | 100.0 | 4.5 | 2/12/2018 | 64.56 | 6499.77 | 2.0 | 6564.33 | 100 | 6462.3 A | 80-100 | 37.4 |
| H42 | 1542813 | 483511 | 100.0 | 4.5 | 10/9/2014 | 64.30 | 6503.50 | 2.0 | 6567.80 | 100 | 6465.8 A | 80-100 | 37.7 |
| H42A | 1542822 | 483522 | 100.0 | 4.5 | 10/1/2015 | 64.00 | 6503.43 | 2.6 | 6567.43 | 100 | 6464.8 A | 80-100 | 38.6 |
| H43 | 1542954 | 483706 | 90.0 | 4.5 | --- | --- | --- | 2.4 | 6569.14 | 90 | 6476.7 A | 70-90 | --- |
| H44 | 1542694 | 483771 | 90.0 | 4.5 | 10/13/2015 | 82.00 | 6487.86 | 3.1 | 6569.86 | 90 | 6476.8 A | 70-90 | 11.1 |
| H45 | 1542945 | 483956 | 90.0 | 4.5 | 10/5/2015 | 63.50 | 6506.15 | 2.0 | 6569.65 | 90 | 6477.7 A | 50-90 | 28.5 |
| H46 | 1542614 | 483981 | 95.0 | 4.5 | 10/28/2019 | 67.50 | 6499.86 | 2.0 | 6567.36 | 95 | 6470.4 A | 75-95 | 29.5 |
| H47 | 1543121 | 484112 | 90.0 | 4.5 | 10/5/2015 | 63.00 | 6506.46 | 2.0 | 6569.46 | 90 | 6477.5 A | 70-90 | 29.0 |
| H48 | 1542787 | 484185 | 90.0 | 4.5 | 10/13/2015 | 62.00 | 6506.26 | 2.0 | 6568.26 | 90 | 6476.3 A | 70-90 | 30.0 |
| H49 | 1543056 | 484342 | 90.0 | 4.5 | --- | --- | --- | 2.0 | 6570.84 | 90 | 6478.8 A | 70-90 | --- |
| H50 | 1542846 | 484394 | 100.0 | 4.5 | 10/14/2015 | 62.00 | 6506.84 | 2.2 | 6568.84 | 90 | 6476.6 A | 80-100 | 30.2 |
| H51 | 1543254 | 484489 | 90.0 | 4.5 | 10/15/2015 | 62.00 | 6507.94 | 2.6 | 6569.94 | 95 | 6472.3 A | 70-90 | 35.6 |
| H52 | 1542976 | 484590 | 100.0 | 4.5 | 10/13/2015 | 54.00 | 6516.01 | 2.5 | 6570.01 | 95 | 6472.5 A | 80-100 | 43.5 |
| H54 | 1543160 | 484723 | 100.0 | 4.5 | 10/15/2015 | 60.00 | 6509.56 | 2.0 | 6569.56 | 70 | 6497.6 A | 80-100 | 12.0 |
| H55 | 1542909 | 484706 | 95.0 | 4.5 | 3/3/2020 | 63.50 | 6505.75 | 2.0 | 6569.25 | 95 | 6472.3 A | 75-95 | 33.5 |
| H56 | 1542625 | 484804 | 95.0 | 4.5 | 10/28/2019 | 63.80 | 6505.69 | 2.0 | 6569.49 | 95 | 6472.5 A | 75-95 | 33.2 |
| H57 | 1543338 | 484884 | 90.0 | 4.5 | 10/16/2015 | 64.00 | 6507.09 | 2.0 | 6571.09 | 90 | 6479.1 A | 70-90 | 28.0 |
| H58 | 1543051 | 484959 | 95.0 | 4.5 | 10/16/2015 | 60.00 | 6511.02 | 2.5 | 6571.02 | 95 | 6473.5 A | 75-95 | 37.5 |
| H59 | 1542764 | 484969 | 100.0 | 4.5 | 10/20/2015 | 58.00 | 6512.15 | 2.5 | 6570.15 | 95 | 6472.7 A | 80-100 | 39.5 |
| H60 | 1542945 | 484152 | 100.0 | 4.5 | 10/23/2015 | 70.00 | 6501.02 | 2.0 | 6571.02 | 100 | 6469.0 A | 80-100 | 32.0 |
| H61 | 1542631 | 485206 | 89.0 | 4.5 | 11/3/2017 | 61.94 | 6508.55 | 2.0 | 6570.49 | 89 | 6479.5 A | 69-89 | 29.1 |
| H62 | 1543413 | 485343 | 100.0 | 4.5 | 10/26/2015 | 81.00 | 6491.52 | 2.3 | 6572.52 | 100 | 6470.3 A | 80-100 | 21.3 |
| H63 | 1543072 | 485346 | 100.0 | 4.5 | 10/23/2015 | 81.00 | 6490.85 | 2.5 | 6571.85 | 100 | 6469.4 A | 80-100 | 21.5 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H64 | 1542779 | 485373 | 90.0 | 4.5 | 10/26/2015 | 83.00 | 6488.86 | 3.0 | 6571.86 | 90 | 6478.9 A | 70-90 | 10.0 |
| H65 | 1543237 | 485530 | 93.0 | 4.5 | 4/30/2014 | 58.00 | 6517.06 | 2.0 | 6575.06 | 93 | 6480.1 A | 73-93 | 37.0 |
| H66 | 1542938 | 485536 | 90.0 | 4.5 | 10/27/2015 | 64.00 | 6507.77 | 2.5 | 6571.77 | 100 | 6469.3 A | 80-90 | 38.5 |
| H67 | 1543489 | 485743 | 90.0 | 4.5 | 10/28/2015 | 64.00 | 6509.76 | 2.9 | 6573.76 | 90 | 6480.9 A | 70-90 | 28.9 |
| H68 | 1543114 | 485766 | 100.0 | 4.5 | 10/28/2015 | 62.00 | 6511.38 | 3.0 | 6573.38 | 100 | 6470.4 A | 80-100 | 41.0 |
| H69 | 1542779 | 485752 | 100.0 | 4.5 | 10/29/2015 | 61.00 | 6512.08 | 3.6 | 6573.08 | 95 | 6474.5 A | 80-100 | 37.6 |
| H70 | 1543343 | 485979 | 93.0 | 4.5 | 10/28/2019 | 66.30 | 6508.32 | 2.0 | 6574.62 | 93 | 6479.6 A | 73-93 | 28.7 |
| H71 | 1542939 | 485966 | 91.0 | 4.5 | 10/28/2019 | 64.65 | 6507.67 | 2.0 | 6572.32 | 91 | 6479.3 A | 71-91 | 28.3 |
| H72 | 1543147 | 486104 | 90.0 | 4.5 | 11/2/2015 | 64.00 | 6511.17 | 3.3 | 6575.17 | 90 | 6481.9 A | 70-90 | 29.3 |
| H73 | 1541828 | 482047 | 91.0 | 4.5 | 4/30/2014 | 60.00 | 6496.73 | 2.0 | 6556.73 | 91 | 6463.7 A | 71-91 | 33.0 |
| H74 | 1541953 | 482471 | 95.0 | 4.5 | 6/24/2014 | 65.00 | 6498.05 | 2.0 | 6563.05 | 95 | 6466.1 A | 75-95 | 32.0 |
| H75 | 1542212 | 483453 | 93.0 | 4.5 | 3/29/2017 | 66.29 | 6498.96 | 2.0 | 6565.25 | 93 | 6470.3 A | 73-93 | 28.7 |
| H93 | 1543202 | 483884 | 100.0 | 4.5 | 9/4/2014 | 59.50 | 6507.25 | 2.0 | 6566.75 | 100 | 6464.8 A | 80-100 | 42.5 |
| H95 | 1543327 | 484311 | 100.0 | 4.5 | 11/25/2020 | 65.92 | 6502.99 | 2.0 | 6568.91 | 100 | 6466.9 A | 80-100 | 36.1 |
| H97 | 1543406 | 484644 | 95.0 | 4.5 | 9/4/2014 | 58.16 | 6512.06 | 2.0 | 6570.22 | 95 | 6473.2 A | 75-95 | 38.8 |
| H99 | 1543525 | 485140 | 100.0 | 4.5 | 9/4/2014 | 58.93 | 6512.73 | 2.0 | 6571.66 | 100 | 6469.7 A | 80-100 | 43.1 |
| H100 | 1543724 | 485306 | 90.0 | 4.5 | 11/4/2015 | 82.00 | 6492.12 | 2.8 | 6574.12 | 80 | 6491.3 A | 70-90 | 0.8 |
| H101 | 1543764 | 485695 | 90.0 | 4.5 | 11/6/2015 | 64.00 | 6511.52 | 3.8 | 6575.52 | 90 | 6481.8 A | 70-90 | 29.8 |
| H102 | 1543624 | 485946 | 90.0 | 4.5 | 11/6/2015 | 63.00 | 6512.62 | 2.5 | 6575.62 | 90 | 6483.1 A | 70-90 | 29.5 |
| H103 | 1543767 | 486104 | 90.0 | 4.5 | 11/9/2015 | 70.00 | 6505.61 | 2.3 | 6575.61 | 90 | 6483.4 A | 70-90 | 22.3 |
| H104 | 1543562 | 486140 | 90.0 | 4.5 | 11/9/2015 | 83.00 | 6492.05 | 2.0 | 6575.05 | 80 | 6493.1 A | 70-90 | 0.0 |
| H105 | 1542792 | 486149 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6574.76 | 90 | 6482.8 A | 80-100 | --- |
| H106 | 1542087 | 482933 | 94.0 | 4.5 | 3/29/2017 | 65.97 | 6498.78 | 2.0 | 6564.75 | 94 | 6468.8 A | 74-94 | 30.0 |
| H107 | 1541784 | 481742 | 98.0 | 4.5 | 10/28/2019 | 67.30 | 6495.06 | 2.0 | 6562.36 | 98 | 6462.4 A | 78-98 | 32.7 |
| M16 | 1543252 | 485112 | 93.3 | 5.0 | 11/25/2020 | 63.40 | 6507.19 | 1.4 | 6570.59 | 100 | 6469.2 A | 60-100 | 38.0 |
| M17 | 1542752 | 484617 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6569.21 | 95 | 6472.2 A | 80-100 | --- |
| M18 | 1542607 | 485970 | 88.0 | 4.5 | 3/29/2017 | 60.52 | 6511.76 | 2.0 | 6572.28 | 88 | 6482.3 A | 68-88 | 29.5 |
| MO | 1543620 | 485518 | 88.0 | 4.5 | 11/25/2020 | 64.40 | 6508.49 | 2.0 | 6572.89 | 80 | 6490.9 A | 45-85 | 17.6 |
| MP | 1544164 | 485492 | 80.0 | 5.0 | 11/25/2020 | 64.85 | 6509.63 | 2.1 | 6574.48 | 50 | 6522.4 A | 33-63 | 0.0 |
| MR | 1542609 | 483574 | 100.0 | 5.0 | 11/25/2020 | 69.35 | 6496.91 | 1.8 | 6566.26 | 100 | 6464.5 A | 54-94 | 32.5 |
| MS | 1542607 | 485570 | 82.0 | 5.0 | 12/17/2019 | 61.34 | 6509.33 | 1.5 | 6570.67 | 89 | 6480.2 A | 52-82 | 29.2 |
| MT | 1543221 | 483531 | 98.0 | 4.5 | 11/25/2020 | 60.50 | 6506.93 | 2.3 | 6567.43 | 87 | 6478.1 A | 34-94 | 28.8 |
| MV | 1542618 | 484418 | 105.0 | 4.5 | 11/25/2020 | 67.94 | 6501.84 | 1.3 | 6569.78 | 95 | 6473.5 A | 75-105 | 28.4 |
| R1 | 1534551 | 487790 | 120.0 | 5.0 | 11/20/2020 | 50.78 | 6504.34 | 2.0 | 6555.12 | 84 | 6469.1 A | 80-120 | 35.2 |
| | | | | | | | | | | 84 | 6469.1 M | 80-120 | 35.2 |
| R2 | 1534548 | 487968 | 115.0 | 5.0 | 10/28/2020 | 67.39 | 6486.77 | 2.0 | 6554.16 | 83 | 6469.2 M | 75-115 | 17.6 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R2 | 1534548 | 487968 | 115.0 | 5.0 | 10/28/2020 | 67.39 | 6486.77 | 2.0 | 6554.16 | 83 | 6469.2 A | 75-115 | 17.6 |
| R3 | 1534546 | 488196 | 140.0 | 5.0 | 10/28/2020 | 62.64 | 6493.09 | 2.0 | 6555.73 | 88 | 6465.7 A | 60-80 | 27.4 |
| | | | | | | | | | | 88 | 6465.7 M | 100-140 | 27.4 |
| R4 | 1534541 | 488446 | 130.0 | 5.0 | 10/28/2020 | 54.04 | 6504.74 | 2.0 | 6558.78 | 84 | 6472.8 M | 90-130 | 32.0 |
| | | | | | | | | | | 84 | 6472.8 A | 90-130 | 32.0 |
| R5 | 1534560 | 488666 | 125.0 | 5.0 | 10/29/2020 | 54.43 | 6503.32 | 2.0 | 6557.75 | 71 | 6484.8 A | 65-125 | 18.6 |
| | | | | | | | | | | 71 | 6484.8 M | 65-125 | 18.6 |
| R6 | 1534356 | 488448 | 130.0 | 5.0 | 3/25/2019 | 38.42 | 6521.22 | 2.0 | 6559.64 | 68 | 6489.6 M | 110-130 | 31.6 |
| | | | | | | | | | | 68 | 6489.6 A | 50-90 | 31.6 |
| R7 | 1534399 | 488087 | 145.0 | 5.0 | 3/25/2019 | 31.52 | 6523.29 | 2.0 | 6554.81 | 74 | 6478.8 M | 125-145 | 44.5 |
| | | | | | | | | | | 74 | 6478.8 A | 65-105 | 44.5 |
| R8 | 1534412 | 487891 | 145.0 | 5.0 | 3/25/2019 | 34.16 | 6520.00 | 2.0 | 6554.16 | 94 | 6458.2 A | 65-105 | 61.8 |
| R9 | 1534420 | 487700 | 120.0 | 4.5 | 3/25/2019 | 33.61 | 6522.14 | 2.0 | 6555.75 | 104 | 6449.8 A | 60-120 | 72.4 |
| R10 | 1534305 | 488003 | 120.0 | 4.5 | 8/28/2019 | 58.05 | 6497.17 | 2.0 | 6555.22 | 83 | 6470.2 A | 60-120 | 27.0 |
| R11 | 1534320 | 488280 | 120.0 | 4.5 | 12/17/2019 | 62.11 | 6496.34 | 2.0 | 6558.45 | 70 | 6486.5 M | 60-120 | 9.9 |
| | | | | | | | | | | 70 | 6486.5 A | 60-120 | 9.9 |
| R12 | 1534220 | 488360 | 120.0 | 4.5 | 3/25/2019 | 36.82 | 6520.13 | 2.0 | 6556.95 | 66 | 6489.0 M | 60-120 | 31.2 |
| | | | | | | | | | | 66 | 6489.0 A | 60-120 | 31.2 |
| R13 | 1534220 | 488150 | 120.0 | 4.5 | 3/25/2019 | 43.18 | 6513.71 | 2.0 | 6556.89 | 96 | 6458.9 A | 60-120 | 54.8 |
| R14 | 1534168 | 487971 | 100.0 | 4.5 | 3/25/2019 | 33.91 | 6522.88 | 2.0 | 6556.79 | 83 | 6471.8 A | 60-100 | 51.1 |
| R15 | 1534180 | 487700 | 100.0 | 4.5 | 3/25/2019 | 37.64 | 6518.59 | 2.0 | 6556.23 | 98 | 6456.2 A | 60-100 | 62.4 |
| R16 | 1533973 | 487394 | 100.0 | 4.5 | 11/14/2013 | 68.19 | 6486.30 | 2.0 | 6554.49 | 92 | 6460.5 A | 60-100 | 25.8 |
| R17 | 1534040 | 487810 | 100.0 | 4.5 | 3/25/2019 | 40.38 | 6514.84 | 2.0 | 6555.22 | 95 | 6458.2 A | 60-100 | 56.6 |
| R18 | 1534030 | 487970 | 100.0 | 4.5 | 3/12/2020 | 61.10 | 6494.90 | 2.0 | 6556.00 | 87 | 6467.0 A | 60-100 | 27.9 |
| R19 | 1534029 | 488173 | 100.0 | 4.5 | 3/25/2019 | 48.62 | 6507.88 | 2.0 | 6556.50 | 90 | 6464.5 A | 60-100 | 43.4 |
| R20 | 1534120 | 488260 | 100.0 | 4.5 | 3/12/2020 | 59.90 | 6496.44 | 2.0 | 6556.34 | 80 | 6474.3 A | 60-100 | 22.1 |
| R21 | 1534031 | 488350 | 100.0 | 4.5 | 3/25/2019 | 31.52 | 6524.05 | 2.0 | 6555.57 | 88 | 6465.6 A | 60-100 | 58.5 |
| R22 | 1533940 | 488091 | 100.0 | 4.5 | 3/12/2020 | 61.70 | 6495.44 | 2.0 | 6557.14 | 91 | 6464.1 A | 60-100 | 31.3 |
| R23 | 1533880 | 487750 | 100.0 | 4.5 | 11/14/2013 | 62.02 | 6493.73 | 2.0 | 6555.75 | 97 | 6456.8 A | 60-100 | 37.0 |
| R24 | 1533872 | 487526 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6552.30 | 100 | 6450.3 A | 60-100 | --- |
| R26 | 1533761 | 486760 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6548.29 | 95 | 6451.3 A | 75-95 | --- |
| R27 | 1533765 | 487017 | 98.0 | 4.5 | --- | --- | --- | 2.0 | 6550.07 | 98 | 6450.1 A | 78-98 | --- |
| R28 | 1533761 | 487226 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6550.30 | 100 | 6448.3 A | 60-100 | --- |
| R29 | 1533785 | 487629 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6554.08 | 100 | 6452.1 A | 60-100 | --- |
| R32 | 1533704 | 487163 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6550.10 | 90 | 6458.1 A | 75-95 | --- |
| R33 | 1533672 | 486914 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6548.72 | 100 | 6446.7 A | 80-100 | --- |
| R34 | 1533675 | 486617 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6547.79 | 95 | 6450.8 A | 75-95 | --- |

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R35 | 1533668 | 486345 | 90.0 | 4.5 | --- | --- | --- | 2.0 | 6545.26 | 90 | 6453.3 A | 70-90 | --- |
| R36A | 1533568 | 486184 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6545.48 | 90 | 6453.5 A | 75-95 | --- |
| R37A | 1533579 | 486472 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6546.81 | 95 | 6449.8 A | 75-95 | --- |
| R38 | 1533574 | 486762 | 98.0 | 4.5 | --- | --- | --- | 2.0 | 6547.69 | 98 | 6447.7 A | 78-98 | --- |
| R39 | 1533571 | 487014 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6549.34 | 95 | 6452.3 A | 75-95 | --- |
| R40 | 1533581 | 487263 | 90.0 | 4.5 | --- | --- | --- | 2.0 | 6549.12 | 90 | 6457.1 A | 70-90 | --- |
| R41 | 1533596 | 487388 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6550.90 | 100 | 6448.9 A | 60-100 | --- |
| R42 | 1533466 | 487346 | 90.0 | 4.5 | --- | --- | --- | 2.0 | 6549.34 | 90 | 6457.3 A | 70-90 | --- |
| R43 | 1533509 | 487134 | 100.0 | 4.5 | 4/5/2017 | 63.25 | 6487.90 | 2.0 | 6551.15 | 100 | 6449.2 A | 60-100 | 38.8 |
| R47 | 1533470 | 485780 | 160.0 | 4.5 | 12/20/2013 | 75.59 | 6471.58 | 2.0 | 6547.17 | 103 | 6442.2 A | 100-160 | 29.4 |
| | | | | | | | | | | 103 | 6442.2 L | 100-160 | 29.4 |
| R48 | 1533345 | 485775 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6545.24 | 100 | 6443.2 L | 100-160 | --- |
| | | | | | | | | | | 100 | 6443.2 A | 100-160 | --- |
| R49A | 1533394 | 485951 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6545.70 | --- | --- A | 75-95 | --- |
| R50A | 1533376 | 486217 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6544.69 | --- | --- A | 60-100 | --- |
| R52A | 1533367 | 486751 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6546.91 | 95 | 6449.9 A | 75-95 | --- |
| R53 | 1533402 | 487020 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6549.47 | 95 | 6452.5 A | 75-95 | --- |
| R54 | 1533331 | 487163 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6549.93 | 95 | 6452.9 A | 75-95 | --- |
| R55 | 1533272 | 486897 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6548.22 | 95 | 6451.2 A | 75-95 | --- |
| R57 | 1533260 | 485880 | 135.0 | 4.5 | 12/20/2013 | 74.67 | 6472.40 | 2.0 | 6547.07 | 99 | 6446.1 A | 75-135 | 26.3 |
| | | | | | | | | | | 99 | 6446.1 L | 75-135 | 26.3 |
| R58 | 1533170 | 485710 | 160.0 | 4.5 | 4/8/2014 | 70.98 | 6473.47 | 2.0 | 6544.45 | 98 | 6444.5 A | 100-160 | 29.0 |
| | | | | | | | | | | 98 | 6444.5 L | 100-160 | 29.0 |
| R59 | 1533125 | 485963 | 150.0 | 4.5 | 8/2/2016 | 66.61 | 6478.40 | 2.0 | 6545.01 | 107 | 6436.0 L | 110-150 | 42.4 |
| | | | | | | | | | | 107 | 6436.0 A | 110-150 | 42.4 |
| R60A | 1533093 | 486213 | 107.0 | 4.5 | --- | --- | --- | 2.0 | 6544.99 | --- | --- A | 60-107 | --- |
| R61A | 1533135 | 486485 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6544.69 | 95 | 6447.7 A | 60-100 | --- |
| R63 | 1533189 | 487028 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6549.92 | 95 | 6452.9 A | 75-95 | --- |
| R64 | 1533059 | 486921 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6548.15 | 85 | 6461.2 A | 75-95 | --- |
| R65A | 1533056 | 486614 | 95.0 | 4.5 | --- | --- | --- | 2.0 | 6545.64 | 95 | 6448.6 A | 75-95 | --- |
| R66A | 1533023 | 486355 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6545.33 | --- | --- A | 60-100 | --- |
| R67A | 1532999 | 486075 | 90.0 | 4.5 | --- | --- | --- | 2.0 | 6544.38 | 90 | 6452.4 A | 70-90 | --- |
| R68 | 1533025 | 485819 | 160.0 | 4.5 | 10/10/2014 | 69.44 | 6475.41 | 2.0 | 6544.85 | 99 | 6443.9 L | 100-160 | 31.6 |
| | | | | | | | | | | 99 | 6443.9 A | 100-160 | 31.6 |
| R69 | 1532987 | 486024 | 160.0 | 4.5 | 4/8/2014 | 70.53 | 6474.82 | 2.0 | 6545.35 | 96 | 6447.4 A | 100-160 | 27.5 |
| | | | | | | | | | | 96 | 6447.4 L | 100-160 | 27.5 |
| R70A | 1532881 | 486261 | 105.0 | 4.5 | --- | --- | --- | 2.0 | 6545.30 | --- | --- A | 60-105 | --- |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R73 | 1533019 | 485560 | 150.0 | 4.5 | 5/13/2015 | 69.92 | 6474.42 | 2.3 | 6544.34 | 99 | 6443.0 | A | 110-150 | 31.4 |
| | | | | | | | | | | 99 | 6443.0 | L | 110-150 | 31.4 |
| R74 | 1532852 | 485502 | 140.0 | 4.5 | 11/20/2020 | 71.33 | 6472.70 | 2.4 | 6544.03 | 104 | 6437.6 | A | 100-140 | 35.1 |
| | | | | | | | | | | 104 | 6437.6 | L | 100-140 | 35.1 |
| R75 | 1532922 | 485716 | 140.0 | 4.5 | 5/13/2015 | 69.14 | 6475.74 | 2.3 | 6544.88 | 98 | 6444.6 | A | 100-140 | 31.2 |
| | | | | | | | | | | 98 | 6444.6 | L | 100-140 | 31.2 |
| R76 | 1532888 | 485891 | 140.0 | 4.5 | 5/13/2015 | 68.37 | 6476.72 | 2.3 | 6545.09 | 106 | 6436.8 | L | 100-140 | 39.9 |
| | | | | | | | | | | 106 | 6436.8 | A | 100-140 | 39.9 |
| R77 | 1532683 | 485800 | 140.0 | 4.5 | 5/13/2015 | 68.28 | 6476.69 | 2.4 | 6544.97 | 80 | 6462.6 | A | 100-140 | 14.1 |
| | | | | | | | | | | 80 | 6462.6 | L | 100-140 | 14.1 |
| R78 | 1532683 | 485612 | 140.0 | 4.5 | 5/13/2015 | 69.16 | 6474.87 | 2.0 | 6544.03 | 85 | 6457.0 | A | 100-140 | 17.8 |
| | | | | | | | | | | 85 | 6457.0 | L | 100-140 | 17.8 |
| R79 | 1532703 | 485379 | 120.0 | 4.5 | --- | --- | --- | 2.0 | 6542.94 | 80 | 6460.9 | L | 80-120 | --- |
| | | | | | | | | | | 80 | 6460.9 | A | 80-120 | --- |
| R80 | 1533169 | 485471 | 120.0 | 4.5 | --- | --- | --- | 2.0 | 6543.72 | --- | --- | L | 80-120 | --- |
| | | | | | | | | | | --- | --- | A | 80-120 | --- |

Note: A = Alluvial Aquifer
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 groundwater 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 groundwater flow.

Figures 4.2-1, 4.2-1A, 4.2-1B and 4.2-1C present the fall of 2020 alluvial aquifer water-level elevation contours for the Grants Project area. The three insert maps are used to show water-level elevations where the spacing of the wells is too close for showing the information on Figure 4.2-1. The alluvial aquifer limits (green lines on figure) are based on the 2014 water-level elevation map and base of the alluvium map. This 2014 adjustment in the alluvial aquifer limits resulted in only small changes in the limits of the alluvial aquifer. Locations of the alluvial wells, with their respective well names listed adjacent to the well symbol, are plotted on Figure 4.1-1 in the previous section. The 2020 groundwater flow patterns in the alluvial aquifer are very similar to those observed in the fall of 2014. The ridge in the piezometric surface west of the LTP is attributable to continued injection of water into the injection wells and lines in 2020 (see Figure 4.1-1 for locations). The water-level elevations and flow directions indicate the extent of the area of the alluvial aquifer from which groundwater is drawn by the collection system. The area of collection is between the treated water injection area and the collection wells, where groundwater is flowing back to the collection wells. The area underlying the LTP is also within the collection area, because alluvial groundwater in this area flows to the collection wells. The collection area also extends from the southeast corner of the STP through the injection ridge to the zero saturation line to the east. There are a small number of alluvial wells where the measured water-level elevation is not representative of the local alluvial potentiometric surface and the water-level elevation in those wells may not be honored in the contouring.

The water-level elevations in Section 3 overall decreased in 2020 with the collection and treated water injection (see Figure 4.2-1B). Water-level elevations also decreased a few feet in Section 33 (see the western half of Figure 4.2-1). The water levels in Section 28 also generally decreased a few feet in 2020.

Several wells have been drilled in the past 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. Water levels were measured in wells 652, 680, 851, 852, 867, 877, 879, 887, 889, 892, 897, 1C, 1H, 1I, 1P, 1N, 1O, MN and MP in late 2020 to define the amount of limited groundwater that exists near the saturation boundary.

Flow in the San Mateo alluvium is naturally diverted either west through the western portion of Section 28 or south/southwest through Sections 35 and 3 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. Further down-gradient, the San Mateo alluvial groundwater then mixes with the Rio San Jose alluvial groundwater flowing from the northwest. The combined flow continues to flow in a southerly direction. The gradient of the alluvial water-level elevation surface in the Rio San Jose alluvium has been increased in Section 33, but it is still relatively flat due to its large transmitting ability. San Mateo alluvial groundwater that flows through the northern portion of Section 3 (see Figure 4.2-1) joins the Rio San Jose groundwater system in the eastern portion of Section 4.

Water-level data for the alluvial wells are presented in Appendix A as Table A.2-1 (HMC alluvial wells), Table A.2-2 (Murray Acres, Broadview Acres, Felice Acres, and Pleasant Valley Estates alluvial wells) and Table A.2-3 (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 in the black boxes depicted on Figure 4.2-2. 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 eight years of data to illustrate the recent water-level elevation trends.

Water levels in the alluvial aquifer up-gradient of the LTP have been fairly stable during the last year except for a gradual declining trend in the wells DD, NC and P3 and a gradual rise in wells ND and Q. Figures 4.2-3 and 4.2-3A present water-level elevation data for up-gradient wells NC, ND, P3, P4, Q and R and DD, DD2, P, P1 and P2 respectively.

Water-level elevation data are presented for two sets of wells monitored for the purpose of detection of a reversal of the direction of alluvial groundwater 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 very flat in the area of wells SM, SN, SO and SP. Water levels for well SS, which is to the south of the other four wells, show a similar trend but with a lower water-level elevation. Very gradual water-level rises were observed in wells SM, SN, SO and SP in the last half of 2020. The head is larger near the injection line than near wells SP and SO. The water-level elevations at these four wells (see Figure 4.2-1A) shows that they are located on the northern edge of the depression developed by the RO collection wells and therefore the gradient in this area is mainly to the south into the RO collection depression.

Wells S2 and S5 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 very good reversal of the groundwater flow direction due to the operation of collection wells near well S5 and the rise in water levels caused by the injection (see Figure 4.2-5).

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 declined in each of these wells during the last five years.

The alluvial water levels north of Murray Acres gradually declined in 2020 in wells H55, M7, M9, MO, MR and MX (see Figure 4.2-7).

Wells B and BA are monitored in order to define the reversal in the groundwater gradient between the M and J injection lines and the B and D collection lines. Figure 4.2-8 presents water-level elevation data for wells B and BA and indicates a gradient reversal between these two wells in 2020. The smaller collection rate up-gradient of these two wells in 2020 caused water level to be fairly steady in 2020. Figure 4.2-9 presents water-level elevation plots for alluvial wells B12, B13, D1, DT, M5 and MB, which are located near and west of the lined

collection ponds. Water levels overall declined in this area of the alluvial aquifer in 2020. Water-level elevations in the alluvial aquifer near the STP collection system are presented on Figure 4.2-10 for reversal wells DZ and KZ and collection well B11. 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. A slight reversal was generally maintained with the smaller collection rates in 2020.

Figure 4.2-11 presents water-level elevation data for wells C8, C10, K4 and L6. This data reflects the changes in water levels near the STP. Injection of treated water has caused the higher water-level elevations observed in well L6 with steady levels in 2011 through 2016, a decline in 2017, and fairly steady water levels in 2018 through 2020. Figure 4.2-12 shows the water-level elevation plots for wells K5, K9, K11, KF and X which indicate fairly steady water levels in well X in 2020.

Water-level elevations in the alluvial aquifer north of the Broadview Acres injection system declined in 2020. The pumping in Felice Acres for South Off-site collection supply caused overall steady water levels in wells 497 and Q48 in 2020 (see water levels for wells 497, F, GH, Q48 and SUB3 on Figure 4.2-13). Figure 4.2-13A shows variable water levels in alluvial wells Q5, Q8, Q11, Q23 and Q29 due to the pumping in this area.

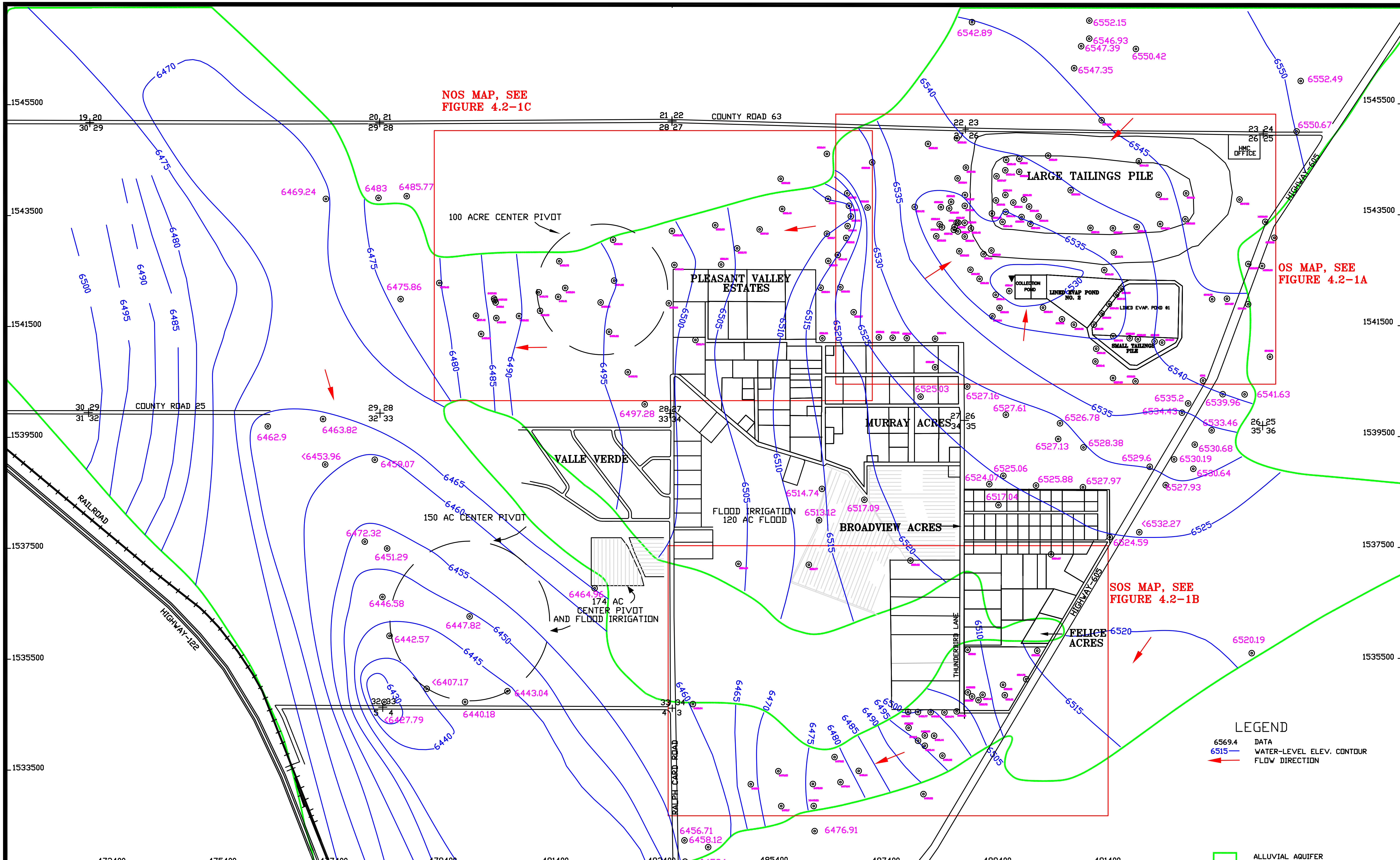
Water levels in the former flood irrigation area south of Murray Acres in alluvial wells 555, 556, 557, 844, 845 and 846 during 2020 (see Figure 4.2-14) gradually declined in wells 844 and 845 while levels were fairly steady in wells 555, 556, 557 and 846.

Figure 4.2-15 presents water-level hydrographs for five wells located in Section 3. Water levels gradually increased in wells 540, 862 and 867 in 2020 and were steady in wells 631 and 644. Figure 4.2-15A presents water-level elevations for four of the R wells with variable levels depending on which wells are operating as collection wells.

Water-level hydrographs for six wells in the former irrigation area in Section 28 are presented on Figure 4.2-16. Water levels in 2020 overall slightly declined in this area except in well 886 which was generally steady. Water-level hydrographs for five wells just west of the former Section 28 irrigation area are presented on Figure 4.2-16A and show a very small decline in water levels in 2020 except for the steady levels in wells 659 and H16.

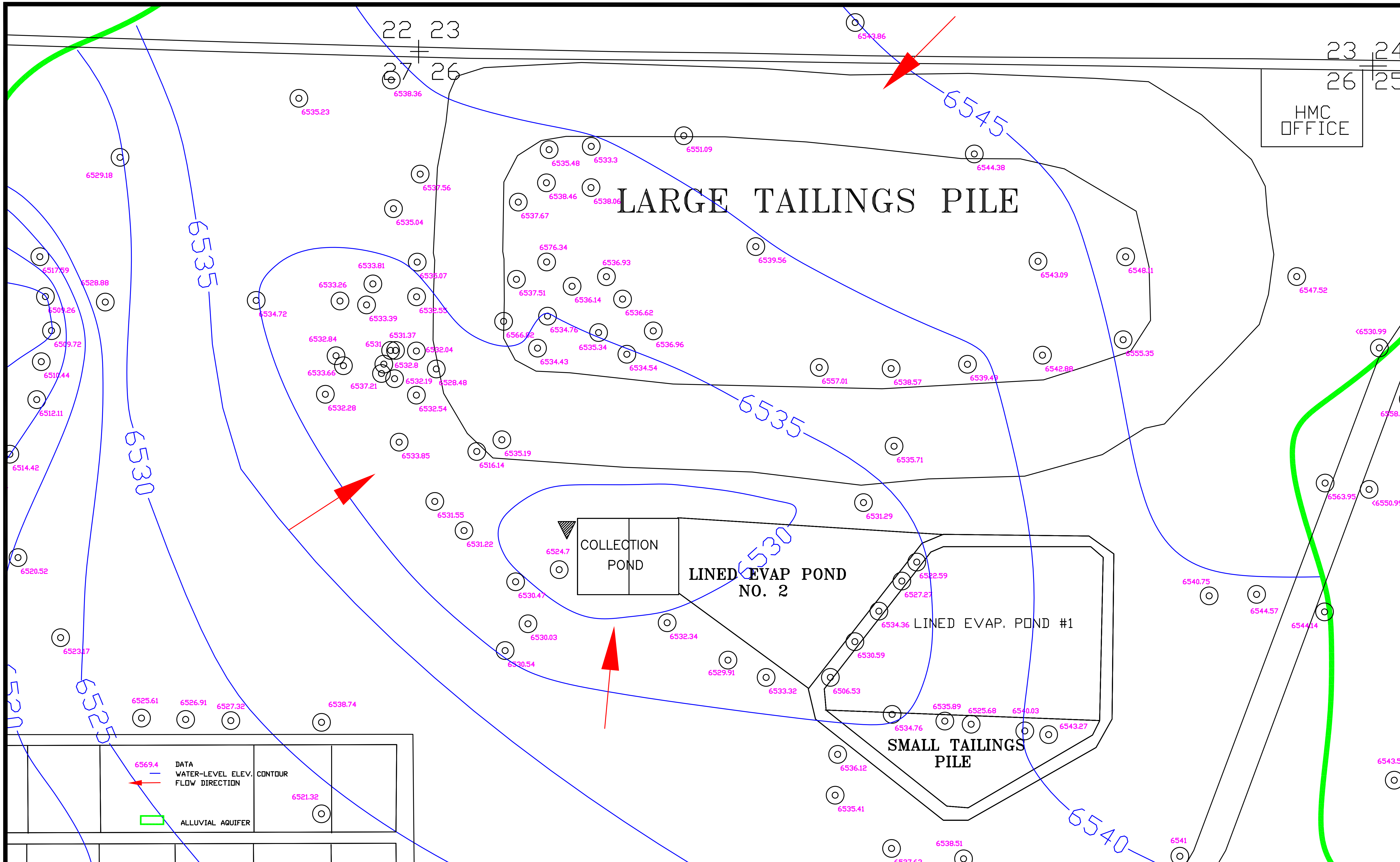
Figure 4.2-17 presents the water-level time plots for one well located in Section 20 and three wells located in Section 32.  Water levels gradually declined in these wells in 2020 except for the increase in well 994.

Figure 4.2-18 presents the water-level plots for the Section 33 wells.  Water levels were fairly steady in these wells in 2020 except for the one likely anomalous higher value in well 649.  No pumping other than for sample collection from the Section 33 wells was done after 2012 and no future pumping operations are anticipated.



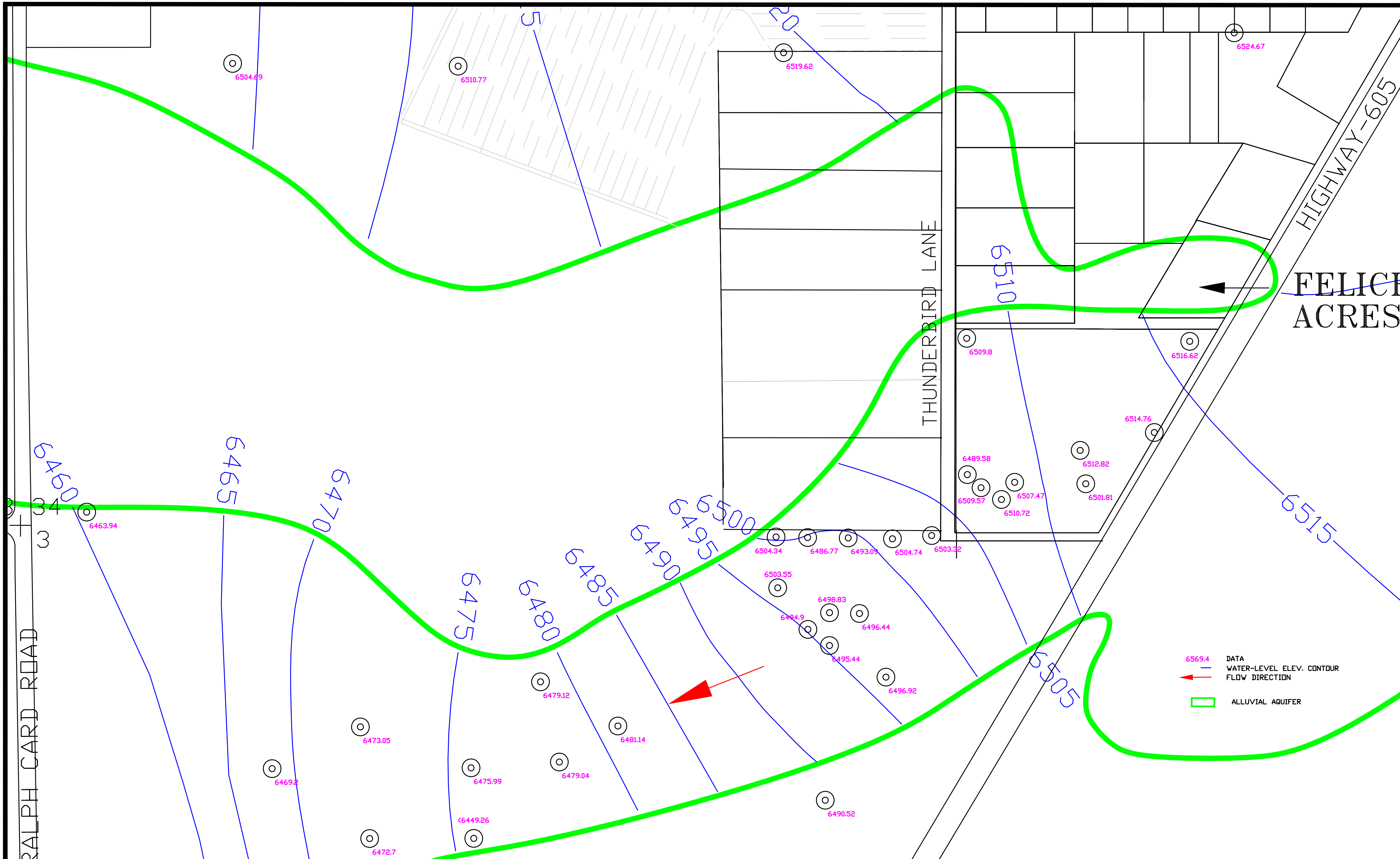

SCALE: 1"=1600'
C:\PROJECTS\ 2021-06
1600QAL20
DATE: 1/12/2021

FIGURE 4.2-1. WATER-LEVEL ELEVATIONS OF THE ALLUVIAL AQUIFER, FALL 2020, FT-MSL



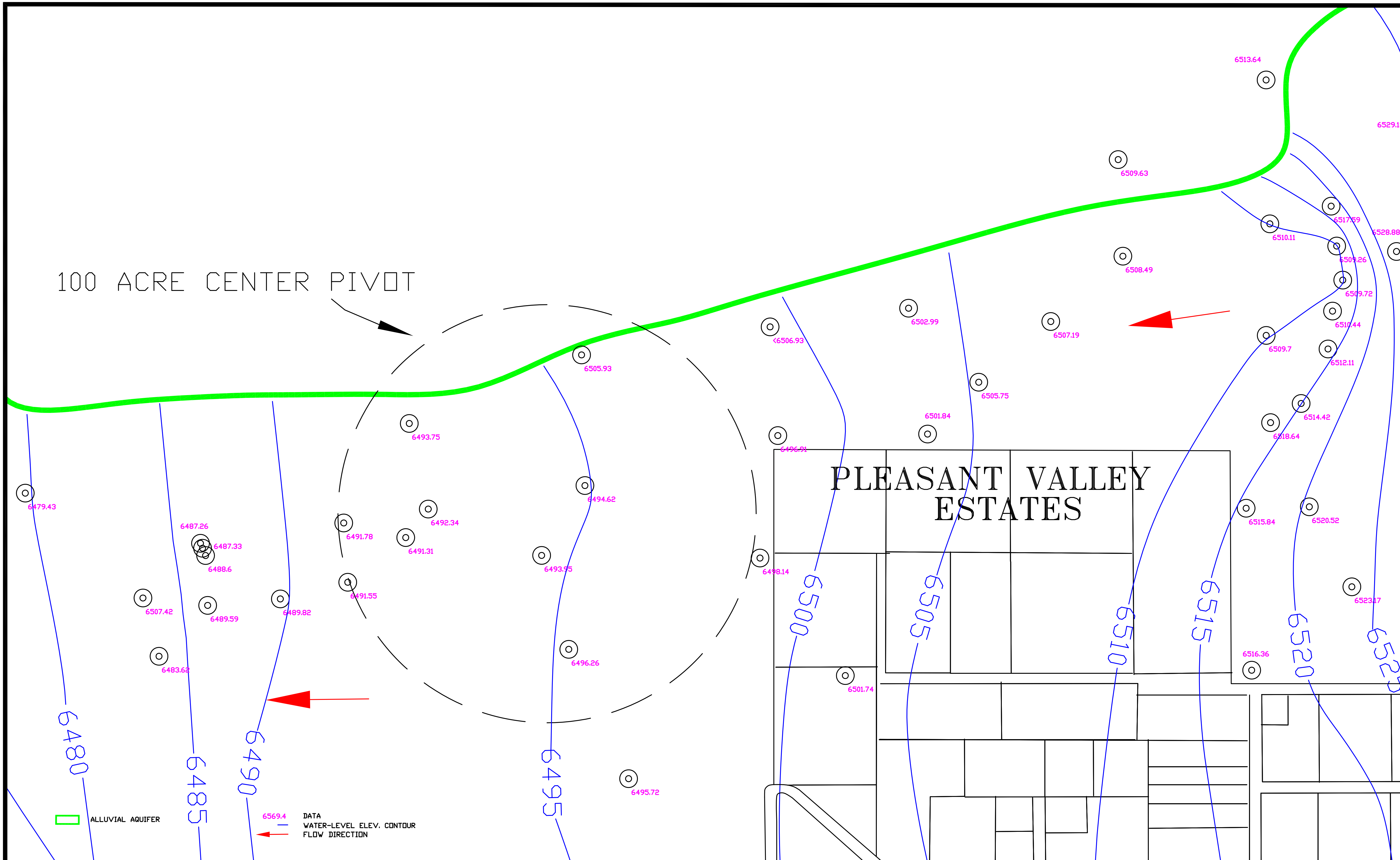

SCALE: 1"=500'
C:\PROJECTS\ 2021-06 1600QAL20
DATE: 1/8/2021

FIGURE 4.2-1A. WATER-LEVEL ELEVATIONS OF THE ALLUVIAL AQUIFER, OS, FALL 2020, FT-MSL




SCALE: 1"=500'
C:\PROJECTS\ 2021-06 1600QAL20
DATE: 1/20/2021

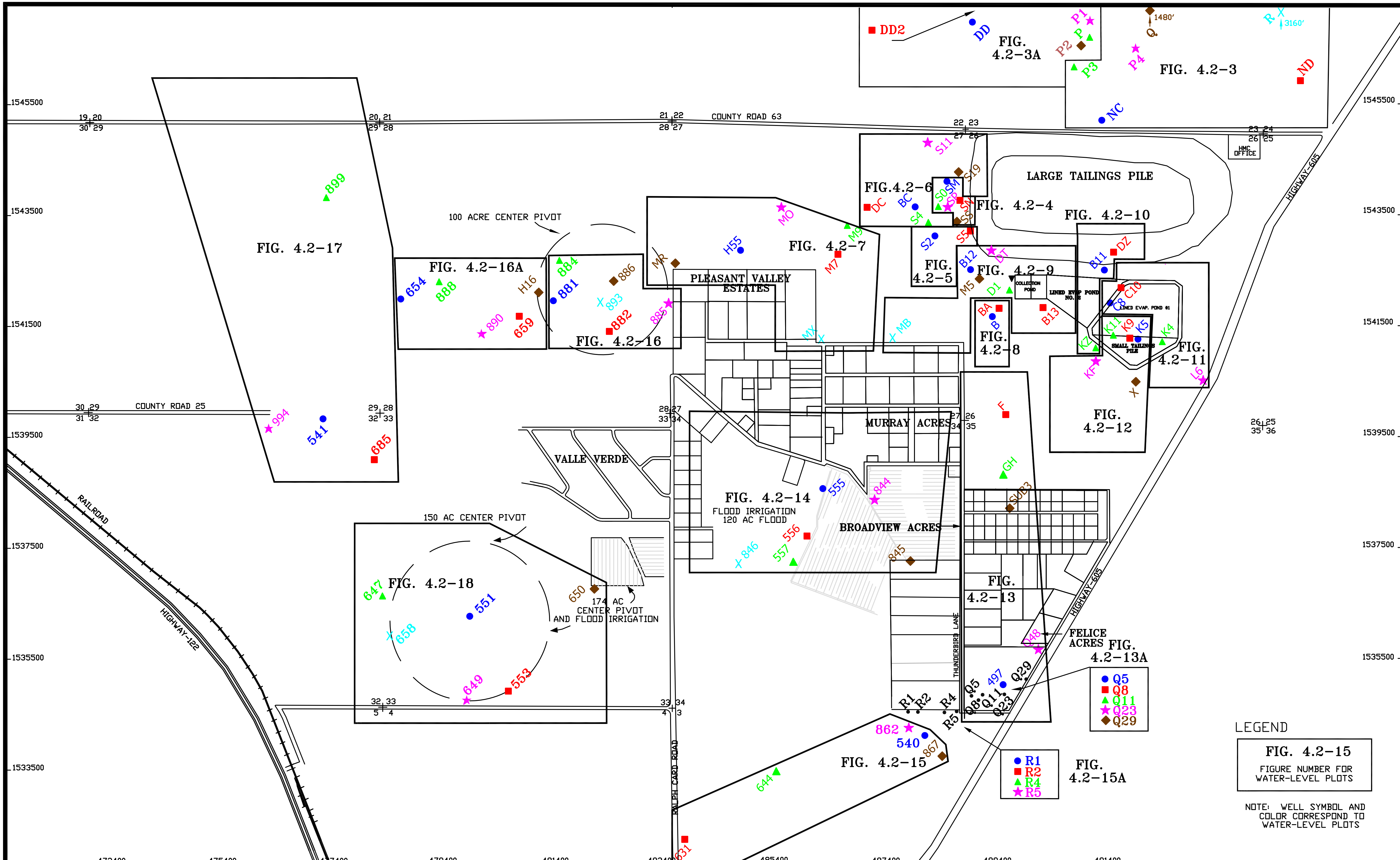
FIGURE 4.2-1B. WATER-LEVEL ELEVATIONS OF THE ALLUVIAL AQUIFER, SOS, FALL 2020, FT-MSL




SCALE: 1"=500'
C:\PROJECTS\2021-06 1600QAL20
DATE: 1/11/2021

FIGURE 4.2-1C. WATER-LEVEL ELEVATIONS OF THE ALLUVIAL AQUIFER, NOS, FALL 2020, FT-MSL

4.2-9




SCALE: 1"=1600'
C:\PROJECTS\2021-06 1600QAL20
DATE: 1/12/2021

FIGURE 4.2-2. LOCATION OF ALLUVIAL WELLS WITH WATER-LEVEL PLOTS, 2020

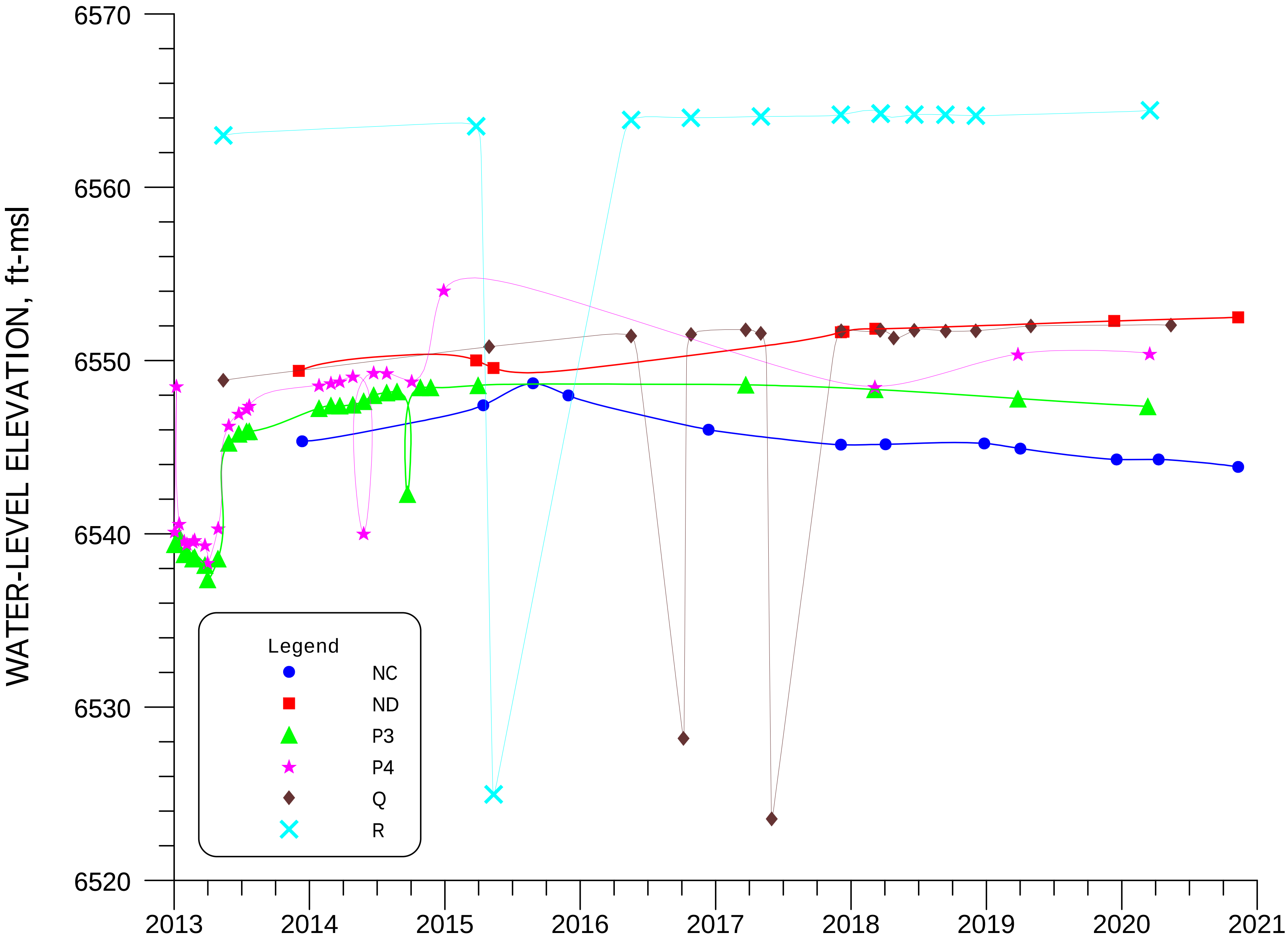



**FIGURE 4.2-3. WATER-LEVEL ELEVATION FOR WELLS NC, ND, P3, P4, Q AND R.**

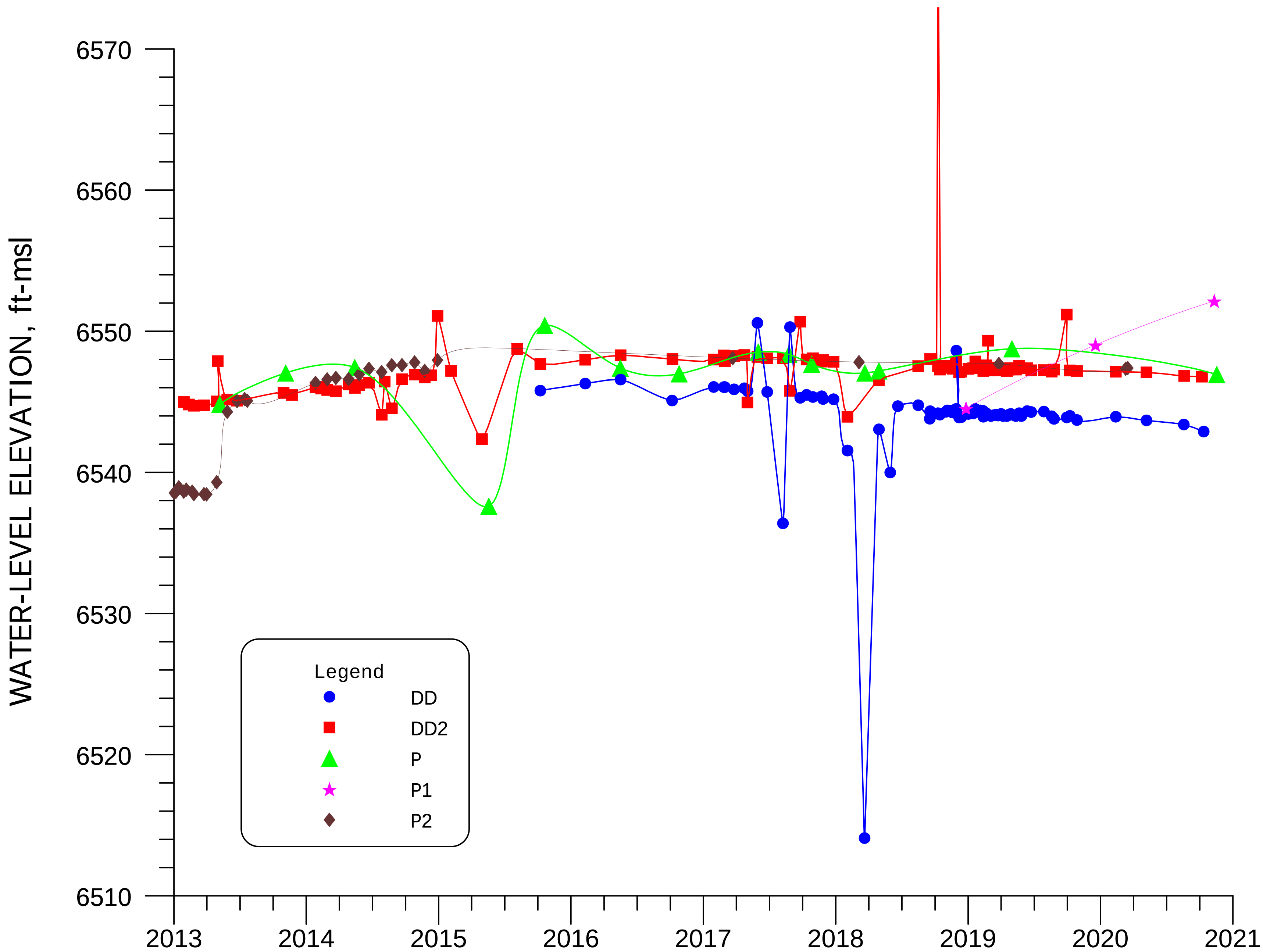



**FIGURE 4.2-3A. WATER-LEVEL ELEVATION FOR WELLS DD, DD2, P, P1 AND P2.**

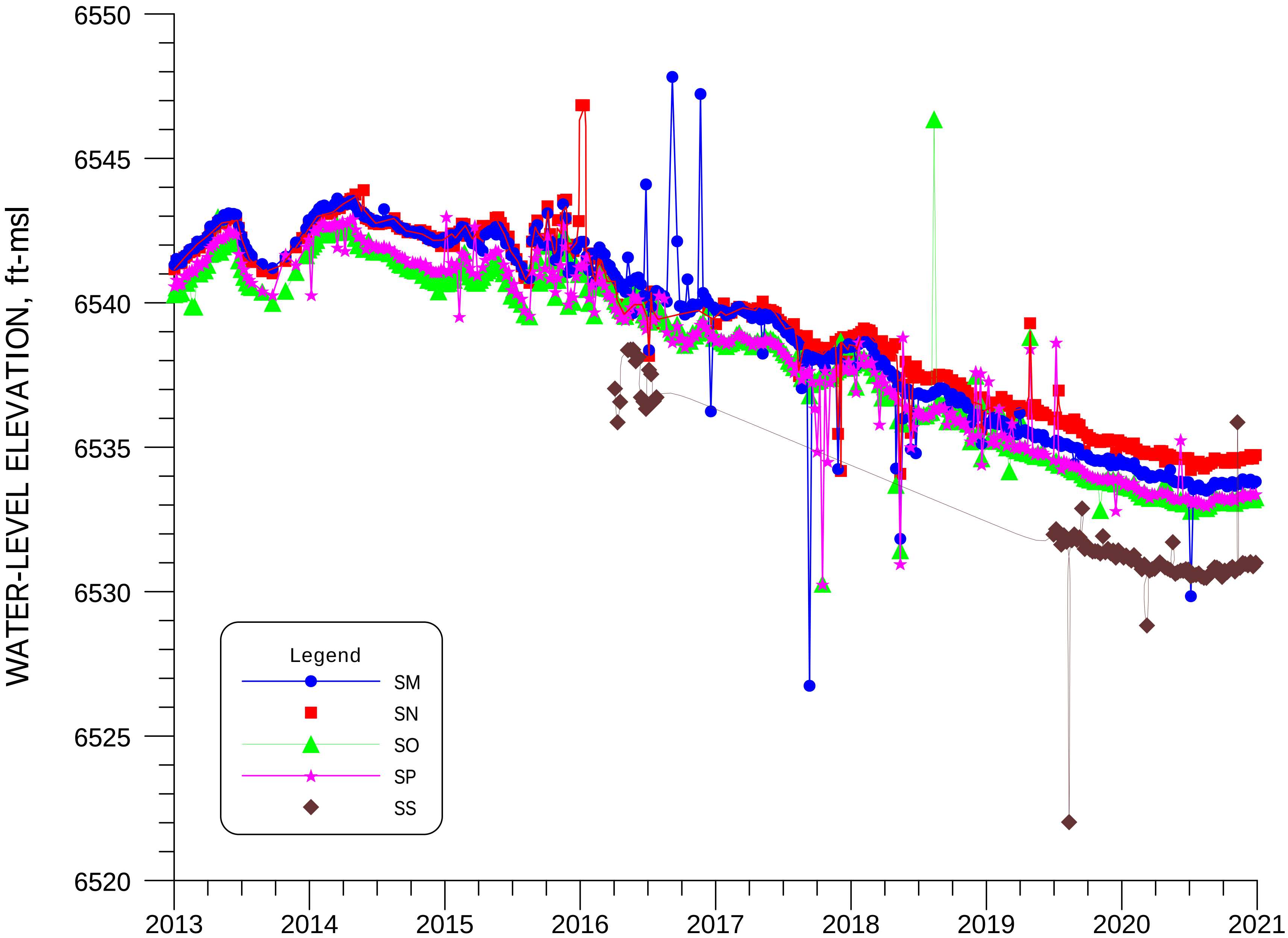



**FIGURE 4.2-4. WATER-LEVEL ELEVATION FOR WELLS SM, SN, SO, SP AND SS.**

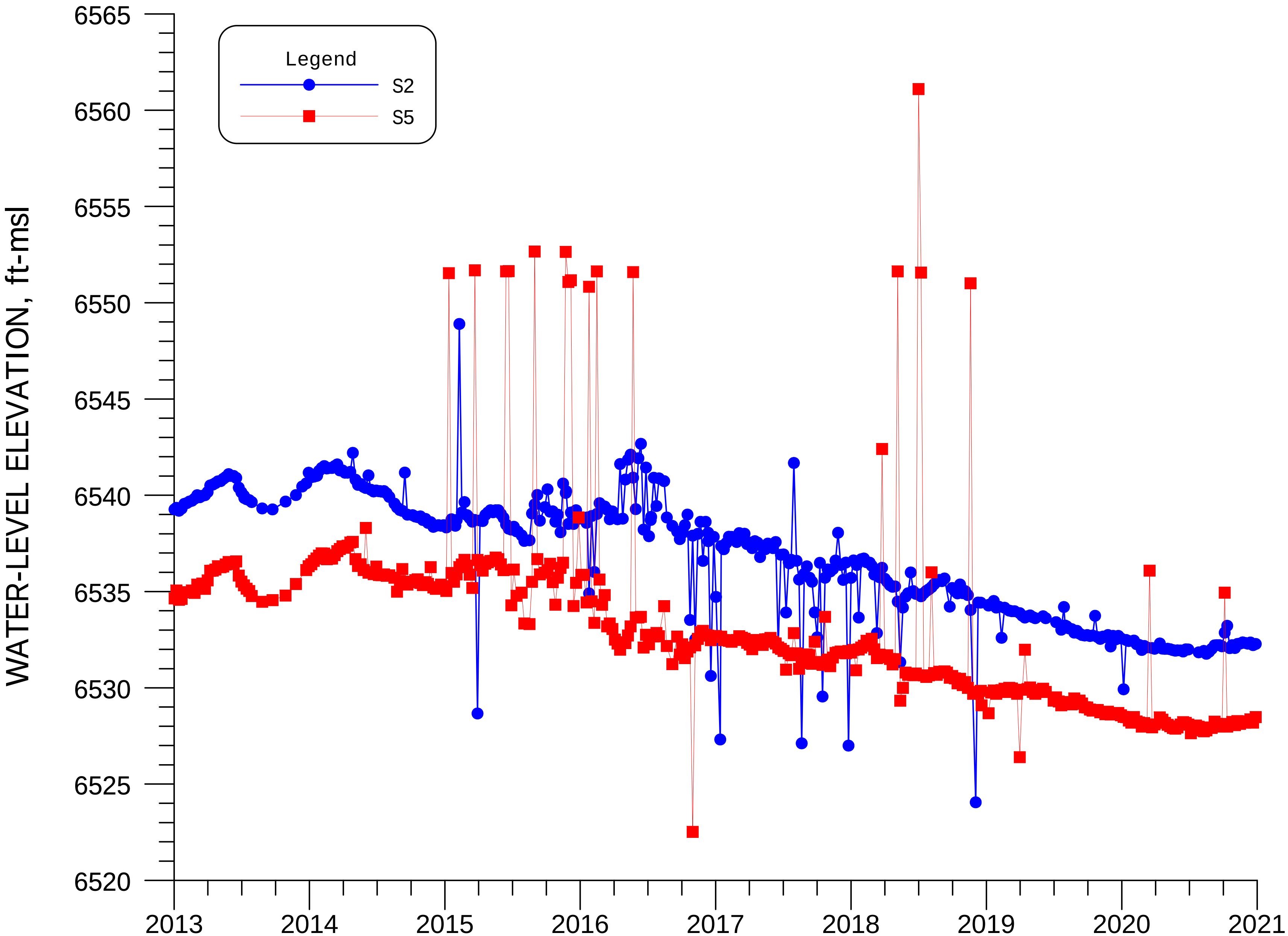



**FIGURE 4.2-5. WATER-LEVEL ELEVATION FOR WELLS S2 AND S5.**

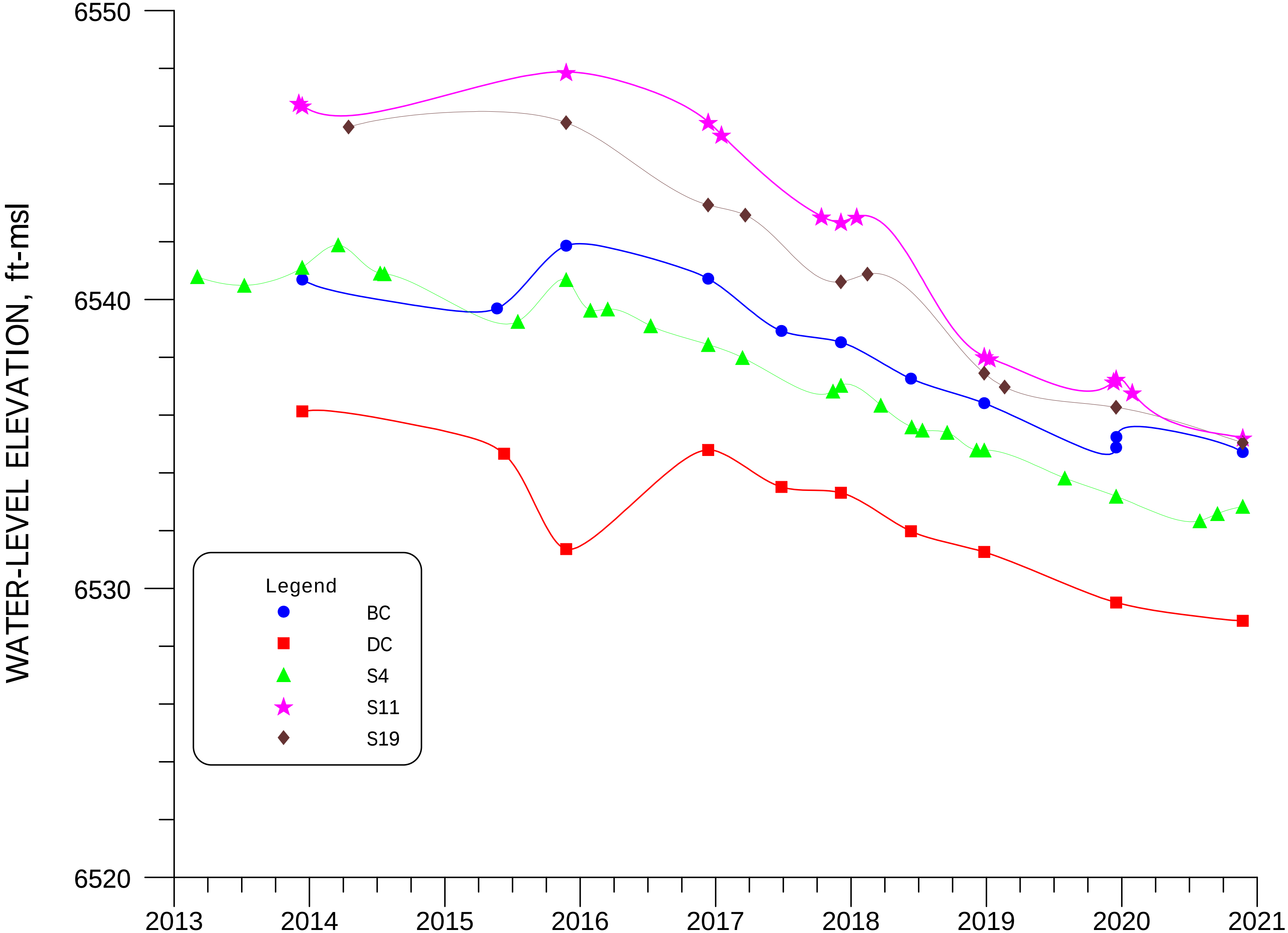



**FIGURE 4.2-6. WATER-LEVEL ELEVATION FOR WELLS BC, DC, S4, S11 AND S19.**

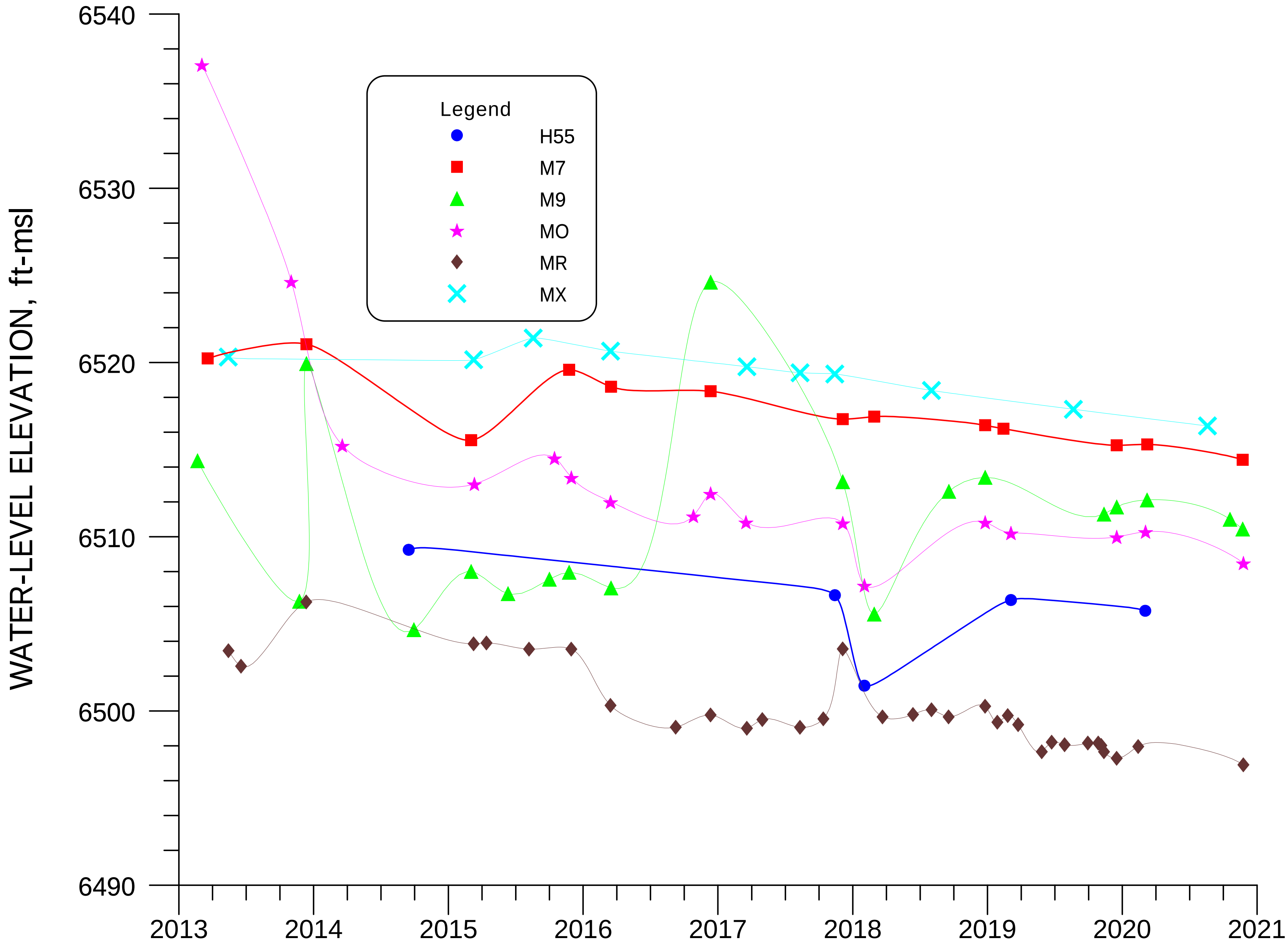



**FIGURE 4.2-7. WATER-LEVEL ELEVATION FOR WELLS H55, M7, M9, MO, MR AND MX.**

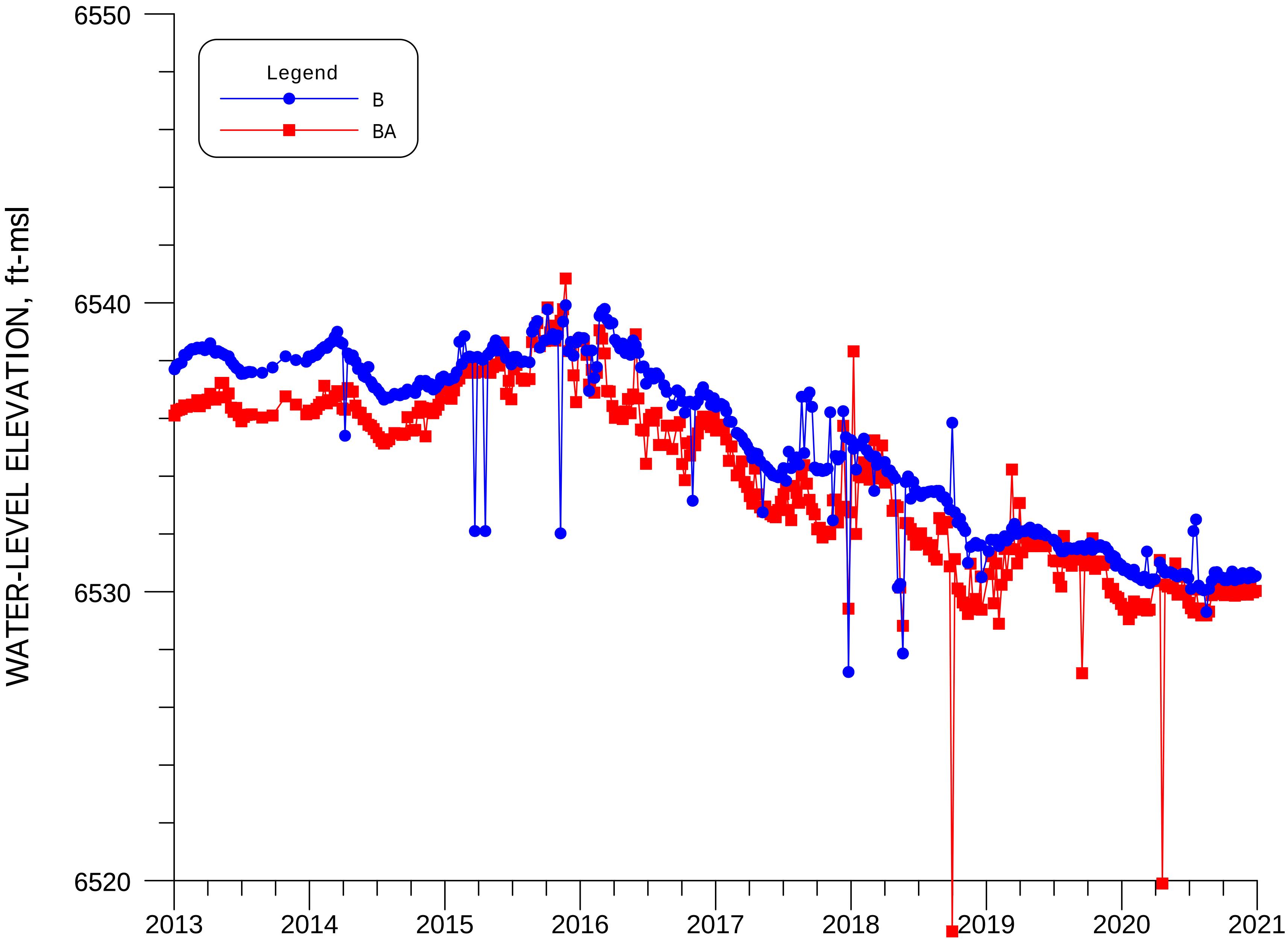



**FIGURE 4.2-8. WATER-LEVEL ELEVATION FOR WELLS B AND BA.**

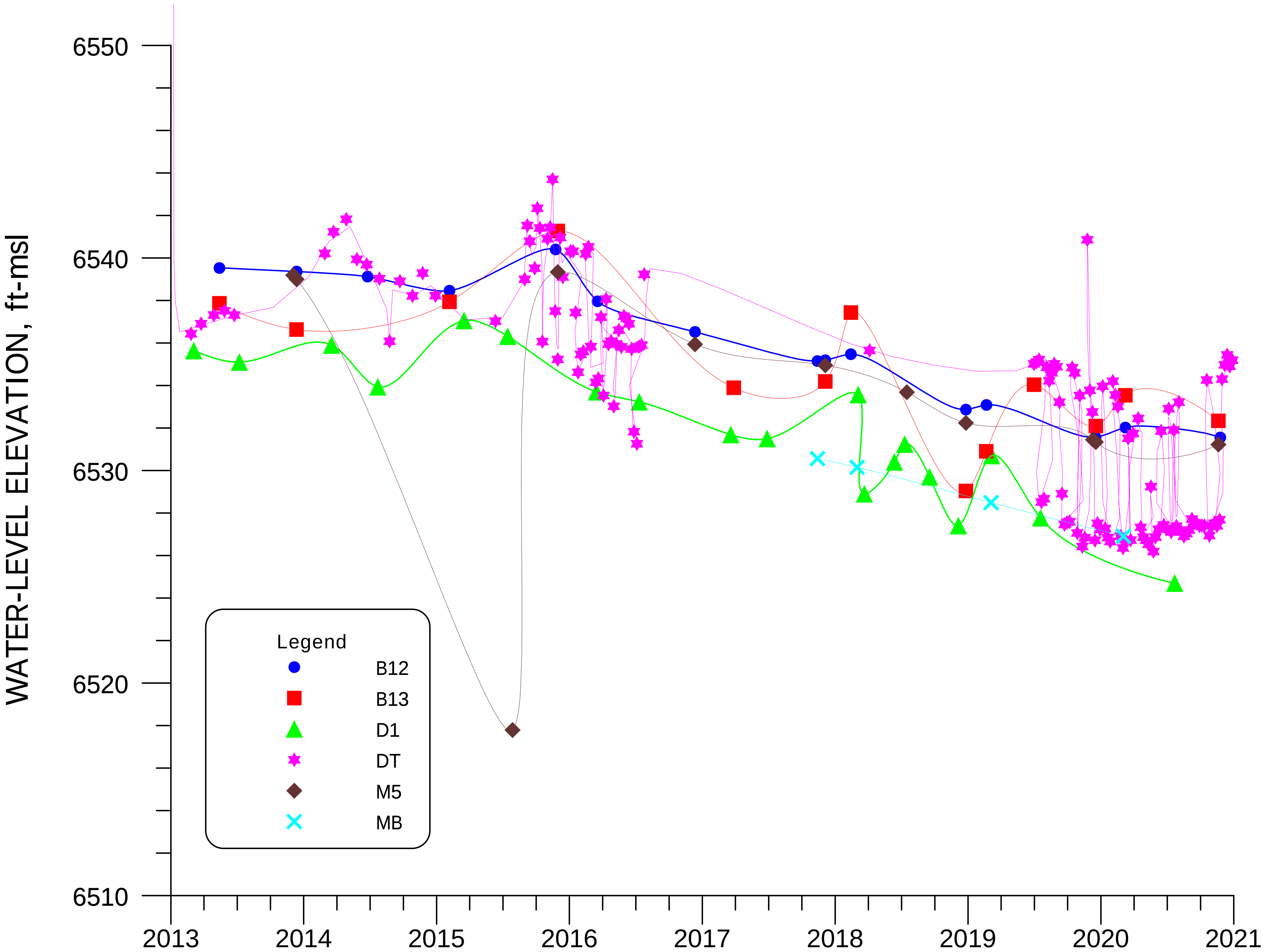



**FIGURE 4.2-9. WATER-LEVEL ELEVATION FOR WELLS B12, B13, D1, DT, M5 AND MB.**

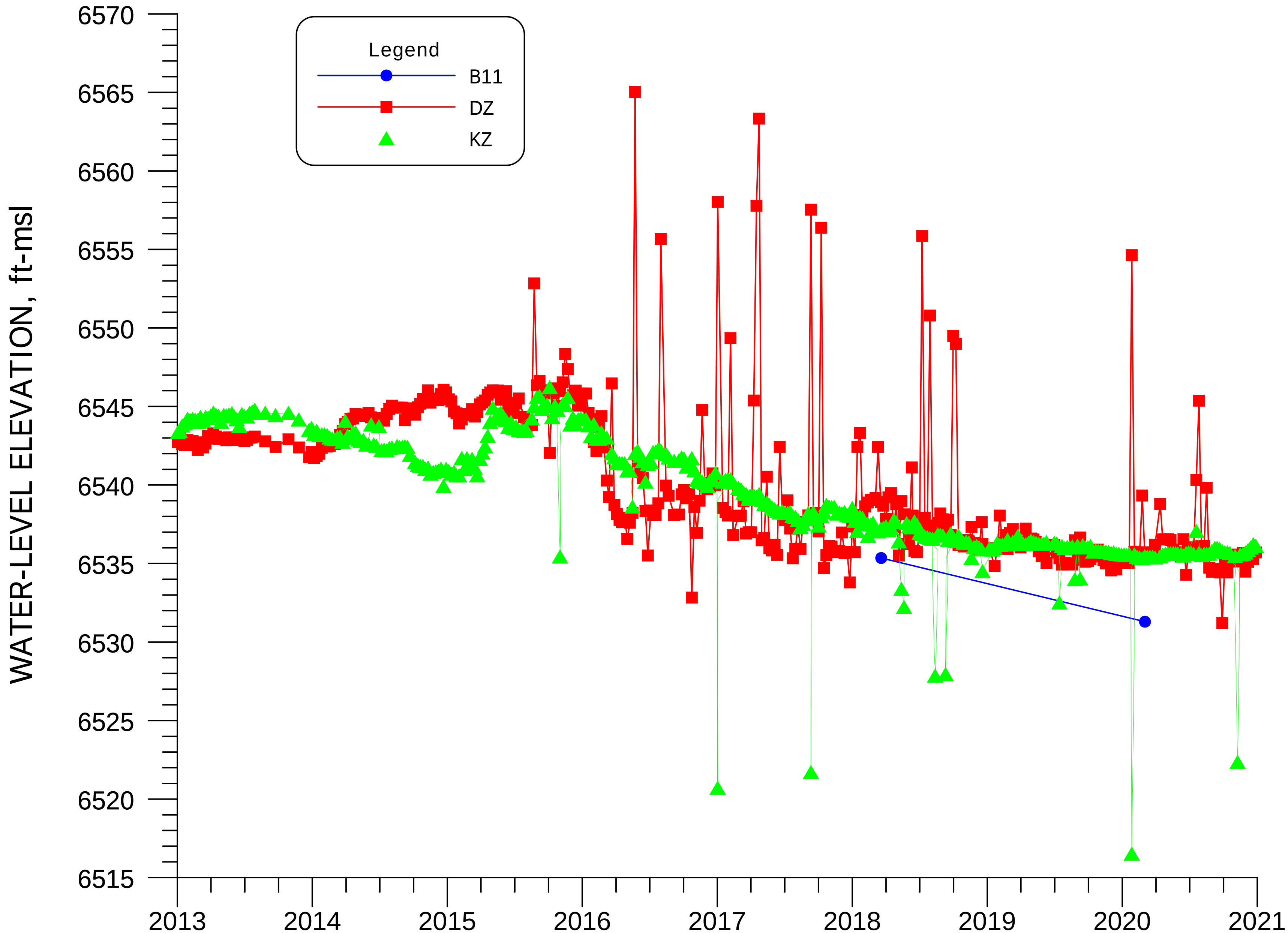



**FIGURE 4.2-10. WATER-LEVEL ELEVATION FOR WELLS B11, DZ AND KZ.**

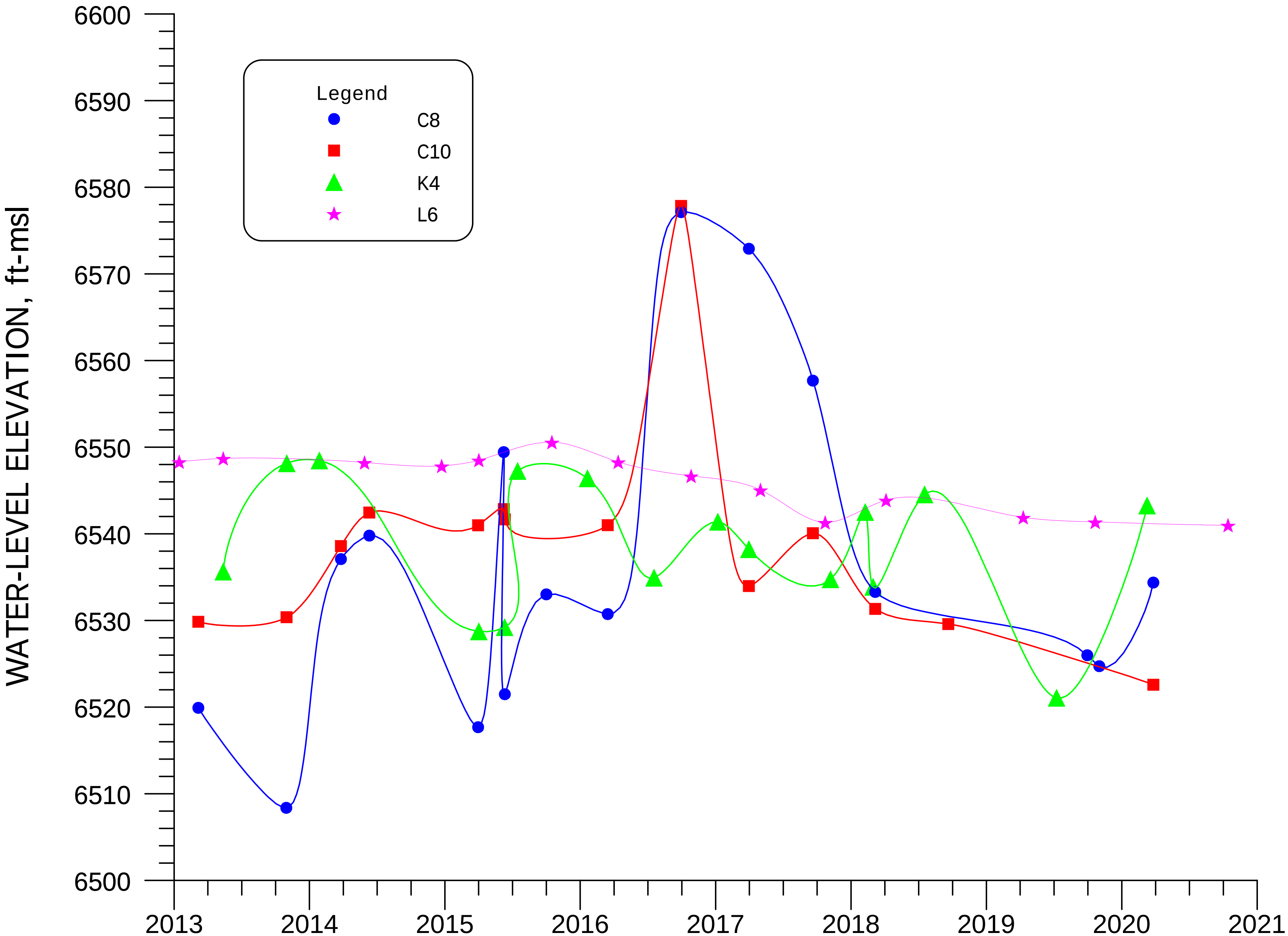



**FIGURE 4.2-11. WATER-LEVEL ELEVATION FOR WELLS C8, C10, K4 AND L6.**

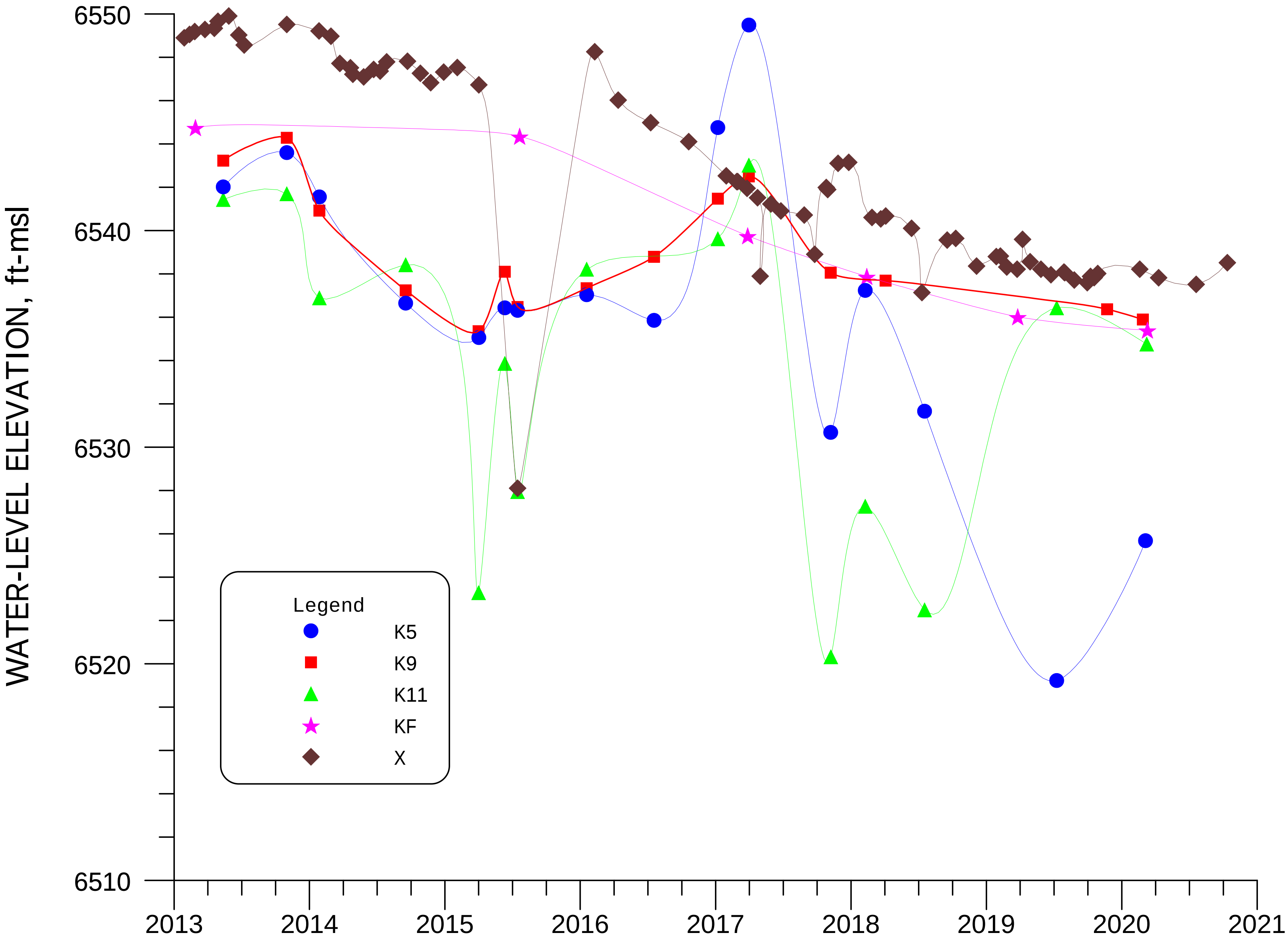



**FIGURE 4.2-12. WATER-LEVEL ELEVATION FOR WELLS K5, K9, K11, KF AND X.**

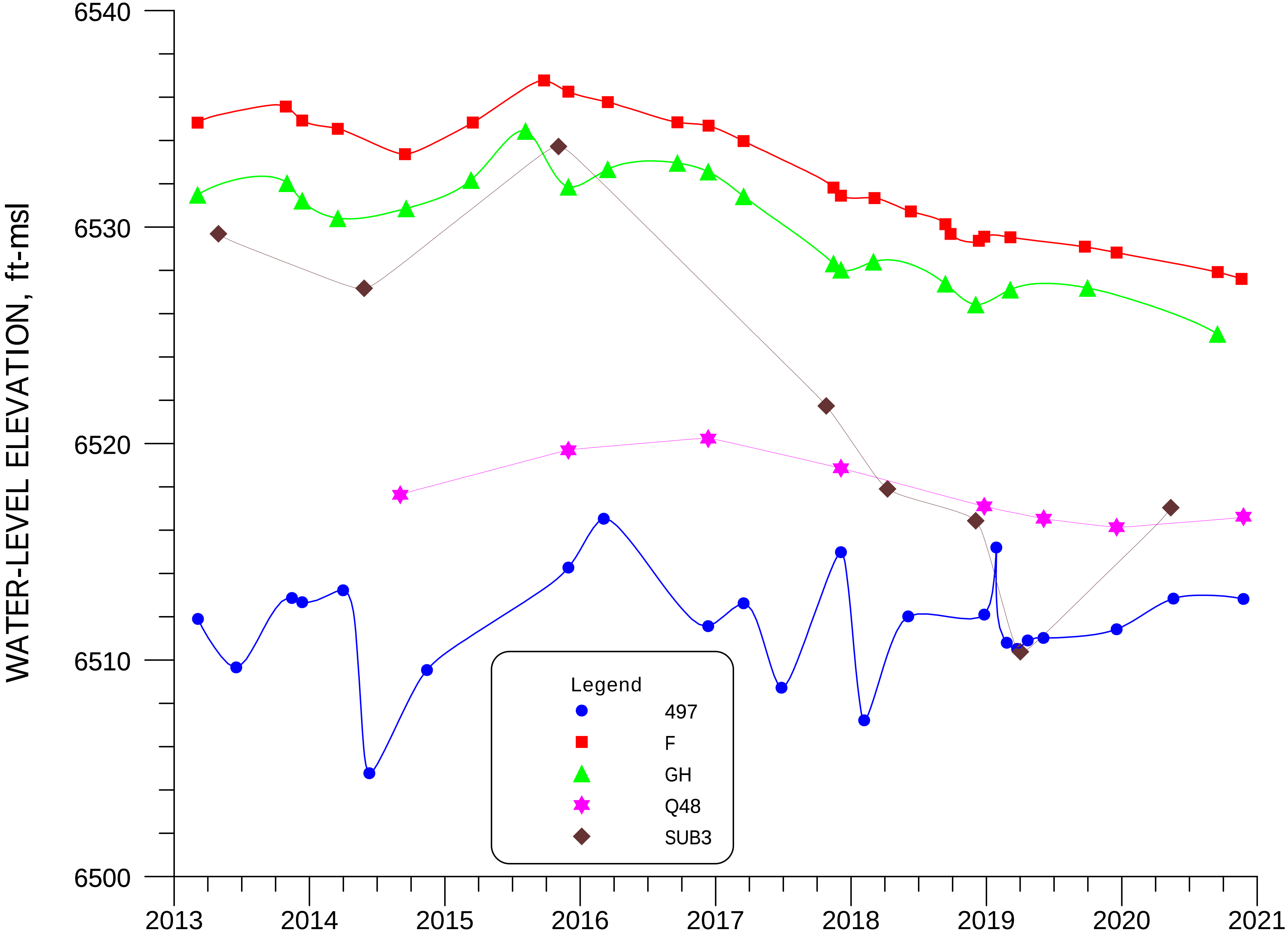



**FIGURE 4.2-13. WATER-LEVEL ELEVATION FOR WELLS 497, F, GH, Q48 AND SUB3.**

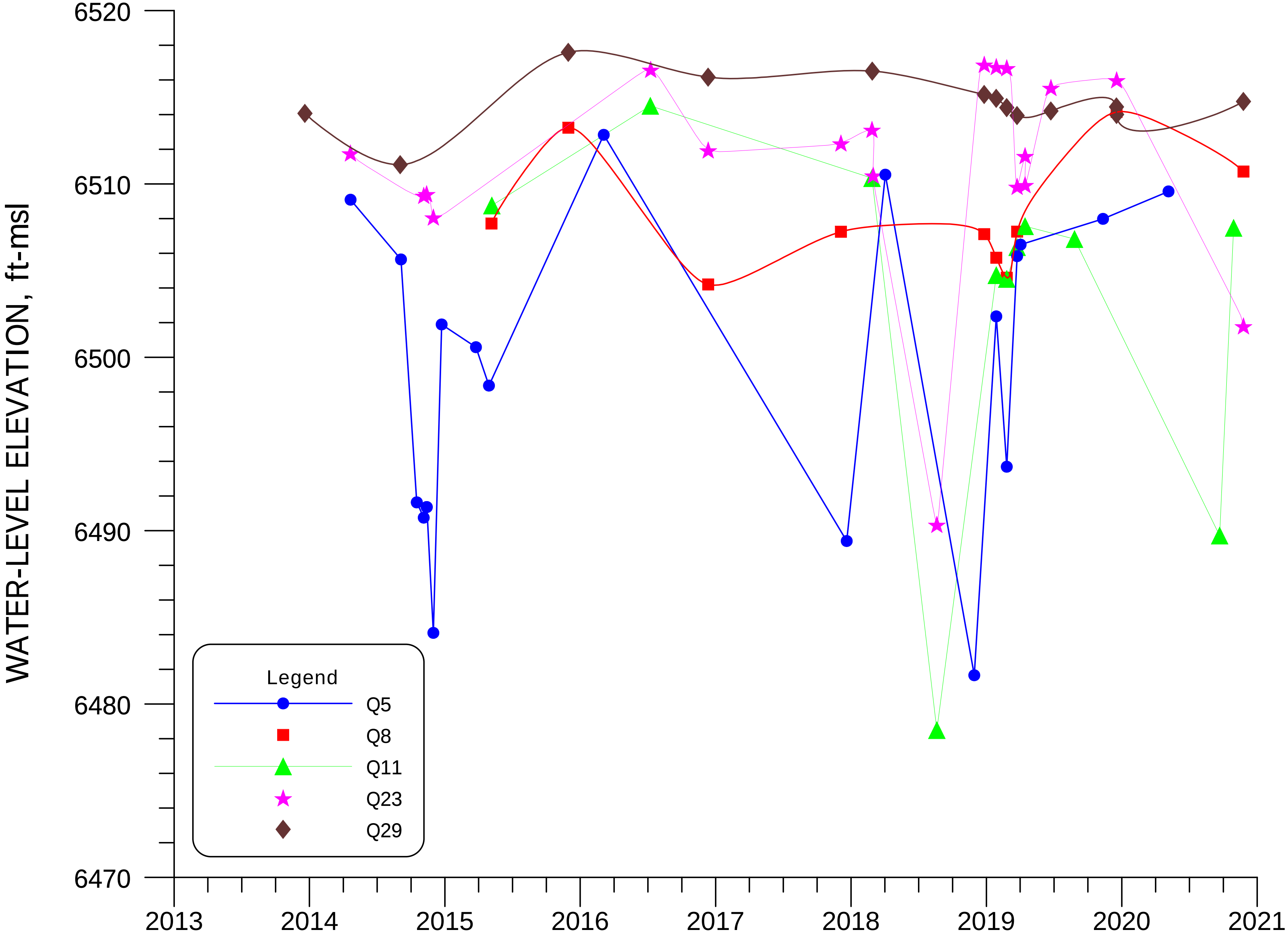



**FIGURE 4.2-13A. WATER-LEVEL ELEVATION FOR WELLS Q5, Q8, Q11, Q23 AND Q29.**

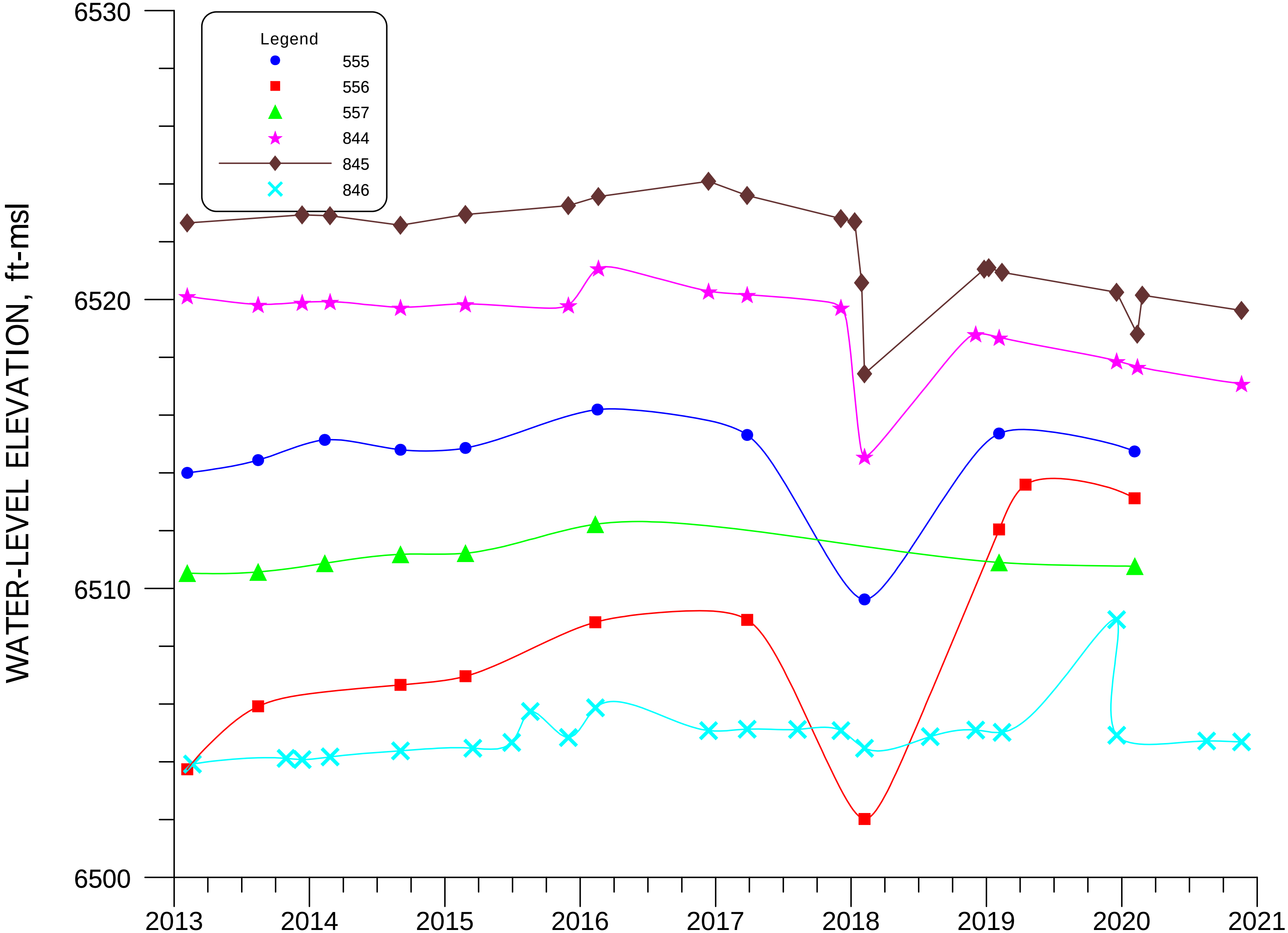



**FIGURE 4.2-14. WATER-LEVEL ELEVATION FOR WELLS 555, 556, 557, 844, 845, AND 846.**

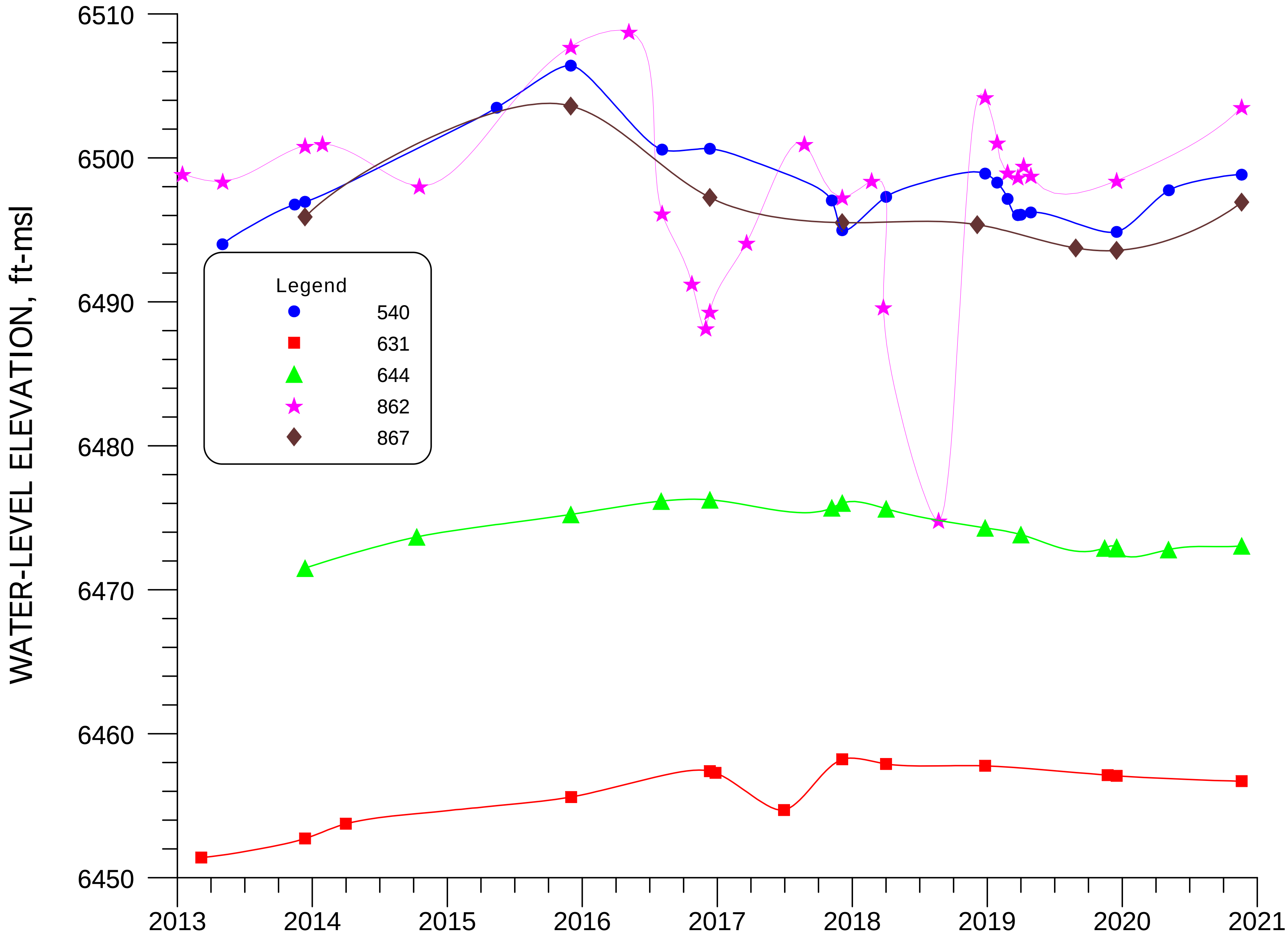



**FIGURE 4.2-15. WATER-LEVEL ELEVATION FOR WELLS 540, 631, 644, 862 AND 867.**

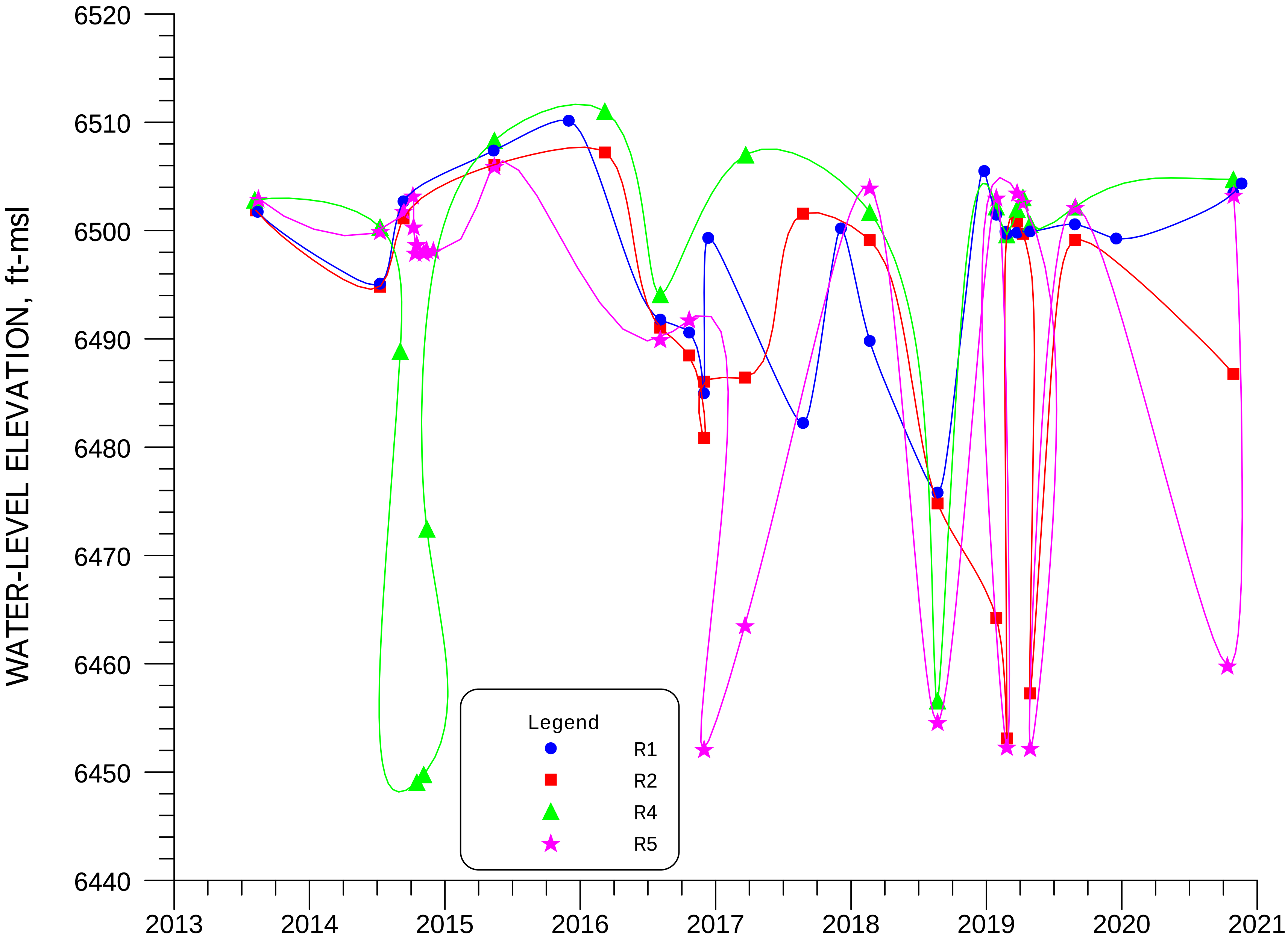



**FIGURE 4.2-15A. WATER-LEVEL ELEVATION FOR WELLS R1, R2, R4 AND R5.**

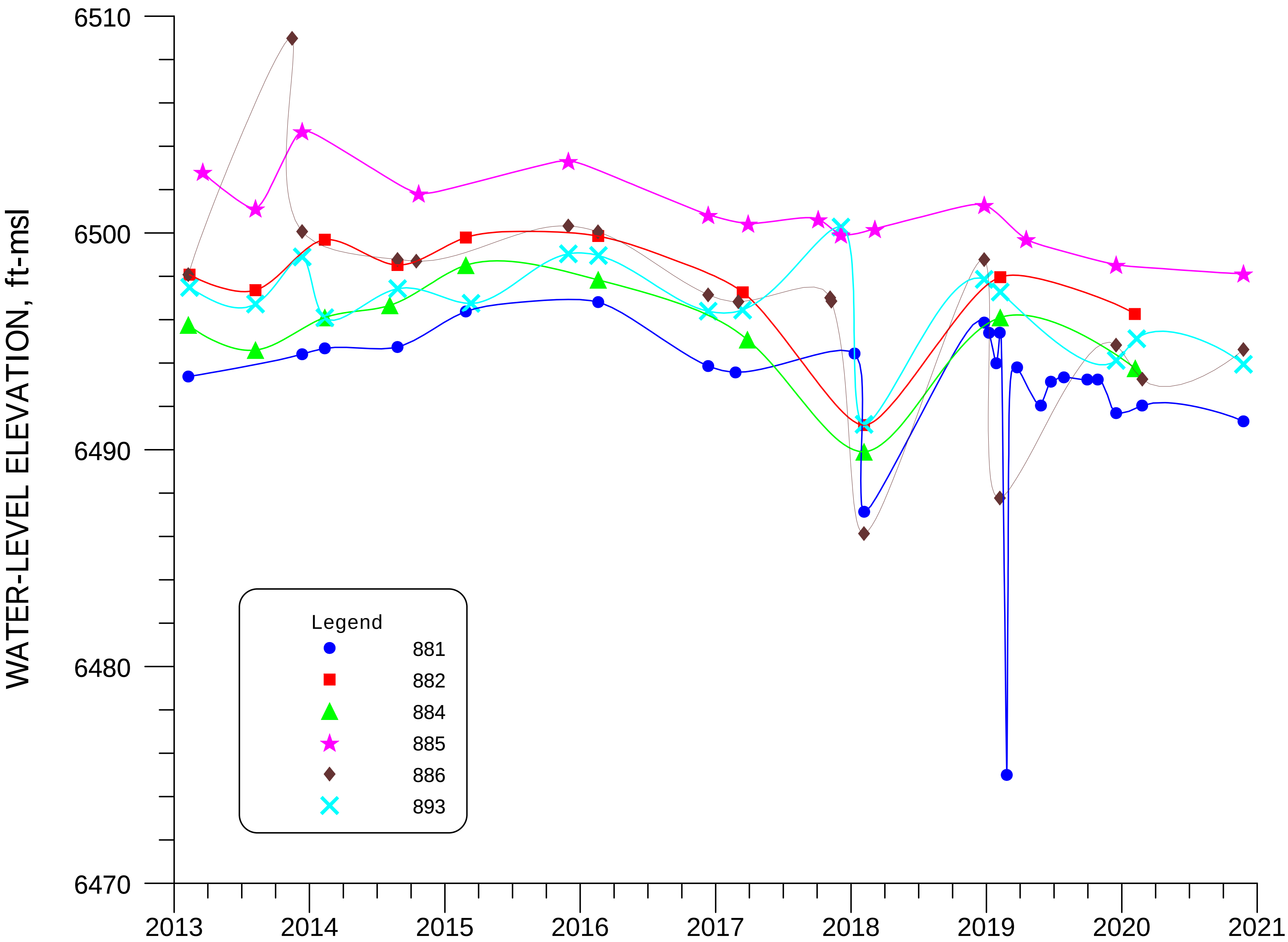



**FIGURE 4.2-16. WATER-LEVEL ELEVATION FOR WELLS 881, 882, 884, 885, 886 AND 893.**

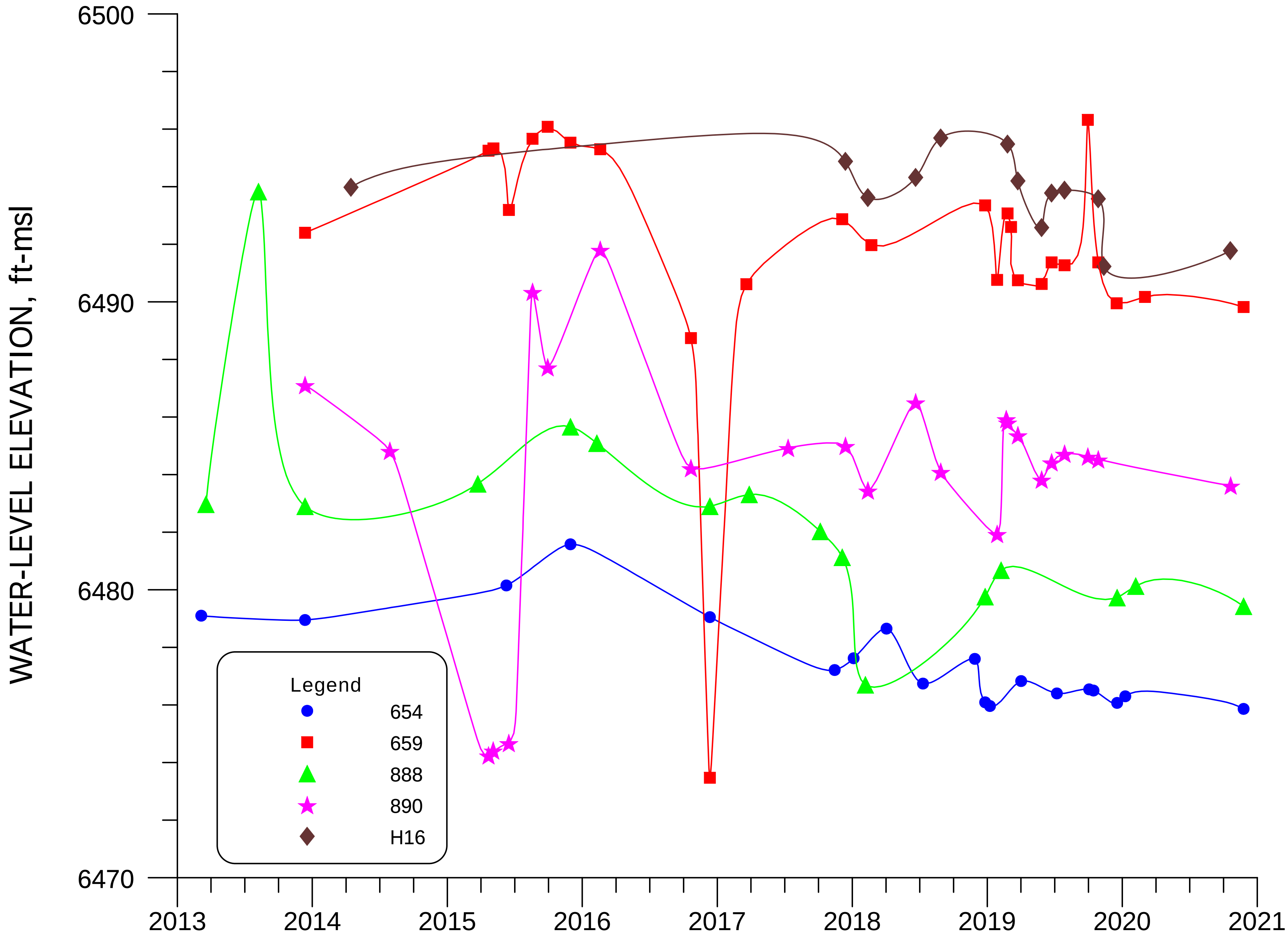



**FIGURE 4.2-16A. WATER-LEVEL ELEVATION FOR WELLS 654, 659, 888, 890 AND H16.**

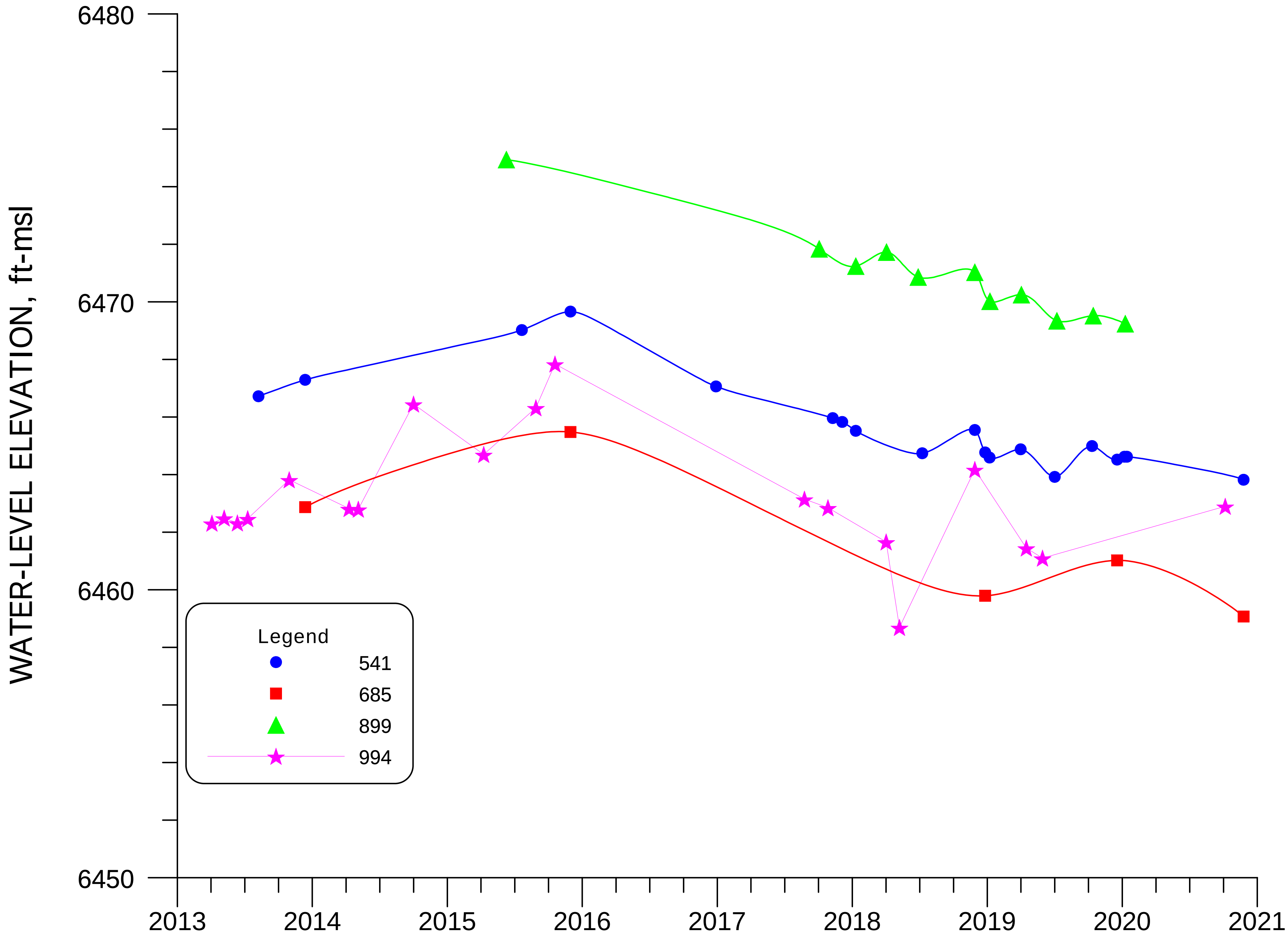



**FIGURE 4.2-17. WATER-LEVEL ELEVATION FOR WELLS 541, 685, 899 AND 994.**

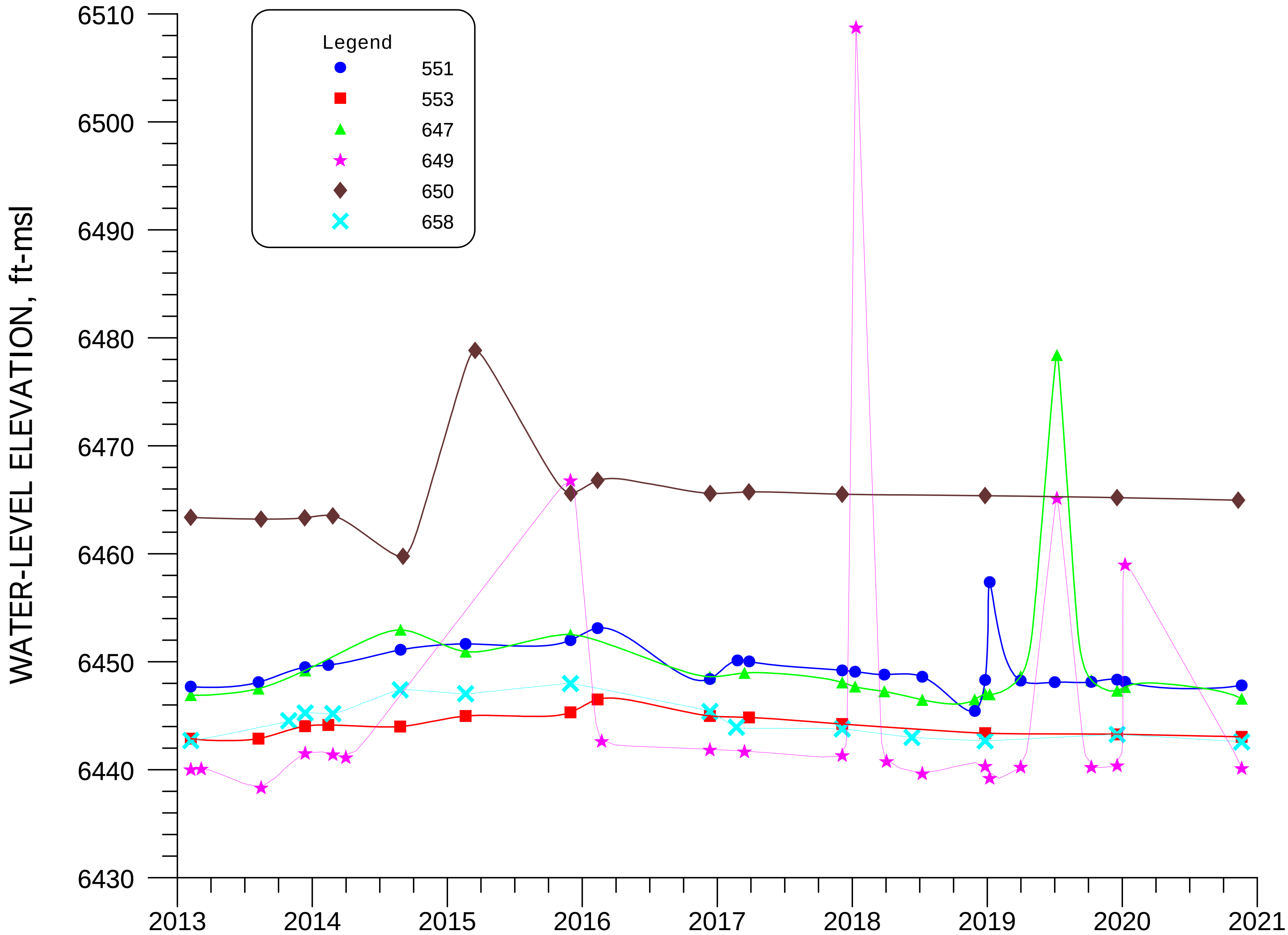



**FIGURE 4.2-18. WATER-LEVEL ELEVATION FOR WELLS 551, 553, 647, 649, 650 AND 658.**

## 4.3 ALLUVIAL WATER QUALITY

This section presents the 2020 water-quality data for the alluvial aquifer. The major general water quality constituents that are typically measured at this site are sulfate, chloride and TDS. Sulfate concentrations are used as the primary indicator where contaminant remediation remains to be completed. Selenium, uranium and molybdenum are the primary metals of concern at this site. Nitrate, radium, 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 2020 alluvial water-quality data for each well.

Ten water-quality site standards (U, Se, Mo, SO4, Cl, TDS, NO3, Ra226 + Ra228, Th230 and V) have been set for the alluvial aquifer at the HMC site by the United States Nuclear Regulatory Commission (NRC) and the New Mexico Environmental Department (NMED) and the site Radioactive Materials License was amended accordingly. These site standards were established on the basis of defining the full range in alluvial aquifer background concentration values for these constituents. The site standards and background values, as well as the procedures used to establish them were reviewed and approved by the NRC, the EPA and NMED in 2005. Adjustment of the site standards to account for the full range in natural background concentrations was important in assuring that appropriate site standards are set in relation to background concentrations. The NRC and NMED alluvial aquifer site standards are shown in Table 4.3-1. Alluvial site standards for the Grants Project are for all of the alluvial aquifer at the Grants Project.

Background alluvial aquifer water-quality conditions at the Grants site are those found up-gradient or north of the Large Tailings Pile (see Figure 4.3-1). These conditions in the San Mateo alluvium have been monitored since 1976. Groundwater flow in the San Mateo alluvial system is generally from the northeast to the southwest. Lobo Creek joins San Mateo Creek in the Felice Acres subdivision area at the HMC site, although neither creek has a well-defined surface flow channel in this area. 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 Sections 4.2 and 4.3 of this report. Wells DD, DD2, DD3, DD4, DD5, ND, P, P1, P2, P3, P4, Q and R, 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 near up-gradient wells, DD3, DD4, DD5, DD6 and DD7 were drilled in 2017 with wells DD6 and DD7 on the southwest side of EP3 being dry, as expected. Well DD3 was drilled on the northeast and up-gradient side of EP3 while well DD4 was drilled on the southeast side and northeast of well DD2. Well DD5 was drilled on the southwest side of EP3 but near the southern corner where the alluvium is saturated. Wells DD6 and DD7 were drilled on the southwest side of EP3 and to the northwest of well DD5. Four additional near up-gradient wells were added in 2019 with one pair (BK1c and BK1f) of these wells located approximately 800 feet to the east and southeast of well DD and the second pair (BK2c and BK2f) of these wells located slightly greater than 200 feet west and northwest of well P4.

Additional alluvial background wells located farther north have also been sampled (wells 914, 920, 921, 922 and 950, see Figure 4.3-1 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. The EPA has added three wells (N-15, N-16 and N-17) in the far up-gradient area for additional data in this area.

Figure 4.3-1 presents the latest 2020 water-quality data for the near and far-up-gradient alluvial background wells for six parameters: sulfate, uranium, selenium, chloride, TDS and nitrate. The very small selenium concentrations in wells DD2 and DD4 are thought to be a result of reduced conditions also. The large selenium difference in up-gradient wells P and P2 are likely due to the differing reducing conditions in these two nearby wells.

The 95$^{th}$ 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 was used to define the upper limit of background. Background data for a ten-year period of 1995 through 2004 was used to determine the 95$^{th}$ percentile values. 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. A tabulation of alluvial standards for the Grants Project area constituents is included in Figure 4.3-1.

The concentrations in the alluvial up-gradient wells[1] sampled during 2020 are tabulated in Table 4.3-2 with a list of the site standards that were established from data from the near up-gradient wells[2]. As shown by the present data, there is a large natural areal variability in the background water quality.

The most recent monitoring values were used for the iso-concentration contour figures presented in this section. Colored patterns are used on the figures to delineate where measured concentration exceeds the site standards for each of the constituents. The 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.

## 4.3.1 SULFATE - ALLUVIAL

Sulfate has been used as a primary indicator constituent for this site because concentrations are large in the tailings water. Concentrations of sulfate in the alluvial aquifer for 2020 are presented on Figure 4.3-1C. An updated statistical evaluation of the background sulfate concentration with data for a ten-year period (1995 – 2004) showed that concentrations as great as 1500 mg/L could occur naturally at this site and is, therefore, the alluvial site standard. Areas where sulfate concentrations exceed 1500 mg/L are shown with a green pattern on Figure 4.3-1C. This figure shows the locations of three areas where the sulfate concentrations are also posted for the On-site (OS), the South Off-site (SOS) and the North Off-site (NOS) areas in Figures 4.3-1B, 4.3-1C and 4.3-1D, respectively. As shown on Figure 4.3-1B, sulfate concentration near and beneath the LTP exceeds 5,000 mg/L. The observed sulfate concentrations in the four adjacent subdivisions were less than the site standard of 1500 mg/L in 2020 except for samples from two wells in Section 34. Sulfate concentrations were similar in Section 3 and South Felice Acres in 2020 with no wells with a sulfate concentration above 1000 mg/L except at one well in the northeast portion of Section 3 (see Figure 4.3-1C). A few slightly smaller concentrations were observed in these two areas due the injection of treated water. Sulfate concentrations exceeded 1000 mg/L in the southwest portion of Murray Acres, southern Pleasant Valley Estates, eastern Valle Verde and to the southeast of Valle Verde. Sulfate concentrations also exceeded 1000 mg/L just north of Pleasant Valley in the northern portion of Section 27 (see Figure 4.3-1D). Down-gradient of the Grants Project site, the sulfate

concentrations are all within the natural range of background except two wells south of Murray Acres and Pleasant Valley (see Figure 4.3-1C).

Plots of constituent concentration 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 except for an additional uranium plot in South Felice Acres area. 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 near up-gradient background wells NC, P3, P4, Q and R. Fairly steady concentrations occurred in these up-gradient wells in recent years except for a very gradual increasing trend that existed in wells P3 and Q prior to 2020. The historical values for these wells show similar periods of short term increasing and decreasing trends in the alluvial aquifer. The changes in sulfate concentration in these wells are well within the range previously observed for sulfate in the up-gradient wells. Figure 4.3-3A presents sulfate concentrations plotted versus time for near up-gradient wells DD, DD2, P and P2. Sulfate concentrations in well DD in 2016 and 2017 indicated an overall increasing trend followed by steady concentrations in 2018 and 2019 and a gradual decline in 2020. Steady concentrations were observed in 2016 through 2020 in wells DD2 and P2. The alluvial site standard is presented on each of the water quality plots for comparison with the water quality data.

Sulfate concentrations immediately west of the LTP in alluvial wells S4, S11, SE6 and SSR were fairly steady in 2020, except for the return to higher concentrations in collection well SSR in late 2019 (see Figure 4.3-4) and a small increase in well S4. Figure 4.3-5 presents sulfate concentrations plotted versus time for alluvial wells H55, M9, MO, MQ, MR and MX situated further west of the LTP. Sulfate concentration in these wells has been fairly steady during 2020. Figure 4.3-6 presents sulfate concentration versus time plots for alluvial wells 802, B12, D1, M3 and MB. Steady concentrations in 2017 through 2020 were observed in well D1. A large increase was observed in the sulfate concentration in collection well M3 in 2019 and is supported by the 2020 value. A decline to below the site standard was observed in well B12 in

2020. Figure 4.3-7 presents time plots of sulfate concentrations for wells B11, T2, T19, T23, T41 and T54 which show a decline in sulfate concentrations in wells T2, T23 and T54 in 2020. Figure 4.3-8 presents a plot of sulfate concentration versus time for alluvial wells on the west side of the STP. The plot shows steady concentrations in 2020 in wells B13, C2 and C8, while an increase was observed in well C6. Figure 4.3-9 presents sulfate concentration versus time for alluvial wells on the STP and the south side of the STP. The plot shows a small overall decline in these concentrations except for fairly steady values in wells K9 and K11. Figure 4.3-10 shows the sulfate concentrations for the STP area collection wells K4, K5 and K7 and monitoring wells 1A and 1K which indicate a slight decreasing trend in wells 1A and K4 while concentration increased in well K5.

Time plots of sulfate concentrations in L collection wells located southeast of the STP are presented on Figure 4.3-11. This figure shows a steady sulfate concentration in 2020 in wells 639 and L5 while concentrations increased in wells 521 and 522.

Figure 4.3-12 presents sulfate concentration time plots for wells in and to the north and east of Broadview Acres for alluvial wells F, FB, GH, GN, SUB2 and SUB3. A decline in concentration was measured in well SUB3 in 2019 and 2020 while concentrations in the remainder of the wells were steady. Figure 4.3-13 presents sulfate concentrations versus time for Felice Acres alluvial wells 490, 497, Q2, Q5 and Q11. A very gradual decline in concentration was observed in 2020 in wells 497 and Q2.

Figure 4.3-14 contains time plots of sulfate concentrations for alluvial wells 555, 556, 557, 844, 845 and 846 which are located in and near the former flood irrigation area in Section 34. This plot shows that sulfate concentrations in samples from alluvial wells 555, 556, 557 and 845 were fairly steady in 2020. Sulfate concentrations are higher than the site standard in alluvial wells 555 and 846 but are declining toward the site standard. The sulfate concentrations in well 846 are not thought to be from the Section 34 irrigation. The changes in the last few years in the other wells could be showing the small effect on sulfate concentrations from the past flood irrigation.

Figures 4.3-15 and 4.3-15A present the sulfate concentration time plots for wells in Section 3 (see Figure 4.3-2 for the location of these wells). Sulfate concentrations in the Section 3 alluvial wells have been fairly steady over the last few years except for decreases in wells 540 and 631.

The sulfate concentrations in water from five wells within and near the former Section 28 center pivot irrigation area and Pleasant Valley monitoring well 688 are presented on Figure 4.3-16 while Figure 4.3-16A presents sulfate concentrations for six wells located west of the Section 28 irrigation area where restoration activity has occurred. The sulfate concentrations in these wells are below the site standard and were generally steady the last two years.

Figure 4.3-17 presents sulfate concentrations with time for four wells located farther west and after the confluence with the Rio San Jose alluvium. Concentrations in these four wells could be influenced by the Rio San Jose and/or San Mateo alluvial systems. Fairly steady sulfate concentrations were observed in 2020 in these wells. The time variations of sulfate concentrations in water sampled from five wells in the Section 33 Center Pivot area are plotted on Figure 4.3-18. Sulfate concentrations in well 551 have gradually increased since 2017.

The western North Off-site post closure wells 541, 551, 647, 649, 654, 899 and 996 had been monitored quarterly from 2018 through 2019. The sulfate concentrations observed in these wells for the previous two years had been steady except the gradual increase observed in sulfate concentrations in well 551 and the small increase observed in well 654 sulfate concentrations in 2019. These variations in concentration are thought to be natural and not affected by the past tailings seepage or restoration operations.

### 4.3.2 TOTAL DISSOLVED SOLIDS - ALLUVIAL

Total dissolved solids (TDS) concentration contours for the alluvial aquifer during 2020 are presented on Figures 4.3-19, 4.3-19A, 4.3-19B and 4.3-19C. Based on an updated statistical analysis, TDS concentration must exceed 2734 mg/L before it is considered elevated beyond the naturally occurring range. A light green pattern is shown on Figures 4.3-19, 4.3-19A, 4.3-19B and 4.3-19C to indicate where the TDS concentrations exceed the 2734 mg/L site standard. None of the observed concentrations in the west half of Figure 4.3-19 exceed this level. The TDS concentrations exceed 2734 mg/L near the tailings and to the west and south of the LTP. TDS concentration in a significant portion of the alluvial aquifer underlying the LTP exceeds 10,000 mg/L (see Figure 4.3-19A). A zone of 2000 mg/L or greater TDS concentration extends to the west of the LTP through the eastern half of Section 28 (see Figure 4.3-19C). Additional areas of TDS concentration greater than 2000 mg/L exist in the southern portion of Pleasant Valley Estates, the southern portion of Murray Acres, the eastern portion of Valle Verde

and to the south of this area (see Figure 4.3-19). The only other areas of TDS concentration above 2000 mg/L is in two wells to the southwest of this area. Only the areas closely proximate to the two tailings piles, a small area west of the Large Tailings Pile, and two small areas east of Valle Verde and south of the Murray Acres exceed the TDS site standard.

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). Figures 4.3-20 and 4.3-20A present the TDS concentrations versus time for the up-gradient wells. The TDS in well P3 has increased during the last four years while TDS concentrations had gradually increased in wells DD and DD2 for a few years until becoming fairly steady over the last two years.

Figures 4.3-21 through 4.3-24 present TDS concentrations plotted versus time for wells on, near and west of the LTP and shows that concentrations in collection wells M3 and SSR have increased in the last two years. Plots of TDS concentrations on and near the STP and in one well east of the LTP are presented in Figures 4.3-25 through 4.3-27. TDS concentrations in samples from the L line of wells are presented in Figure 4.3-28 while Figure 4.3-29 presents the TDS concentrations versus time for wells north of Broadview Acres and for two wells in Broadview Acres.

The TDS concentrations in the Felice Acres alluvial wells are presented in Figure 4.3-30 which indicates small variations in TDS in these wells for the last few years. TDS concentrations for the former flood irrigation area alluvial wells are presented in Figure 4.3-31. Fairly steady TDS concentrations were observed in these wells in 2020 with a small decline in wells 844, 845 and 846 and fairly steady concentrations in wells 555 and 557. The prior increases in TDS concentrations in recent years in wells 555, 844 and 845 could be due to the flood irrigation in this area which ceased after the 2012 season.

Figures 4.3-32 and 4.3-32A present time plots of TDS concentrations for five wells located in Section 3 and five of the R series collection wells. The TDS concentration in wells R1 and R2 had very gradually increased in the previous couple of years but became steady in both wells in 2020. TDS concentrations for the former Section 28 irrigation monitoring wells and Pleasant Valley monitoring well 688 were stable in 2020 (see Figure 4.3-33). The observed changes in these wells in 2013 through 2015 could be due to ceasing irrigation in Section 28 but could also be due to freshwater injection proximate to these wells. The TDS in the freshwater injection source increased in 2012 due to the switch from San Andres well 951 to well 951R.

Some of the TDS variations could be due to past irrigation in this area. TDS concentrations in alluvial wells just west of the Section 28 former irrigation area are presented on Figure 4.3-33A which shows a small TDS concentration increase in wells 890 and H2A in 2019 and 2020.

TDS concentrations in alluvial wells in Sections 29 and 32 are presented on Figure 4.3-34 while Figure 4.3-35 presents TDS concentrations in the Section 33 alluvial wells. TDS concentration in well 551 showed an abrupt decline in 2015 with an increase in 2018 and 2019 and a steady value in 2020. TDS concentrations in the other wells were relatively steady with generally natural variations observed in the area. The variations observed in wells 541, 551, 647, 649, 654, 899 and 996 over the previous two years of monitoring have shown natural variations in the TDS concentrations.

### 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 2020 in the alluvial aquifer near the tailings are presented on Figures 4.3-36, 4.3-36A, 4.3-36B and 4.3-36C. The fresh-water injection systems have used water with chloride concentrations of approximately 200 mg/L, whereas the RO product chloride concentration is less than 10 mg/L and the typical treated water from the PTT is 150 mg/L. The alluvial aquifer around and underlying the LTP contains chloride concentrations in excess of the State drinking water standard of 250 mg/L (site standard). Measurement of chloride concentration in alluvial groundwater is useful in defining areas where the treated water has migrated in the alluvial aquifer. A light green pattern on Figures 4.3-36, 4.3-36A, 4.3-36B and 4.3-36C is used to illustrate where concentrations exceed 250 mg/L. The limited areal extent of the green pattern on these figures shows that the area exceeding the chloride standard is limited to the immediate area of the tailings and in the area of three wells in Section 34. Chloride concentrations in the alluvial water in the western half of Figure 4.3-36 have not typically exceeded 250 mg/L. None of the alluvial wells just north of the northern boundary of Pleasant Valley exceed the site standard in 2020 (see Figure 4.3-36C).

Figures 4.3-37 and 4.3-37A present chloride concentrations versus time for a total of nine up-gradient wells. Analysis of the data on these figures shows overall steady chloride concentrations in 2020 with small chloride concentrations of between 40 and 80 mg/L.

Figures 4.3-38 through 4.3-40 present time plots of chloride concentration for wells west and southwest of the LTP with higher values in collection wells M3 and SSR during 2019 and 2020. Chloride concentrations in wells on and near the LTP are presented on Figure 4.3-41 with the main change in these wells being a concentration decline in well T54 in 2019 and 2020. Chloride concentrations in alluvial wells on and near the STP and in one well east of the LTP are presented on Figures 4.3-42 through 4.3-44. A decline in the chloride concentration in wells K4, KEB and KF was observed in 2020. The chloride concentrations in samples from the L line collection wells are presented in Figure 4.3-45, showing increasing concentrations in wells 521, 522, 639 and L5 in 2020 while a concentration decrease was observed in well L.

Figure 4.3-46 presents time plots of chloride concentrations in wells near and in Broadview Acres with the concentrations very similar to the fresh water chloride concentration. Figure 4.3-47 presents the chloride concentration time plots for wells in Felice Acres, showing fairly steady concentrations.

Chloride concentration plots for the former flood irrigation area monitoring wells are presented on Figure 4.3-48. Chloride concentrations are very similar to the fresh water injection concentration except for larger chloride concentrations in wells 555, 556 and 844. The recent higher values in these three wells could possibly be due to the flood irrigation in this area. The decline in chloride concentration in wells 844 and 845 indicates that the effects from irrigation are dissipating while the concentration increase in well 556 in 2019 and 2020 could be showing a small residual irrigation effect in this area.

The plots of chloride concentration versus time in Section 3 wells are presented on Figures 4.3-49 and 4.3-49A. The Section 3 area chloride concentrations have generally been declining except for near collection wells R1, R2, R4 and R5 where concentrations are generally steady. Figure 4.3-50 presents a plot of the chloride concentrations with time in Section 28 wells and Pleasant Valley monitoring well 688. Chloride concentrations in these wells in the Section 28 Center Pivot area had been fairly steady since the irrigation ceased. Chloride concentrations in six wells west of the Section 28 irrigation area are presented on Figure 4.3-50A. Chloride concentrations in this area of active groundwater restoration gradually declined in recent years but a small increase was observed in wells 890 and H2A in 2019 and 2020.

Chloride concentrations in the Section 29 and Section 32 monitoring wells are presented on Figure 4.3-51, while Figure 4.3-52 presents time plots of chloride concentrations in

the Section 33 wells. The 2020 chloride concentrations were generally stable in the Section 33 wells following the increase in concentrations in well 551 since 2018. Chloride concentrations in well 649 increased in 2019 and 2020. Slightly higher chloride concentrations may indicate a minor effect from the Section 33 irrigation but it could also be a small natural change. The higher levels in 2019 and 2020 are thought to be due to variations in alluvial water up-gradient of the Section 33 irrigation. Chloride concentration in well 996, which is up-gradient of the Section 33 irrigation area, was showing a very gradual rising trend for six years prior to steady values for the last three years. The chloride concentrations observed in the seven post closure wells (541, 551, 647, 649, 654, 899 and 996) for the previous two years are considered natural and not affected by seepage.

### 4.3.4 URANIUM - ALLUVIAL

Uranium is considered an important groundwater constituent at this site due to the significant levels in the tailings seepage. Uranium data and contours for 2020 are presented on Figure 4.3-53. The light green pattern on Figure 4.3-53 shows where uranium concentrations exceed 0.16 mg/L, the site standard and statistical upper range of background from previous statistical analysis of the 1995-2004 data. The uranium values inside three areas outlined on Figure 4.3-53 are posted on additional uranium figures due to the density of the wells in these three areas. Figures 4.3-53A, 4.3-53B and 4.3-53C present the OS, SOS and NOS areas respectively. The HMC uranium measurements made on site (KPA U) are also posted in a green color adjacent to the laboratory measurements on these figures.

Uranium concentrations exceed background in the area of the LTP and STP and west of the LTP (see Figure 4.3-53A). Elevated uranium concentrations extend to the west of the LTP through the eastern half of Section 28 based on wells in the NOS area (see Figure 4.3-53C). All of the uranium concentrations in the west half of Section 28 have been reduced to below the site standard except for samples from four wells which slightly exceed 0.16 mg/L in 2020. Some increase in uranium concentrations occurred in 2020 in this area while the Off-site collection was off during the first half of the year. Uranium concentration in a few of these wells was measured both by HMC with the KPA and by a laboratory. Uranium concentrations in Sections 29 and 32 also reflect a contribution from the Rio San Jose alluvial system in Section 20, but the maximum level observed in these wells in 2020 was less than the site standard of 0.16 mg/L. The zones of

moderately elevated concentrations join together and the combined area extends down-gradient approximately one mile into the western side of Section 33. The depression in the alluvial piezometric surface in the southwest portion of Section 33 prevents elevated concentrations from moving farther to the south in the alluvial aquifer.

Uranium concentrations greater than 0.16 mg/L are also present near the L collection wells south of the STP. Uranium concentrations in the L wells in 2020 were generally similar to values observed in 2019.

Additional areas, where uranium concentrations in the alluvium are greater than 0.16 mg/L, exist in Felice Acres and to the southwest into Section 3 (see Figure 4.3-53B). The area of elevated concentrations extends approximately 3800 feet to the southwest of the southwest corner of Felice Acres. Concentrations have been lowered in the northeast corner of Section 3 with the collection and injection into the R well field in 2014 through the present. Concentrations slightly decreased in 2020 in this area with a slightly smaller area exceeding the site standard. The uranium concentration in another small area in the northeast portion of Murray Acres at well 802 has been restored with the measured value in 2020 near 0.1 mg/L.

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 other time plots. The open symbols in the uranium figures indicate the uranium concentration was measured with the KPA.

Figure 4.3-54 presents uranium concentrations plotted versus time for up-gradient wells NC, P3, P4, Q and R. The uranium concentrations in these wells have been fairly steady during the last two years. Figure 4.3-54A presents uranium concentrations plotted versus time for near up-gradient wells DD, DD2, P and P2. Overall steady concentrations were observed in 2016 through 2020 in wells DD and DD2. The alluvial site standard is presented on each of the water quality plots for comparison with the water quality data.

Uranium concentrations in wells west and southwest of the LTP are presented in Figures 4.3-55 through 4.3-57. These plots show that uranium concentrations in collection wells M3, M9 and SSR increased in 2020. Plots of uranium concentration versus time are presented

on Figure 4.3-58 for alluvial wells on and near the LTP with a steady decline observed in wells T2 and T23 in 2020 while an increase was observed in well T19. Figure 4.3-59 presents a plot of uranium concentration versus time for wells B13, C2, C6, C8 and C9 located on the west side of the STP for all of the historical data for these C wells showing that uranium concentrations in this area exceeded 100 mg/L historically. Figures 4.3-60 through 4.3-61 present plots of uranium concentration versus time for additional wells on and near the STP and well 1A east of the LTP. Large variations in concentration have been observed in these STP area wells in recent years. Uranium concentrations in water from alluvial wells in the L area are presented on Figure 4.3-62 which shows a very gradual decline in 2020 in uranium in wells 521 and L. A larger concentration decline was observed in well 639 while an increase occurred in well L5.

Figure 4.3-63 presents uranium concentrations versus time for six wells near and in Broadview Acres with all the historical uranium data for these six wells. Uranium concentrations have been restored from levels near 10 mg/L in this area. Figures 4.3-64 and 4.3-64A present the uranium concentration time plots for Felice Acres wells. Figure 4.3-64 shows small declines in uranium concentrations in collection well Q5 in 2020 while fairly steady levels were observed in the other collection wells in this area. Figure 4.3-65 presents uranium concentrations for wells in the former flood irrigation area. Uranium concentration had declined in well 844 for the previous few years but has become fairly steady for the last five years. The previous higher uranium concentrations in well 844 may have revealed minor effects of past irrigation on the alluvial groundwater in the area. Uranium concentrations in the remainder of these wells in this area have been fairly steady except the 2016 value from well 556 which is an outlier.

The uranium concentrations for wells in Section 3 southwest of Felice Acres are plotted on Figures 4.3-66 and 4.3-66A. The uranium concentrations in the R collection wells in northeast corner of Section 3 became fairly steady in 2019 and 2020 except for a small increase in well R5 in 2020. The changes in uranium concentrations in this area are due to the collection of alluvial water and injection of treated water in the northeast portion of Section 3.

Uranium concentrations from five Section 28 wells and Pleasant Valley well 688 are plotted on Figure 4.3-67 with concentrations above the site standard for wells 881 and 886. The recent slightly elevated uranium concentrations in these Section 28 wells result from past tailings seepage impacts and are not caused by the past Section 28 irrigation. Uranium concentrations

from six wells west of the Section 28 irrigation are plotted on Figure 4.3-67A. Uranium concentrations declined to below the alluvial site standard in each of these wells in 2017 and 2018 while values in wells 659, H2A, H7 and H16 have increased in 2020 due to reduced collection in 2019 and 2020. Uranium concentration in well 888, which is down-gradient of the restoration area, was steady in 2020.

Uranium concentration time plots for wells in Sections 29 and 32 are presented on Figure 4.3-68. These wells are completed in the Rio San Jose alluvium up-gradient and down-gradient of the confluence with the San Mateo alluvium in Section 29 and concentrations have stayed fairly steady except for a small increase in wells 541 and 654 in 2019 and 2020. Uranium concentrations in wells located in Section 33 are relatively small (see Figure 4.3-69). Wells 647 and 996 are up-gradient of the Section 33 irrigation area and their slightly higher values are not caused by the Section 33 irrigation. There were no uranium concentration increases in the Section 33 wells that would indicate groundwater impacts from the past Section 33 irrigation. The small variations observed in the Section 33 wells are within the range of concentrations measured in wells up-gradient of this area.

### 4.3.5 SELENIUM - ALLUVIAL

Selenium is an important constituent at the Grants Project site because, like uranium, it was present in significant concentrations in the tailings water. Figures 4.3-70, 4.3-70A, 4.3-70B and 4.3-70C present maps of the spatial distribution of selenium concentrations throughout the site. The alluvial site standard for selenium is 0.32 mg/L. A green pattern is superimposed on the concentration contour figures to show where concentrations exceed 0.32 mg/L. The green pattern north of the LTP shows where selenium concentrations exceed the site standard of 0.32 mg/L due to up-gradient sources. These higher selenium concentrations are likely starting to affect the concentrations on the north side of the LTP.

A 0.1 mg/L selenium concentration contour surrounds the LTP, most of the STP and a portion of the L Area south of the STP (see Figures 4.3-70, 4.3-70A and 4.3-70C). All selenium concentrations measured west of this area are less than 0.1 mg/L, except for two values above 0.1 mg/L near the center of Section 27. Selenium concentrations in the alluvial aquifer in all of wells in the nearby subdivisions are less than 0.1 mg/L.

Selenium concentrations exceeding 0.32 mg/L were measured in wells around the LTP and STP and also extend to the east of the STP in the area north of the L area collection wells.

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 NC, P3, P4, Q and R while Figure 4.3-71A presents selenium concentrations plotted versus time for near up-gradient wells DD, DD2, P and P2. There have been small variations in the selenium concentration in up-gradient wells for last few years with an increasing trend in well P3 continuing in 2020. The selenium changes in well P3 indicate the front of the up-gradient selenium concentration above the site standard will be at the northwest side of the LTP in a few years. The concentrations in the northernmost near up-gradient well R are larger than the remainder of the near up-gradient wells and the level in up-gradient well Q is larger than the remainder near up-gradient wells except for the recent values from wells DD3, P2 and P3. Selenium concentration in wells Q and R were fairly steady the last eleven years after a long gradual increasing trend. A small increase in the selenium concentration in well DD was observed in 2016 followed by steady concentrations until a very small decrease in 2020. The alluvial site standard is presented on each of the water quality plots for comparison with the water quality data.

Figures 4.3-72 through 4.3-74 show selenium concentrations in water from alluvial wells located west and southwest of the LTP. Selenium concentrations increased in 2019 and 2020 in collection wells M3 and SSR. Figure 4.3-75 presents plots of selenium concentrations for wells on and near the LTP with an increase in concentration in collection well B11 in 2019 and 2020. The selenium concentration exhibited variability in wells located on and near the STP and east of the LTP as shown on Figures 4.3-76 through 4.3-78. Figure 4.3-79 presents selenium concentration for wells 521, 522, 639, L and L5, with overall small changes the last two years.

Figure 4.3-80 presents a selenium concentration plot for four wells to the north of Broadview Acres and for two wells in the subdivision. Figure 4.3-81 presents selenium concentration plots for wells in Felice Acres with steady and small values.

Selenium concentrations are presented for wells in the former flood irrigation area adjacent to Murray Acres on Figure 4.3-82. This plot shows continuing low and steady selenium concentrations in monitoring wells in this area of the alluvial aquifer except for a small decline in well 846 in 2020. This data indicates that the flood irrigation did not affect the selenium concentrations in the groundwater in this area.

Selenium concentrations for the Section 3 wells are plotted on Figures 4.3-83 and 4.3-83A. The selenium concentration in these R collection wells was small prior to the start of the collection in this area in 2014 and they stayed low during 2015 through 2020. A small increase in selenium was observed in 2019 in well R1 with the 2020 value being steady.

The selenium concentrations in alluvial water in Section 28 have been fairly steady with time. Figures 4.3-84 and 4.3-84A present the selenium concentrations from the Section 28 alluvial wells.

Figure 4.3-85 displays selenium concentrations in wells in Sections 29 and 32, which are located before and after the confluence with the Rio San Jose alluvium. Selenium concentrations from wells in Section 33 are presented on Figure 4.3-86. These two plots show steady and small concentrations in wells 541, 551, 647, 649, 654, 899 and 996, which are the seven western North Off-site post closure wells

### 4.3.6 MOLYBDENUM – ALLUVIAL

This section discusses the molybdenum concentrations in the alluvial aquifer at the Grants Project during 2020. Figures 4.3-87, 4.3-87A, 4.3-87B and 4.3-87C are spatial presentations of the concentration data and contours. Molybdenum concentrations in alluvial water in the west area of Figure 4.3-87 have typically been less than 0.03 mg/L and, therefore, this parameter is not important in the western wells. Molybdenum concentrations measured in 2020 and previous years indicate that a 2019 value of 0.07 mg/L in the well in the center of the Section 33 center pivot was an outlier. A lower laboratory detection limit was used for most of the 2018 and all of the 2019 samples and these samples indicate that actual concentrations are generally much less than the 0.03 mg/L detection limit used for many samples. The movement of molybdenum in the alluvial aquifer is dramatically attenuated in comparison to that of selenium and uranium. Molybdenum concentrations did not exceed 100 mg/L in any location under the LTP in 2020

with only three of the LTP area wells with values above 50 mg/L. A 10 mg/L contour extends around most of the LTP and to the west side of the STP (see Figure 4.3-87A).

The light green patterns on these four figures show the area where molybdenum concentrations exceed the alluvial site standard of 0.10 mg/L. A molybdenum concentration of 0.10 mg/L is considered the threshold of significance for this constituent at this site. Significant molybdenum concentrations extend to just north of Pleasant Valley west of the LTP (see Figures 4.3-87A and 4.3-87C) and also to the southeast of the STP to the L collection wells (see Figure 4.3-87). Molybdenum concentrations in one well in the west half of Section 27 is only slightly less than the site standard of 0.10 mg/L in this area. None of the concentrations in alluvial wells in the subdivisions exceed 0.10 mg/L of molybdenum.

Figures 4.3-88 and 4.3-88A presents molybdenum concentration for the up-gradient wells DD, DD2, NC, P, P2, P3, P4, Q and R. Concentrations have remained low in these nine wells in 2020 with the use of a smaller detection limit except for one sample each from wells DD, DD2 and Q.

Molybdenum concentrations are presented in Figures 4.3-89 through 4.3-91 for the alluvial aquifer to the west and southwest of the LTP with increases in concentration in wells M3, M9, MQ and SSR in 2019 and 2020. Figure 4.3-92 presents molybdenum concentrations for wells on and near the LTP with higher levels in this area and no consistent trend. Molybdenum concentrations in wells on and near the STP and in one well east of the LTP are presented on Figures 4.3-93 through 4.3-95. These plots show variable concentrations with generally no consistent trend. Figure 4.3-96 presents molybdenum concentrations in wells 521, 522, 639, L and L5 which are located further to the southeast of the STP. The molybdenum concentration in well 639 decreased in 2020.

Molybdenum concentrations in alluvial wells located north and in Broadview Acres are plotted on Figure 4.3-97 with small and steady values through 2020. Figure 4.3-98 presents the molybdenum concentrations for the Felice Acres wells. A small increase in molybdenum concentrations in 2019 was followed by a decrease in 2020 in well 490.

Figure 4.3-99 presents the molybdenum concentrations for wells in the former flood irrigation area near Murray Acres. This plot shows that molybdenum concentrations have remained low in these alluvial wells.

Molybdenum concentration plots for the Section 3 wells are presented in Figures 4.3-100 and 4.3-100A. The western area wells molybdenum concentrations are plotted on Figures 4.3-101 through 4.3-103 with the Section 28 wells presented on the first two figures, Sections 29 and 32 wells presented on the third figure and Section 33 wells presented on the fourth figure. The previous two years of data for the seven post closure monitoring wells (541, 551, 647, 649, 654, 899 and 996) show that the molybdenum concentrations have been small through 2020 with the exception of an anomalous sample value from well 551 in the fourth quarter of 2019.

### 4.3.7 NITRATE - ALLUVIAL

The presence of relatively large nitrate concentrations up-gradient of the Grants site has resulted in a site background standard of 12 mg/L (see Table 3.1-1). A statistical analysis of the up-gradient 1995 through 2004 data produced the nitrate concentration of 12 mg/L based on the 95$^{th}$ percentile of background. Figures 4.3-104, 4.3-104A, 4.3-104B and 4.3-104C present nitrate concentrations measured in 2020 in the alluvial aquifer. The pattern on Figure 4.3-104 shows that nitrate concentrations exceed the site standard to the north of the LTP and these higher concentrations will be moving into the LTP area in the future. Some of the nitrate concentrations to the north of the LTP are small, such as the value from well P in 2020, due to the reducing conditions at the well. The pattern on Figure 4.3-104 is drawn similar to the selenium pattern and does not account for the reduced concentrations from some of the wells. Figure 4.3-104A presents the nitrate values for the wells near the LTP and STP, showing that samples from two of these wells exceed the site standard in 2020. The nitrate concentrations north and up-gradient of the tailings will ultimately impact the nitrate concentrations down-gradient of the LTP. 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 LTP makes modestly elevated nitrate concentrations indistinguishable from background. Also the recent seepage from the LTP contains much smaller nitrate concentrations.

Nitrate concentrations exceed 12 mg/L in some portions of the LTP and an area between the LTP and STP, and these exceedances are likely due to seepage from the tailings. Nitrate concentration above 12 mg/L was measured in one well southeast of Valle Verde. Nitrate concentration in all of the alluvial subdivision wells is below 12 mg/L. Areas where

nitrate concentrations are above the site standard are shown by the green patterns on Figures 4.3-104, 4.3-104A, 4.3-104B and 4.3-104C.

Plots of nitrate concentration over time were prepared for the alluvial wells that are listed on Figure 4.3-2. Figures 4.3-105 and 4.3-105A present the nitrate concentrations for the background wells. Concentrations in these wells have been relatively stable in 2020 except for a gradual decline in nitrate concentration in wells DD and Q. Nitrate concentrations in up-gradient wells farther to the north have been slightly larger than the site standard. The nitrate concentrations in wells west and southwest of the LTP, are plotted on Figures 4.3-106 through 4.3-108. Figure 4.3-109 presents nitrate concentrations in wells B11, T2, T19, T23, T41 and T54, which are located on and near the LTP. A large decline in the nitrate concentrations has been observed in well T23 since 2015. Nitrate concentrations in wells on and near the STP and in one well east of the LTP are plotted on Figures 4.3-110 through 4.3-112. The nitrate concentrations in the L series wells are presented on Figure 4.3-113 with the 2020 data for these wells being steady and significantly below the site standard.

Nitrate concentrations in wells near Broadview Acres are presented on Figure 4.3-114 while nitrate concentrations for the Felice Acres wells are presented on Figure 4.3-115 with all of these levels below the site standard.

Nitrate concentrations for wells in and near the former flood irrigation area are presented on Figure 4.3-116. Nitrate concentrations in well 846 are higher than the other five wells shown on this figure and show a decrease from 2012 through 2020. Well 846 is down-gradient of the flood irrigation area and is not thought to be affected by the irrigation. The nitrate concentration in the remainder of these wells adjacent to the flood irrigation was fairly steady in 2020 except for a gradual decline in well 844 and a gradual increase in well 556 in recent years. This could possibly be showing a minor change in the nitrate groundwater concentration resulting from the past irrigation.

Nitrate concentrations in Section 3 wells are presented on Figure 4.3-117. Nitrate concentrations for the Section 28 wells are presented on Figure 4.3-118. Figure 4.3-119 presents nitrate concentrations in wells 541, 654, 899 and 994. Nitrate concentrations in the Section 33 wells are presented on Figure 4.3-120 and were steady in 2020. All of nitrate concentrations from the wells in these four figures are below the site standard. The nitrate concentration for the

previous two years in the seven western portion North Off-site post closure monitoring wells has been small and relatively steady.

### 4.3.8 RADIUM-226 AND RADIUM-228 - ALLUVIAL

Figures 4.3-121, 4.3-121A, 4.3-121B and 4.3-121C present radium concentrations for the alluvial groundwater in the Grants Project area. Radium concentrations are very small in the alluvial aquifer except directly underneath the LTP. The monitoring program for radium has been scaled back because radium is not present in significant concentrations in the alluvial aquifer, except very near the LTP. 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 NRC site standard is 5 pCi/L.

Measured activities of radium-226 in alluvial wells beneath the LTP exceed 10 pCi/L. No radium-226 plus radium-228 values exceeded 5 pCi/L in 2020 outside of the LTP footprint (see Figures 4.3-121, 4.3-121A, 4.3-121B and 4.3-121C), but a value of 5 pCi/L was measured in well 688 in Pleasant Valley. The radium-228 concentration of 4.8 pCi/L for well 688 is considered to be an outlier because the previous six values were less than two pCi/L. Additionally, larger detection levels utilized by a new laboratory for some samples resulted in wells 497, 540, 631, 644, 864, 869, DD, DD2, M3, Q5, R3 and SUB3 having a numeric combined value that was greater than 5 pCi/L despite having non-detects for radium-226 and/or radium-228. Samples where this was the case were not considered exceedances, and single samples with a higher radium-228 concentration are not considered significant. Single higher radium-228 values should not be given any significance. Past data has shown that radium is not mobile in the alluvial aquifer at this site. In 2008, the laboratory utilized through early 2020 started reporting negative and zero values for the radionuclides instead of a less than value. These very low results should be considered non-detect values.

### 4.3.9 VANADIUM - ALLUVIAL

Vanadium concentrations measured in 2020 are shown on Figures 4.3-122, 4.3-122A, 4.3-122B and 4.3-122C. None of the vanadium concentrations in 2020 exceeded the site standard of 0.02 mg/L except for values in the area of the LTP and STP. Well X was the only well that routinely contained a vanadium concentration above the site standard prior to

restoration of that area and was measured at less than 0.02 mg/L in 2020. Therefore, none of the alluvial wells outside of the immediate tailings areas are expected to contain vanadium concentrations above the site standard of 0.02 mg/L in the future. Injection of treated water has effectively restored groundwater quality in the area near well X. Vanadium concentrations in three alluvial wells located within the footprint of the LTP and in one well near the southern portion of the STP were above the site standard for vanadium in 2020. Previous measurements from the alluvial wells located outside of the LTP area show that the actual vanadium concentrations should be less than the site standard.

### 4.3.10 THORIUM-230 - ALLUVIAL

Figures 4.3-123, 4.3-123A, 4.3-123B and 4.3-123C present the 2020 thorium-230 concentrations in the alluvial aquifer. Thorium-230 concentrations are low at this site. The site standard of 0.3 pCi/L was established to reflect the low background concentrations. The thorium-230 activity has been significant in some of the alluvial wells underneath the LTP. Thorium-230 has not been mobile in the alluvial aquifer except in the immediate vicinity of the tailings. The site standard for thorium-230 was exceeded in 2020 in four wells in the alluvial aquifer underneath the LTP. Additional values also slightly exceeded the site standard in wells 884 in the north pivot area and in well MB just north of Murray Acres. The 0.5 and 0.6 piC/L values from wells 884 and MB respectively are considered outliers because the previous six and three values from these two wells, respectively, were all less than 0.3 piC/L. A large detection level was initially used by the new laboratory for thorium-230 for wells 497, 540, 631, 644, 864, DD, DD2, M3, Q5, R3 and SUB3. Previously measured values from these wells that are up-gradient or a large distance down-gradient of the LTP are generally very small as expected.

Thorium-230 levels from the wells near the tailings, as well as all other alluvial wells away from the LTP were less than the site standard in 2020 except those mentioned in the previous paragraph. Therefore, only the alluvial aquifer underneath the LTP exceeds the site standard for thorium-230.

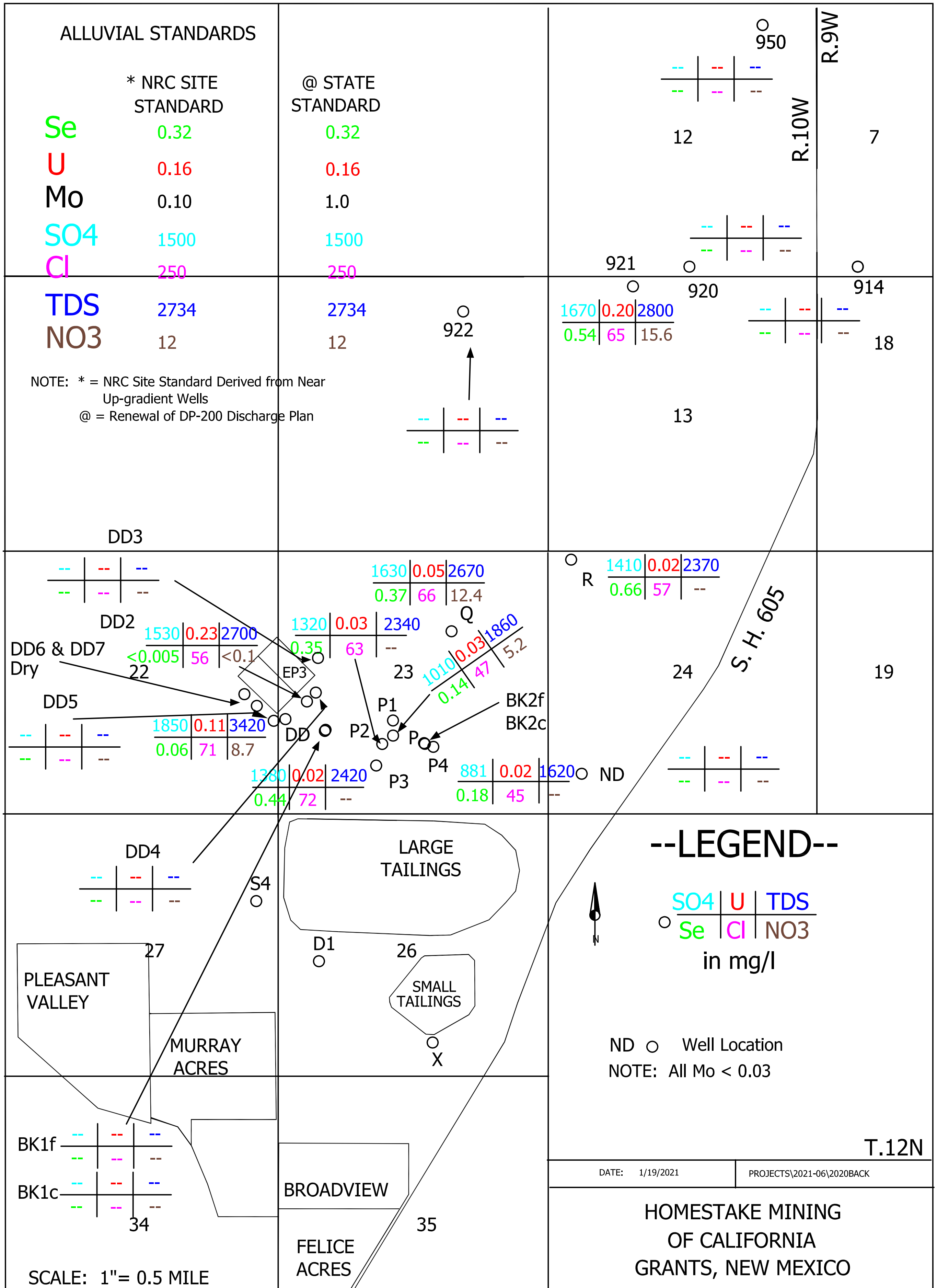
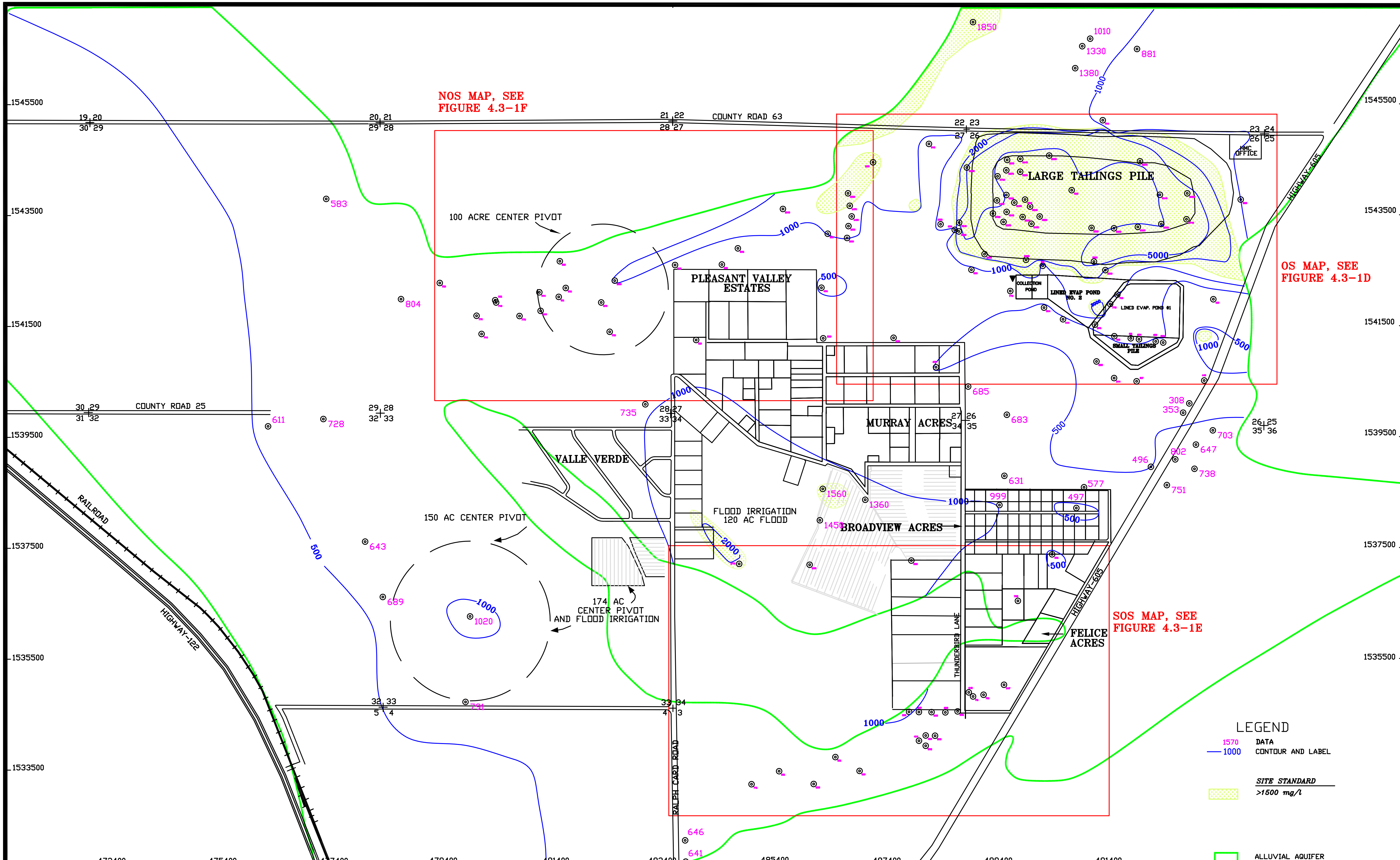
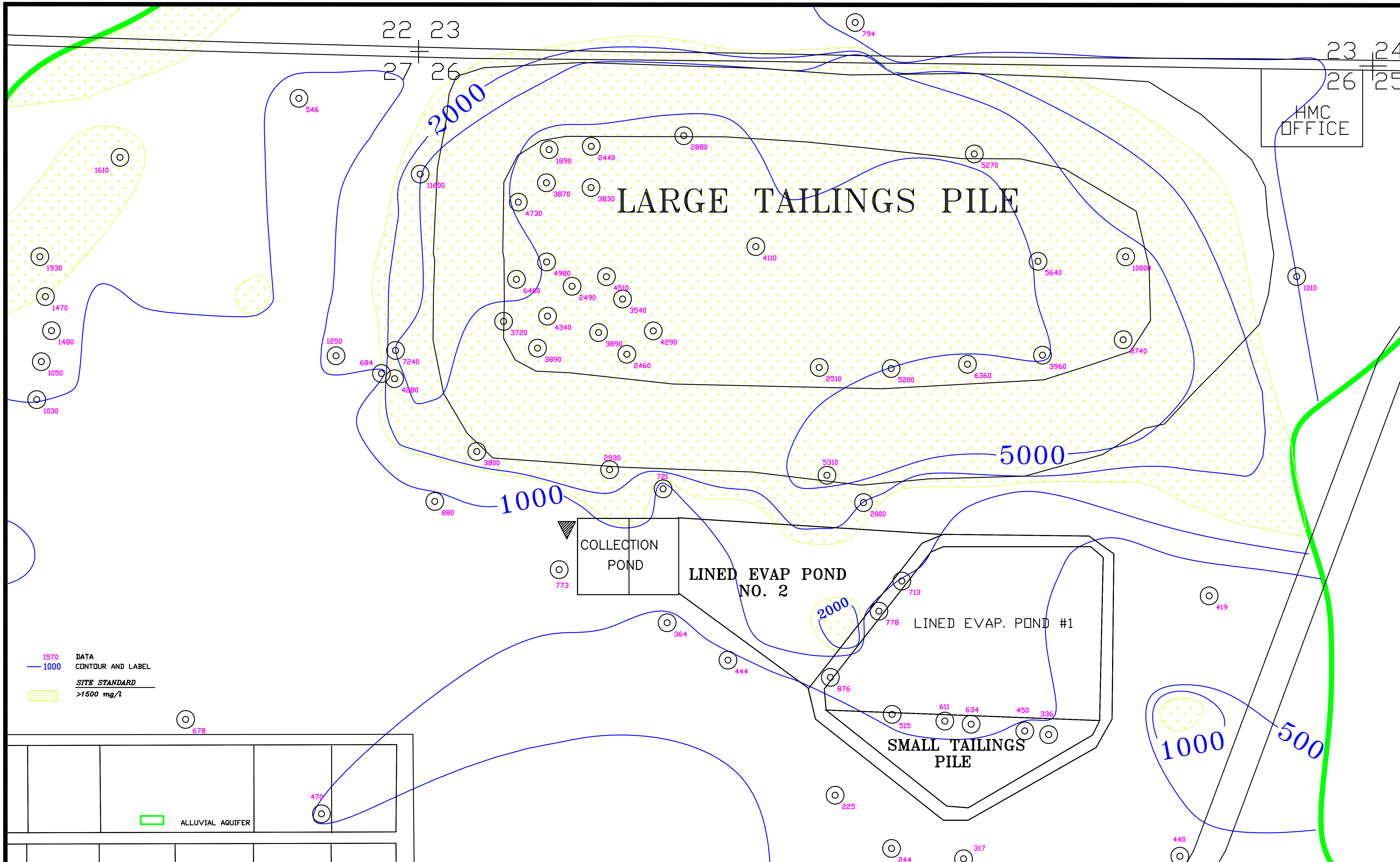



FIGURE 4.3-1. ALLUVIAL BACKGROUND GROUND WATER QUALITY, 2020




SCALE: 1"=1600'
C:\PROJECTS\2021-06 1600QAL20
DATE: 3/19/2021

FIGURE 4.3-1A. SULFATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, mg/L

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1600QAL20
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FIGURE 4.3-1B. SULFATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, mg/L

4.3-23

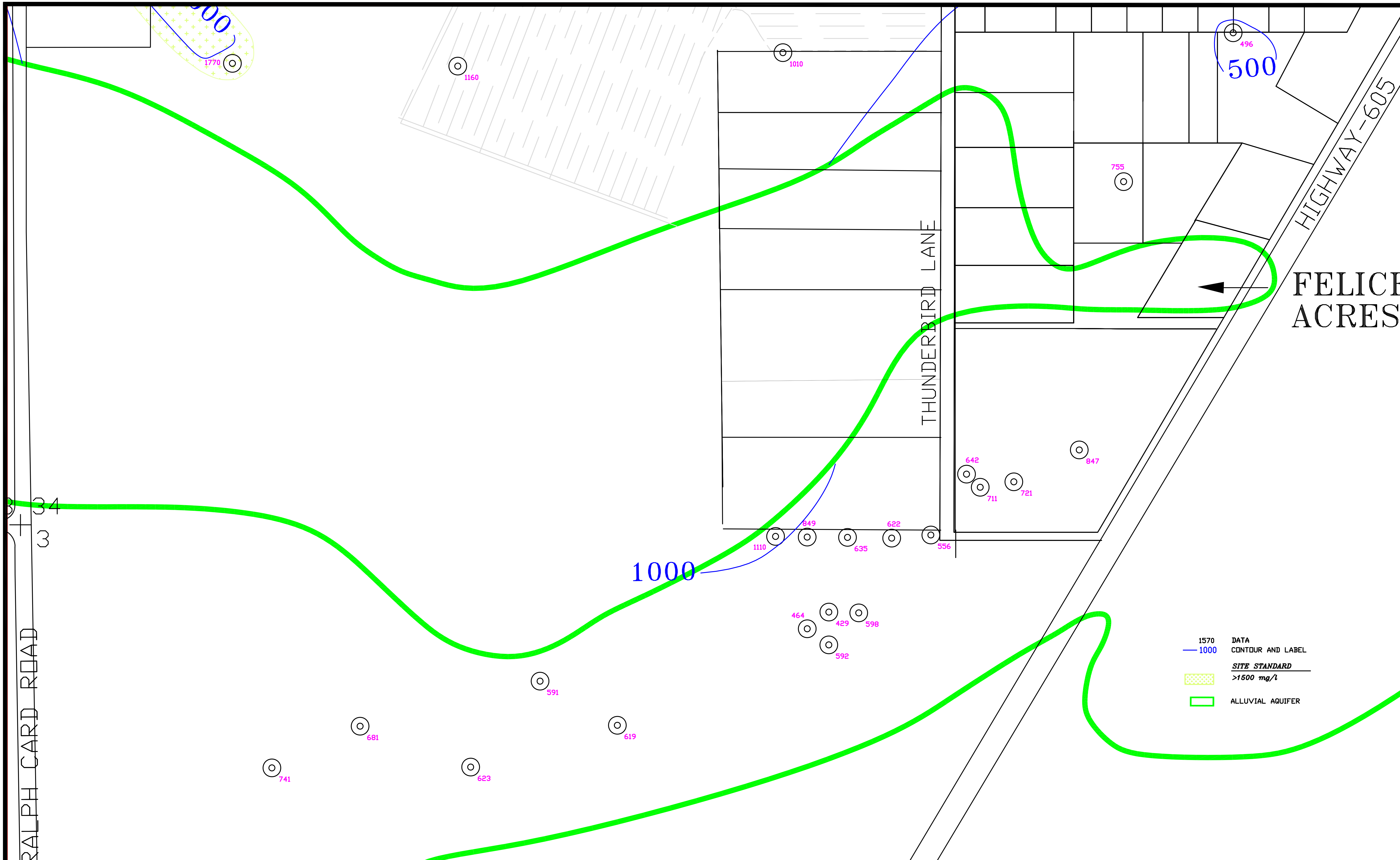


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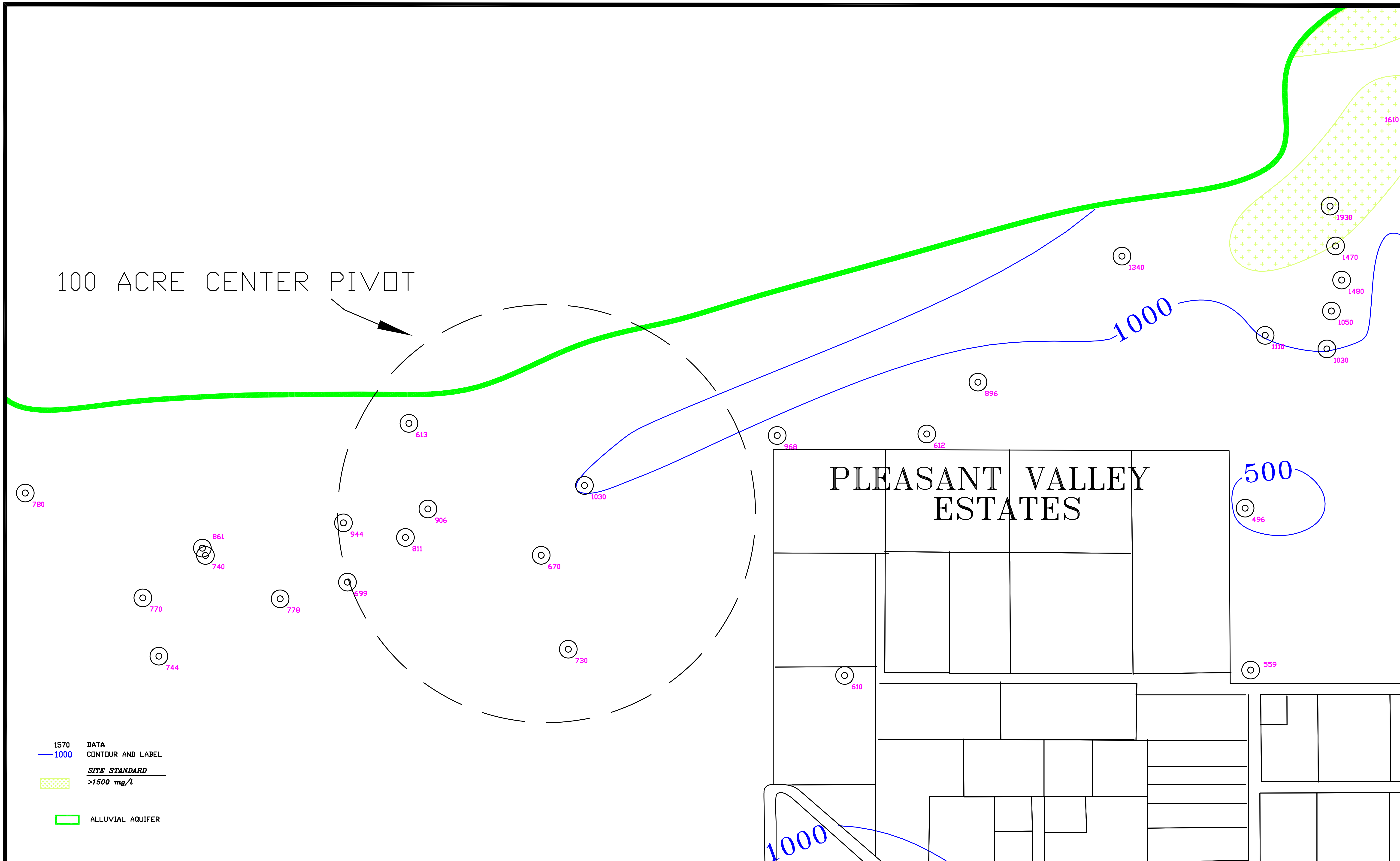
FIGURE 4.3-1C. SULFATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, mg/L

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DATE: 3/19/2021

FIGURE 4.3-1D. SULFATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, mg/L

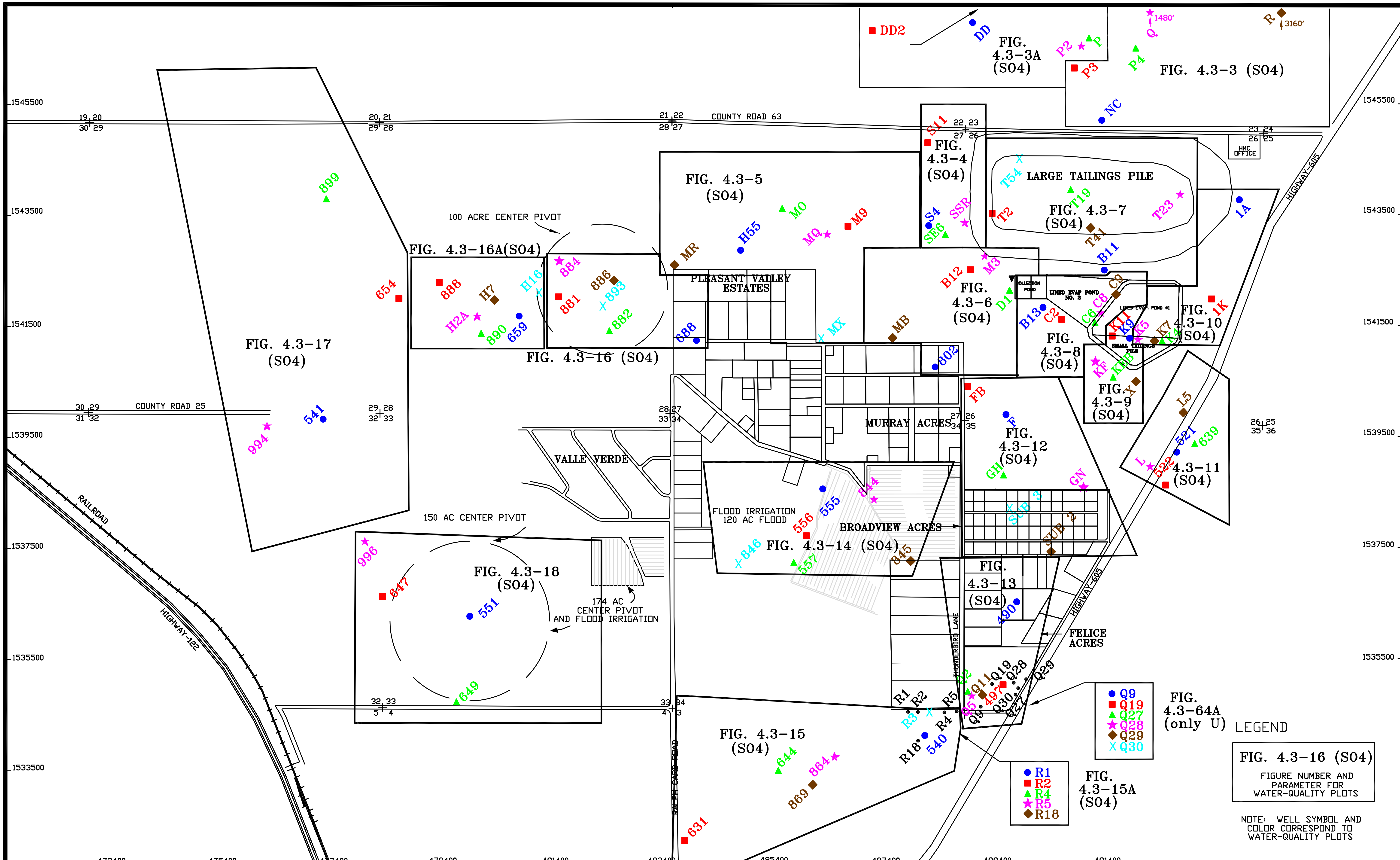


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FIGURE 4.3-2. LOCATION OF ALLUVIAL WELLS WITH WATER-QUALITY PLOTS, 2020

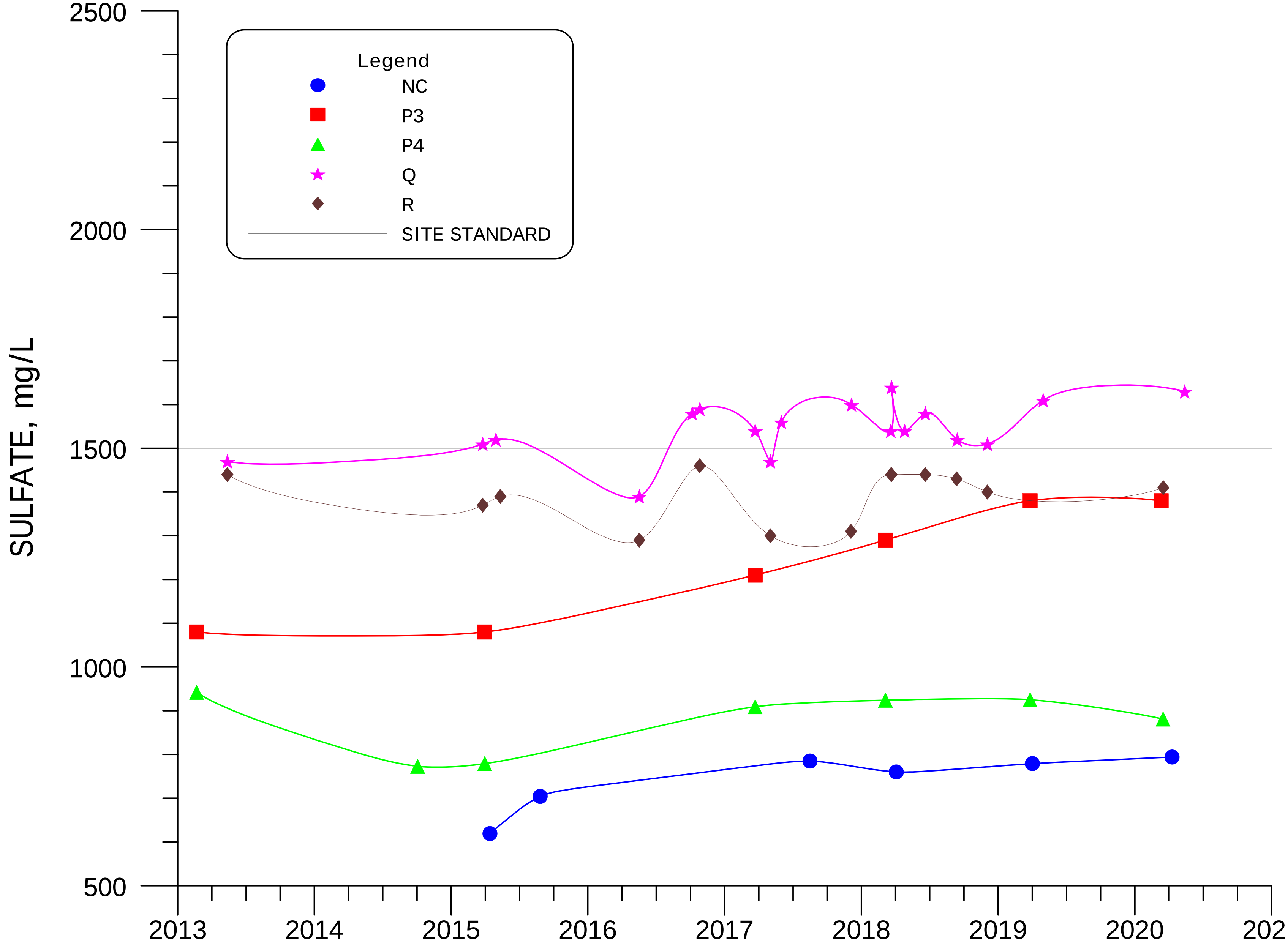


**FIGURE 4.3-3. SULFATE CONCENTRATIONS FOR WELLS NC, P3, P4, Q AND R.**

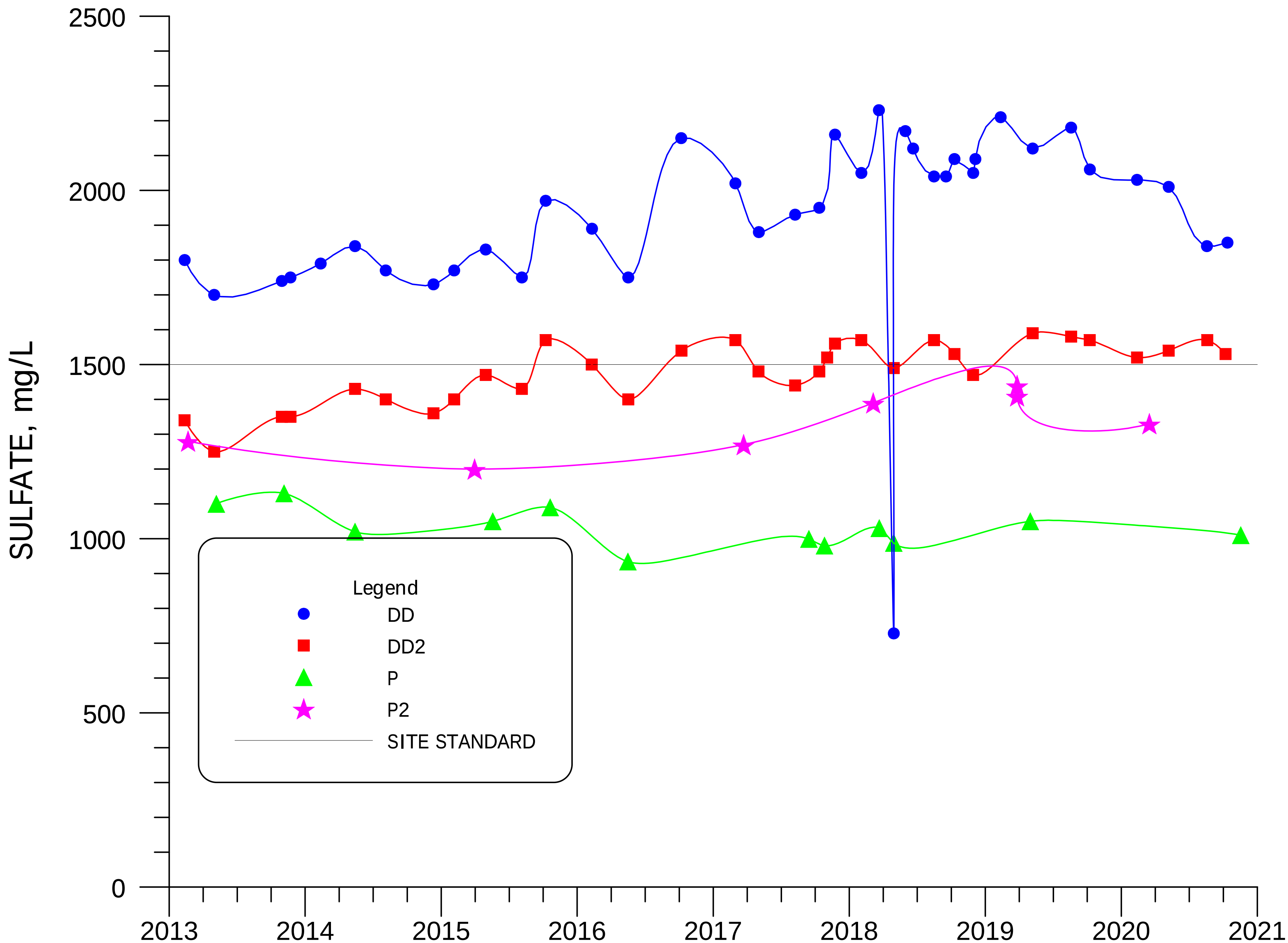


**FIGURE 4.3-3A. SULFATE CONCENTRATIONS FOR WELLS DD, DD2, P AND P2.**

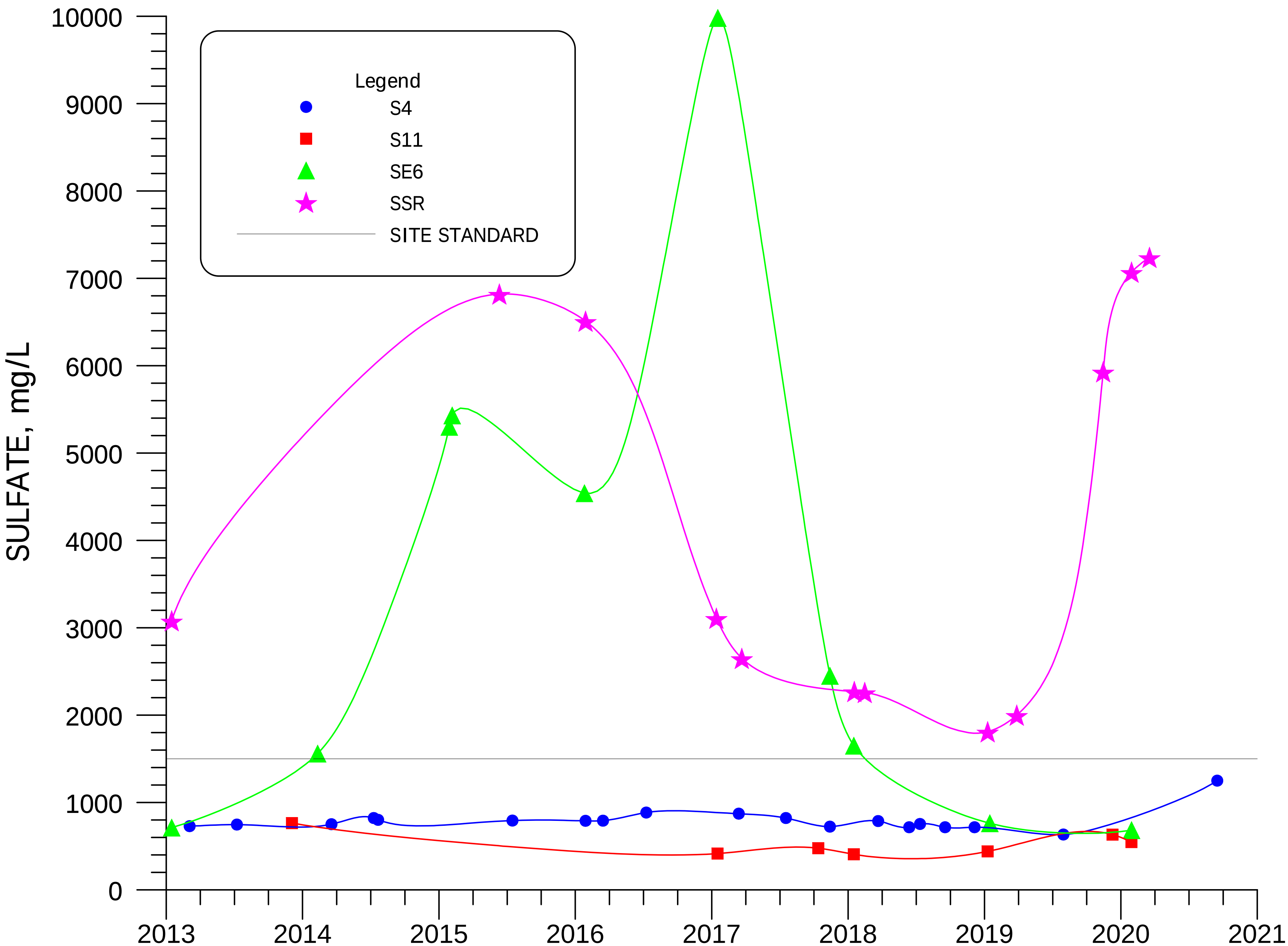


**FIGURE 4.3-4. SULFATE CONCENTRATIONS FOR WELLS S4, S11, SE6 AND SSR.**

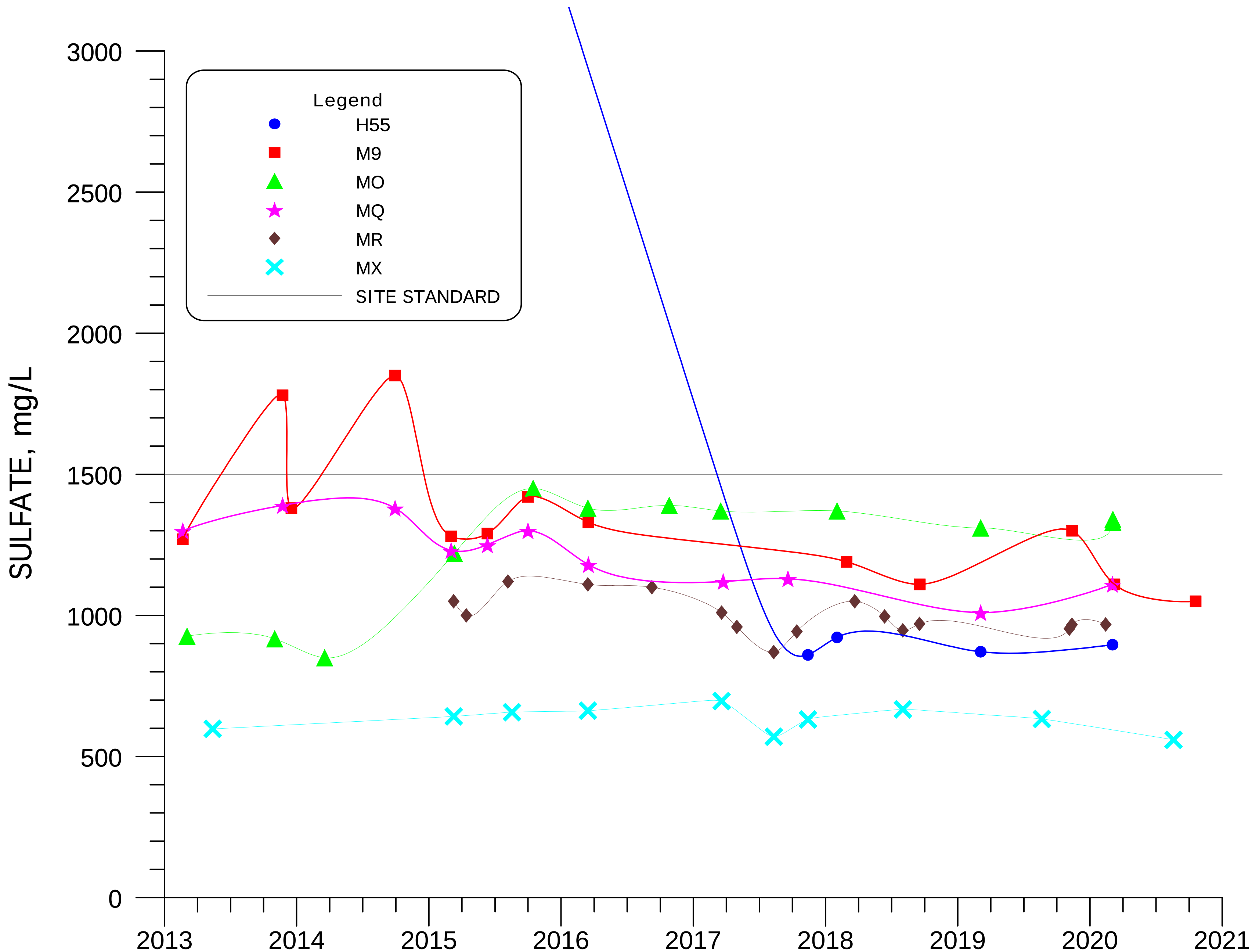


**FIGURE 4.3-5. SULFATE CONCENTRATIONS FOR WELLS H55, M9, MO, MQ, MR AND MX.**

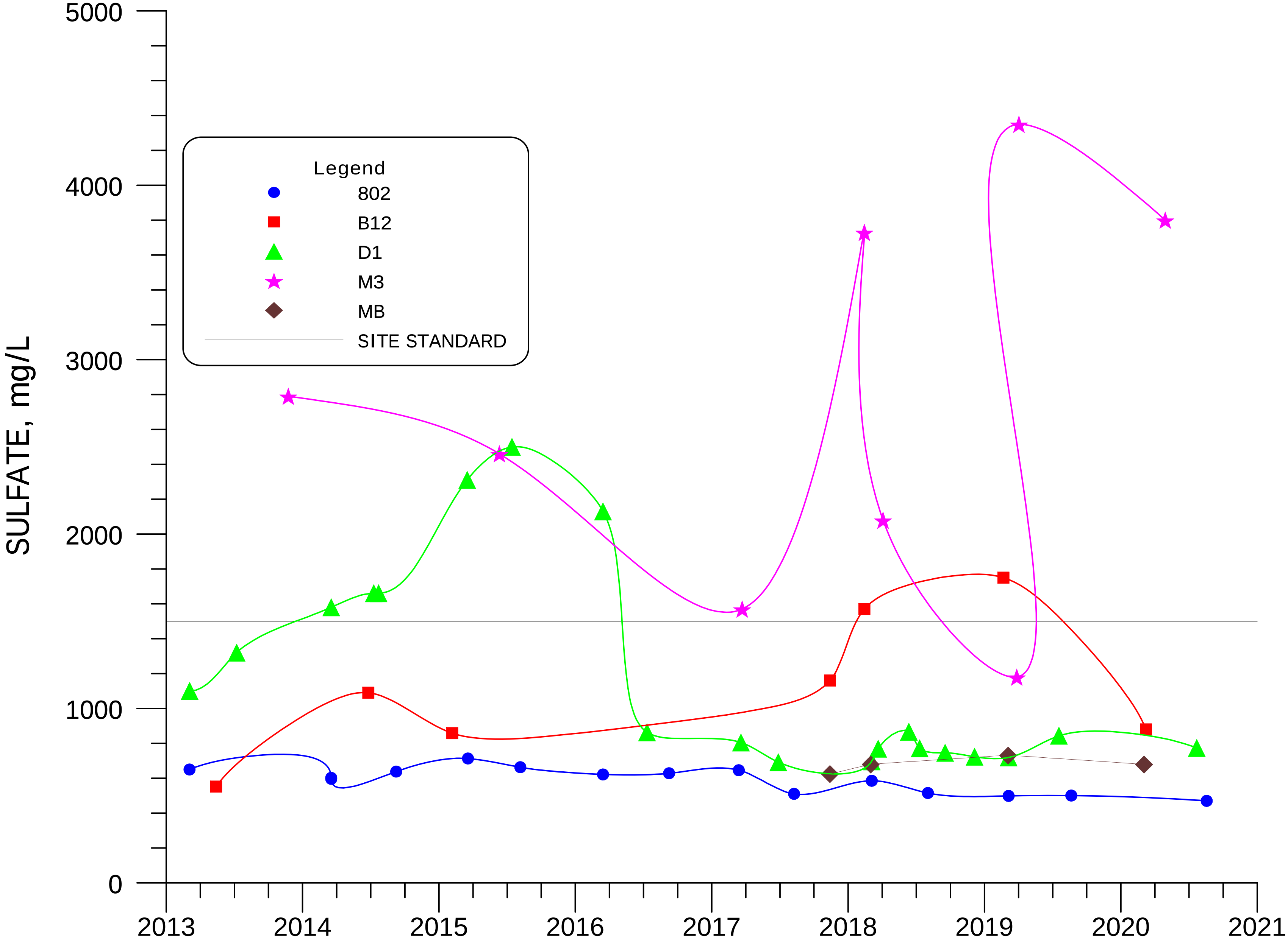


**FIGURE 4.3-6. SULFATE CONCENTRATIONS FOR WELLS 802, B12, D1, M3 AND MB.**

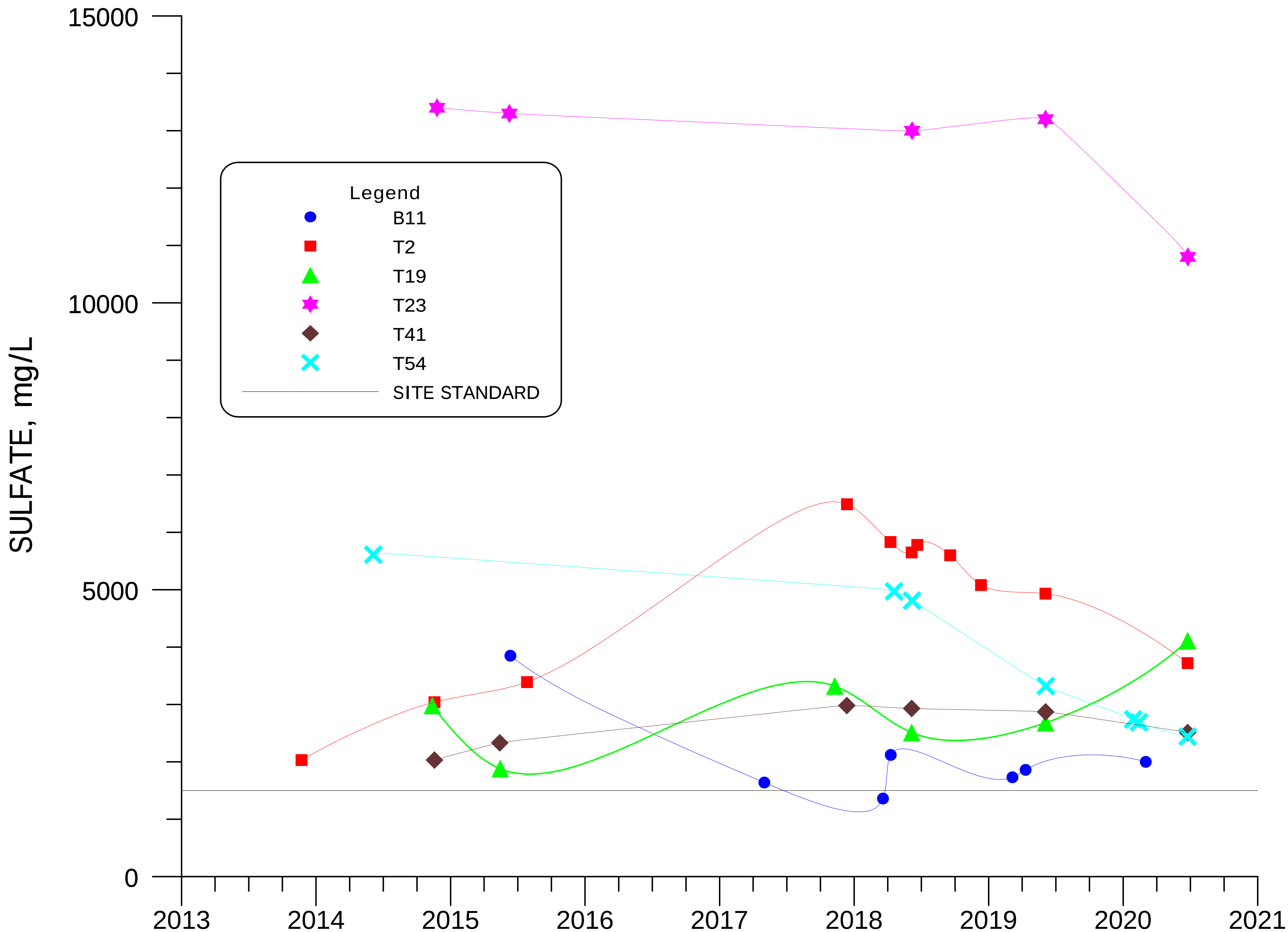


**FIGURE 4.3-7. SULFATE CONCENTRATIONS FOR WELLS B11, T2, T19, T23, T41 AND T54.**

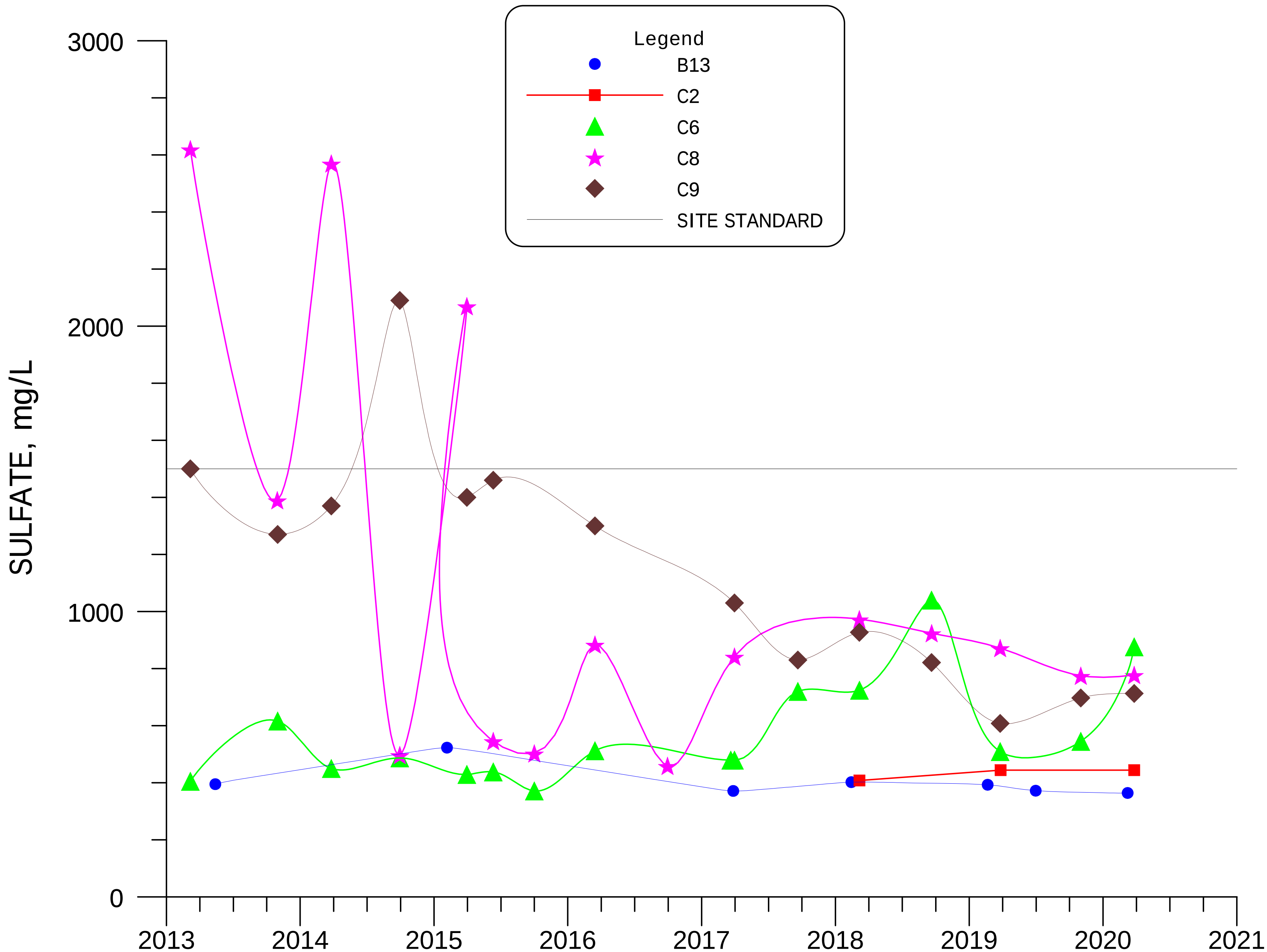


**FIGURE 4.3-8. SULFATE CONCENTRATIONS FOR WELLS B13, C2, C6, C8 AND C9.**

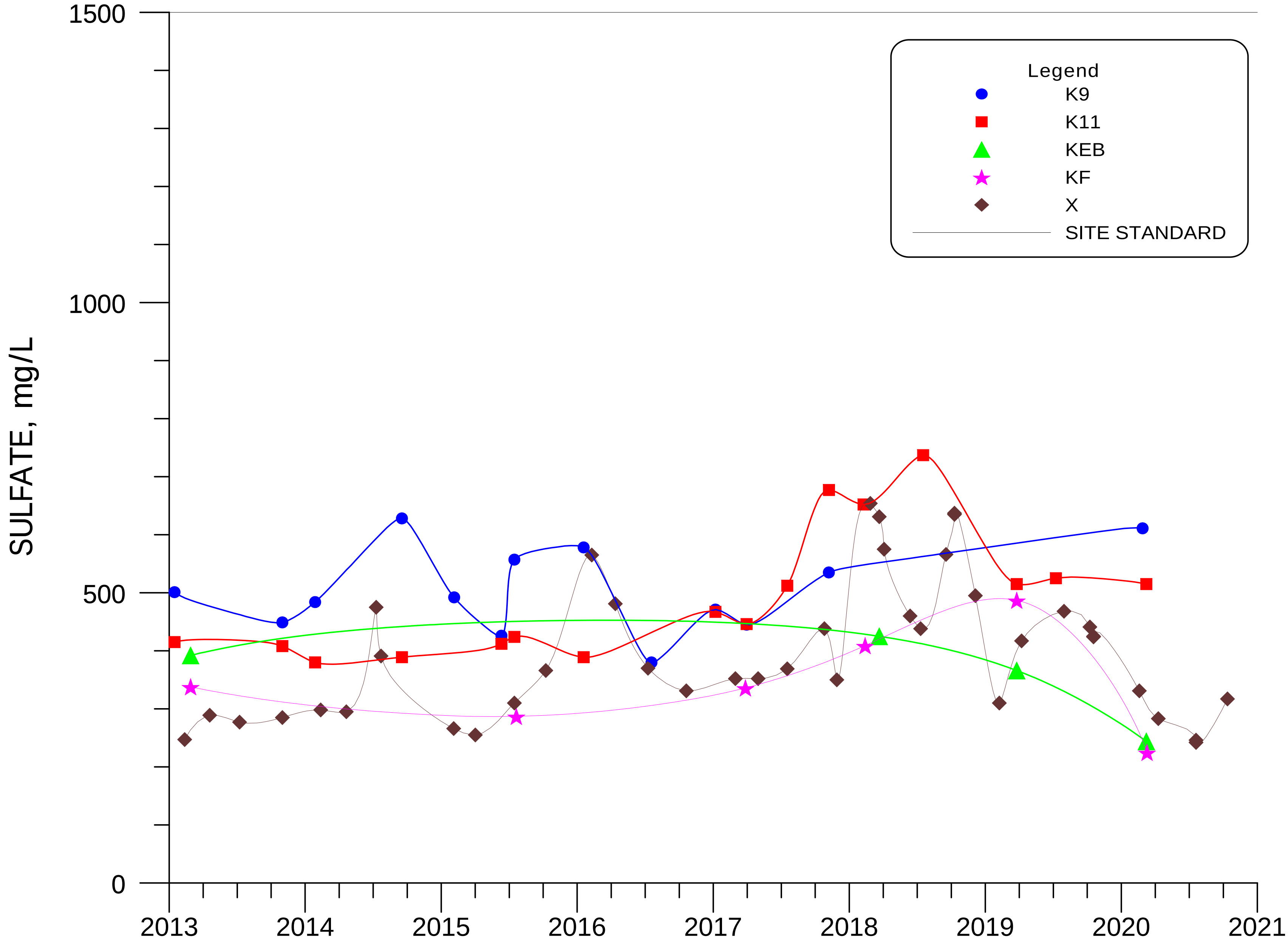


**FIGURE 4.3-9. SULFATE CONCENTRATIONS FOR WELLS K9, K11, KEB, KF AND X.**

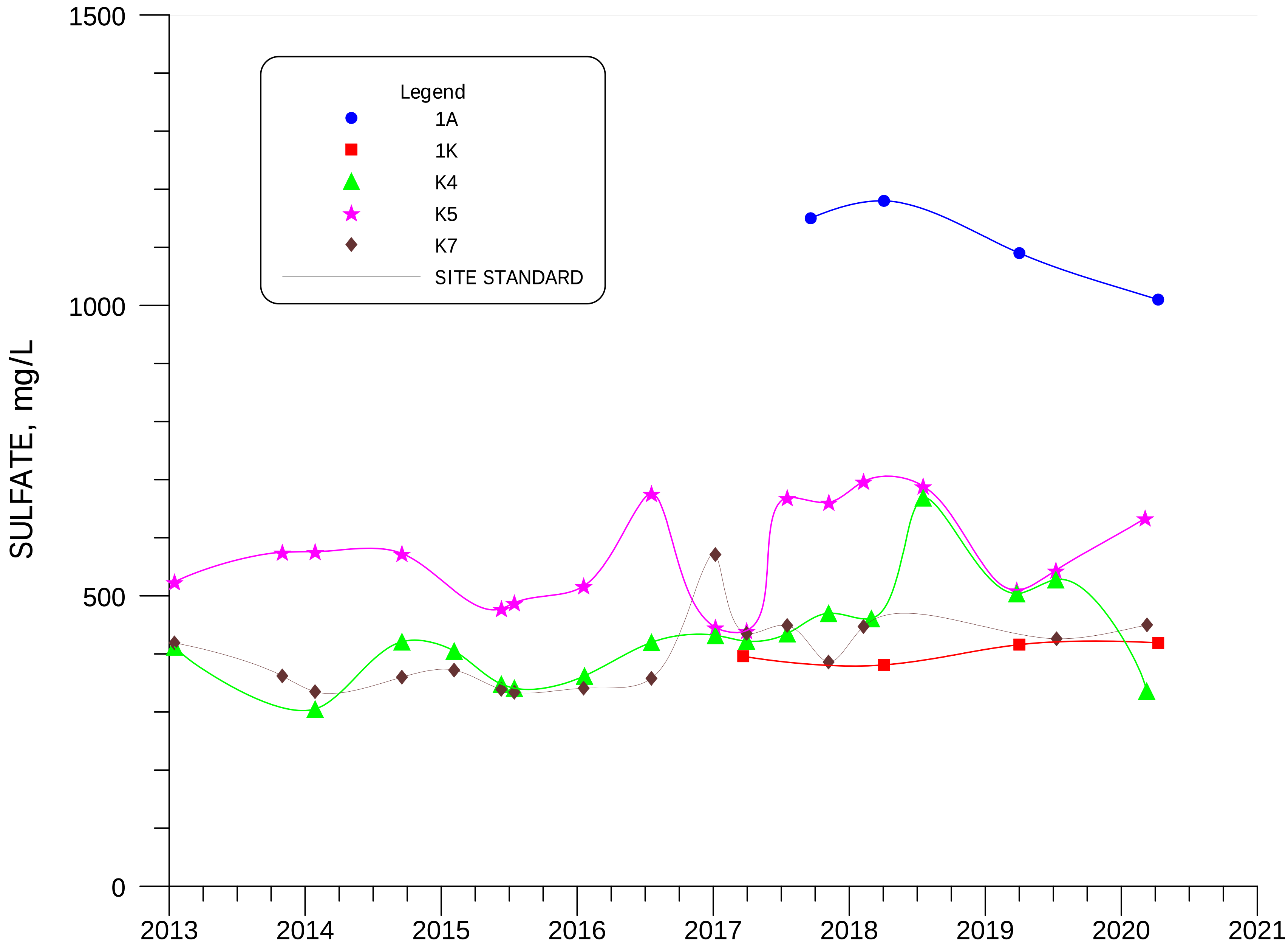


**FIGURE 4.3-10. SULFATE CONCENTRATIONS FOR WELLS 1A, 1K, K4, K5 AND K7.**

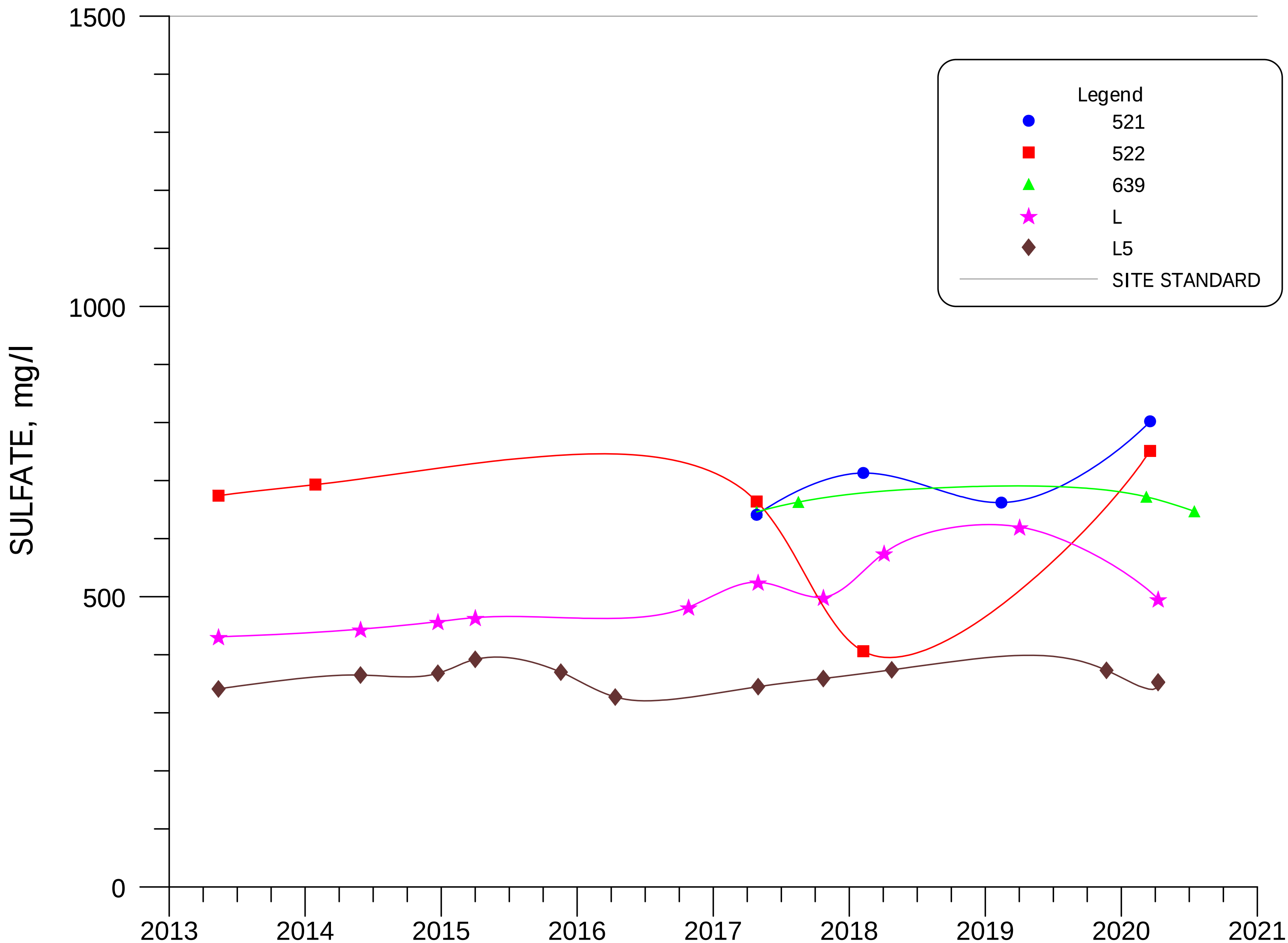


**FIGURE 4.3-11. SULFATE CONCENTRATIONS FOR WELLS 521, 522, 639, L AND L5.**

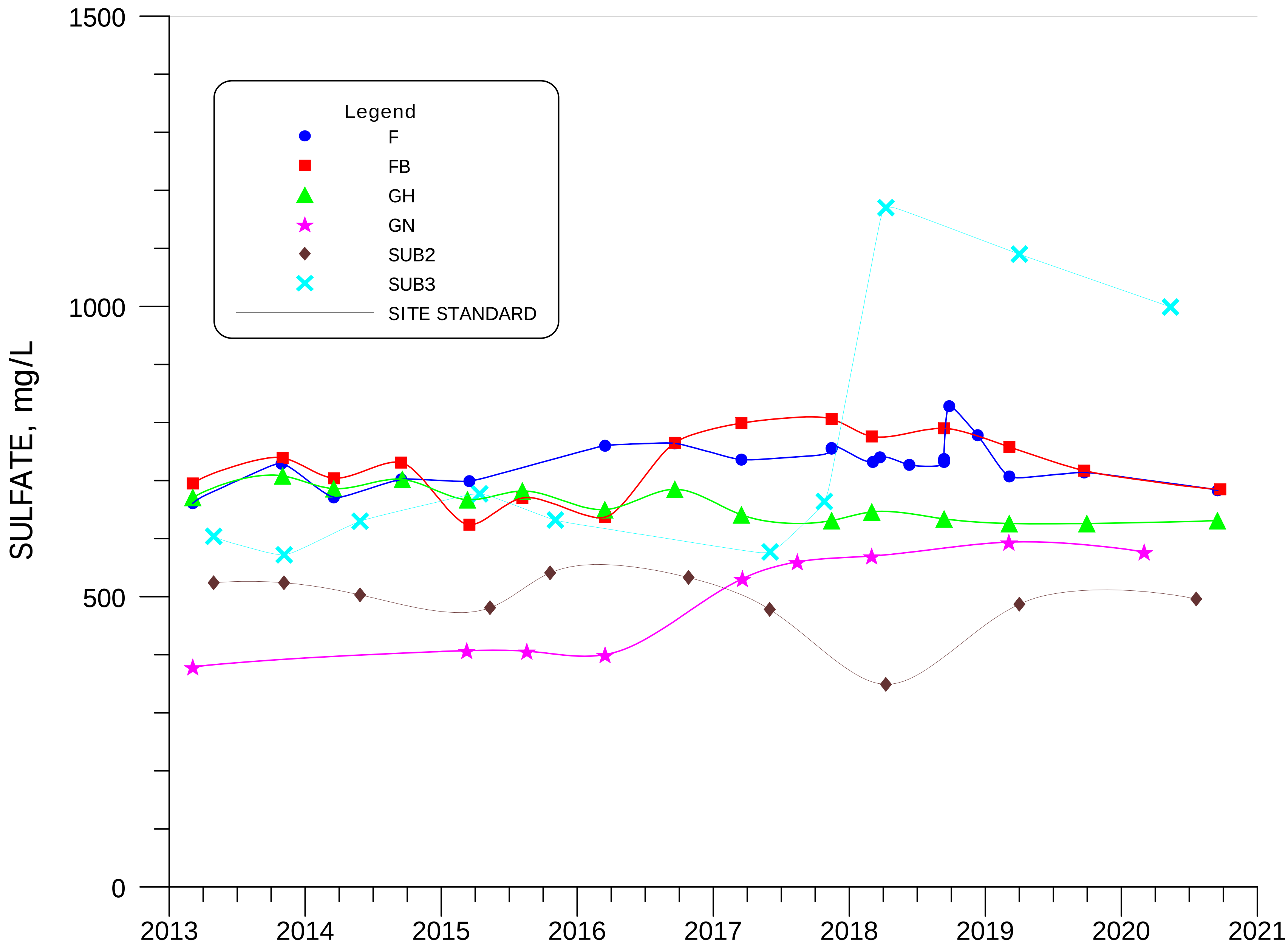


**FIGURE 4.3-12. SULFATE CONCENTRATIONS FOR WELLS F, FB, GH, GN, SUB2 AND SUB3.**

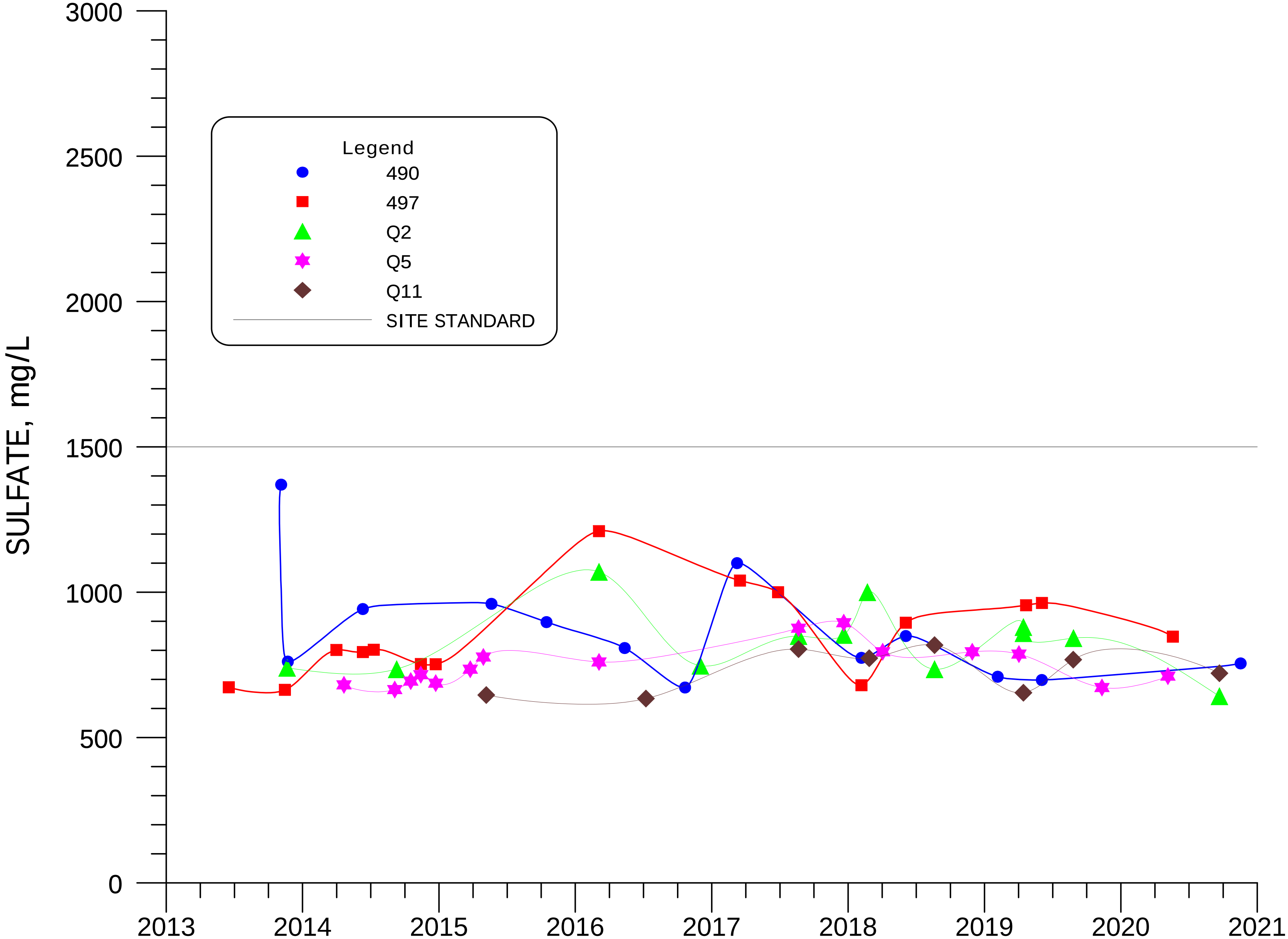


**FIGURE 4.3-13. SULFATE CONCENTRATIONS FOR WELLS 490, 497, Q2, Q5 AND Q11.**

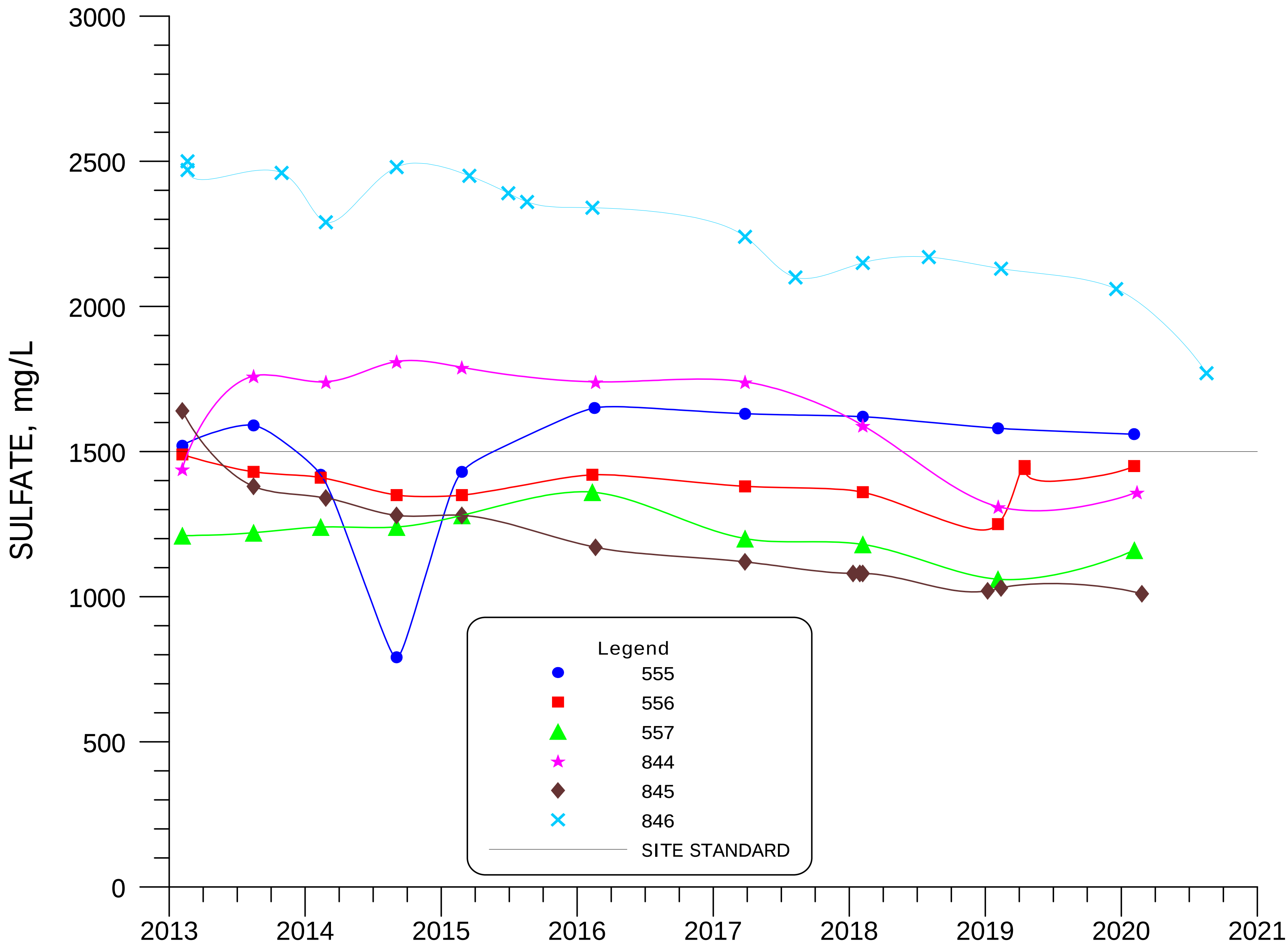


**FIGURE 4.3-14. SULFATE CONCENTRATIONS FOR WELLS 555, 556, 557, 844, 845, AND 846.**

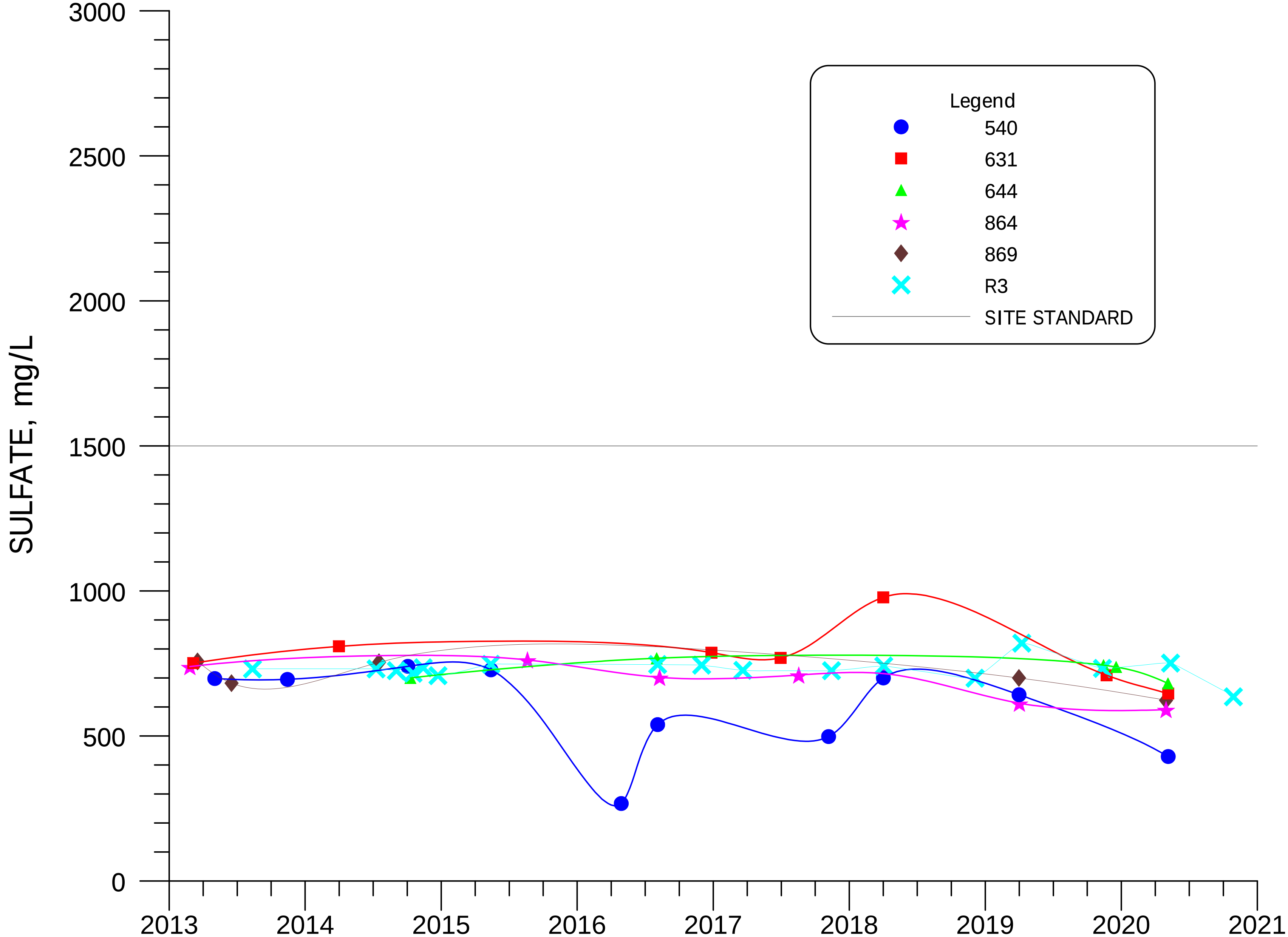


**FIGURE 4.3-15. SULFATE CONCENTRATIONS FOR WELLS 540, 631, 644, 864, 869 AND R3.**

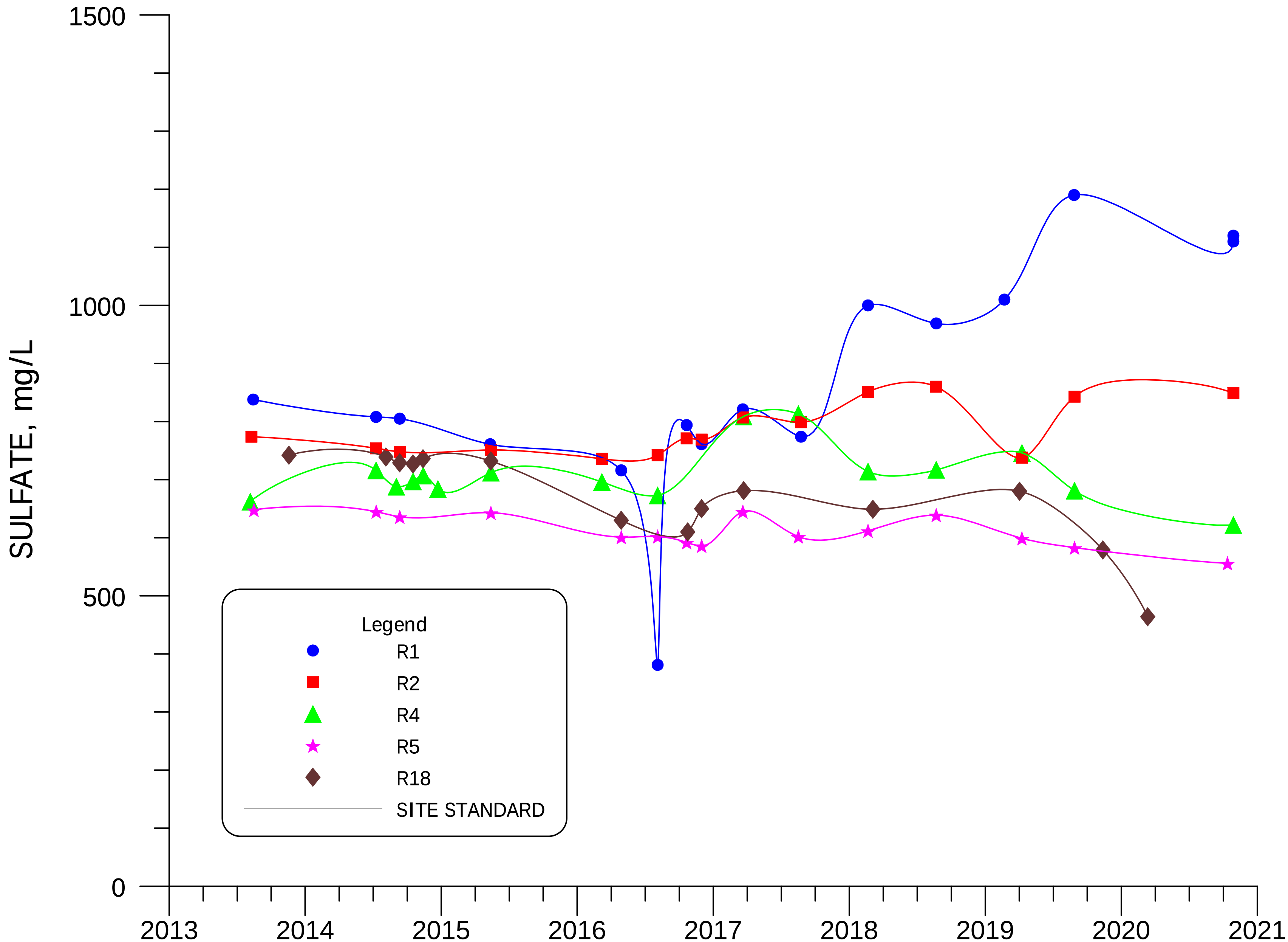


**FIGURE 4.3-15A. SULFATE CONCENTRATIONS FOR WELLS R1, R2, R4, R5 AND R18.**

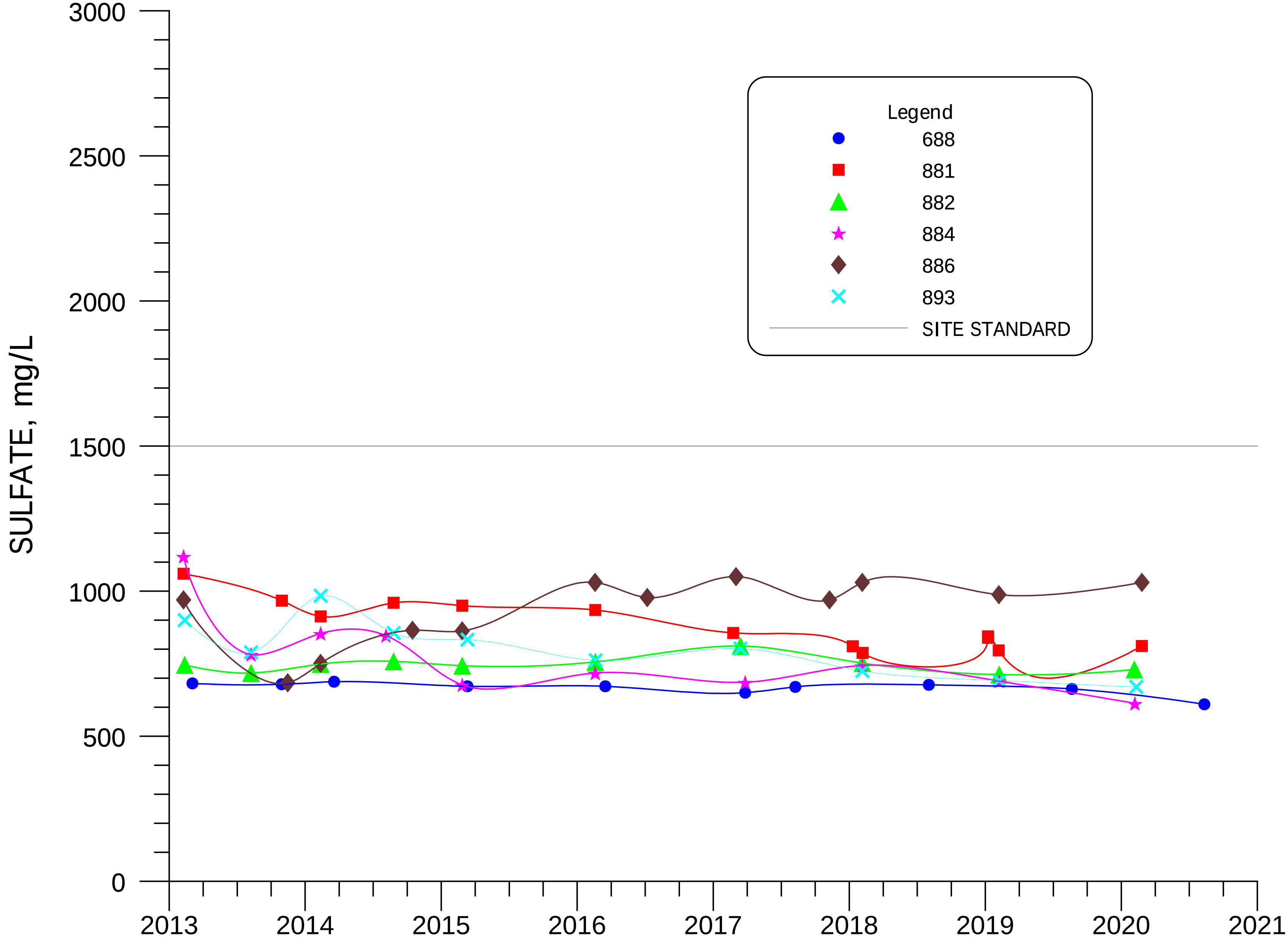


**FIGURE 4.3-16. SULFATE CONCENTRATIONS FOR WELLS 688, 881, 882, 884, 886, AND 893.**

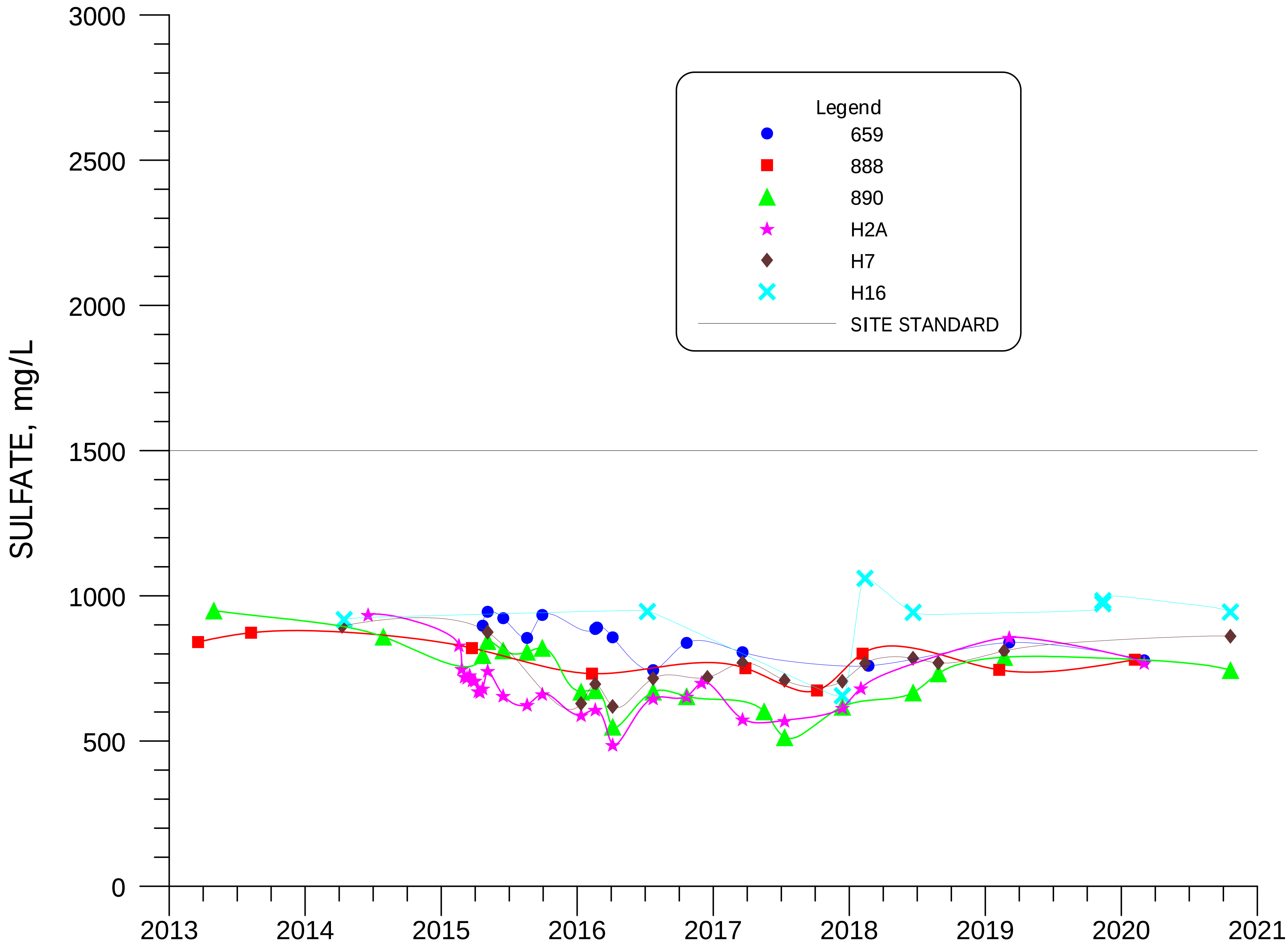


**FIGURE 4.3-16A. SULFATE CONCENTRATIONS FOR WELLS 659, 888, 890, H2A, H7 AND H16.**

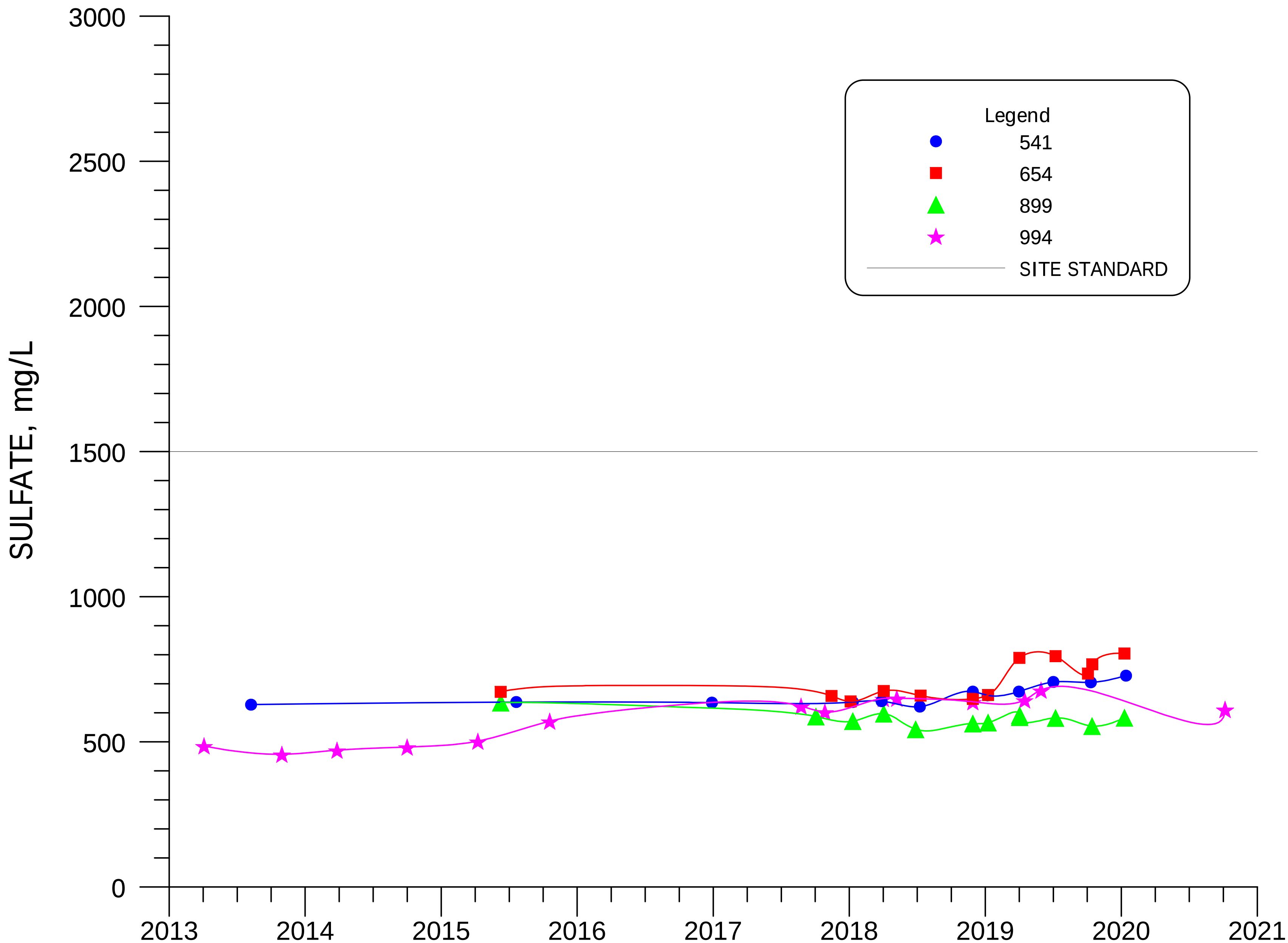


**FIGURE 4.3-17. SULFATE CONCENTRATIONS FOR WELLS 541, 654, 899 and 994.**

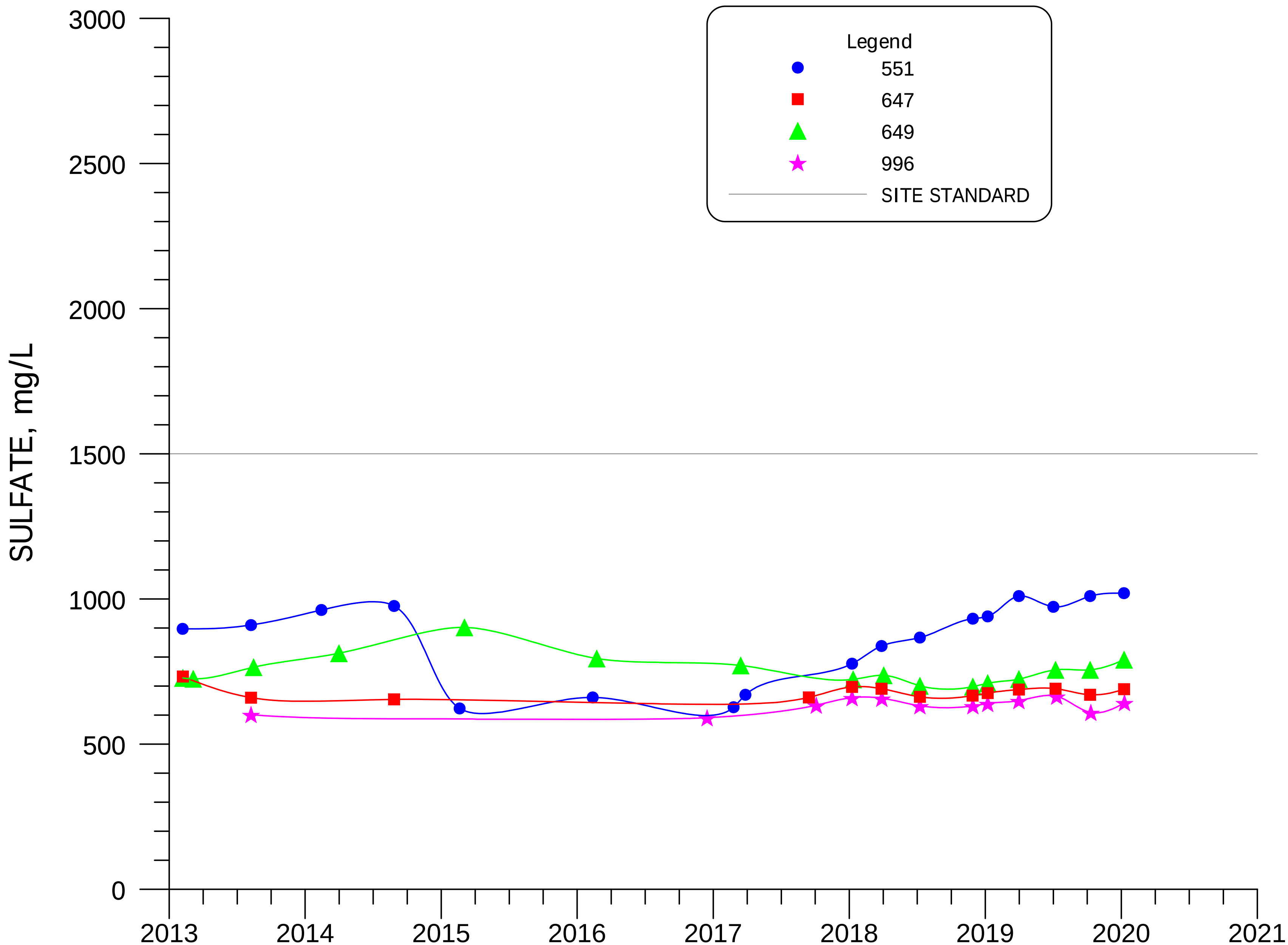


**FIGURE 4.3-18. SULFATE CONCENTRATIONS FOR WELLS 551, 647, 649 AND 996.**

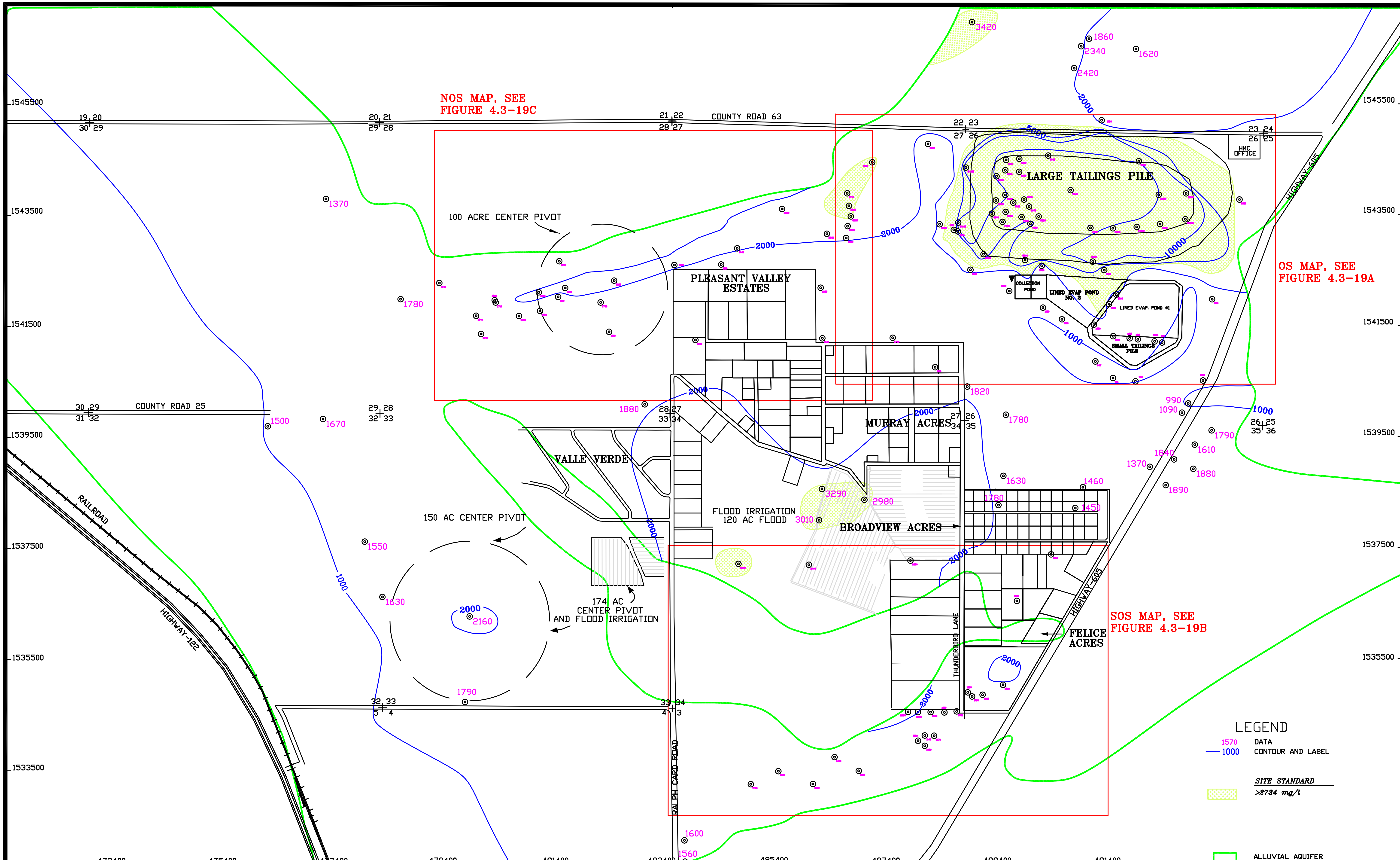


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FIGURE 4.3-19. TDS CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, mg/L

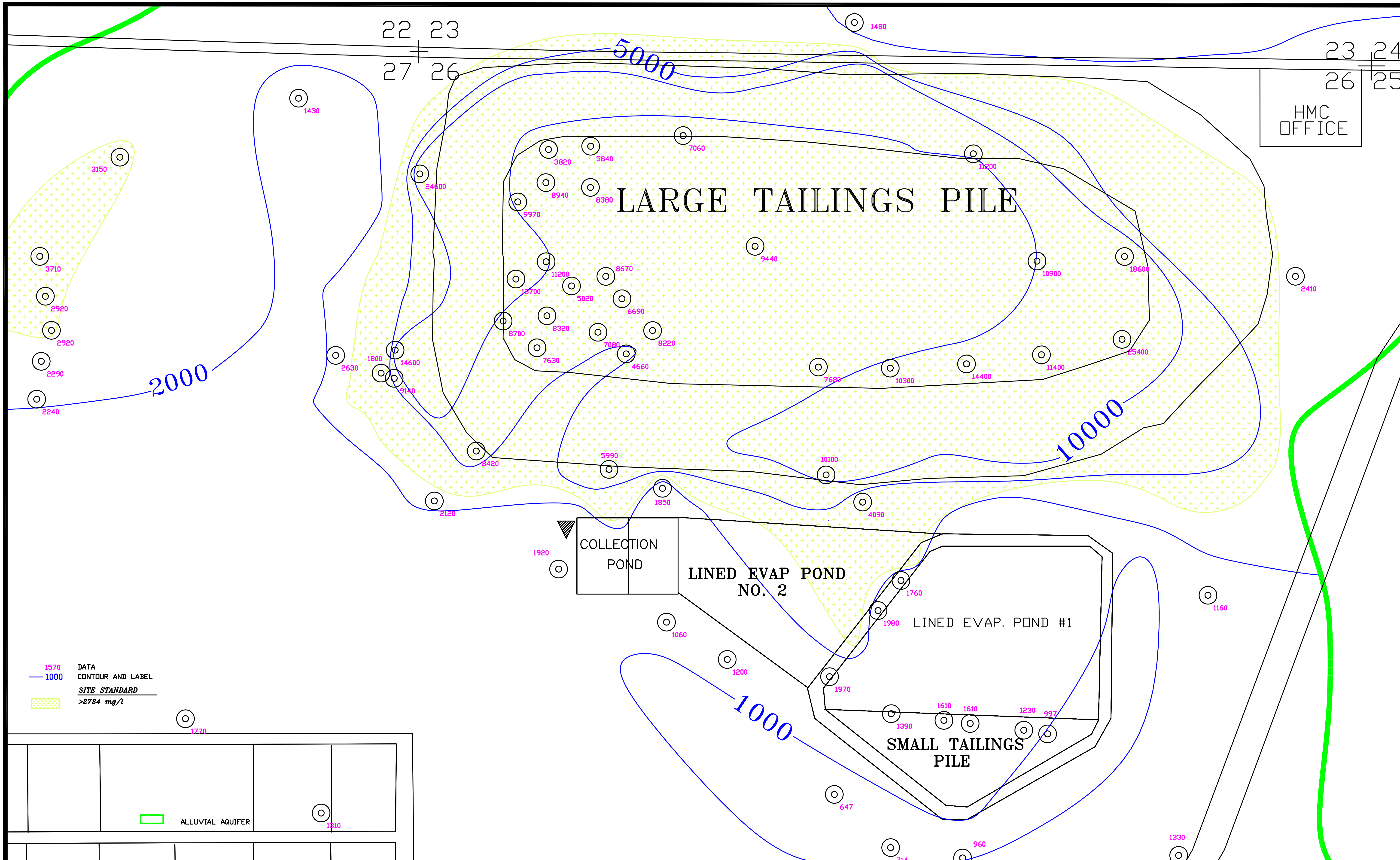


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FIGURE 4.3-19A. TDS CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, mg/L

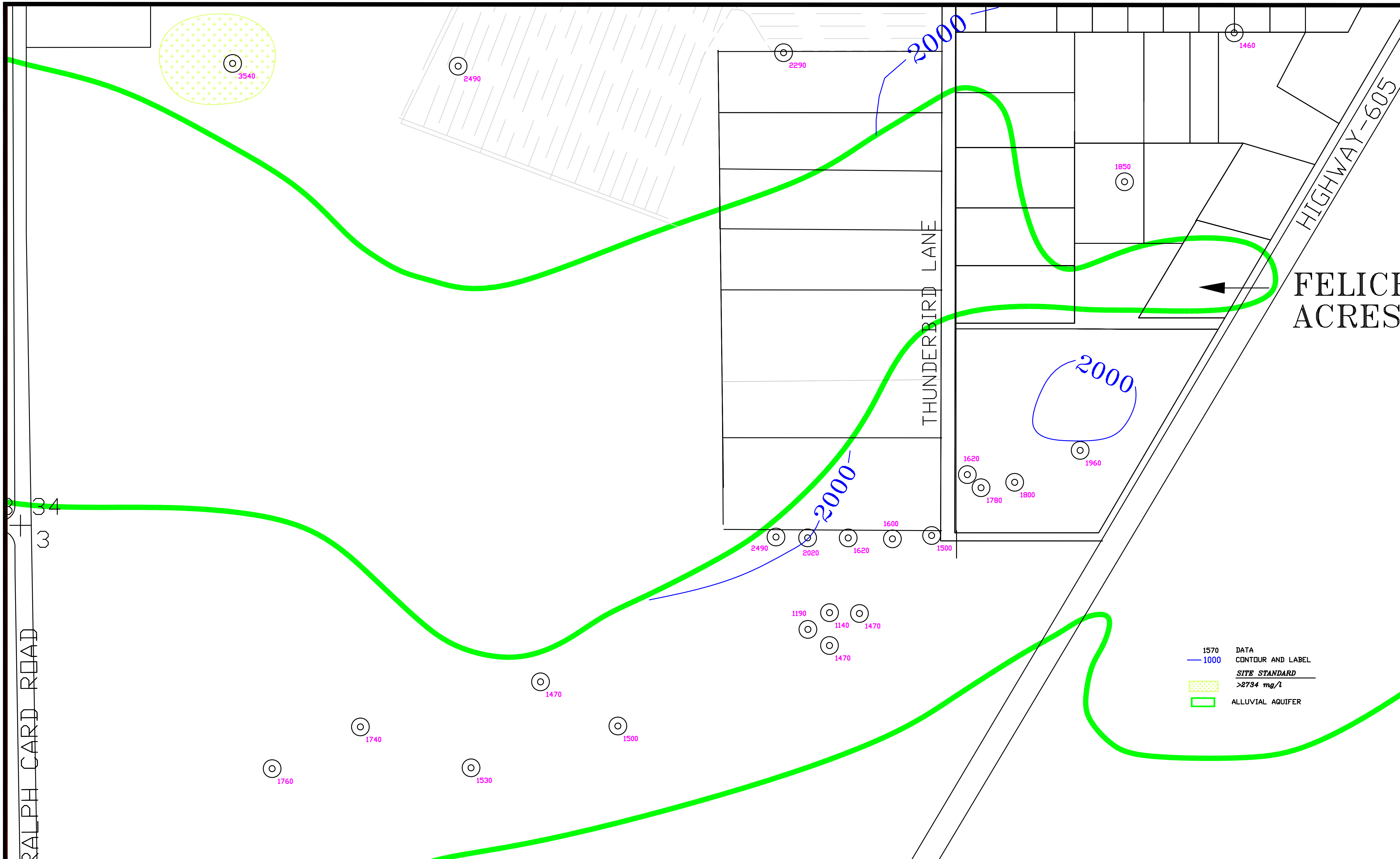


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FIGURE 4.3-19B. TDS CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, mg/L

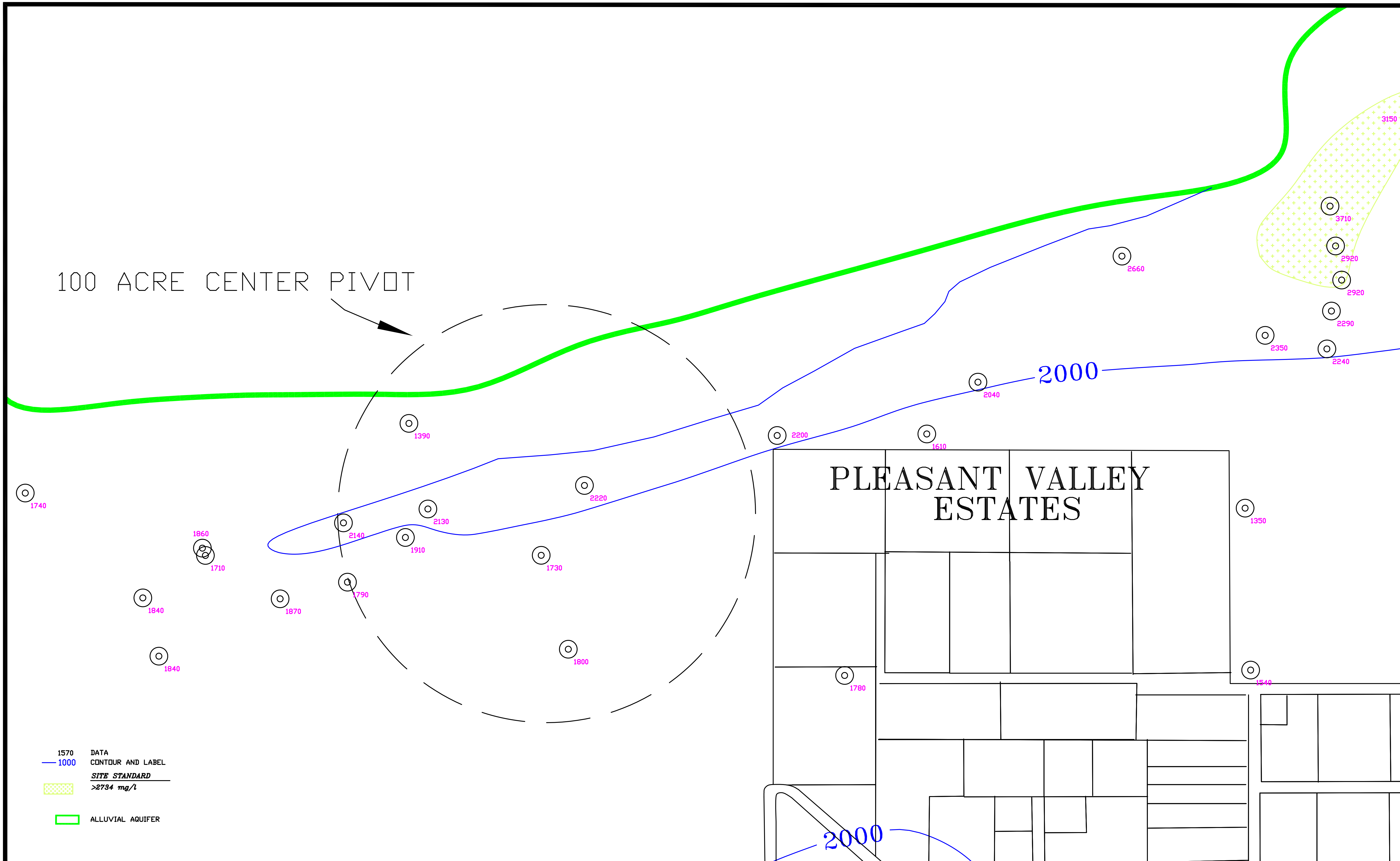


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FIGURE 4.3-19C. TDS CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, mg/L

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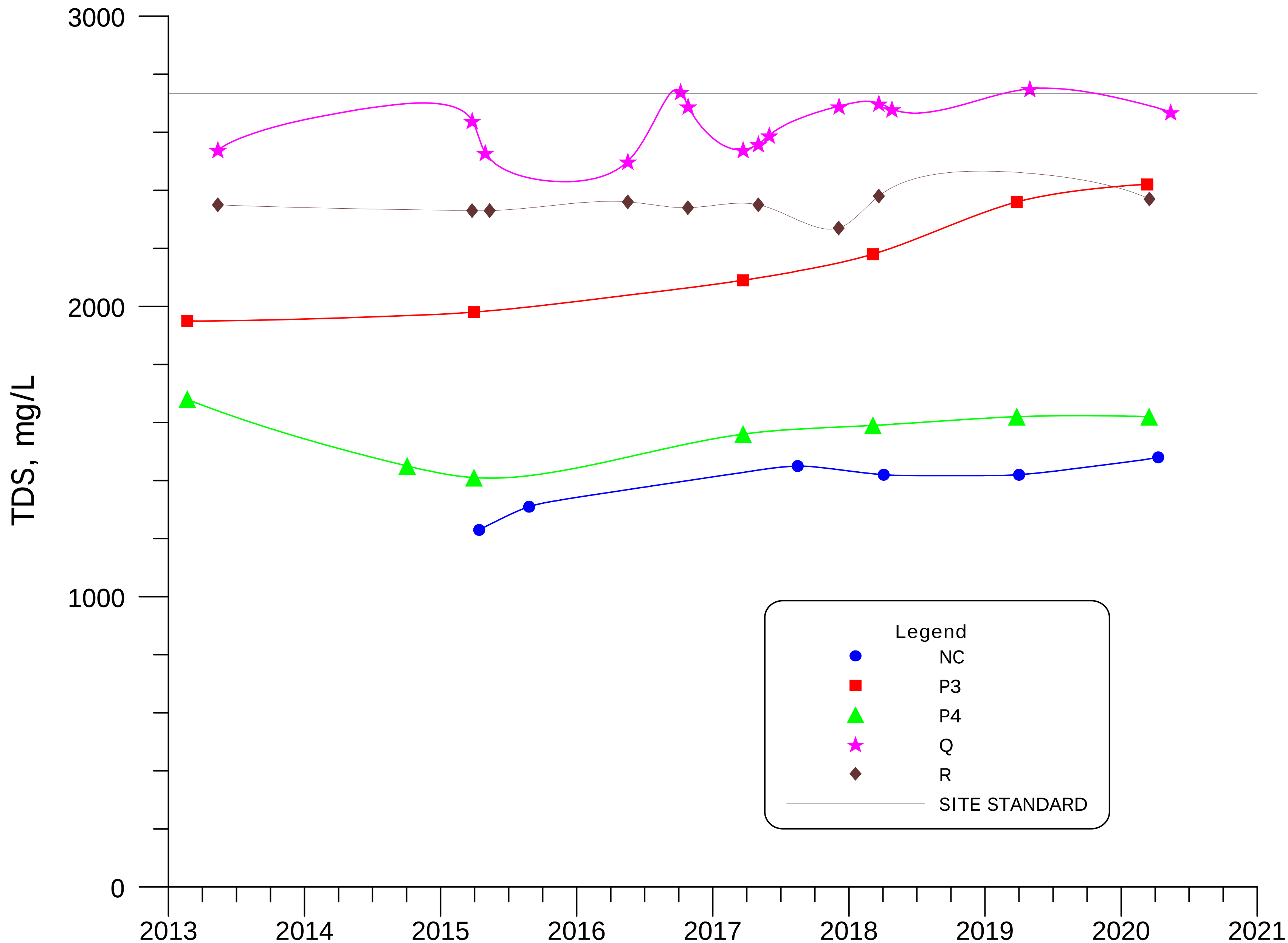


**FIGURE 4.3-20. TDS CONCENTRATIONS FOR WELLS NC, P3, P4, Q AND R.**

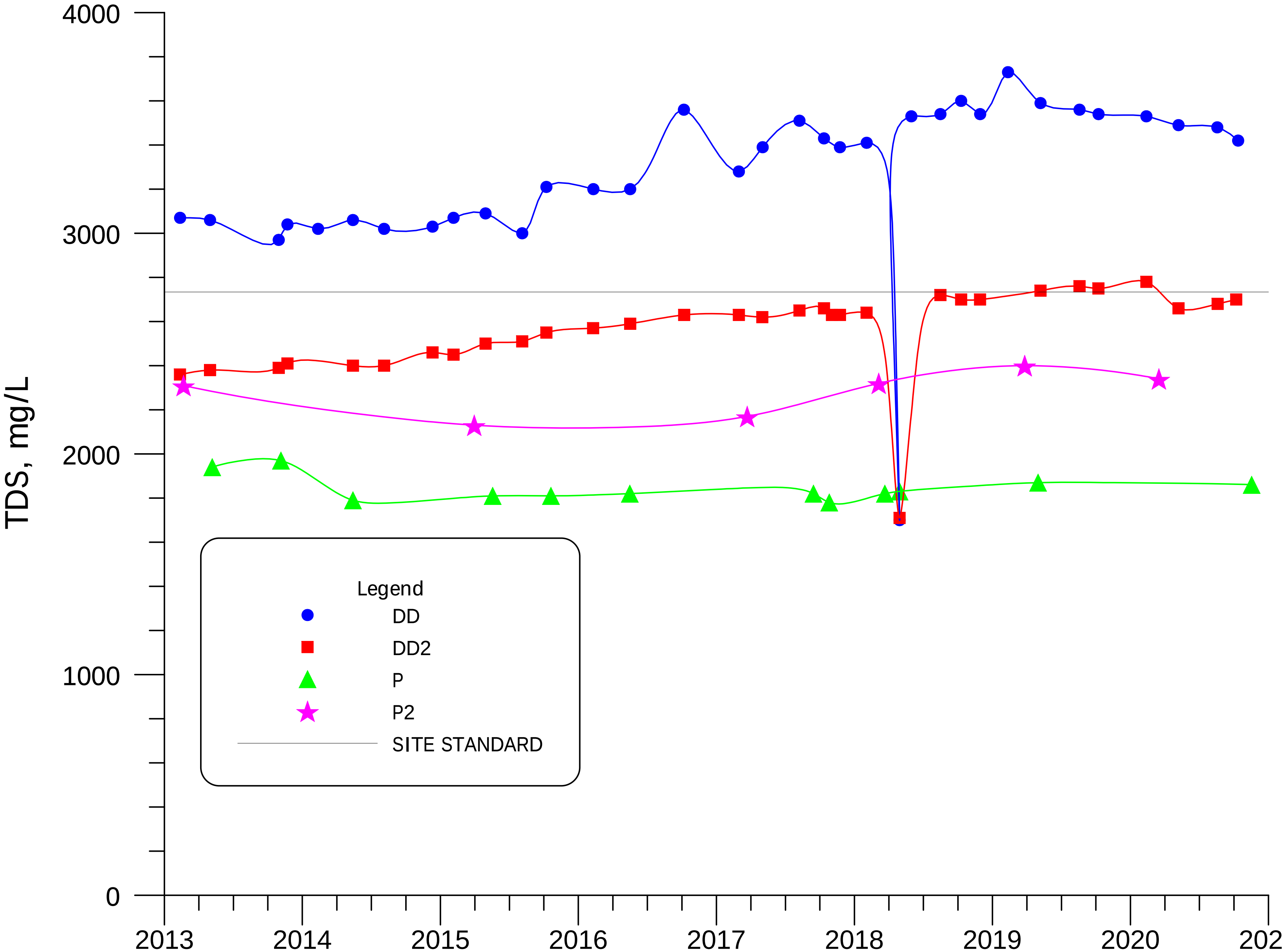


**FIGURE 4.3-20A. TDS CONCENTRATIONS FOR WELLS DD, DD2, P AND P2.**

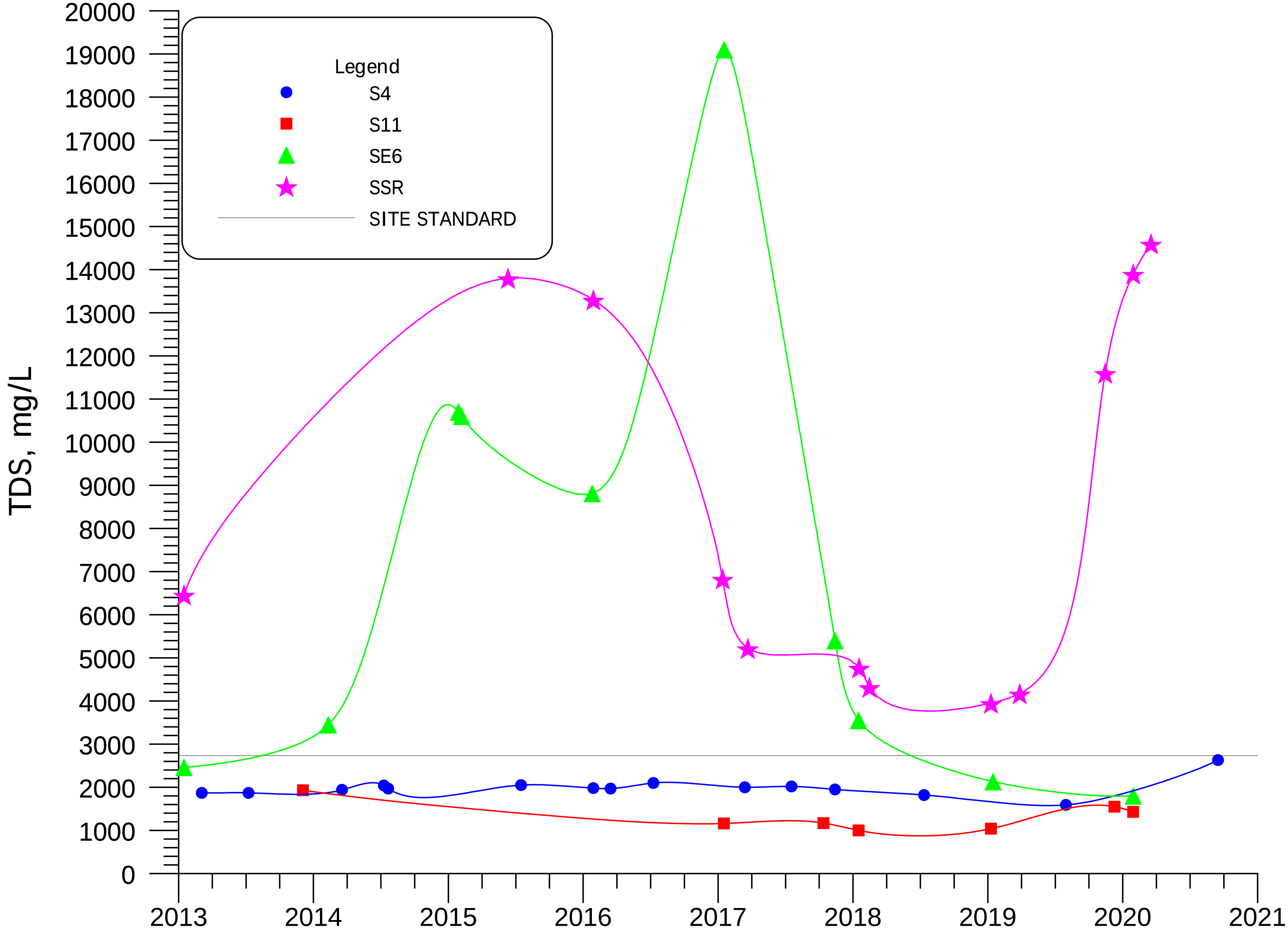


**FIGURE 4.3-21. TDS CONCENTRATIONS FOR WELLS S4, S11, SE6 AND SSR.**

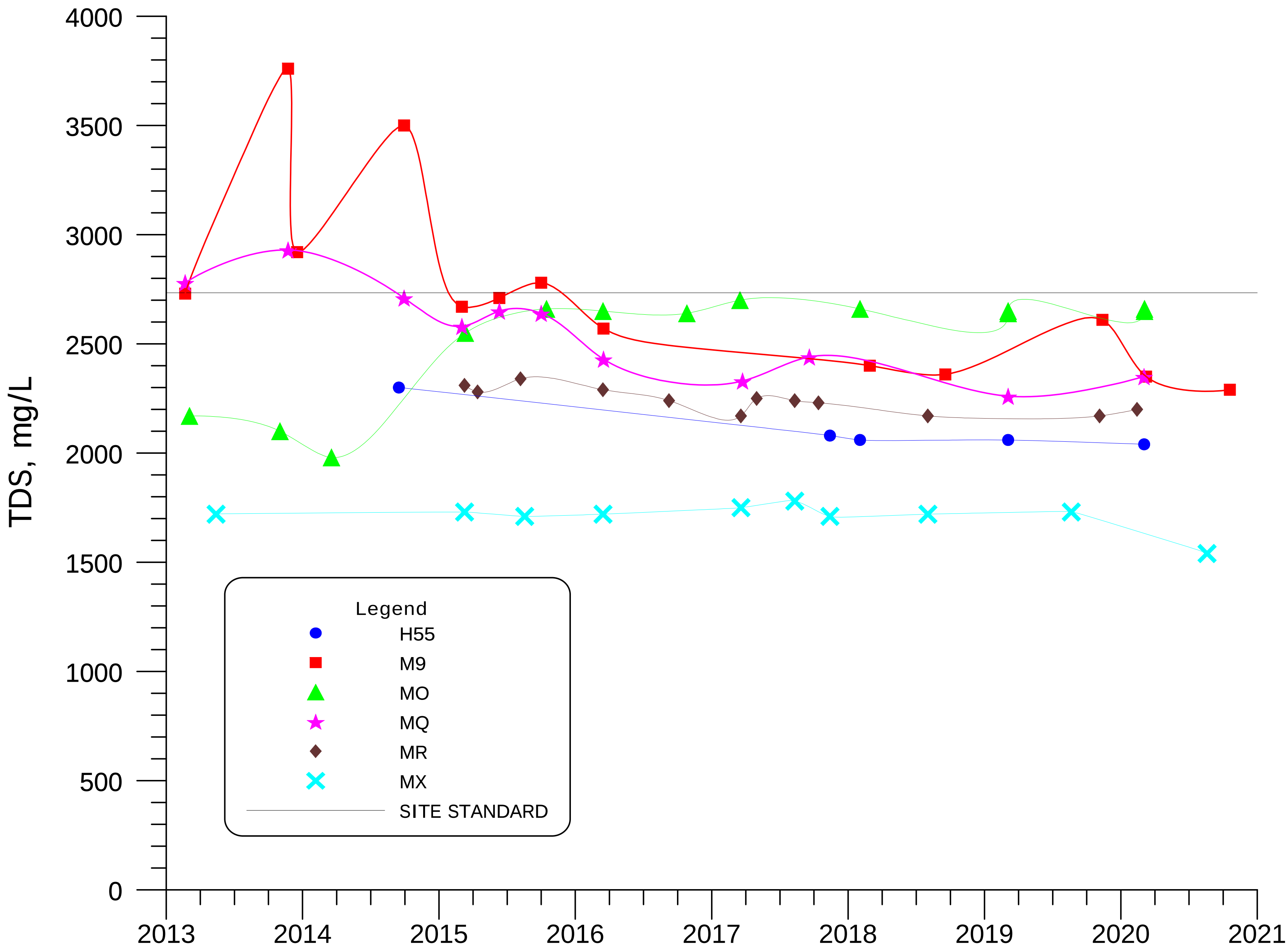


**FIGURE 4.3-22. TDS CONCENTRATIONS FOR WELLS H55, M9, MO, MQ, MR AND MX.**

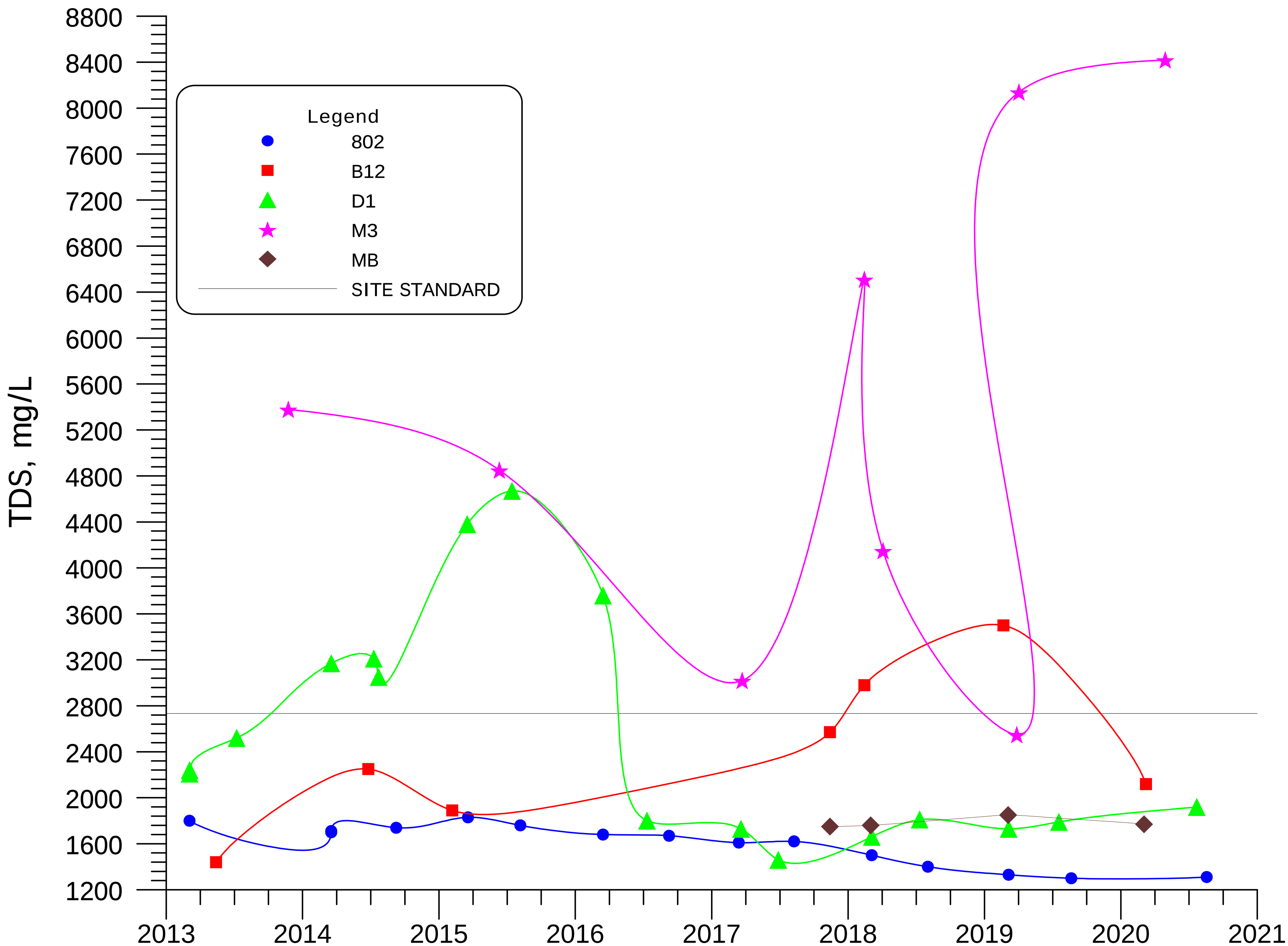


**FIGURE 4.3-23. TDS CONCENTRATIONS FOR WELLS 802, B12, D1, M3 AND MB.**

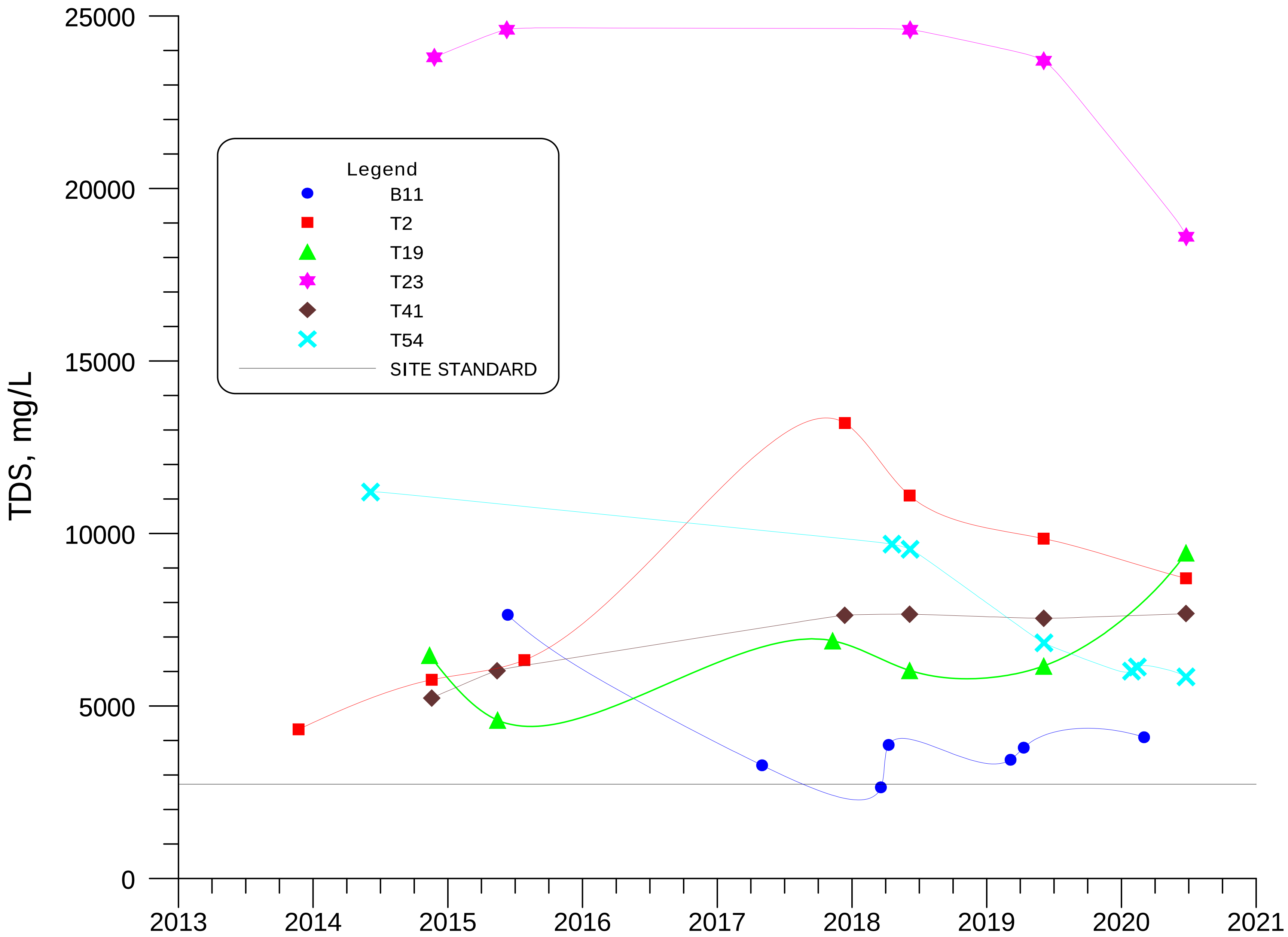


**FIGURE 4.3-24. TDS CONCENTRATIONS FOR WELLS B11, T2, T19, T23, T41 AND T54.**

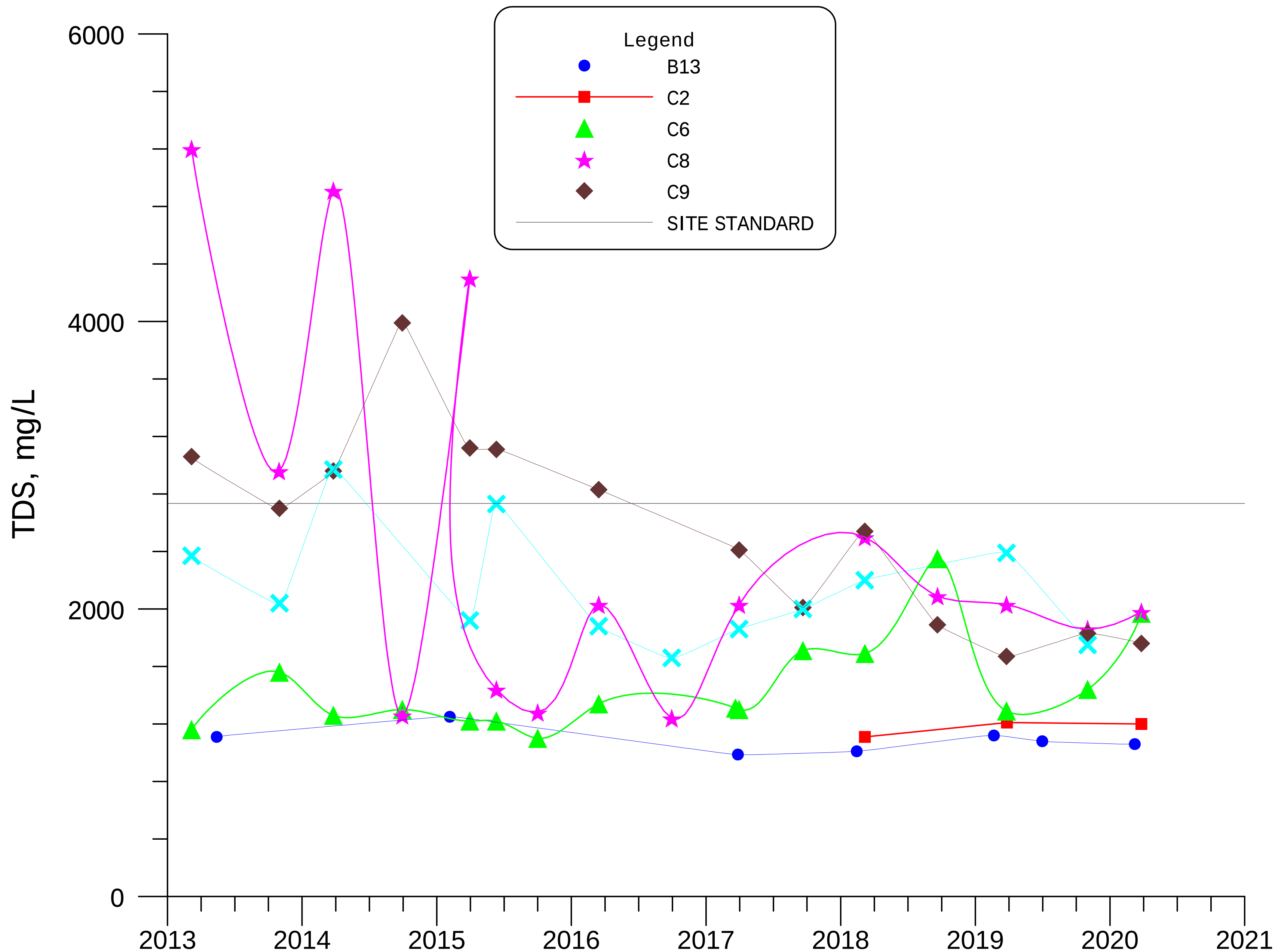


**FIGURE 4.3-25. TDS CONCENTRATIONS FOR WELLS B13, C2, C6, C8 AND C9.**

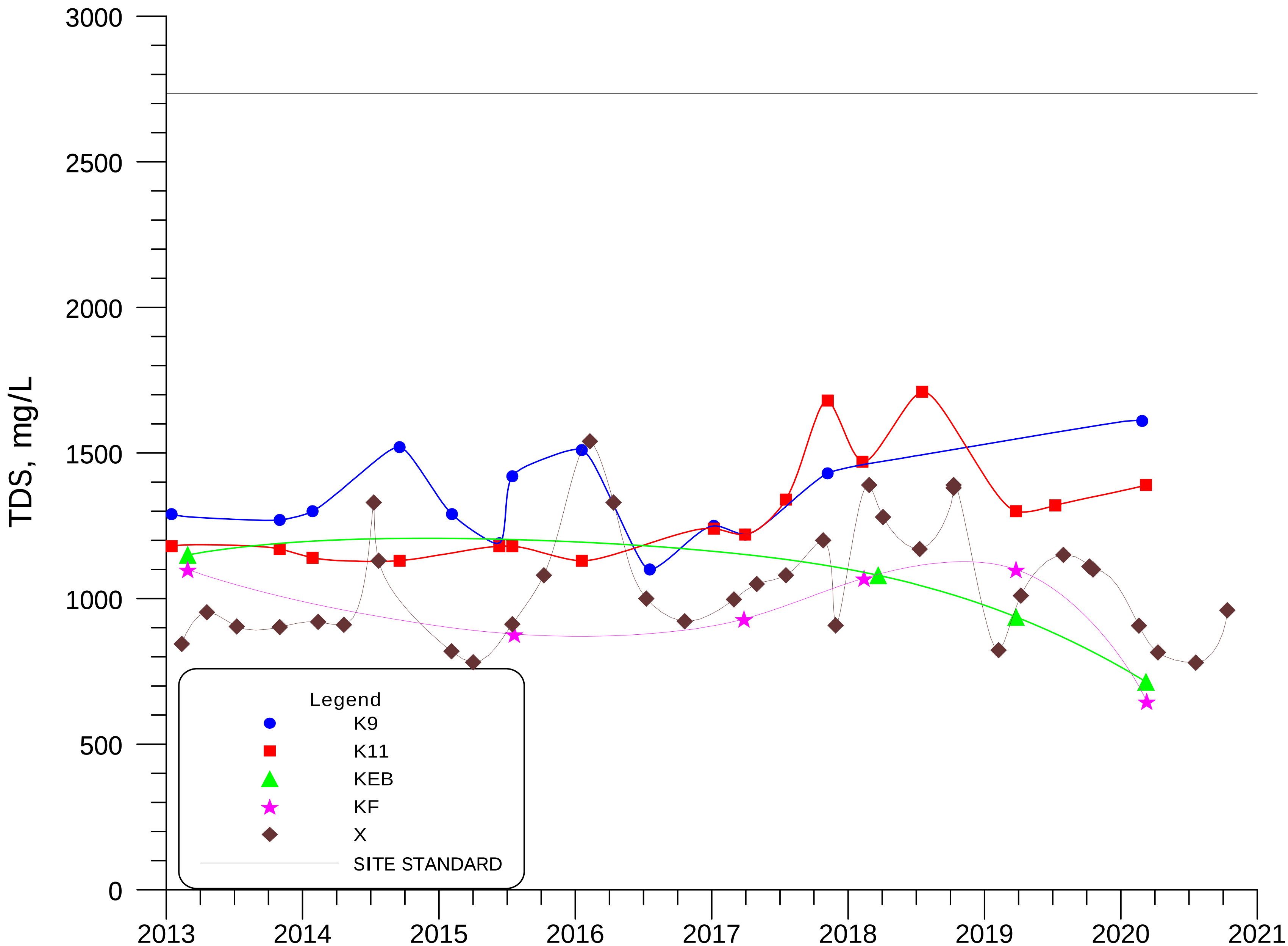


**FIGURE 4.3-26. TDS CONCENTRATIONS FOR WELLS K9, K11, KEB, KF AND X.**

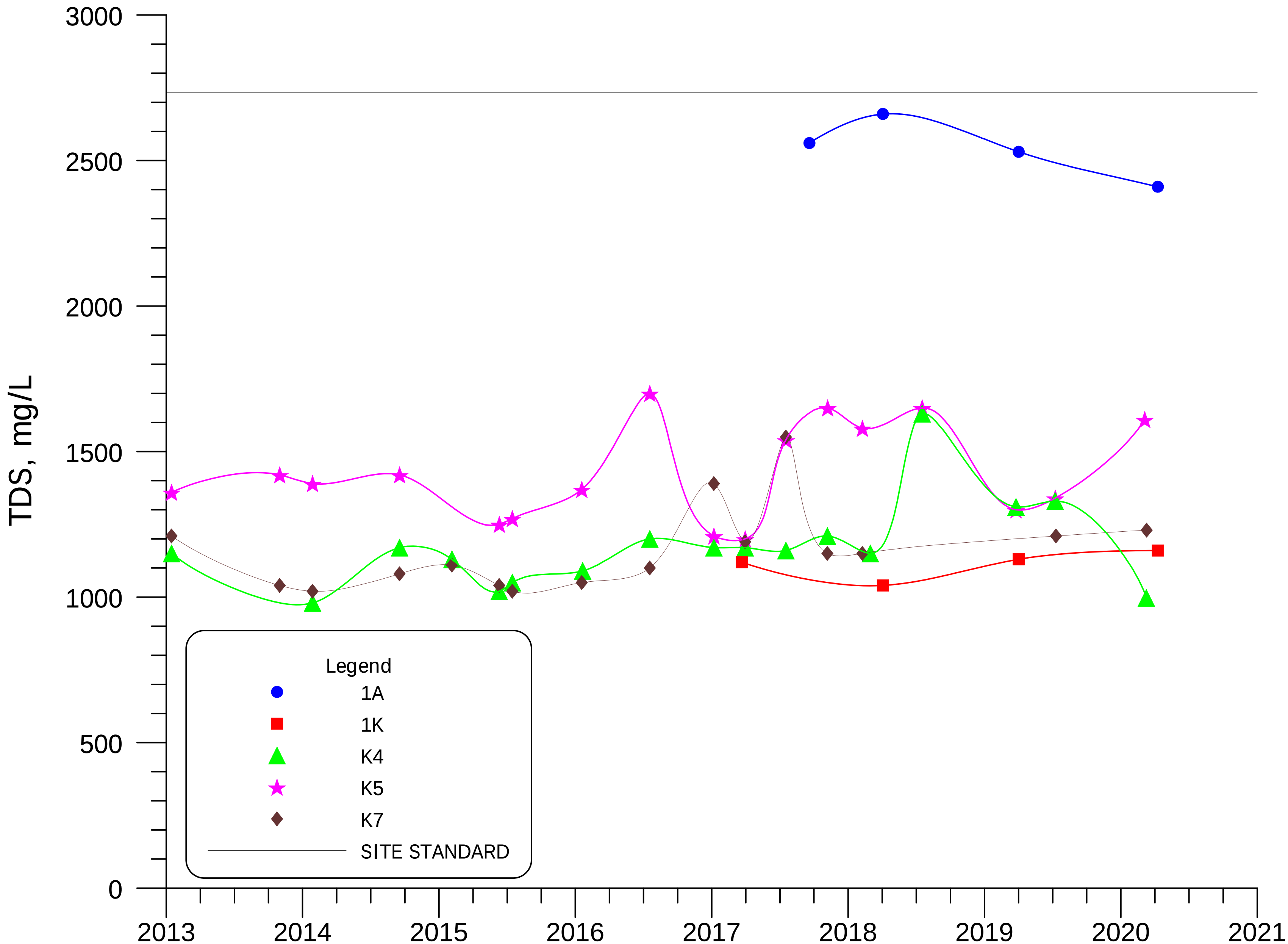


**FIGURE 4.3-27. TDS CONCENTRATIONS FOR WELLS 1A, 1K, K4, K5 AND K7.**

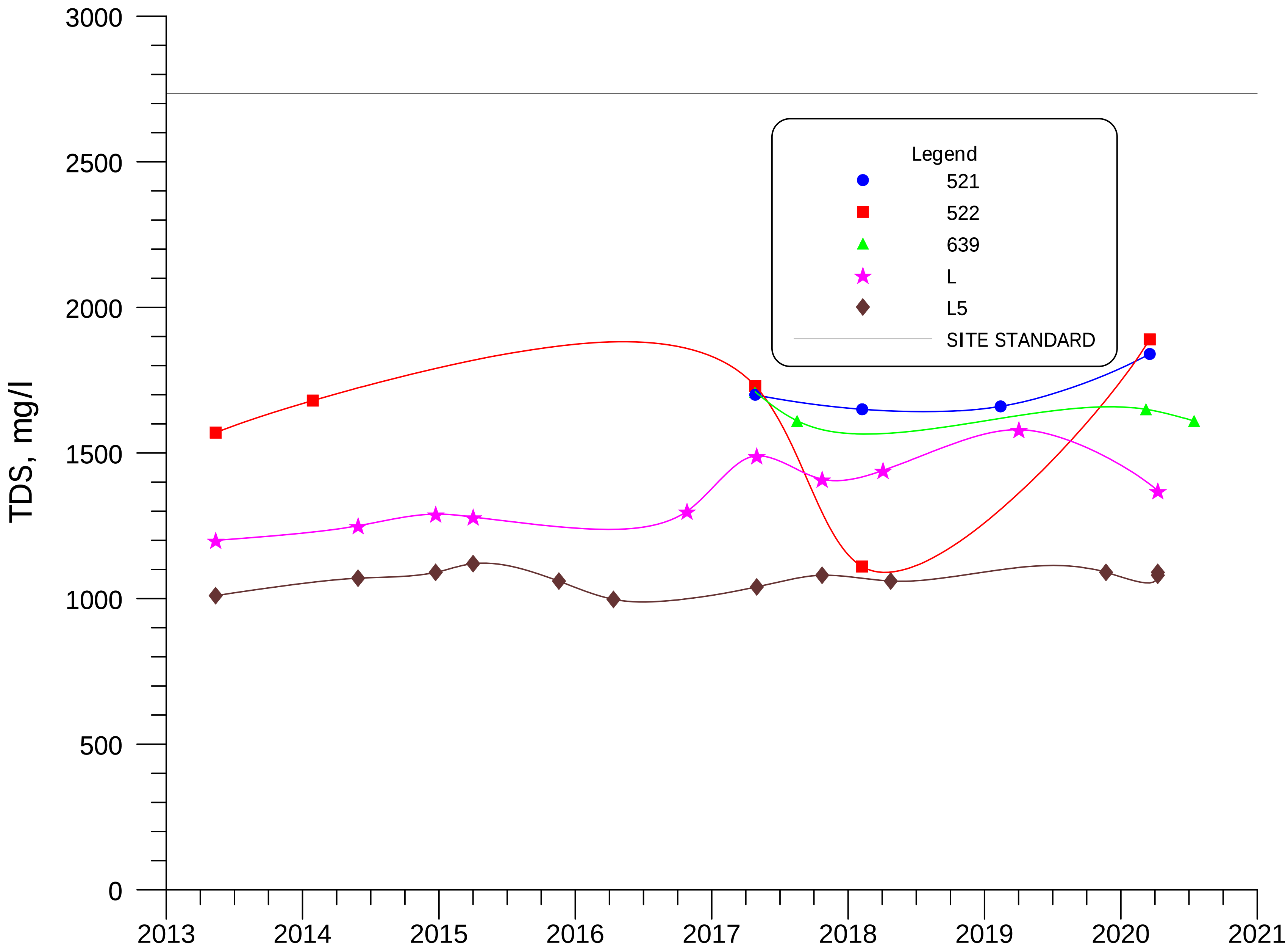


**FIGURE 4.3-28. TDS CONCENTRATIONS FOR WELLS 521, 522, 639, L AND L5.**

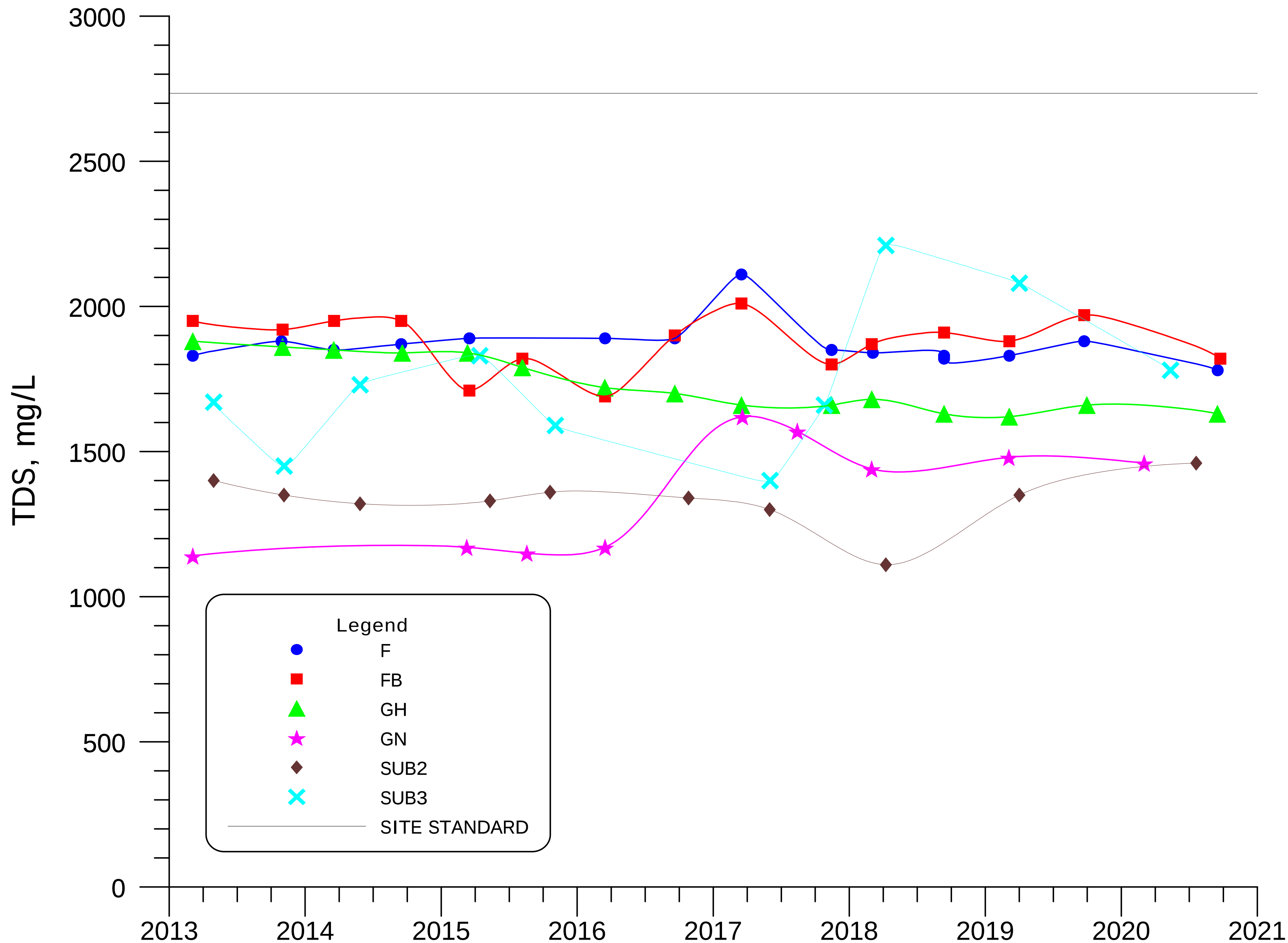


**FIGURE 4.3-29. TDS CONCENTRATIONS FOR WELLS F, FB, GH, GN, SUB2 AND SUB3.**

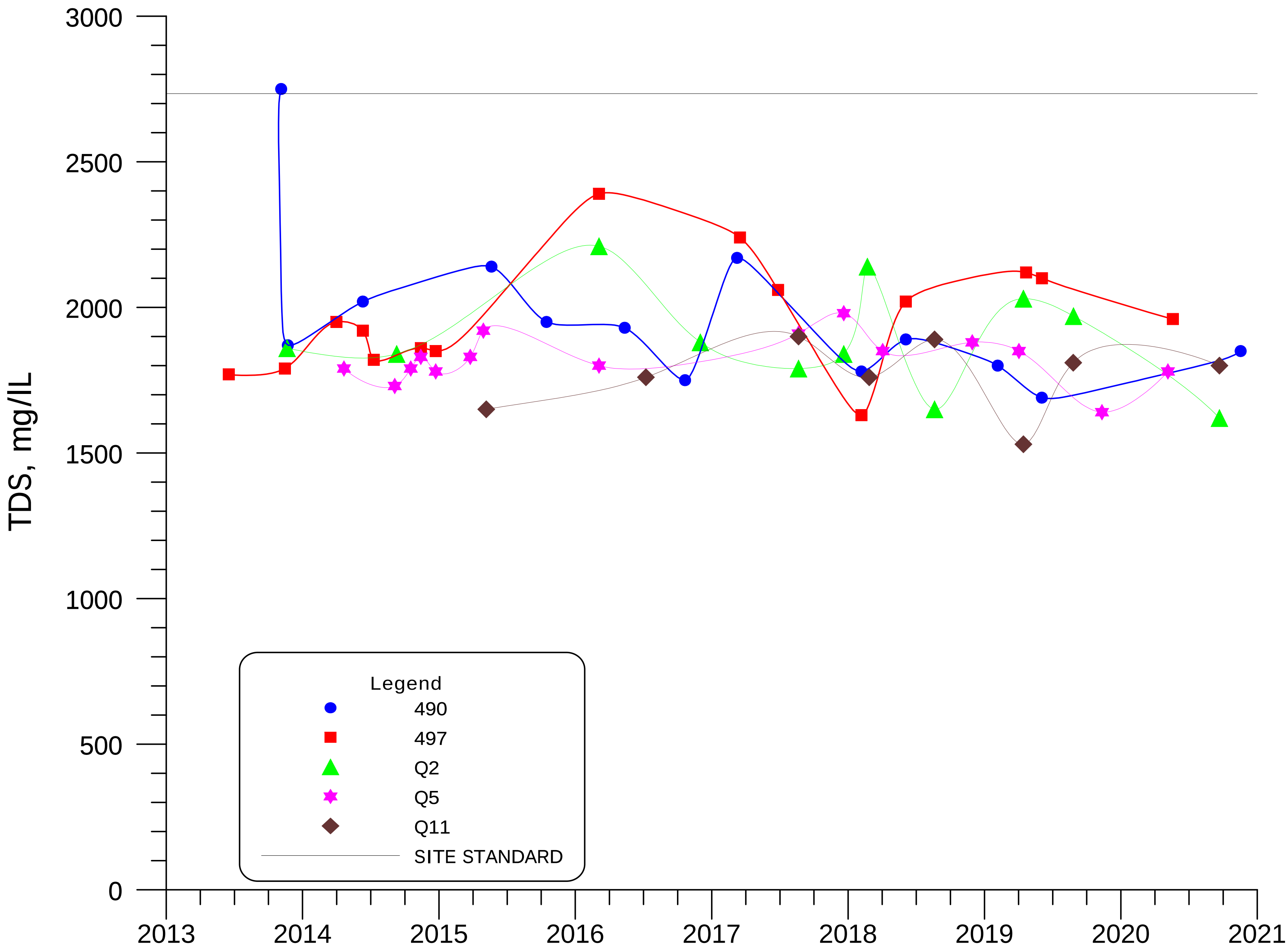


**FIGURE 4.3-30. TDS CONCENTRATIONS FOR WELLS 490, 497, Q2, Q5 AND Q11.**

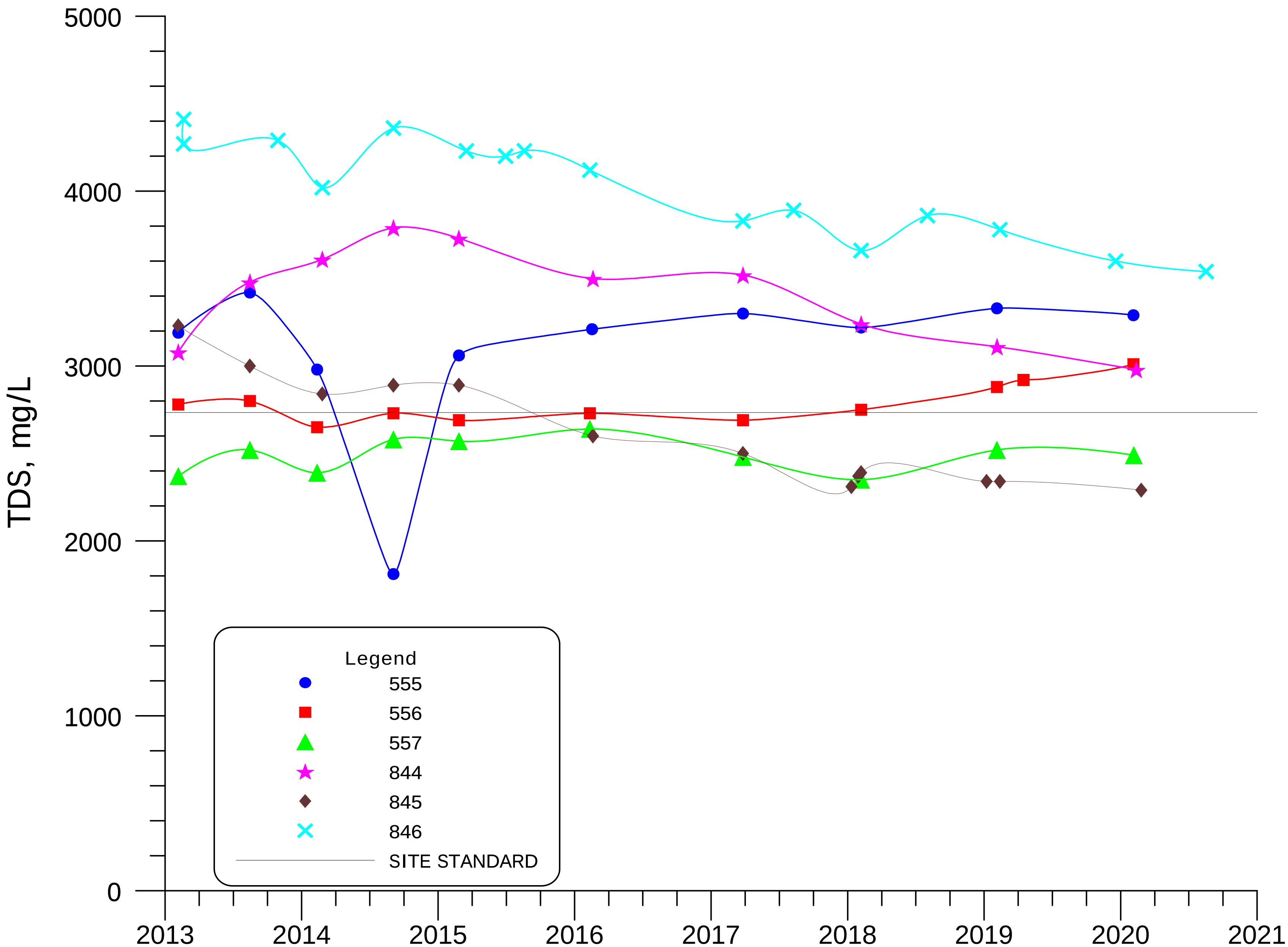


**FIGURE 4.3-31. TDS CONCENTRATIONS FOR WELLS 555, 556, 557, 844, 845 AND 846.**

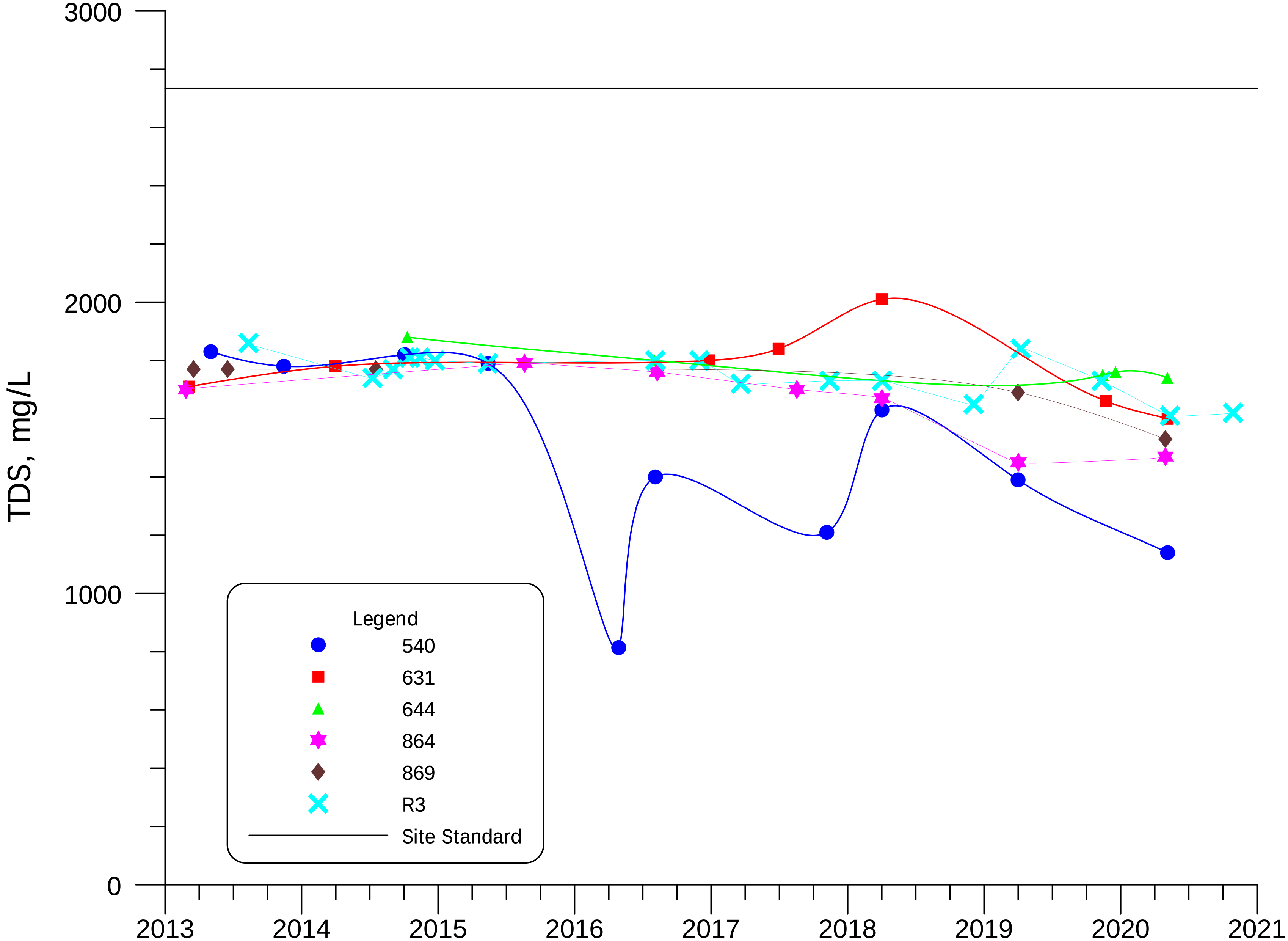


**FIGURE 4.3-32. TDS CONCENTRATIONS FOR WELLS 540, 631, 644, 864, 869 AND R3.**

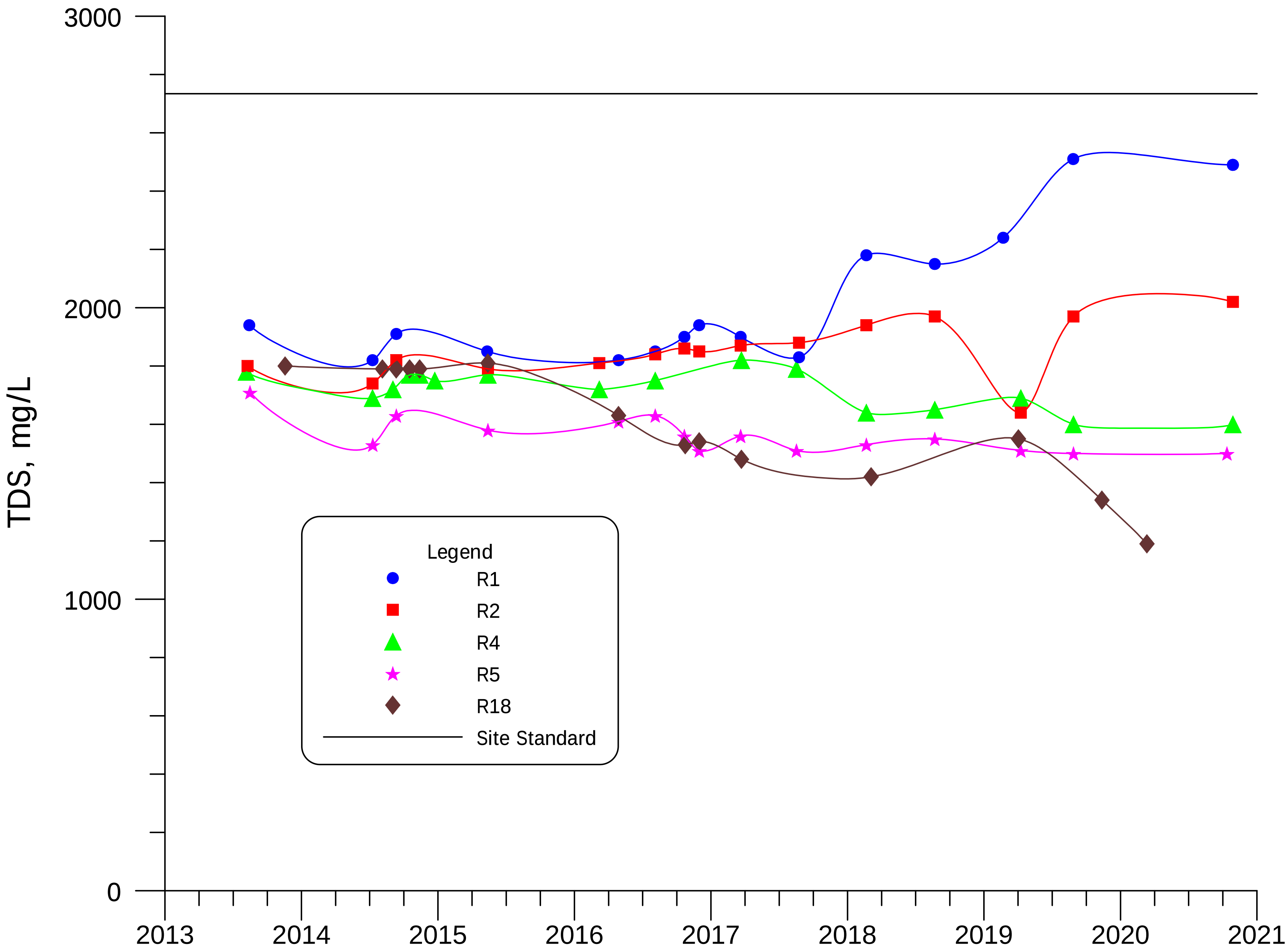


**FIGURE 4.3-32A. TDS CONCENTRATIONS FOR WELLS R1, R2, R4, R5 AND R18.**

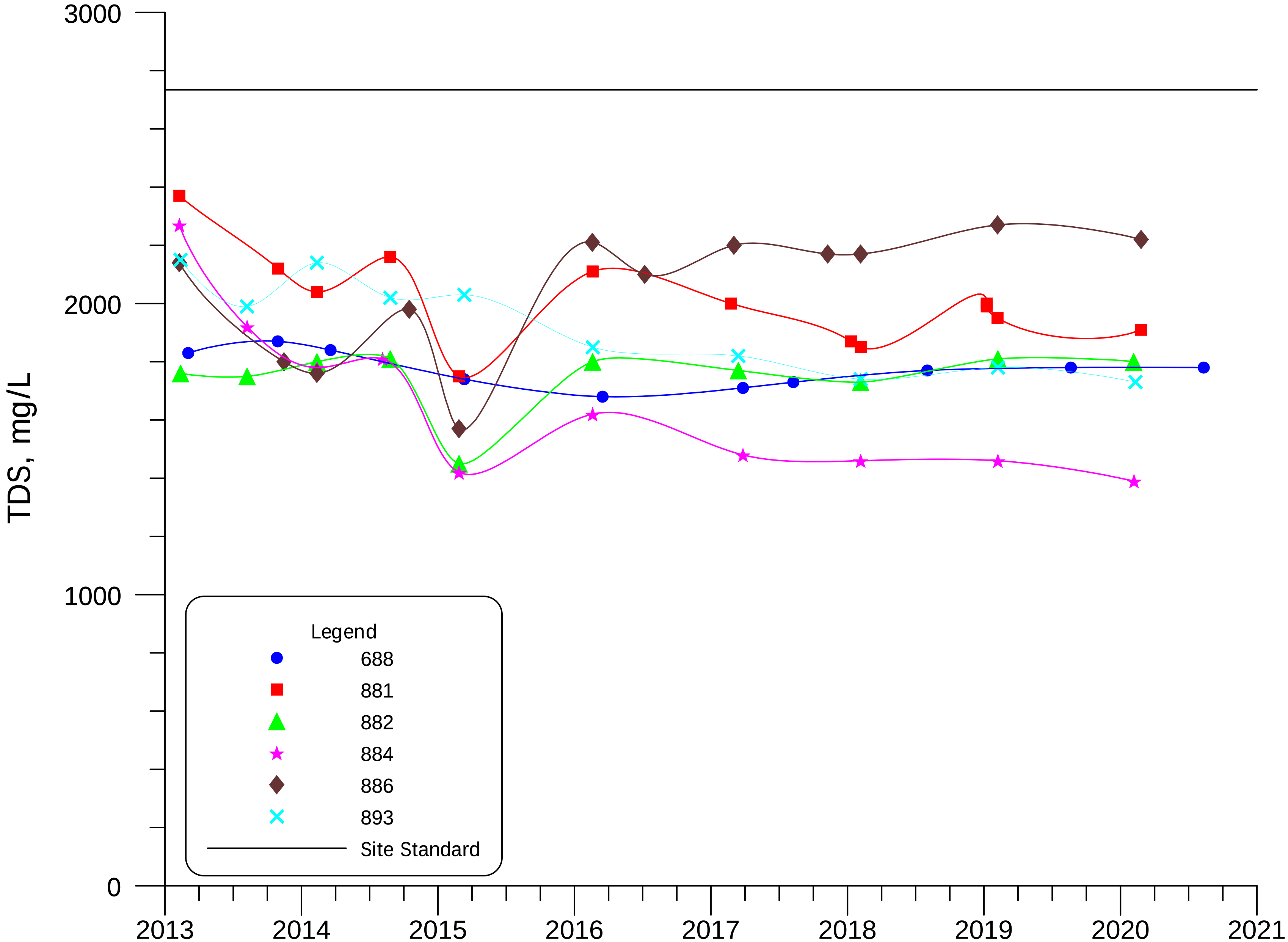


**FIGURE 4.3-33. TDS CONCENTRATIONS FOR WELLS 688, 881, 882, 884, 886 AND 893.**

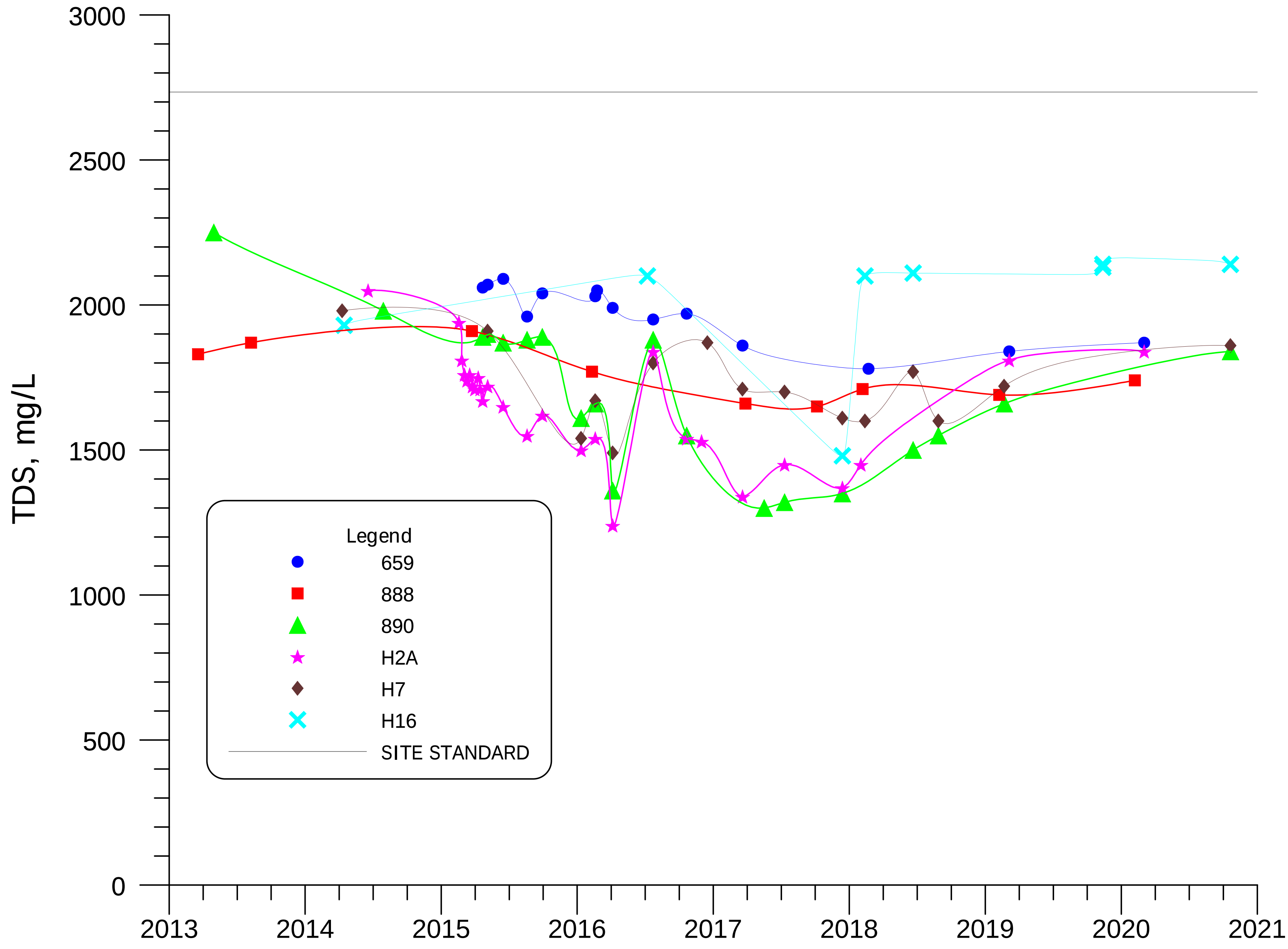


**FIGURE 4.3-33A. TDS CONCENTRATIONS FOR WELLS 659, 888, 890, H2A, H7 AND H16.**

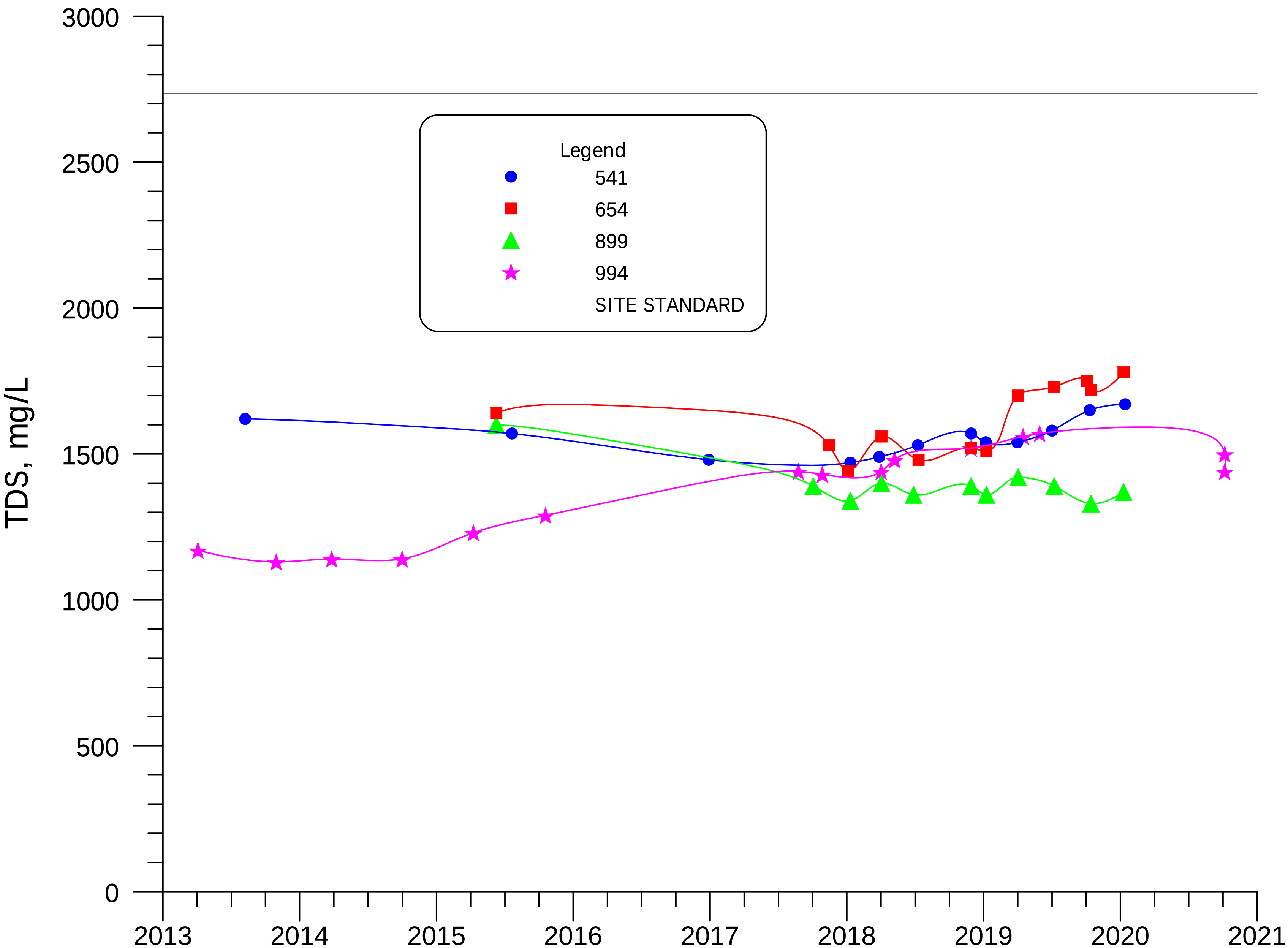


**FIGURE 4.3-34. TDS CONCENTRATIONS FOR WELLS 541, 654, 899 and 994.**

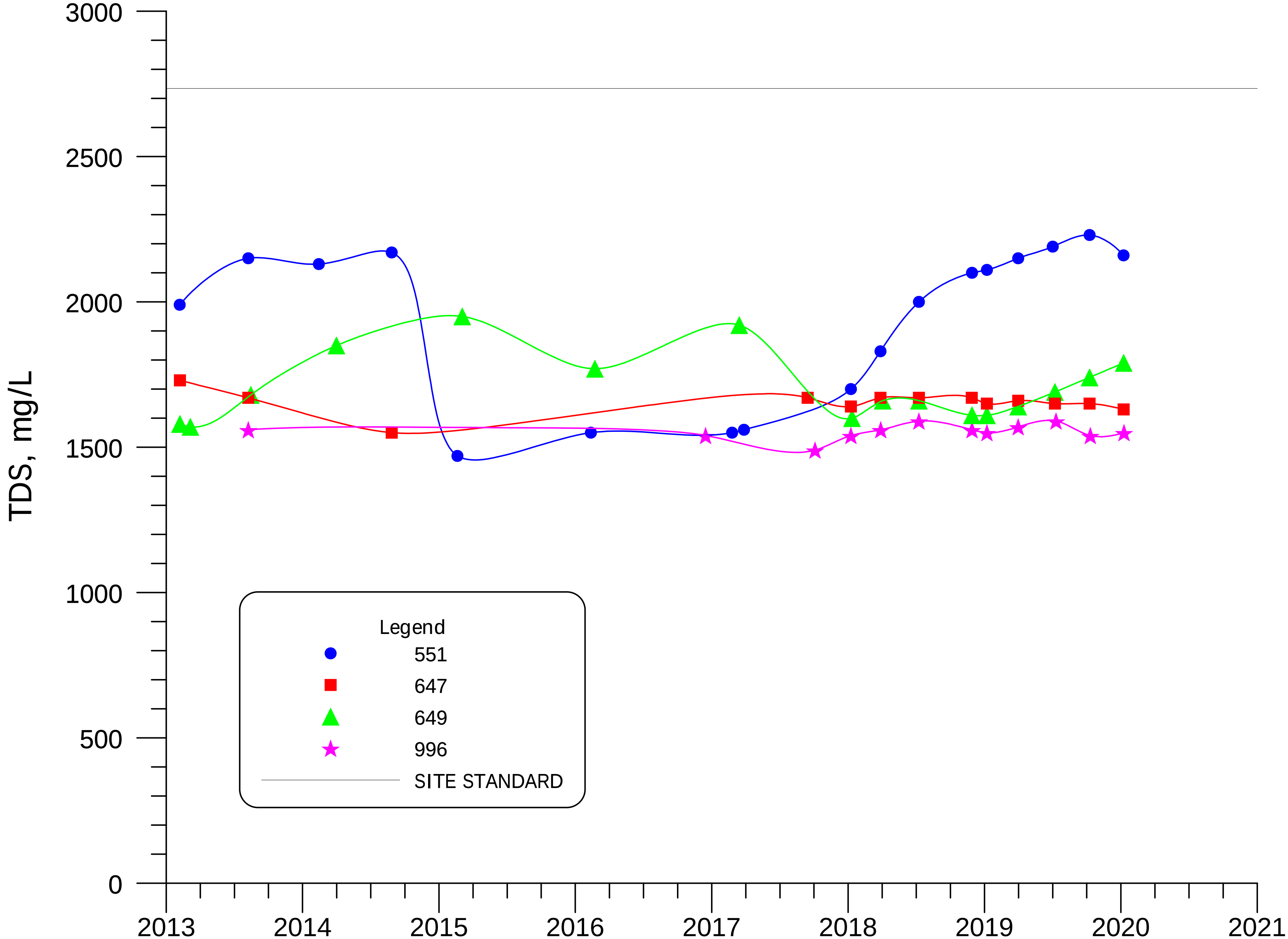


**FIGURE 4.3-35. TDS CONCENTRATIONS FOR WELLS 551, 647, 649 AND 996.**

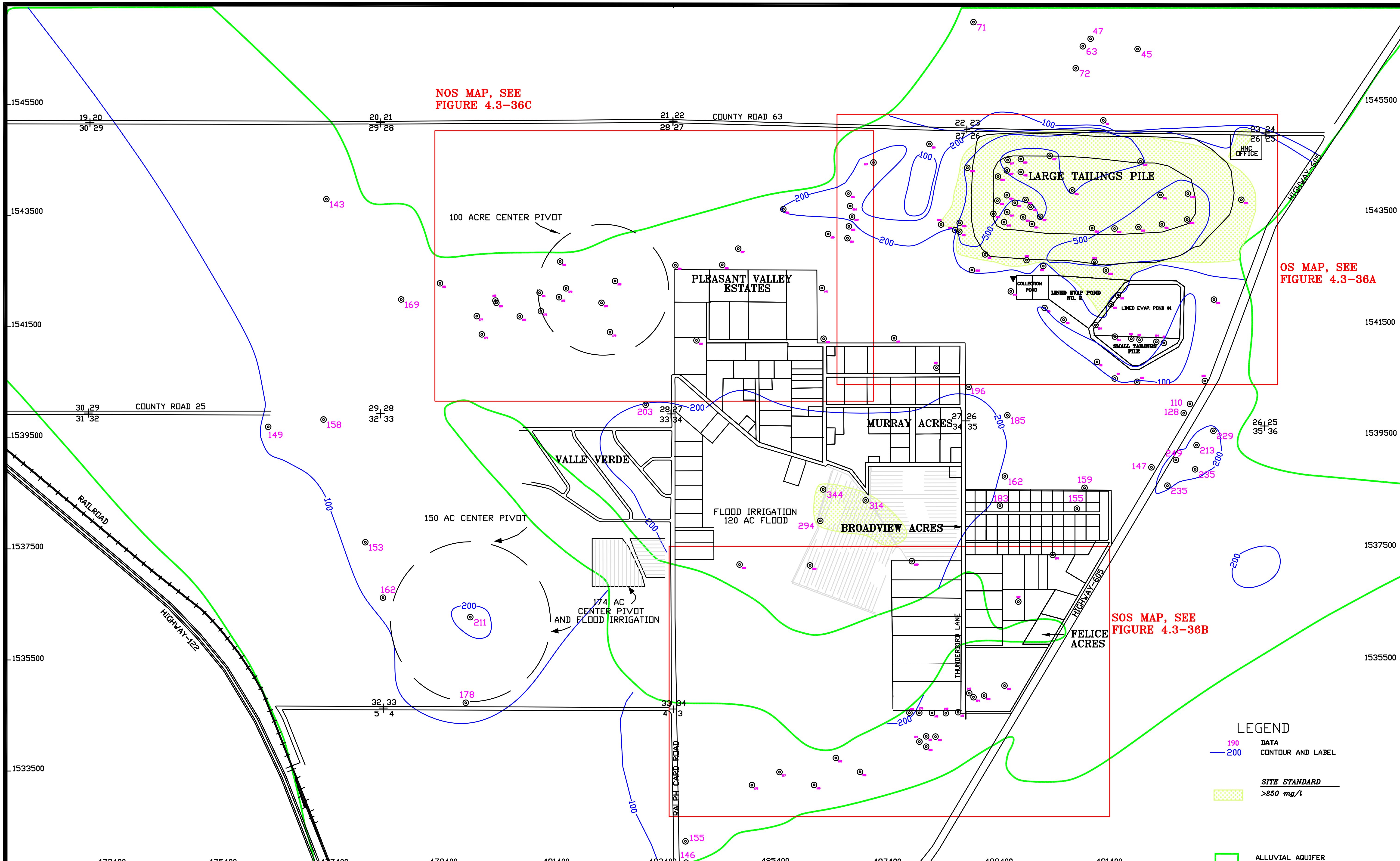


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FIGURE 4.3-36. CHLORIDE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, mg/L

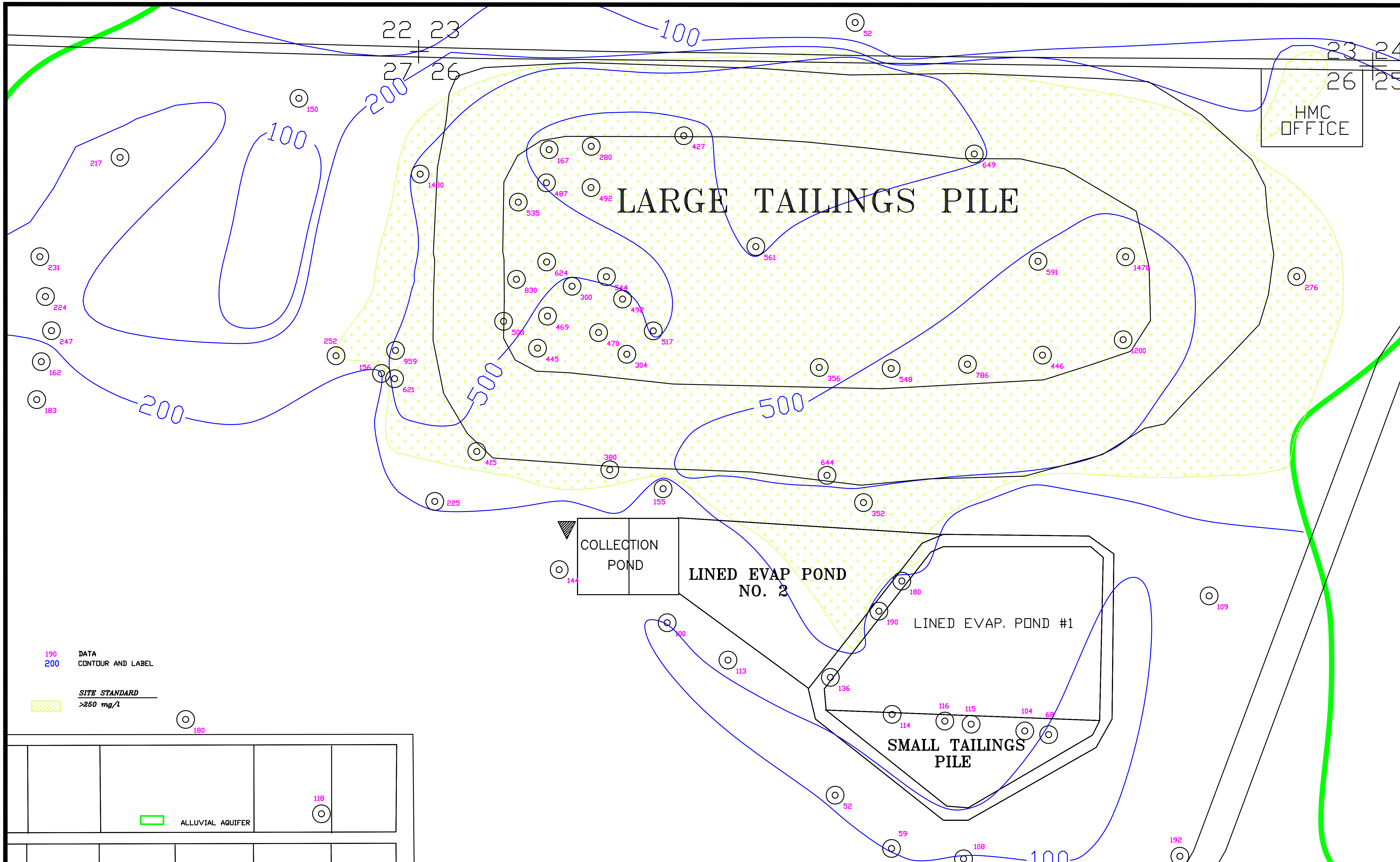


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FIGURE 4.3-36A. CHLORIDE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, mg/L

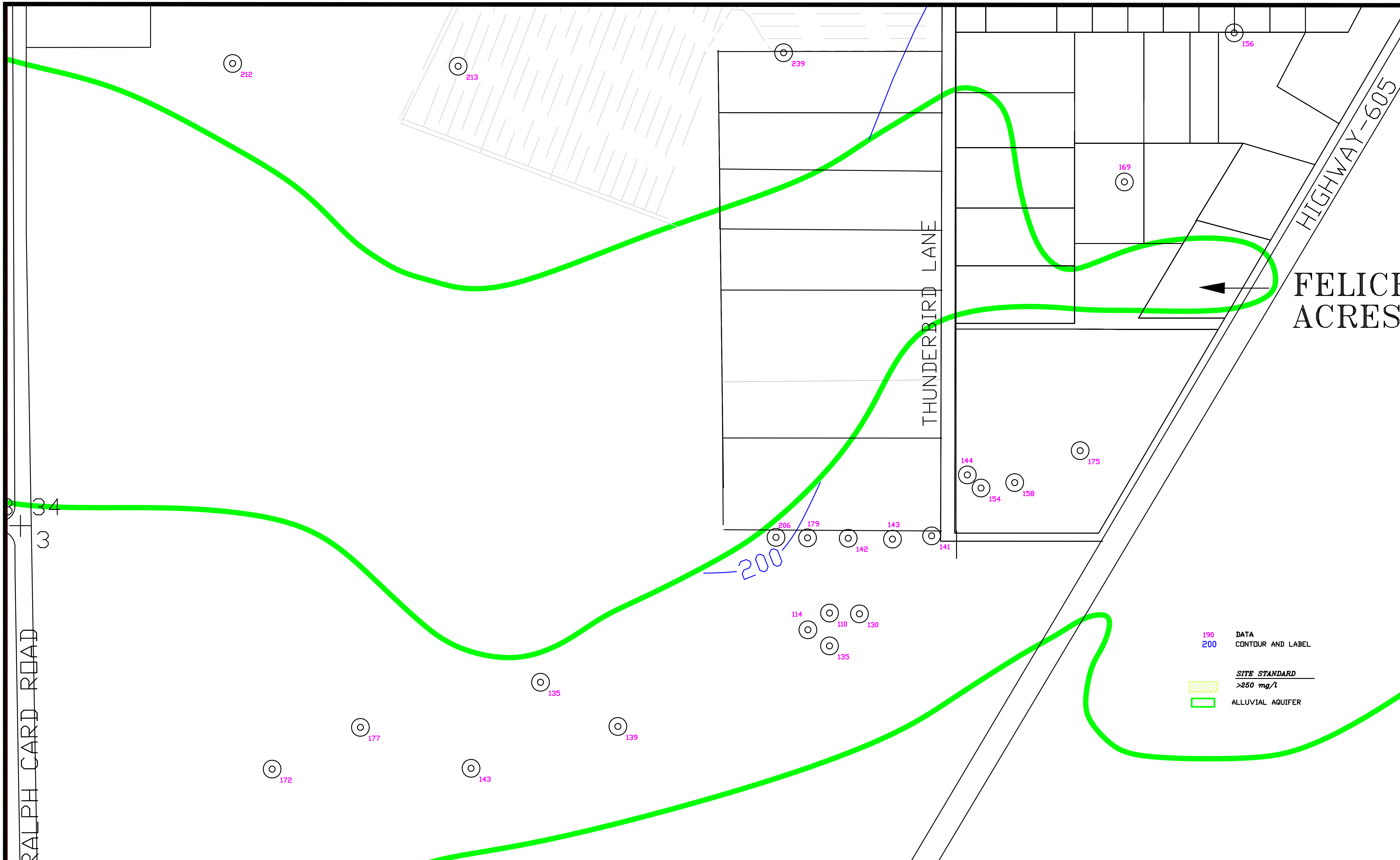


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FIGURE 4.3-36B. CHLORIDE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, mg/L

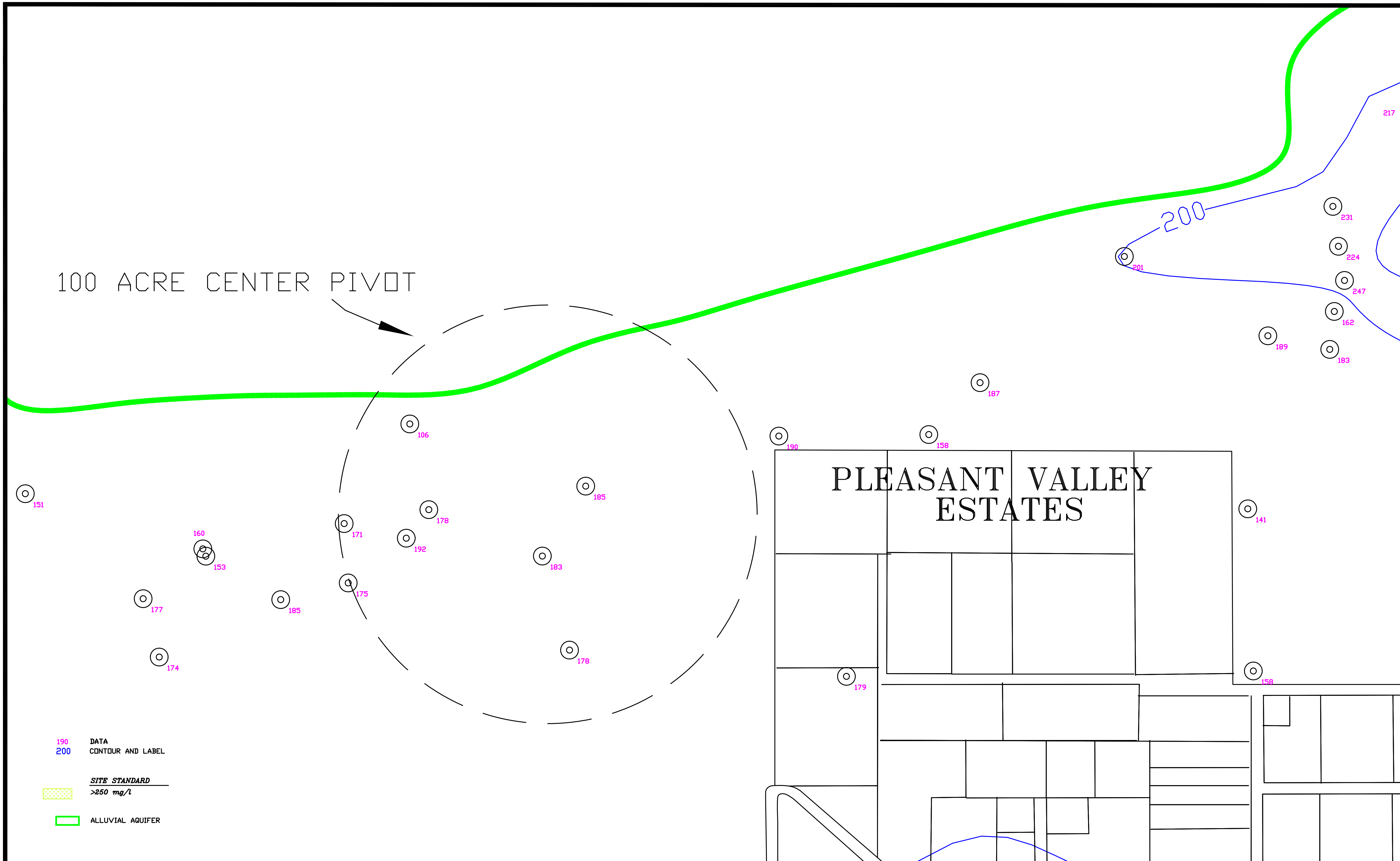


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FIGURE 4.3-36C. CHLORIDE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, mg/L

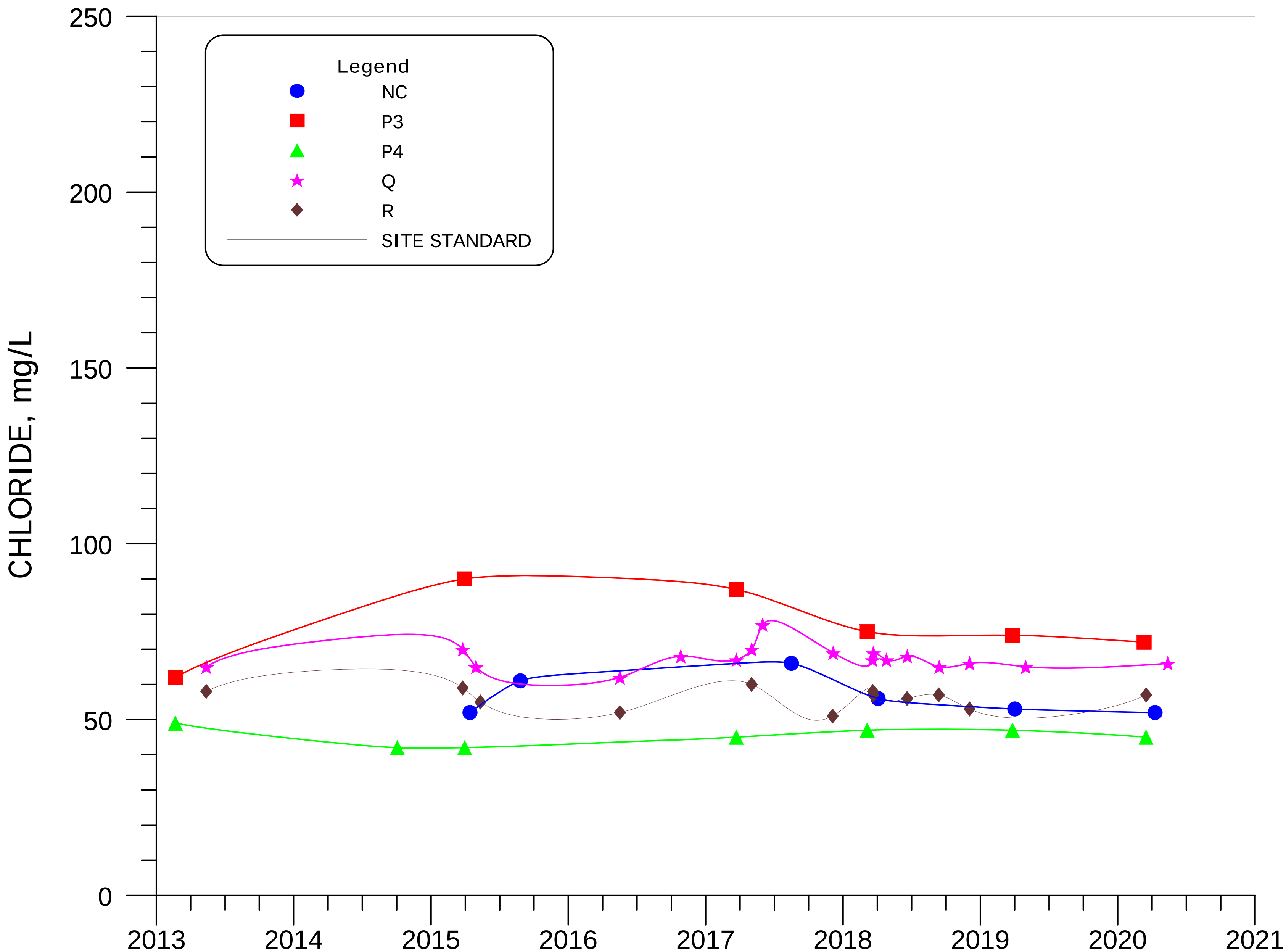


**FIGURE 4.3-37. CHLORIDE CONCENTRATIONS FOR WELLS NC, P3, P4, Q AND R.**

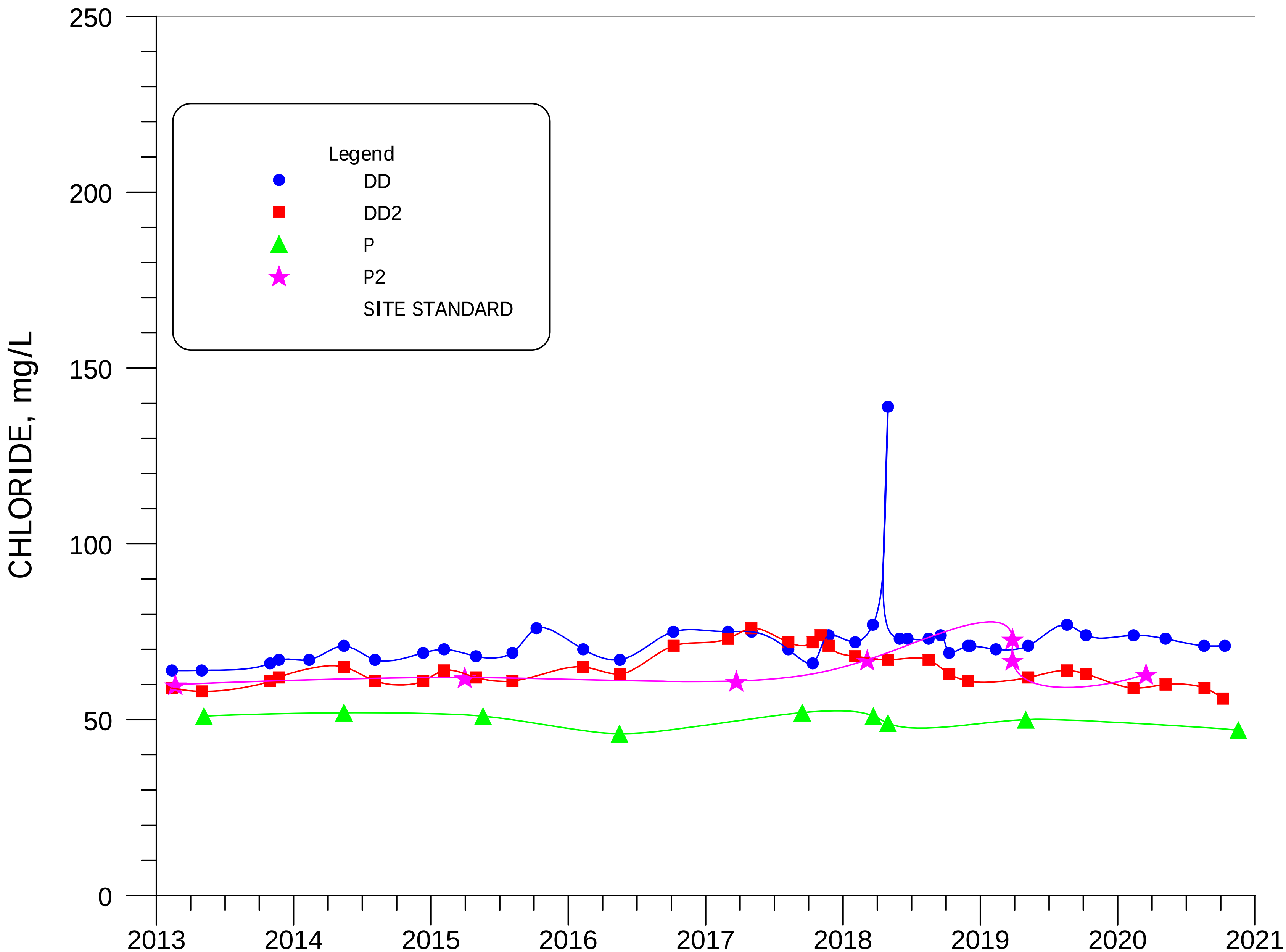


**FIGURE 4.3-37A. CHLORIDE CONCENTRATIONS FOR WELLS DD, DD2, P AND P2.**

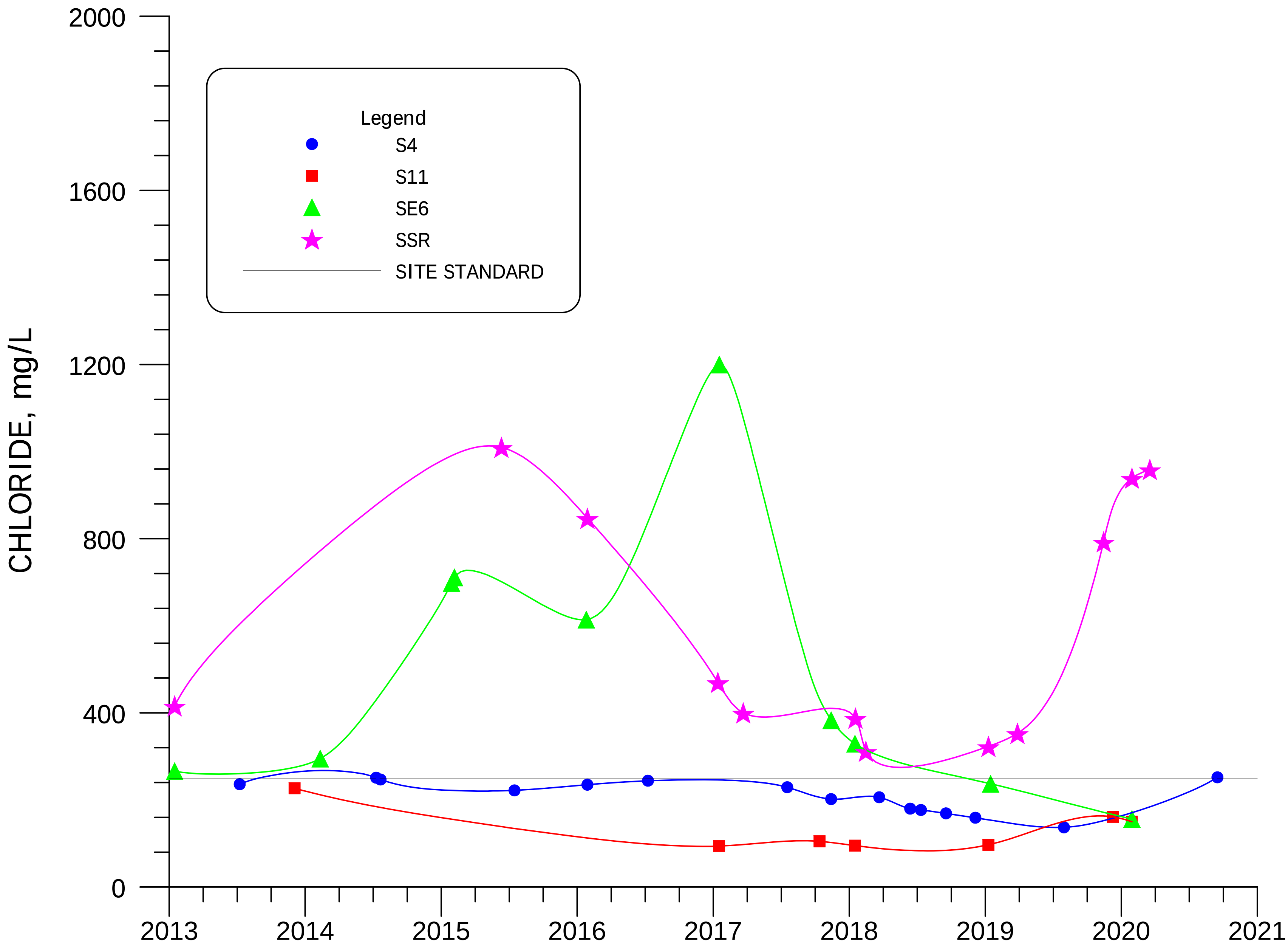


**FIGURE 4.3-38. CHLORIDE CONCENTRATIONS FOR WELLS S4, S11, SE6 AND SSR.**

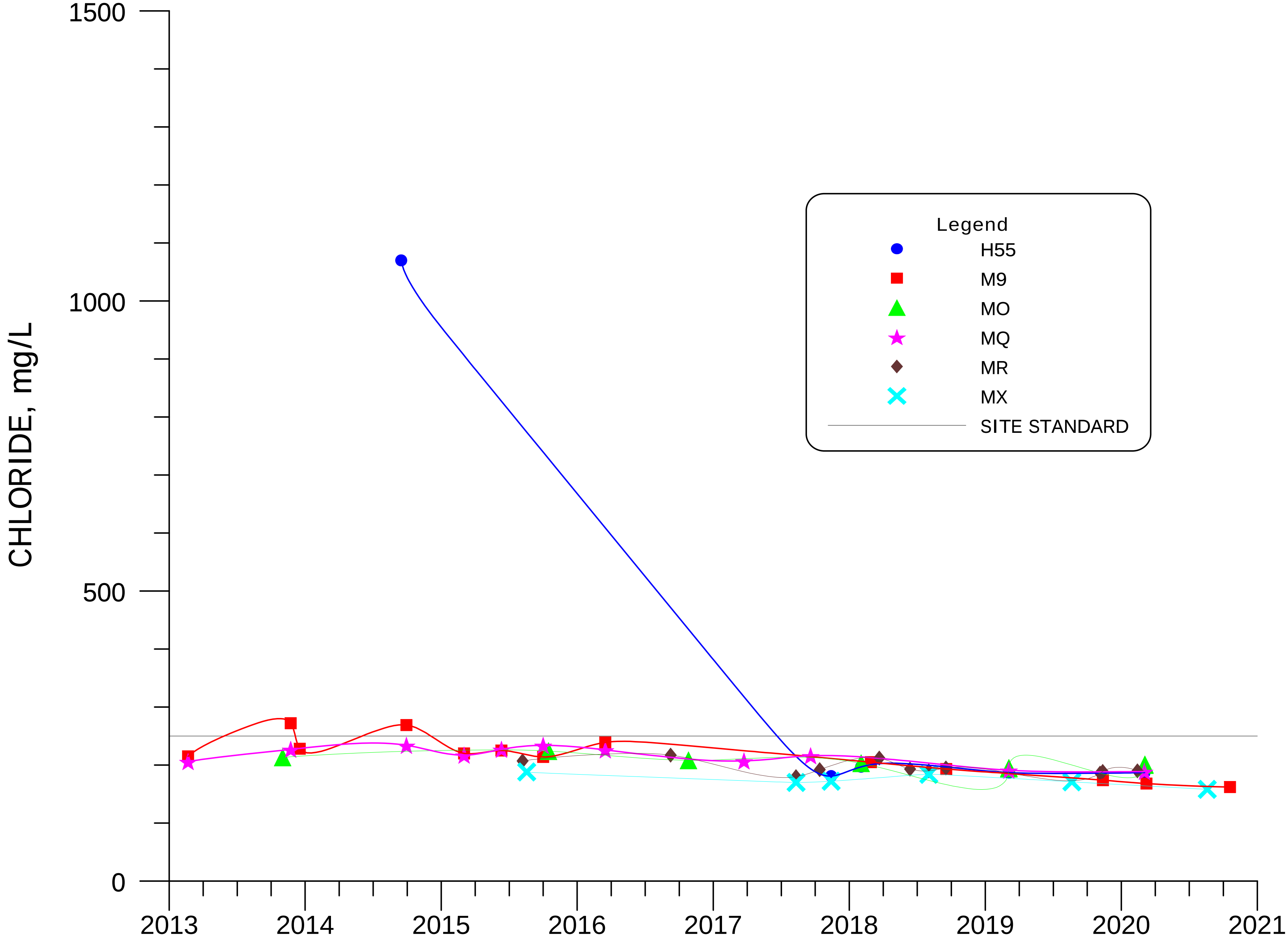


**FIGURE 4.3-39. CHLORIDE CONCENTRATIONS FOR WELLS H55, M9, MO, MQ, MR AND MX.**

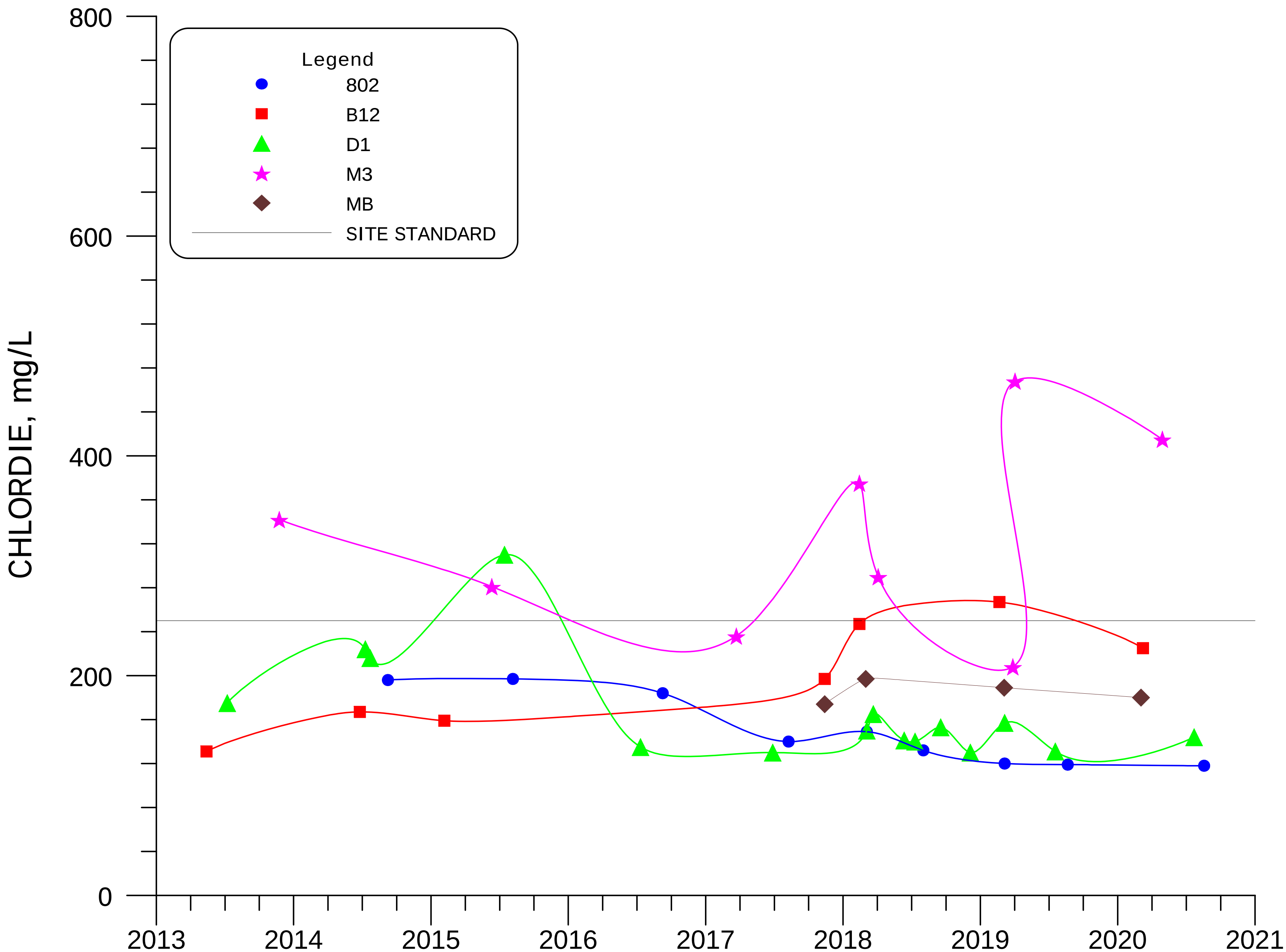


**FIGURE 4.3-40. CHLORIDE CONCENTRATIONS FOR WELLS 802, B12, D1, M3 AND MB.**

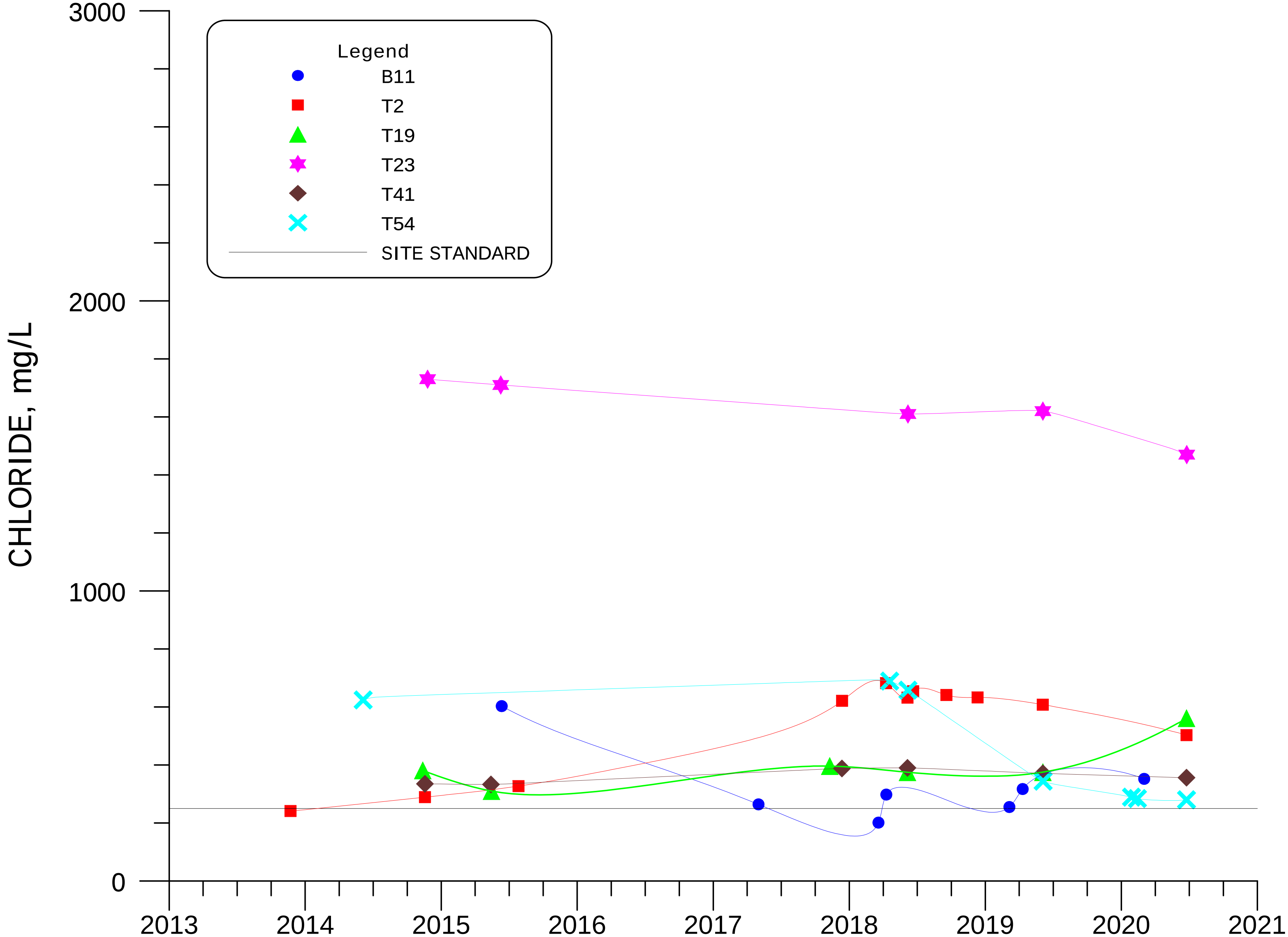


**FIGURE 4.3-41. CHLORIDE CONCENTRATIONS FOR WELLS B11, T2, T19, T23, T41 AND T54.**

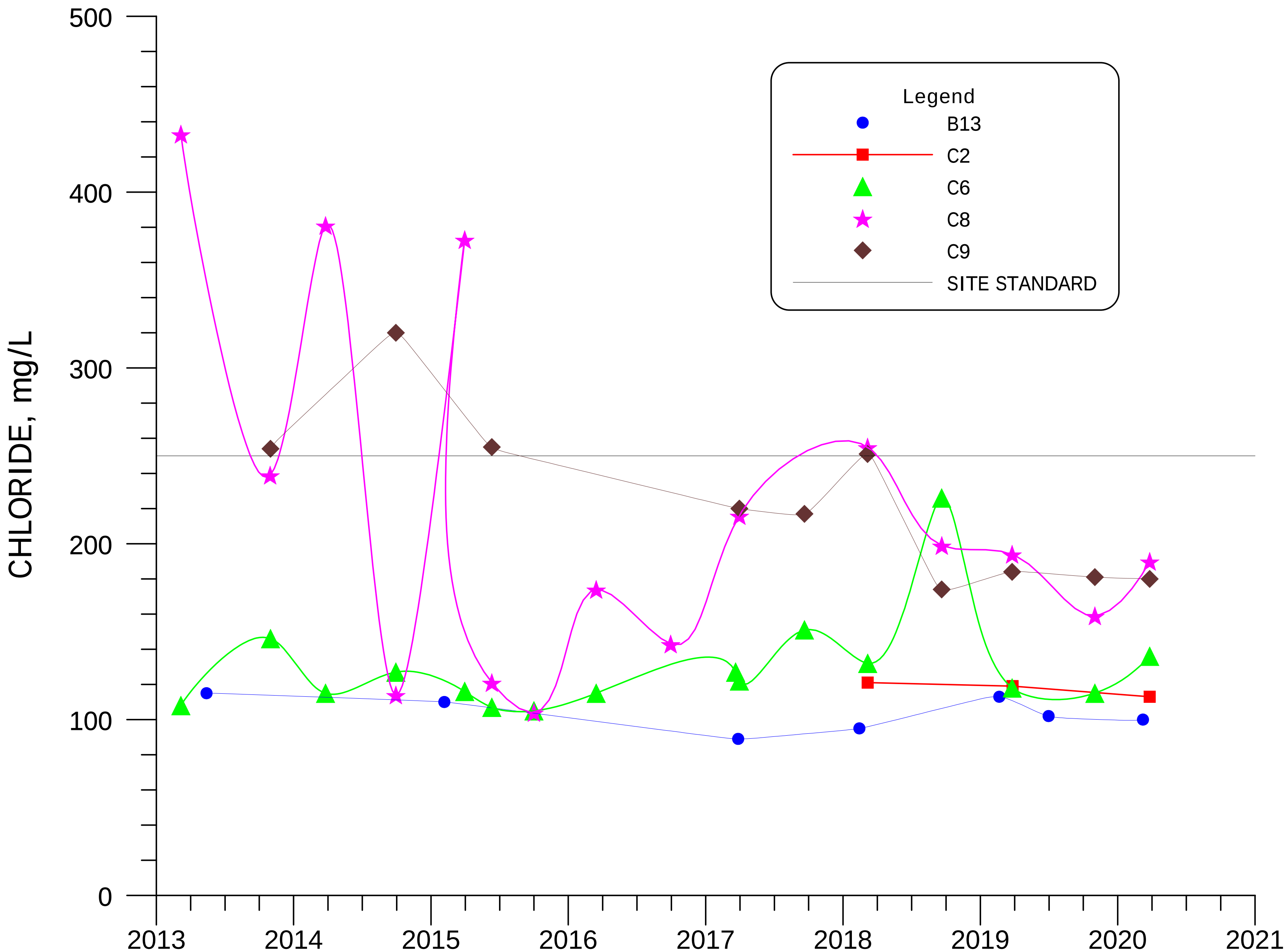


**FIGURE 4.3-42. CHLORIDE CONCENTRATIONS FOR WELLS B13, C2, C6, C8 AND C9.**

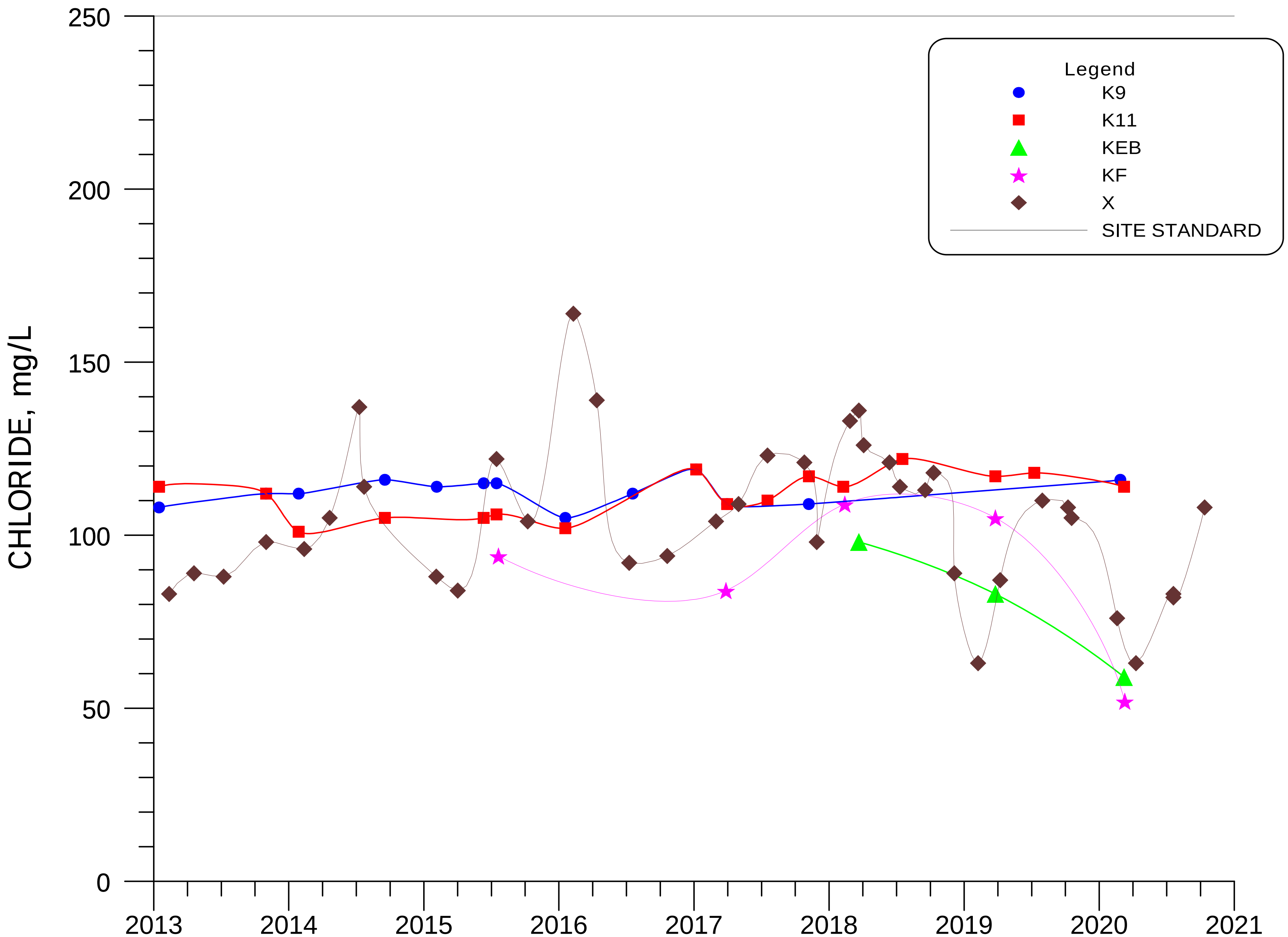


**FIGURE 4.3-43. CHLORIDE CONCENTRATIONS FOR WELLS K9, K11, KEB, KF AND X.**

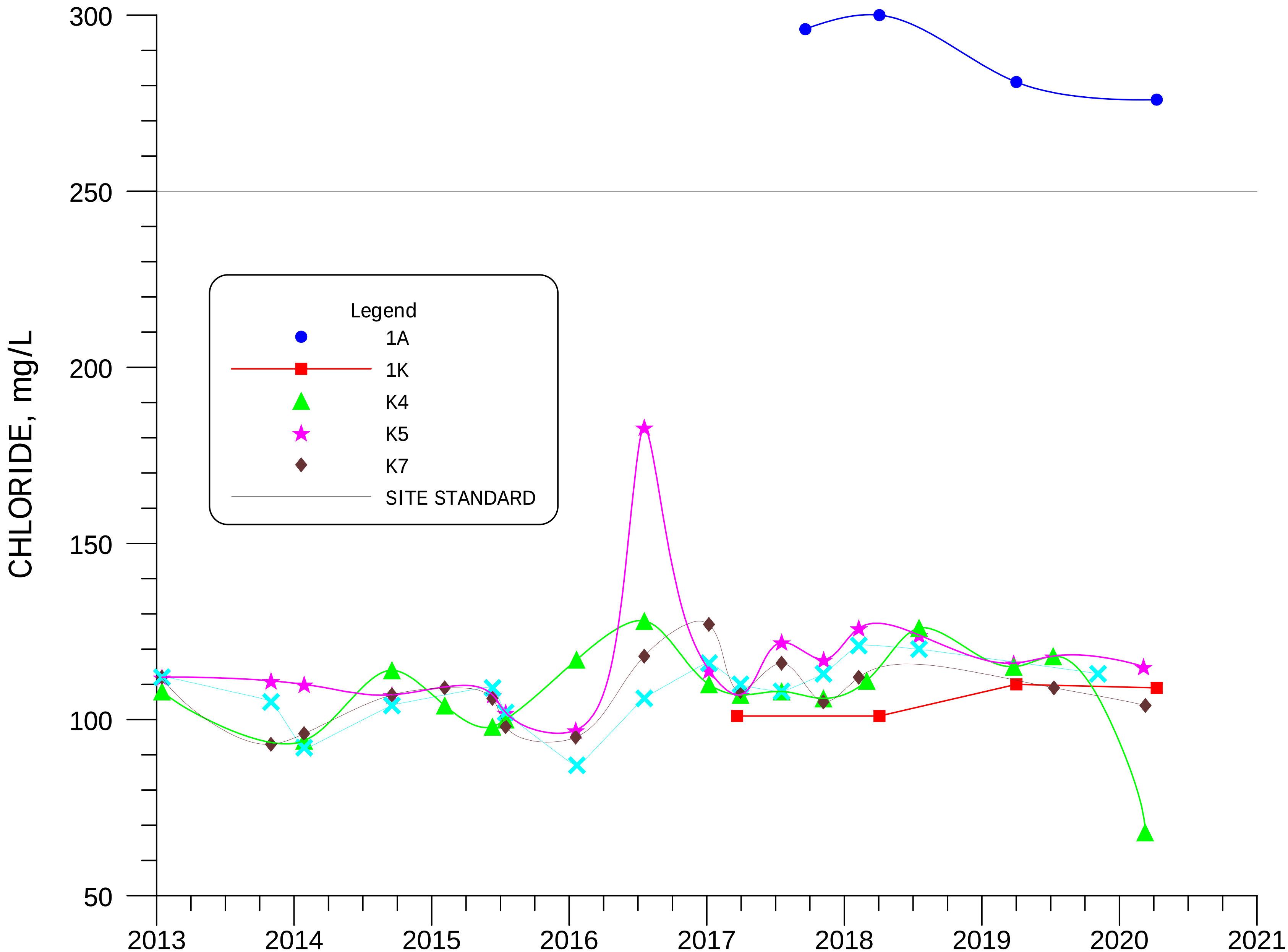


**FIGURE 4.3-44. CHLORIDE CONCENTRATIONS FOR WELLS 1A, 1K, K4, K5 AND K7.**

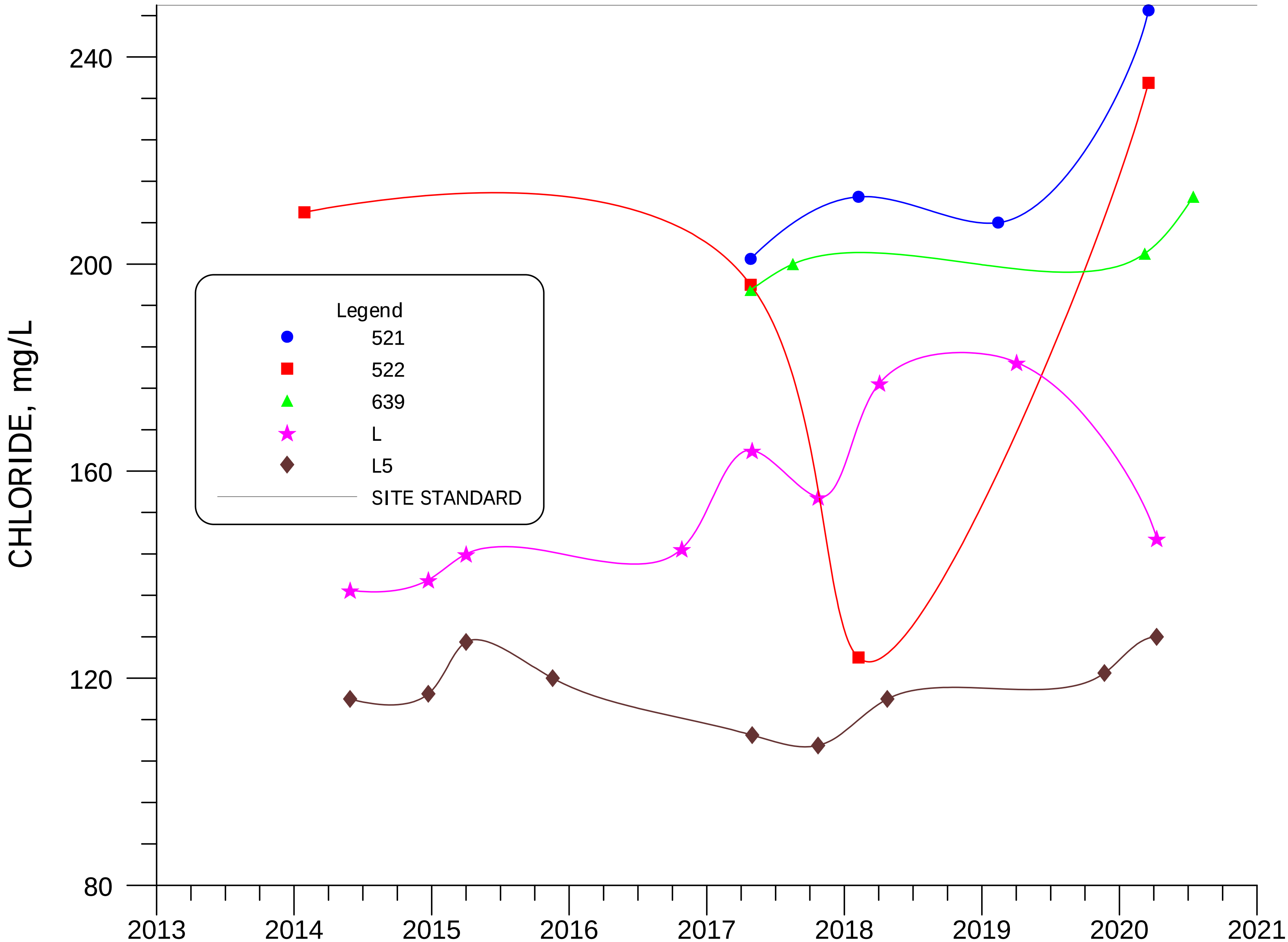


**FIGURE 4.3-45. CHLORIDE CONCENTRATIONS FOR WELLS 521, 522, 639, L AND L5.**

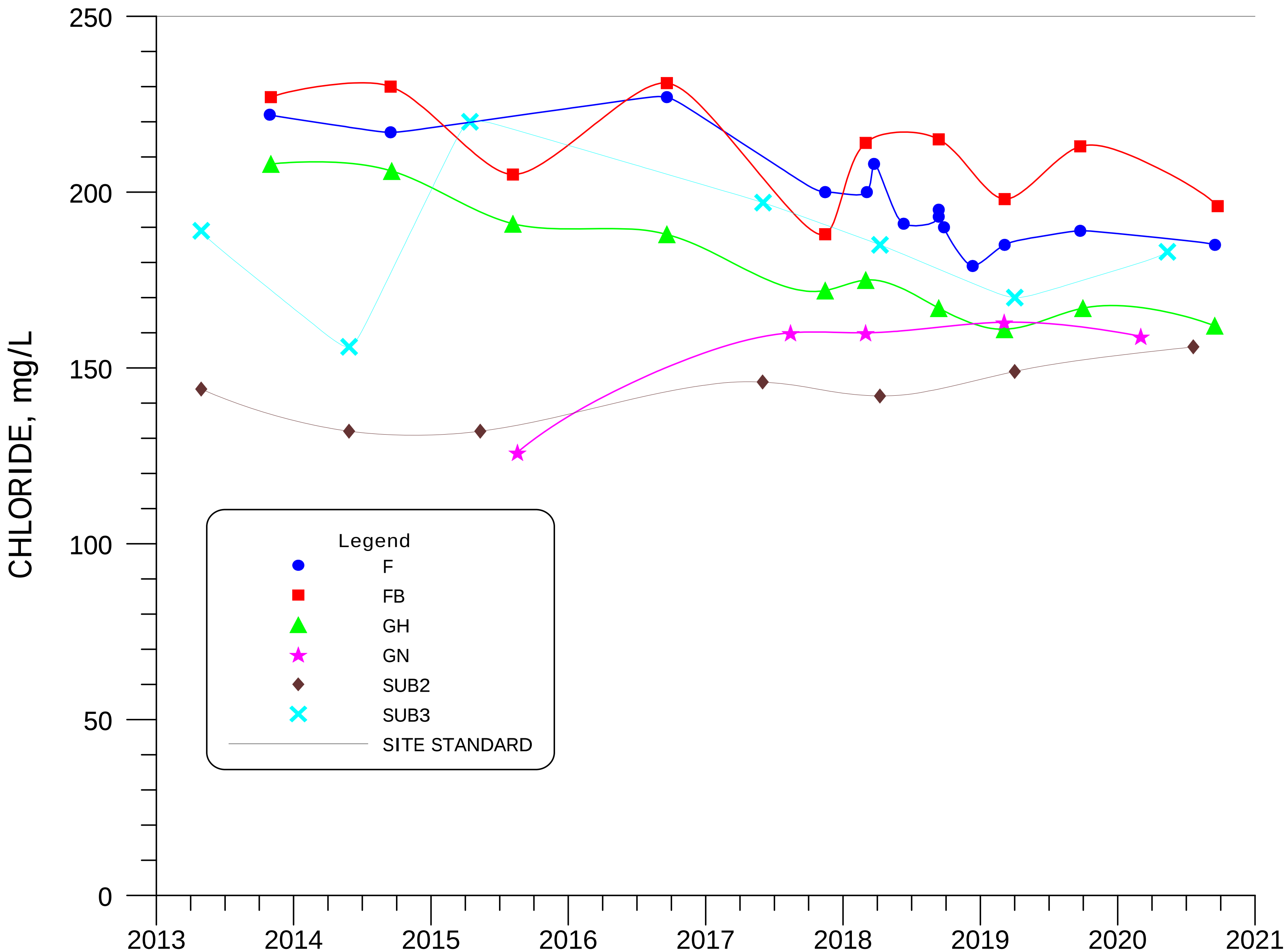


**FIGURE 4.3-46. CHLORIDE CONCENTRATIONS FOR WELLS F, FB, GH, GN, SUB2 AND SUB3.**

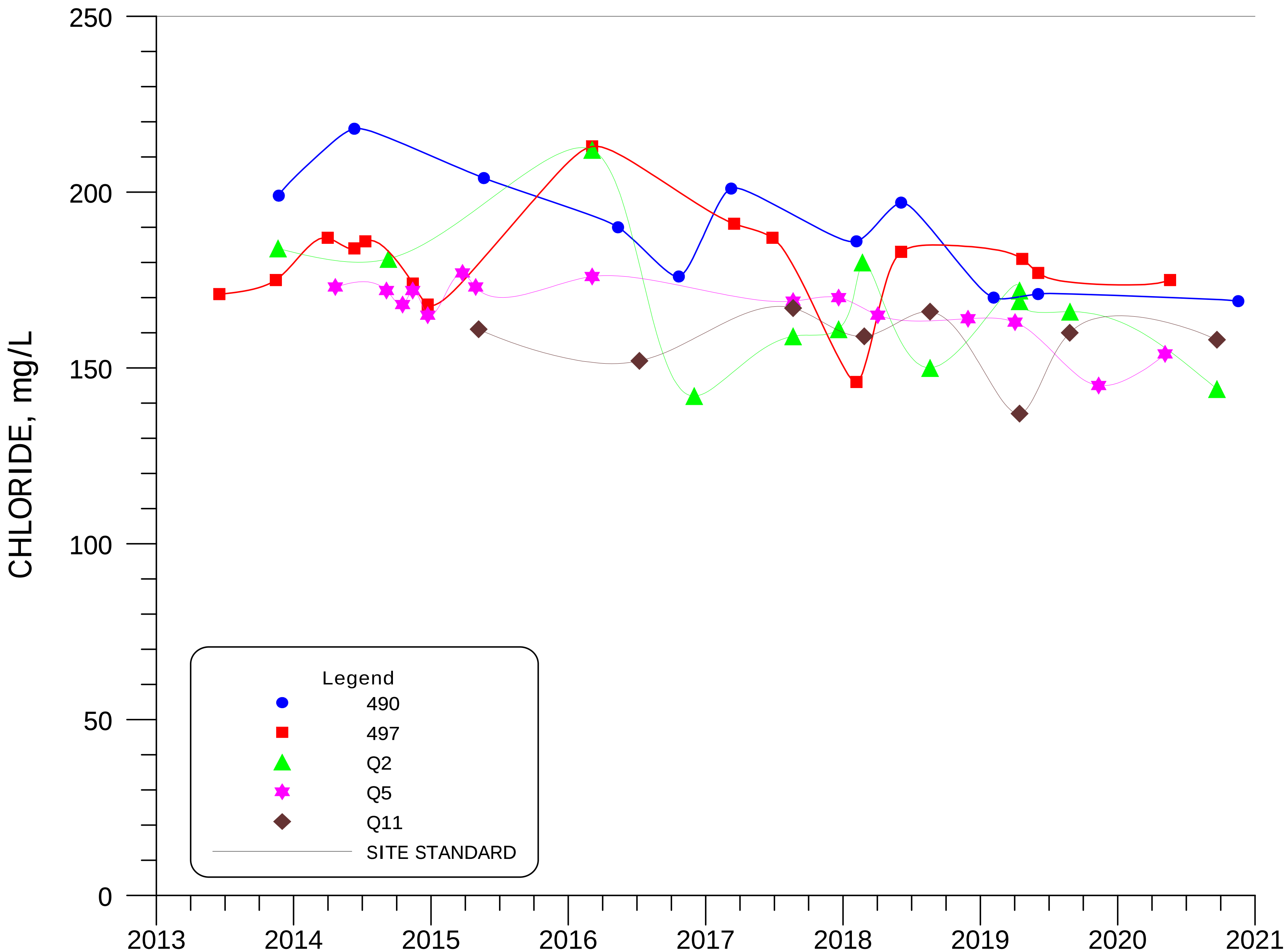


**FIGURE 4.3-47. CHLORIDE CONCENTRATIONS FOR WELLS 490, 497, Q2, Q5 AND Q11.**

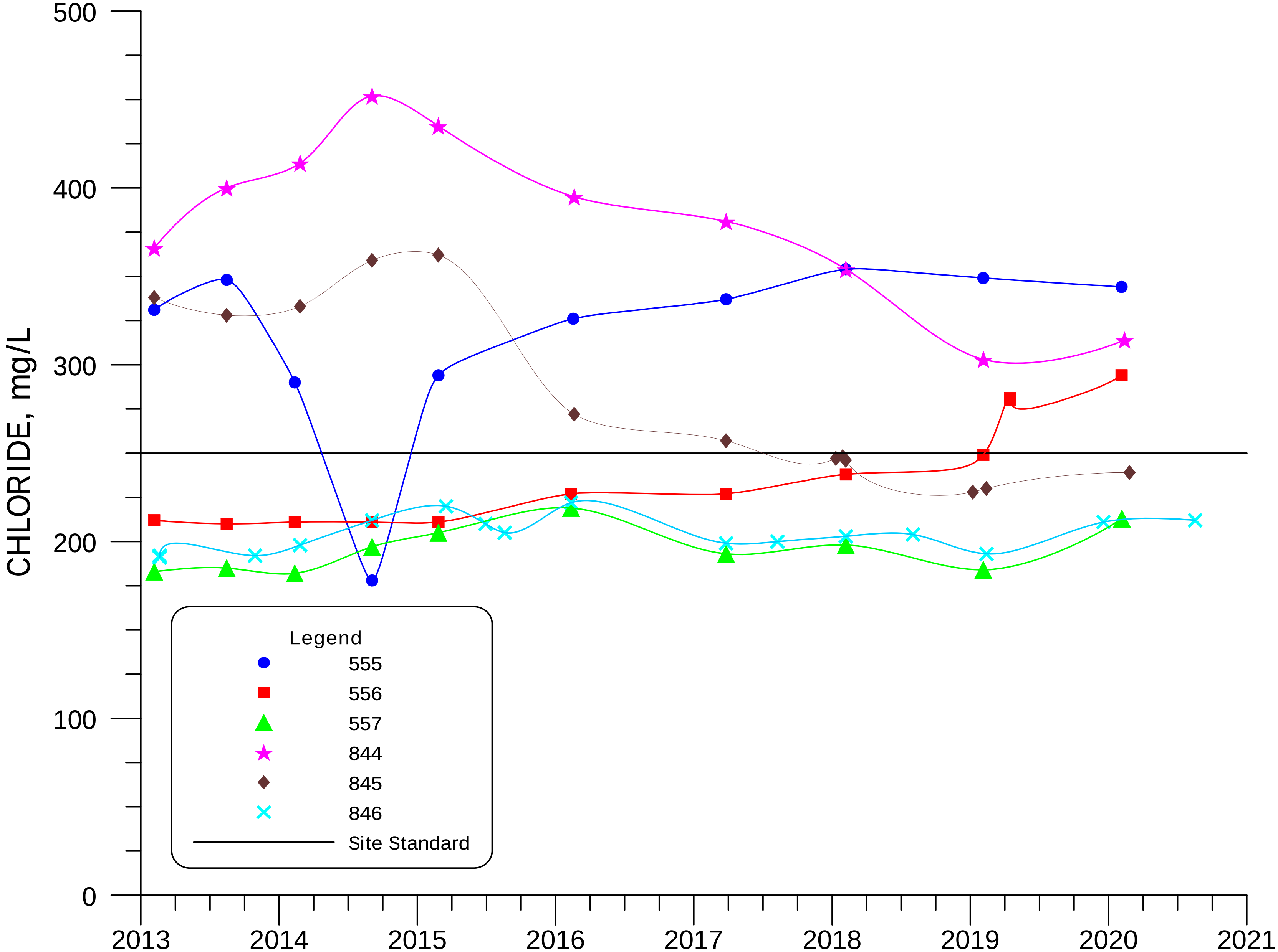


**FIGURE 4.3-48. CHLORIDE CONCENTRATIONS FOR WELLS 555, 556, 557, 844, 845 AND 846.**

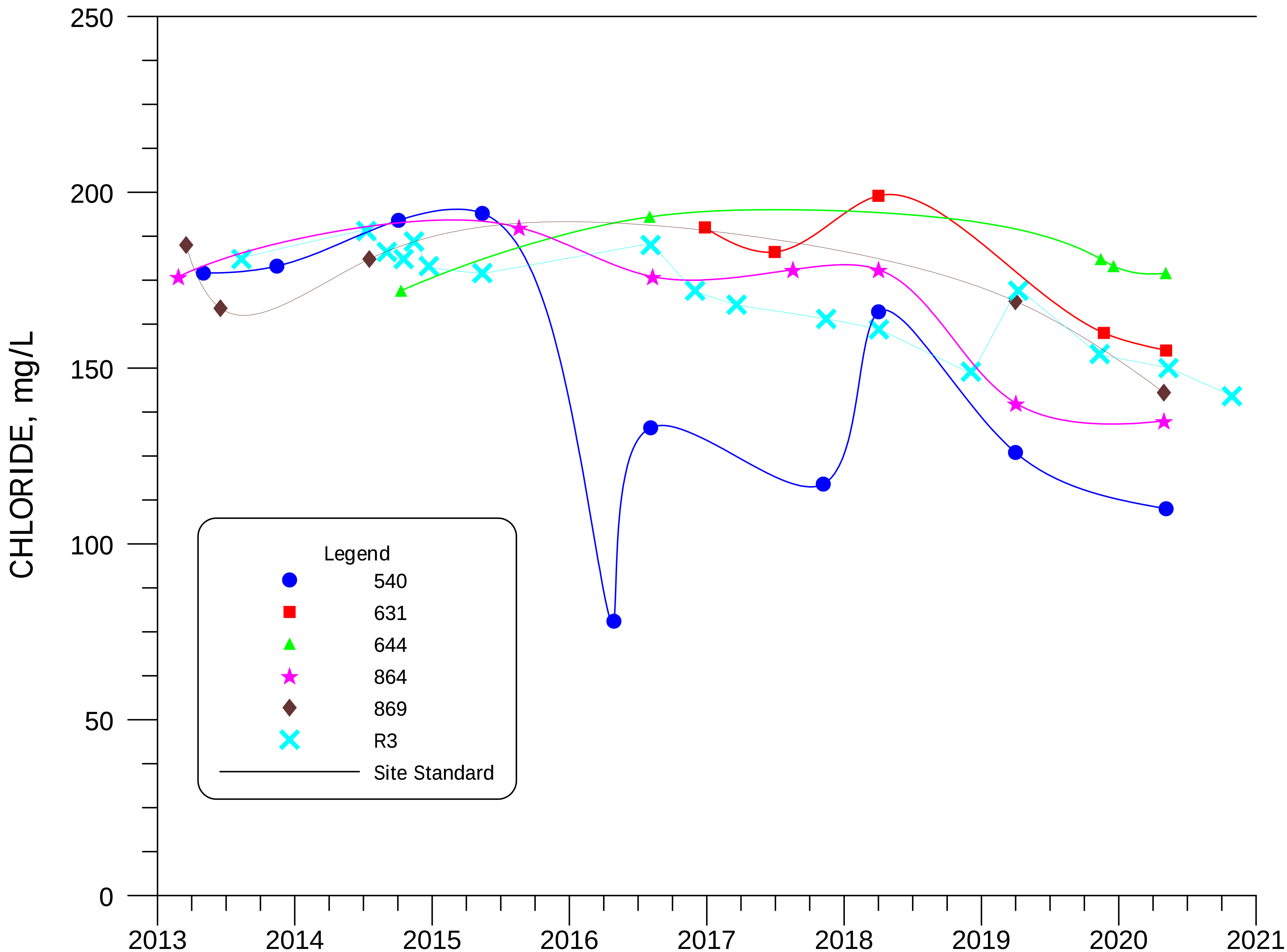


**FIGURE 4.3-49. CHLORIDE CONCENTRATIONS FOR WELLS 540, 631, 644, 864, 869 AND R3.**

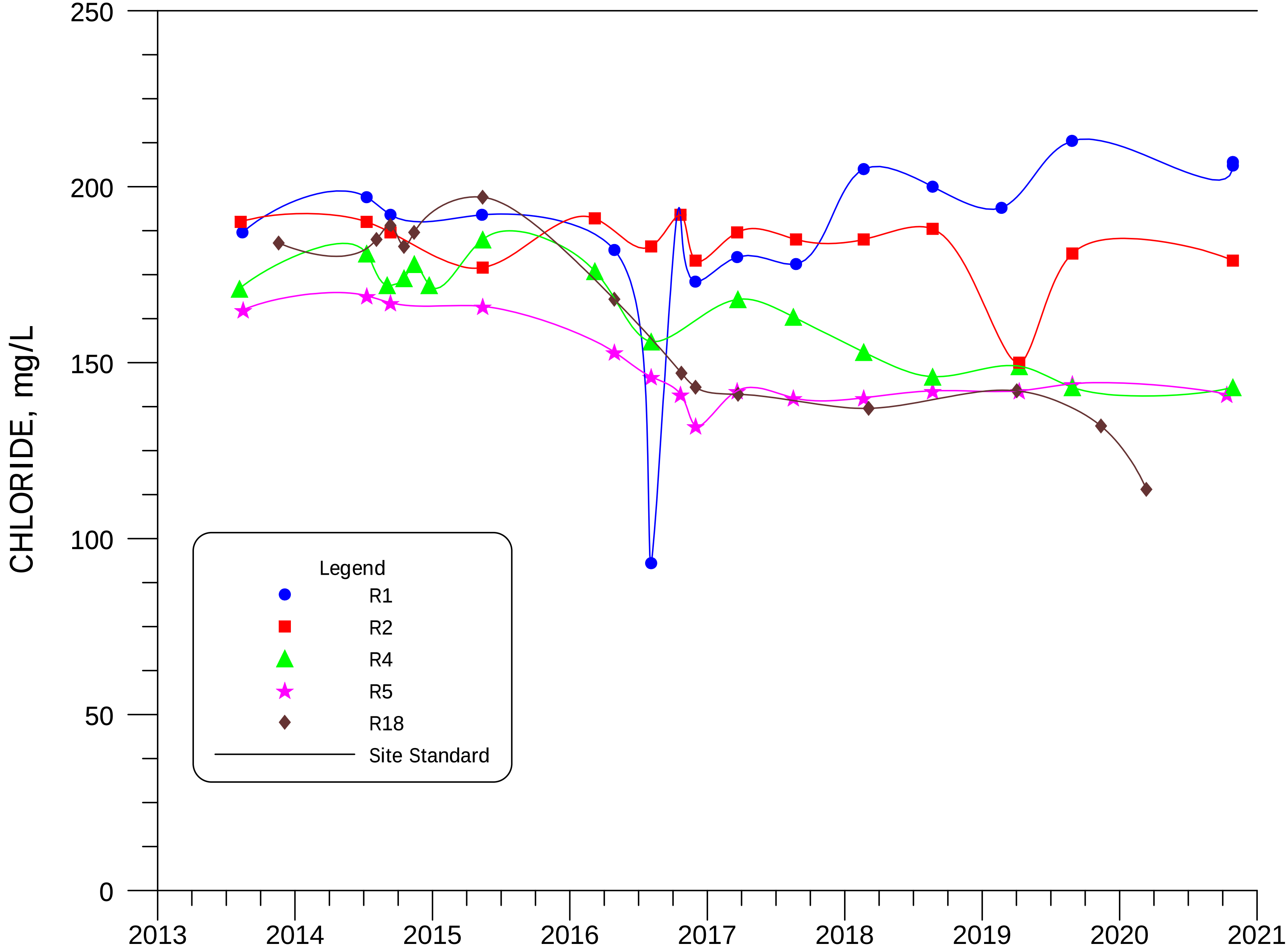


**FIGURE 4.3-49A. CHLORIDE CONCENTRATIONS FOR WELLS R1, R2, R4, R5 AND R18.**

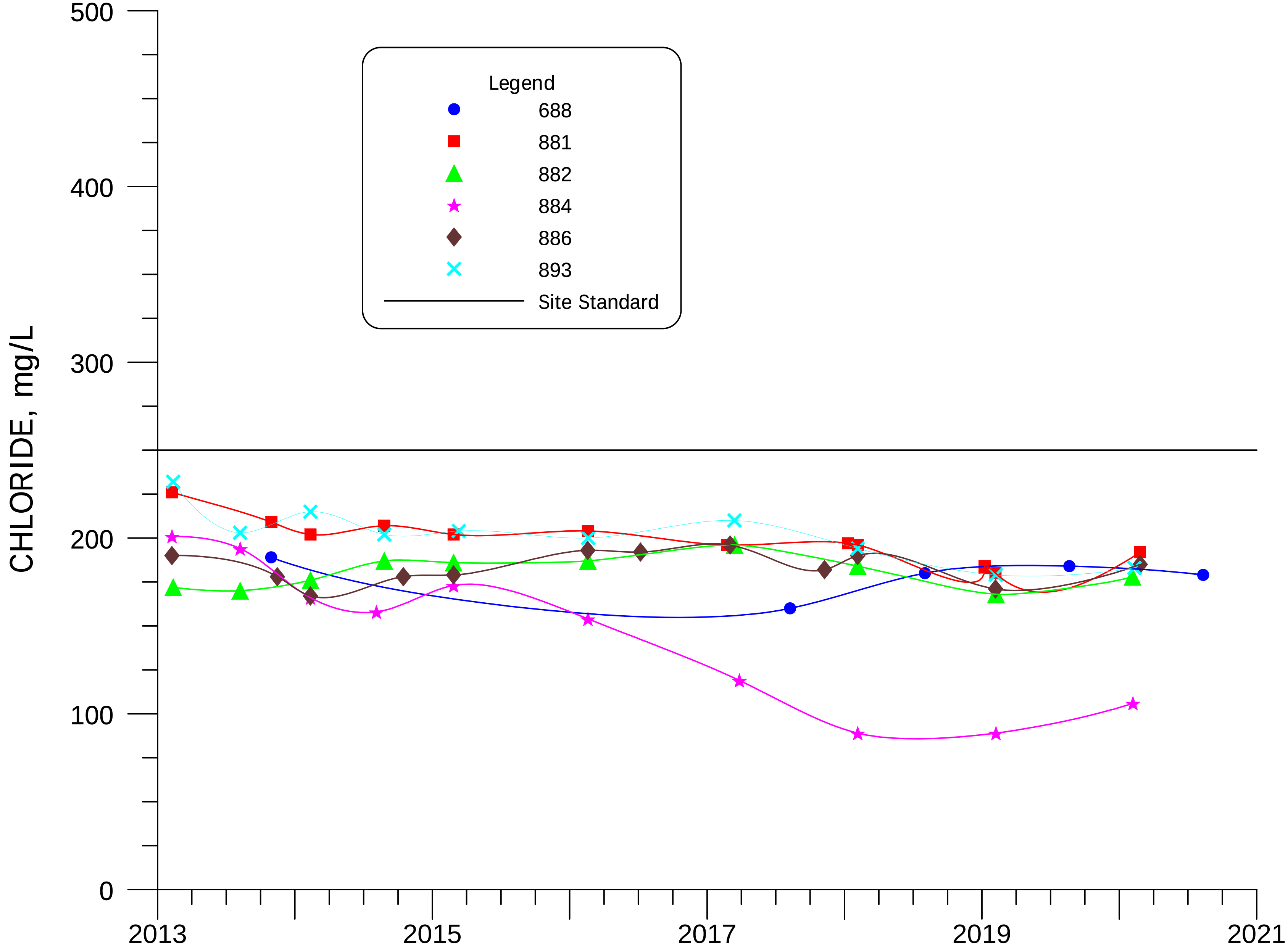


**FIGURE 4.3-50. CHLORIDE CONCENTRATIONS FOR WELLS 688, 881, 882, 884, 886 AND 893.**

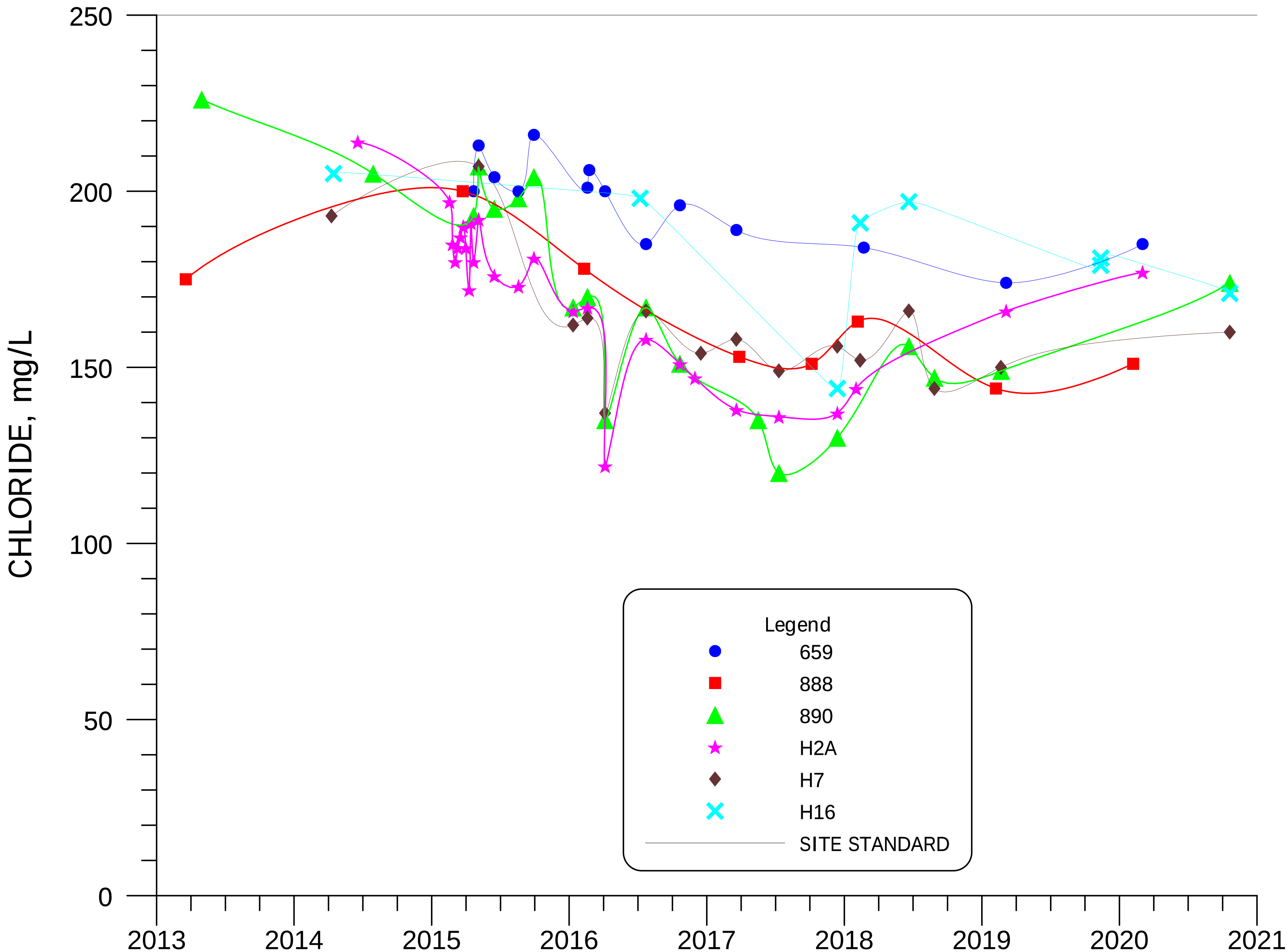


**FIGURE 4.3-50A. CHLORIDE CONCENTRATIONS FOR WELLS 659, 888, 890, H2A, H7 AND H16.**

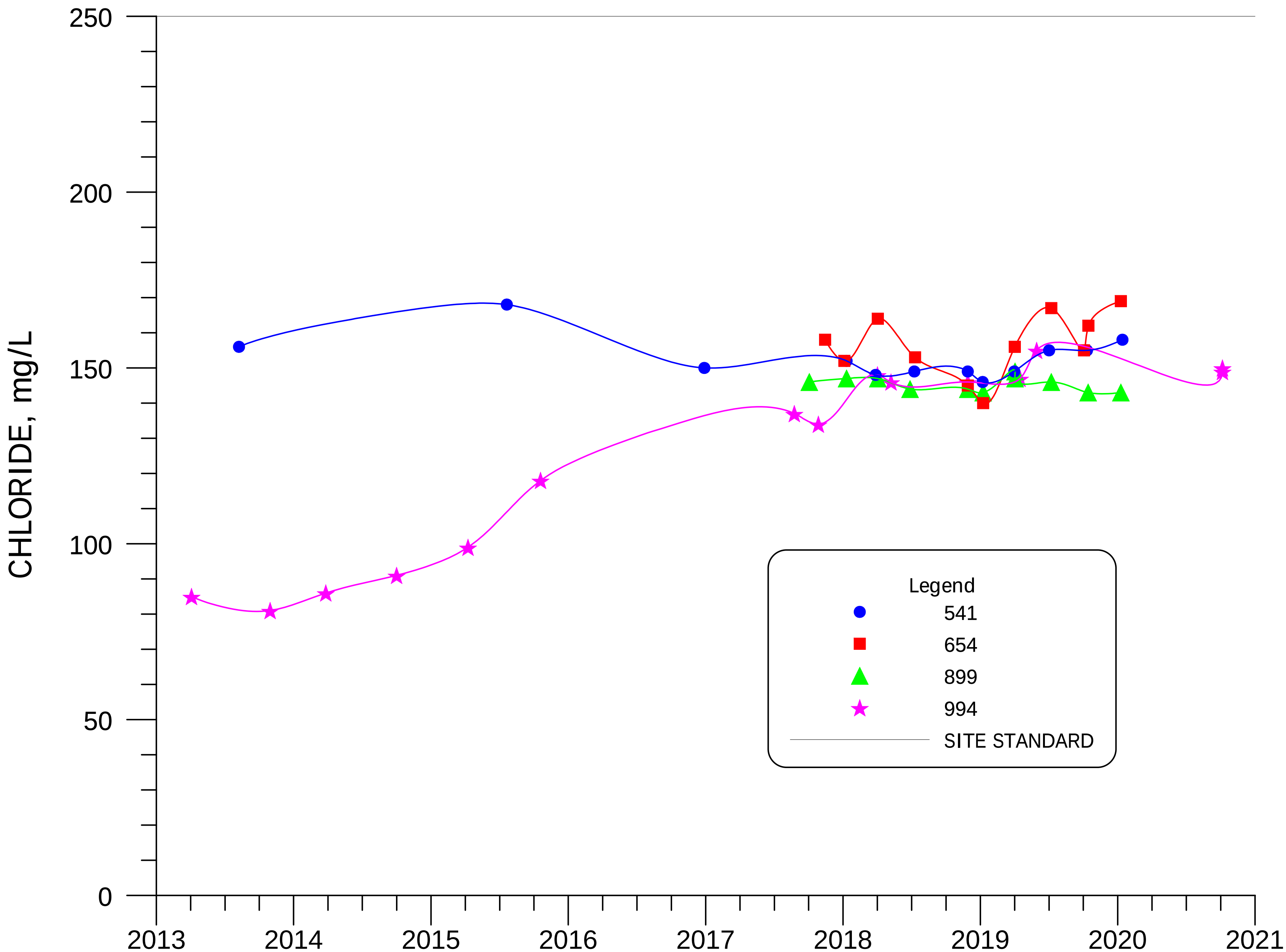


**FIGURE 4.3-51. CHLORIDE CONCENTRATIONS FOR WELLS 541, 654, 899 and 994.**

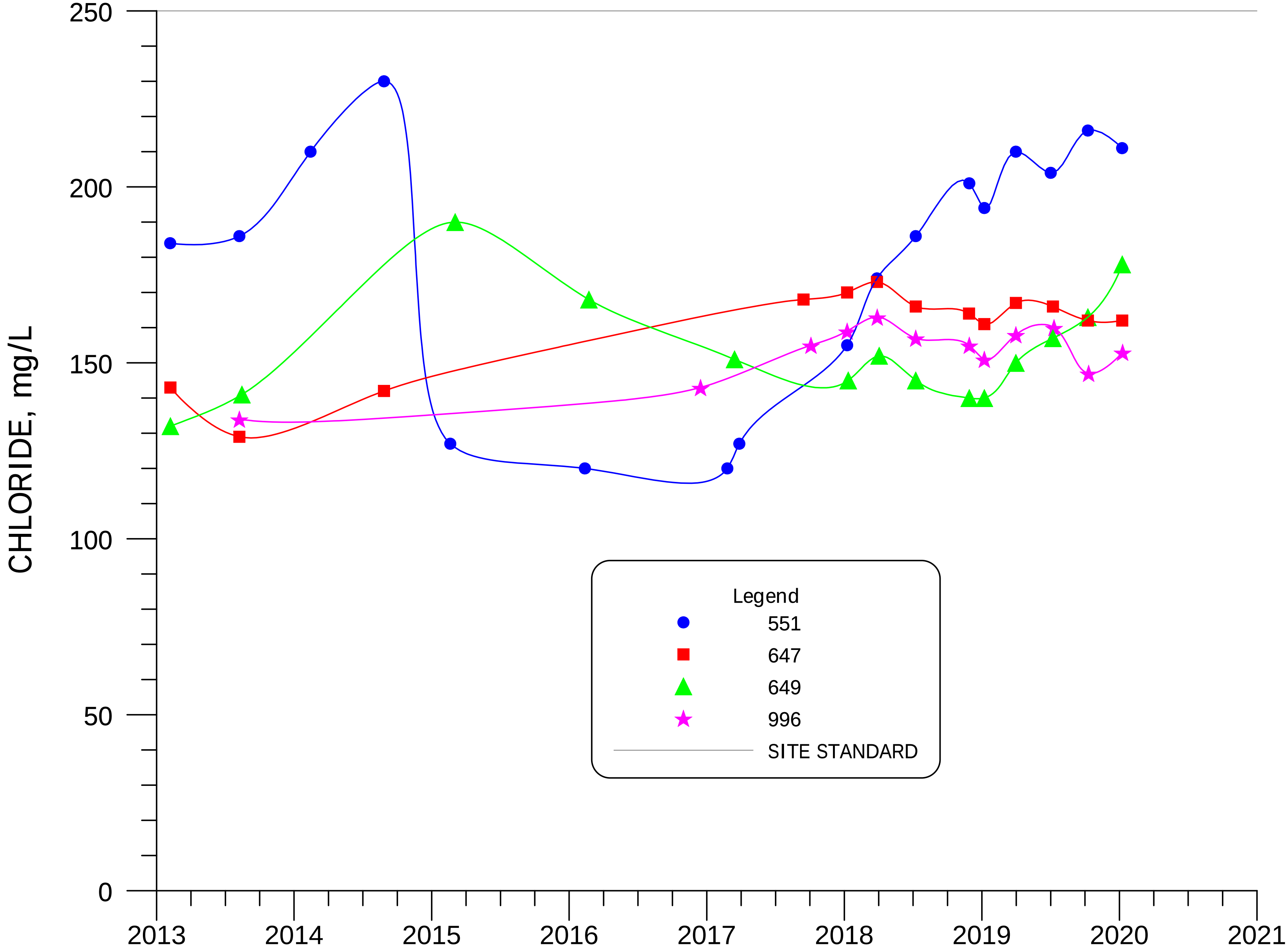


**FIGURE 4.3-52. CHLORIDE CONCENTRATIONS FOR WELLS 551, 647, 649 AND 996.**

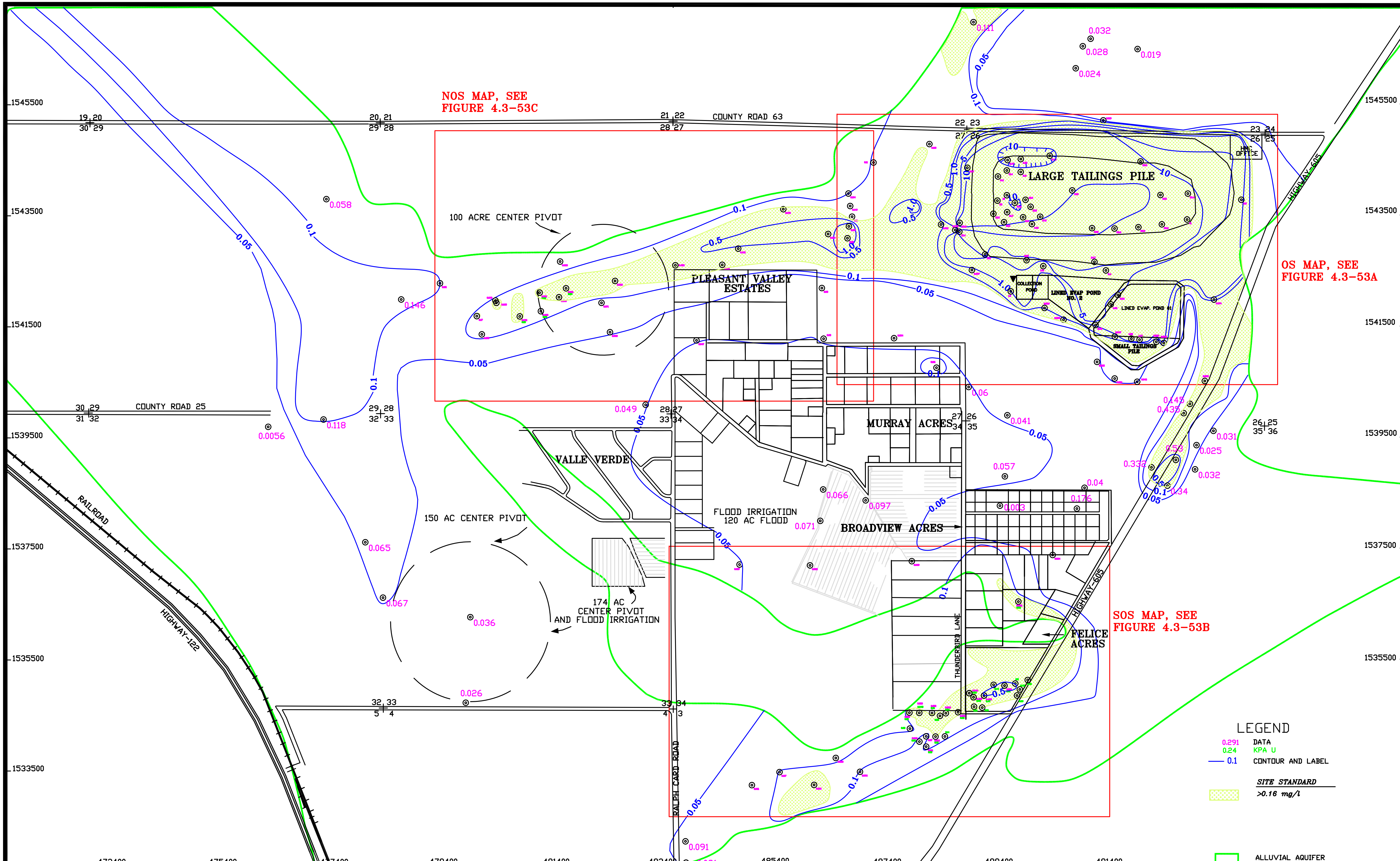


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FIGURE 4.3-53. URANIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, mg/L

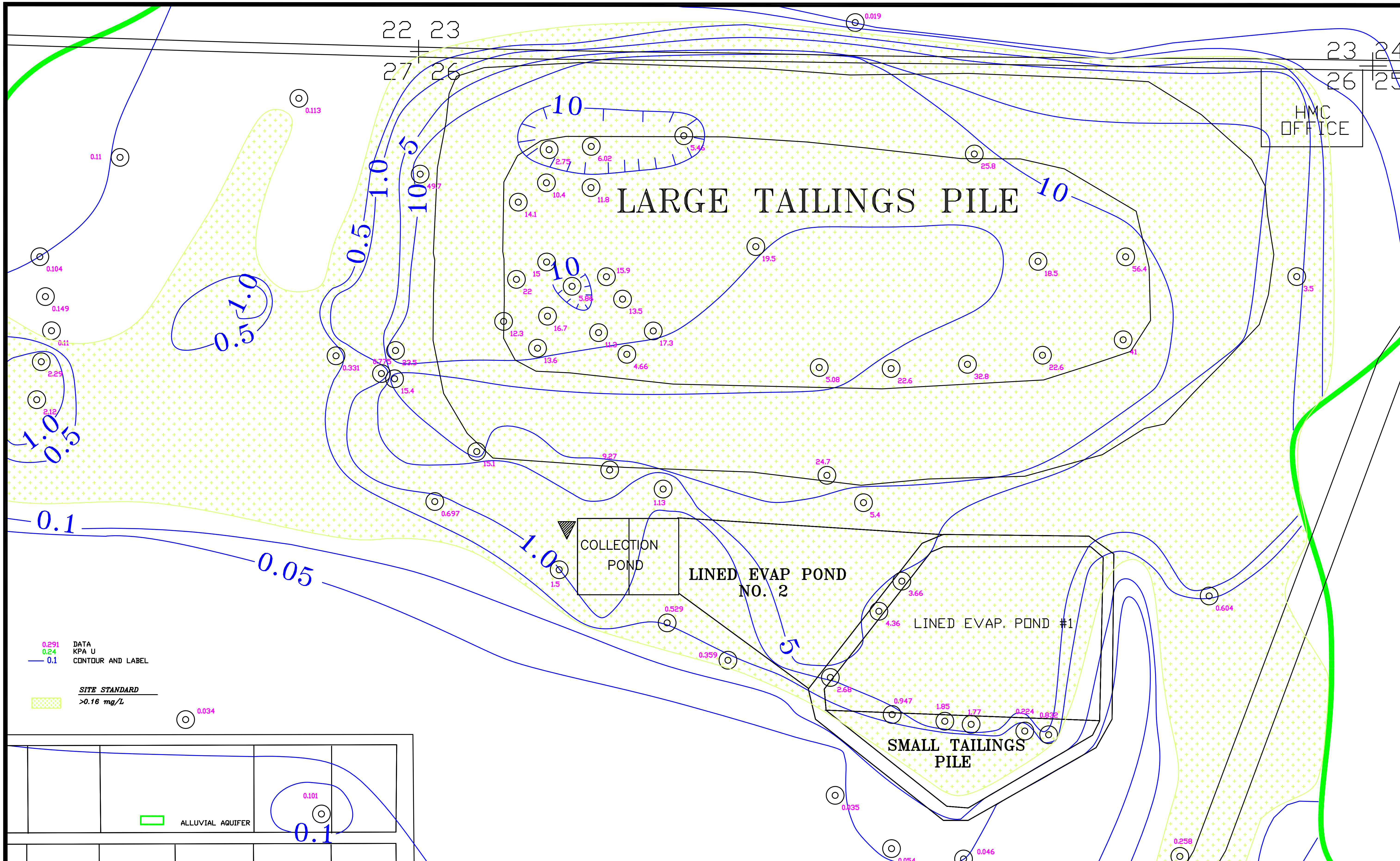


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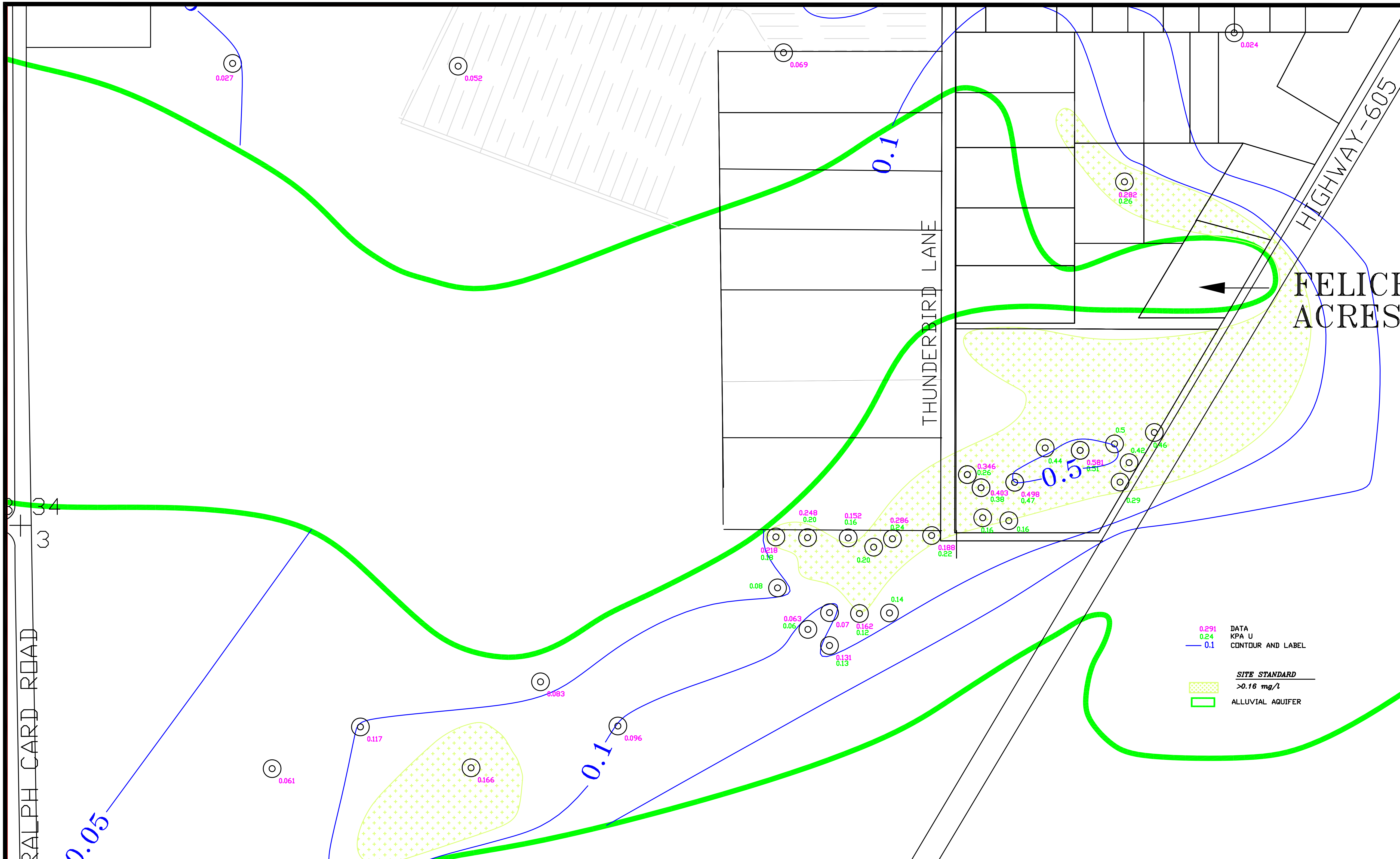
FIGURE 4.3-53A. URANIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, mg/L




| | |
|---|---|
| SCALE: 1"=500' | FIGURE 4.3-53B. URANIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, mg/L |
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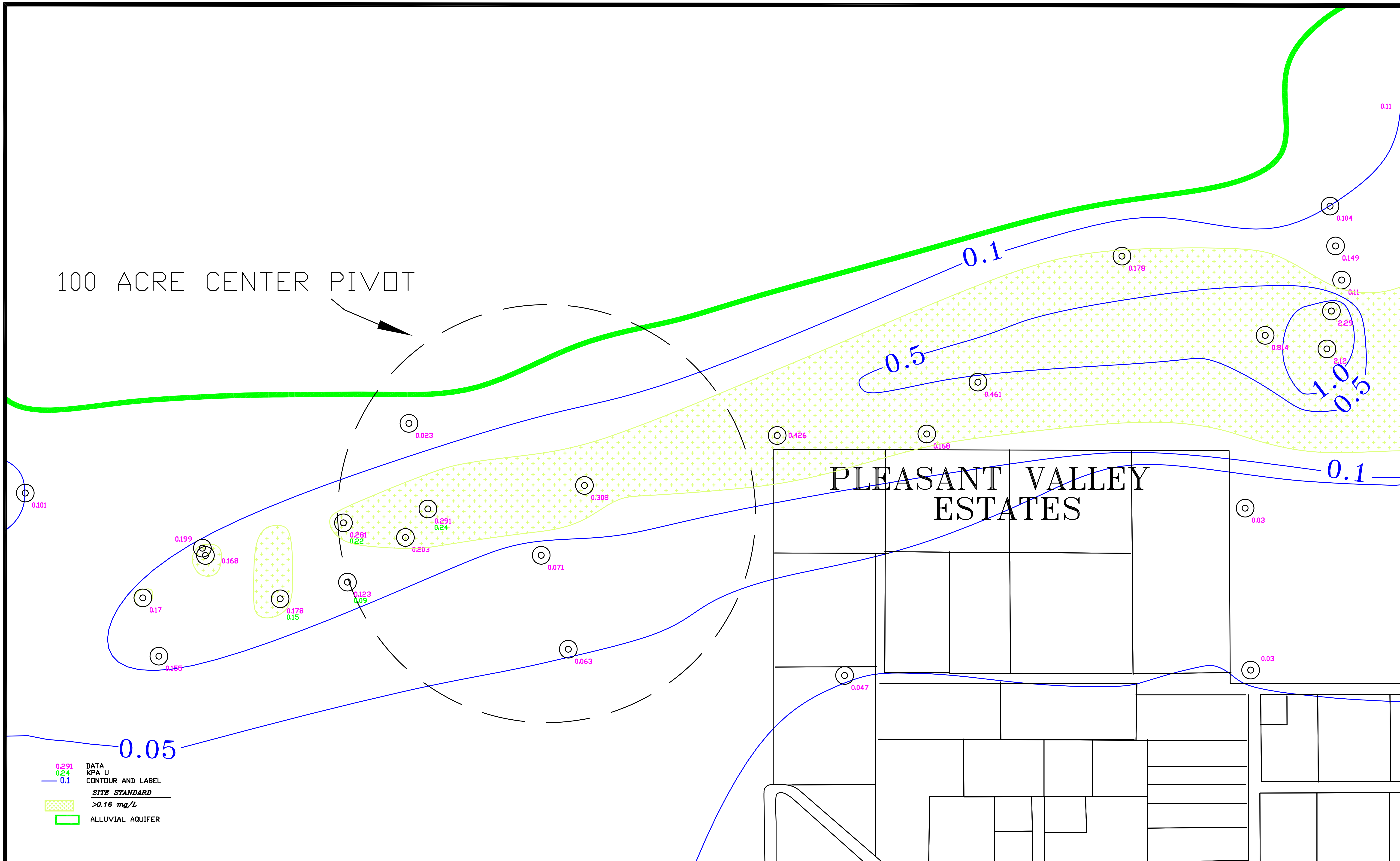


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FIGURE 4.3-53C. URANIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, mg/L

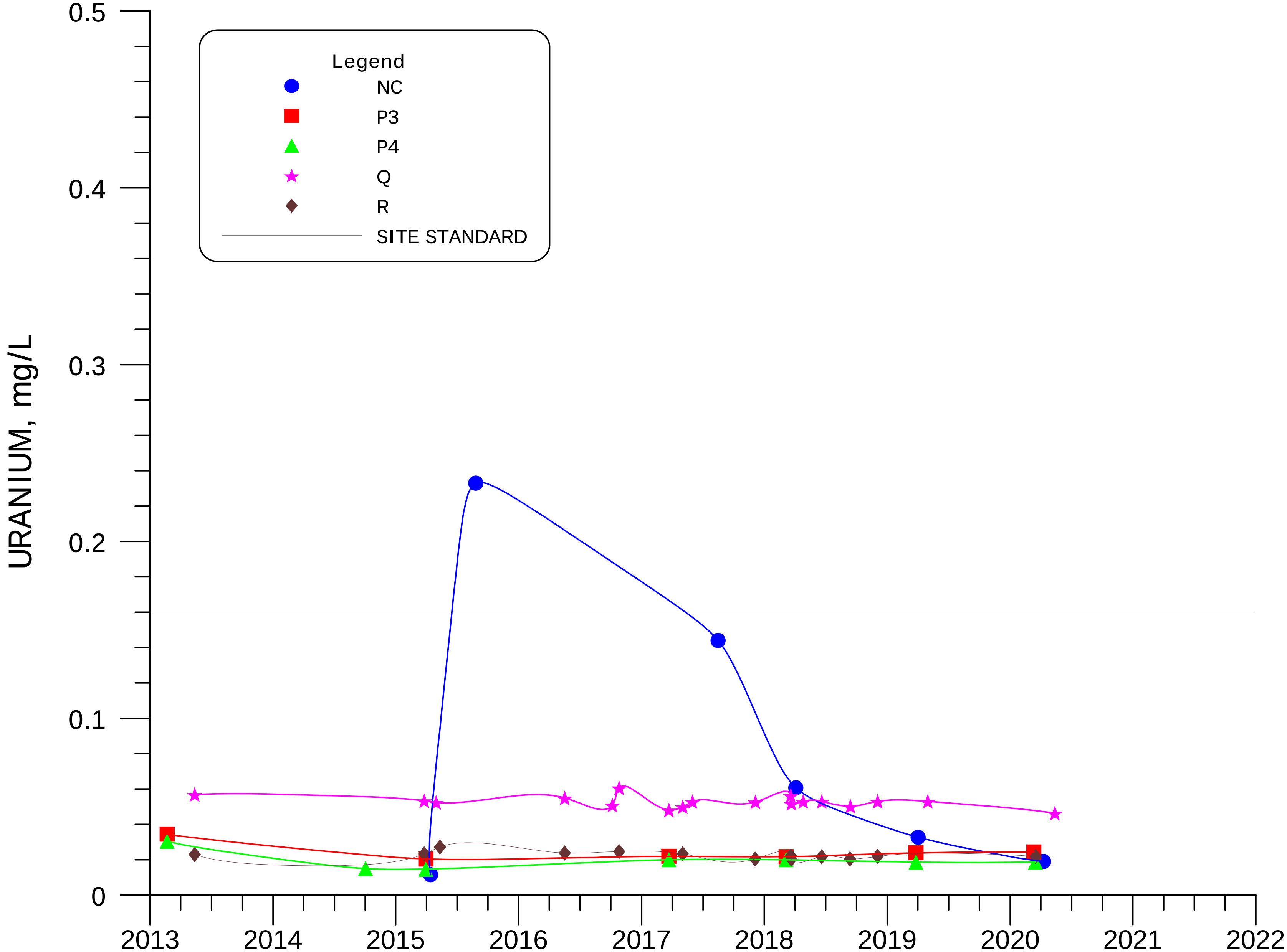


**FIGURE 4.3-54. URANIUM CONCENTRATIONS FOR WELLS NC, P3, P4, Q AND R.**

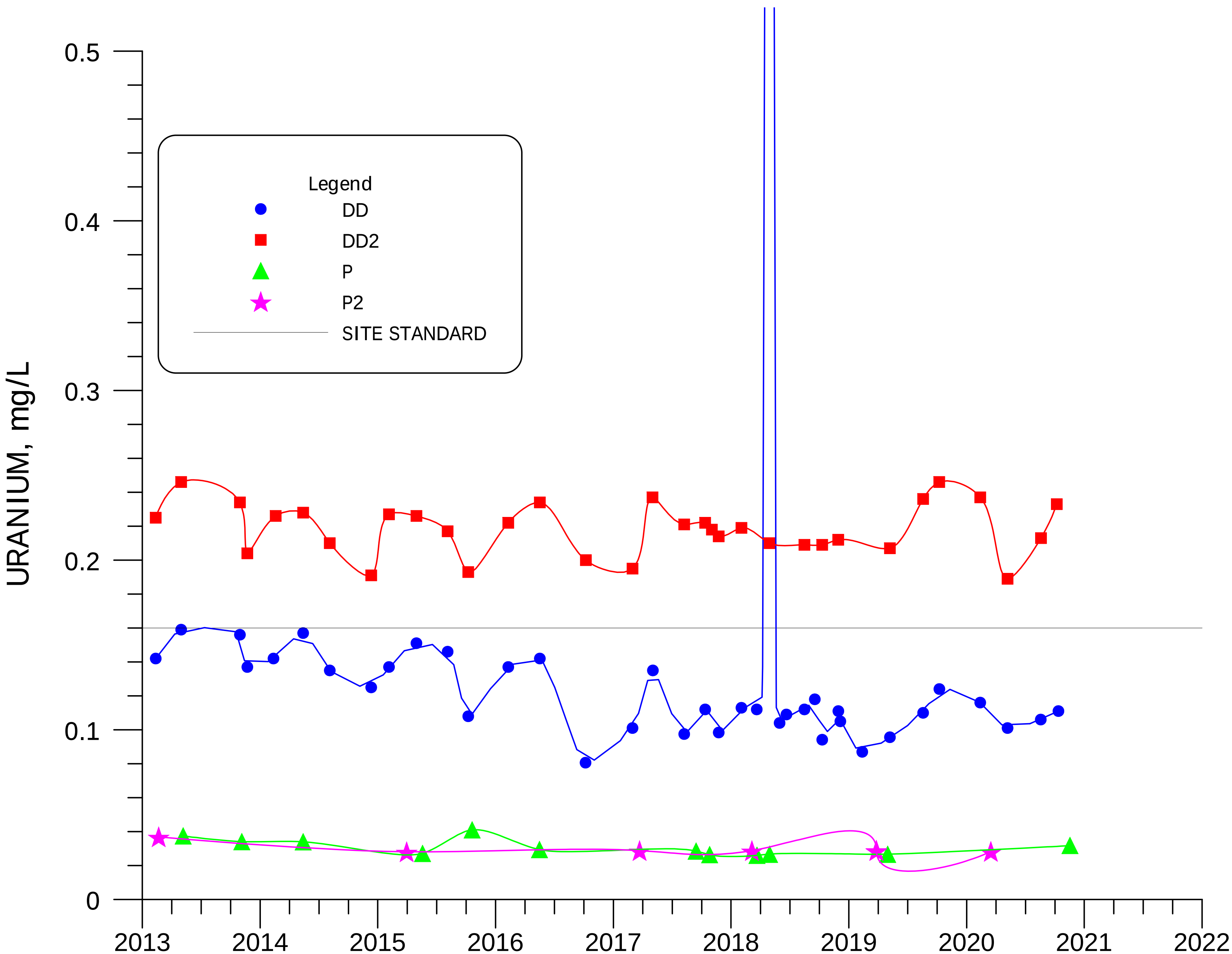


**FIGURE 4.3-54A. URANIUM CONCENTRATIONS FOR WELLS DD, DD2, P AND P2.**

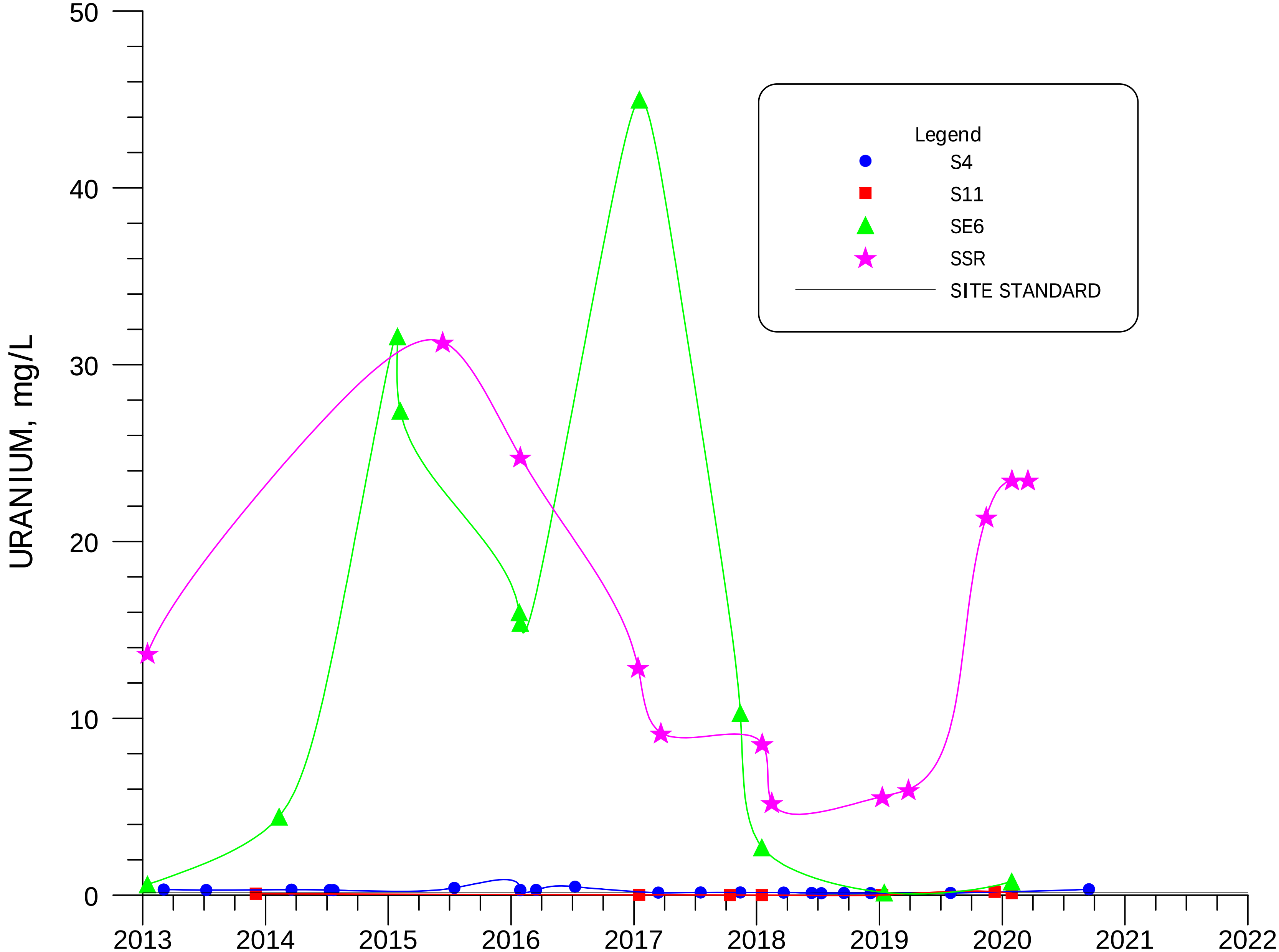


**FIGURE 4.3-55. URANIUM CONCENTRATIONS FOR WELLS S4, S11, SE6 AND SSR.**

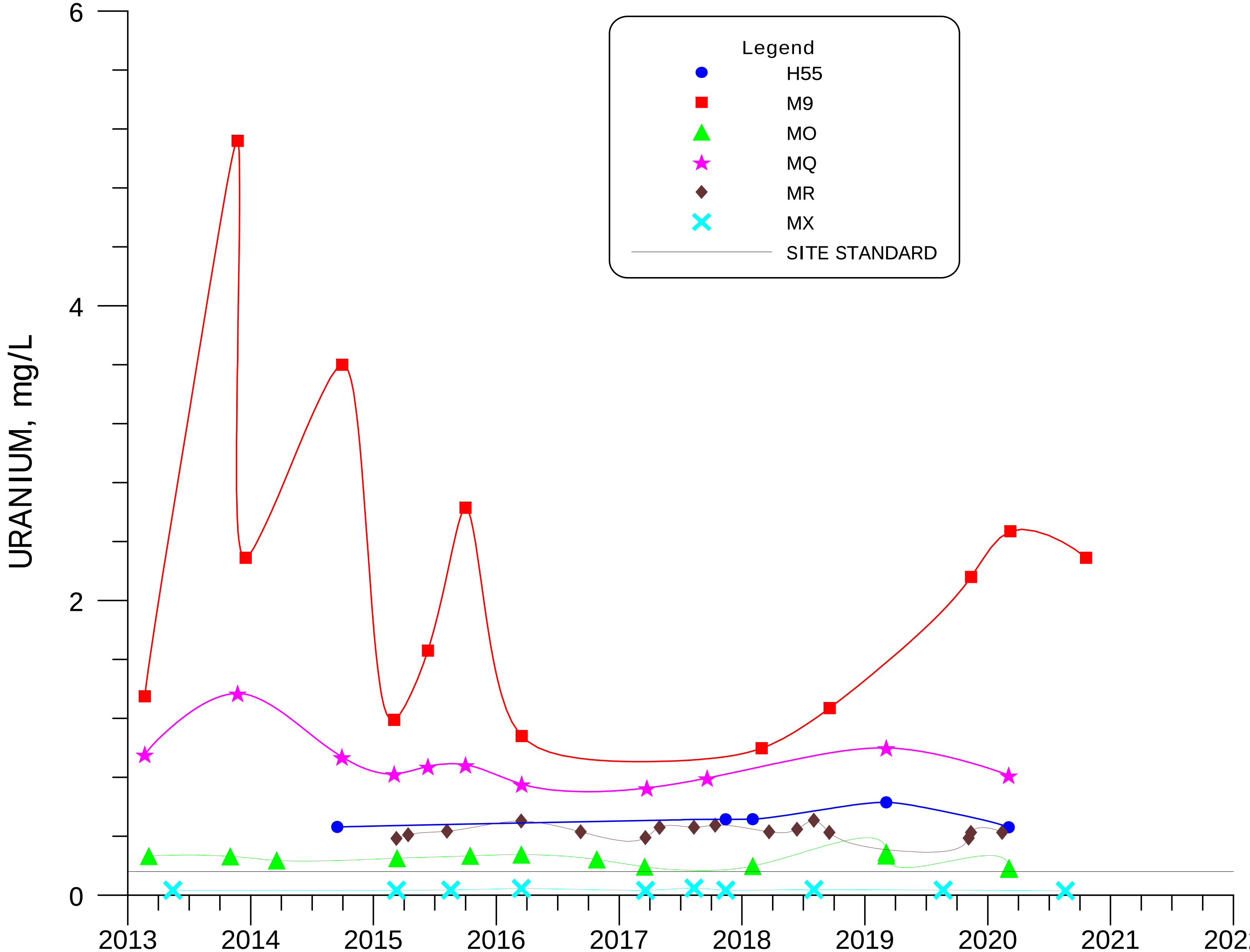


**FIGURE 4.3-56. URANIUM CONCENTRATIONS FOR WELLS H55, M9, MO, MQ, MR AND MX.**

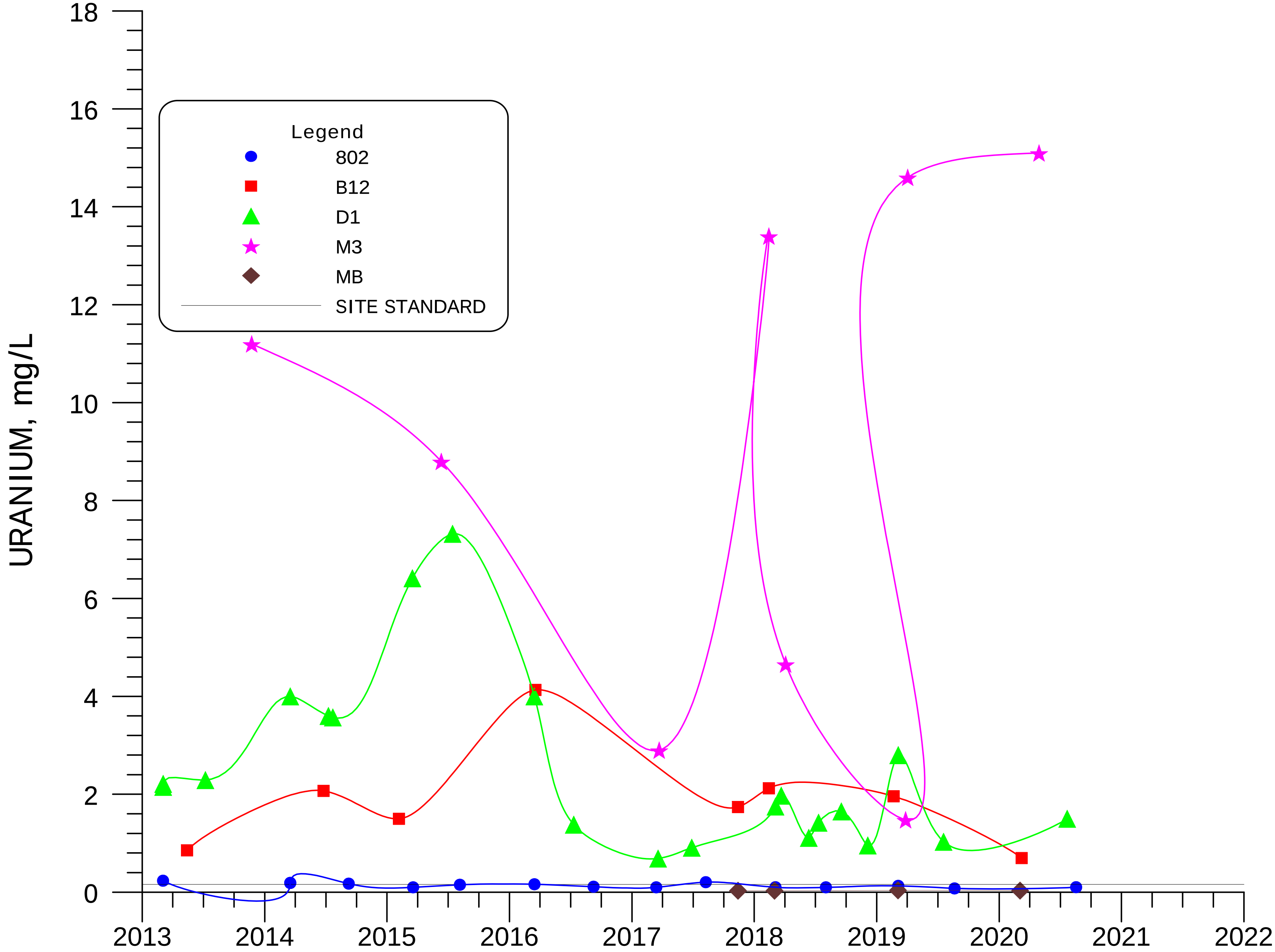


**FIGURE 4.3-57. URANIUM CONCENTRATIONS FOR WELLS 802, B12, D1, M3 AND MB.**

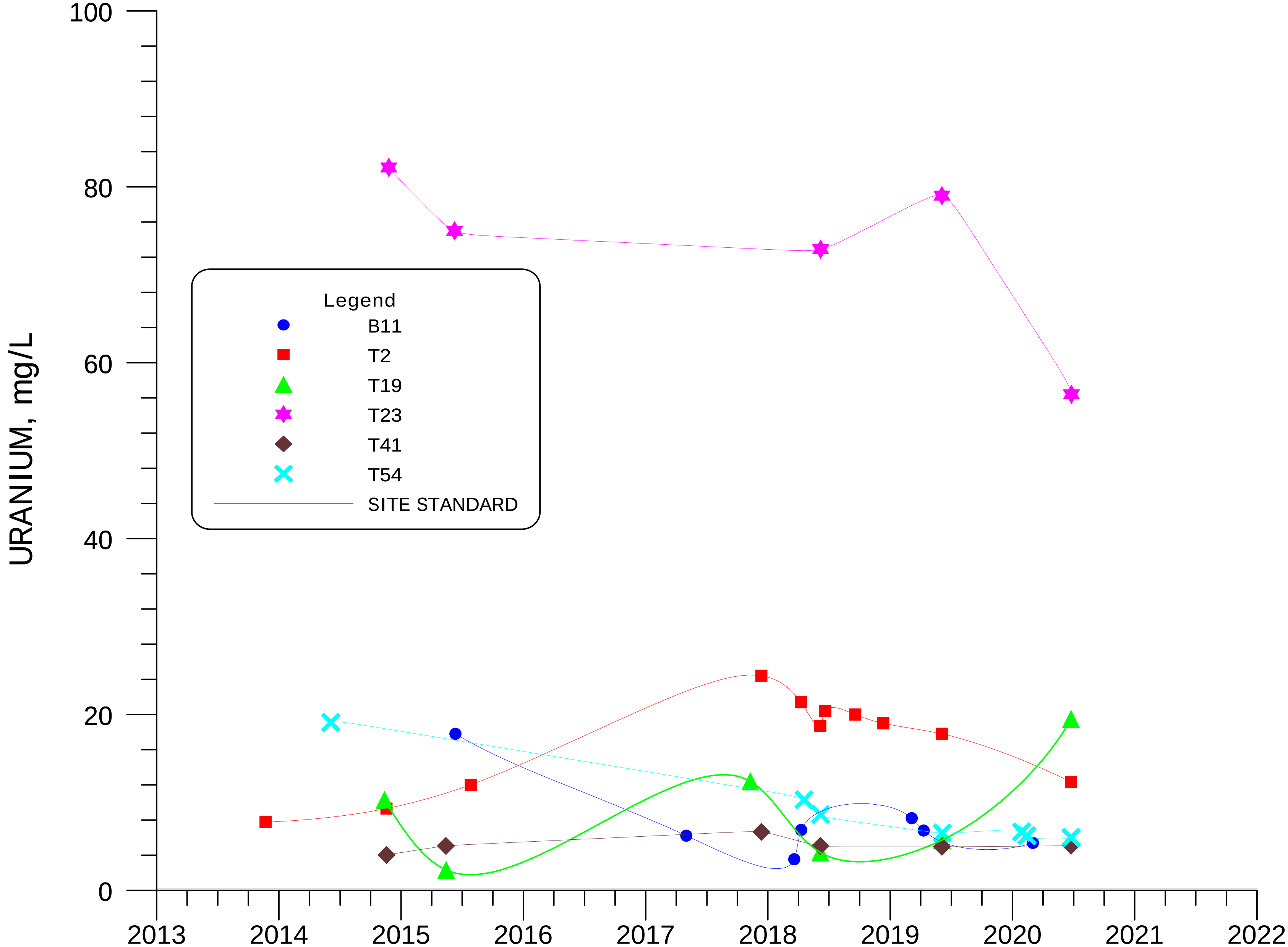


**FIGURE 4.3-58. URANIUM CONCENTRATIONS FOR WELLS B11, T2, T19, T23, T41 AND T54.**

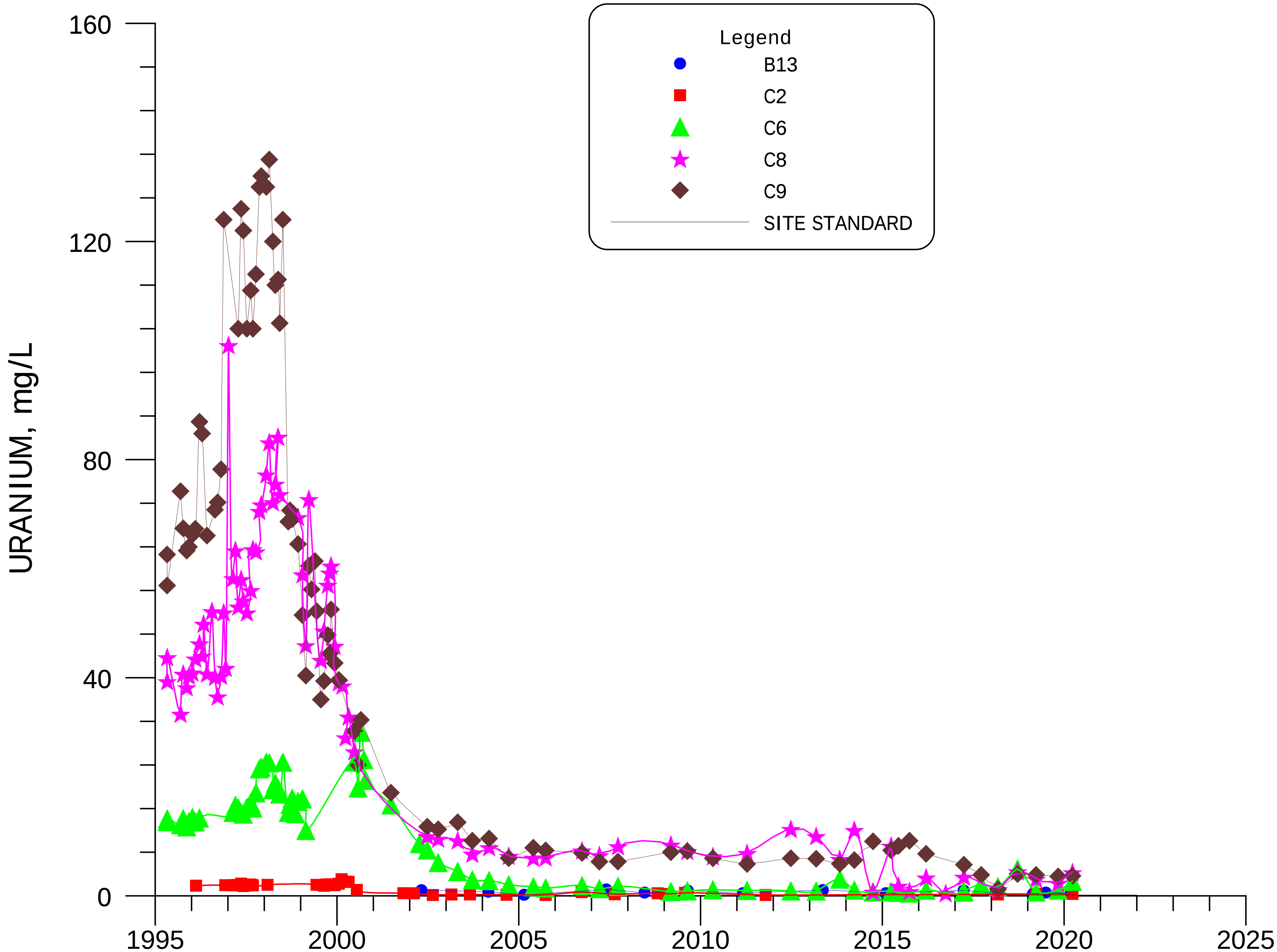


**FIGURE 4.3-59. URANIUM CONCENTRATIONS FOR WELLS B13, C2, C6, C8 AND C9 FOR ALL HISTORICAL DATA.**

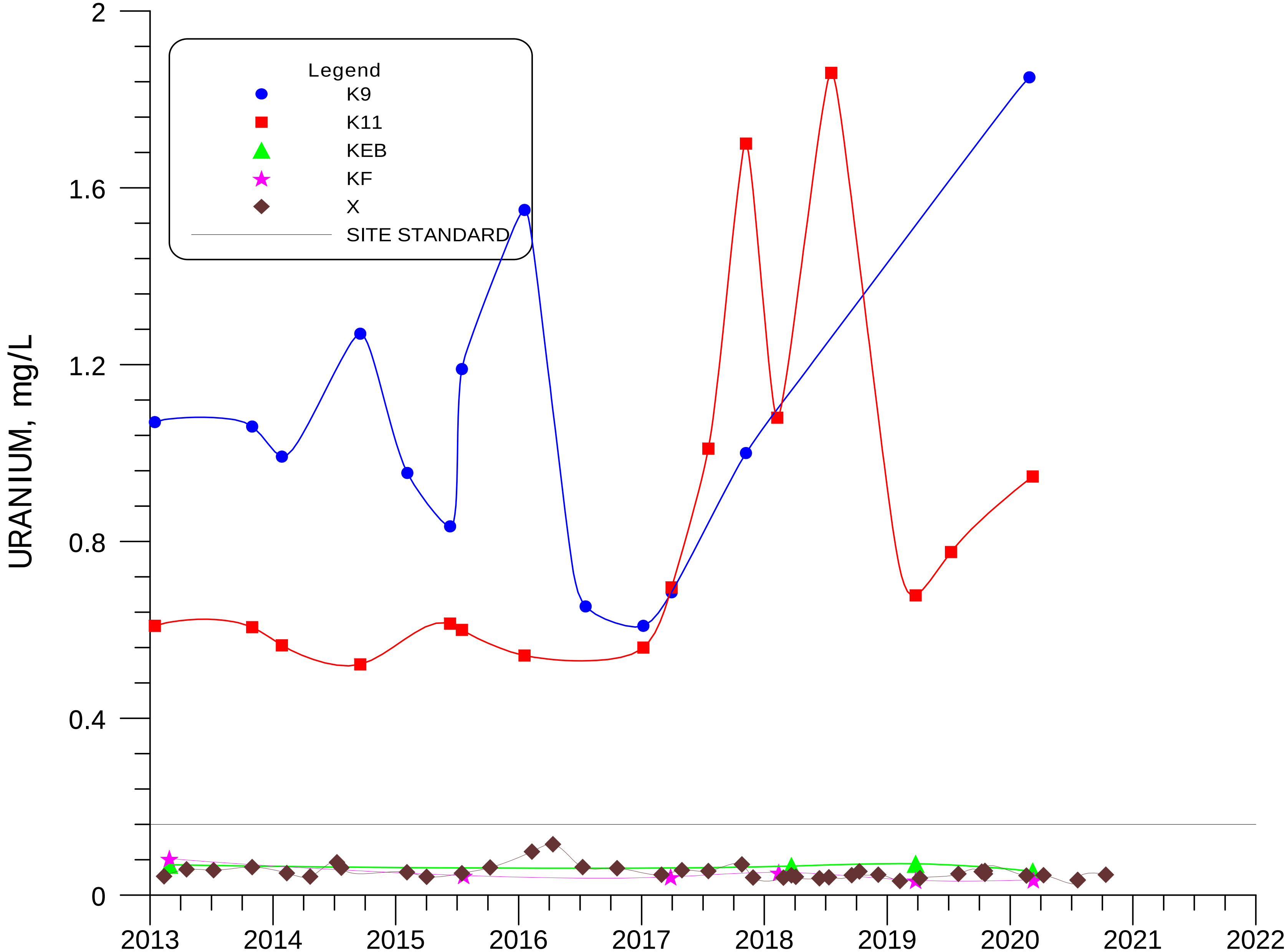


**FIGURE 4.3-60. URANIUM CONCENTRATIONS FOR WELLS K9, K11, KEB, KF AND X.**

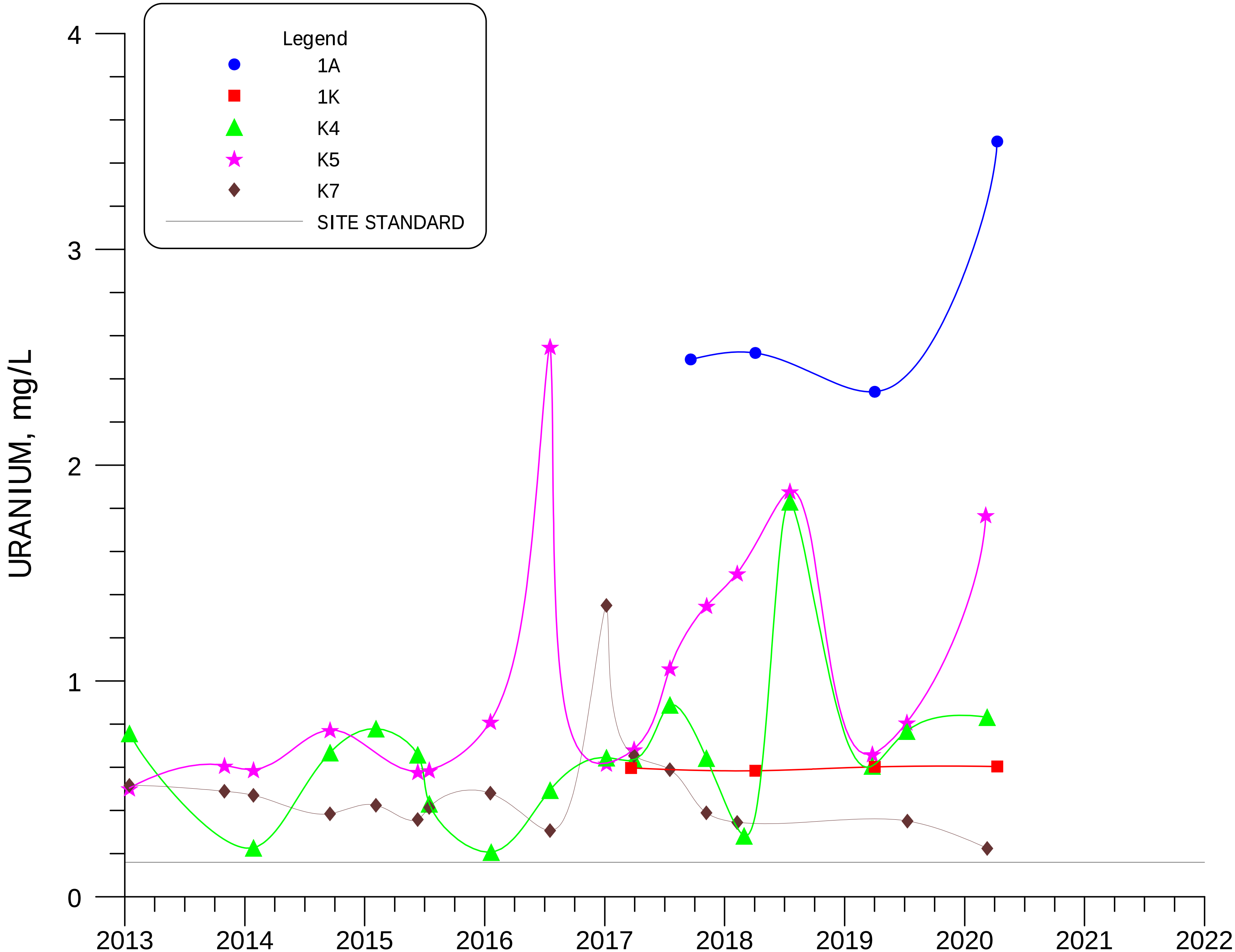


**FIGURE 4.3-61. URANIUM CONCENTRATIONS FOR WELLS 1A, 1K, K4, K5 AND K7.**

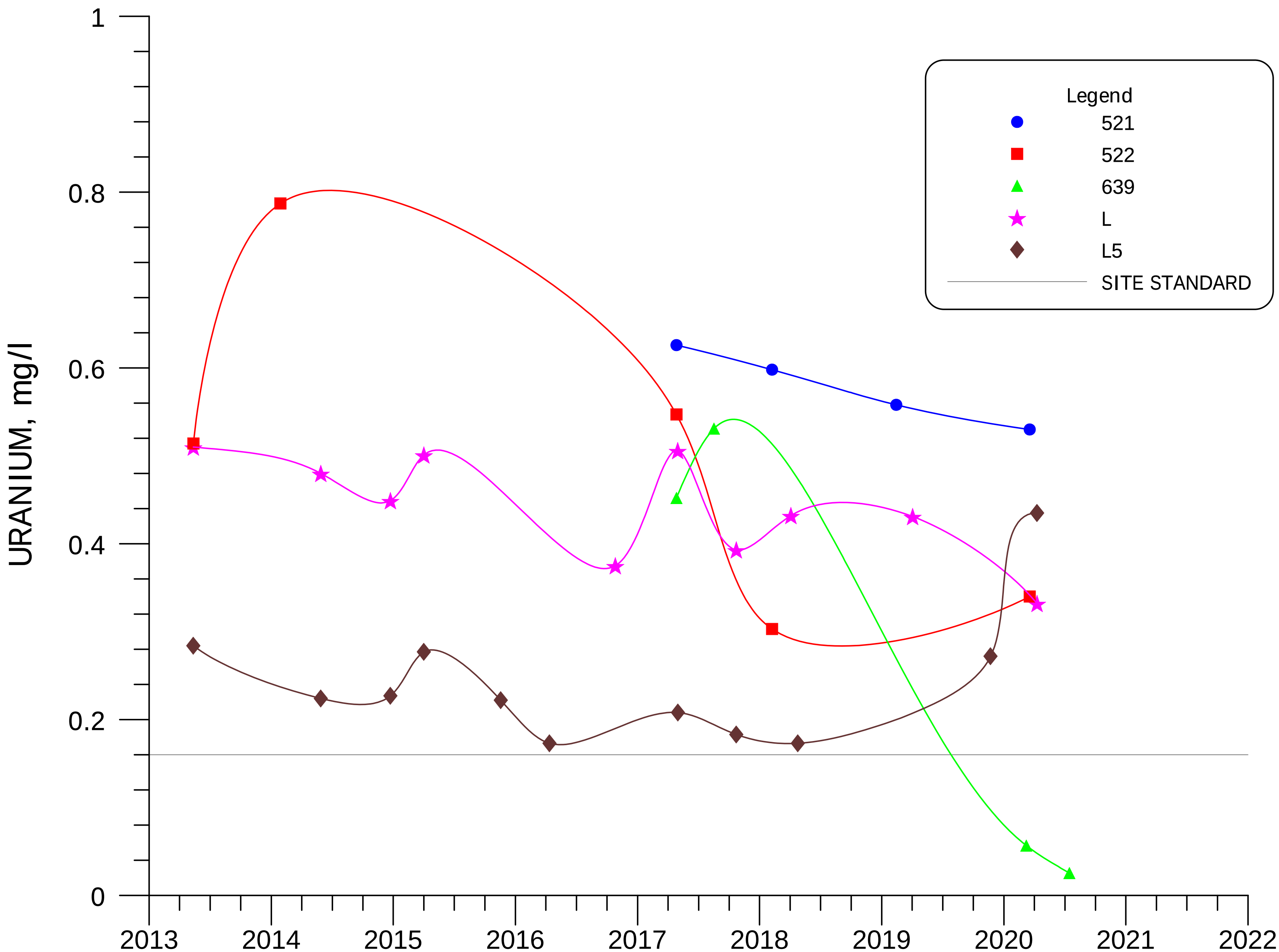


**FIGURE 4.3-62. URANIUM CONCENTRATIONS FOR WELLS 521, 522, 639, L AND L5.**

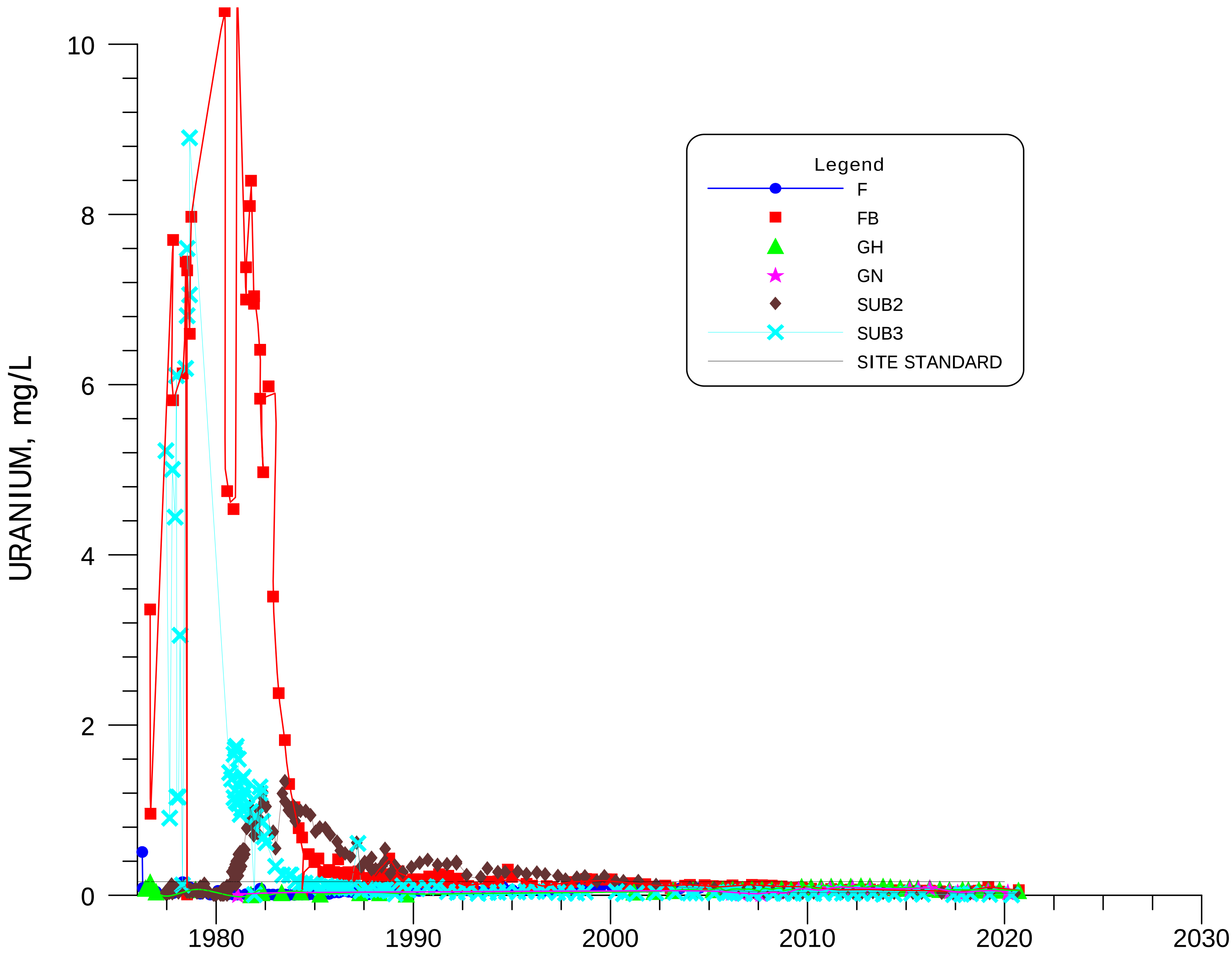


**FIGURE 4.3-63. URANIUM CONCENTRATIONS FOR WELLS F, FB, GH, GN, SUB2 AND SUB3 FOR ALL HISTORICAL DATA.**

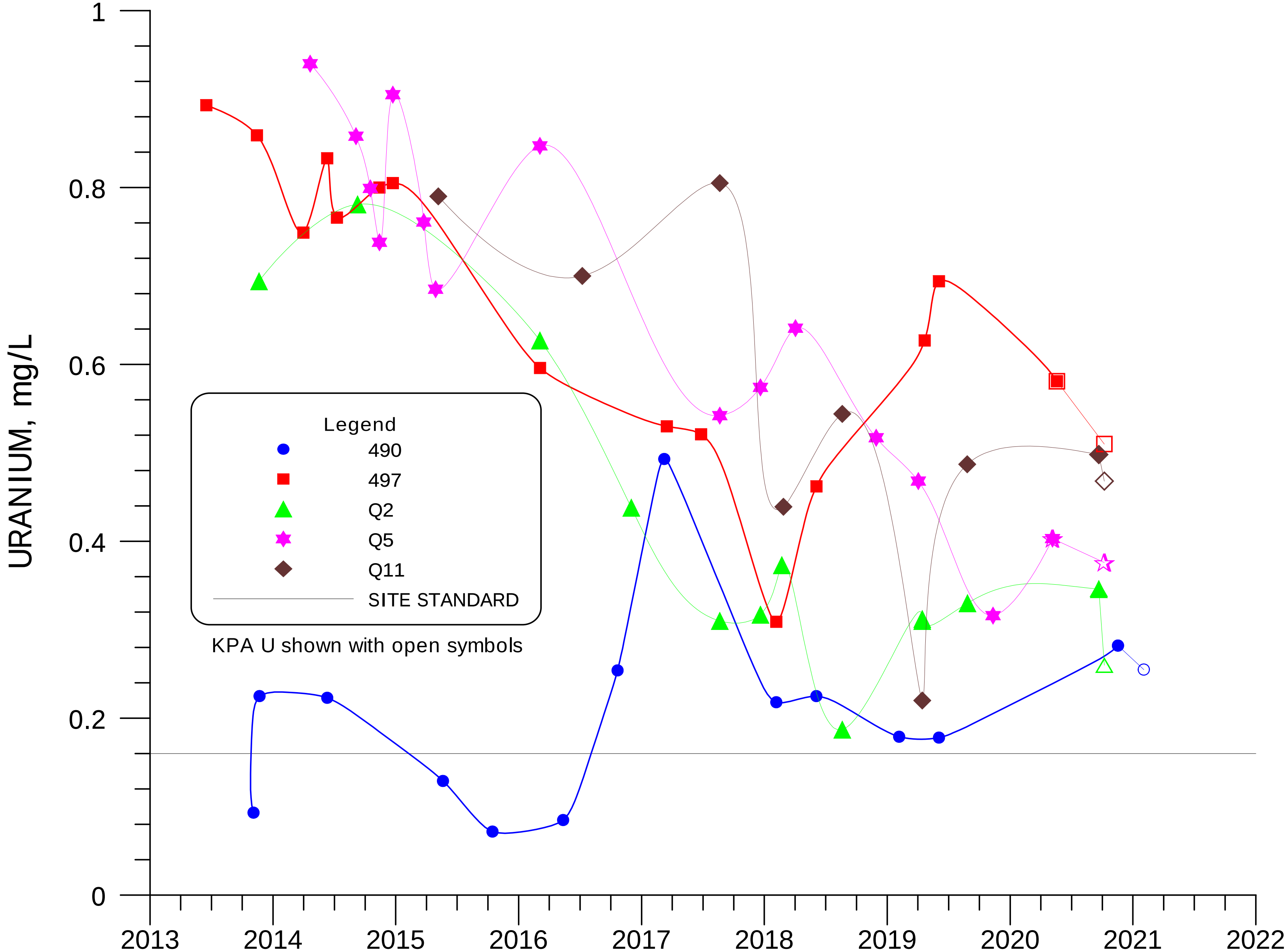


**FIGURE 4.3-64. URANIUM CONCENTRATIONS FOR WELLS 490, 497, Q2, Q5 AND Q11.**

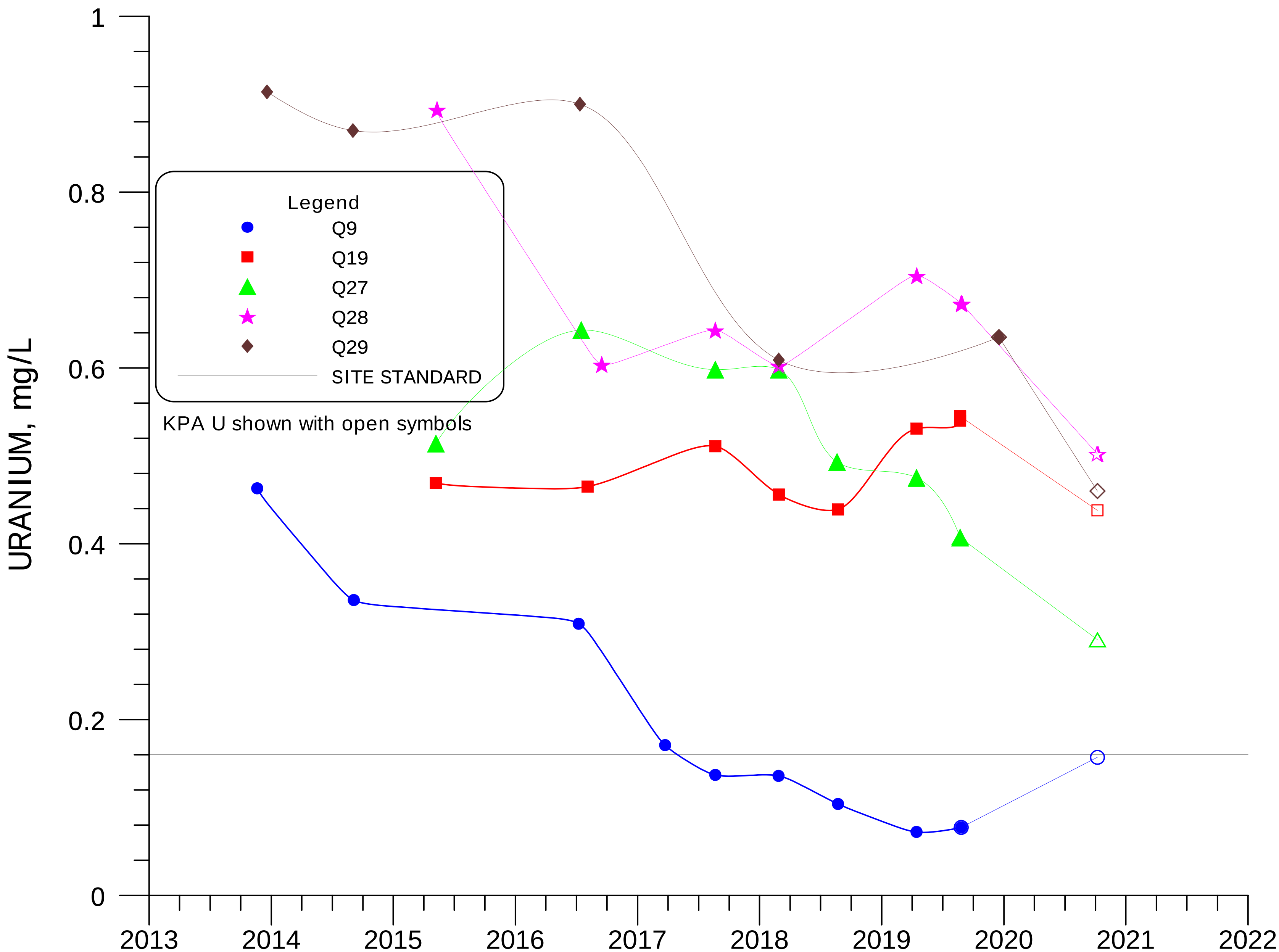


**FIGURE 4.3-64A. URANIUM CONCENTRATIONS FOR WELLS Q9, Q19, Q27, Q28, Q29 AND Q30.**

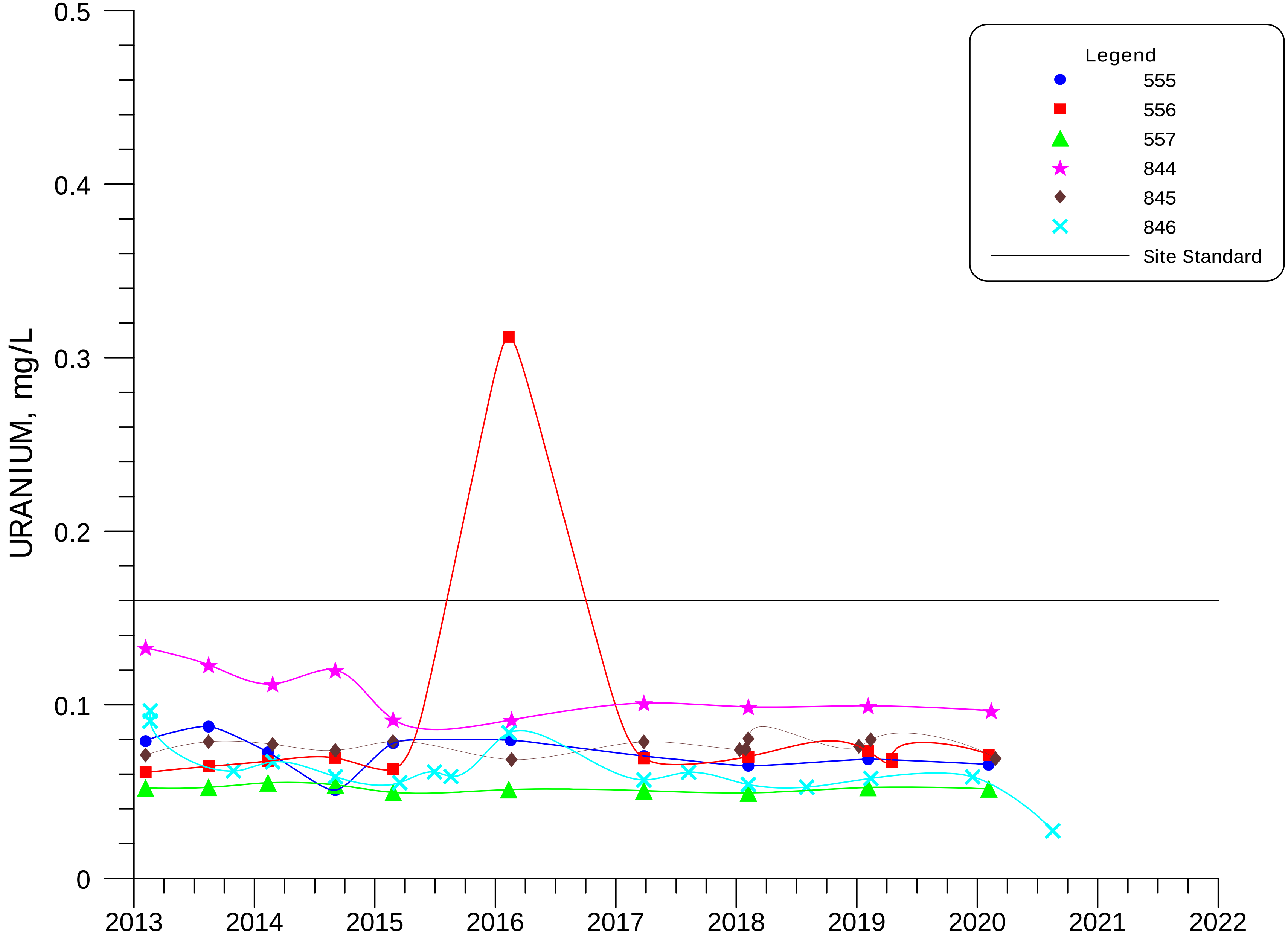


**FIGURE 4.3-65. URANIUM CONCENTRATIONS FOR WELLS 555, 556, 557, 844, 845, AND 846.**

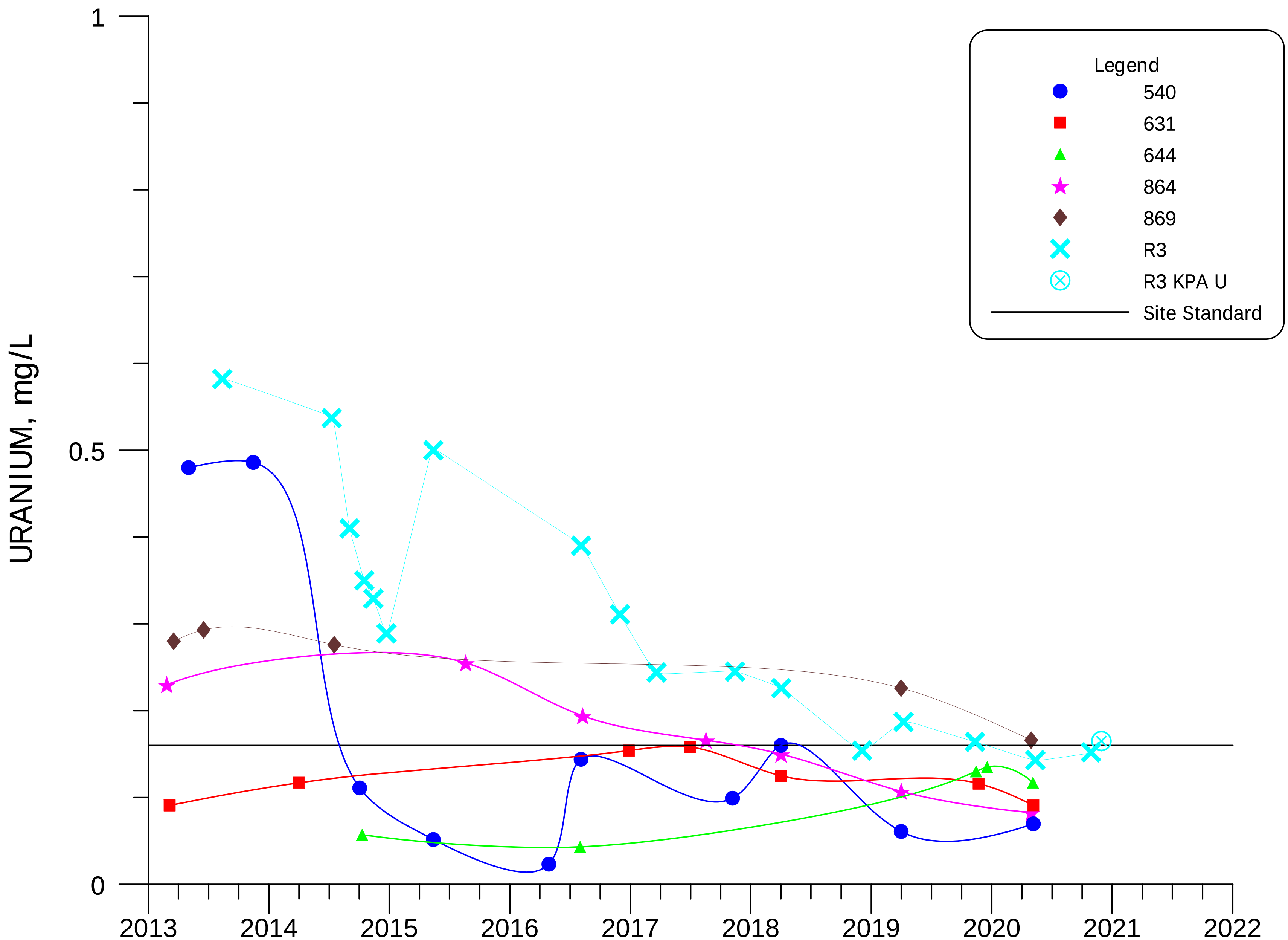


**FIGURE 4.3-66. URANIUM CONCENTRATIONS FOR WELLS 540, 631, 644, 864, 869 AND R3.**

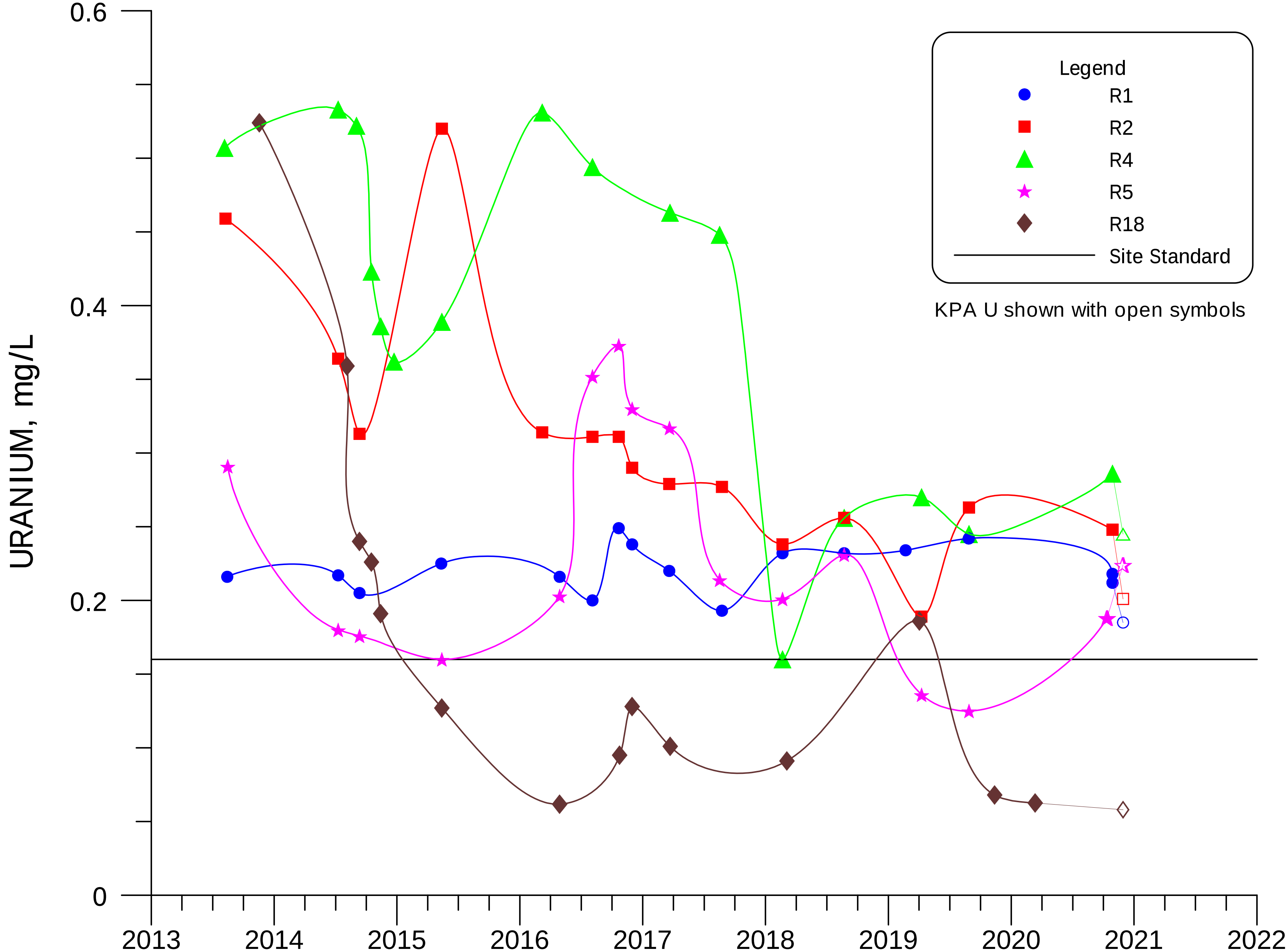


**FIGURE 4.3-66A. URANIUM CONCENTRATIONS FOR WELLS R1, R2, R4, R5 AND R18.**

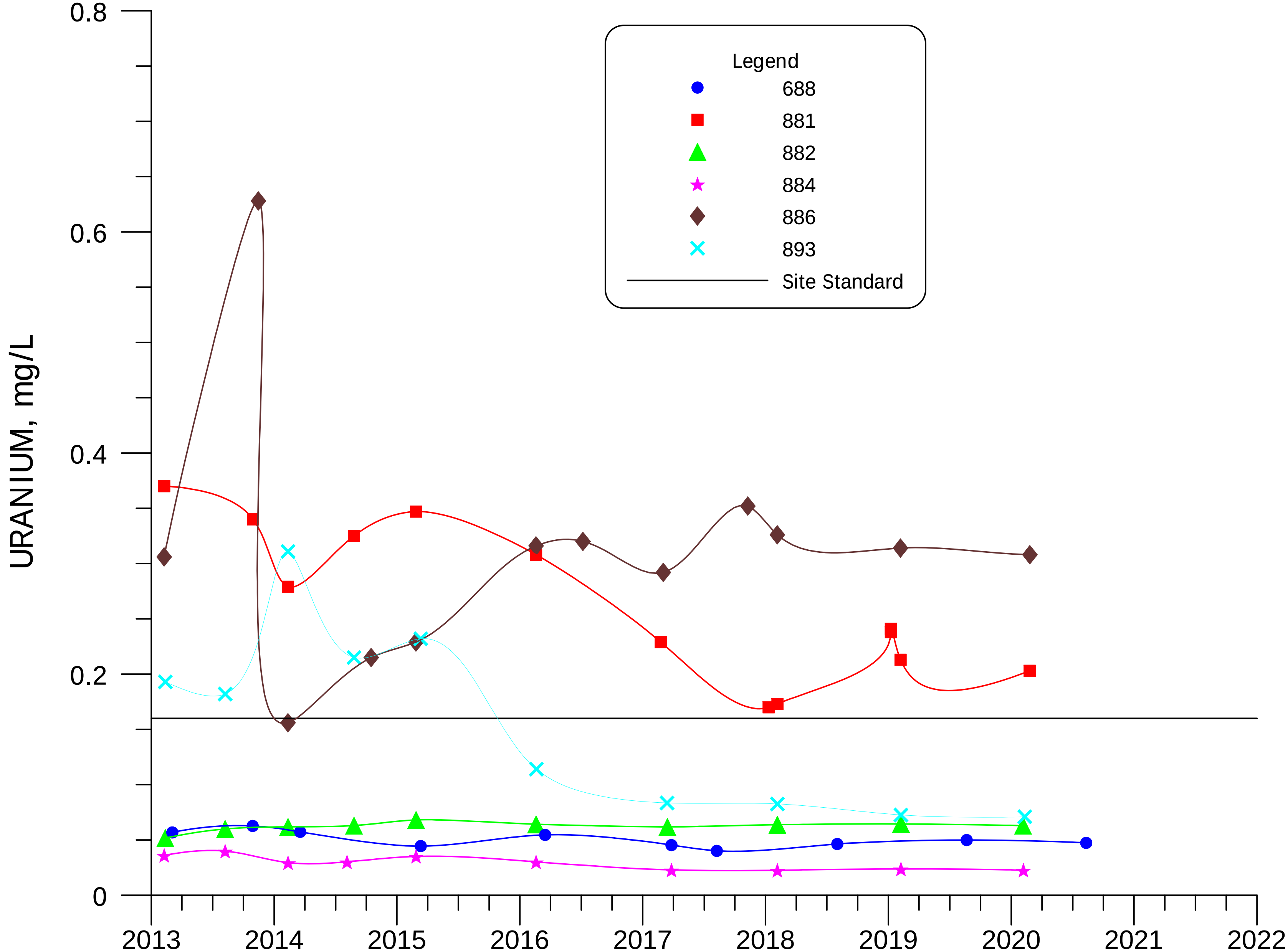


**FIGURE 4.3-67. URANIUM CONCENTRATIONS FOR WELLS 688, 881, 882, 884, 886 AND 893.**

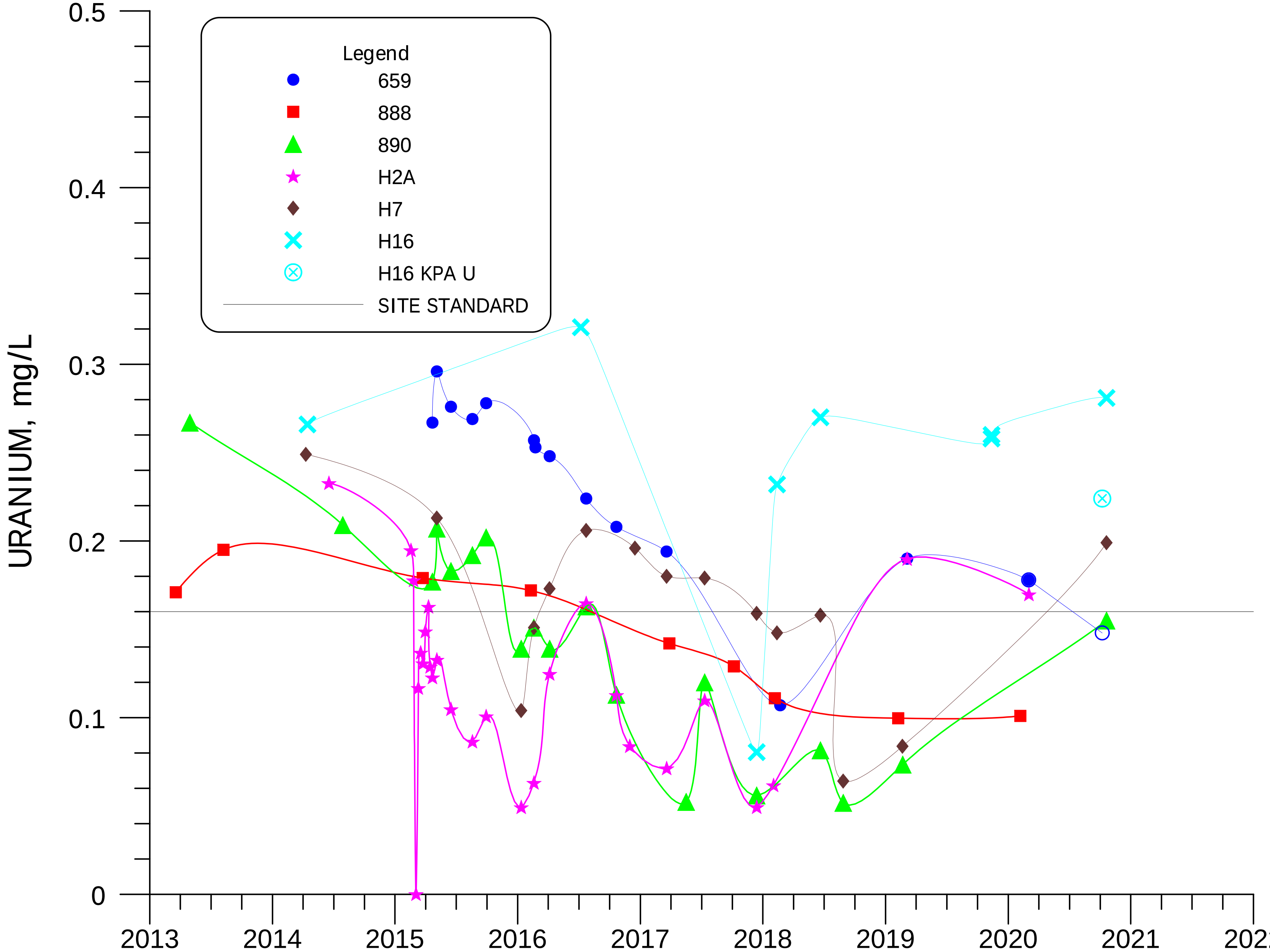


**FIGURE 4.3-67A. URANIUM CONCENTRATIONS FOR WELLS 659, 888, 890, H1, H2A AND H12.**

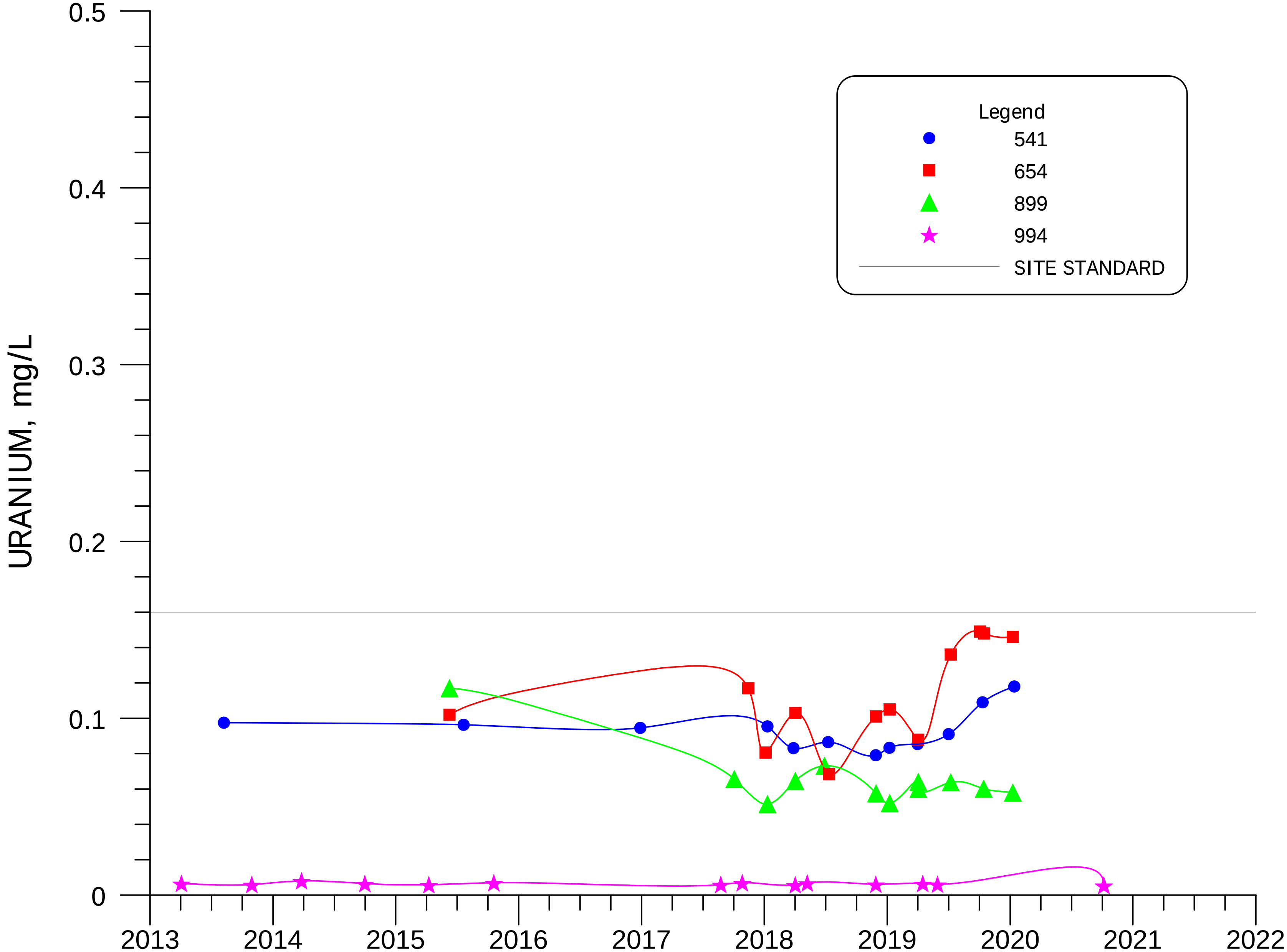


**FIGURE 4.3-68. URANIUM CONCENTRATIONS FOR WELLS 541, 654, 899 and 994.**

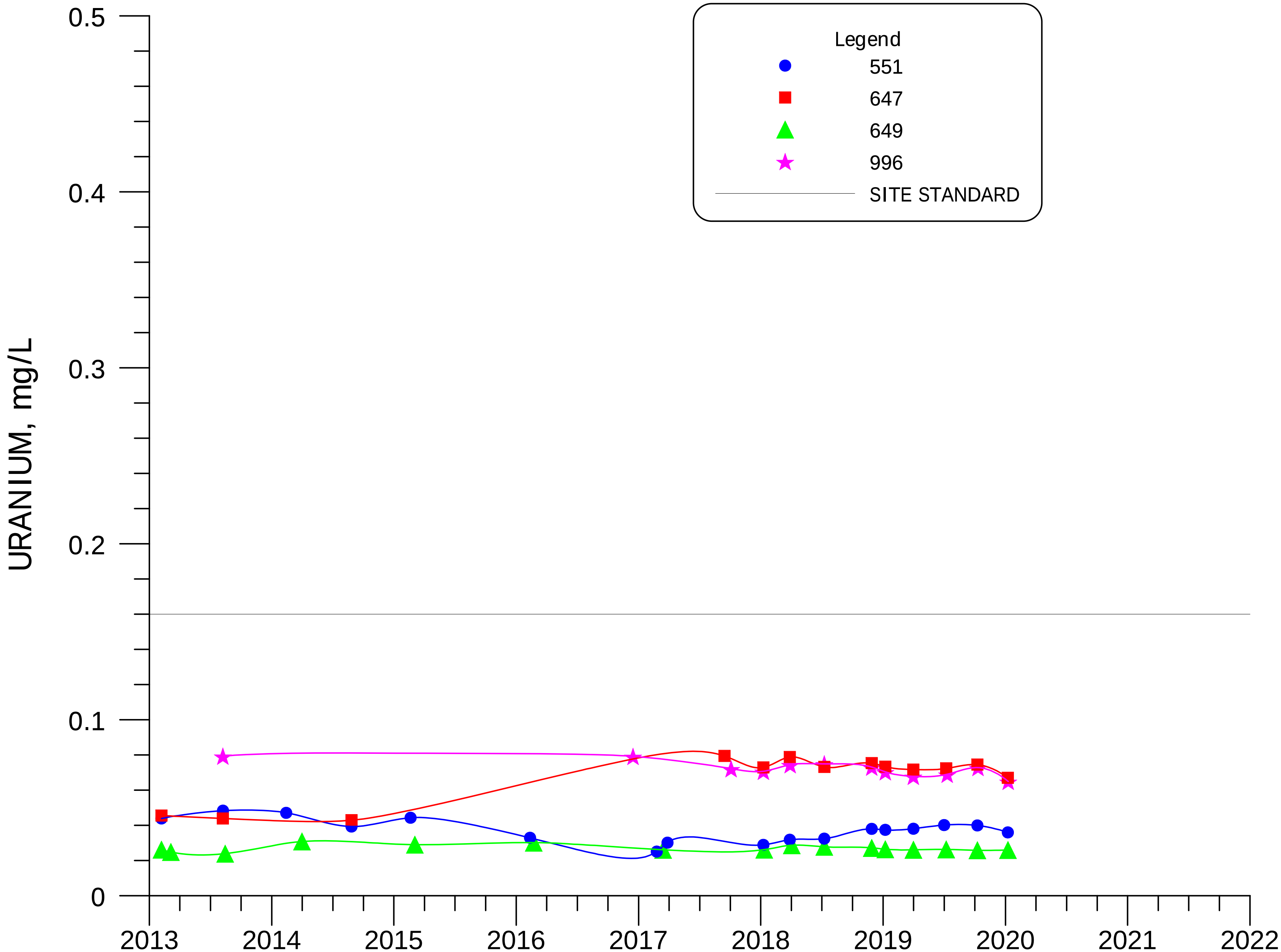


**FIGURE 4.3-69. URANIUM CONCENTRATIONS FOR WELLS 551, 647, 649 AND 996.**

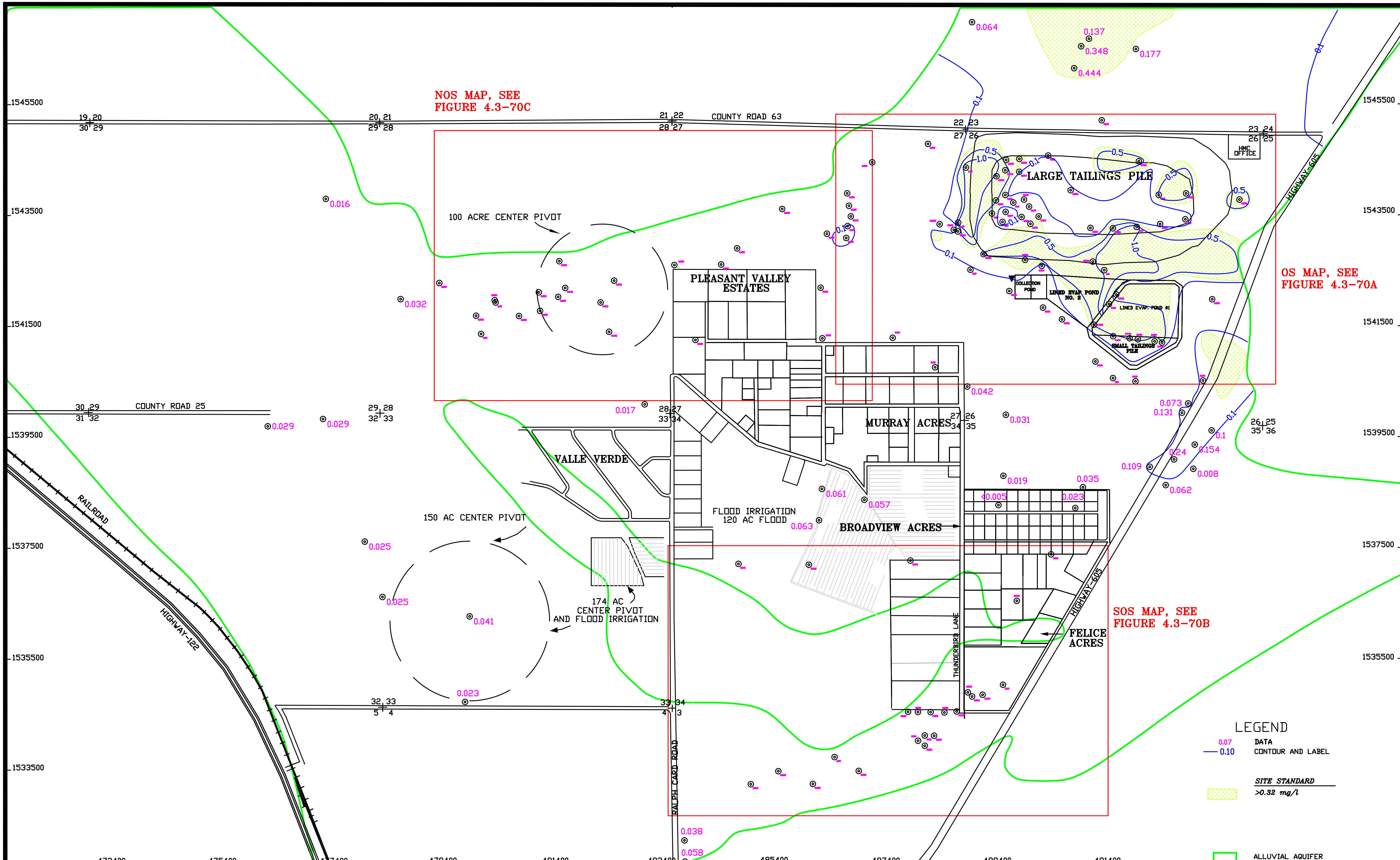


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FIGURE 4.3-70. SELENIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, mg/L

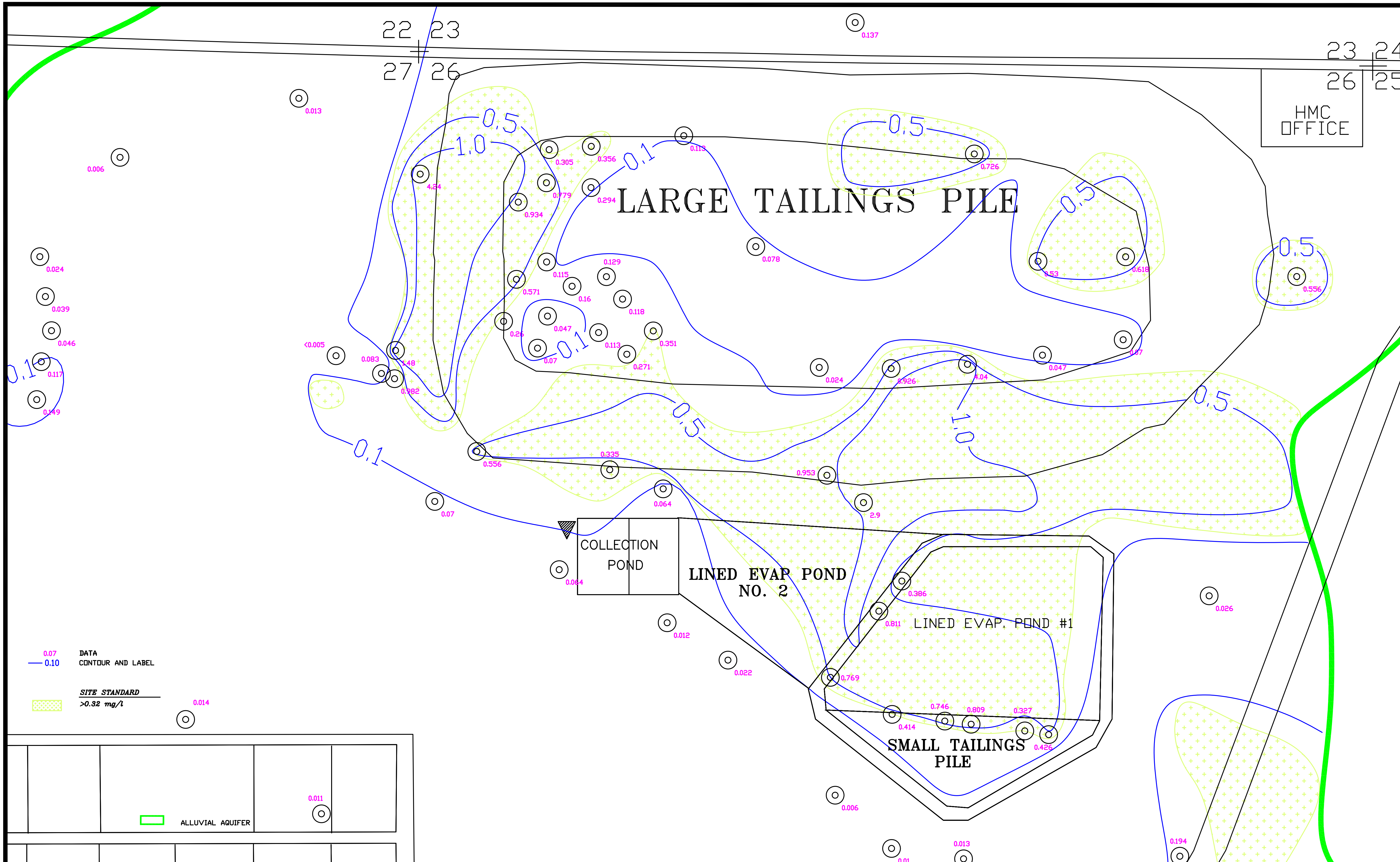


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FIGURE 4.3-70A. SELENIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, mg/L

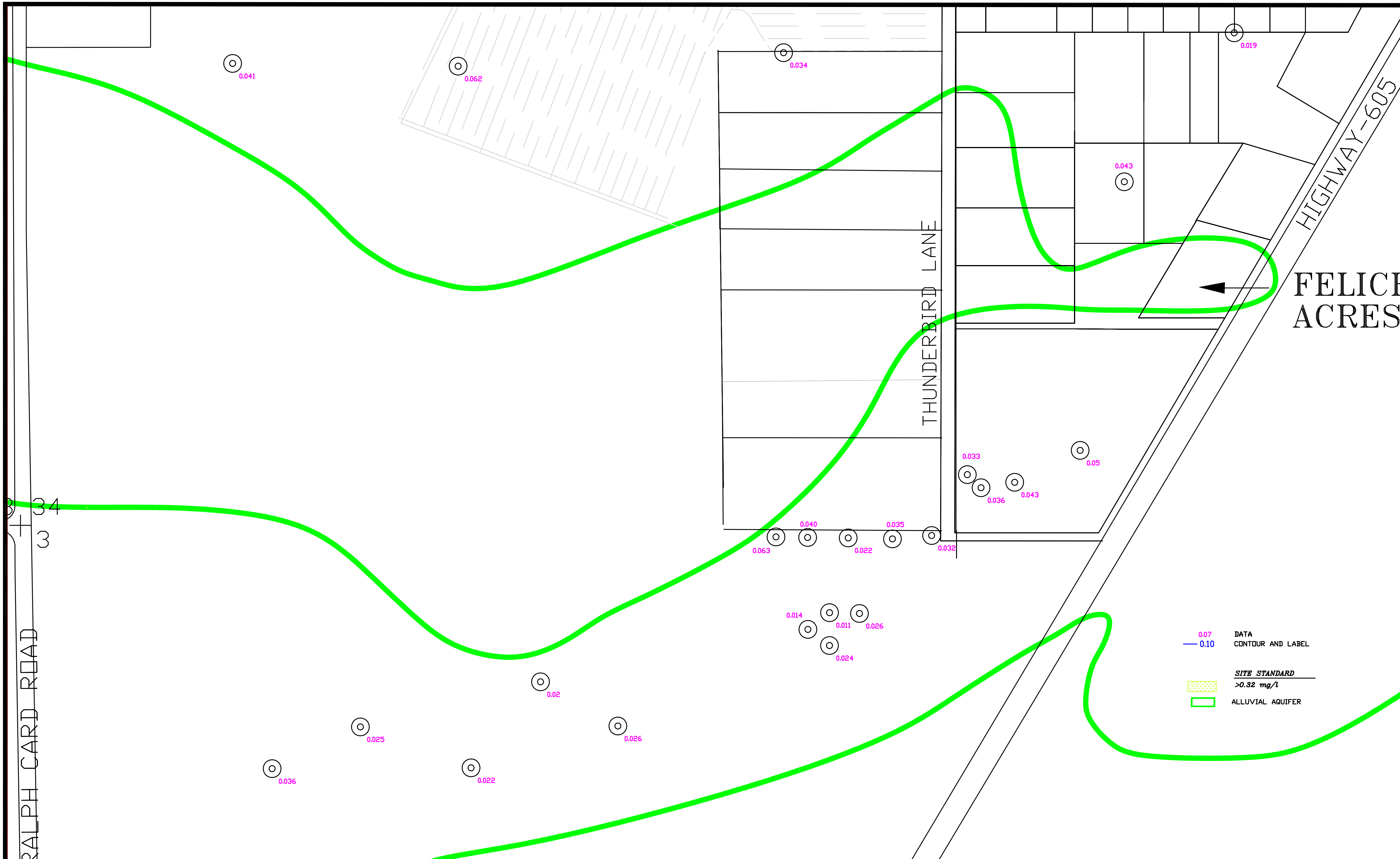


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FIGURE 4.3-70B. SELENIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, mg/L

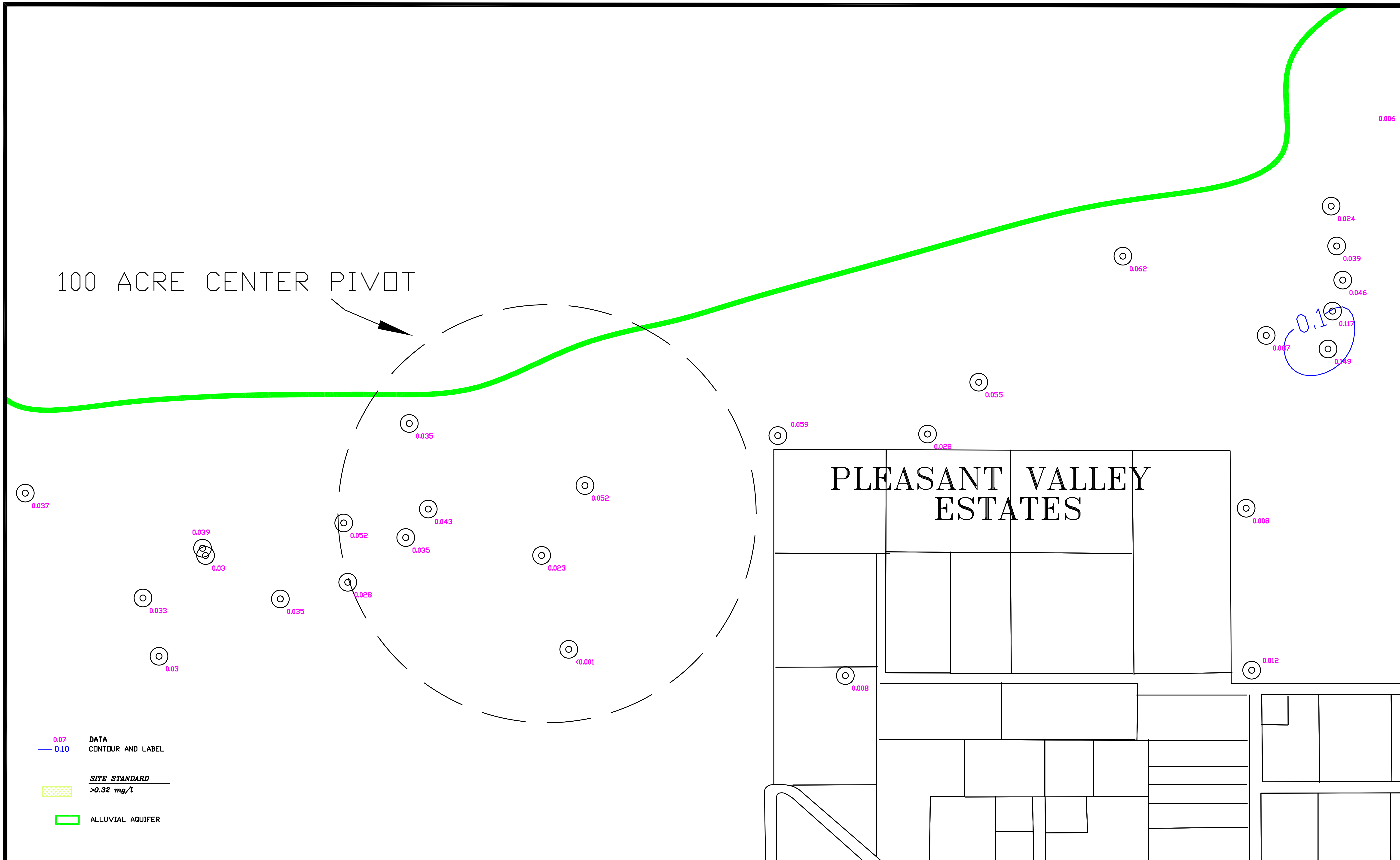


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FIGURE 4.3-70C. SELENIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, mg/L

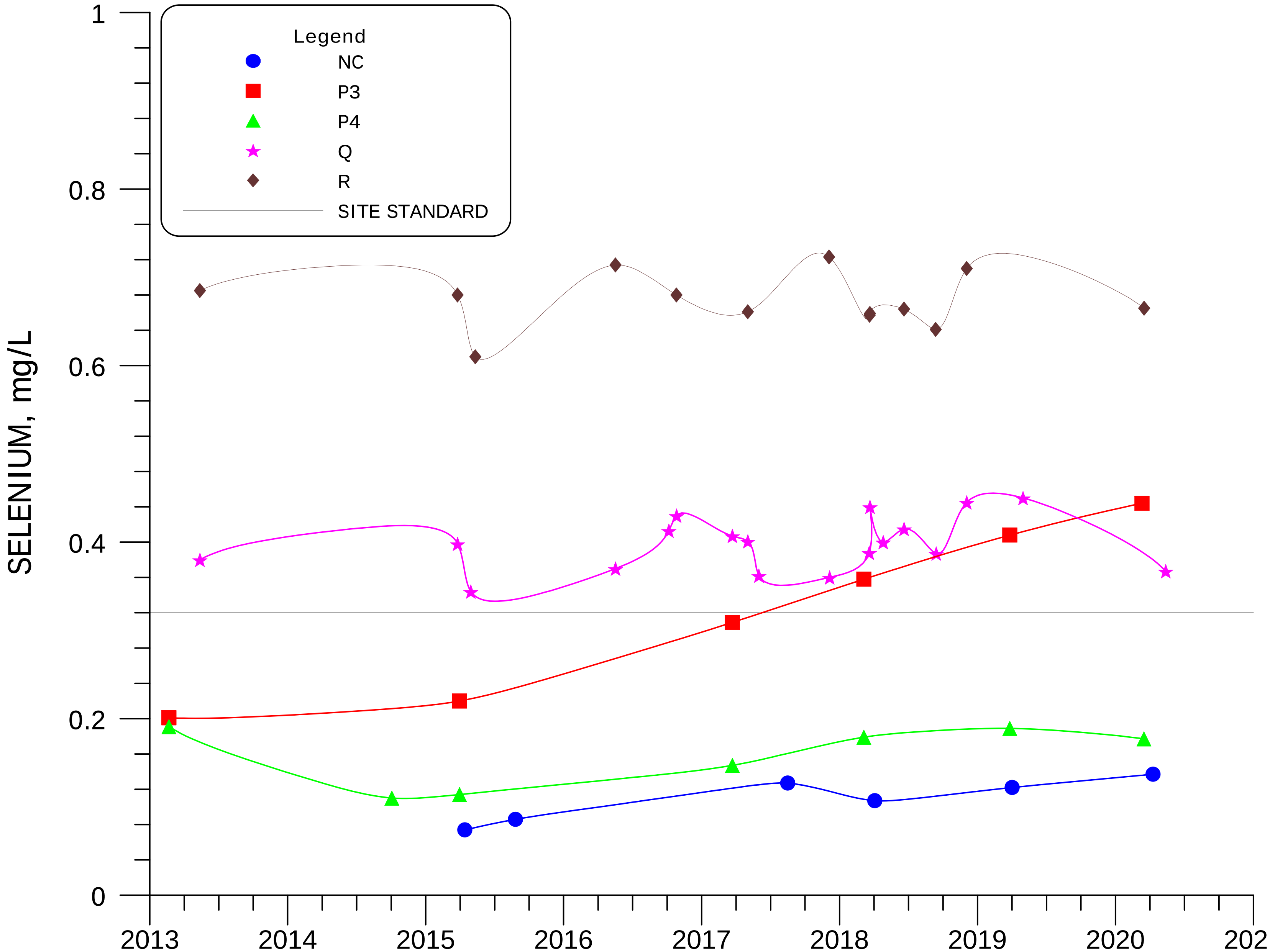


**FIGURE 4.3-71. SELENIUM CONCENTRATIONS FOR WELLS NC, P3, P4, Q AND R.**

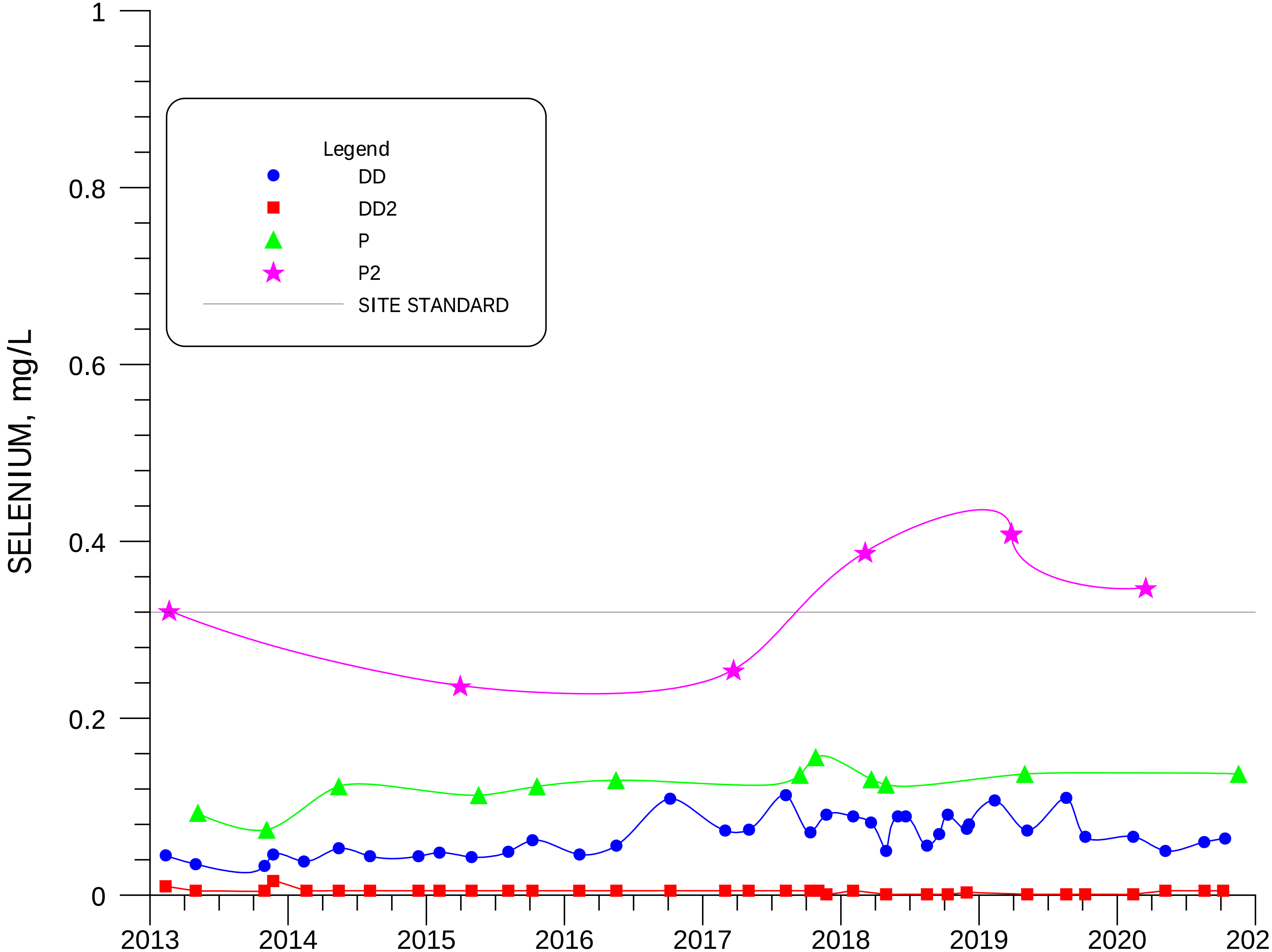


**FIGURE 4.3-71A. SELENIUM CONCENTRATIONS FOR WELLS DD, DD2, P AND P2.**

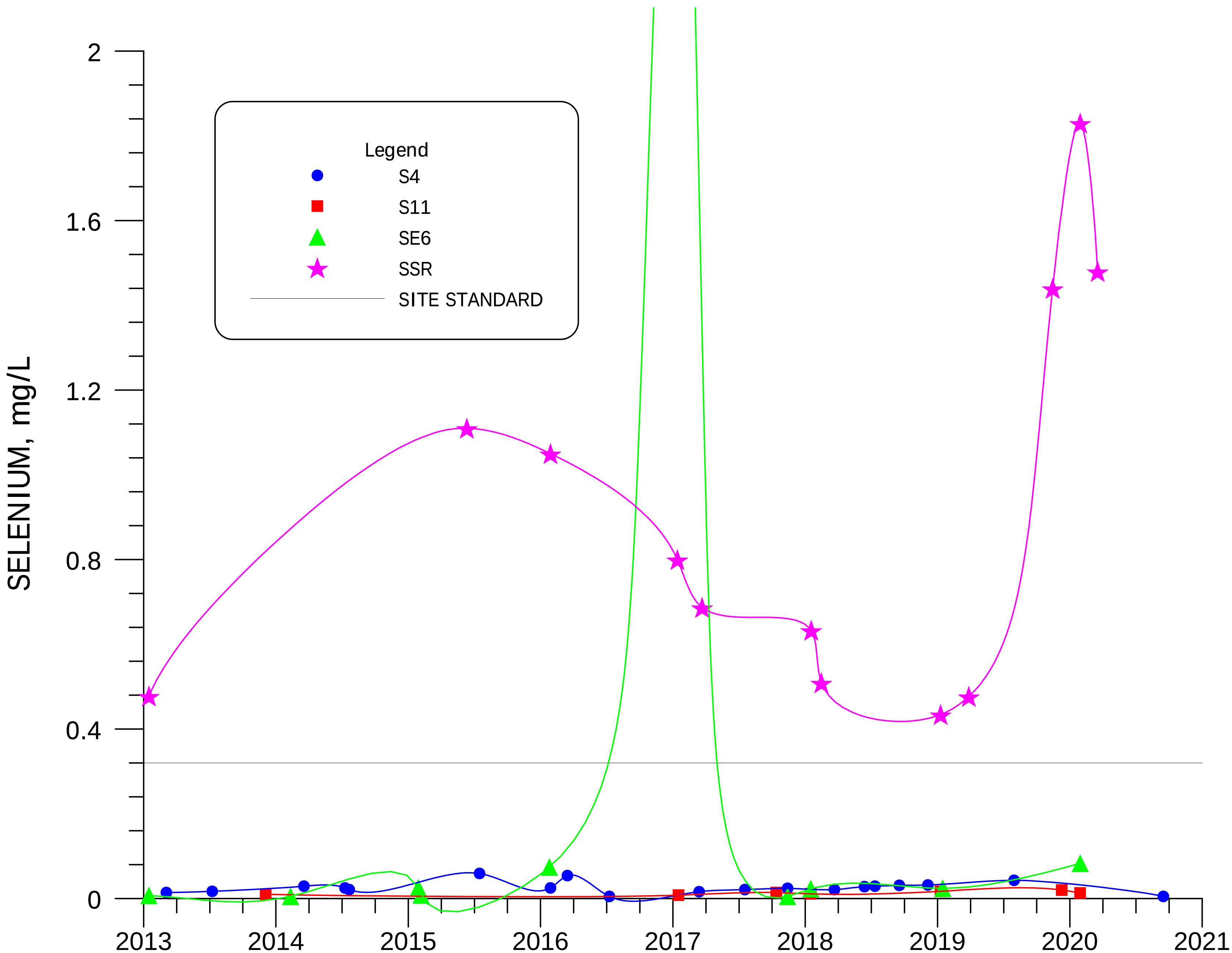


**FIGURE 4.3-72. SELENIUM CONCENTRATIONS FOR WELLS S4, S11, SE6 AND SSR.**

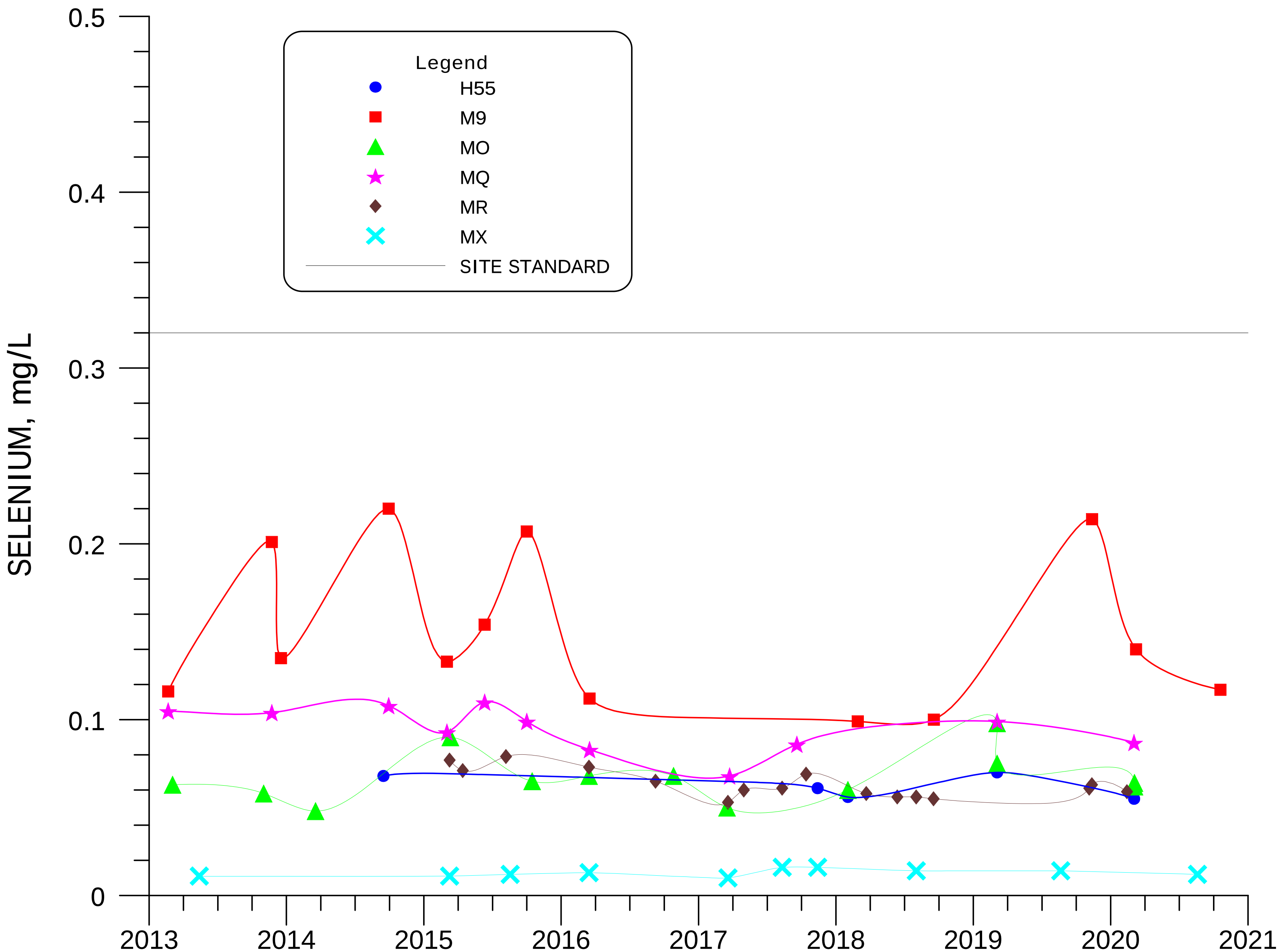


**FIGURE 4.3-73. SELENIUM CONCENTRATIONS FOR WELLS H55, M9, MO, MQ, MR AND MX.**

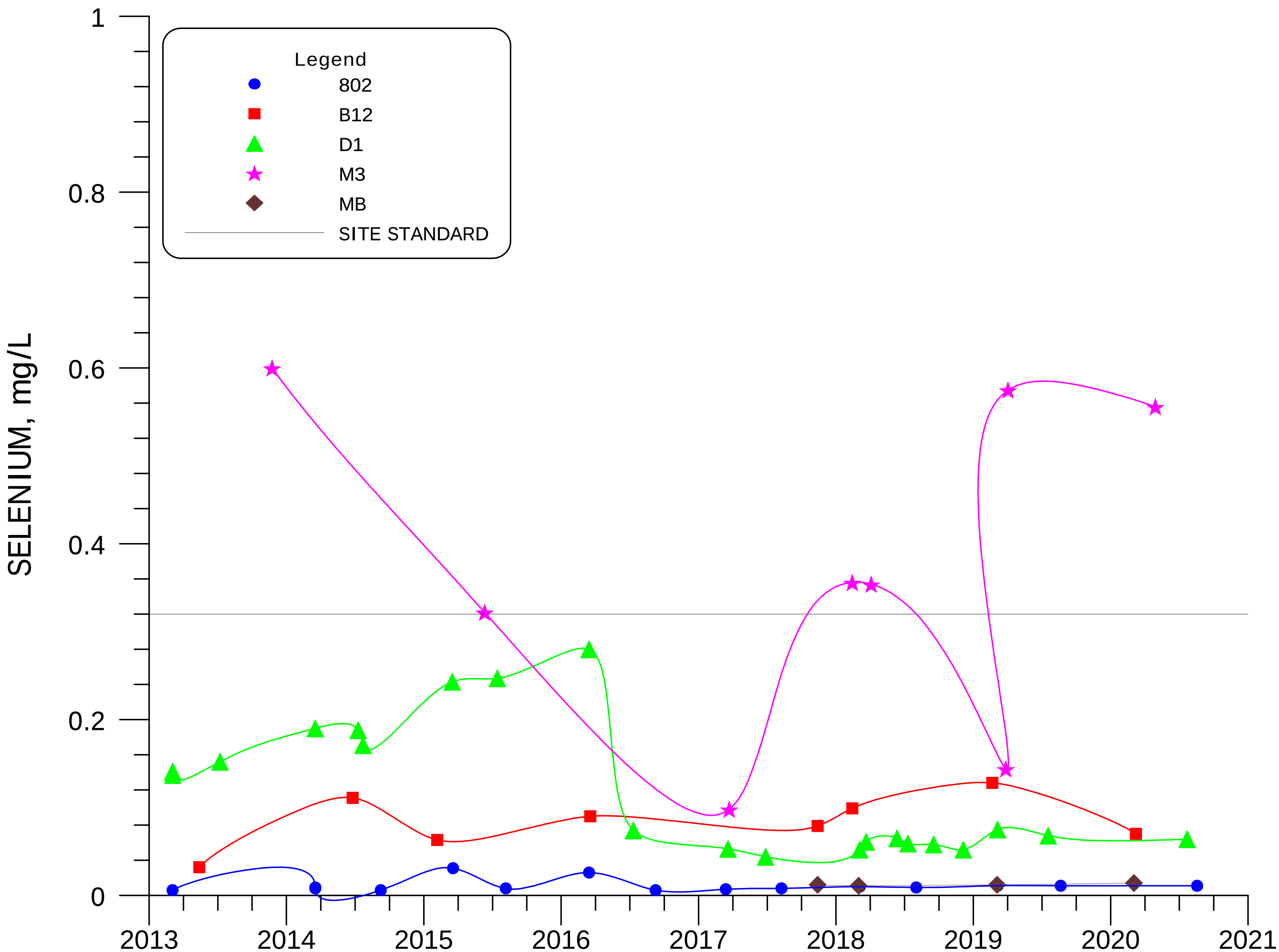


**FIGURE 4.3-74. SELENIUM CONCENTRATIONS FOR WELLS 802, B12, D1, M3 AND MB.**

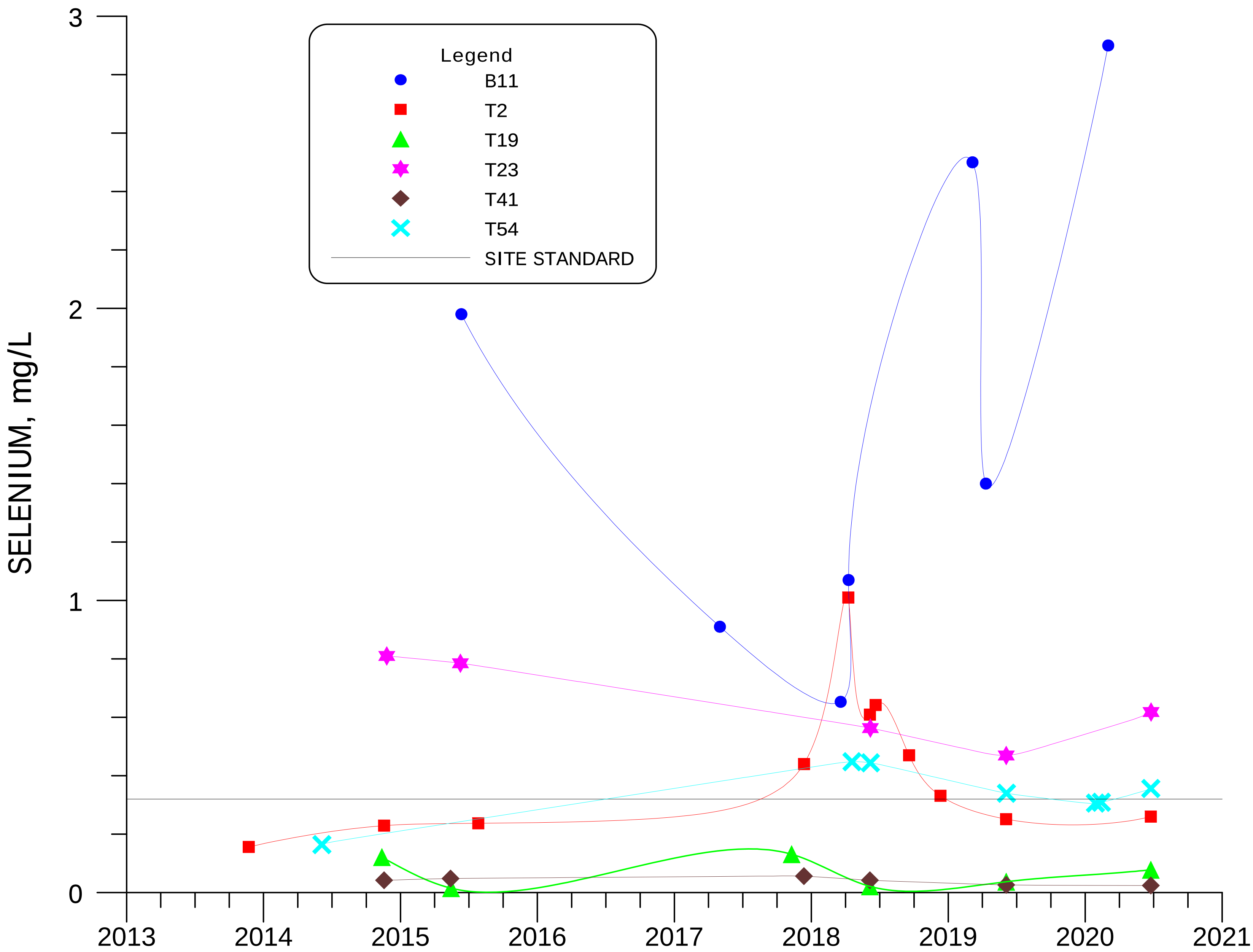


**FIGURE 4.3-75. SELENIUM CONCENTRATIONS FOR WELLS B11, T2, T19, T23, T41 AND T54.**

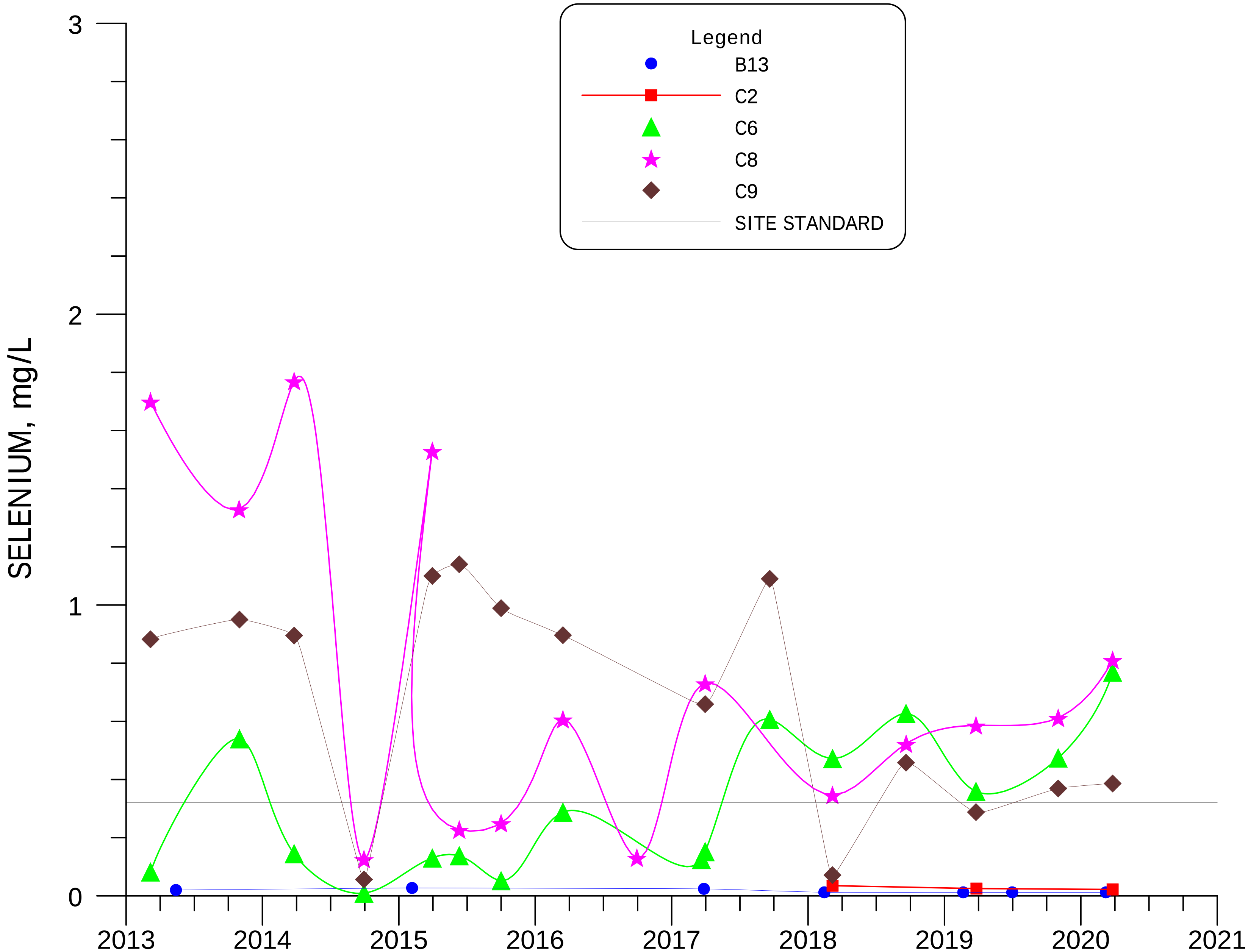


**FIGURE 4.3-76. SELENIUM CONCENTRATIONS FOR WELLS B13, C2, C6, C8 AND C9.**

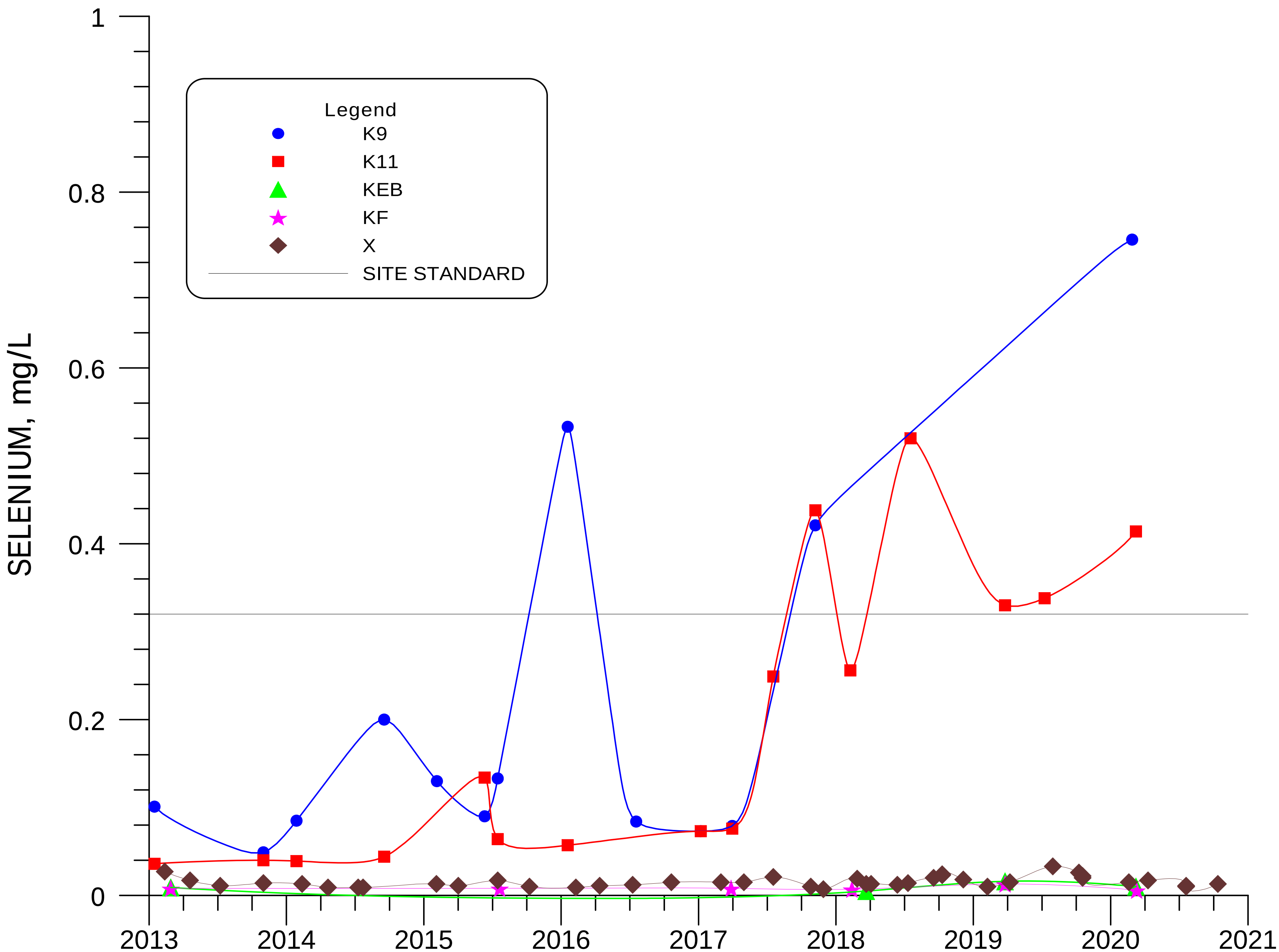


**FIGURE 4.3-77. SELENIUM CONCENTRATIONS FOR WELLS K9, K11, KEB, KF AND X.**

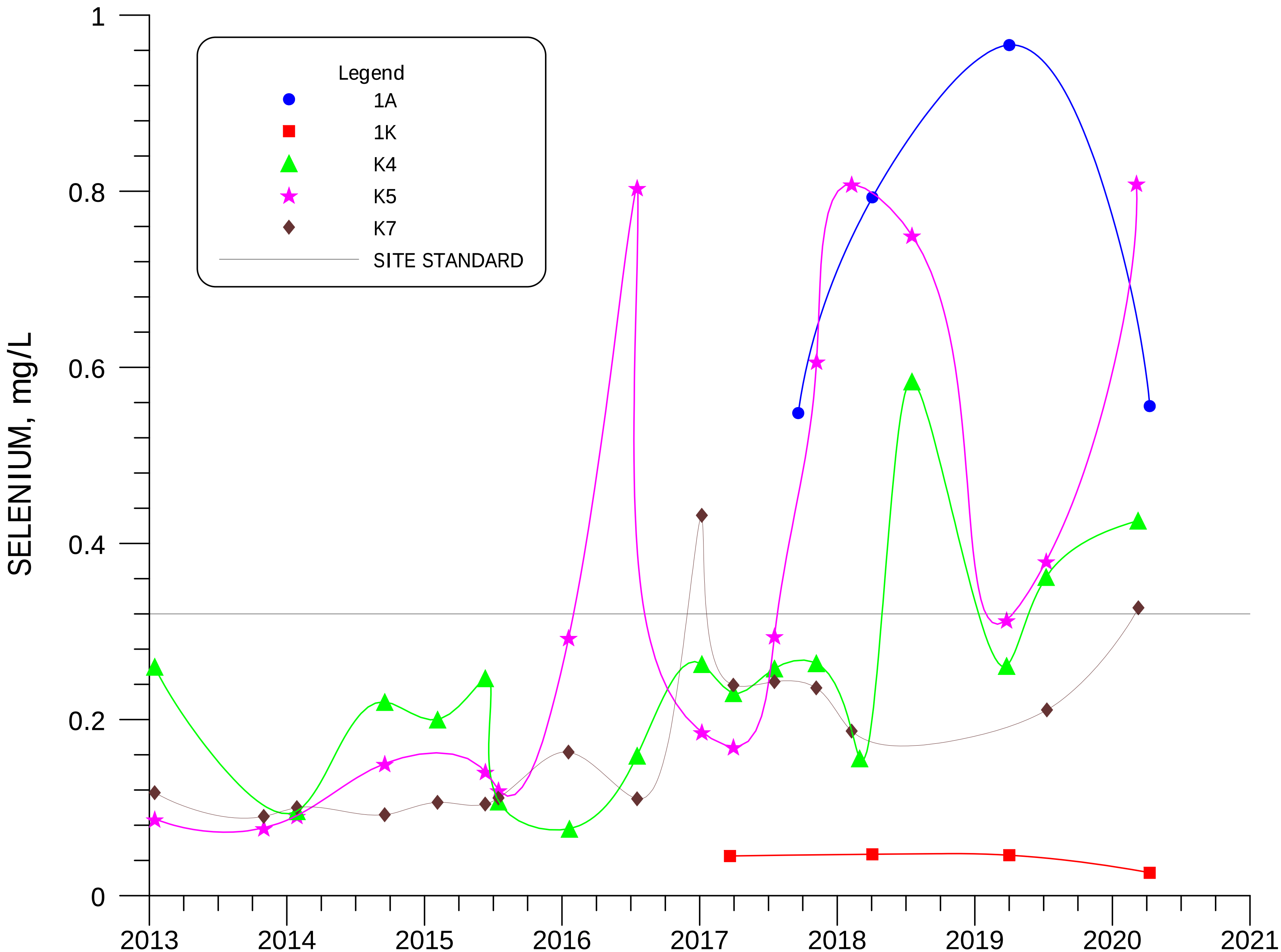


**FIGURE 4.3-78. SELENIUM CONCENTRATIONS FOR WELLS 1A, 1K, K4, K5 AND K7.**

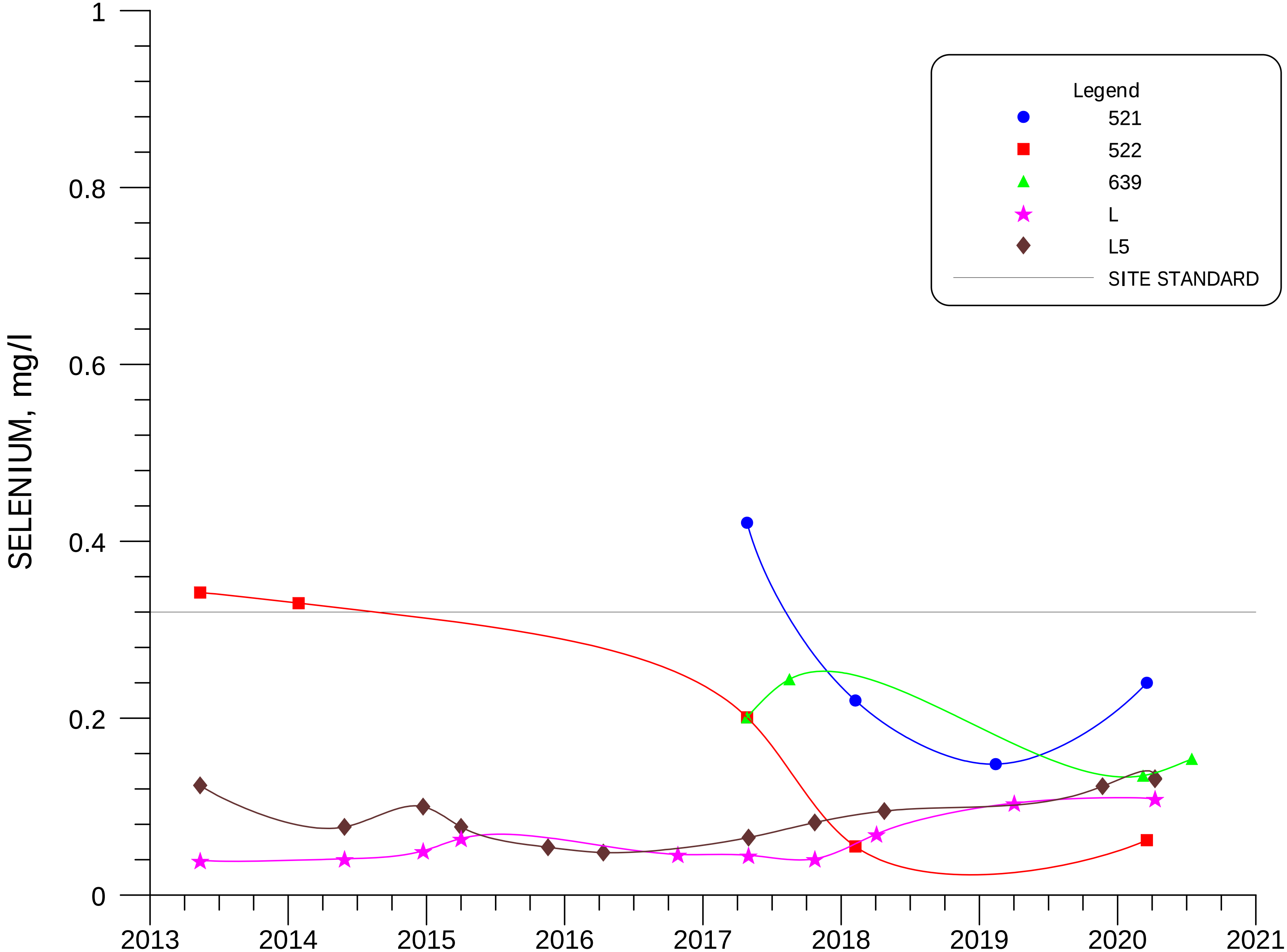


**FIGURE 4.3-79. SELENIUM CONCENTRATIONS FOR WELLS 521, 522, 639, L AND L5.**

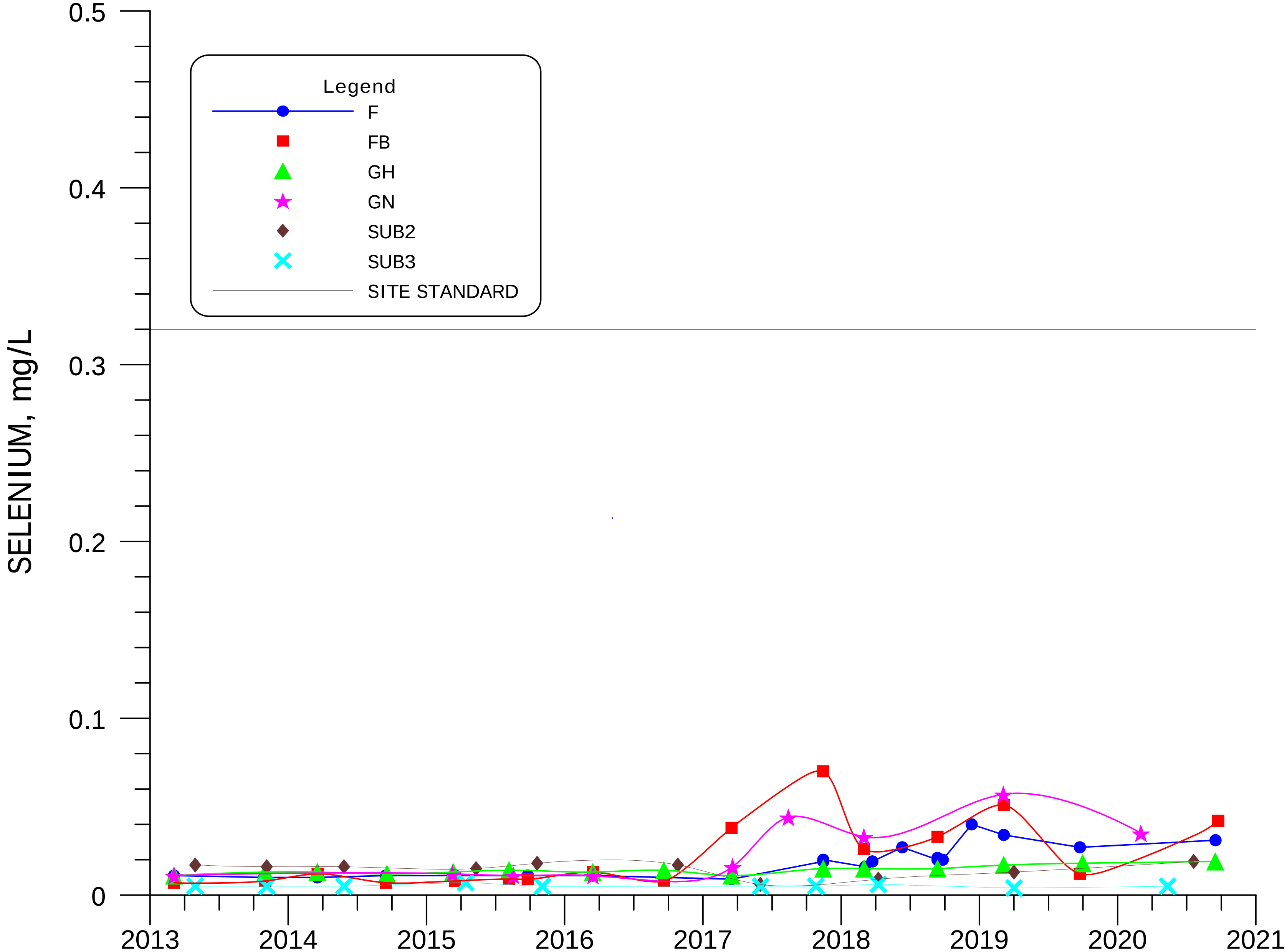


**FIGURE 4.3-80. SELENIUM CONCENTRATIONS FOR WELLS F, FB, GH, GN, SUB2 AND SUB3.**

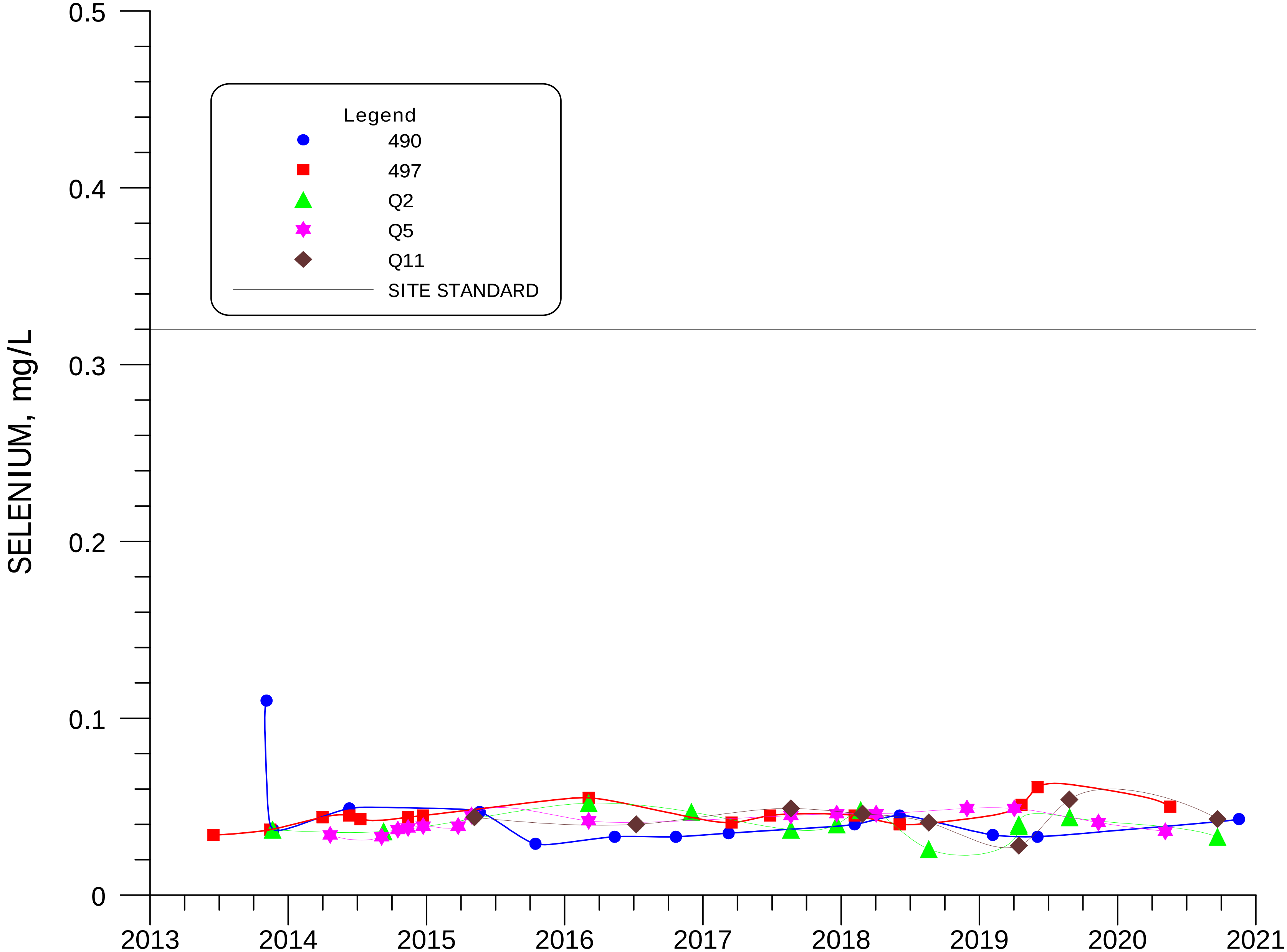


**FIGURE 4.3-81. SELENIUM CONCENTRATIONS FOR WELLS 490, 497, Q2, Q5 AND Q11.**

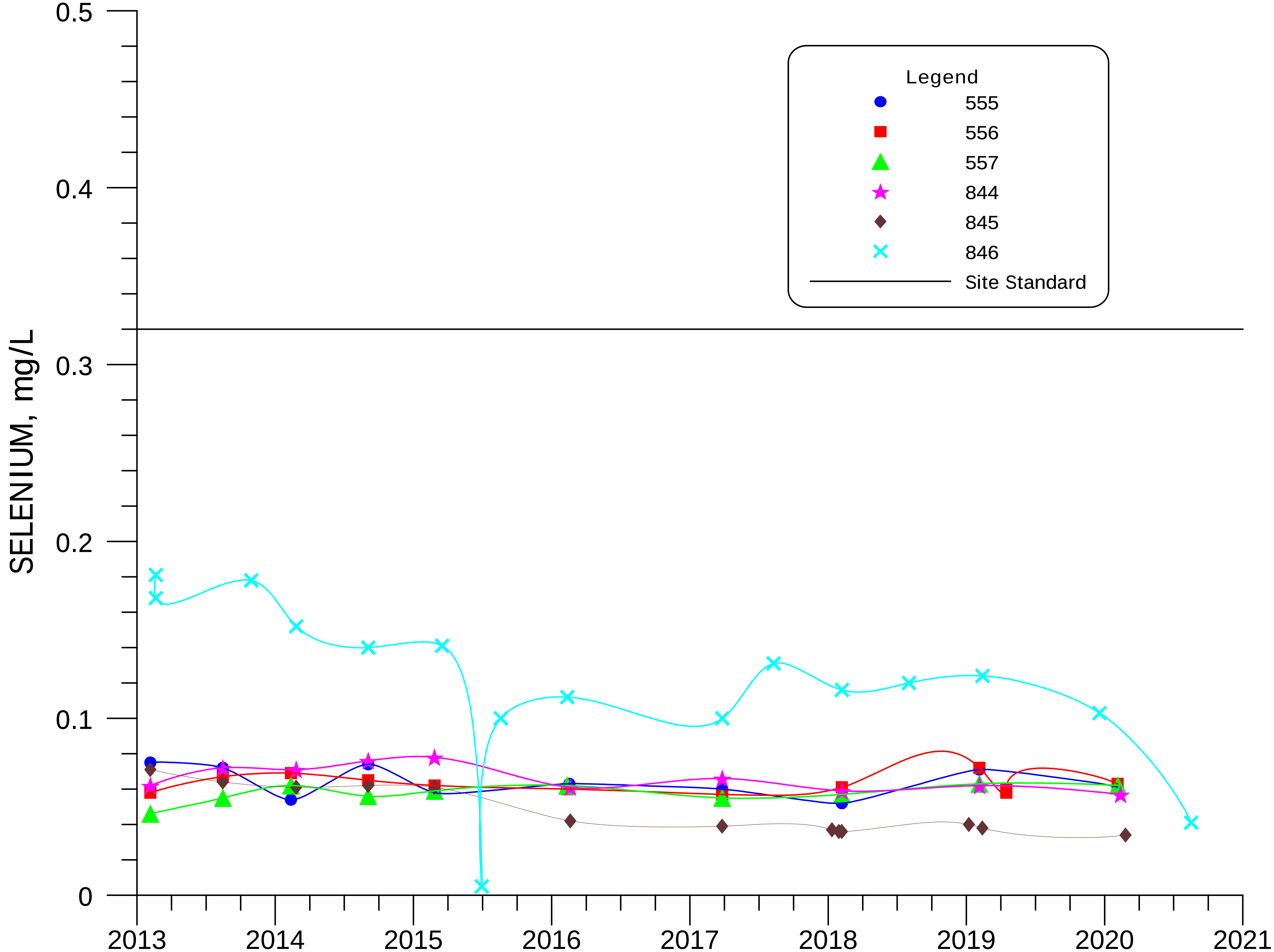


**FIGURE 4.3-82. SELENIUM CONCENTRATIONS FOR WELLS 555, 556, 557, 844, 845, AND 846.**

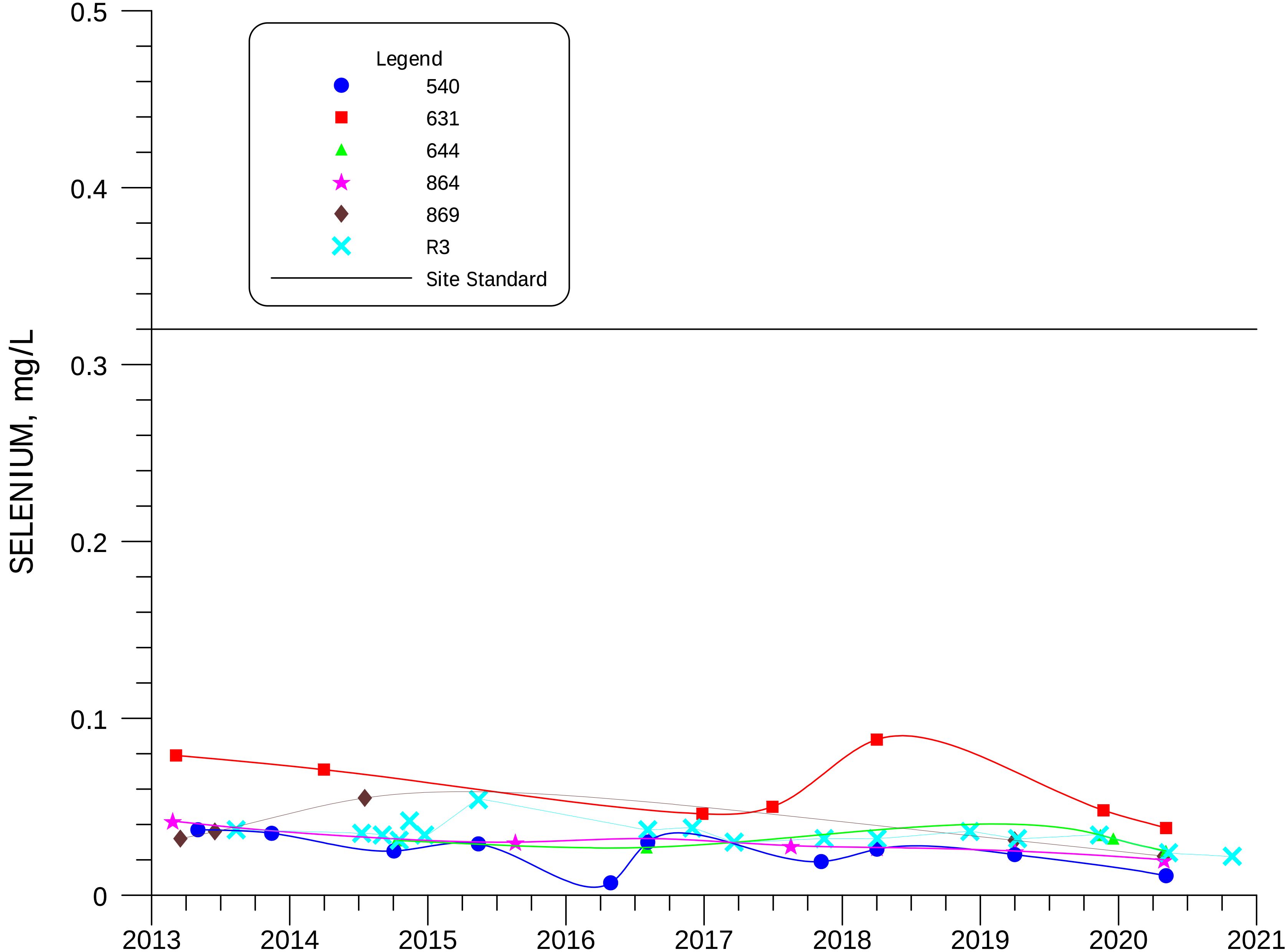


**FIGURE 4.3-83. SELENIUM CONCENTRATIONS FOR WELLS 540, 631, 644, 864, 869 AND R3.**

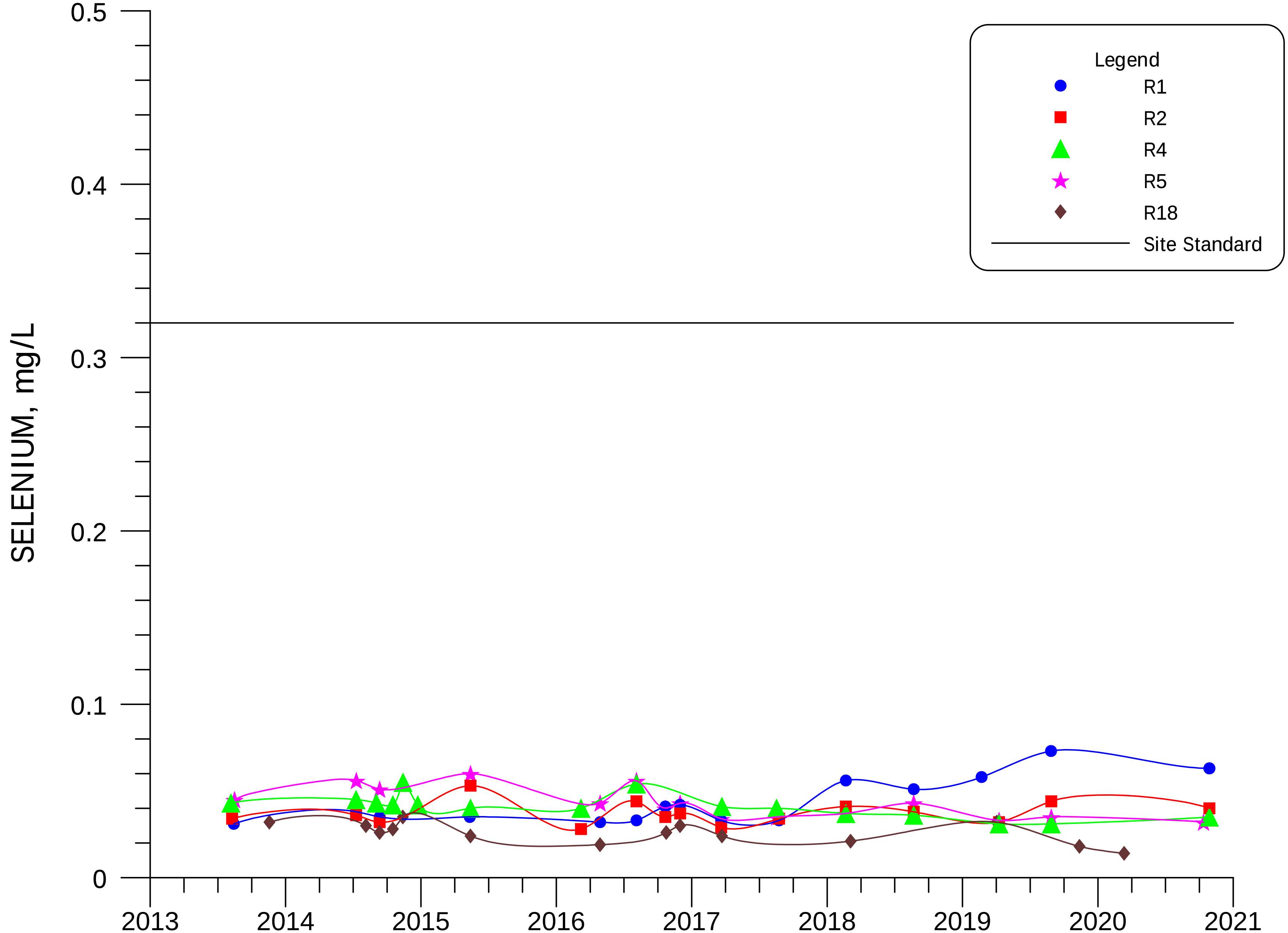


**FIGURE 4.3-83A. SELENIUM CONCENTRATIONS FOR WELLS R1, R2, R4, R5 AND R18.**

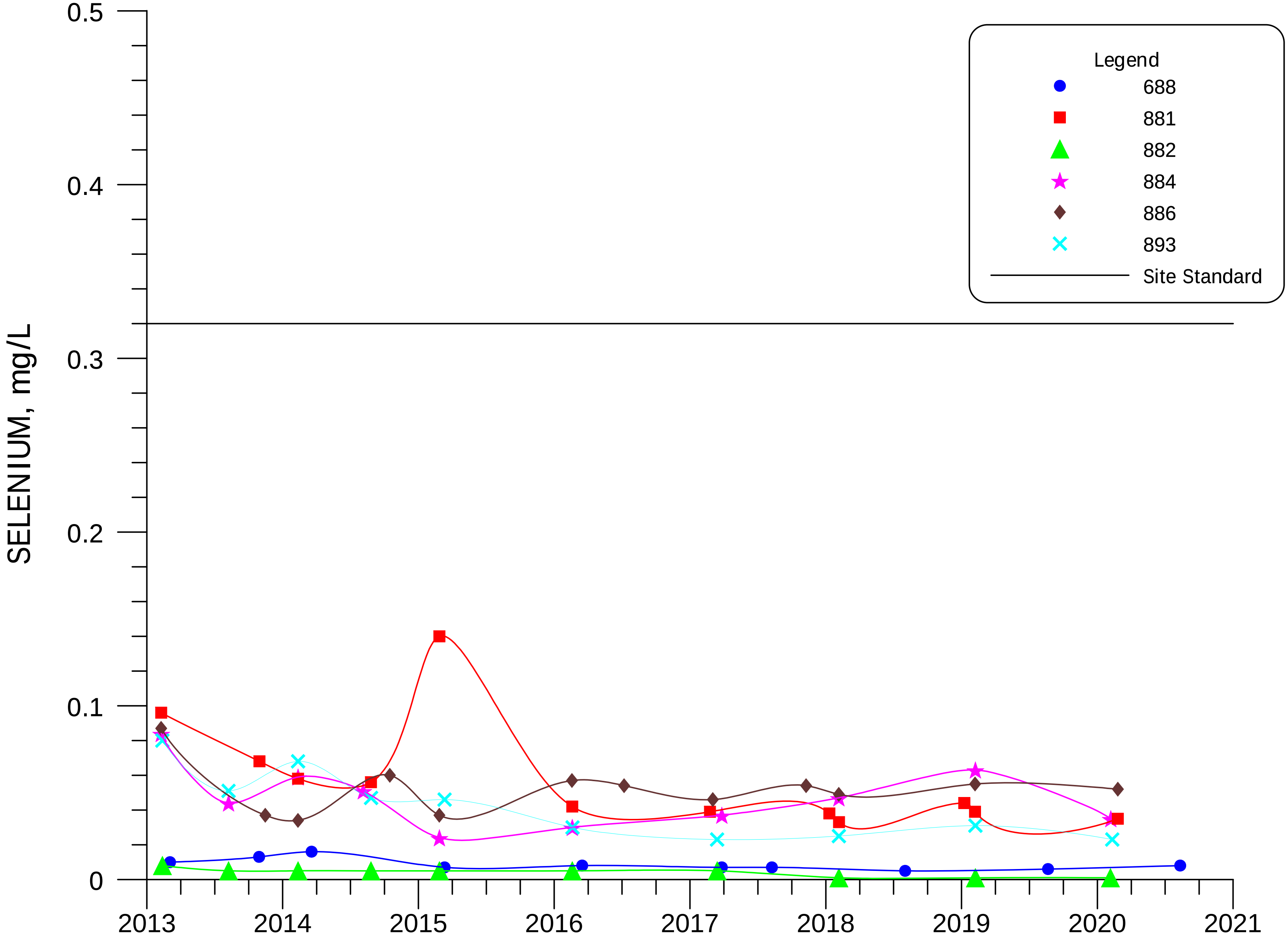


**FIGURE 4.3-84. SELENIUM CONCENTRATIONS FOR WELLS 688, 881, 882, 884, 886, AND 893.**

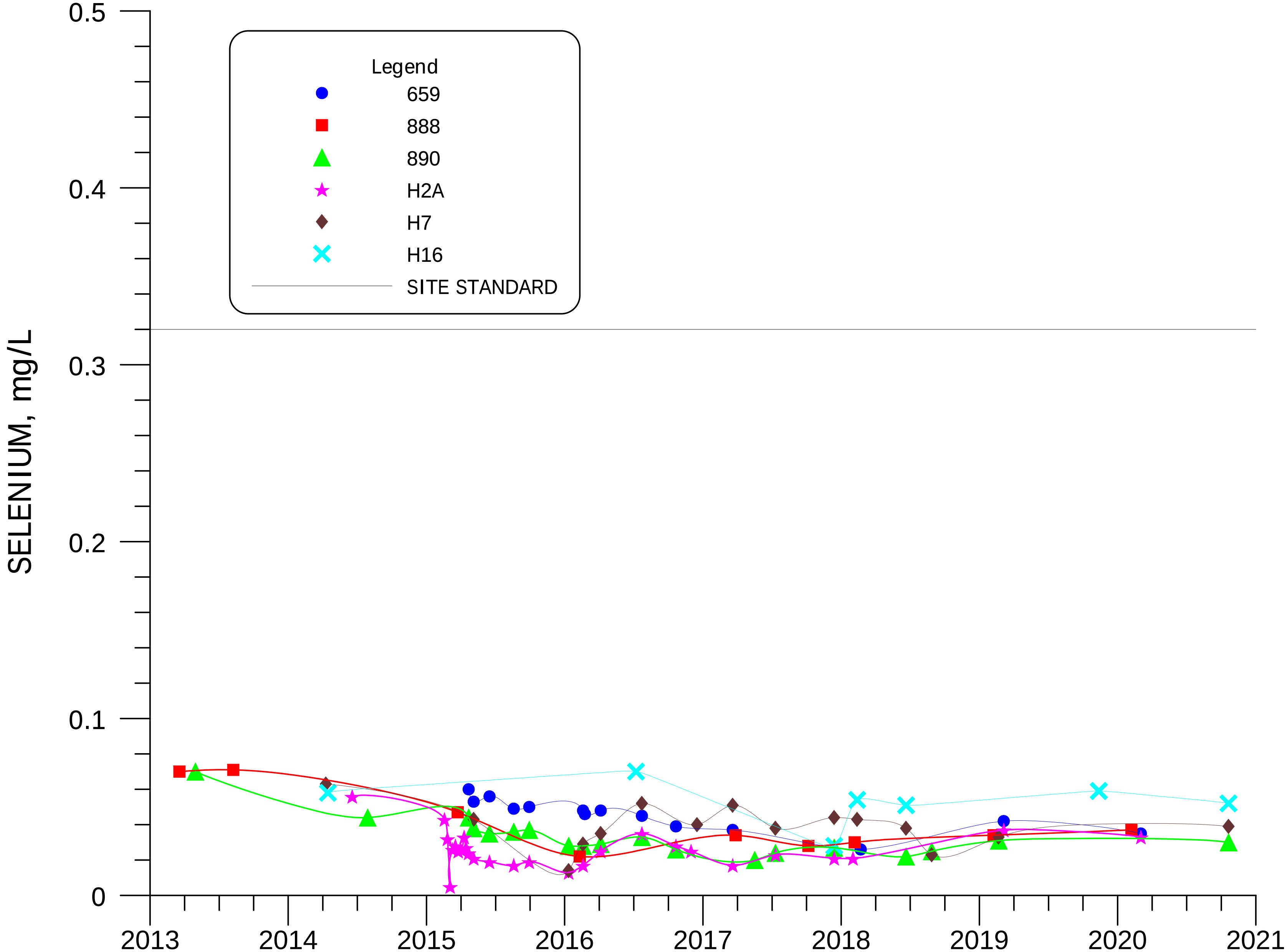


**FIGURE 4.3-84A. SELENIUM CONCENTRATIONS FOR WELLS 659, 888, 890, H2A, H7 AND H16.**

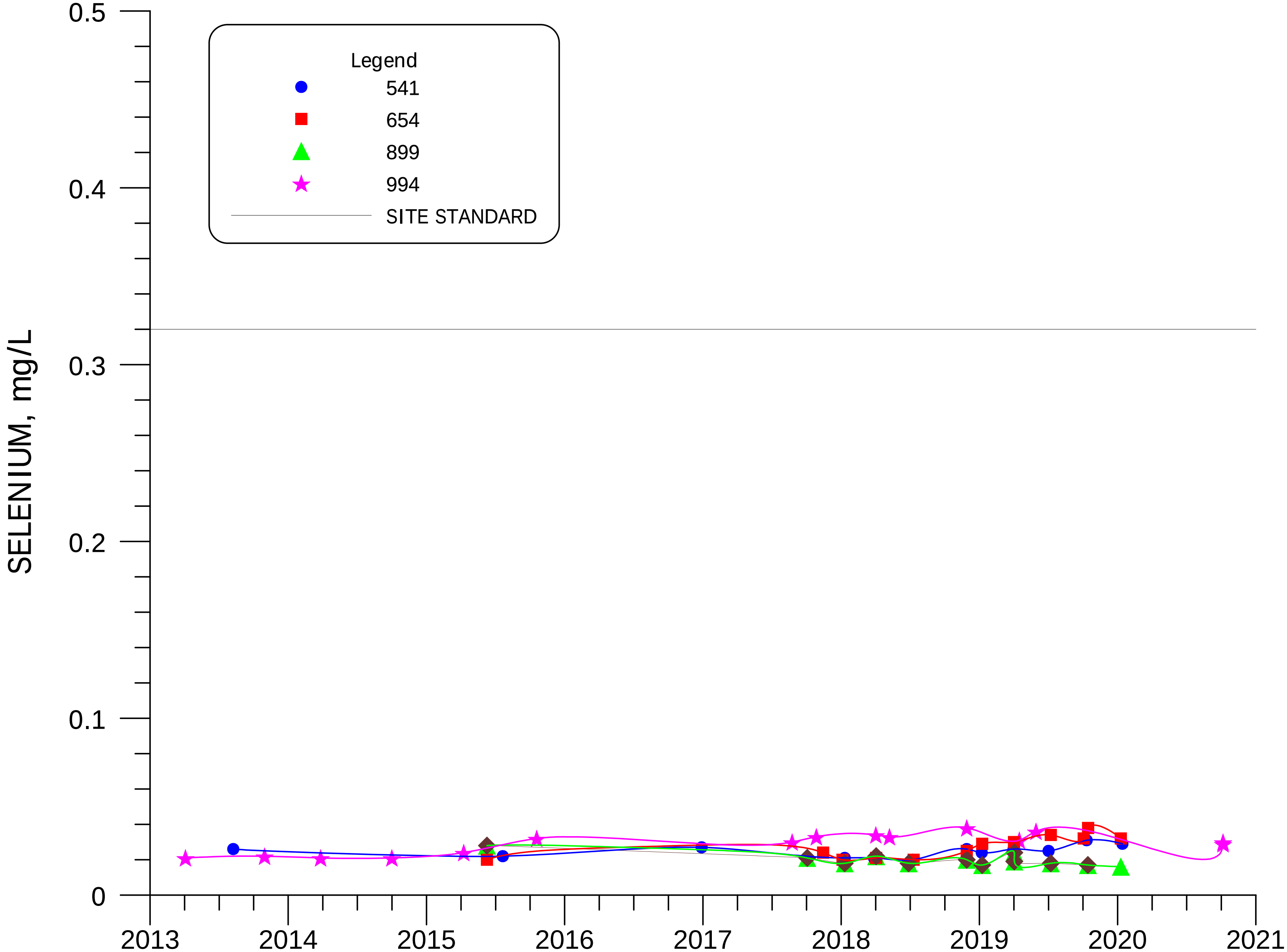


**FIGURE 4.3-85. SELENIUM CONCENTRATIONS FOR WELLS 541, 654, 899 and 994.**

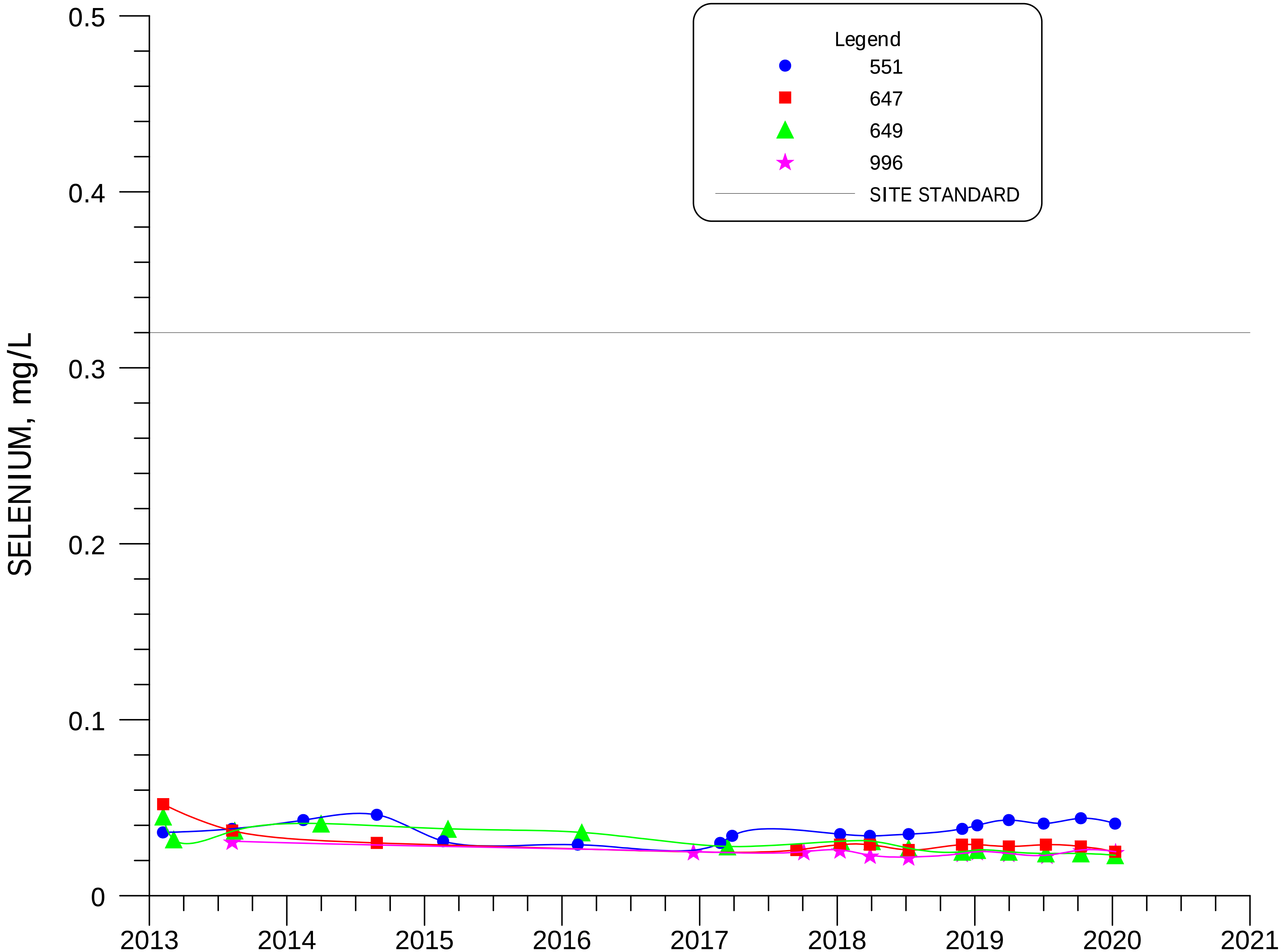


**FIGURE 4.3-86. SELENIUM CONCENTRATIONS FOR WELLS 551, 647, 649 AND 996.**

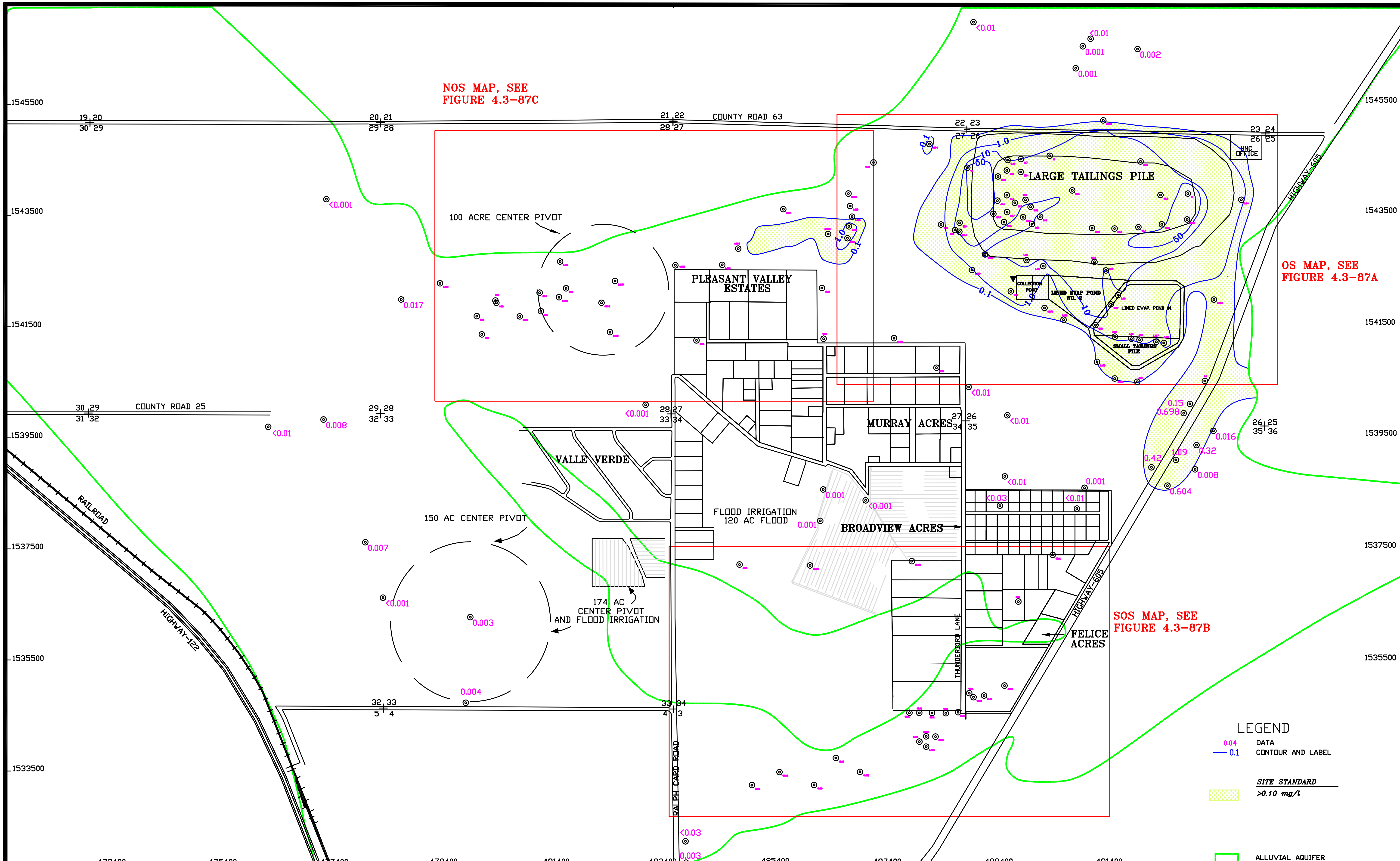


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FIGURE 4.3-87. MOLYBDENUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, mg/L

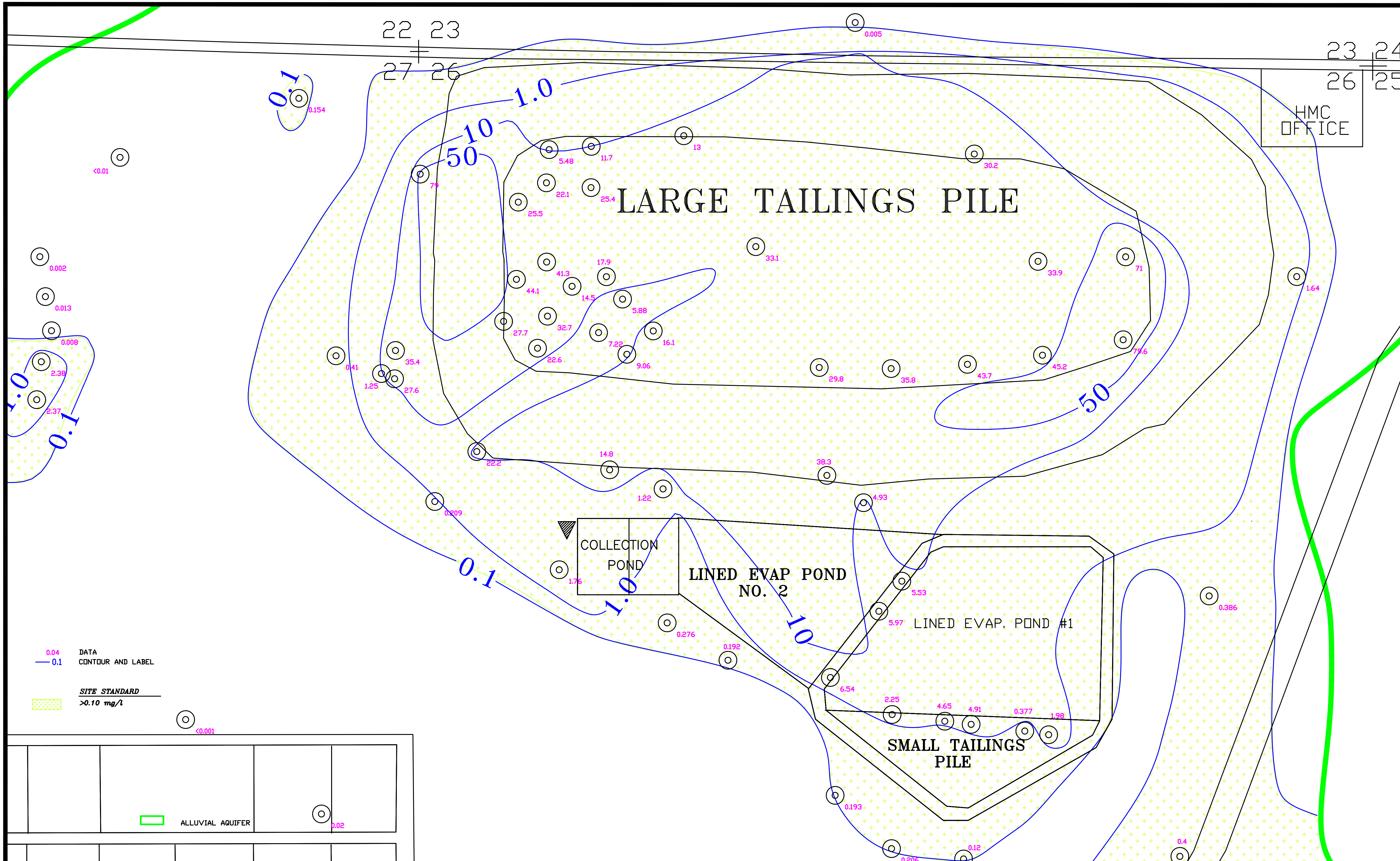


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FIGURE 4.3-87A. MOLYBDENUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, mg/L

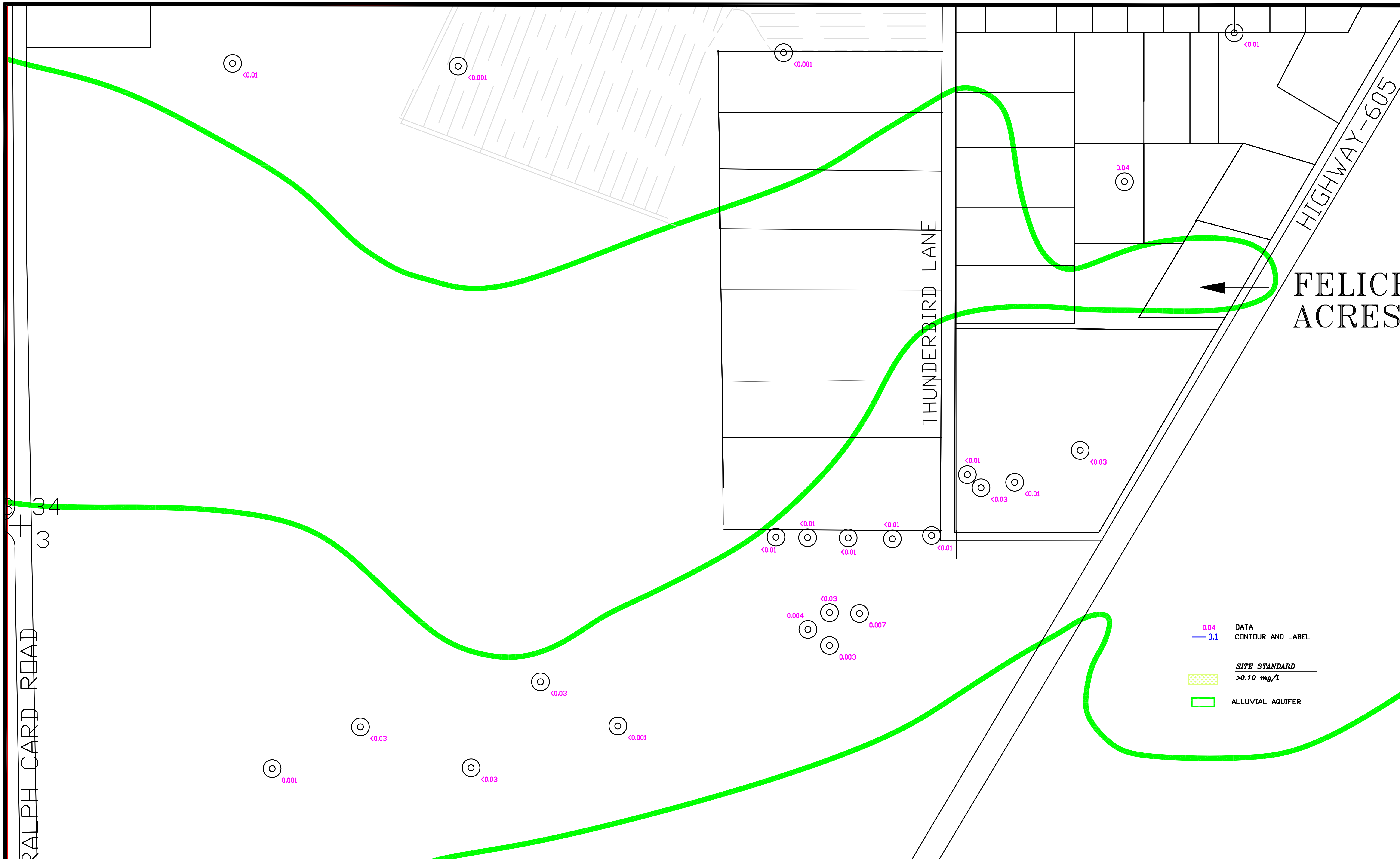


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FIGURE 4.3-87B. MOLYBDENUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, mg/L

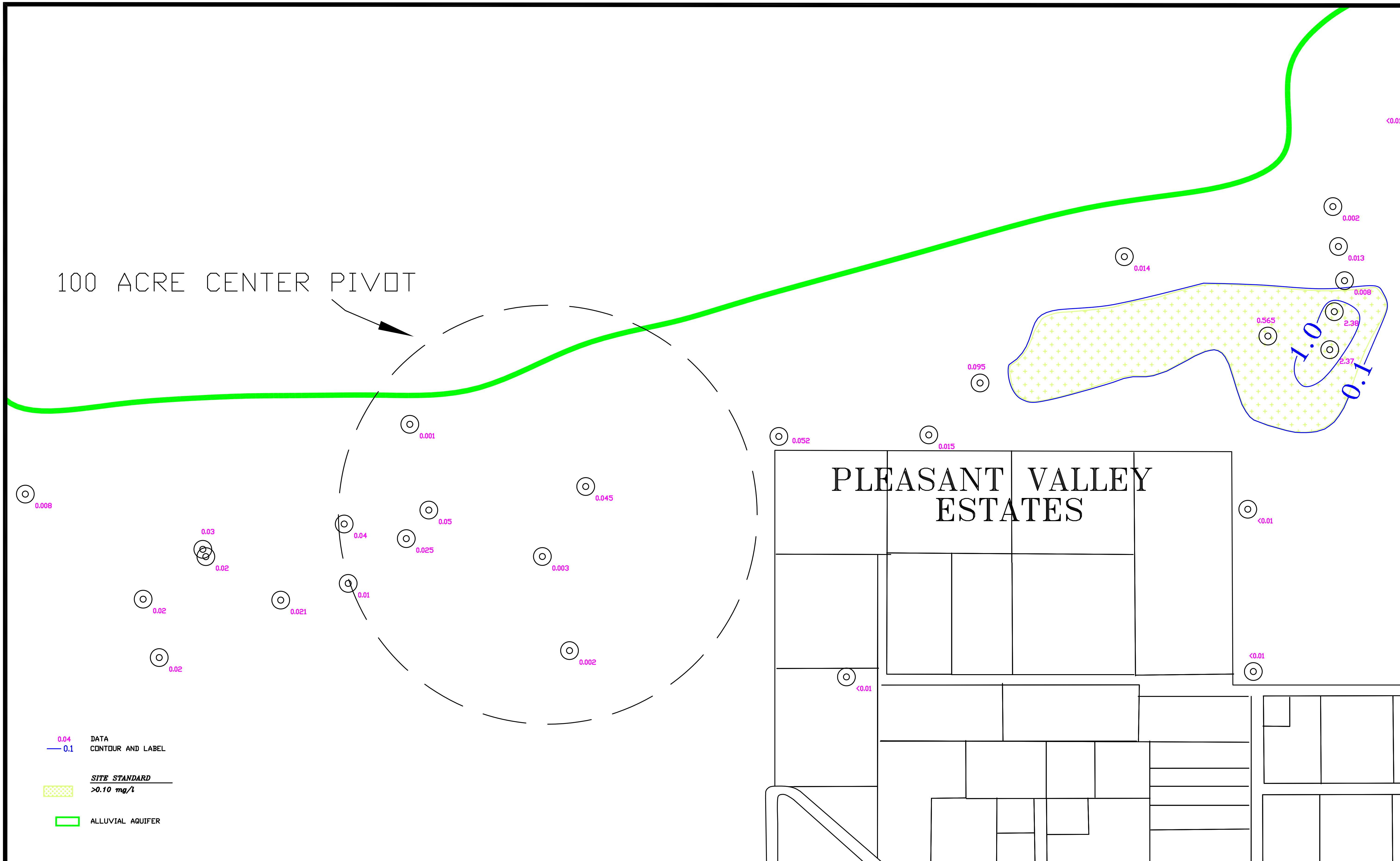


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FIGURE 4.3-87C. MOLYBDENUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, mg/L

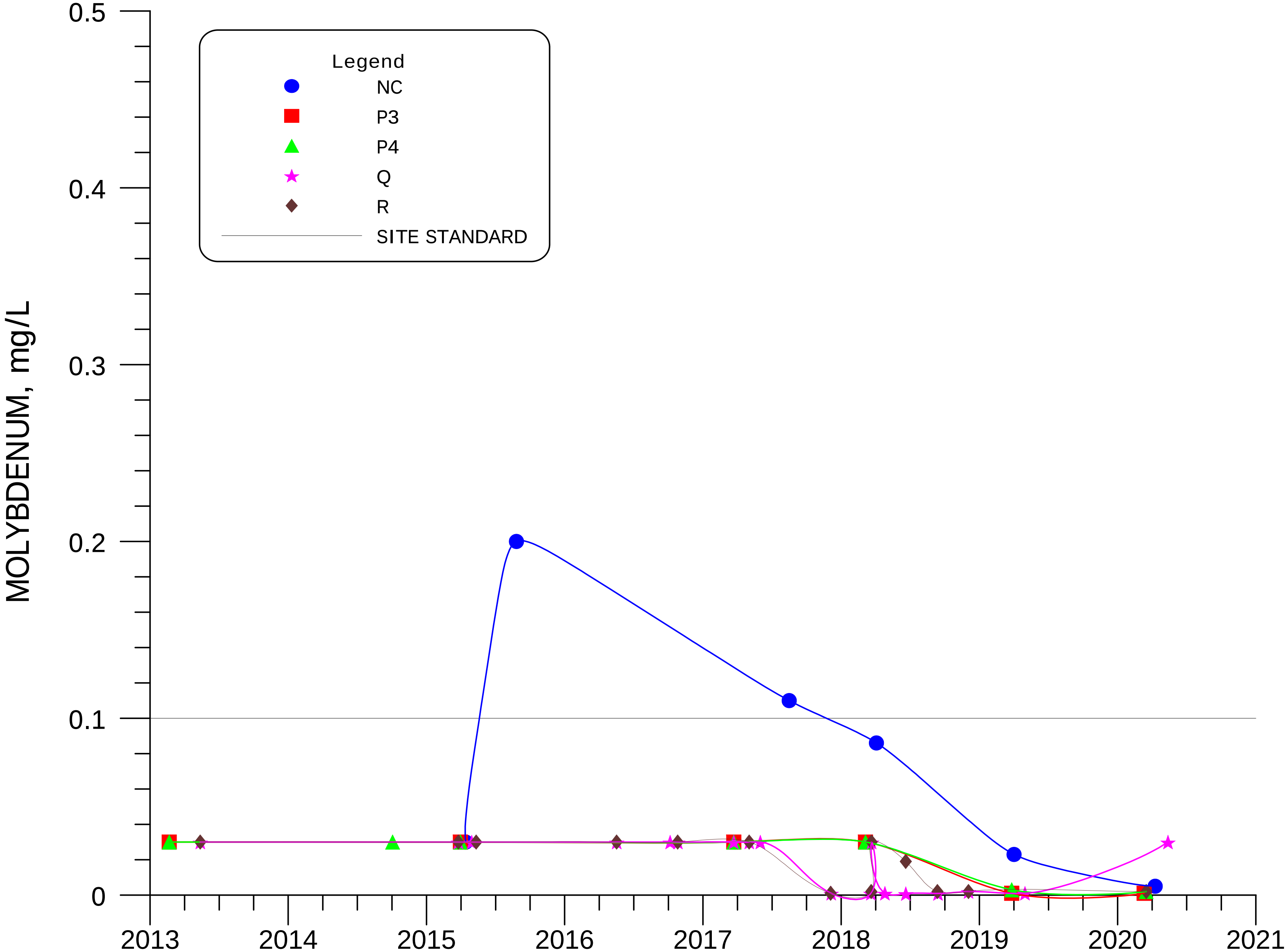


**FIGURE 4.3-88. MOLYBDENUM CONCENTRATIONS FOR WELLS NC, P3, P4, Q AND R.**

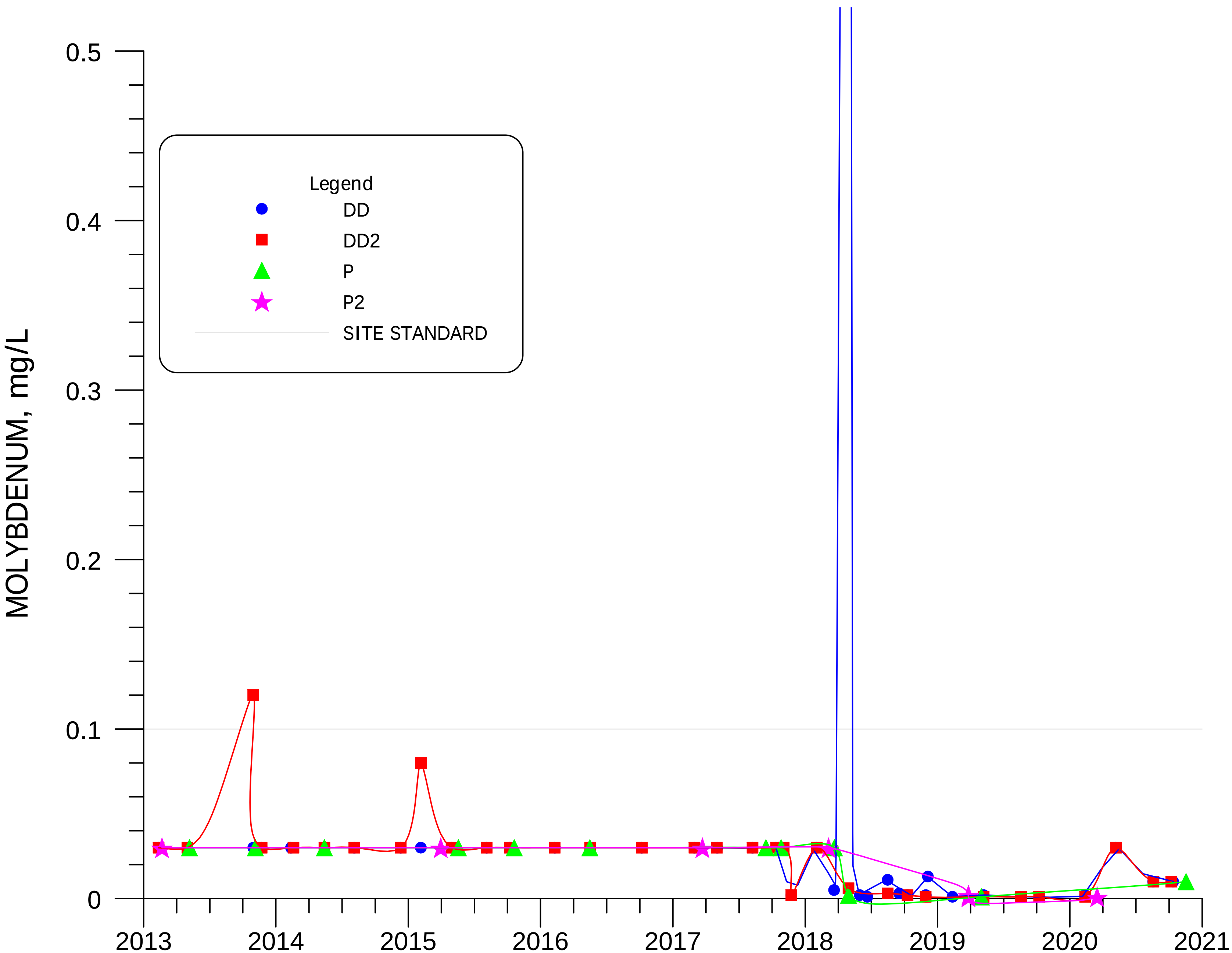


**FIGURE 4.3-88A. MOLYBDENUM CONCENTRATIONS FOR WELLS DD, DD2, P AND P2.**

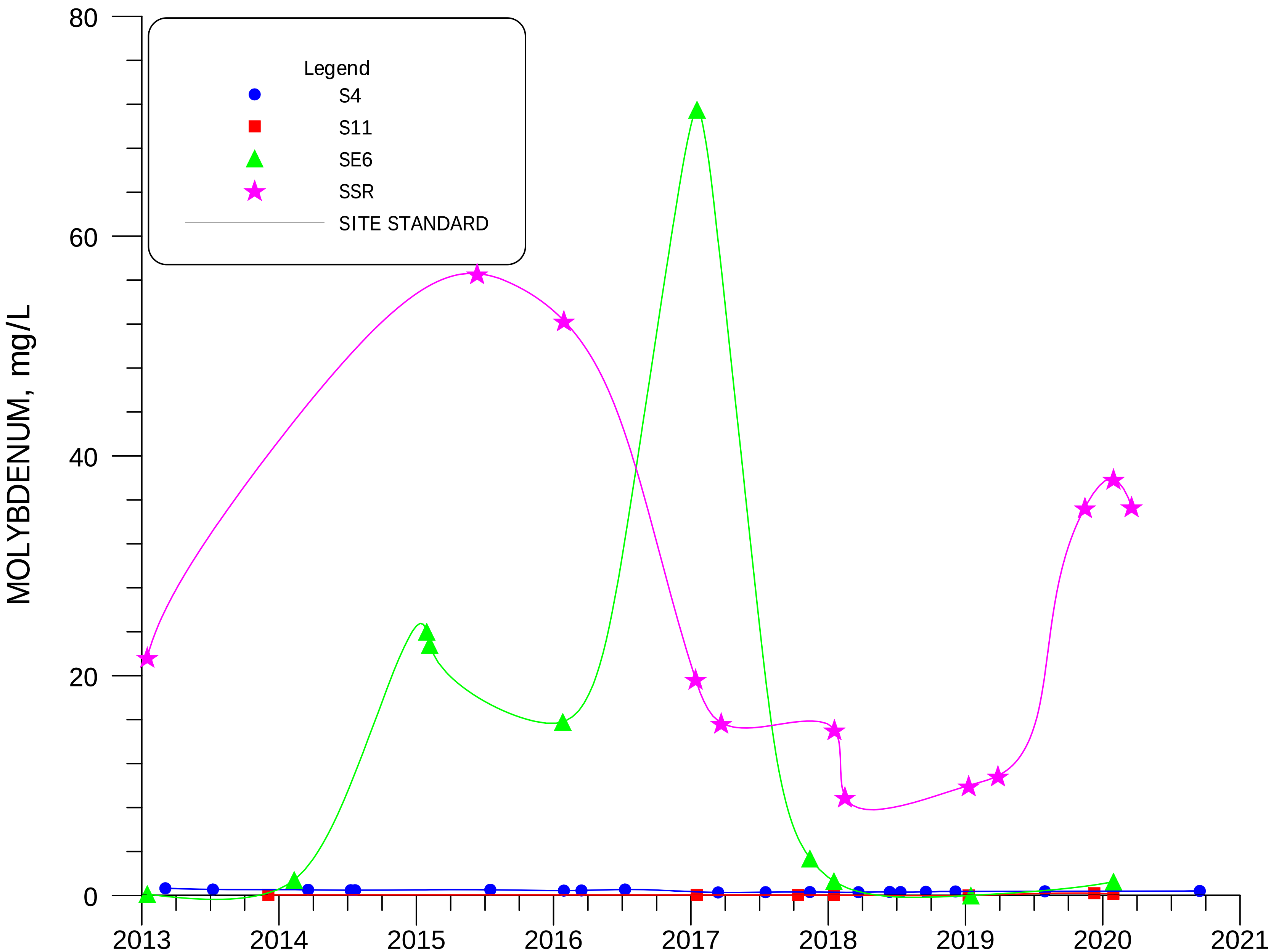


**FIGURE 4.3-89. MOLYBDENUM CONCENTRATIONS FOR WELLS S4, S11, SE6 AND SSR.**

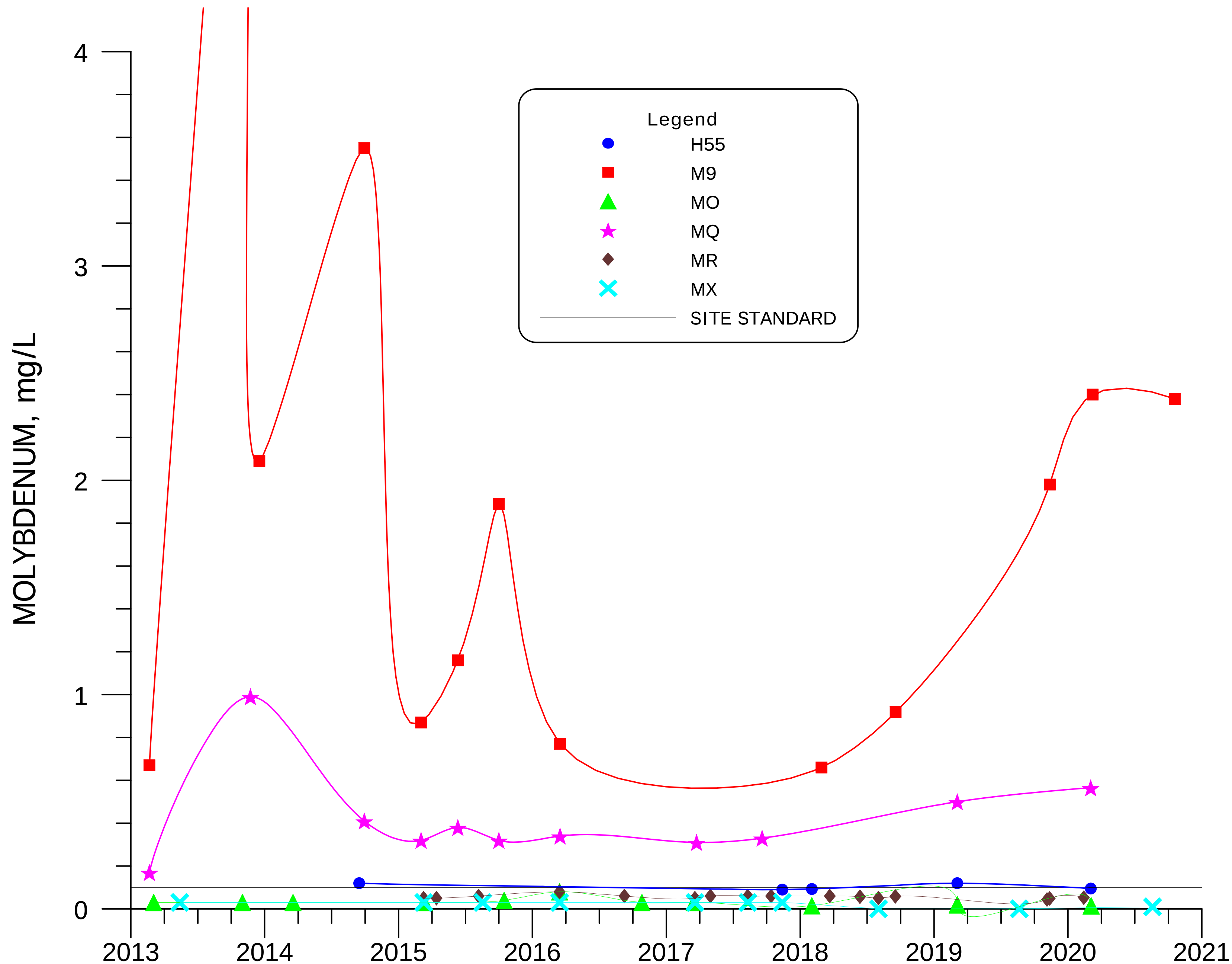


**FIGURE 4.3-90. MOLYBDENUM CONCENTRATIONS FOR WELLS H55, M9, MO, MQ, MR AND MX.**

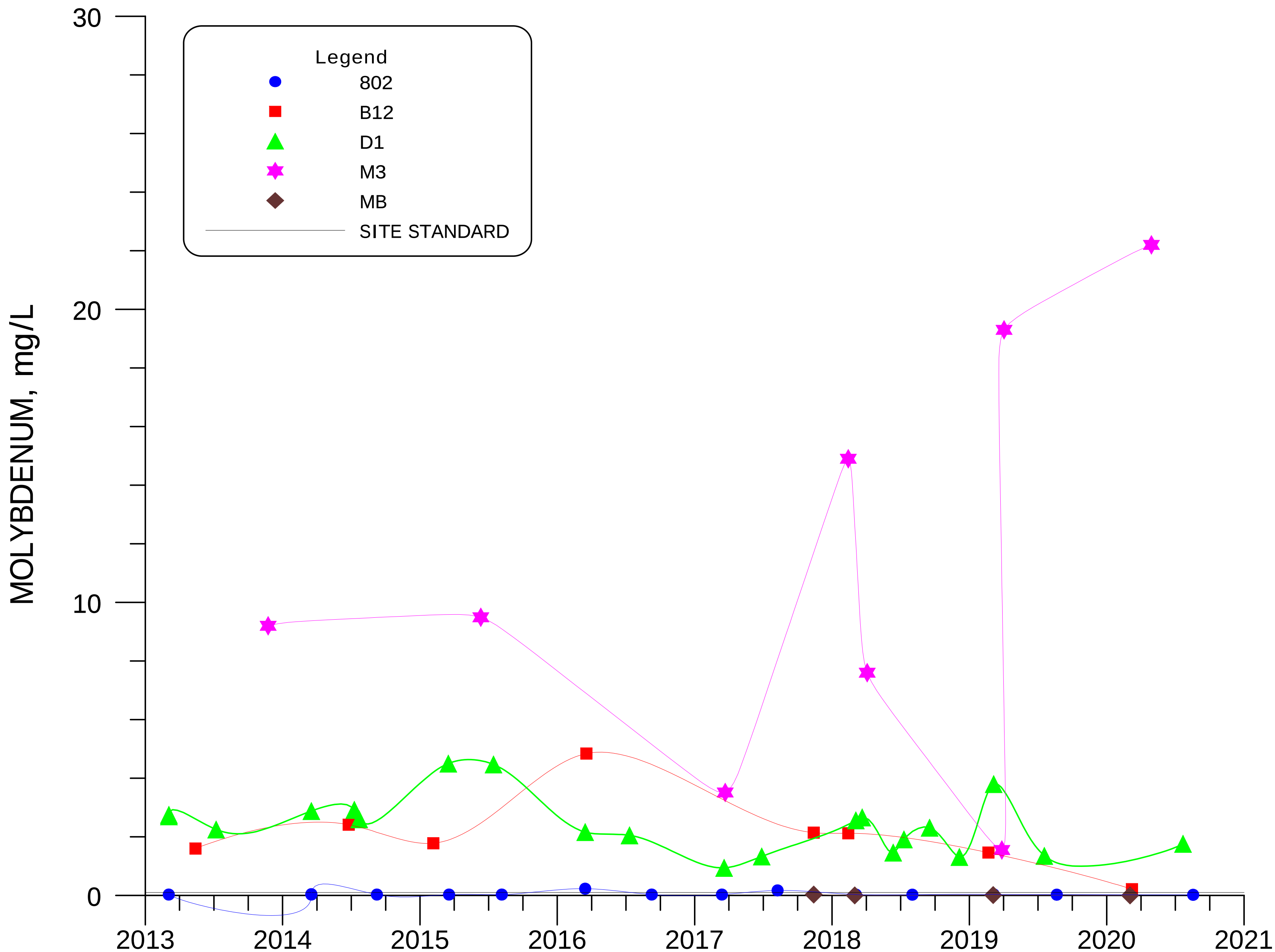


**FIGURE 4.3-91. MOLYBDENUM CONCENTRATIONS FOR WELLS 802, B12, D1, M3 AND MB.**

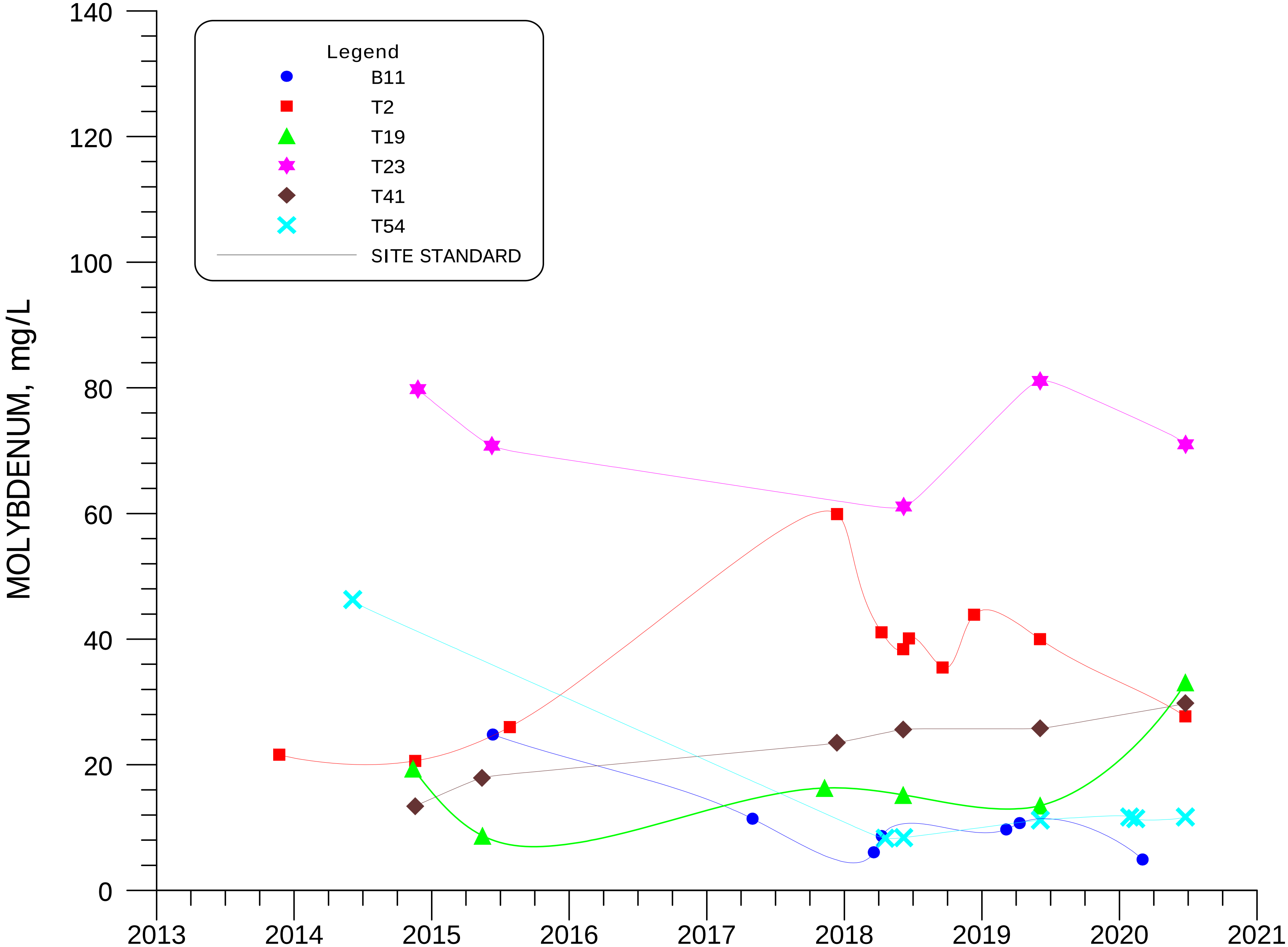


**FIGURE 4.3-92. MOLYBDENUM CONCENTRATIONS FOR WELLS B11, T2, T19, T23, T41 AND T54.**

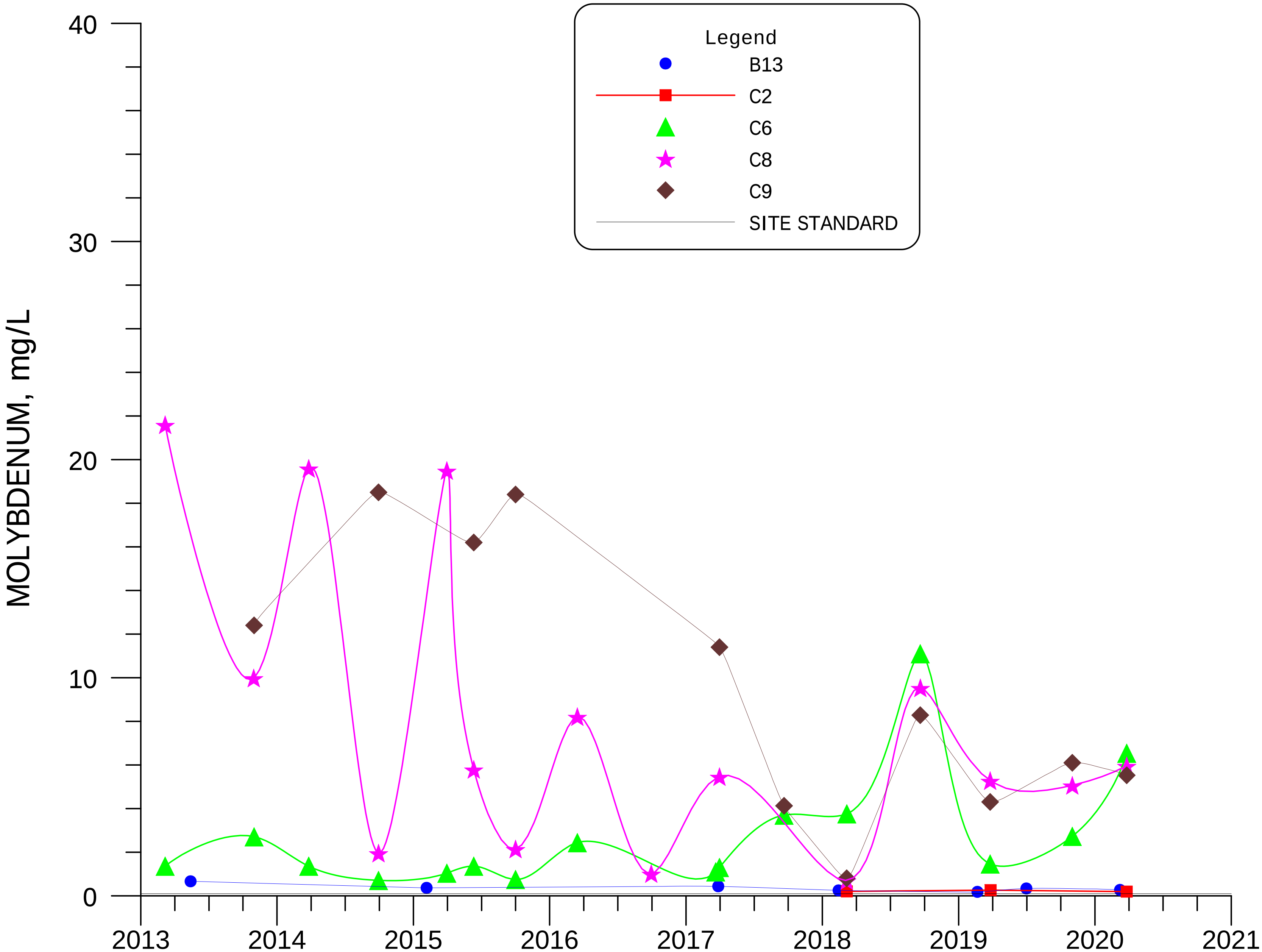


**FIGURE 4.3-93. MOLYBDENUM CONCENTRATIONS FOR WELLS B13, C2, C6, C8 AND C9.**

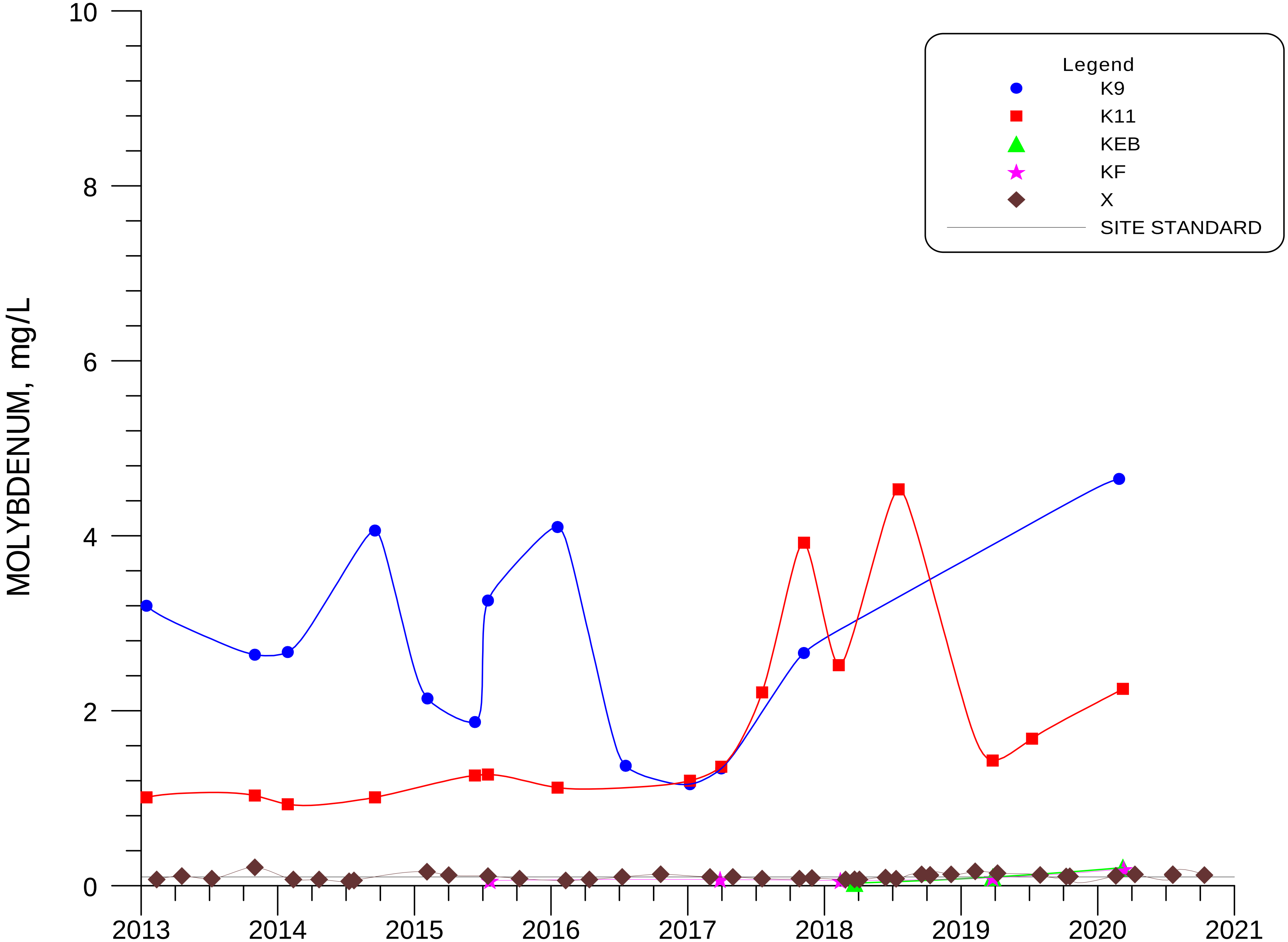


**FIGURE 4.3-94. MOLYBDENUM CONCENTRATIONS FOR WELLS K9, K11, KEB, KF AND X.**

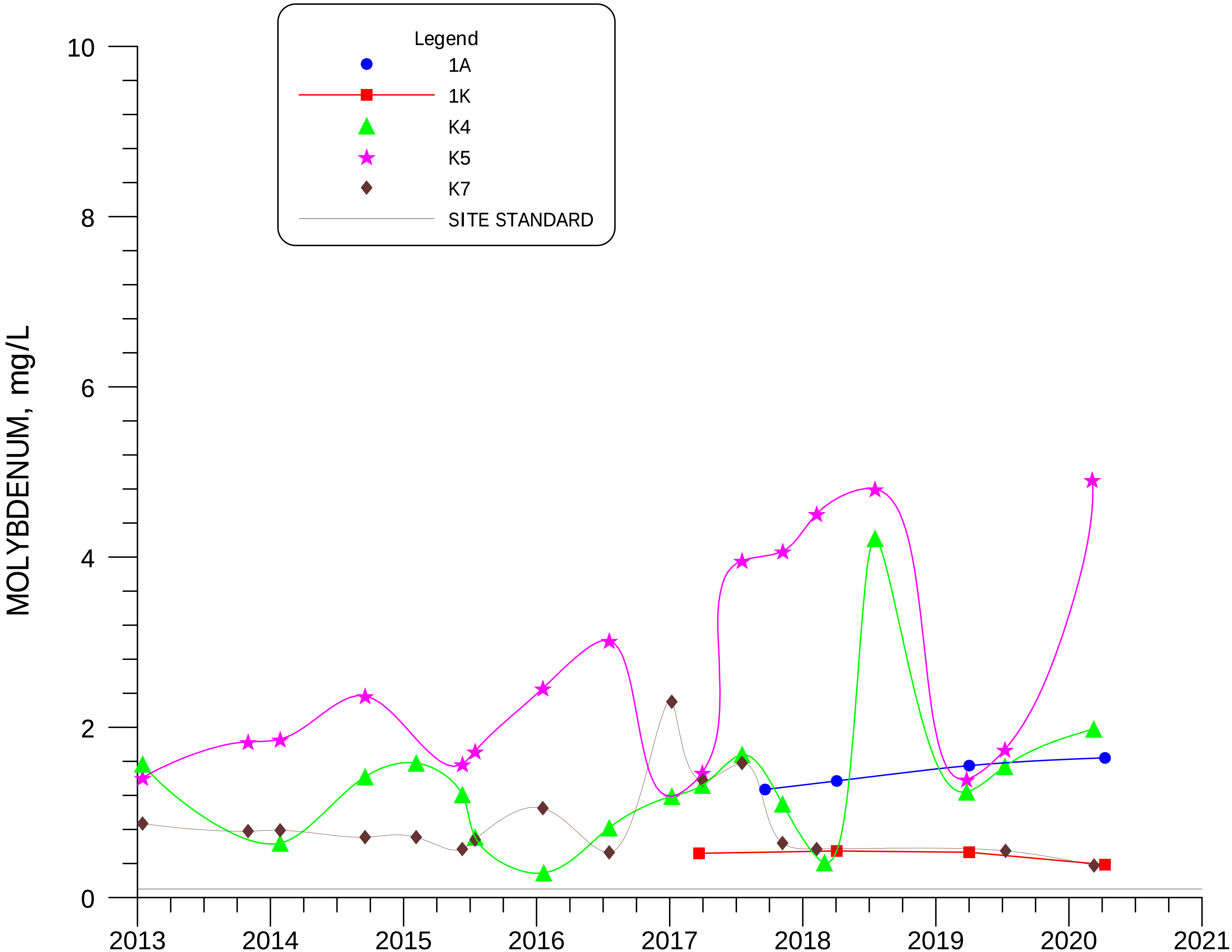


**FIGURE 4.3-95. MOLYBDENUM CONCENTRATIONS FOR WELLS 1A, 1K, K4, K5 AND K7.**

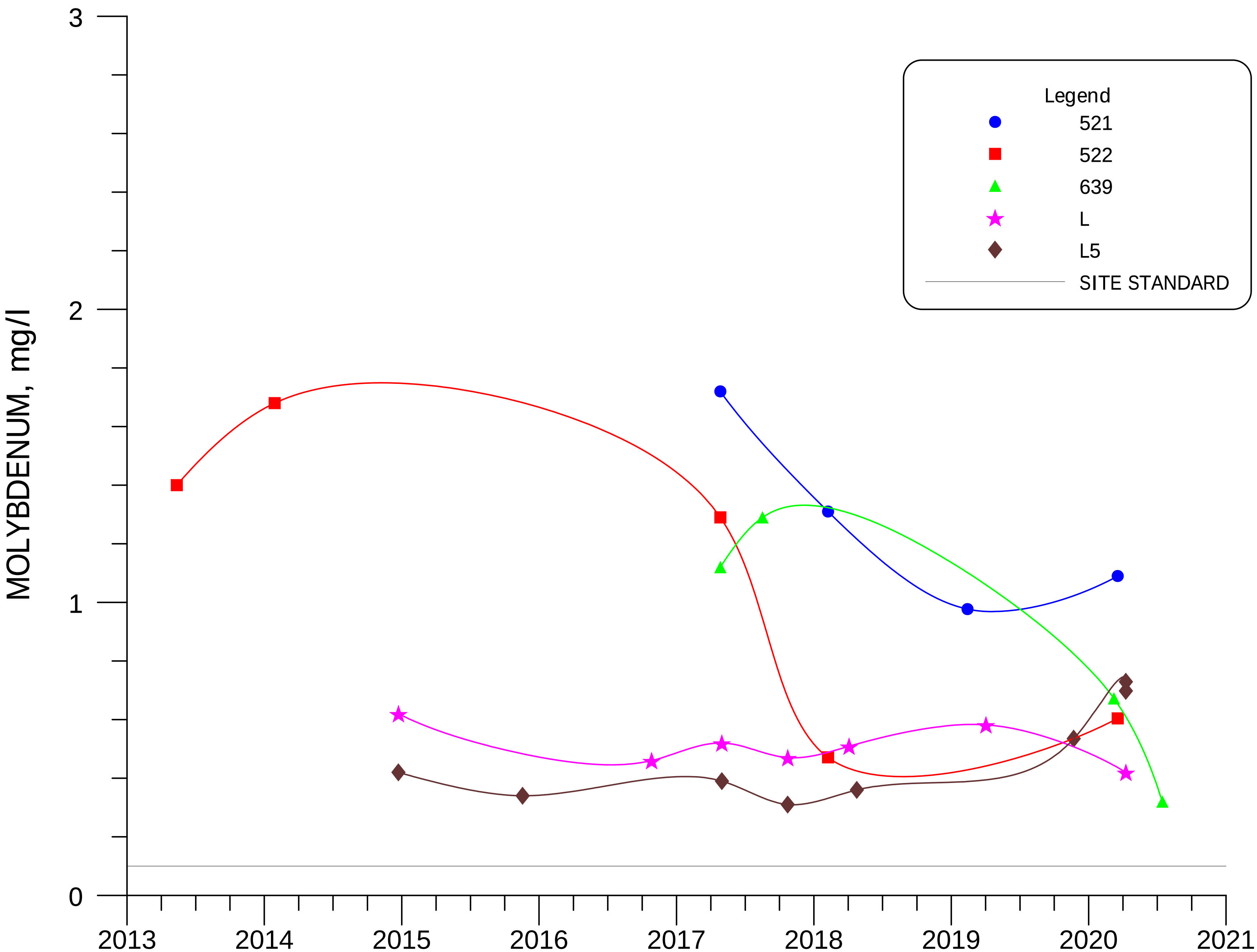


**FIGURE 4.3-96. MOLYBDENUM CONCENTRATIONS FOR WELLS 521, 522, 639, L AND L5.**

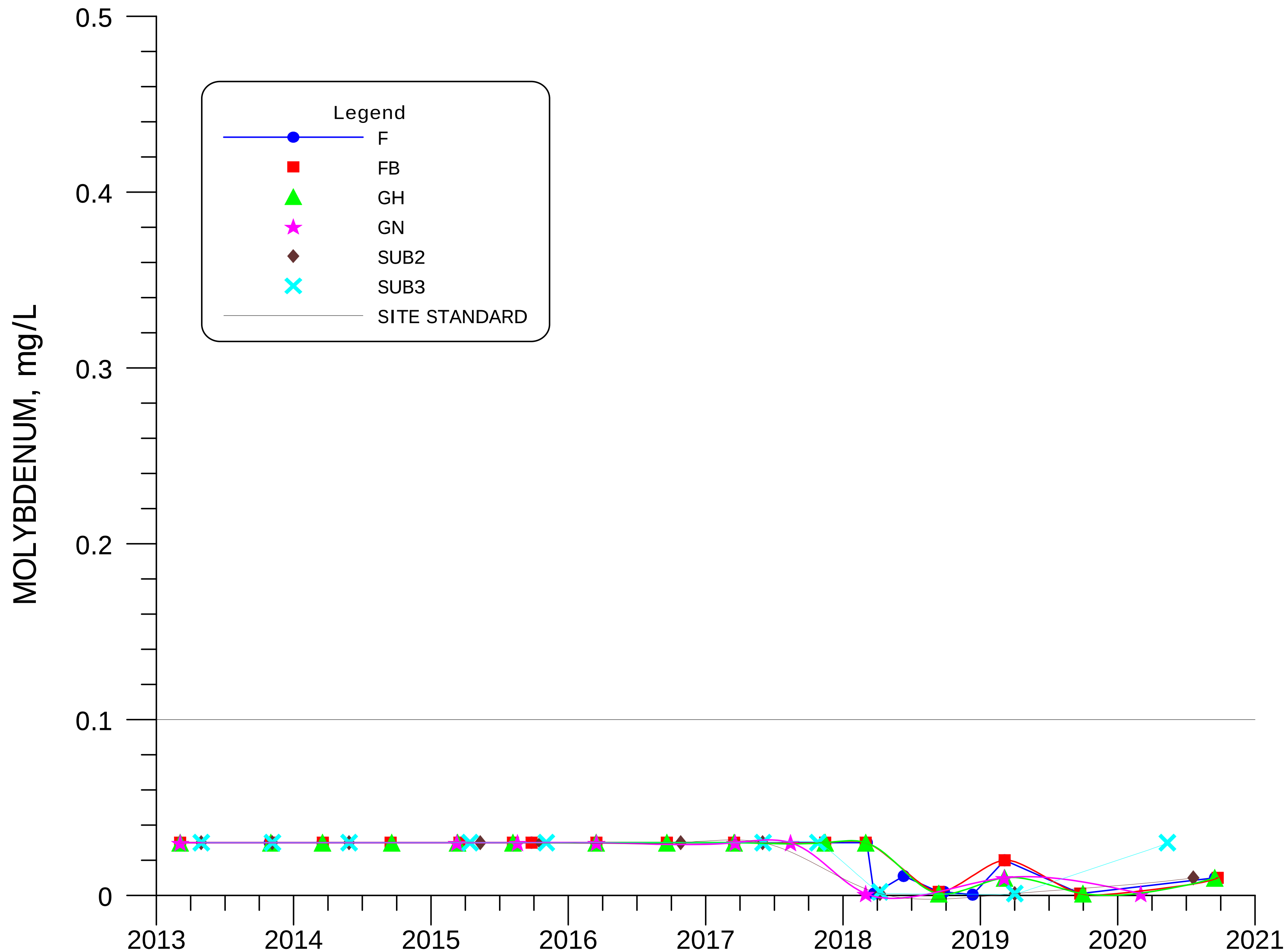


**FIGURE 4.3-97. MOLYBDENUM CONCENTRATIONS FOR WELLS F, FB, GH, GN, SUB2 AND SUB3.**

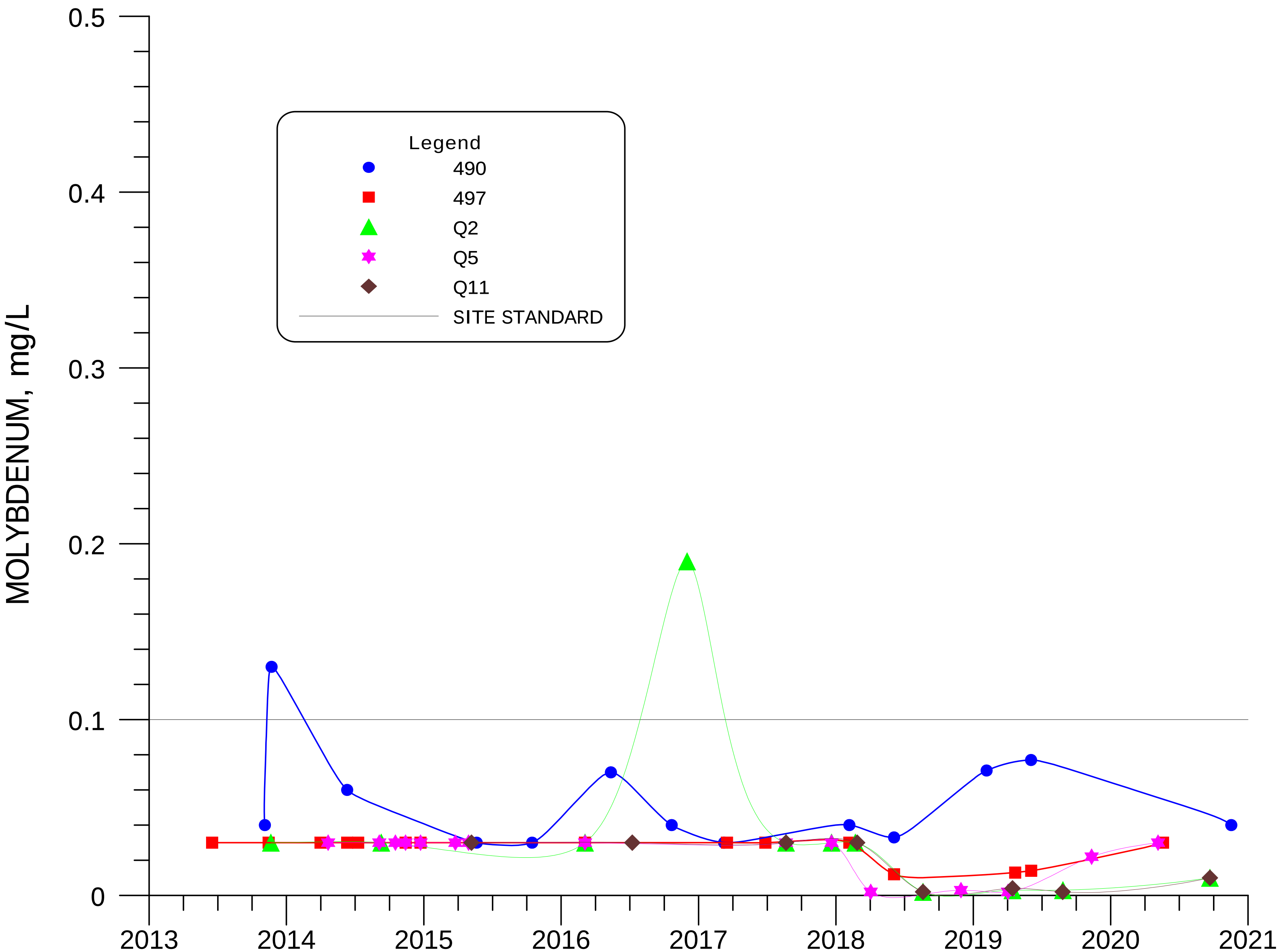


**FIGURE 4.3-98. MOLYBDENUM CONCENTRATIONS FOR WELLS 490, 497, Q2, Q5 AND Q11.**

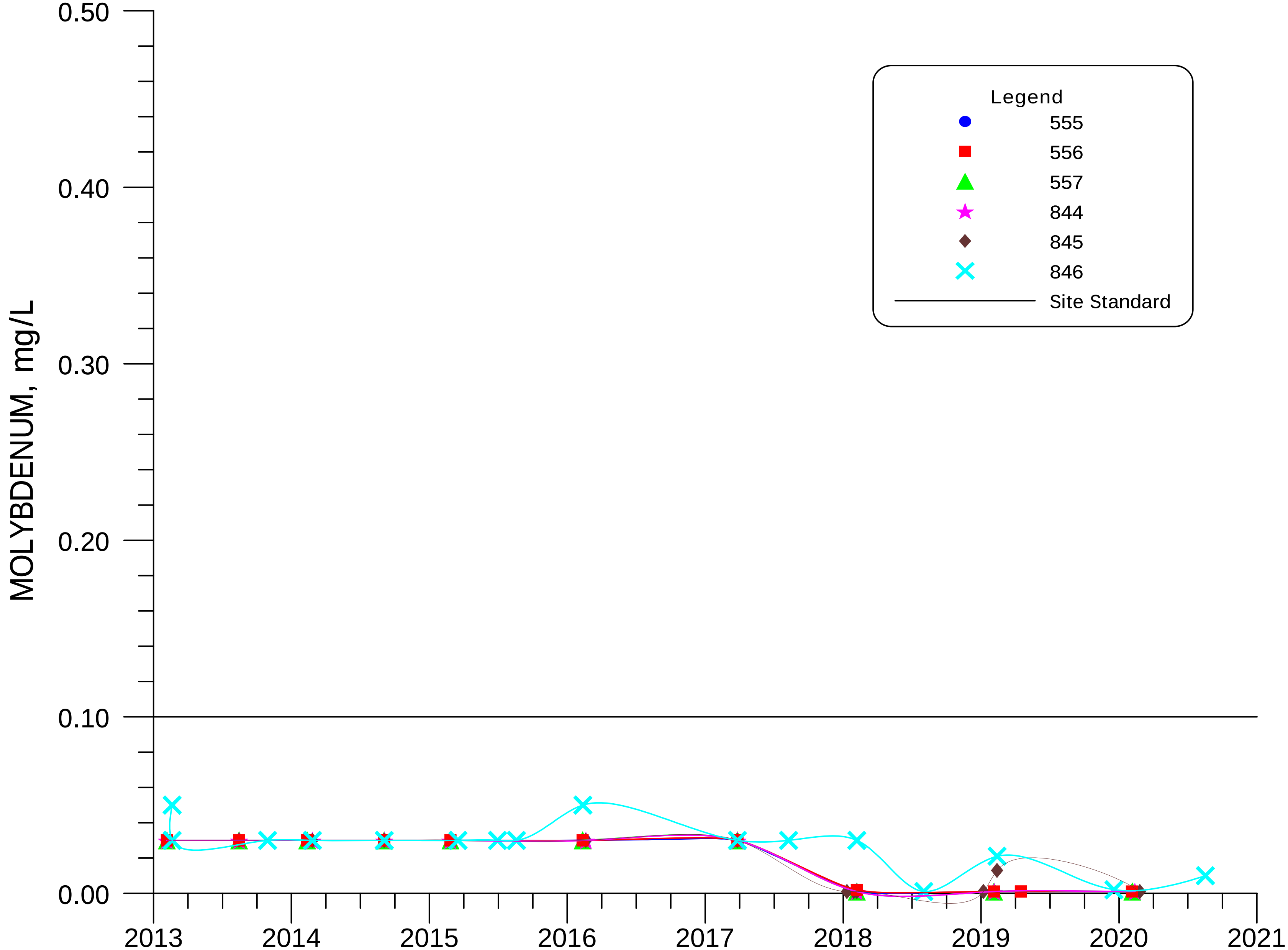


**FIGURE 4.3-99. MOLYBDENUM CONCENTRATIONS FOR WELLS 555, 556, 557, 844, 845, AND 846.**

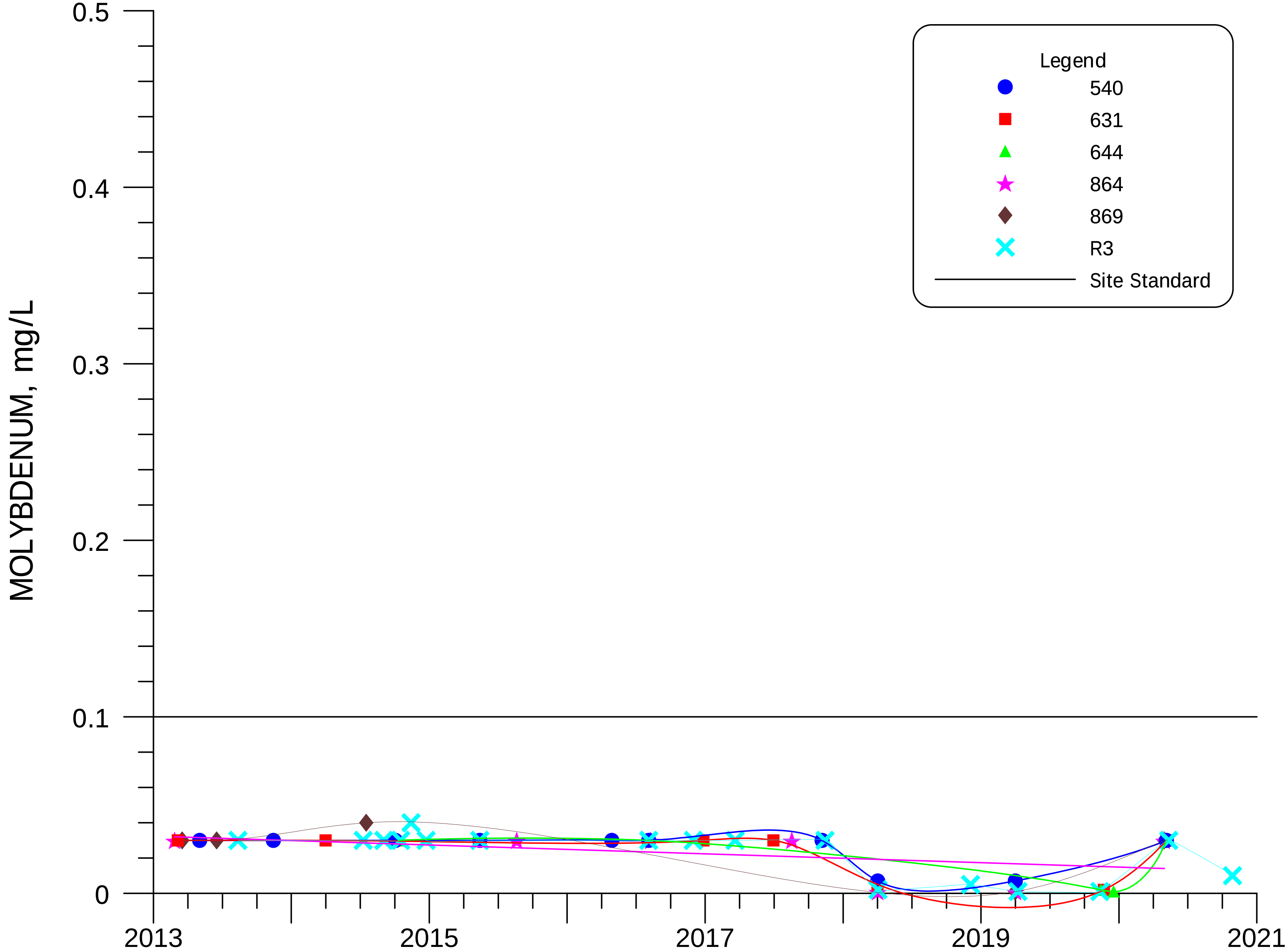


**FIGURE 4.3-100. MOLYBDENUM CONCENTRATIONS FOR WELLS 540, 631, 644, 864, 869 AND R3.**

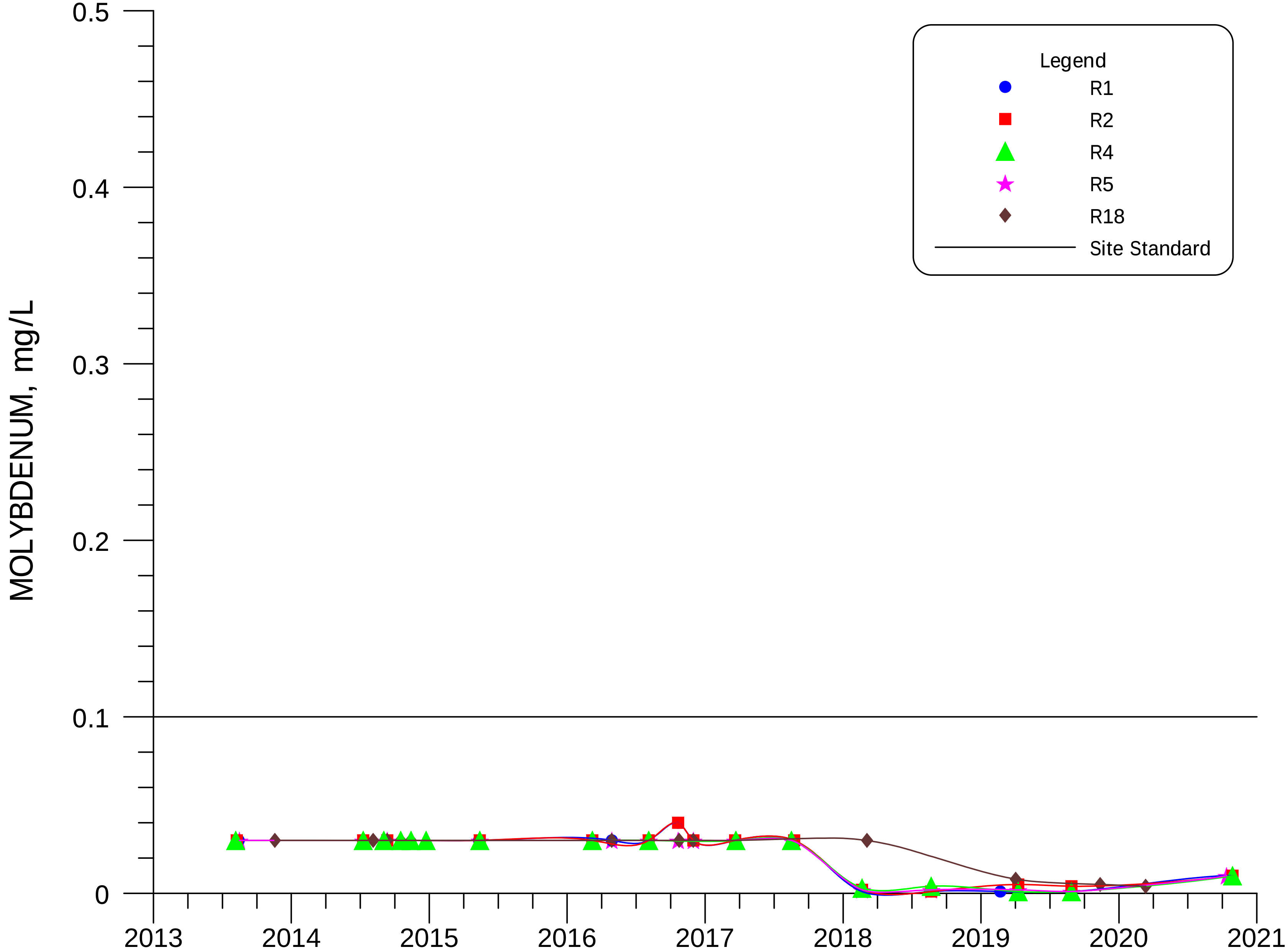


**FIGURE 4.3-100A. MOLYBDENUM CONCENTRATIONS FOR WELLS R1, R2, R4, R5 AND R18.**

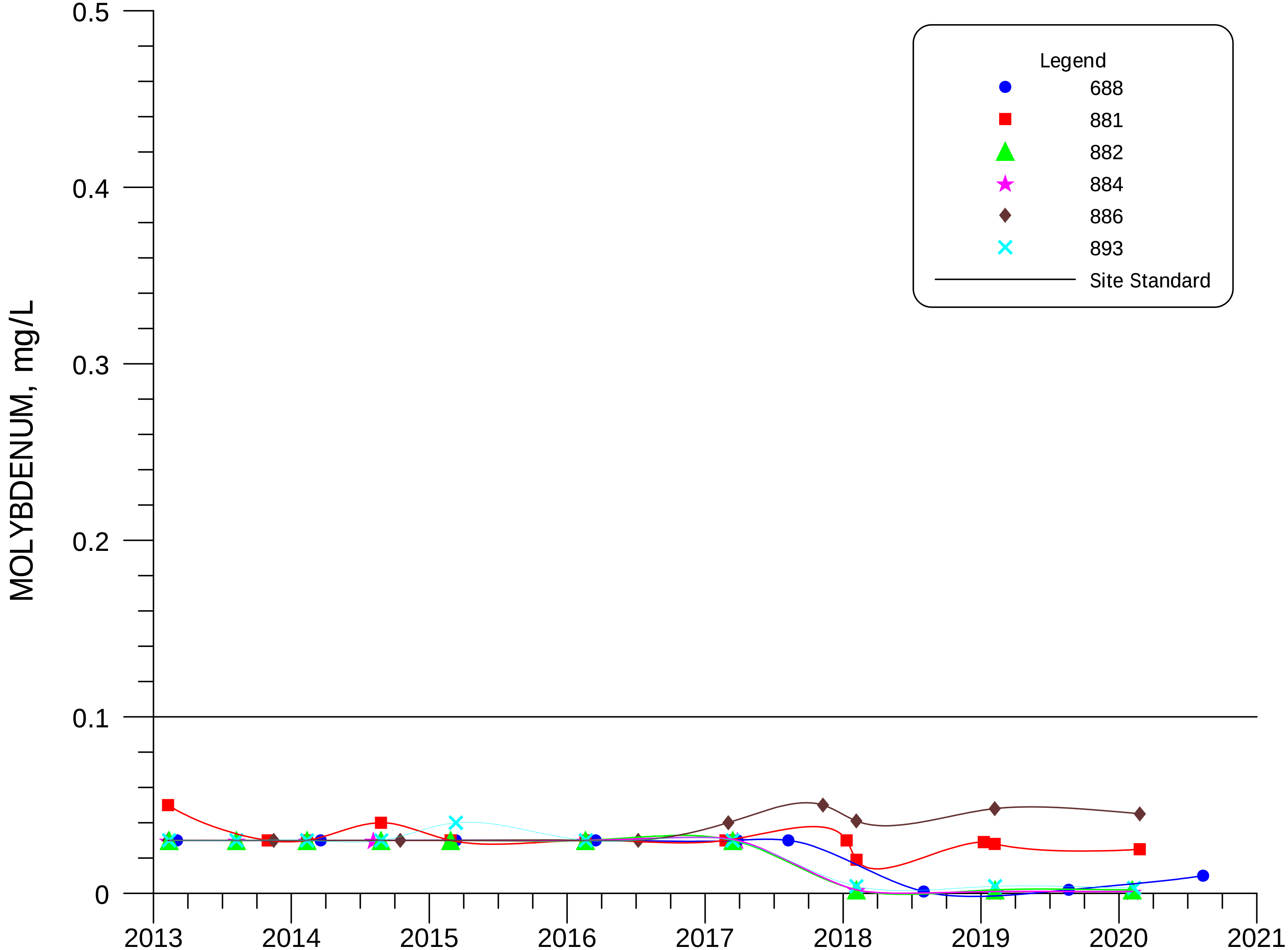


**FIGURE 4.3-101. MOLYBDENUM CONCENTRATIONS FOR WELLS 688, 881, 882, 884, 886 AND 893.**

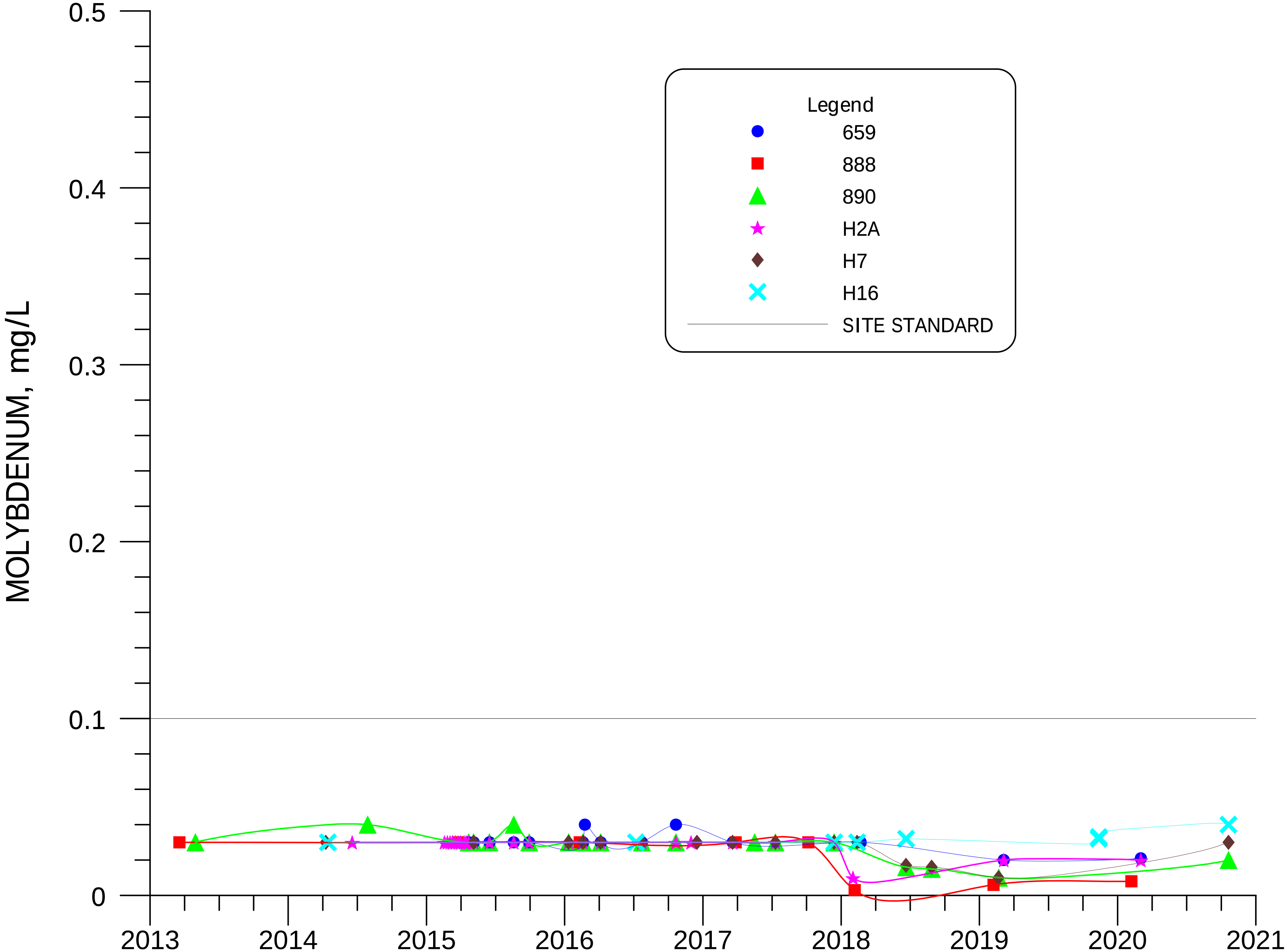


**FIGURE 4.3-101A. MOLYBDENUM CONCENTRATIONS FOR WELLS 659, 888, 890, H2A, H7 AND H16.**

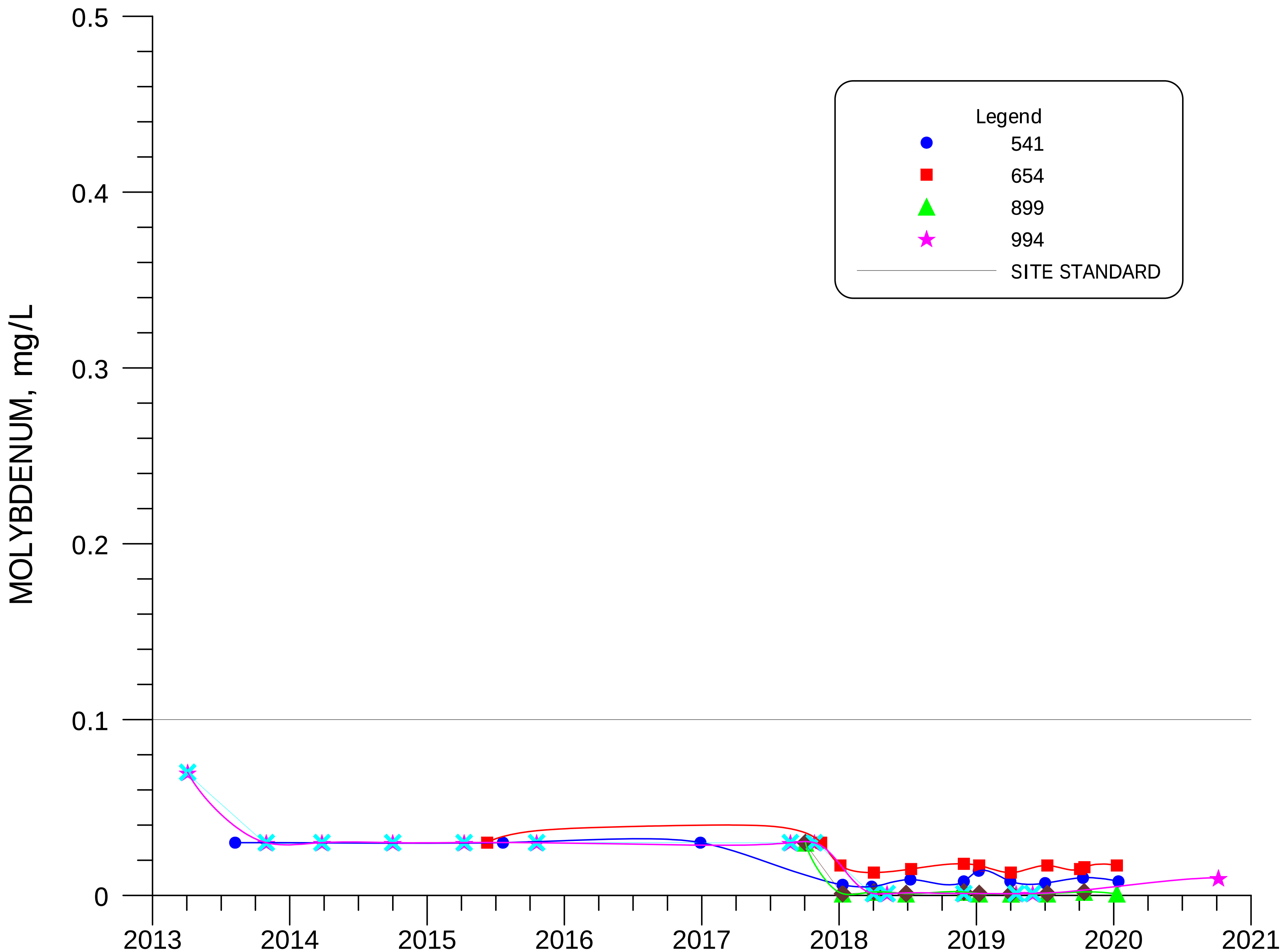


**FIGURE 4.3-102. MOLYBDENUM CONCENTRATIONS FOR WELLS 541, 654, 899 and 994.**

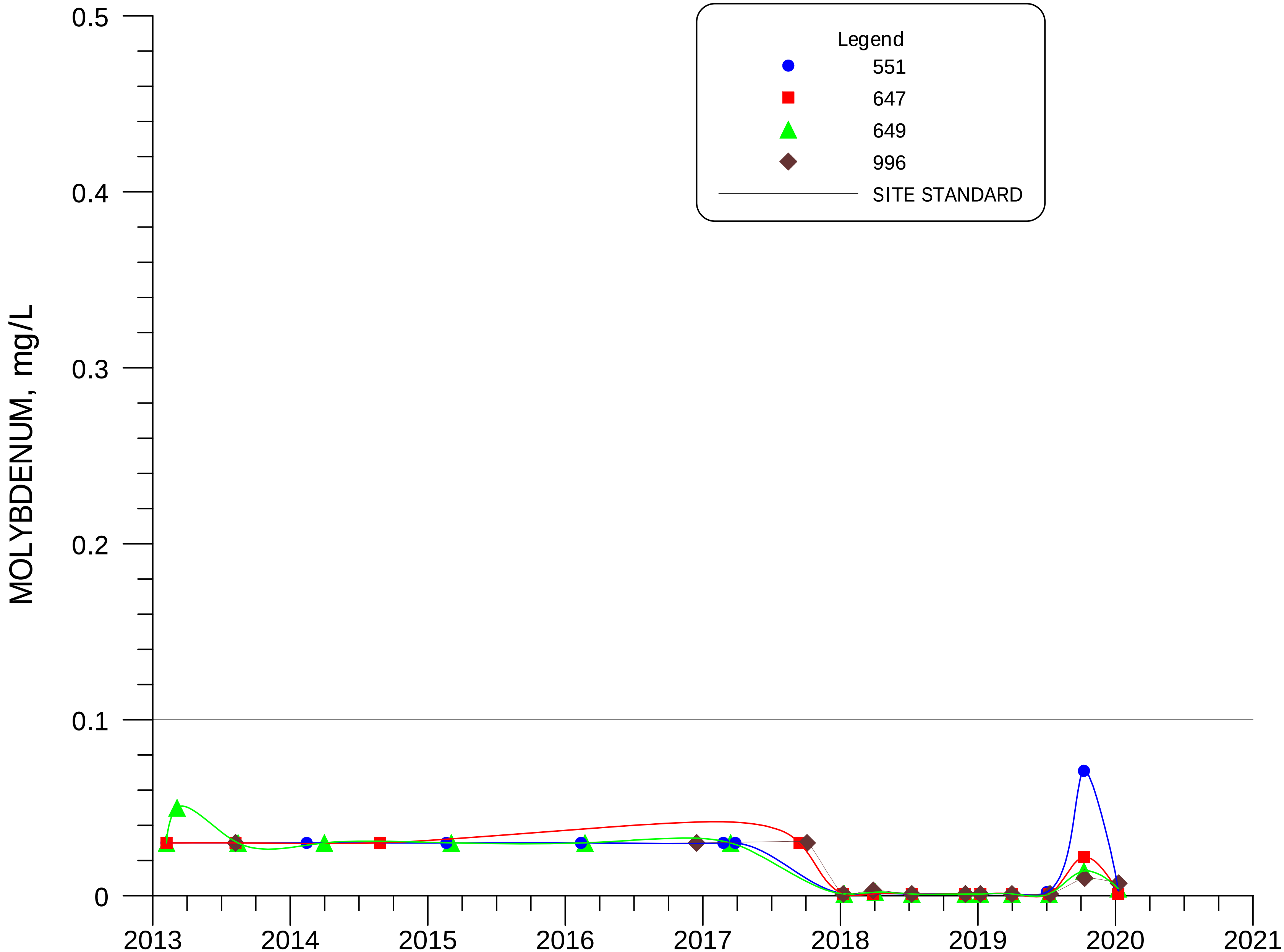


**FIGURE 4.3-103. MOLYBDENUM CONCENTRATIONS FOR WELLS 551, 647, 649 AND 996.**

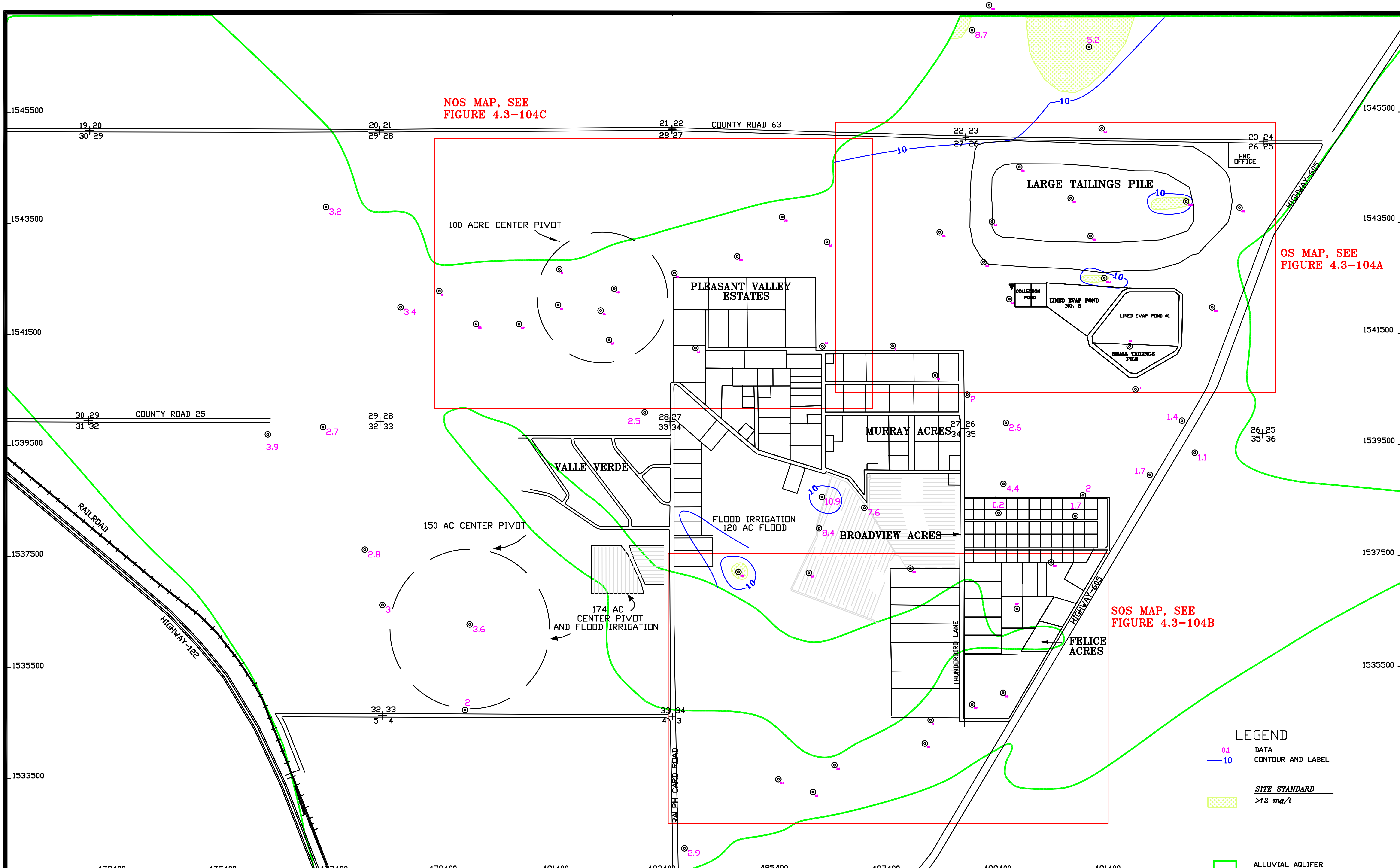


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FIGURE 4.3-104. NITRATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, mg/L

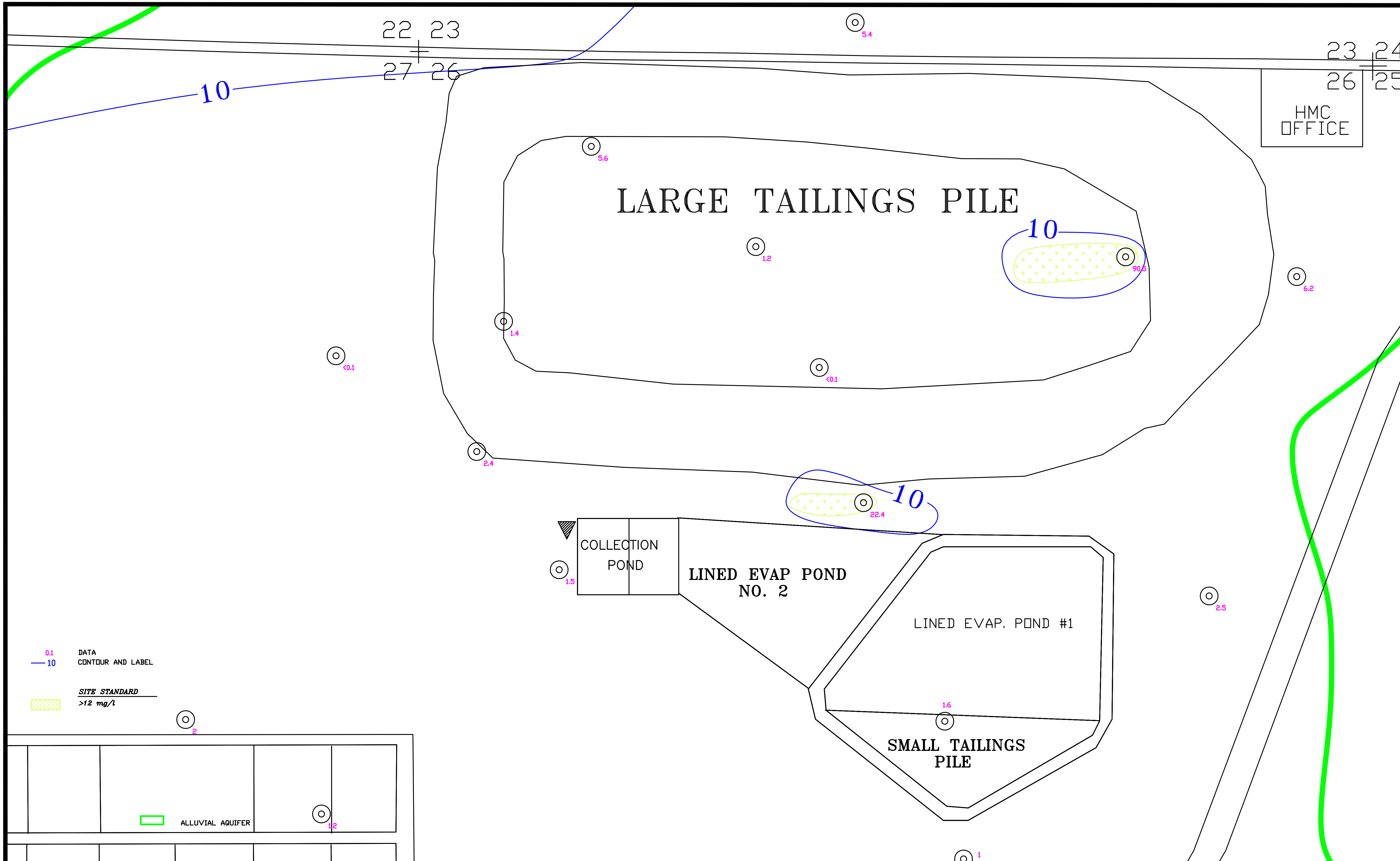


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FIGURE 4.3-104A. NITRATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, mg/L

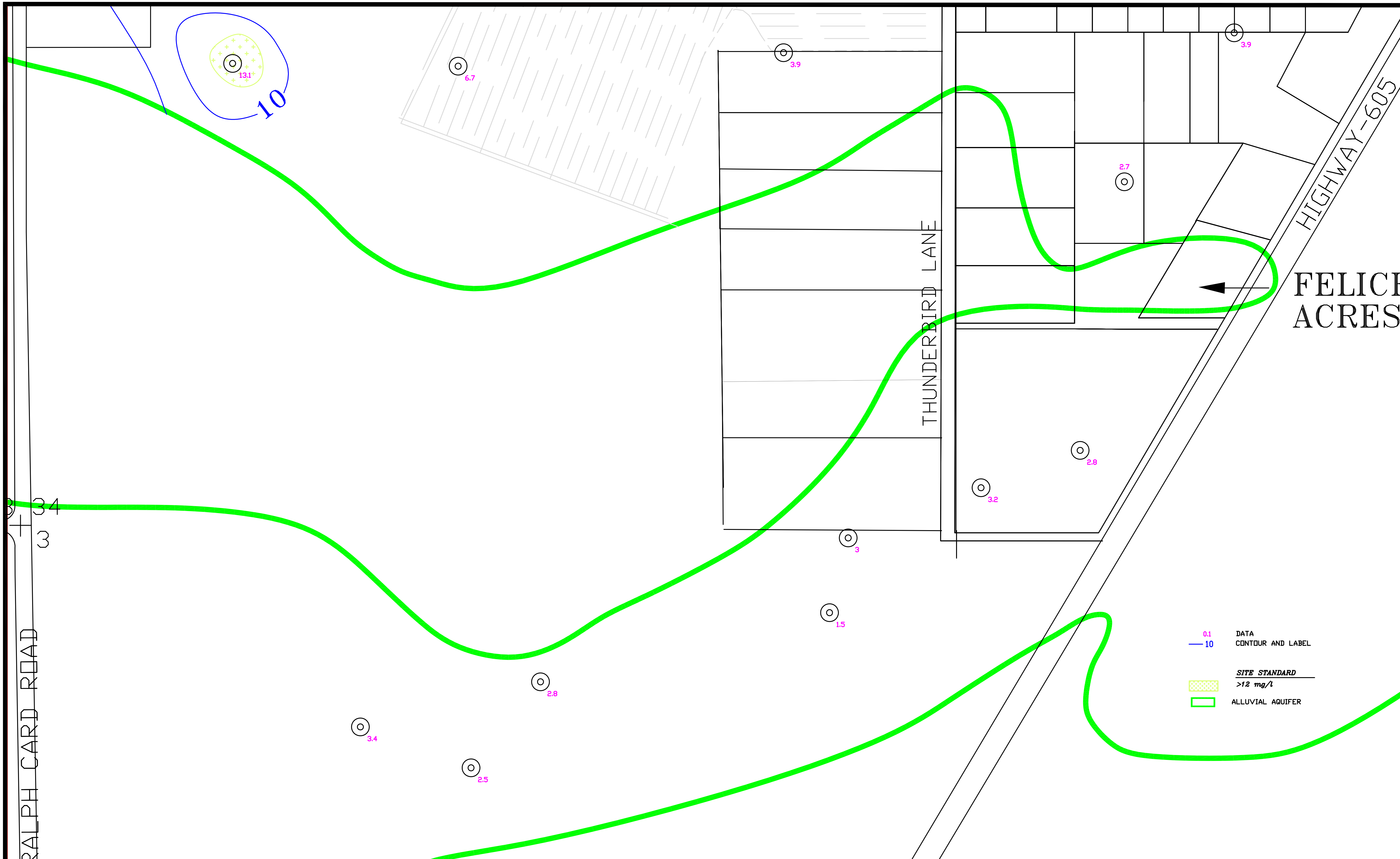


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FIGURE 4.3-104B. NITRATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, mg/L

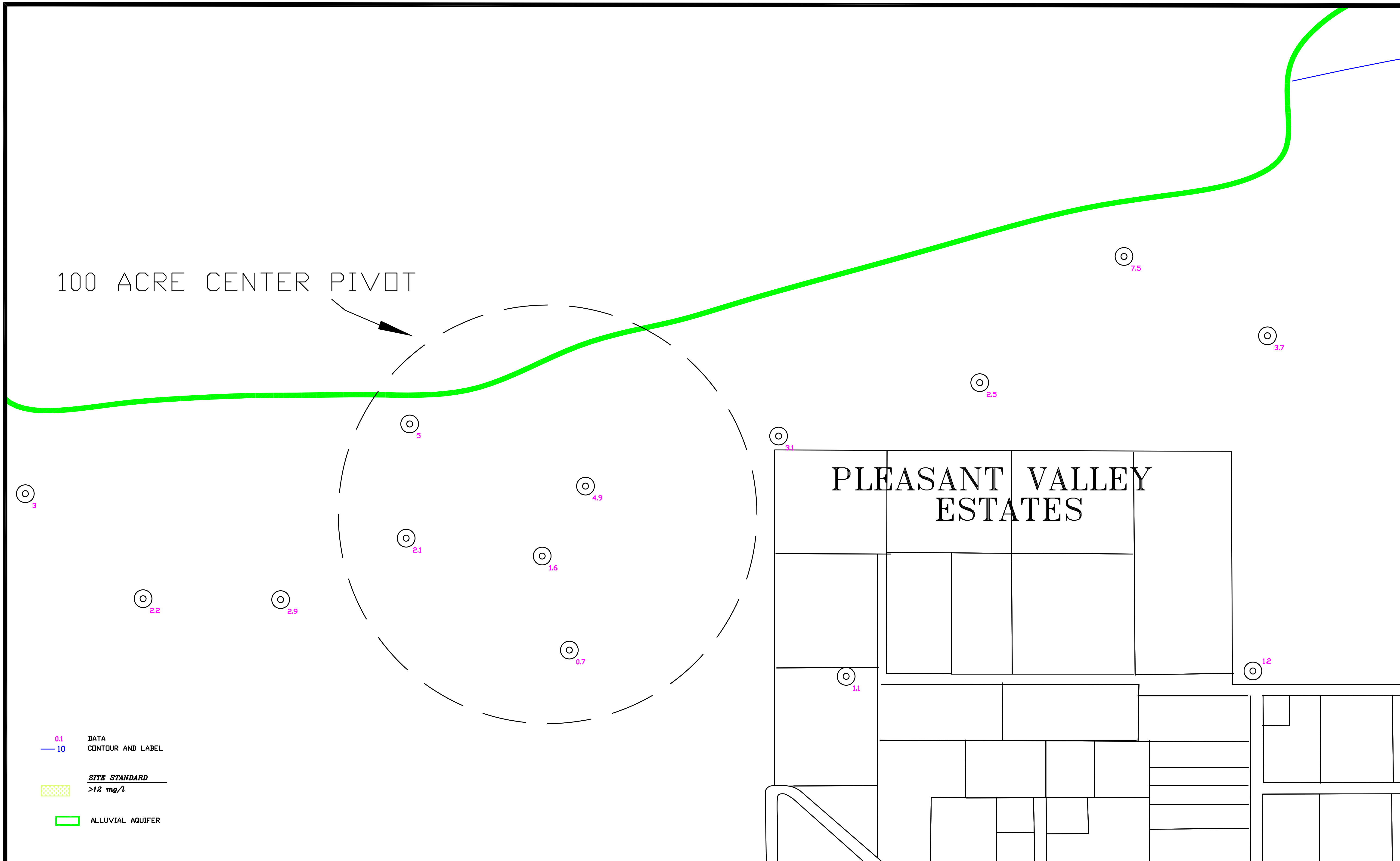


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FIGURE 4.3-104C. NITRATE CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, mg/L

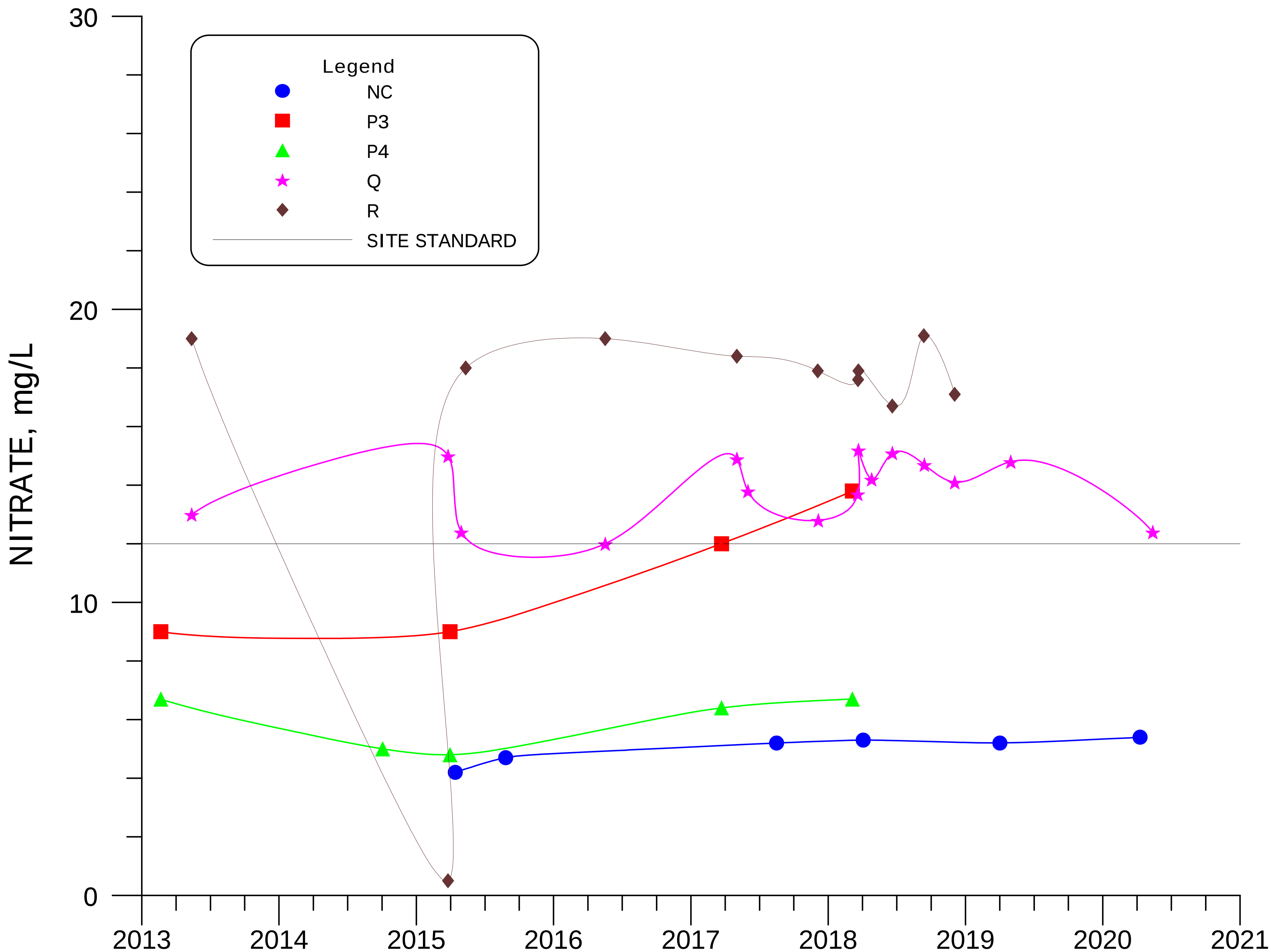


**FIGURE 4.3-105. NITRATE CONCENTRATIONS FOR WELLS NC, P3, P4, Q AND R.**

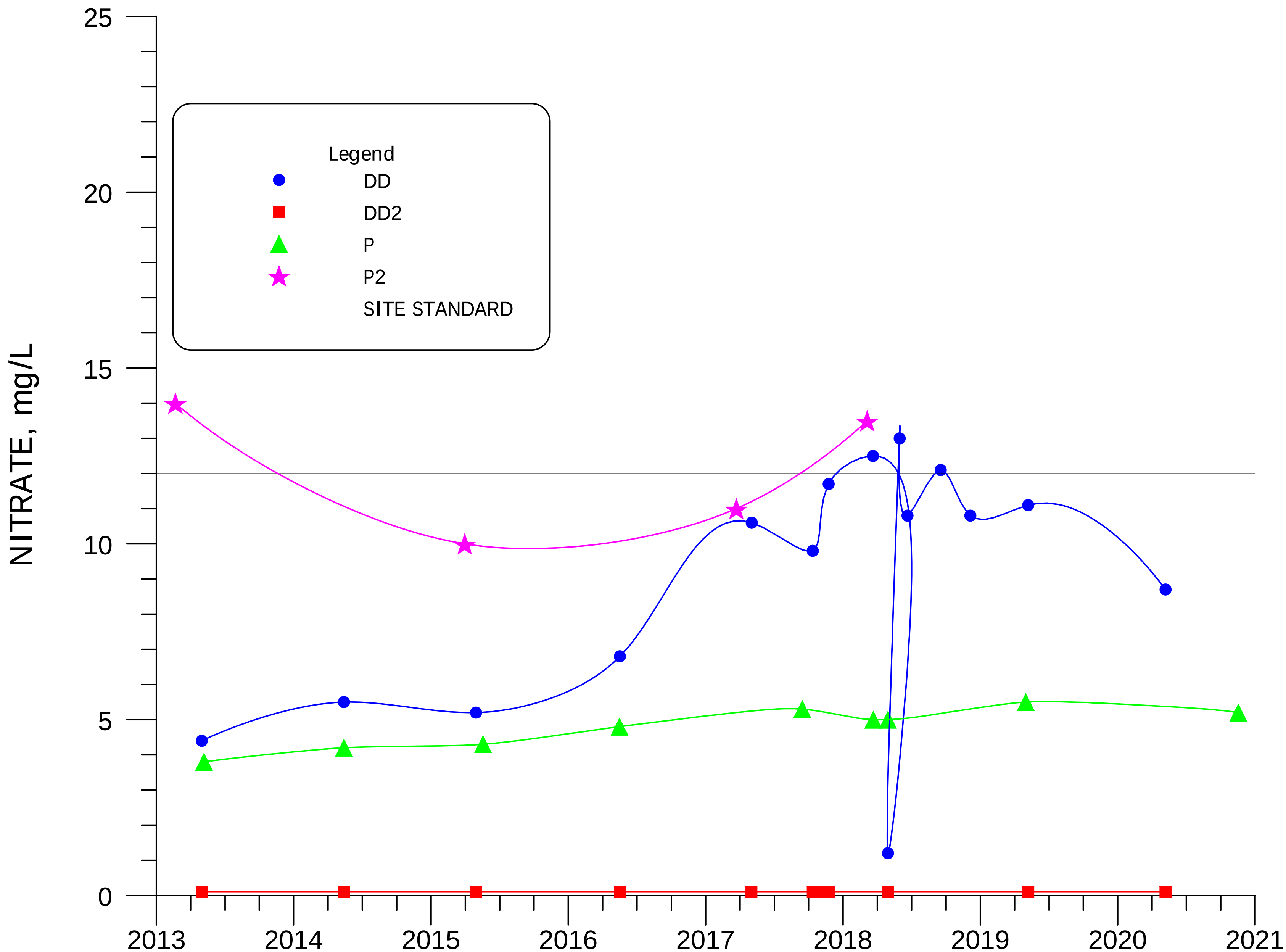


**FIGURE 4.3-105A. NITRATE CONCENTRATIONS FOR WELLS DD, DD2, P AND P2.**

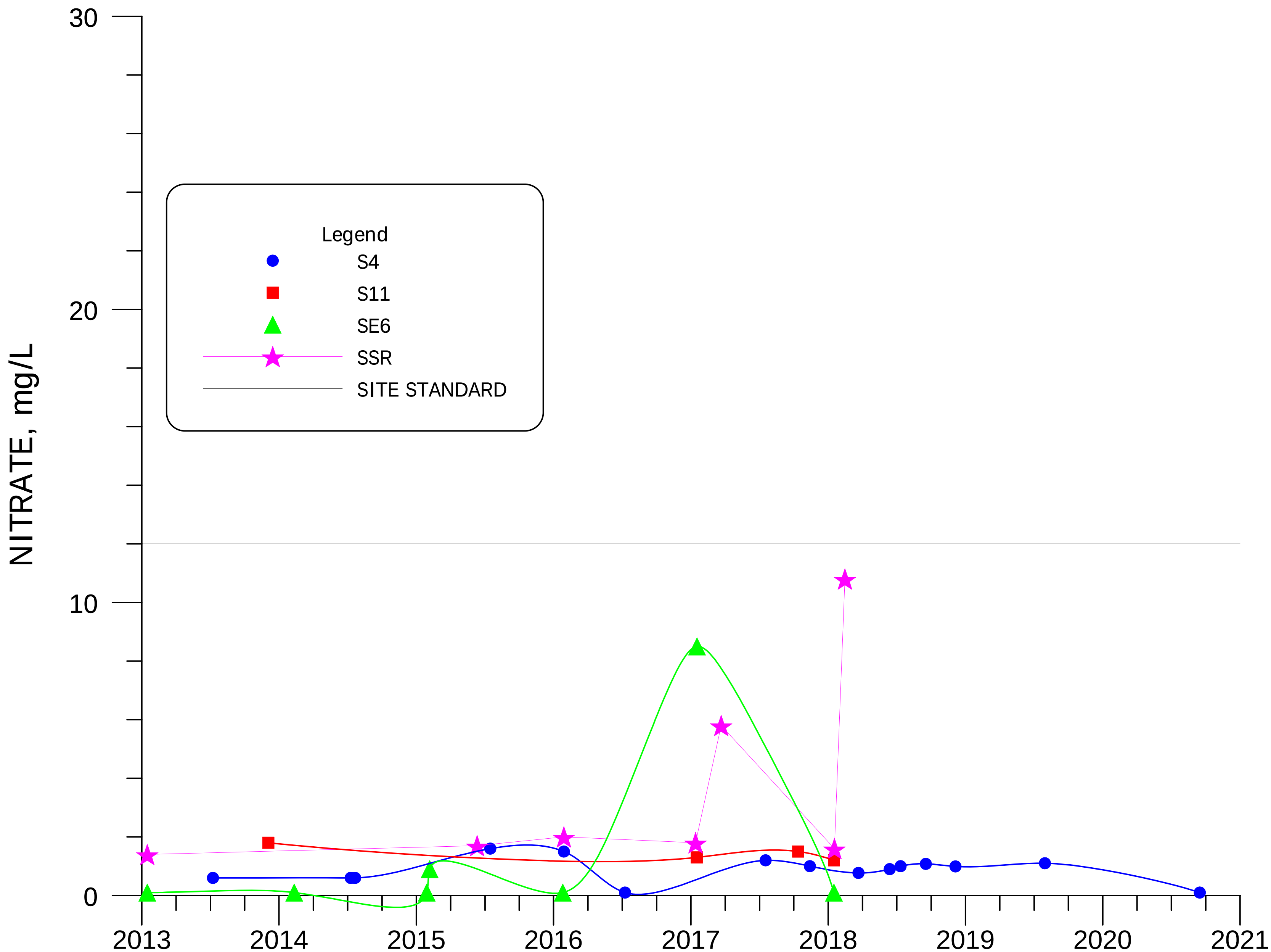


**FIGURE 4.3-106. NITRATE CONCENTRATIONS FOR WELLS S4, S11, SE6 AND SSR.**

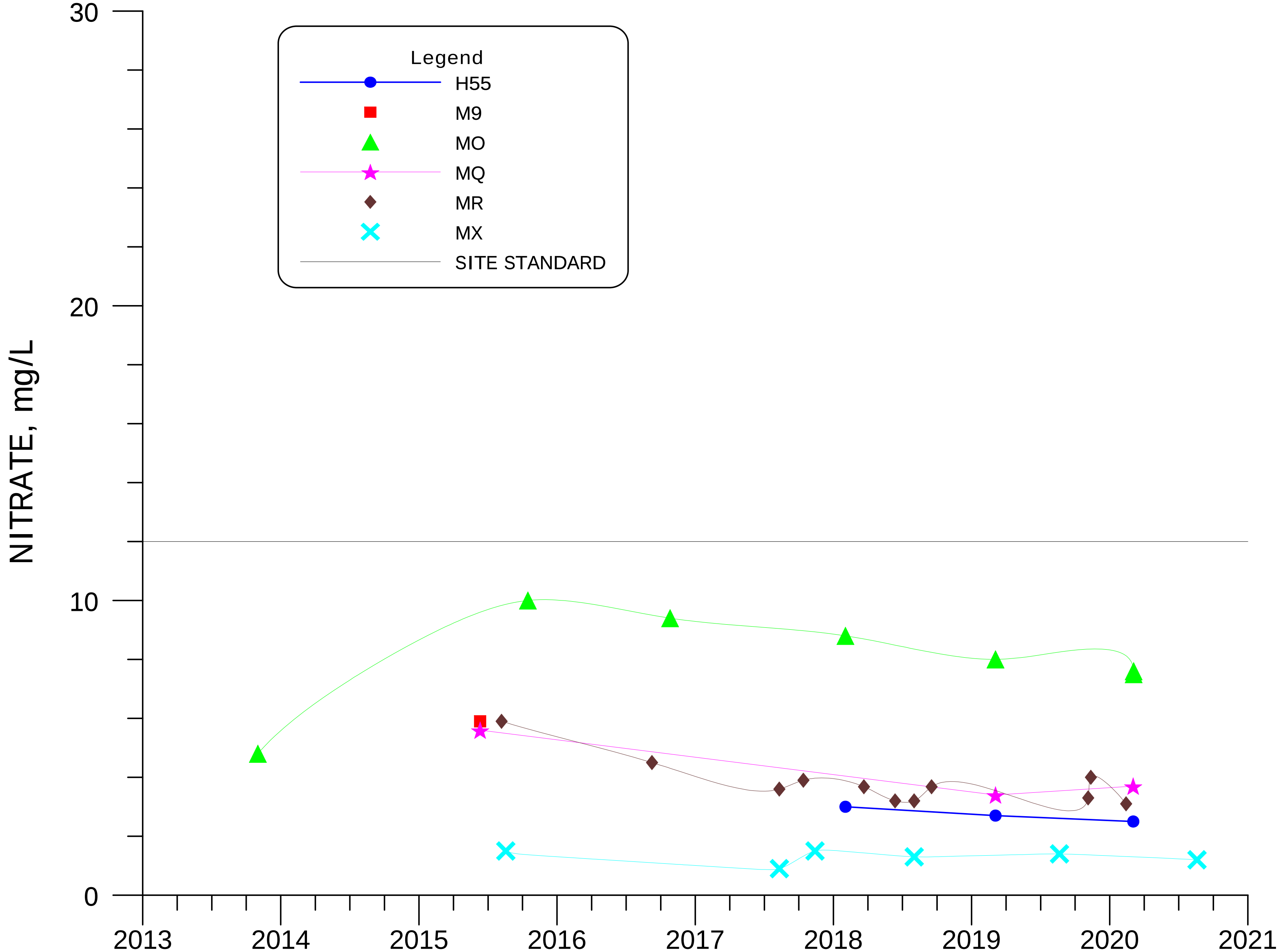


**FIGURE 4.3-107. NITRATE CONCENTRATIONS FOR WELLS H55, M9, MO, MQ, MR AND MX.**

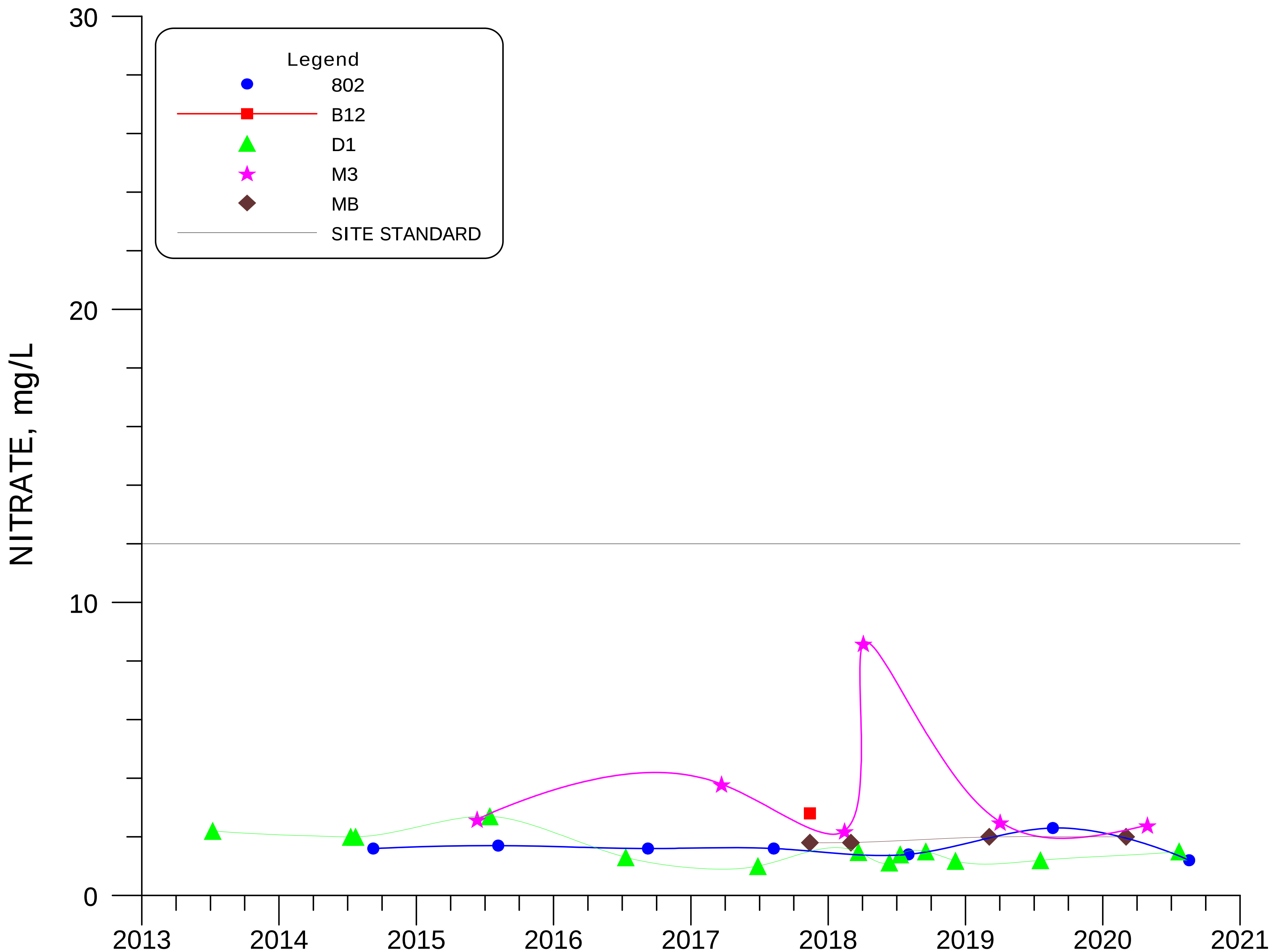


**FIGURE 4.3-108. NITRATE CONCENTRATIONS FOR WELLS 802, B12, D1, M3 AND MB.**

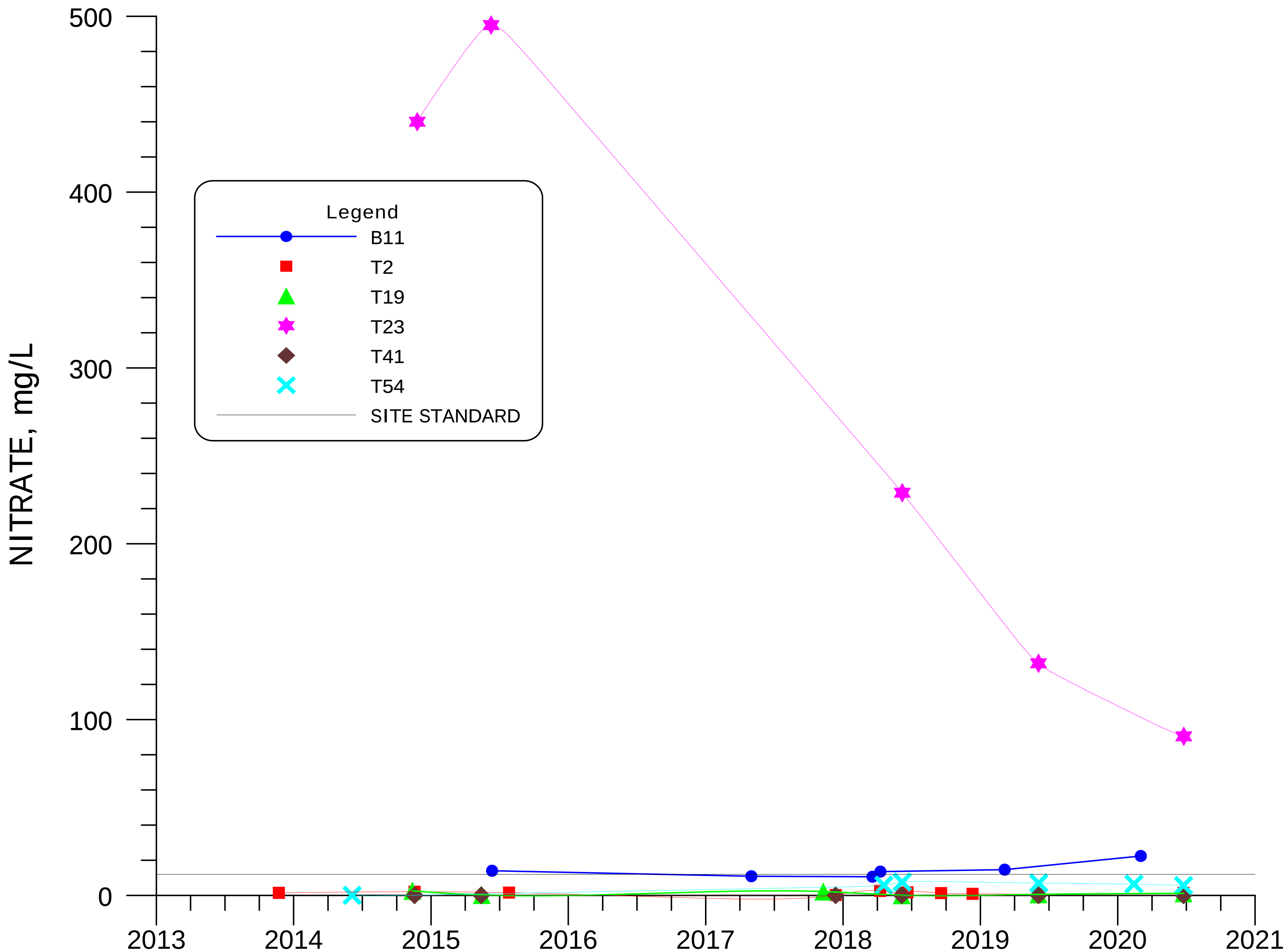


**FIGURE 4.3-109. NITRATE CONCENTRATIONS FOR WELLS B11, T2, T19, T23, T41 AND T54.**

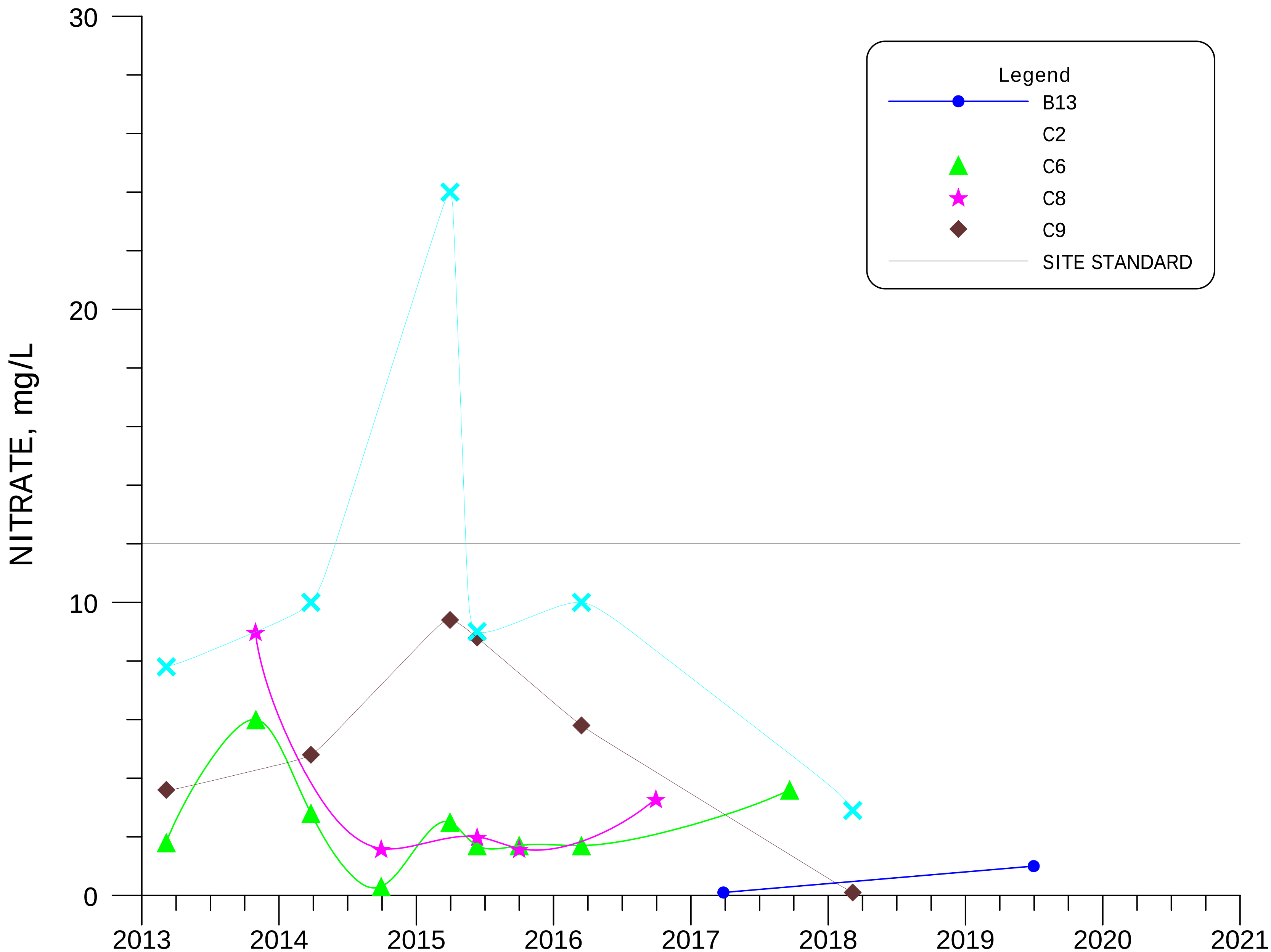


**FIGURE 4.3-110. NITRATE CONCENTRATIONS FOR WELLS B13, C2, C6, C8 AND C9.**

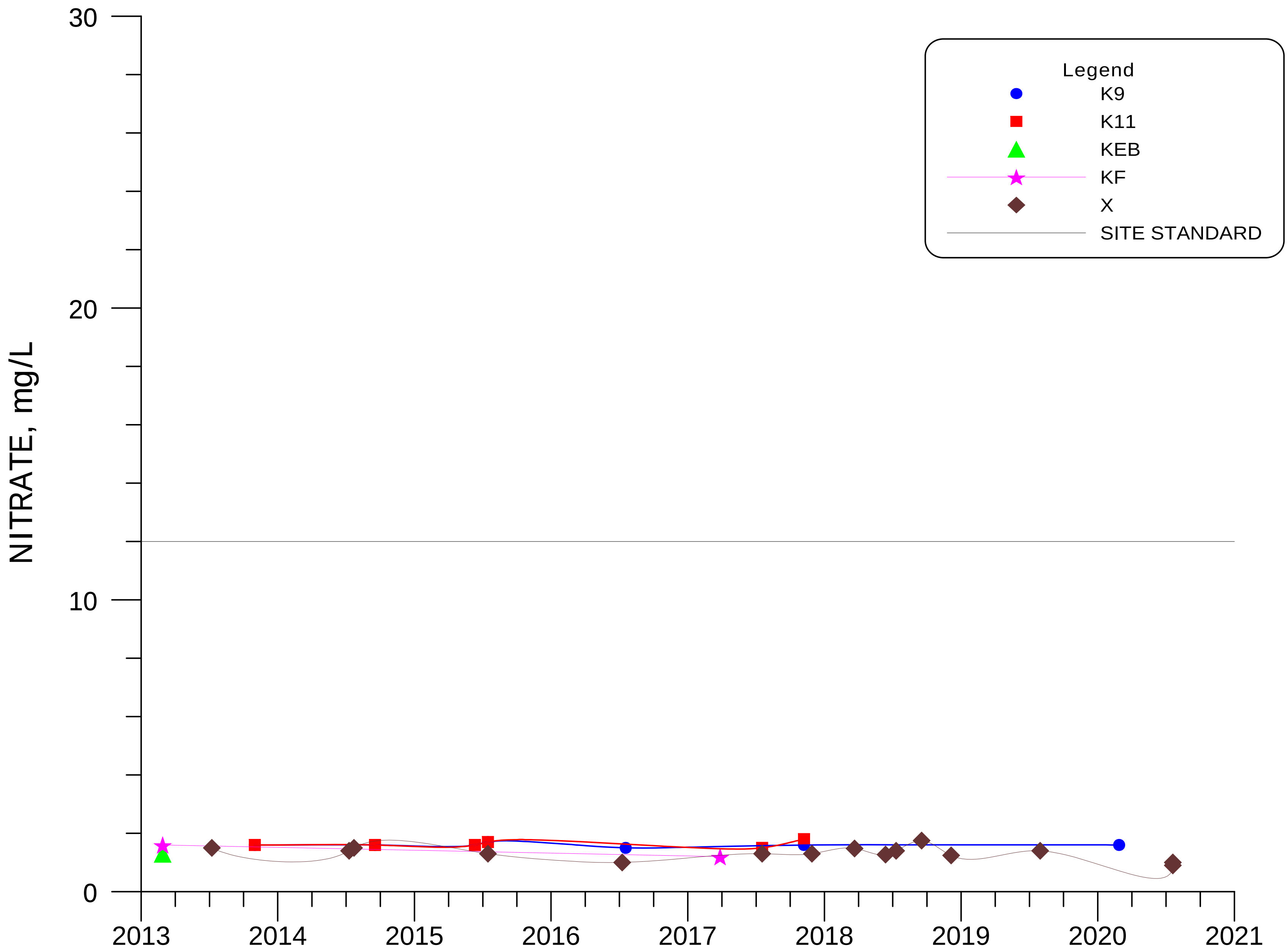


**FIGURE 4.3-111. NITRATE CONCENTRATIONS FOR WELLS K9, K11, KEB, KF AND X.**

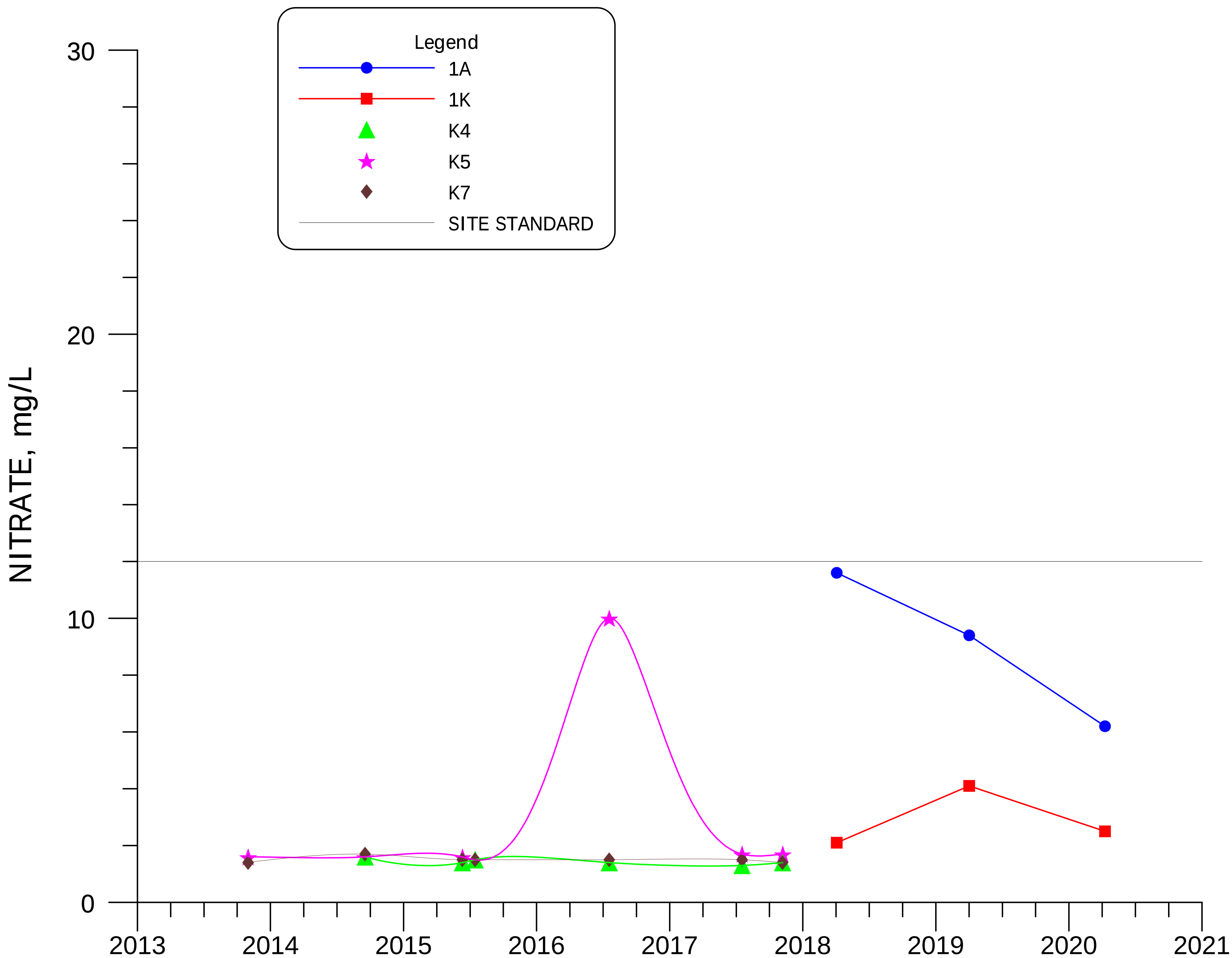


**FIGURE 4.3-112. NITRATE CONCENTRATIONS FOR WELLS 1A, 1K, K4, K5 AND K7.**

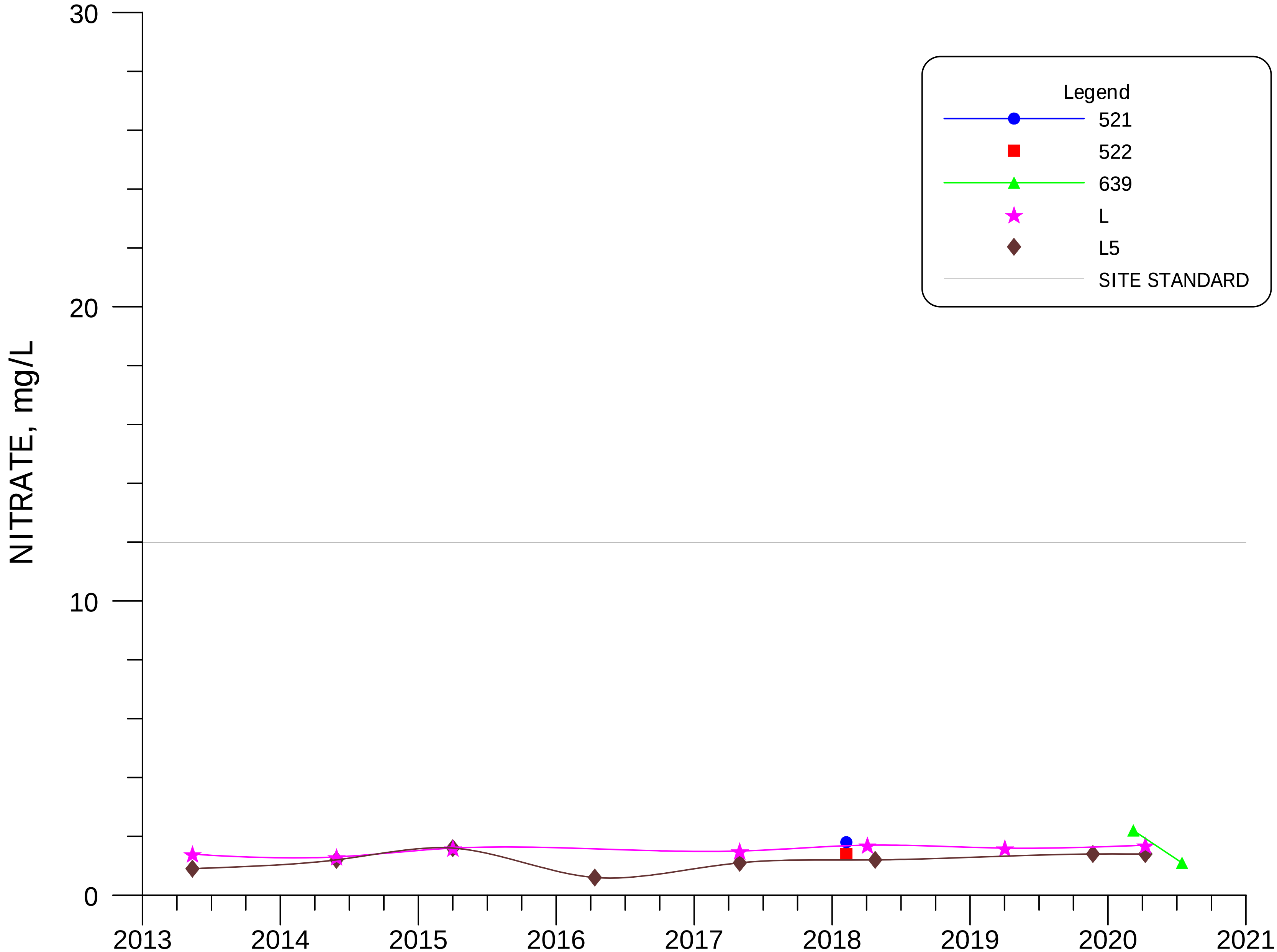


**FIGURE 4.3-113. NITRATE CONCENTRATIONS FOR WELLS 521, 522, 639, L AND L5.**

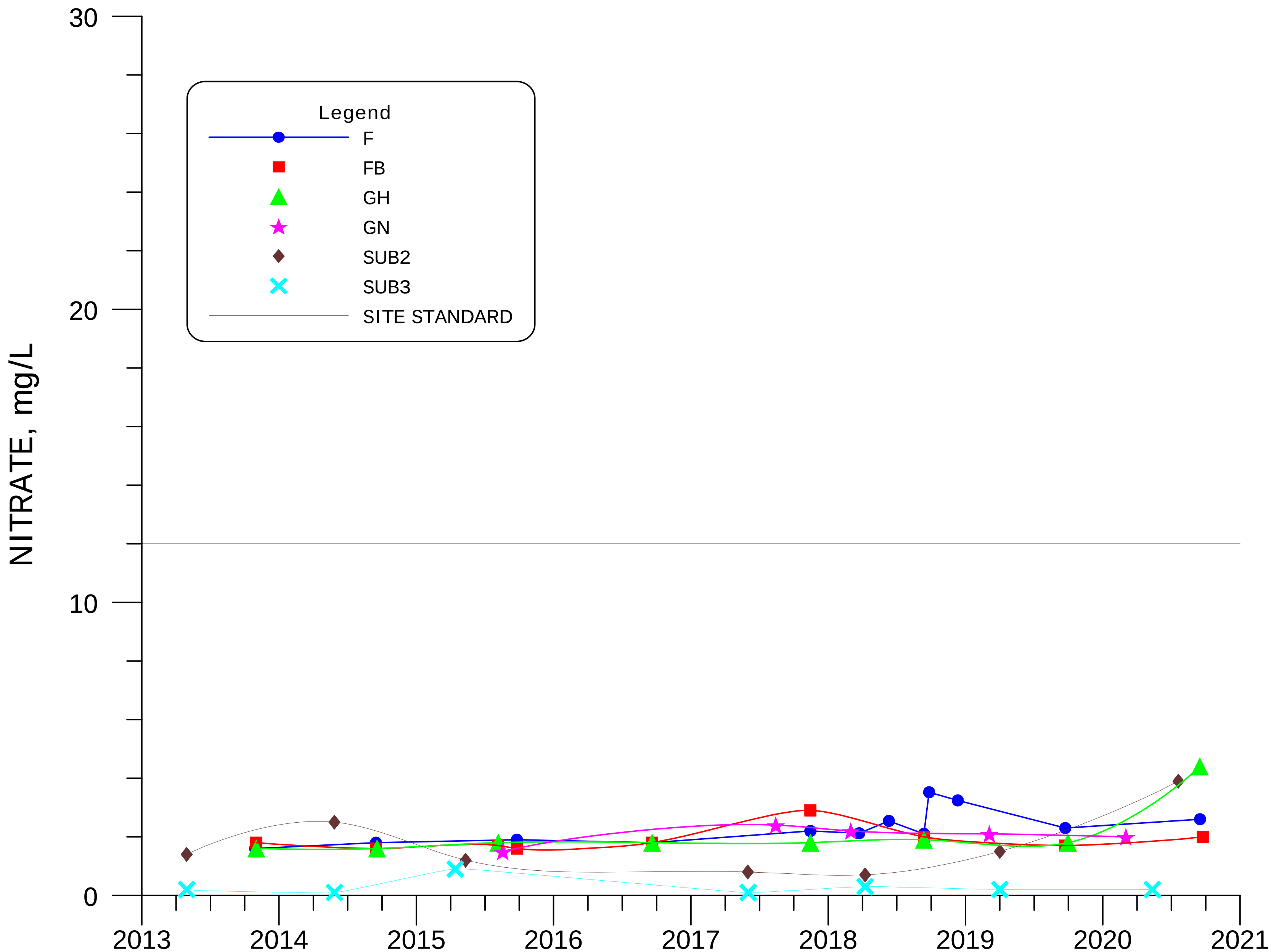


**FIGURE 4.3-114. NITRATE CONCENTRATIONS FOR WELLS F, FB, GH, GN, SUB2 AND SUB3.**

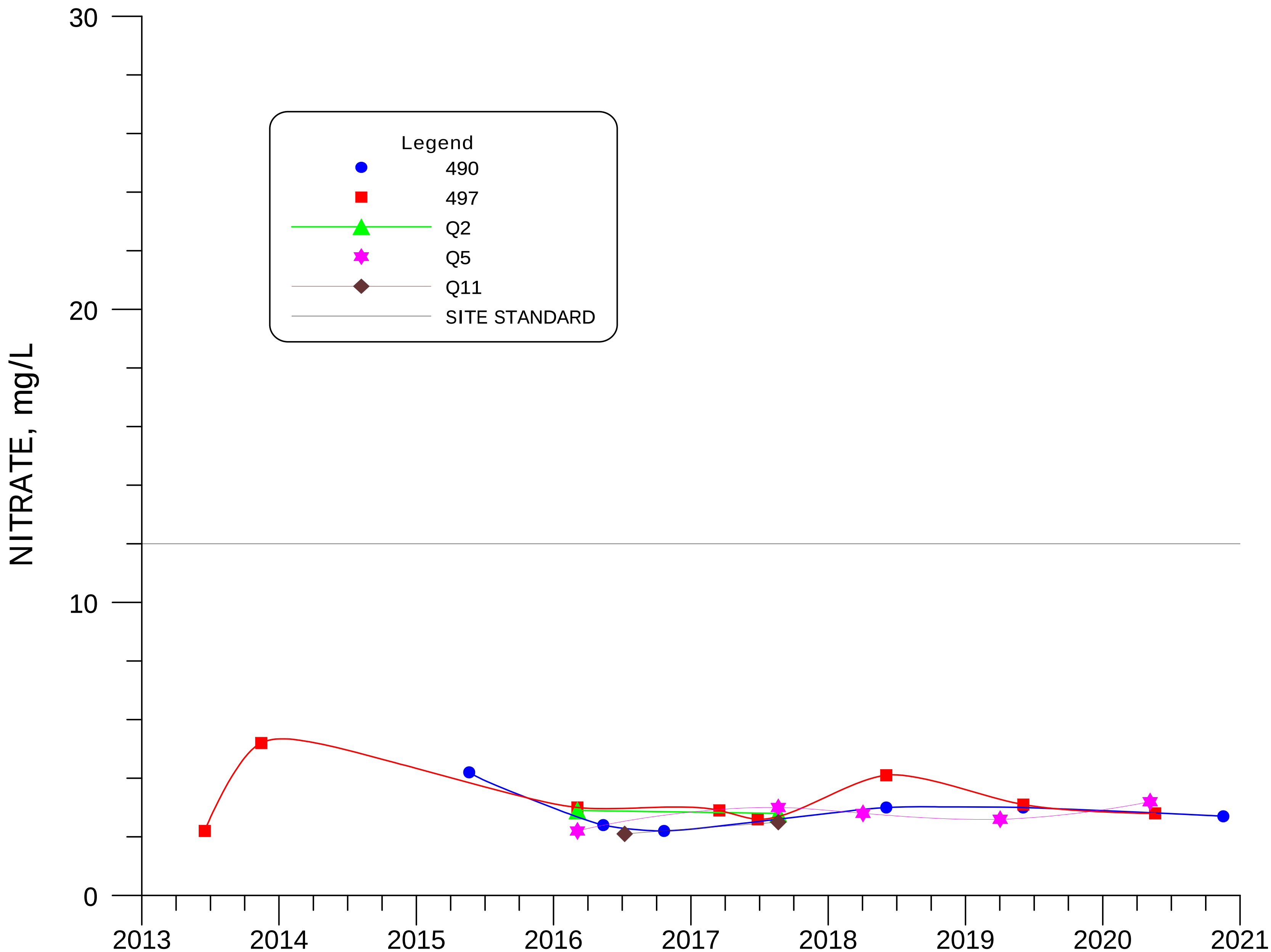


**FIGURE 4.3-115. NITRATE CONCENTRATIONS FOR WELLS 490, 497, Q2, Q5 AND Q11.**

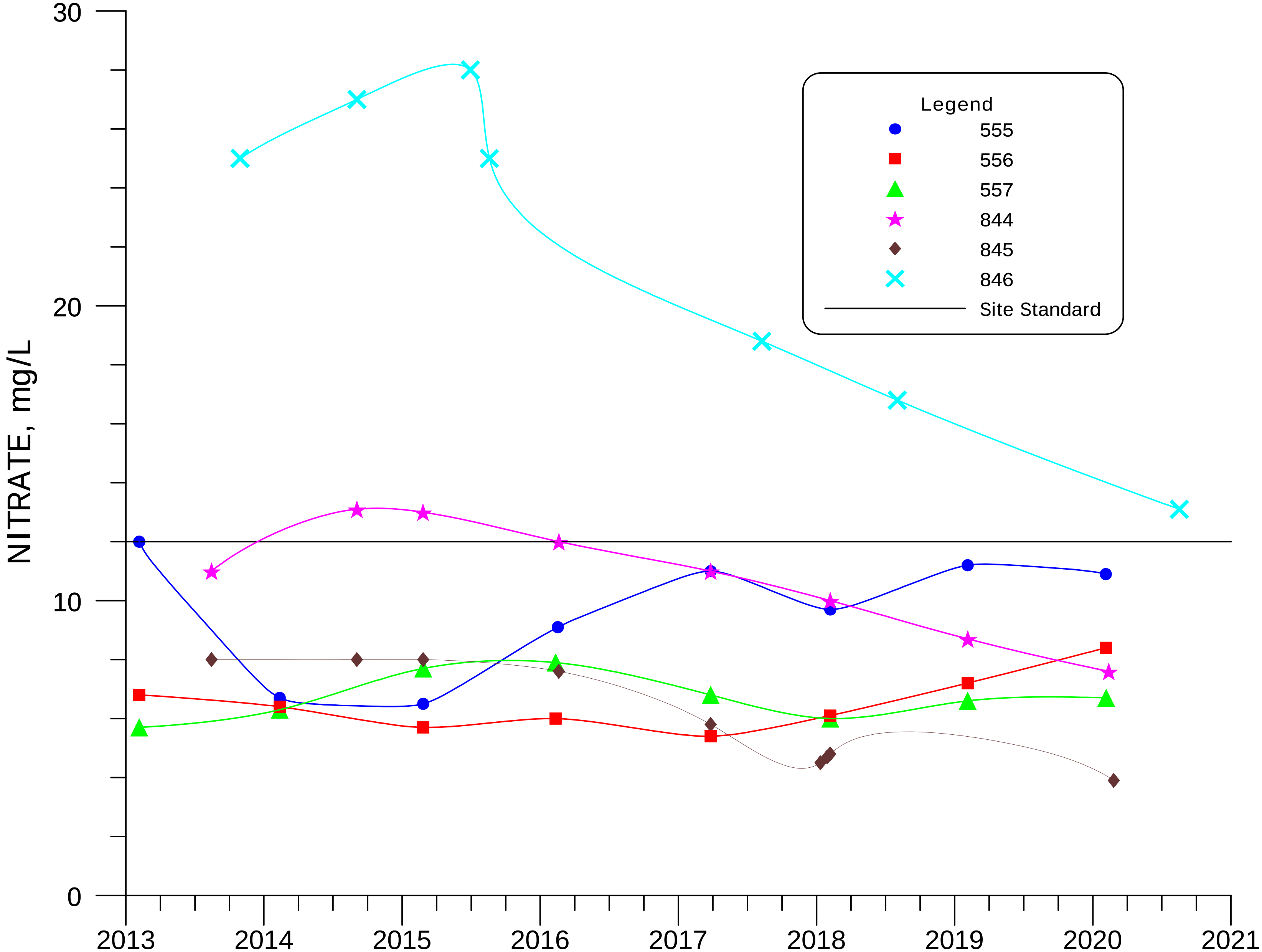


**FIGURE 4.3-116. NITRATE CONCENTRATIONS FOR WELLS 555, 556, 557, 844, 845, AND 846.**

4.3-179

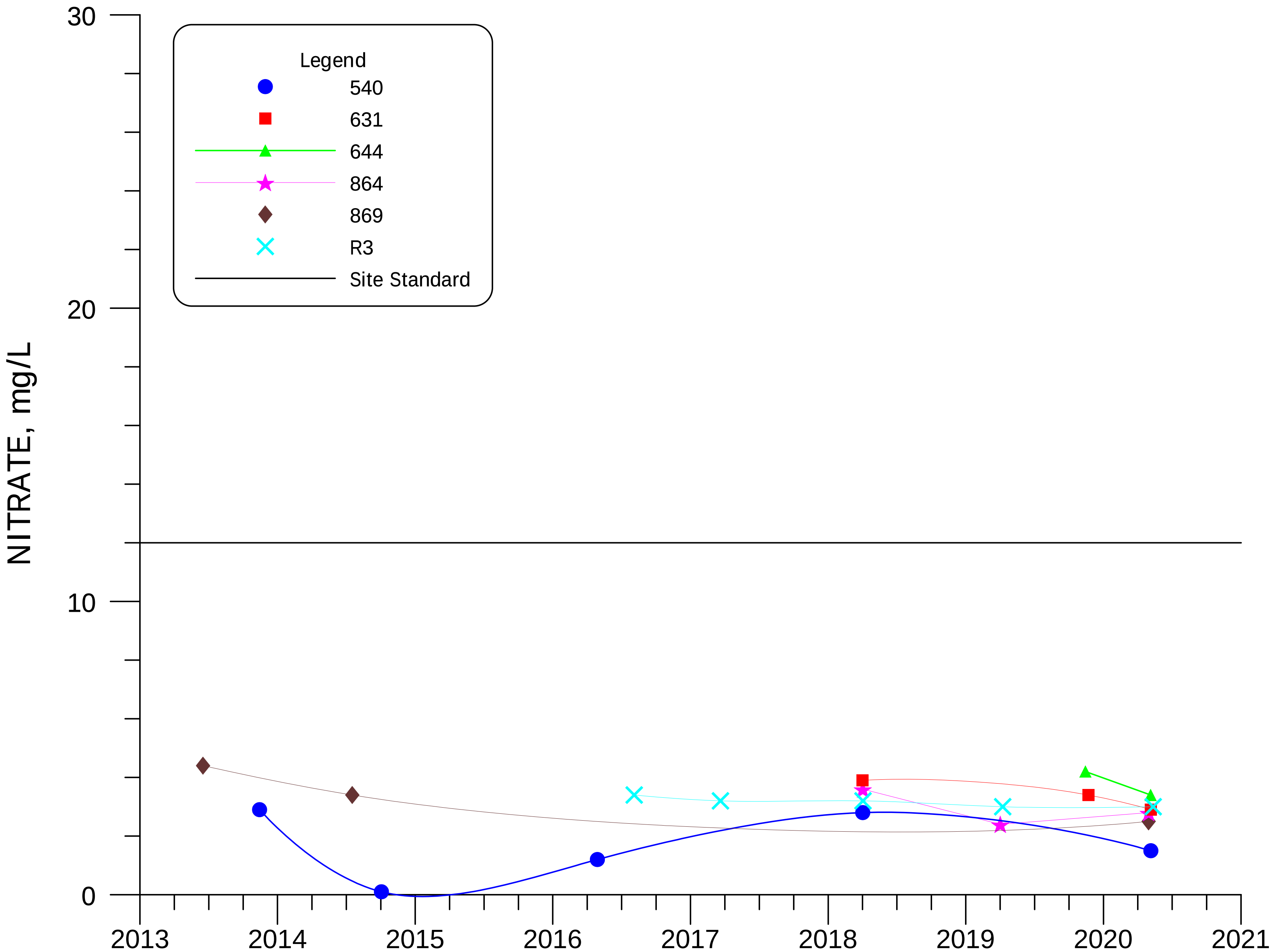


**FIGURE 4.3-117. NITRATE CONCENTRATIONS FOR WELLS 540, 631, 644, 864, 869 AND R3.**

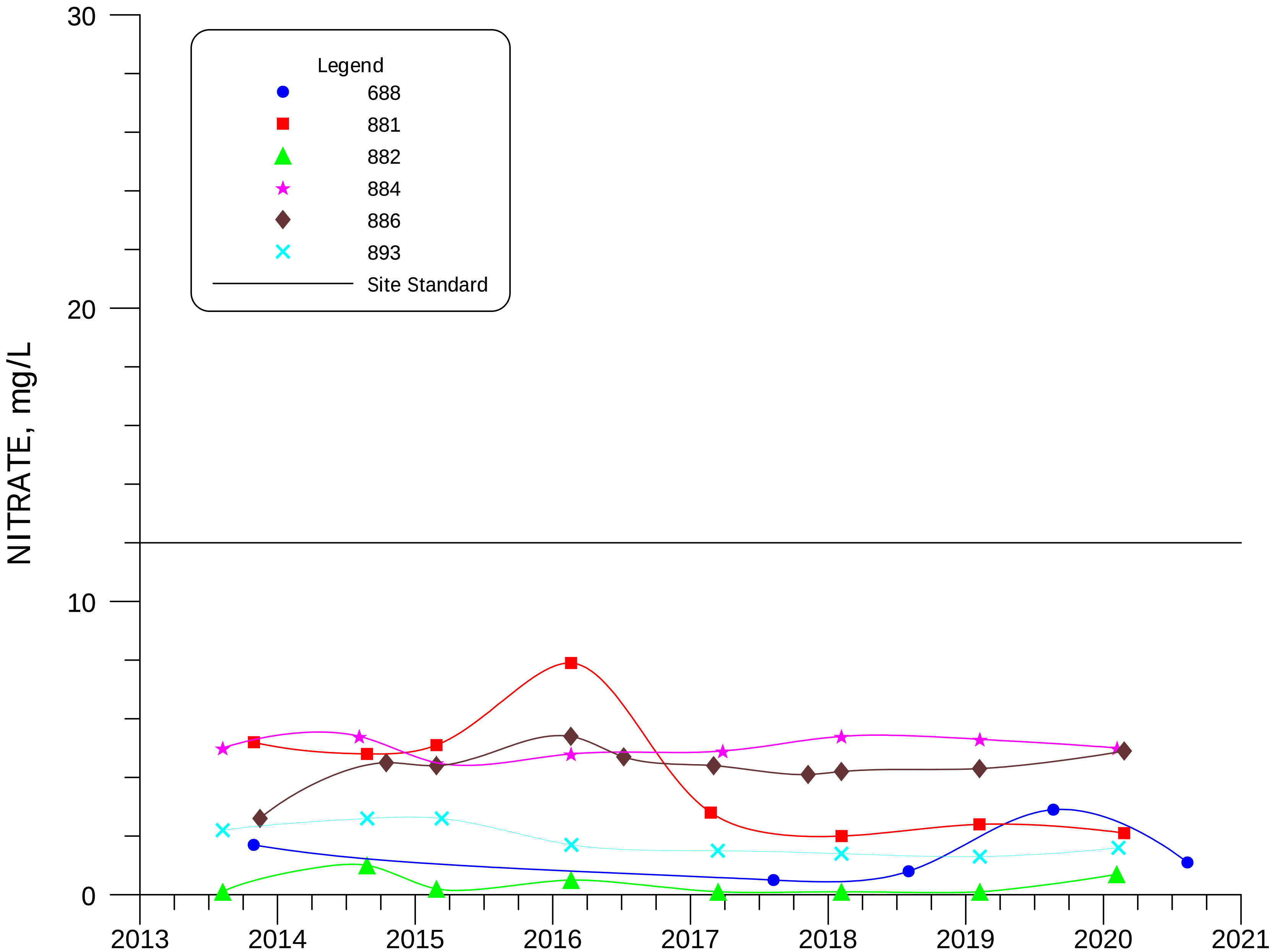


**FIGURE 4.3-118. NITRATE CONCENTRATIONS FOR WELLS 688, 881, 882, 884, 886 AND 893.**

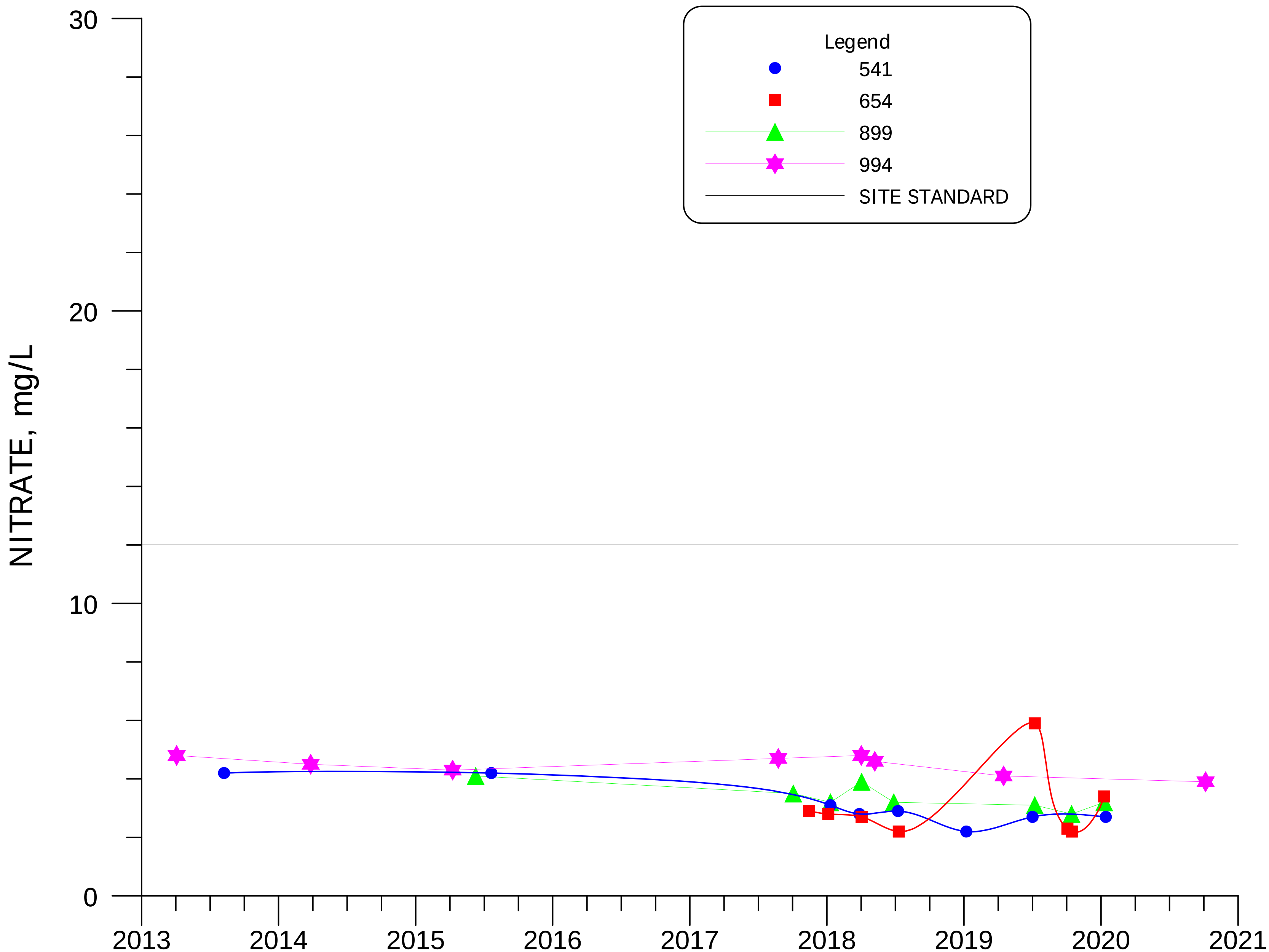


**FIGURE 4.3-119. NITRATE CONCENTRATIONS FOR WELLS 541, 654, 899 AND 994.**

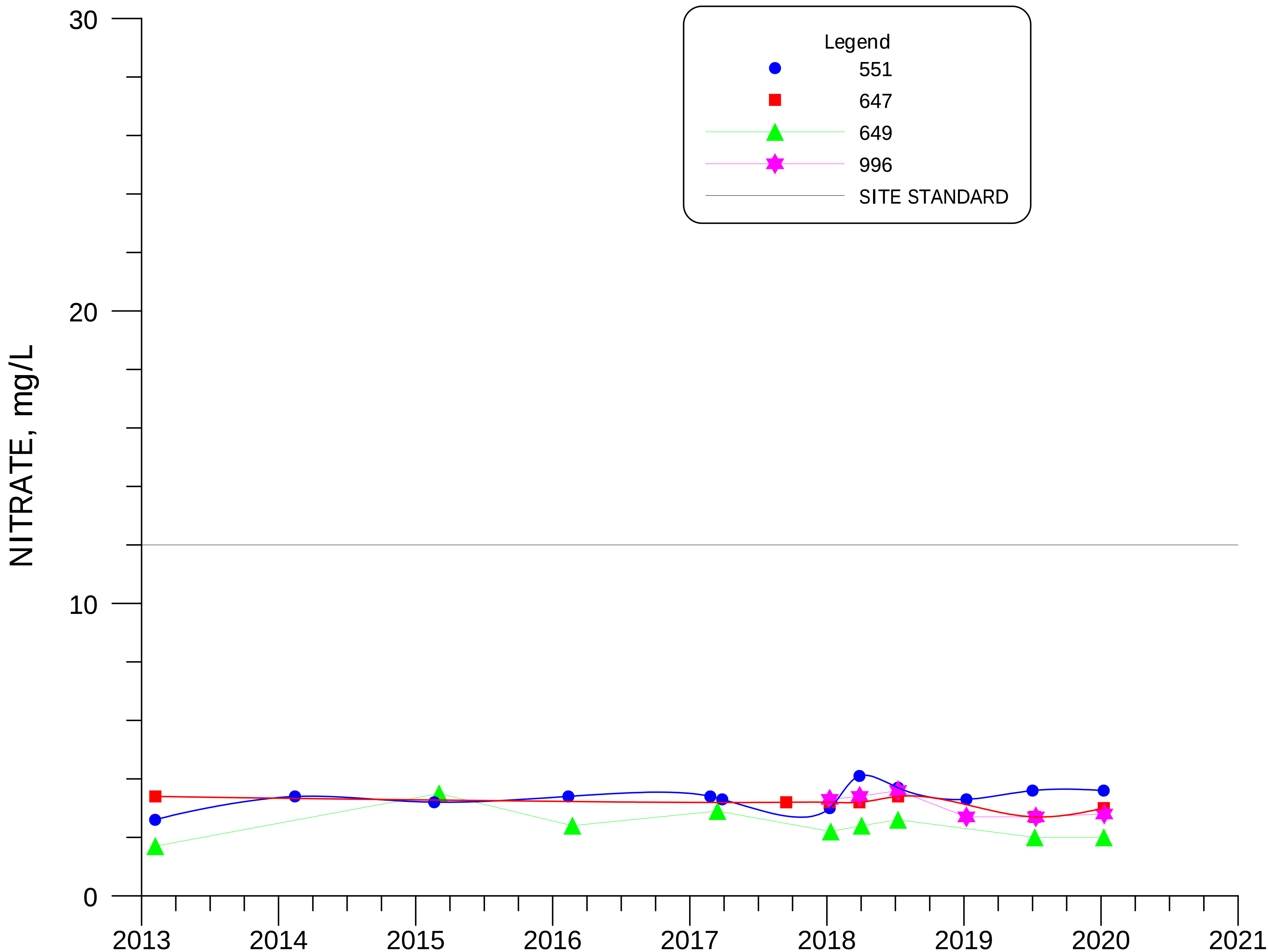


**FIGURE 4.3-120. NITRATE CONCENTRATIONS FOR WELLS 551, 647, 649 AND 996.**

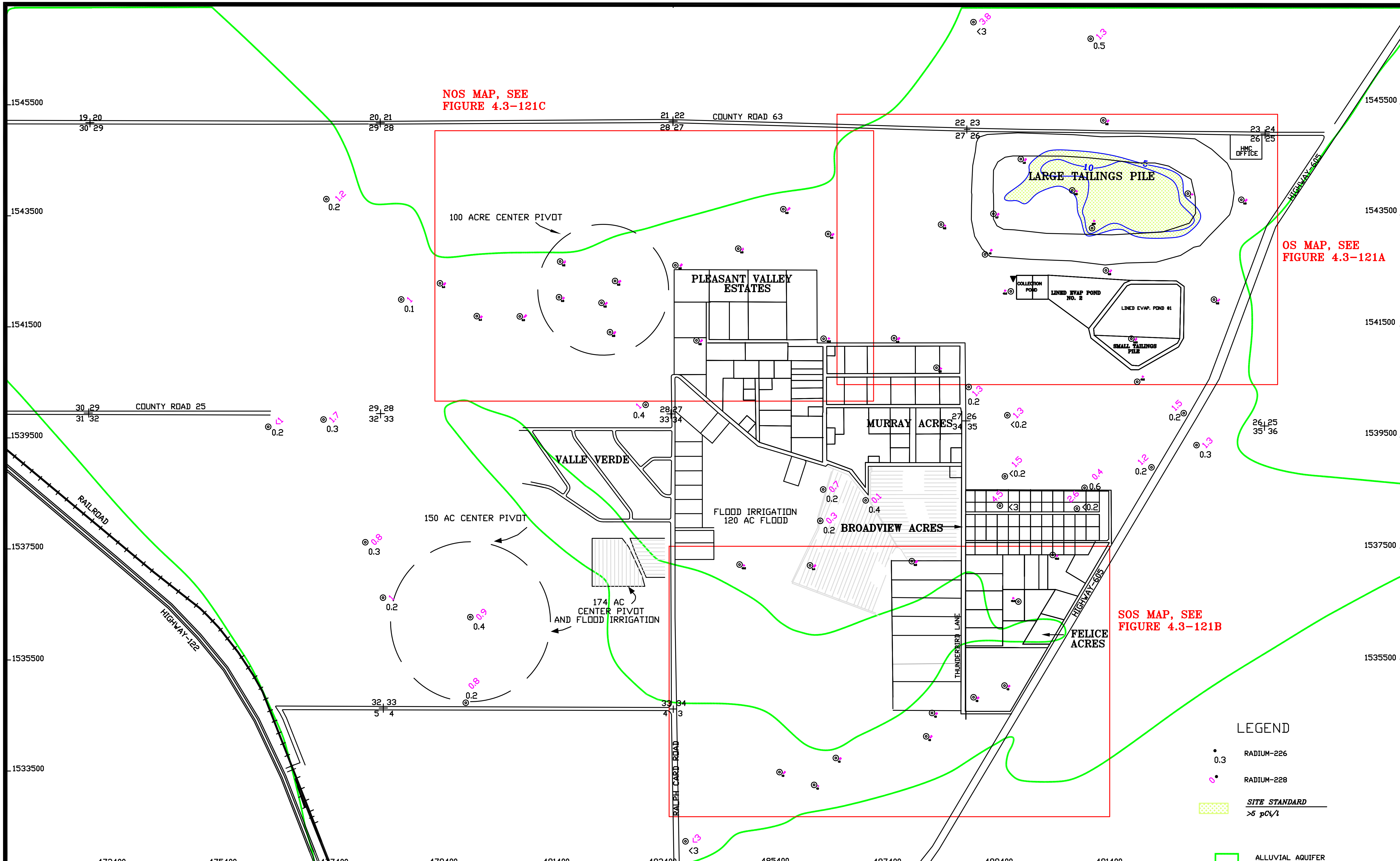


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FIGURE 4.3-121. RADIUM-226 AND RADIUM-228 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, pCi/L

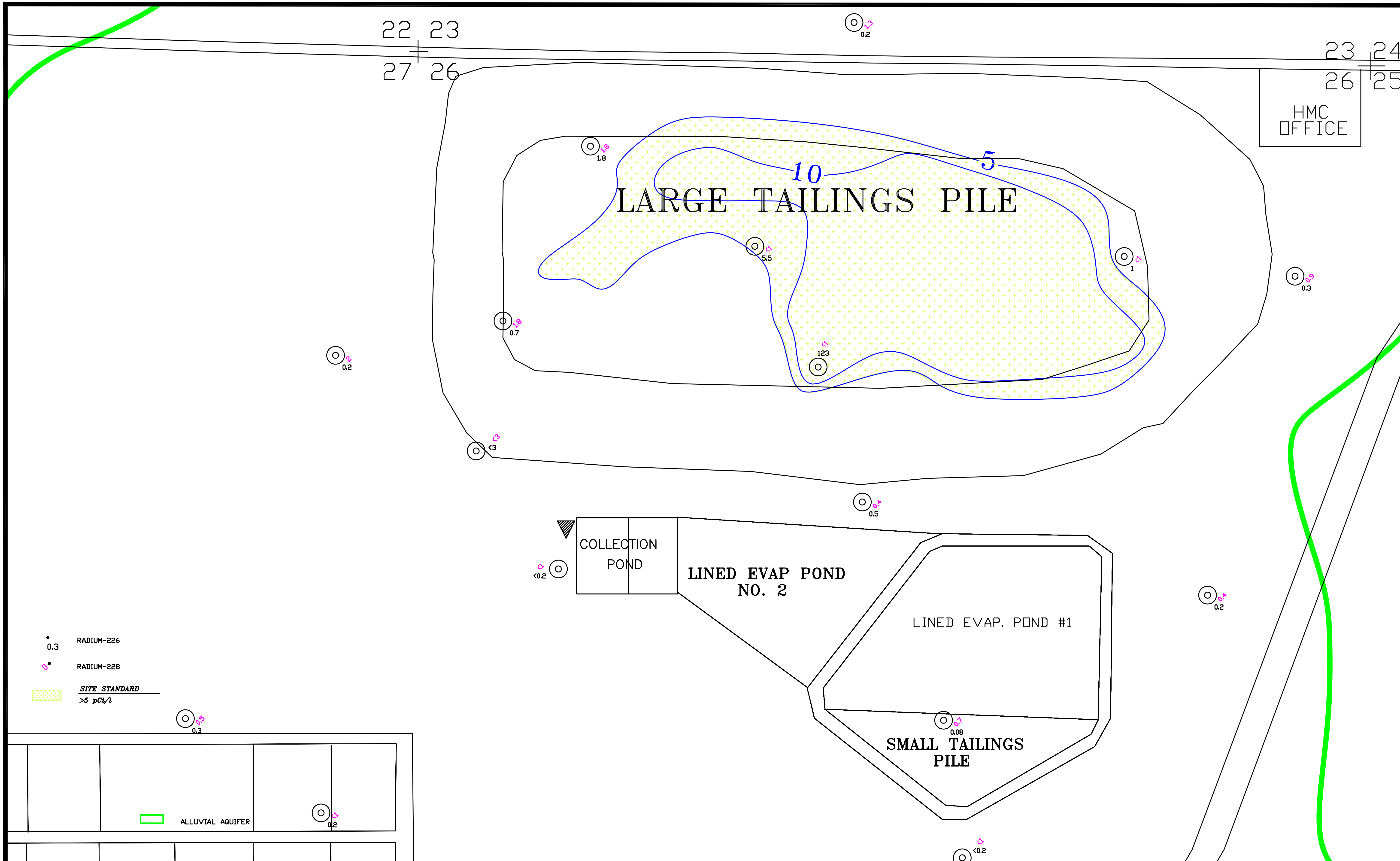


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FIGURE 4.3-121A. RADIUM-226 AND RADIUM-228 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, pCi/L

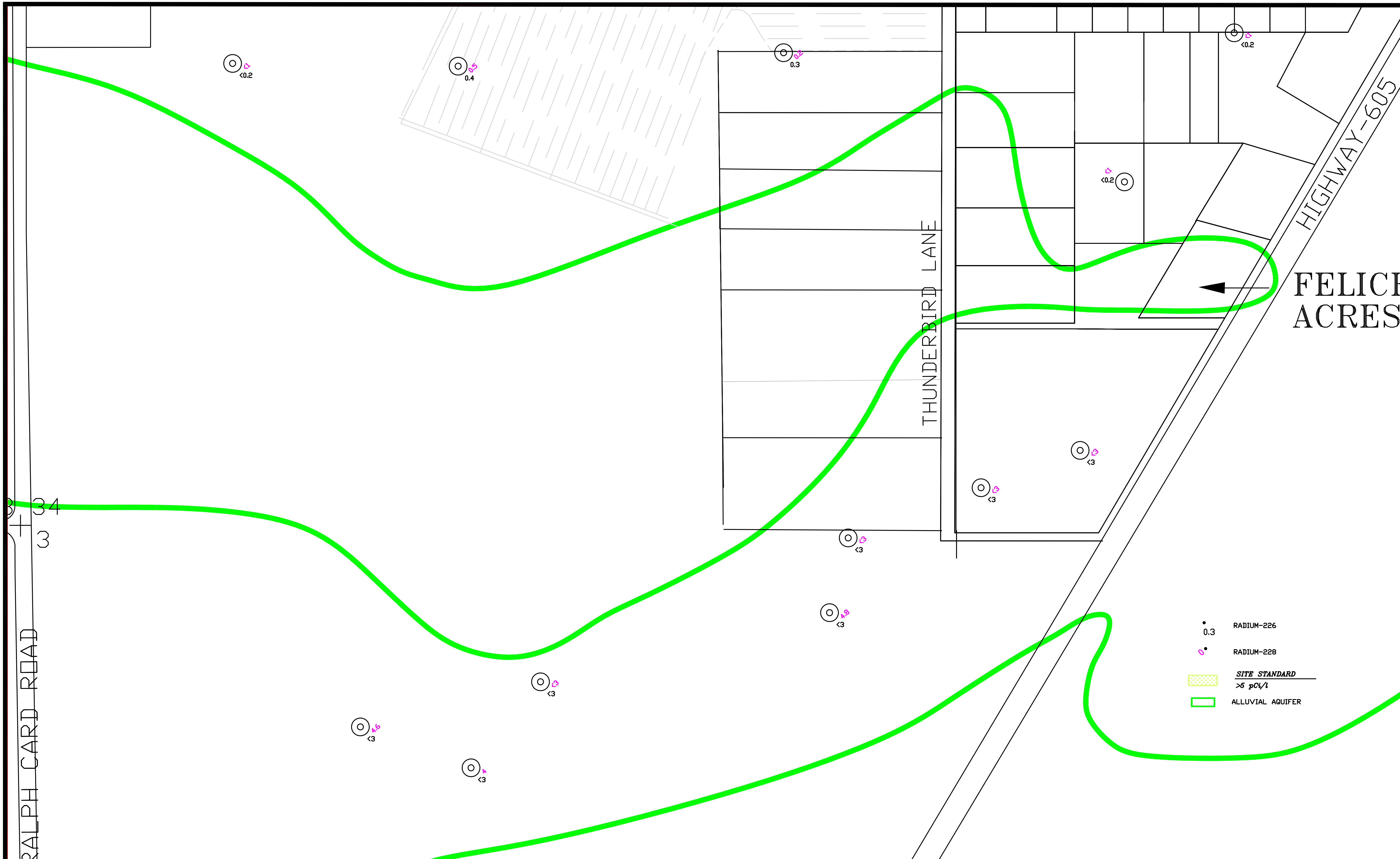


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FIGURE 4.3-121B. RADIUM-226 AND RADIUM-228 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, pCi/L

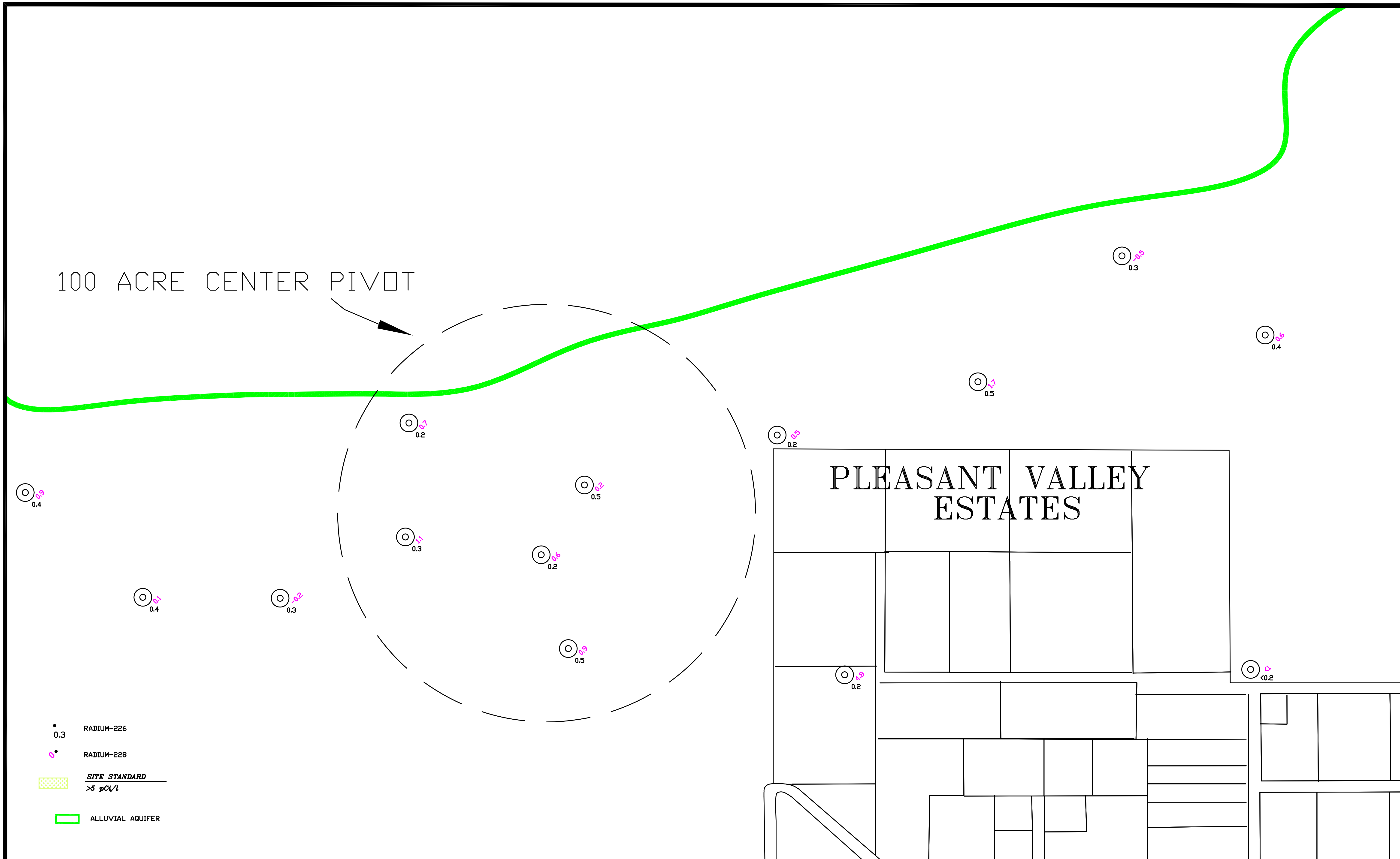


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FIGURE 4.3-121C. RADIUM-226 AND RADIUM-228 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, pCi/L

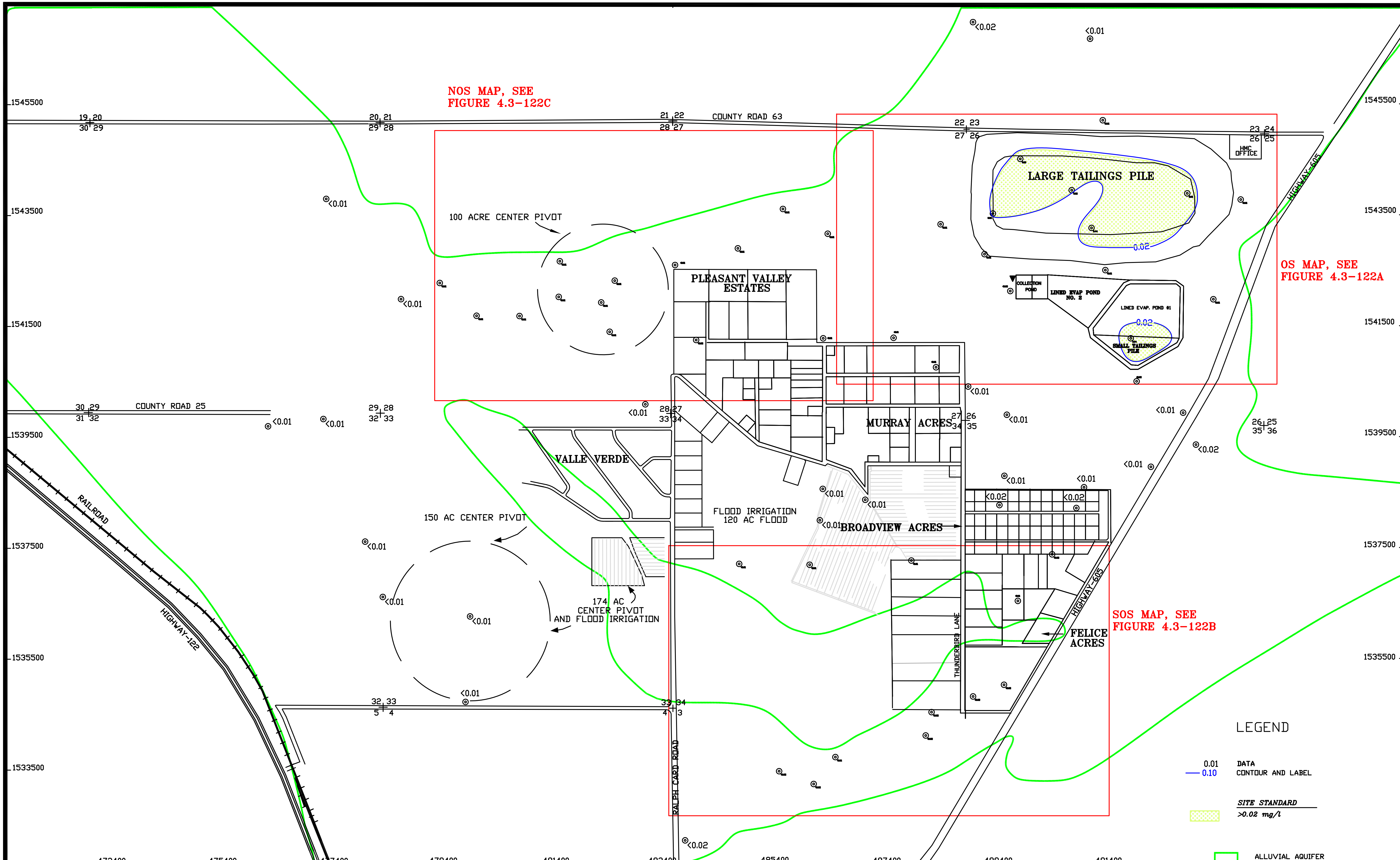


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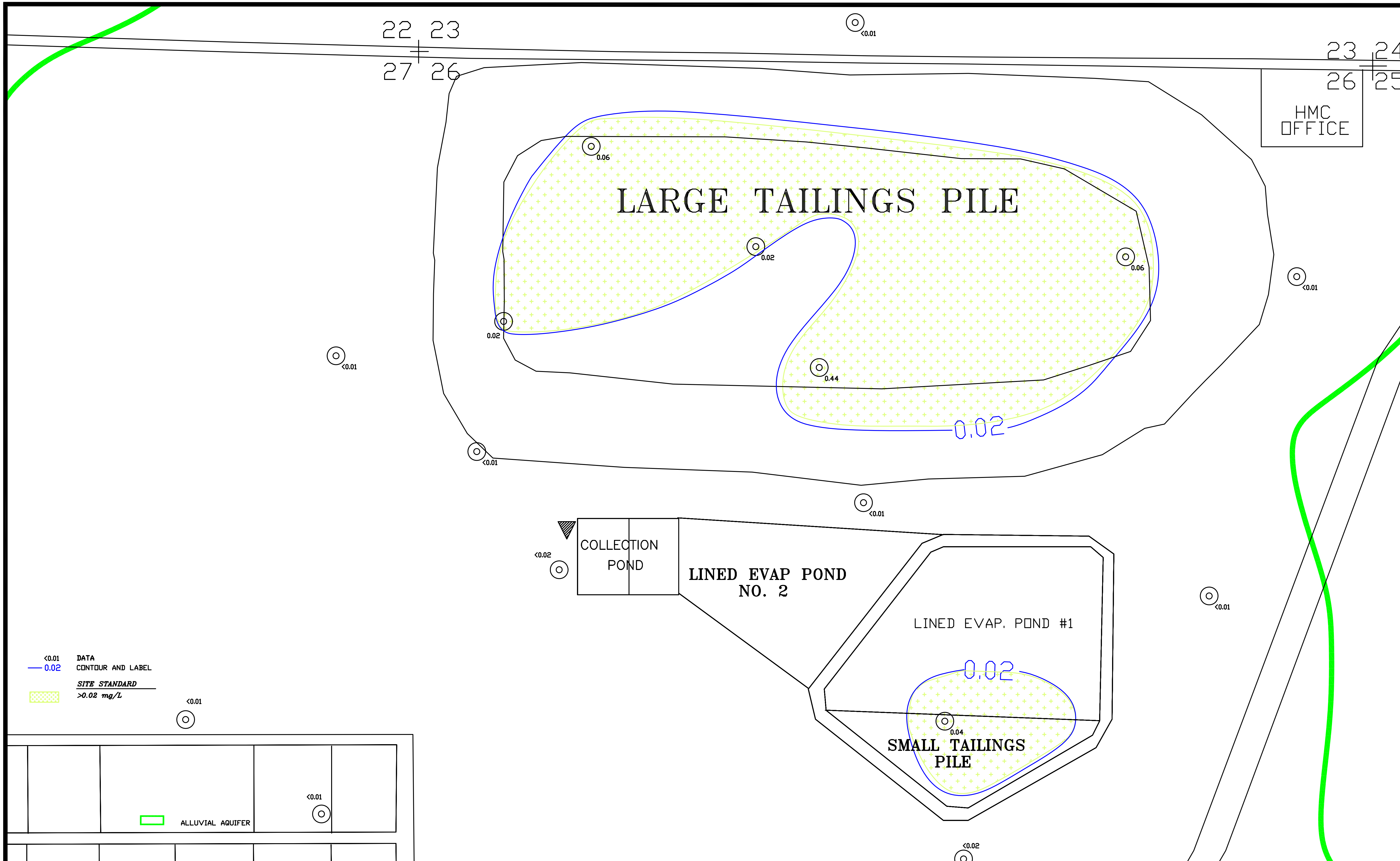
FIGURE 4.3-122. VANADIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, mg/L




SCALE: 1"=500'
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FIGURE 4.3-122A. VANADIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, mg/L

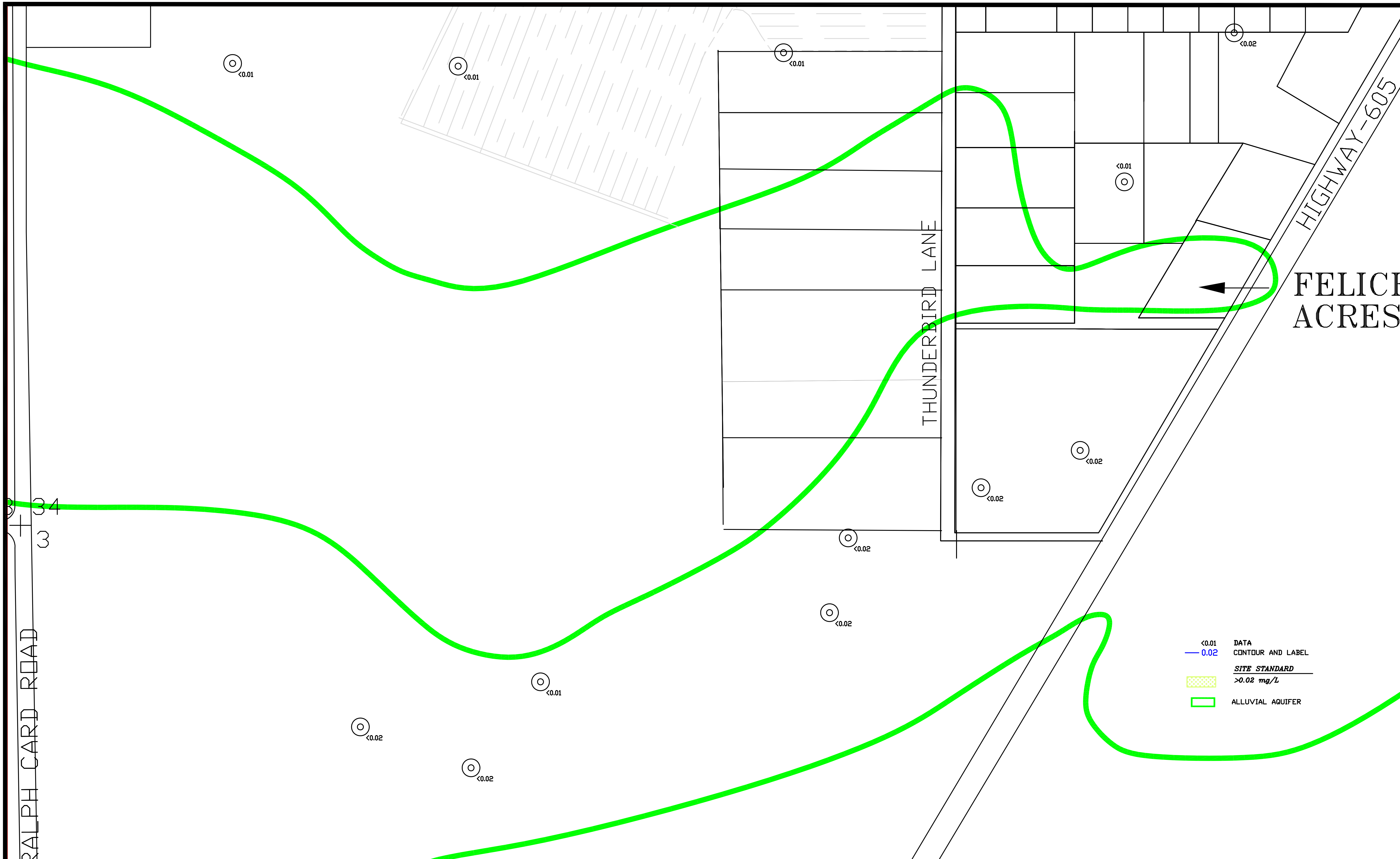


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FIGURE 4.3-122B. VANADIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, mg/L

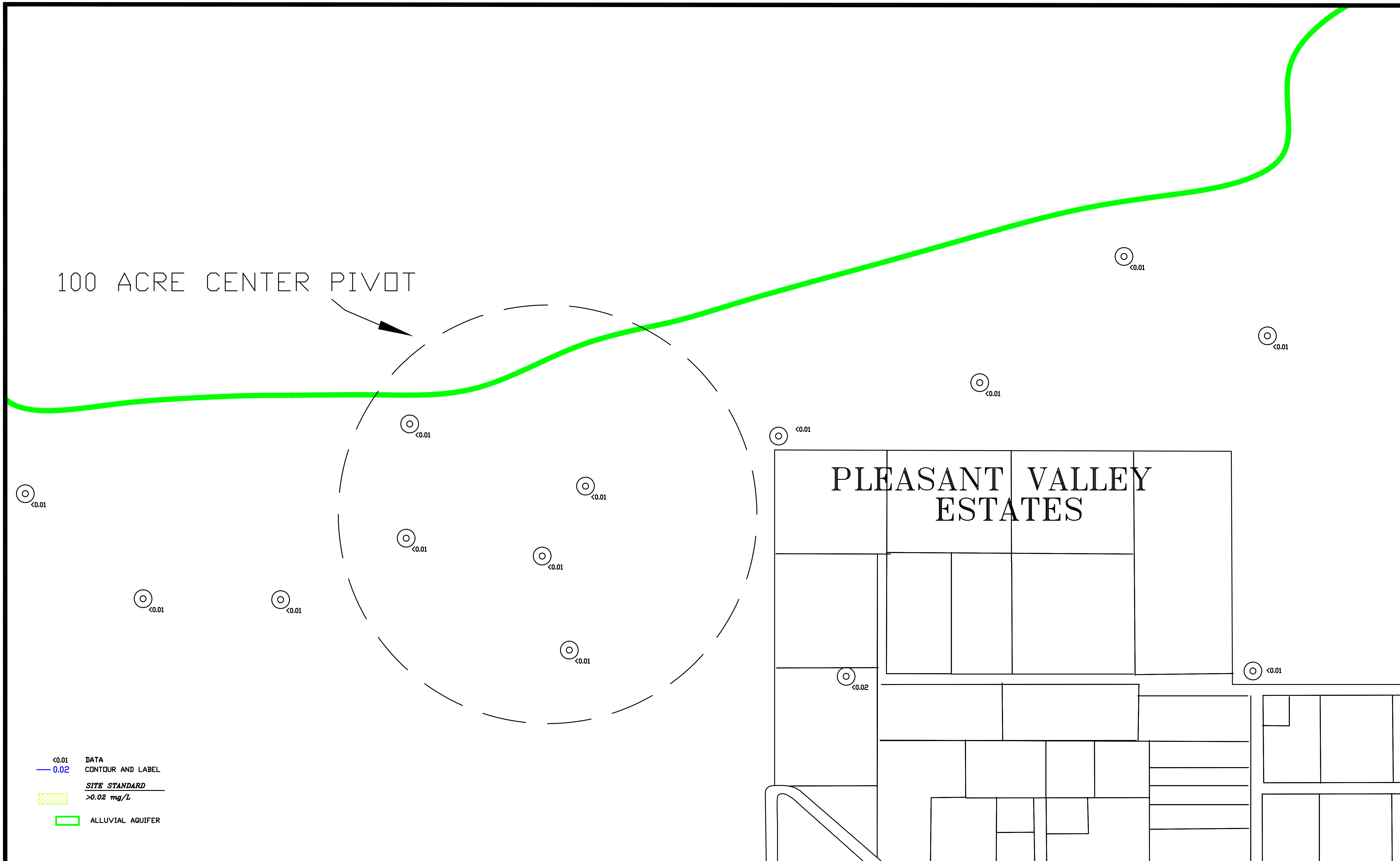


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FIGURE 4.3-122C. VANADIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, mg/L

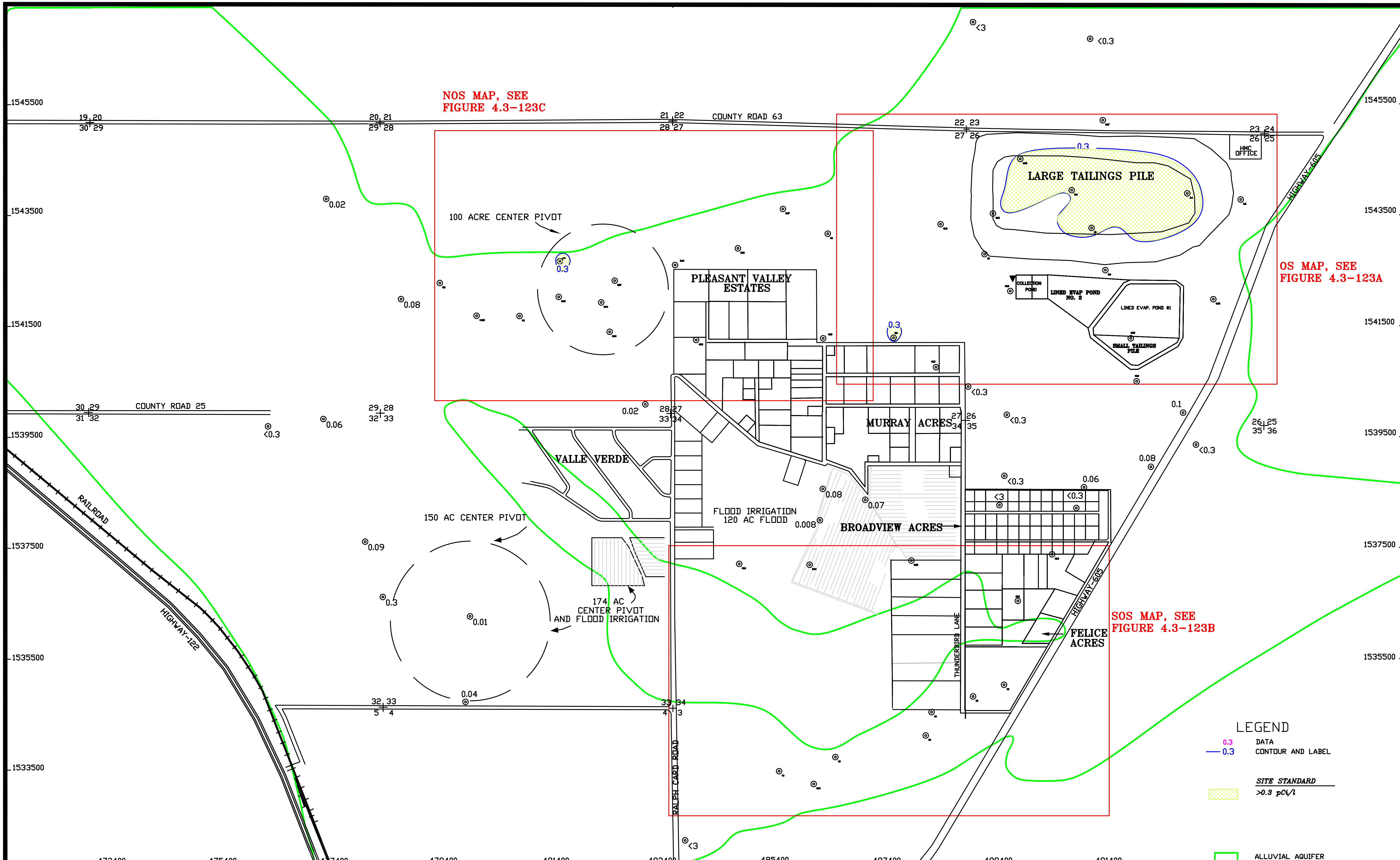


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FIGURE 4.3-123. THORIUM-230 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2020, pCi/L

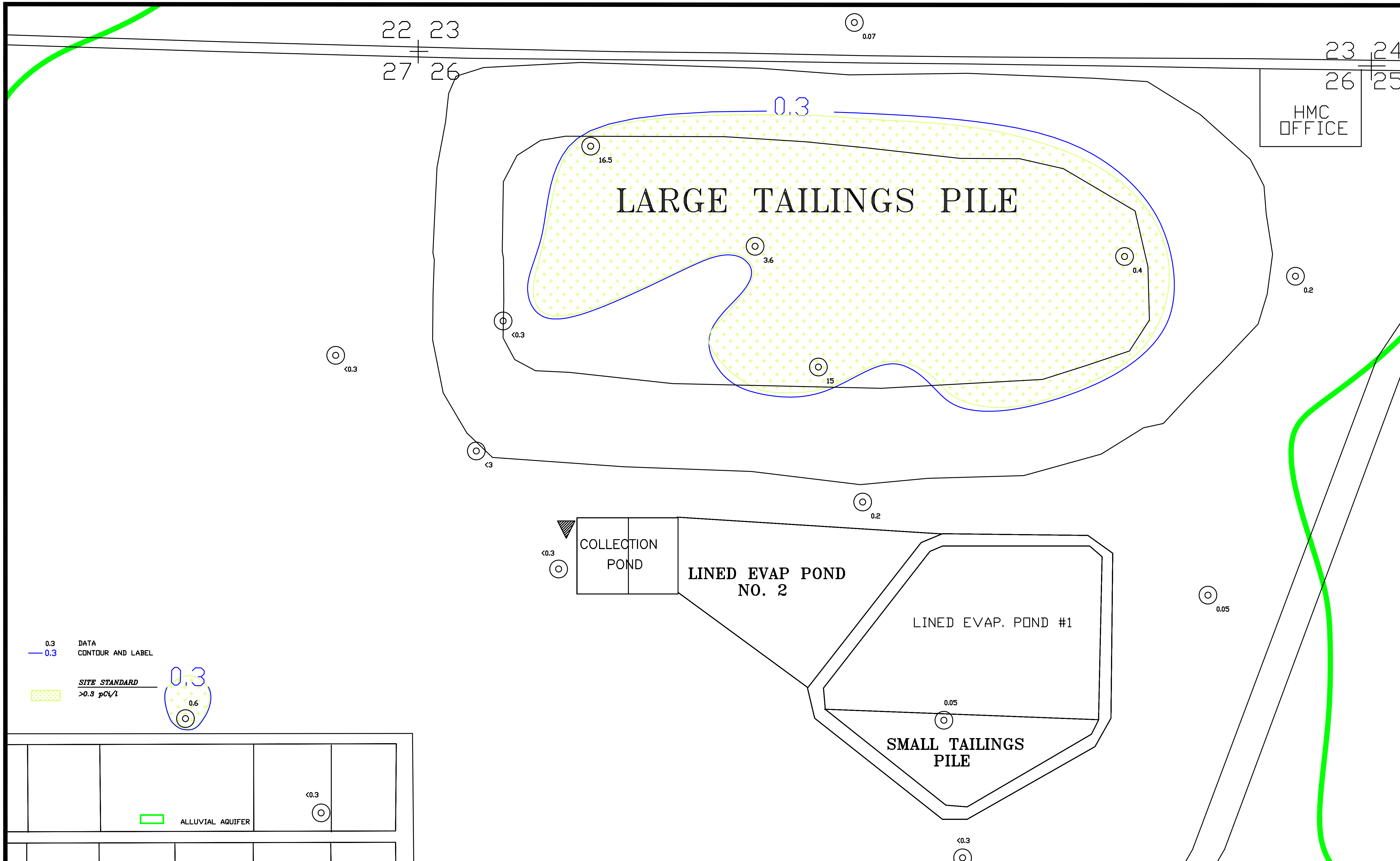


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FIGURE 4.3-123A. THORIUM-230 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, OS, 2020, pCi/L

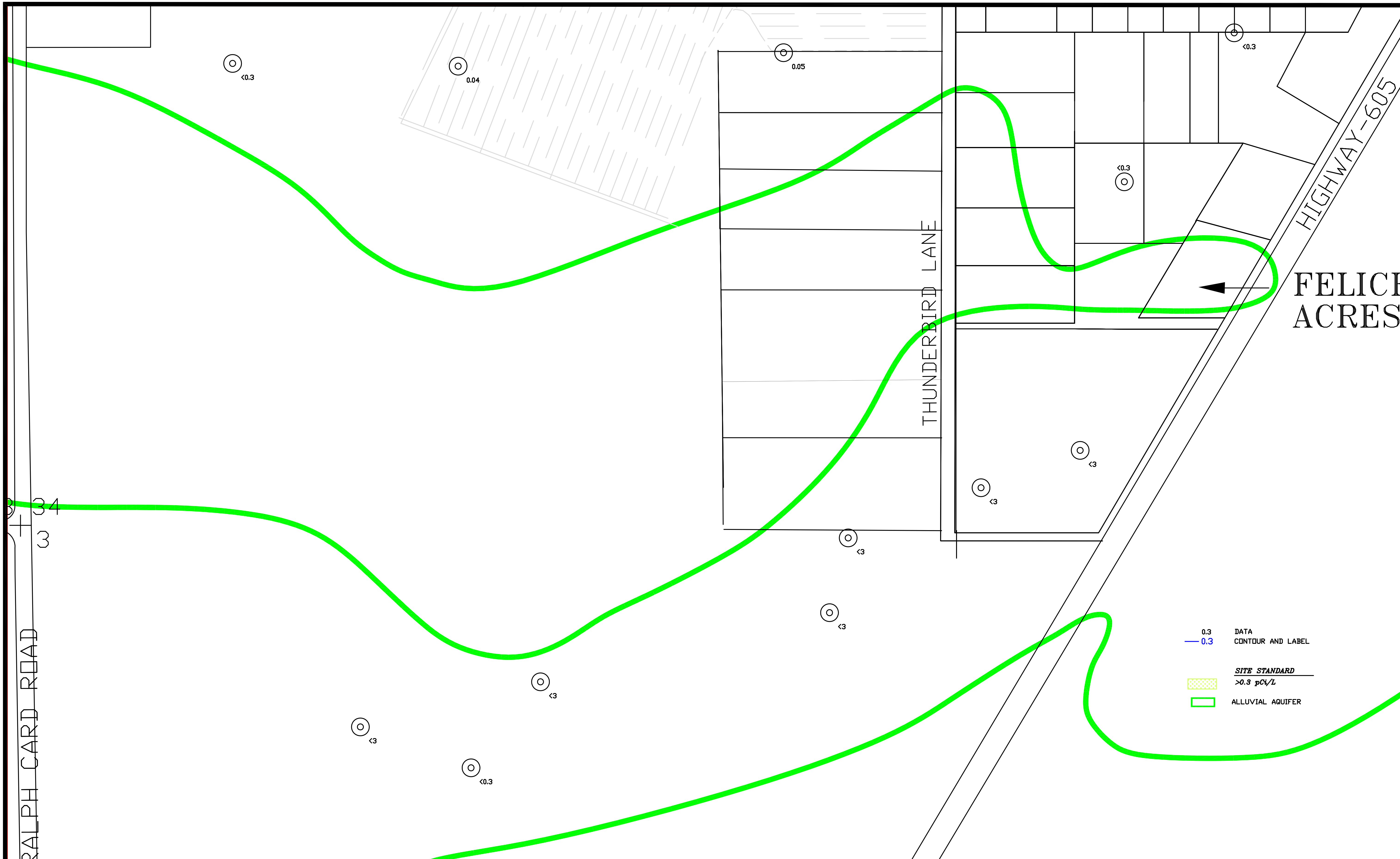


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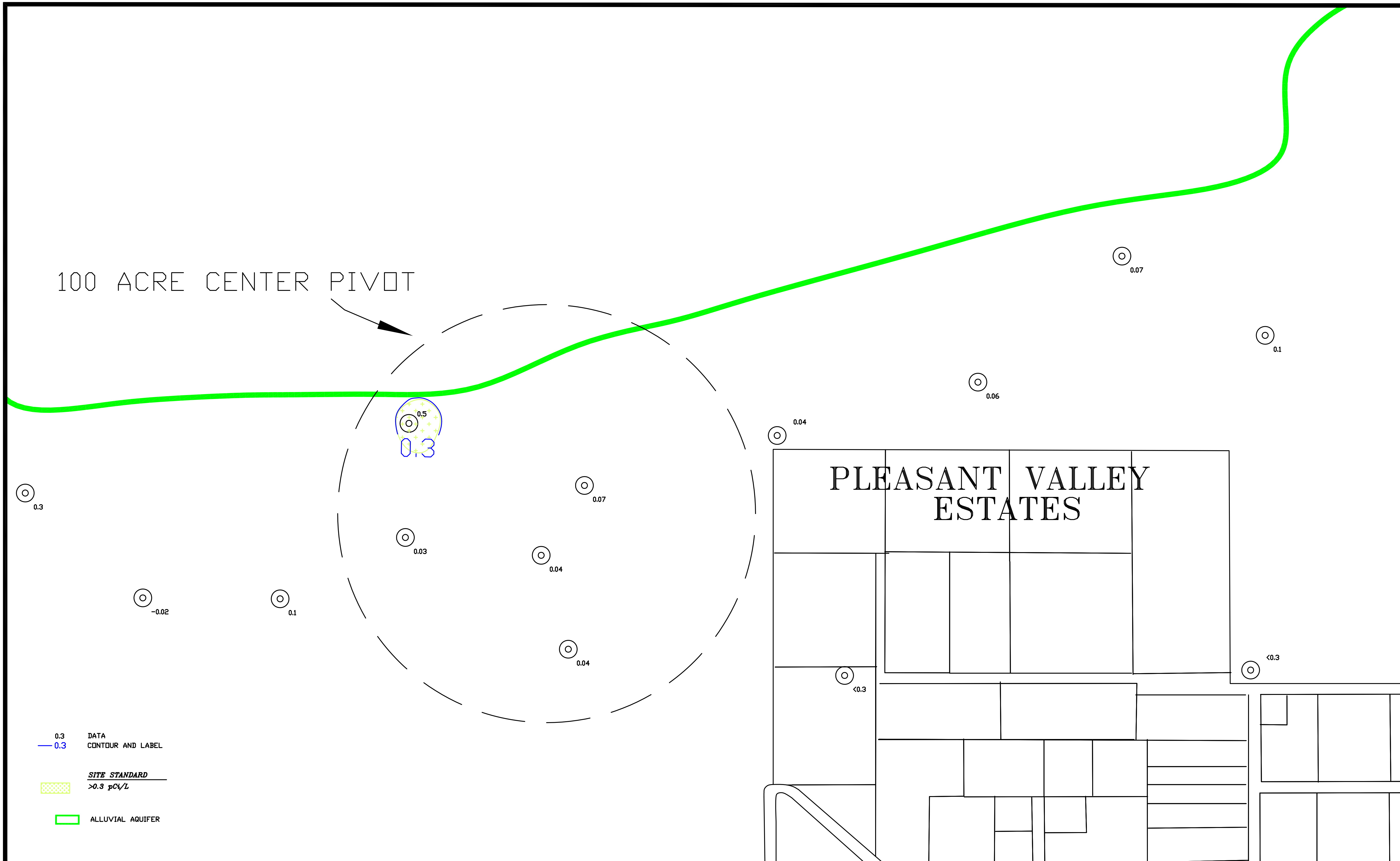
FIGURE 4.3-123B. THORIUM-230 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, SOS, 2020, pCi/L

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DATE: 3/19/2021

FIGURE 4.3-123C. THORIUM-230 CONCENTRATIONS OF THE ALLUVIAL AQUIFER, NOS, 2020, pCi/L

**TABLE 4.3-1. GRANTS PROJECT ALLUVIAL SITE STANDARDS.**

| Constituents | NRC License Site Standards | New Mexico Site Standards* |
|---|---|---|
| Uranium | 0.16 | 0.16 |
| Selenium | 0.32 | 0.32 |
| Molybdenum | 0.10 | 1.0** |
| Vanadium | 0.02 | ----- |
| RA-226 + Ra-228 | 5 | 30 |
| Thorium-230 | 0.3 | ----- |
| Sulfate | 1500 | 1500 |
| Chloride | 250 | 250 |
| TDS | 2734 | 2734 |
| Nitrate | 12 | 12 |

NOTE: All concentrations are in mg/L except: Ra-226 + Ra-228 and Th-230, which are in pCi/L.
* = NMED renewal of DP-200 Discharge Plan
** = New Mexico Irrigation Standard

| TABLE 4.3-2 2020 BACKGROUND WELL DATA - ALLUVIUM | | | | | | | |
|---|---|---|---|---|---|---|---|
| | PARAMETERS | | | | | | |
| | Se | U | Mo | SO4 | Cl | TDS | $NO_3$ |
| NRC Site Standard | 0.32 | 0.16 | 0.10 | 1500 | 250 | 2734 | 12 |
| NMED Site Standard | 0.32 | 0.16 | 1.0 | 1500 | 250 | 2734 | 12 |
| NEAR UP-GRADIENT WELLS | | | | | | | |
| DD | 0.06 | 0.11 | <0.01 | 1850 | 71 | 3420 | 8.7 |
| DD2 | <0.005 | 0.23 | <0.01 | 1530 | 56 | 2700 | <0.1 |
| DD3 | - | - | - | - | - | - | - |
| DD4 | - | - | - | - | - | - | - |
| DD5 | - | - | - | - | - | - | - |
| ND | - | - | - | - | - | - | - |
| P | 0.14 | 0.03 | <0.01 | 1010 | 47 | 1860 | 5.2 |
| P2 | 0.35 | 0.03 | 0.001 | 1320 | 63 | 2340 | - |
| P3 | 0.44 | 0.02 | 0.001 | 1380 | 72 | 2420 | - |
| P4 | 0.18 | 0.02 | 0.002 | 881 | 45 | 1620 | - |
| Q | 0.37 | 0.05 | <0.03 | 1630 | 66 | 2670 | 12.4 |
| R | 0.66 | 0.02 | 0.002 | 1410 | 57 | 2370 | - |
| FAR UP-GRADIENT WELLS | | | | | | | |
| 914 | - | - | - | - | - | - | - |
| 920 | - | - | - | - | - | - | - |
| 921 | 0.54 | 0.20 | 0.003 | 1670 | 65 | 2800 | 15.6 |
| 922 | - | - | - | - | - | - | - |
| 950 | - | - | - | - | - | - | - |

[1] Wells DD, DD2, P, P2, P3, P4, Q, R, and 921 are up-gradient wells sampled in 2020.
[2] Wells DD, ND, P, P1, P2, P3, P4, Q and R were used to establish site standards.

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## 5.0 UPPER CHINLE AQUIFER MONITORING

Numerous Upper Chinle wells were monitored in 2020 to define conditions in this aquifer and define Upper Chinle restoration for the year.

## 5.1 UPPER CHINLE WELL COMPLETIONS

Chinle aquifer well locations are shown on Figures 5.1-1, 5.1-1A and 5.1-1B. 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 HMC 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.

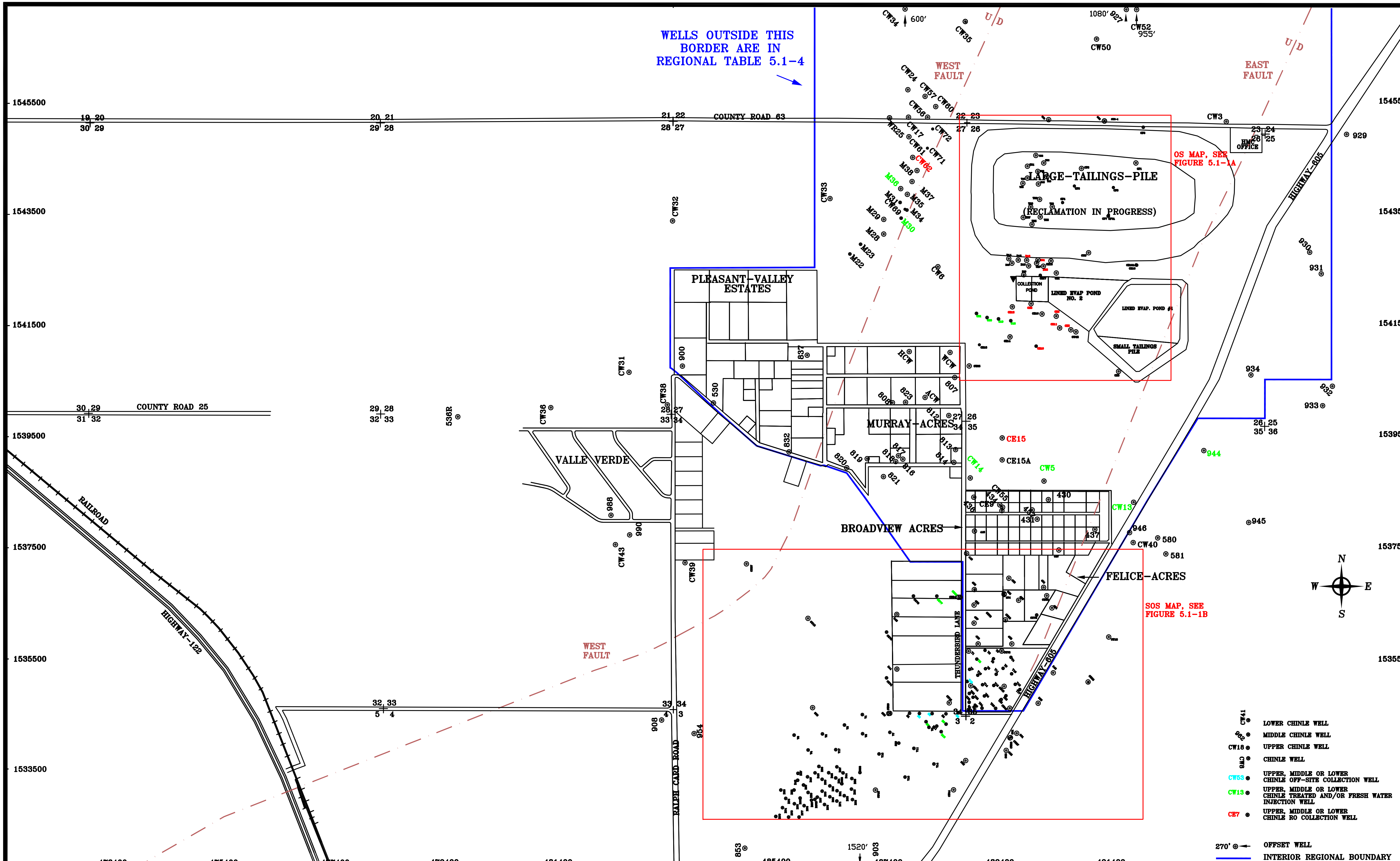
Table 5.1-2 presents basic well data for Chinle wells in Broadview Acres and Felice Acres. Table 5.1-3 presents similar data for Murray Acres and Pleasant Valley Estates Chinle wells. Wells that are not located within the immediate Grants Project property or within the four subdivision boundaries are denoted as the regional Chinle wells and are presented in Table 5.1-4 (see Figure 5.1-1 for inner regional boundary shown in blue). Figure 5.1-1A shows the locations of the On-Site Chinle wells while Figure 5.1-1B presents the Chinle well locations for the South Off-Site wells. No Upper, Middle and Lower Chinle wells were drilled by HMC in 2020.

The location of Upper Chinle wells and the areal extent of the Upper Chinle aquifer at the Grants Project are shown on Figures 5.1-2 and 5.1-2A. Upper Chinle wells 944, C18, C19, C20, C21, CW5 and CW13 are shown in green to denote that these are treated and/or fresh-water injection wells. Upper Chinle wells B16, B31, B32, CE2, CE5, CE6, CE11, CE12, CE15 and CE19 were pumped to supply the R.O. plant in 2020 and are shown in red.

Figure 5.1-2 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 1.1-2 presents a typical geologic cross section to show the

relative position of the alluvial and Chinle aquifers (see Figure 1.1-1 for the location of this cross section). Figures 1.1-3 and 1.1-4 present additional geologic cross sections which show the relative position of the Chinle aquifers (see Figure 1.1-1 for the locations of these cross sections).

The subcrop of the Upper Chinle sandstone where the alluvium is saturated or unsaturated above the Upper Chinle sandstone is also shown on Figures 5.1-2 and 5.1-2A. 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'

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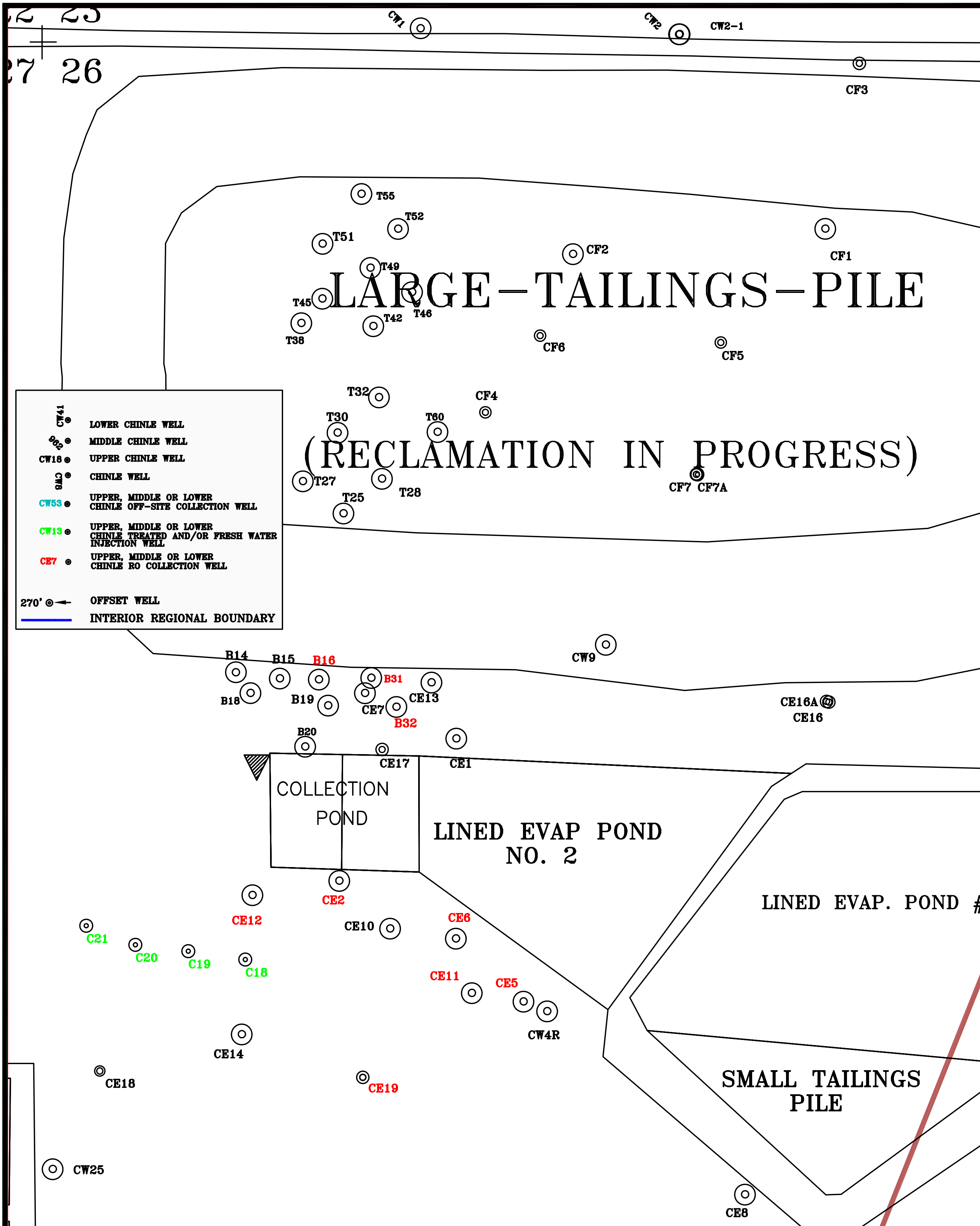
DATE: 12/9/2020

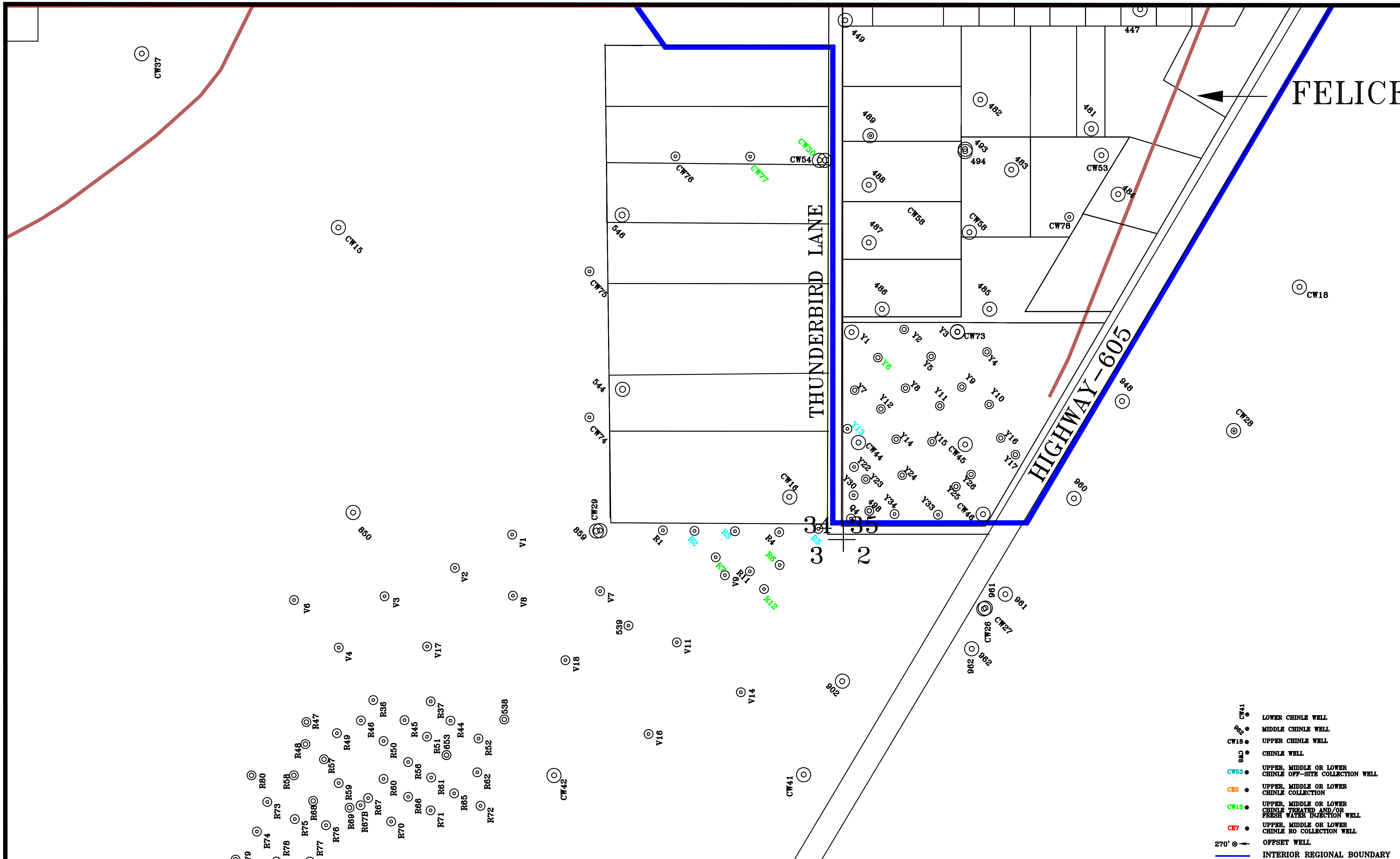
FIGURE 5.1-1. CHINLE AQUIFER WELL LOCATIONS, 2020




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

FIGURE 5.1-1A. CHINLE AQUIFER WELL LOCATIONS, OS, 2020

DATE: 12/9/2020
SCALE: 1"=500'
PAGE: 5.1-4




SCALE: 1"=500'
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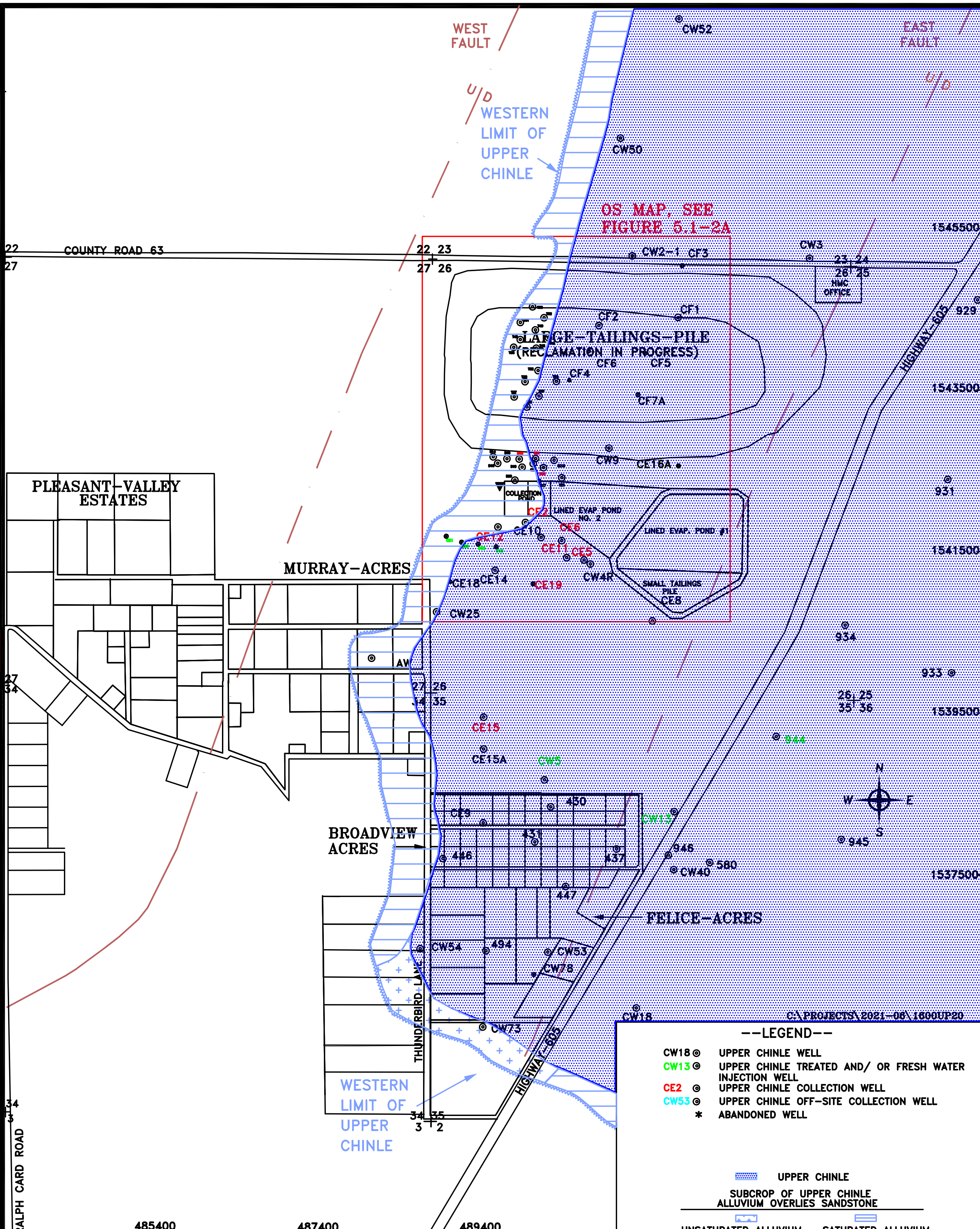
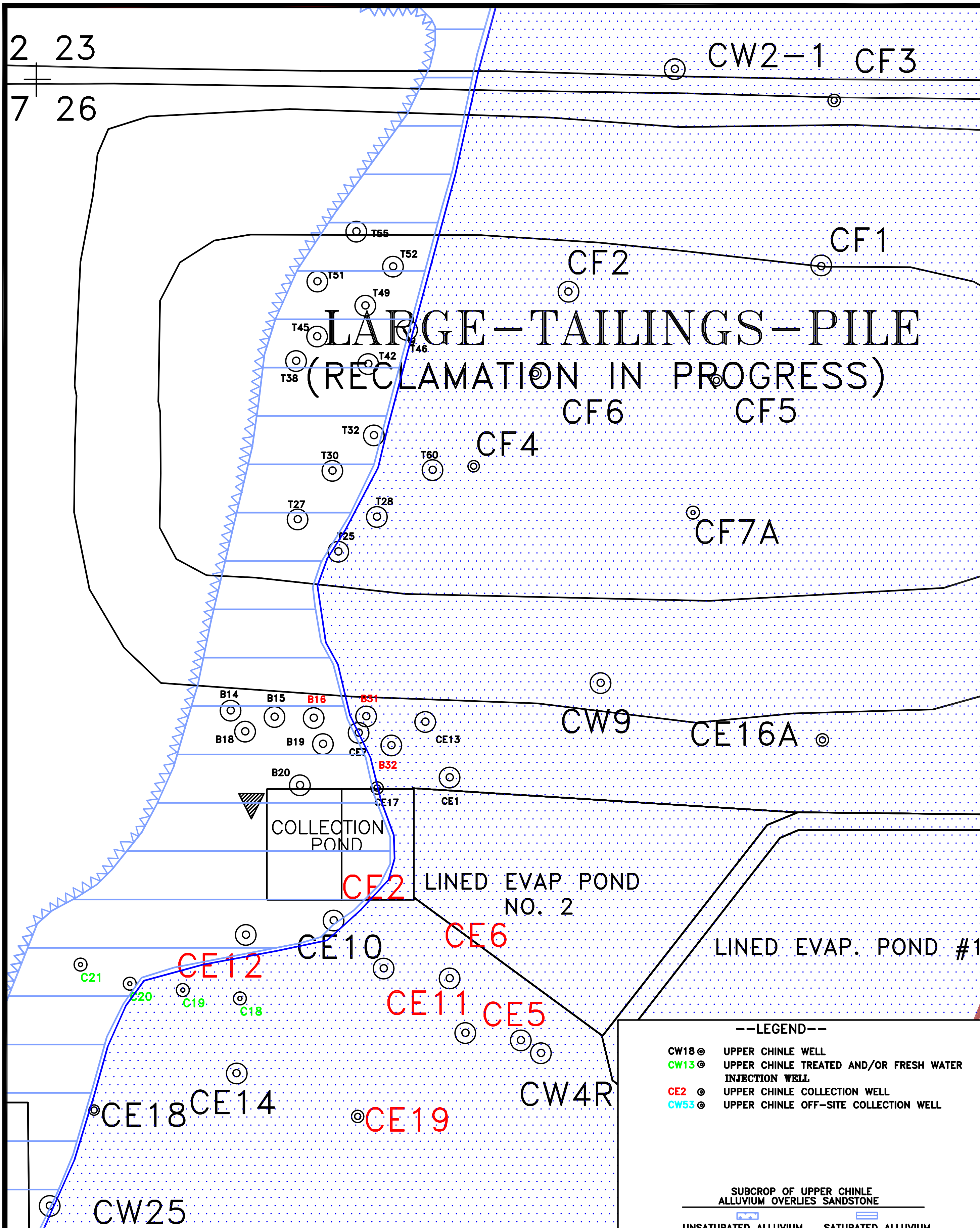
BASE20chinle.DWG
DATE: 12/9/2020

FIGURE 5.1-1B CHINLE AQUIFER WELL LCOATIONS, SOS, 2020




| | |
|---|---|
| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 3/11/2021 |
| FIGURE 5.1-2 LIMITS OF UPPER CHINLE AQUIFER AND WELL LOCATIONS, 2020 | SCALE: 1"= 1600' |
| | PAGE: 5.1-6 |




| | |
|---|---|
| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 12/9/2020 |
| FIGURE 5.1-2A. LIMITS OF UPPER CHINLE AQUIFER AND WELL LOCATIONS, OS, 2020 | SCALE: 1"= 500' |
| | PAGE: 5.1-7 |

## 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 | | | 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) | | | | | | |
| 0930 | 1542848 | 494997 | 410.0 | 6.0 | 11/11/2020 | 103.40 | 6495.14 | 0.0 | 6598.54 | 30 | 6569 | A - | --- |
| | | | | | | | | | | 335 | 6264 | M 330-400 | Middle |
| 0931 | 1542461 | 495207 | 366.7 | 6.0 | 11/11/2020 | 92.97 | 6517.59 | 0.9 | 6610.56 | 339 | 6271 | U - | Upper |
| 0934 | 1540641 | 493941 | 293.0 | 6.0 | 8/27/2012 | 110.97 | 6474.62 | 2.0 | 6585.59 | 30 | 6554 | A - | --- |
| | | | | | | | | | | 282 | 6302 | U - | Upper |
| B14 | 1542733 | 489579 | 120.0 | 4.5 | 4/22/2014 | 34.46 | 6541.19 | 2.0 | 6575.65 | 68 | 6506 | U 60-120 | Upper |
| | | | | | | | | | | 68 | 6506 | A 60-120 | Alluvium |
| B15 | 1542708 | 489749 | 120.0 | 4.5 | 10/28/2019 | 46.20 | 6530.11 | 2.0 | 6576.31 | 72 | 6502 | A 60-120 | Alluvium |
| | | | | | | | | | | 72 | 6502 | U 60-120 | Upper |
| B16 | 1542705 | 489900 | 120.0 | 4.5 | 10/28/2019 | 60.75 | 6514.62 | 2.0 | 6575.37 | 83 | 6490 | U 60-120 | Upper |
| | | | | | | | | | | 83 | 6490 | A 60-120 | Alluvium |
| B17 | 1542659 | 489493 | 95.0 | 4.5 | 10/28/2019 | 42.80 | 6531.51 | 2.0 | 6574.31 | --- | --- | A 55-95 | Alluvium |
| | | | | | | | | | | --- | --- | U 55-95 | Upper |
| B18 | 1542652 | 489634 | 120.0 | 4.5 | 10/28/2019 | 45.60 | 6530.53 | 2.0 | 6576.13 | 70 | 6504 | U 60-120 | Upper |
| | | | | | | | | | | 70 | 6504 | A 60-120 | Alluvium |
| B19 | 1542605 | 489936 | 120.0 | 4.5 | 9/11/2014 | 39.79 | 6534.22 | 2.0 | 6574.01 | 90 | 6482 | U 60-120 | Upper |
| | | | | | | | | | | 90 | 6482 | A 60-120 | Alluvium |
| B20 | 1542444 | 489847 | 120.0 | 4.5 | 10/9/2014 | 40.11 | 6534.33 | 2.0 | 6574.44 | 90 | 6482 | U 60-120 | Upper |
| | | | | | | | | | | 90 | 6482 | A 60-120 | Alluvium |
| B31 | 1542710 | 490103 | 120.0 | 4.5 | 10/28/2019 | 59.40 | 6516.56 | 2.0 | 6575.96 | 83 | 6491 | A 60-100 | Alluvium |
| | | | | | | | | | | 83 | 6491 | U 60-100 | Upper |
| B32 | 1542598 | 490201 | 120.0 | 4.5 | 10/28/2019 | 46.10 | 6529.29 | 2.0 | 6575.39 | 93 | 6480 | A 60-120 | Alluvium |
| | | | | | | | | | | 93 | 6480 | U 60-120 | Upper |
| C18 | 1541616 | 489614 | 120.0 | 4.5 | 10/28/2019 | 10.40 | 6560.70 | 0.5 | 6571.10 | --- | --- | U 40-120 | Upper |
| | | | | | | | | | | 60 | 6511 | A 40-120 | Alluvium |
| C19 | 1541648 | 489392 | 120.0 | 4.5 | 10/28/2019 | 18.60 | 6551.31 | 0.5 | 6569.91 | --- | --- | U 40-120 | Upper |
| | | | | | | | | | | 80 | 6489 | A 40-120 | Alluvium |
| C20 | 1541673 | 489187 | 110.0 | 4.5 | 10/28/2019 | 17.20 | 6552.96 | 0.5 | 6570.16 | --- | --- | U 50-110 | Upper |
| | | | | | | | | | | 70 | 6500 | A 50-110 | Alluvium |
| C21 | 1541747 | 488996 | 100.0 | 4.5 | 10/28/2019 | 26.24 | 6545.75 | 0.5 | 6571.99 | --- | --- | U 40-100 | Upper |
| | | | | | | | | | | 90 | 6481 | A 40-100 | Alluvium |
| CE1 | 1542475 | 490434 | 137.0 | 5.0 | 11/11/2020 | 14.03 | 6556.16 | 4.4 | 6570.19 | 75 | 6491 | A - | --- |
| | | | | | | | | | | 106 | 6460 | U 98-138 | Upper |
| CE2 | 1541923 | 489979 | 119.7 | 5.0 | 5/28/2020 | 41.34 | 6535.01 | 1.8 | 6576.35 | 74 | 6501 | A - | --- |
| | | | | | | | | | | 74 | 6501 | U 78-118 | Upper |
| CE5 | 1541453 | 490695 | 140.0 | 5.0 | 10/28/2019 | 42.53 | 6526.02 | 1.6 | 6568.55 | 63 | 6504 | A - | --- |
| | | | | | | | | | | 103 | 6464 | U 100-140 | Upper |
| CE6 | 1541698 | 490433 | 140.0 | 6.0 | 10/28/2019 | 38.55 | 6526.64 | 1.5 | 6565.19 | 75 | 6489 | U - | Upper |
| CE7 | 1542652 | 490079 | 120.0 | 6.0 | 11/11/2020 | 44.19 | 6531.80 | 1.9 | 6575.99 | 95 | 6479 | U 100-140 | Upper |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CE8 | 1540704 | 491556 | 216.6 | 6.0 | 11/11/2020 | 47.64 | 6522.06 | 1.7 | 6569.70 | 166 | 6402 | U | 160-200 | Upper |
| CE10 | 1541737 | 490177 | 130.0 | 6.0 | 11/11/2020 | 51.75 | 6519.11 | 2.3 | 6570.86 | 80 | 6489 | U | 90-130 | Upper |
| CE11 | 1541487 | 490494 | 140.0 | 6.0 | 12/20/2019 | 42.20 | 6523.22 | 1.6 | 6565.42 | 90 | 6474 | U | 100-140 | Upper |
| CE12 | 1541867 | 489642 | 120.0 | 6.0 | 10/28/2019 | 41.90 | 6530.33 | 2.1 | 6572.23 | 80 | 6490 | U | 80-120 | Upper |
| CE13 | 1542693 | 490338 | 129.2 | 6.0 | 11/11/2020 | 44.26 | 6530.38 | 1.7 | 6574.64 | 95 | 6478 | U | 90-130 | Upper |
| CE14 | 1541326 | 489600 | 130.0 | 5.0 | 11/11/2020 | 40.03 | 6529.42 | 2.0 | 6569.45 | 80 | 6487 | U | 90-130 | Upper |
| CE15 | 1539507 | 489460 | 130.0 | 5.0 | 11/11/2020 | 47.96 | 6518.12 | 2.0 | 6566.08 | 77 | 6487 | U | 90-130 | Upper |
| CE15A | 1539111 | 489459 | 130.0 | 4.5 | 11/11/2020 | 42.27 | 6522.54 | 2.0 | 6564.81 | 75 | 6488 | U | 90-130 | Upper |
| | | | | | | | | | | 75 | 6488 | A | - | --- |
| CE16 | 1542618 | 491883 | 130.0 | 4.5 | 12/21/2016 | 39.50 | 6541.67 | 2.0 | 6581.17 | --- | --- | C | 90-130 | Chinle |
| | | | | | | | | | | 76 | 6503 | A | - | --- |
| CE16A | 1542619 | 491873 | 0.0 | --- | 10/2/2019 | 47.13 | 6532.91 | 2.0 | 6580.04 | --- | --- | U | 125-185 | Upper |
| CE17 | 1542434 | 490146 | 130.0 | 4.5 | 4/15/2014 | 38.43 | 6537.97 | 2.0 | 6576.40 | 94 | 6480 | A | - | --- |
| | | | | | | | | | | 94 | 6480 | U | 90-130 | Upper |
| CE18 | 1541185 | 489048 | 130.0 | 4.5 | 10/17/2019 | 39.41 | 6529.47 | 2.0 | 6568.88 | 74 | 6493 | A | - | --- |
| | | | | | | | | | | 74 | 6493 | U | 90-130 | Upper |
| CE19 | 1541160 | 490070 | 130.0 | 4.5 | 8/20/2020 | 66.70 | 6502.13 | 2.0 | 6568.83 | 88 | 6479 | U | 90-130 | Upper |
| | | | | | | | | | | 88 | 6479 | A | - | --- |
| CF1 | 1544456 | 491868 | 285.0 | 5.0 | 10/25/2019 | 131.91 | 6534.00 | 2.8 | 6665.91 | 230 | 6433 | U | 240-285 | Upper |
| CF2 | 1544358 | 490888 | 260.0 | 5.0 | 12/20/2019 | 122.03 | 6544.13 | 2.0 | 6666.16 | 220 | 6444 | U | 220-260 | Upper |
| CF3 | 1545098 | 492000 | 166.0 | 4.5 | 11/11/2020 | 51.76 | 6535.03 | 2.0 | 6586.79 | 156 | 6429 | U | 146-166 | Upper |
| CF4 | 1543680 | 490520 | 197.0 | 4.5 | 11/11/2020 | 75.11 | 6588.58 | 2.0 | 6663.69 | 166 | 6496 | U | 177-197 | Upper |
| | | | | | | | | | | 166 | 6496 | A | - | --- |
| CF5 | 1544013 | 491463 | 233.0 | 4.5 | 11/29/2020 | 138.20 | 6533.26 | 2.0 | 6671.46 | 163 | 6506 | A | - | --- |
| | | | | | | | | | | 222 | 6447 | U | 213-233 | Upper |
| CF6 | 1544040 | 490759 | 205.0 | 4.5 | 11/29/2020 | 107.00 | 6560.43 | 2.0 | 6667.43 | 163 | 6502 | A | - | --- |
| | | | | | | | | | | 199 | 6466 | U | 185-205 | Upper |
| CF7 | 1543501 | 491362 | 220.0 | 4.5 | 8/13/2014 | 116.76 | 6551.56 | 2.0 | 6668.32 | --- | --- | C | 200-220 | Chinle |
| | | | | | | | | | | 155 | 6511 | A | - | --- |
| CF7A | 1543500 | 491371 | 265.0 | 4.5 | 11/11/2020 | 136.26 | 6531.85 | 2.0 | 6668.11 | 160 | 6506 | A | - | --- |
| | | | | | | | | | | 220 | 6446 | U | 225-265 | Upper |
| CW1 | 1545235 | 490295 | 325.0 | 5.0 | 11/11/2020 | 85.85 | 6499.37 | 0.7 | 6585.22 | 105 | 6480 | A | - | --- |
| | | | | | | | | | | 272 | 6313 | M | 212-323 | Middle |
| CW2 | 1545212 | 491302 | 355.0 | 5.0 | 11/11/2020 | 86.05 | 6499.43 | 1.7 | 6585.48 | 85 | 6499 | A | - | --- |
| | | | | | | | | | | 136 | 6448 | U | - | --- |
| | | | | | | | | | | 305 | 6279 | M | 306-353 | Middle |
| CW2-1 | 1545212 | 491302 | 168.0 | 5.0 | 11/11/2020 | 46.75 | 6538.73 | 1.7 | 6585.48 | 85 | 6499 | A | - | --- |
| | | | | | | | | | | 136 | 6448 | U | 243-253 | Upper |
| CW3 | 1545200 | 493496 | 235.0 | 5.0 | 11/11/2020 | 57.80 | 6529.38 | 0.7 | 6587.18 | 70 | 6516 | A | - | --- |

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CW3 | 1545200 | 493496 | 235.0 | 5.0 | 11/11/2020 | 57.80 | 6529.38 | 0.7 | 6587.18 | 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 | 10/28/2019 | 43.65 | 6525.08 | 1.3 | 6568.73 | 61 | 6506 | A | - | --- |
| | | | | | | | | | | 104 | 6463 | U | 102-142 | Upper |
| CW5 | 1538729 | 490221 | 170.0 | 5.0 | 10/28/2019 | 10.40 | 6558.94 | 1.6 | 6569.34 | 65 | 6503 | A | - | --- |
| | | | | | | | | | | 137 | 6431 | U | 135-170 | Upper |
| CW6 | 1542588 | 488301 | 282.0 | 4.0 | 11/11/2020 | 71.69 | 6503.95 | 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 | 11/11/2020 | 62.01 | 6529.82 | 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 | 10/28/2019 | 22.60 | 6554.10 | 2.7 | 6576.70 | 230 | 6344 | U | 225-265 | Upper |
| | | | | | | | | | | 378 | 6196 | M | - | --- |
| CW14 | 1538786 | 488884 | 360.9 | 6.0 | 10/28/2019 | 36.00 | 6530.09 | 2.9 | 6566.09 | 56 | 6507 | A | - | --- |
| | | | | | | | | | | 66 | 6497 | U | - | --- |
| | | | | | | | | | | 310 | 6253 | M | 278-358 | Middle |
| CW17 | 1545279 | 487771 | 108.0 | 5.0 | 11/11/2020 | 66.55 | 6522.77 | 3.1 | 6589.32 | 73 | 6513 | A | - | --- |
| | | | | | | | | | | 85 | 6501 | M | 83-103 | Middle |
| CW24 | 1545773 | 487760 | 118.0 | 5.0 | 11/11/2020 | 51.90 | 6536.77 | 3.0 | 6588.67 | 61 | 6525 | A | - | --- |
| | | | | | | | | | | 65 | 6521 | M | 78-118 | Middle |
| CW25 | 1540802 | 488866 | 102.0 | 5.0 | 10/28/2019 | 32.60 | 6534.60 | 3.0 | 6567.20 | 53 | 6511 | A | - | --- |
| | | | | | | | | | | 53 | 6511 | U | 62-102 | Upper |
| CW33 | 1543814 | 486347 | 347.0 | 6.0 | 11/11/2020 | 106.40 | 6468.49 | 1.8 | 6574.89 | 63 | 6510 | M | - | --- |
| | | | | | | | | | | 63 | 6510 | A | - | --- |
| | | | | | | | | | | 272 | 6301 | L | 307-347 | --- |
| | | | | | | | | | | 272 | 6301 | L | 267-287 | Lower |
| CW34 | 1547827 | 487707 | 65.7 | 6.0 | 11/11/2020 | 53.55 | 6540.85 | 3.2 | 6594.40 | 20 | 6571 | A | - | --- |
| | | | | | | | | | | 40 | 6551 | M | 33-63 | Middle |
| CW35 | 1547001 | 488794 | 120.0 | 5.0 | 11/11/2020 | 52.80 | 6538.37 | 1.9 | 6591.17 | 63 | 6526 | A | - | --- |
| | | | | | | | | | | 90 | 6499 | M | 93-118 | Middle |
| CW50 | 1546687 | 491159 | 170.0 | 5.0 | 11/11/2020 | 49.15 | 6539.41 | 3.0 | 6588.56 | 128 | 6458 | U | 130-170 | Upper |
| CW52 | 1548171 | 491887 | 180.0 | 5.0 | 11/11/2020 | 38.60 | 6553.80 | 2.0 | 6592.40 | 138 | 6452 | U | 140-180 | Upper |
| CW56 | 1545279 | 488115 | 130.0 | 5.0 | 8/29/2019 | 57.07 | 6530.79 | 2.6 | 6587.86 | 51 | 6534 | A | - | --- |
| | | | | | | | | | | 98 | 6487 | M | 90-110 | Middle |
| CW57 | 1545654 | 488070 | 140.0 | 5.0 | 11/11/2020 | 50.30 | 6534.60 | 2.1 | 6584.90 | 55 | 6528 | A | - | --- |

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CW57 | 1545654 | 488070 | 140.0 | 5.0 | 11/11/2020 | 50.30 | 6534.60 | 2.1 | 6584.90 | 101 | 6482 | M 100-140 | Middle |
| CW60 | 1545470 | 488262 | 150.0 | 5.0 | 11/11/2020 | 47.95 | 6536.25 | 2.8 | 6584.20 | 50 | 6531 | A - | --- |
| | | | | | | | | | | 114 | 6467 | M 100-140 | Middle |
| CW61 | 1544927 | 487779 | 130.0 | 5.0 | 11/11/2020 | 62.23 | 6520.60 | 2.2 | 6582.83 | 62 | 6519 | A - | --- |
| | | | | | | | | | | 108 | 6473 | M 90-130 | Middle |
| CW62 | 1544555 | 487847 | 150.0 | 5.0 | 7/16/2020 | 54.50 | 6525.36 | 1.9 | 6579.86 | 60 | 6518 | A - | --- |
| | | | | | | | | | | 134 | 6444 | M 130-150 | Middle |
| CW69 | 1543638 | 487679 | 180.0 | 4.5 | --- | --- | --- | 2.0 | 6576.42 | --- | --- | C 160-180 | Chinle |
| | | | | | | | | | | 66 | 6508 | A - | --- |
| CW71 | 1544724 | 488111 | 140.0 | 4.5 | 4/14/2014 | 37.63 | 6542.34 | 2.0 | 6579.97 | 72 | 6506 | A - | --- |
| | | | | | | | | | | 121 | 6457 | M 120-140 | Middle |
| CW72 | 1545034 | 488229 | 140.0 | 4.5 | 11/11/2020 | 83.76 | 6496.37 | 2.0 | 6580.13 | 75 | 6503 | A - | --- |
| | | | | | | | | | | 105 | 6473 | M 80-140 | Middle |
| M22 | 1542817 | 486716 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6575.43 | --- | --- | M 60-100 | Middle |
| | | | | | | | | | | 100 | 6473 | A 60-100 | Alluvium |
| M23 | 1542992 | 486908 | 100.0 | 4.5 | --- | --- | --- | 2.0 | 6575.97 | --- | --- | M 60-100 | Middle |
| | | | | | | | | | | 100 | 6474 | A 60-100 | Alluvium |
| M28 | 1543175 | 487326 | 120.0 | 4.5 | 4/23/2014 | 42.11 | 6536.65 | 2.0 | 6578.76 | 69 | 6508 | A 60-120 | Alluvium |
| | | | | | | | | | | 92 | 6485 | M 60-120 | Middle |
| M29 | 1543440 | 487326 | 120.0 | 4.5 | 4/23/2014 | 36.92 | 6535.95 | 2.0 | 6572.87 | 61 | 6510 | A 60-120 | Alluvium |
| | | | | | | | | | | 89 | 6482 | M 60-120 | Middle |
| M30 | 1543462 | 487639 | 110.0 | 4.5 | 9/30/2019 | 36.00 | 6538.91 | 2.0 | 6574.91 | --- | --- | M 80-110 | Middle |
| | | | | | | | | | | 80 | 6493 | A 80-110 | Alluvium |
| M31 | 1543745 | 487620 | 120.0 | 4.5 | 10/28/2019 | 40.40 | 6535.53 | 2.0 | 6575.93 | --- | --- | M 70-120 | Middle |
| | | | | | | | | | | 80 | 6494 | A 70-120 | Alluvium |
| M34 | 1543608 | 487743 | 120.0 | 4.5 | --- | --- | --- | 2.0 | 6574.55 | --- | --- | M 60-120 | Middle |
| | | | | | | | | | | 66 | 6507 | A 60-120 | Alluvium |
| M35 | 1543889 | 487750 | 120.0 | 4.5 | 4/15/2014 | 35.13 | 6539.59 | 2.0 | 6574.72 | 71 | 6502 | A 60-120 | Alluvium |
| | | | | | | | | | | 97 | 6476 | M 60-120 | Middle |
| M36 | 1543993 | 487631 | 120.0 | 4.5 | 4/15/2014 | 36.56 | 6538.88 | 2.0 | 6575.44 | 72 | 6501 | A 60-120 | Alluvium |
| | | | | | | | | | | 97 | 6476 | M 60-120 | Middle |
| M37 | 1544120 | 487835 | 120.0 | 4.5 | 4/15/2014 | 38.37 | 6537.07 | 2.0 | 6575.44 | 73 | 6500 | A 60-120 | Alluvium |
| | | | | | | | | | | 107 | 6466 | M 60-120 | Middle |
| M38 | 1544319 | 487923 | 120.0 | 4.5 | 4/15/2014 | 37.91 | 6541.71 | 2.0 | 6579.62 | --- | --- | M 60-120 | Middle |
| | | | | | | | | | | 79 | 6499 | A 60-120 | Alluvium |
| T25 | 1543352 | 489996 | 200.0 | 4.5 | 1/14/2020 | 122.80 | 6534.54 | 2.0 | 6657.34 | --- | --- | A 140-200 | Alluvium |
| | | | | | | | | | | --- | --- | U 140-200 | Upper |
| T27 | 1543474 | 489837 | 200.0 | 4.5 | 1/15/2020 | 121.80 | 6535.34 | 2.0 | 6657.14 | --- | --- | A 140-200 | Alluvium |
| | | | | | | | | | | --- | --- | U 140-200 | Upper |
| T28 | 1543484 | 490145 | 200.0 | 4.5 | 1/15/2020 | 121.75 | 6536.96 | 2.0 | 6658.71 | --- | --- | A 140-200 | Alluvium |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T28 | 1543484 | 490145 | 200.0 | 4.5 | 1/15/2020 | 121.75 | 6536.96 | 2.0 | 6658.71 | --- | --- | U 140-200 | Upper |
| T30 | 1543663 | 489972 | 200.0 | 4.5 | 1/16/2020 | 123.00 | 6536.62 | 2.0 | 6659.62 | --- | --- | U 140-200 | Upper |
| | | | | | | | | | | --- | --- | A 140-200 | Alluvium |
| T32 | 1543801 | 490134 | 200.0 | 4.5 | 10/28/2019 | 123.70 | 6537.91 | 2.0 | 6661.61 | --- | --- | U 140-200 | Upper |
| | | | | | | | | | | --- | --- | A 140-200 | Alluvium |
| T38 | 1544089 | 489832 | 200.0 | 4.5 | --- | --- | --- | 2.0 | 6658.46 | --- | --- | A 140-200 | Alluvium |
| | | | | | | | | | | --- | --- | U 140-200 | Upper |
| T42 | 1544077 | 490112 | 200.0 | 4.5 | 6/5/2014 | 113.69 | 6546.32 | 2.0 | 6660.01 | --- | --- | U 140-200 | Upper |
| | | | | | | | | | | --- | --- | A 140-200 | Alluvium |
| T45 | 1544183 | 489914 | 200.0 | 4.5 | 10/28/2019 | 118.40 | 6539.66 | 2.0 | 6658.06 | --- | --- | A 140-200 | Alluvium |
| | | | | | | | | | | --- | --- | U 140-200 | Upper |
| T46 | 1544210 | 490262 | 200.0 | 4.5 | 6/3/2014 | 114.24 | 6546.41 | 2.0 | 6660.65 | --- | --- | A 140-200 | Alluvium |
| | | | | | | | | | | --- | --- | U 140-200 | Upper |
| T49 | 1544304 | 490100 | 200.0 | 4.5 | 6/3/2014 | 111.80 | 6546.59 | 2.0 | 6658.39 | --- | --- | A 140-200 | Alluvium |
| | | | | | | | | | | --- | --- | U 140-200 | Upper |
| T51 | 1544397 | 489914 | 200.0 | 4.5 | 3/14/2018 | 121.18 | 6536.16 | 2.0 | 6657.34 | --- | --- | A 140-200 | Alluvium |
| | | | | | | | | | | --- | --- | U 140-200 | Upper |
| T52 | 1544456 | 490208 | 200.0 | 4.5 | 6/3/2014 | 109.87 | 6548.13 | 2.0 | 6658.00 | --- | --- | U 140-200 | Upper |
| | | | | | | | | | | --- | --- | A 140-200 | Alluvium |
| T55 | 1544592 | 490063 | 195.0 | 4.5 | 6/3/2014 | 110.87 | 6546.79 | 2.0 | 6657.66 | --- | --- | A 135-195 | Alluvium |
| | | | | | | | | | | --- | --- | U 135-195 | Upper |
| T60 | 1543666 | 490362 | 200.0 | 4.5 | 8/8/2014 | 116.76 | 6545.10 | 2.0 | 6661.86 | --- | --- | U 140-200 | Upper |
| | | | | | | | | | | --- | --- | A 140-200 | Alluvium |
| WR25 | 1545267 | 487430 | 113.3 | 5.0 | 11/11/2020 | 55.82 | 6530.64 | 2.8 | 6586.46 | 50 | 6534 | A - | --- |
| | | | | | | | | | | 71 | 6513 | M 71-111 | Middle |

NOTE: A = Alluvial Aquifer, Base
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 | 4/12/1994 | 35.00 | 6533.00 | 0.0 | 6568.00 | 60 | 6508 | A 125-130 | Alluvium |
| | | | | | | | | | | 118 | 6450 | U 125-130 | Upper |
| 0434 | 1538303 | 489415 | 280.0 | 6.0 | 10/4/2007 | 39.51 | 6524.17 | 0.0 | 6563.68 | 75 | 6489 | A - | --- |
| | | | | | | | | | | 265 | 6299 | M - | Middle |
| 0436 | 1538439 | 488947 | 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 | 1537859 | 491128 | 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 | 1537830 | 488960 | 110.0 | 6.0 | 9/8/1983 | 41.28 | 6518.72 | 0.0 | 6560.00 | 60 | 6500 | A 60-95 | Alluvium |
| | | | | | | | | | | 60 | 6500 | U 60-95 | Upper |
| 0447 | 1537490 | 490480 | 142.0 | 6.0 | 4/11/1985 | 41.18 | 6526.82 | 0.0 | 6568.00 | 80 | 6488 | A 120-142 | Alluvium |
| | | | | | | | | | | 138 | 6430 | U 120-142 | Upper |
| 0449 | 1537440 | 488830 | 267.0 | 6.0 | 12/5/1994 | 63.42 | 6496.58 | 0.0 | 6560.00 | --- | --- | M - | Middle |
| 0457 | 1538210 | 490000 | 300.0 | 5.0 | 7/2/2008 | 124.88 | 6446.12 | --- | 6571.00 | --- | --- | M - | Middle |
| CE9 | 1538203 | 489458 | 130.0 | 6.0 | 11/11/2020 | 39.86 | 6523.26 | 1.2 | 6563.12 | --- | --- | U 90-130 | Upper |
| CW55 | 1538283 | 489471 | 360.0 | 6.0 | 11/11/2020 | 52.83 | 6511.33 | 2.3 | 6564.16 | 260 | 6302 | M - | Middle |
| | | | | | | **Felice Acres** | | | | | | | |
| 0481 | 1536820 | 490210 | 320.0 | 4.0 | 6/27/2019 | 72.00 | 6496.00 | 2.0 | 6568.00 | 0 | --- | M 270-310 | Middle |
| 0482 | 1536981 | 489579 | 260.0 | 5.0 | 5/14/2014 | 46.60 | 6516.06 | 0.0 | 6562.66 | 80 | 6483 | A 220-260 | Alluvium |
| | | | | | | | | | | 210 | 6353 | M 220-260 | Middle |
| 0483 | 1536586 | 489753 | 280.0 | 5.0 | 4/29/2019 | 41.45 | 6521.21 | 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 | 260.0 | 4.0 | 8/4/2004 | 90.40 | 6468.00 | 0.0 | 6558.40 | --- | --- | M 200-260 | Middle |
| | | | | | | | | | | 21 | 6537 | A - | --- |
| | | | | | | | | | | 21 | 6537 | U - | --- |
| 0487 | 1536175 | 488950 | 260.0 | --- | 7/24/1996 | 49.20 | 6511.80 | 0.0 | 6561.00 | --- | --- | M - | Middle |
| 0488 | 1536500 | 488950 | 190.0 | 6.0 | 8/19/2003 | 113.80 | 6448.20 | 0.0 | 6562.00 | --- | --- | M - | Middle |
| 0489 | 1536778 | 488961 | --- | --- | --- | --- | --- | 0.0 | 6562.00 | --- | --- | M - | Middle |

# 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 PERFORATIONS (FT-LSD) | | AQUIFER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0493 | 1536702 | 489492 | 300.0 | 5.0 | 11/11/2020 | 60.34 | 6499.94 | 0.9 | 6560.28 | 40 | 6519 | A | - | --- |
| | | | | | | | | | | 65 | 6494 | U | - | --- |
| | | | | | | | | | | 236 | 6323 | M | 270-300 | Middle |
| 0494 | 1536689 | 489494 | 85.0 | 5.0 | 11/11/2020 | 38.78 | 6521.36 | 0.6 | 6560.14 | 40 | 6520 | A | - | --- |
| | | | | | | | | | | 65 | 6495 | U | 65-85 | Upper |
| 0498 | 1534661 | 488953 | 150.0 | 6.0 | 4/9/2019 | 54.23 | 6506.36 | 2.0 | 6560.59 | 80 | 6479 | M | 130-150 | Middle |
| | | | | | | | | | | 80 | 6479 | A | 70-110 | Alluvium |
| CW44 | 1535048 | 488891 | 208.0 | 6.0 | 3/25/2019 | 55.51 | 6505.23 | 2.5 | 6560.74 | 94 | 6464 | A | - | Alluvium |
| | | | | | | | | | | 130 | 6428 | M | 69-208 | Middle |
| CW45 | 1535036 | 489494 | 193.0 | 5.0 | 11/11/2020 | 53.36 | 6507.95 | 0.6 | 6561.31 | 90 | 6471 | A | - | --- |
| | | | | | | | | | | 166 | 6395 | M | 163-193 | Middle |
| CW46 | 1534642 | 489595 | 187.3 | 5.0 | 3/25/2019 | 56.31 | 6505.95 | 1.5 | 6562.26 | 88 | 6473 | A | - | --- |
| | | | | | | | | | | 112 | 6449 | M | 125-185 | Middle |
| CW53 | 1536668 | 490262 | 157.0 | 5.0 | 11/11/2020 | 48.96 | 6515.98 | 3.0 | 6564.94 | 110 | 6452 | U | 117-157 | Upper |
| CW58 | 1536230 | 489520 | 305.0 | 4.5 | 11/11/2020 | 61.72 | 6499.08 | 2.0 | 6560.80 | 45 | 6514 | A | - | --- |
| | | | | | | | | | | 45 | 6514 | U | - | --- |
| | | | | | | | | | | 226 | 6333 | M | 265-305 | Middle |
| CW73 | 1535670 | 489450 | 100.0 | 4.5 | 11/11/2020 | 51.05 | 6512.40 | 2.0 | 6563.45 | 68 | 6493 | A | - | --- |
| | | | | | | | | | | 68 | 6493 | U | 80-100 | Upper |
| CW78 | 1536319 | 490080 | 160.0 | 4.5 | 11/11/2020 | 48.82 | 6518.33 | 2.0 | 6567.15 | 46 | 6519 | A | - | --- |
| | | | | | | | | | | 61 | 6504 | U | 120-160 | Upper |
| Q4 | 1534635 | 488880 | 160.0 | 4.5 | 12/1/2014 | 60.53 | 6499.79 | 2.0 | 6560.32 | 90 | 6468 | M | 100-160 | Middle |
| Q42 | 1536662 | 489606 | 80.0 | 4.5 | 6/5/2019 | 40.98 | 6523.50 | 1.6 | 6564.48 | 61 | 6502 | A | 40-80 | Alluvium |
| | | | | | | | | | | 61 | 6502 | U | 40-80 | Upper |
| Q48 | 1535653 | 490120 | 105.0 | 4.5 | 11/25/2020 | 51.22 | 6516.62 | 2.0 | 6567.84 | 73 | 6493 | U | 65-105 | Upper |
| | | | | | | | | | | 73 | 6493 | A | 65-105 | Alluvium |
| Q50 | 1536680 | 490288 | 85.0 | 4.5 | 6/6/2019 | 44.97 | 6523.96 | 2.0 | 6568.93 | 43 | 6524 | A | 45-85 | Alluvium |
| | | | | | | | | | | 61 | 6506 | U | 45-85 | Upper |
| Y1 | 1535670 | 488850 | 260.0 | 4.5 | 11/11/2020 | 59.21 | 6502.23 | 2.0 | 6561.44 | 77 | 6482 | A | - | --- |
| | | | | | | | | | | 77 | 6482 | U | - | --- |
| | | | | | | | | | | 172 | 6387 | M | 220-260 | Middle |
| Y2 | 1535678 | 489151 | 250.0 | 4.5 | 11/11/2020 | 59.80 | 6501.81 | 2.9 | 6561.61 | 64 | 6495 | A | - | --- |
| | | | | | | | | | | 66 | 6493 | U | - | --- |
| | | | | | | | | | | 198 | 6361 | M | 210-250 | Middle |
| Y3 | 1535660 | 489440 | 280.0 | 4.5 | 11/11/2020 | 62.46 | 6500.92 | 2.0 | 6563.38 | 61 | 6500 | U | - | --- |
| | | | | | | | | | | 61 | 6500 | A | - | --- |
| | | | | | | | | | | 196 | 6365 | M | 260-280 | Middle |
| | | | | | | | | | | 196 | 6365 | M | 220-240 | Middle |
| Y4 | 1535558 | 489612 | 260.0 | 4.5 | 12/1/2014 | 82.68 | 6480.46 | 2.4 | 6563.14 | 64 | 6497 | A | - | --- |
| | | | | | | | | | | 64 | 6497 | U | - | --- |
| | | | | | | | | | | 194 | 6367 | M | 220-260 | Middle |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y5 | 1535528 | 489302 | 260.0 | 4.5 | 12/1/2014 | 87.82 | 6474.92 | 3.6 | 6562.74 | 82 | 6477 | A - | --- |
| | | | | | | | | | | 82 | 6477 | U - | --- |
| | | | | | | | | | | 178 | 6381 | M 220-260 | Middle |
| Y6 | 1535518 | 489002 | 250.0 | 4.5 | 3/25/2019 | 57.68 | 6501.40 | 0.9 | 6559.08 | 100 | 6458 | A - | --- |
| | | | | | | | | | | 178 | 6380 | M 210-250 | Middle |
| Y7 | 1535339 | 488870 | 220.0 | 4.5 | 8/19/2020 | 58.00 | 6502.43 | 2.5 | 6560.43 | 90 | 6468 | A - | --- |
| | | | | | | | | | | 158 | 6400 | M 180-220 | Middle |
| Y8 | 1535349 | 489161 | 240.0 | 4.5 | 11/11/2020 | 59.49 | 6501.98 | 2.1 | 6561.47 | 101 | 6458 | A - | --- |
| | | | | | | | | | | 185 | 6374 | M 200-240 | Middle |
| Y9 | 1535358 | 489503 | 235.0 | 4.5 | 12/1/2014 | 76.27 | 6486.45 | 2.6 | 6562.72 | 84 | 6476 | A - | --- |
| | | | | | | | | | | 84 | 6476 | U - | --- |
| | | | | | | | | | | 178 | 6382 | M 195-235 | Middle |
| Y10 | 1535258 | 489632 | 220.0 | 4.5 | 11/11/2020 | 65.04 | 6501.14 | 4.4 | 6566.18 | 72 | 6490 | A - | --- |
| | | | | | | | | | | 72 | 6490 | U - | --- |
| | | | | | | | | | | 183 | 6379 | M 180-220 | Middle |
| Y11 | 1535218 | 489352 | 220.0 | 4.5 | 12/19/2016 | 62.22 | 6499.83 | 1.7 | 6562.05 | 112 | 6448 | A - | --- |
| | | | | | | | | | | 169 | 6391 | M 180-220 | Middle |
| Y12 | 1535208 | 489022 | 210.0 | 4.5 | 3/25/2019 | 60.24 | 6499.44 | 1.2 | 6559.68 | 95 | 6463 | A - | --- |
| | | | | | | | | | | 156 | 6402 | M 170-210 | Middle |
| Y13 | 1535135 | 488830 | 212.0 | 4.5 | 11/11/2020 | 59.17 | 6501.67 | 2.0 | 6560.84 | 106 | 6453 | A - | --- |
| | | | | | | | | | | 140 | 6419 | M 172-212 | Middle |
| Y14 | 1535057 | 489113 | 200.0 | 4.5 | 11/11/2020 | 52.53 | 6508.49 | 1.2 | 6561.02 | 90 | 6470 | A - | --- |
| | | | | | | | | | | 139 | 6421 | M 160-200 | Middle |
| Y15 | 1535046 | 489312 | 190.0 | 4.5 | 12/1/2014 | 63.19 | 6499.17 | 2.3 | 6562.36 | 103 | 6457 | A - | --- |
| | | | | | | | | | | 155 | 6405 | M 150-190 | Middle |
| Y16 | 1535068 | 489702 | 200.0 | 4.5 | 12/1/2014 | 66.16 | 6497.54 | 2.0 | 6563.70 | 89 | 6473 | A - | --- |
| | | | | | | | | | | 158 | 6404 | M 160-200 | Middle |
| Y17 | 1534978 | 489782 | 210.0 | 4.5 | 11/11/2020 | 59.95 | 6504.68 | 2.4 | 6564.63 | 96 | 6466 | A - | --- |
| | | | | | | | | | | 158 | 6404 | M 170-210 | Middle |
| Y22 | 1534912 | 488868 | 210.0 | 4.5 | 12/1/2014 | 89.49 | 6472.20 | 2.0 | 6561.69 | 112 | 6448 | M 160-210 | Middle |
| Y23 | 1534838 | 488942 | 160.0 | 4.5 | 8/27/2019 | 54.90 | 6506.40 | 2.7 | 6561.30 | 106 | 6453 | A - | --- |
| | | | | | | | | | | 106 | 6453 | M 120-160 | Middle |
| Y24 | 1534859 | 489143 | 180.0 | 4.5 | 12/1/2014 | 61.68 | 6500.26 | 2.6 | 6561.94 | 97 | 6462 | A - | --- |
| | | | | | | | | | | 119 | 6440 | M 140-180 | Middle |
| Y25 | 1534798 | 489442 | 180.0 | 4.5 | 11/11/2020 | 59.92 | 6502.75 | 1.8 | 6562.67 | 91 | 6470 | A - | --- |
| | | | | | | | | | | 125 | 6436 | M 140-180 | Middle |
| Y26 | 1534858 | 489532 | 185.0 | 4.5 | 12/1/2014 | 62.39 | 6502.01 | 2.3 | 6564.40 | 111 | 6451 | A - | --- |
| | | | | | | | | | | 122 | 6440 | M 145-185 | Middle |
| Y30 | 1534752 | 488865 | 180.0 | 4.5 | 11/11/2020 | 58.39 | 6501.66 | 2.0 | 6560.05 | 108 | 6450 | M 140-180 | Middle |
| Y33 | 1534639 | 489337 | 180.0 | 4.5 | 3/25/2019 | 57.06 | 6506.16 | 2.0 | 6563.22 | 100 | 6461 | M 140-180 | Middle |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y34 | 1534642 | 489091 | 180.0 | 4.5 | 3/25/2019 | 52.16 | 6508.76 | 2.0 | 6560.92 | 131 | 6428 M | 140-180 | Middle |

NOTE: A = Alluvial Aquifer, Base
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 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **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 | 1540598 | 488610 | 287.0 | 6.0 | --- | --- | --- | 0.0 | 6565.00 | 63 | 6502 | A - | --- |
| | | | | | | | | | | 275 | 6290 | M 275-285 | Middle |
| 0808 | 1540141 | 487482 | 290.0 | 5.0 | 7/12/2019 | 67.70 | 6493.30 | 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 | 280.0 | 6.0 | --- | --- | --- | 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 | 1539085 | 487547 | 243.0 | 4.0 | --- | --- | --- | 0.0 | 6557.00 | 62 | 6495 | A - | --- |
| | | | | | | | | | | 230 | 6327 | M 223-243 | Middle |
| 0819 | 1539133 | 487026 | 222.0 | 6.0 | --- | --- | --- | 0.0 | 6557.00 | 62 | 6495 | A - | --- |
| | | | | | | | | | | 210 | 6347 | M 210-220 | Middle |
| 0820 | 1538970 | 486658 | 230.0 | --- | 5/9/2002 | 99.20 | 6458.80 | 0.0 | 6558.00 | --- | --- | M 125-230 | Middle |
| 0821 | 1538810 | 487320 | 260.0 | 7.0 | 11/30/2017 | 67.56 | 6492.44 | 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 | 11/11/2020 | 64.85 | 6498.95 | 1.2 | 6563.80 | 40 | 6523 | A - | --- |
| | | | | | | | | | | 57 | 6506 | U - | --- |
| | | | | | | | | | | 264 | 6299 | M 265-325 | Middle |
| AW | 1540235 | 488015 | 156.0 | 6.0 | 11/11/2020 | 38.40 | 6525.03 | 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 | 11/11/2020 | 46.20 | 6521.17 | 0.8 | 6567.37 | 83 | 6484 | A - | --- |
| | | | | | | | | | | 254 | 6313 | M 257-307 | Middle |
| | | | | | | **Pleasant Valley** | | | | | | | |
| 0530 | 1540137 | 484259 | 490.0 | 5.0 | 10/30/1998 | 95.78 | 6463.41 | 1.5 | 6559.19 | 265 | 6293 | L - | Lower |
| 0832 | 1539263 | 485629 | 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 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0900 | 1540800 | 483700 | 172.1 | --- | 7/24/1995 | 91.41 | 6468.59 | 1.5 | 6560.00 | --- | --- | L - | Lower |

NOTE: A = Alluvial Aquifer, Base
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 | 1539888 | 479654 | 264.0 | 4.0 | 4/16/2019 | 88.19 | 6466.81 | 2.0 | 6555.00 | 62 | 6491 | A | - | --- |
| | | | | | | | | | | 160 | 6393 | L | - | Lower |
| 0538 | 1533486 | 486899 | 170.0 | 6.0 | 3/4/2020 | 67.80 | 6481.14 | 2.0 | 6548.94 | 95 | 6452 | A | 50-90 | Alluvium |
| | | | | | | | | | | 133 | 6414 | L | 130-170 | Lower |
| 0539 | 1534014 | 487596 | 210.0 | 6.0 | 11/20/2020 | 210.00 | 6345.32 | 2.0 | 6555.32 | 100 | 6453 | A | 80-100 | --- |
| | | | | | | | | | | 100 | 6453 | A | 50-70 | Alluvium |
| | | | | | | | | | | 175 | 6378 | L | 170-210 | Lower |
| 0544 | 1535480 | 487573 | 80.0 | 4.0 | --- | --- | --- | --- | 6558.00 | 60 | --- | M | 60-80 | Middle |
| 0546 | 1536330 | 487560 | 160.0 | 5.0 | 7/19/2010 | 72.50 | 6486.50 | --- | 6559.00 | 80 | --- | M | 130-160 | Middle |
| 0546R | 1536330 | 487560 | 160.0 | 5.0 | 11/29/2018 | 63.05 | --- | --- | --- | --- | --- | U | - | Upper |
| 0547 | 1529133 | 483106 | 127.0 | --- | --- | --- | --- | --- | --- | --- | --- | L | - | Lower |
| 0548 | 1521230 | 482903 | 220.0 | --- | --- | --- | --- | --- | --- | --- | --- | L | - | Lower |
| 0549 | 1528942 | 483572 | 313.0 | --- | --- | --- | --- | --- | --- | --- | --- | L | - | Lower |
| 0580 | 1537708 | 492260 | 235.0 | 4.5 | --- | --- | --- | --- | 6579.00 | --- | --- | U | - | Upper |
| 0653 | 1533283 | 486570 | 206.0 | 6.0 | 11/20/2020 | 65.93 | 6479.04 | 1.6 | 6544.97 | 97 | 6446 | A | 69-206 | Alluvium |
| | | | | | | | | | | 135 | 6408 | L | - | Lower |
| 0850 | 1534652 | 486044 | 54.0 | 5.0 | 11/11/2020 | 54.60 | 6494.55 | 3.2 | 6549.15 | 37 | 6509 | M | 29-54 | Middle |
| | | | | | | | | | | 37 | 6509 | A | - | --- |
| 0853 | 1532124 | 484824 | 95.0 | 5.0 | 11/11/2020 | 66.00 | 6475.38 | 1.7 | 6541.38 | 60 | 6480 | A | - | --- |
| | | | | | | | | | | 60 | 6480 | L | 55-95 | Lower |
| 0859 | 1534549 | 487426 | 83.0 | 5.0 | 11/11/2020 | 58.00 | 6494.76 | 2.7 | 6552.76 | 52 | 6498 | M | 50-83 | Middle |
| 0901 | 1531531 | 492846 | 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 | 11/11/2020 | 123.98 | 6420.39 | 1.5 | 6544.37 | 107 | 6436 | A | - | --- |
| | | | | | | | | | | 232 | 6311 | L | - | Lower |
| 0909 | 1531900 | 483400 | 140.0 | 4.0 | 5/12/2015 | 84.49 | 6454.41 | 0.0 | 6538.90 | 112 | 6427 | A | 80-135 | Alluvium |
| | | | | | | | | | | 112 | 6427 | L | 80-135 | Lower |
| 0927 | 1548300 | 491700 | --- | --- | 11/11/2020 | 99.10 | 6495.90 | 1.0 | 6595.00 | --- | --- | M | - | Middle |
| | | | | | | | | | | --- | --- | C | - | Chinle |
| 0929 | 1544970 | 495662 | 320.0 | 5.0 | 11/11/2020 | 74.10 | 6518.47 | 2.0 | 6592.57 | --- | --- | U | 290-320 | Upper |
| 0932 | 1540436 | 495407 | 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 | 1540087 | 495231 | --- | 5.0 | 12/14/2009 | 78.28 | 6522.23 | 0.5 | 6600.51 | --- | --- | U | - | Upper |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0937 | 1542180 | 471478 | 182.0 | 5.0 | --- | --- | --- | 0.0 | 6578.00 | 70 | 6508 | A - | --- |
| | | | | | | | | | | 160 | 6418 | L 95-182 | Lower |
| 0944 | 1539280 | 493091 | 300.0 | 5.0 | 10/28/2019 | 66.20 | 6522.41 | 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 | 1535280 | 490377 | 255.0 | 5.0 | --- | --- | --- | 0.0 | 6568.10 | 200 | 6368 | M 200-255 | Middle |
| 0954 | 1534187 | 483910 | 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 | 1533883 | 489530 | 238.0 | 6.0 | --- | --- | --- | 0.0 | 6560.00 | 225 | 6335 | M 220-238 | Middle |
| 0963 | 1532555 | 488792 | --- | 4.0 | --- | --- | --- | 0.0 | 6557.00 | --- | --- | L - | Lower |
| 0964 | 1531817 | 488371 | 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 | 1538116 | 482413 | 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 | 15377630 | 482750 | --- | --- | --- | --- | --- | 0.5 | 6550.00 | --- | --- | L - | Lower |
| CW15 | 1536259 | 485961 | 134.6 | 5.0 | 11/11/2020 | 52.30 | 6499.02 | 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 | 11/11/2020 | 55.27 | 6517.38 | 1.5 | 6572.65 | 90 | 6481 | A - | --- |
| | | | | | | | | | | 190 | 6381 | U 177-232 | Upper |
| | | | | | | | | | | 340 | 6231 | M - | --- |
| CW26 | 1534116 | 489593 | 300.0 | 5.0 | 12/11/2013 | 91.10 | 6470.33 | 0.5 | 6561.43 | 50 | 6511 | A - | --- |
| | | | | | | | | | | 50 | 6511 | M - | --- |
| | | | | | | | | | | 231 | 6330 | L 245-285 | Lower |
| CW27 | 1534109 | 489600 | 110.0 | 5.0 | 12/11/2013 | 60.18 | 6502.70 | 1.9 | 6562.88 | 50 | 6511 | A - | --- |
| | | | | | | | | | | 50 | 6511 | M 80-110 | Middle |
| CW28 | 1535112 | 491008 | 370.0 | 5.0 | 11/11/2020 | 70.27 | 6501.41 | 1.9 | 6571.68 | 90 | 6480 | A - | --- |
| | | | | | | | | | | 110 | 6460 | U - | --- |
| | | | | | | | | | | 294 | 6276 | M 280-360 | Middle |
| CW29 | 1534551 | 487435 | 290.0 | 5.0 | 11/11/2020 | 77.90 | 6474.32 | 1.7 | 6552.22 | 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) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CW29 | 1534551 | 487435 | 290.0 | 5.0 | 11/11/2020 | 77.90 | 6474.32 | 1.7 | 6552.22 | 52 | 6499 | M - | --- |
| | | | | | | | | | | 228 | 6323 | L 230-270 | Lower |
| CW30 | 1536642 | 488704 | 251.5 | 5.0 | 3/25/2019 | 65.22 | 6493.09 | 2.0 | 6558.31 | 35 | 6521 | A - | --- |
| | | | | | | | | | | 220 | 6336 | M 219-249 | Middle |
| CW31 | 1540689 | 482738 | 311.0 | 6.0 | 11/11/2020 | 86.50 | 6473.76 | 2.0 | 6560.26 | 111 | 6447 | A - | --- |
| | | | | | | | | | | 254 | 6304 | L 231-271 | --- |
| | | | | | | | | | | 254 | 6304 | L 136-156 | Lower |
| | | | | | | | | | | 254 | 6304 | L 291-311 | --- |
| CW32 | 1543413 | 483523 | 300.0 | 6.0 | 11/11/2020 | 147.40 | 6419.88 | 1.7 | 6567.28 | 77 | 6489 | A - | --- |
| | | | | | | | | | | 157 | 6409 | L 158-188 | Lower |
| | | | | | | | | | | 157 | 6409 | L 218-303 | --- |
| CW36 | 1540053 | 481329 | 180.0 | 5.0 | 11/11/2020 | 42.60 | 6508.49 | 2.8 | 6551.09 | 96 | 6452 | A - | --- |
| | | | | | | | | | | 152 | 6396 | L 155-177 | Lower |
| CW37 | 1537240 | 484853 | 150.1 | 5.0 | 11/11/2020 | 62.85 | 6488.32 | 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 | 10/22/2012 | 28.56 | 6522.15 | 3.4 | 6550.71 | 40 | 6507 | A - | --- |
| | | | | | | | | | | 87 | 6460 | L 90-123 | Lower |
| CW40 | 1537624 | 491819 | 264.0 | 5.0 | 11/11/2020 | 61.60 | 6517.34 | 2.6 | 6578.94 | 75 | 6501 | A - | --- |
| | | | | | | | | | | 220 | 6356 | U 224-264 | Upper |
| CW41 | 1533174 | 488584 | 206.0 | 6.0 | 11/11/2020 | 78.60 | 6476.81 | 1.5 | 6555.41 | 59 | 6495 | A - | --- |
| | | | | | | | | | | 138 | 6416 | L 146-206 | Lower |
| CW42 | 1533169 | 487177 | 205.0 | 6.0 | 11/11/2020 | 69.60 | 6479.18 | 0.0 | 6548.78 | 98 | 6451 | A - | --- |
| | | | | | | | | | | 124 | 6425 | L 125-205 | Lower |
| CW43 | 1537587 | 482493 | 104.1 | 5.0 | 11/11/2020 | 67.90 | 6480.89 | 2.0 | 6548.79 | 57 | 6490 | A - | --- |
| | | | | | | | | | | 57 | 6490 | L 81-101 | Lower |
| CW54 | 1536645 | 488675 | 103.1 | 5.0 | 11/11/2020 | 33.70 | 6524.85 | 2.2 | 6558.55 | 70 | 6486 | C 60-100 | Chinle |
| CW74 | 1535188 | 487376 | 130.0 | 4.5 | 11/11/2020 | 55.00 | 6498.41 | 3.1 | 6553.41 | 40 | 6510 | A - | --- |
| | | | | | | | | | | 100 | 6450 | M 90-130 | Middle |
| CW75 | 1536012 | 487376 | 190.0 | 4.5 | 11/11/2020 | 55.40 | 6498.18 | 1.8 | 6553.58 | 59 | 6493 | A - | --- |
| | | | | | | | | | | 136 | 6416 | M 150-190 | Middle |
| CW76 | 1536661 | 487861 | 270.0 | 4.5 | 11/11/2020 | 56.20 | 6500.41 | 2.4 | 6556.61 | 40 | 6514 | A - | --- |
| | | | | | | | | | | 210 | 6344 | M 230-270 | Middle |
| CW77 | 1536659 | 488282 | 280.0 | 4.5 | 3/25/2019 | 57.22 | 6502.09 | 2.3 | 6559.31 | 53 | 6504 | A - | --- |
| | | | | | | | | | | 210 | 6347 | M 240-280 | Middle |
| R1 | 1534551 | 487790 | 120.0 | 5.0 | 11/20/2020 | 50.78 | 6504.34 | 2.0 | 6555.12 | 84 | 6469 | A 80-120 | Alluvium |
| | | | | | | | | | | 84 | 6469 | M 80-120 | Middle |
| R2 | 1534548 | 487968 | 115.0 | 5.0 | 10/28/2020 | 67.39 | 6486.77 | 2.0 | 6554.16 | 83 | 6469 | A 75-115 | Alluvium |
| | | | | | | | | | | 83 | 6469 | M 75-115 | Middle |

## TABLE 5.1-4. WELL DATA FOR THE CHINLE REGIONAL WELLS.

(cont'd.)

| | | | | | WATER LEVEL | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELL NAME | NORTH. COORD. | EAST. COORD. | WELL DEPTH (FT-MP) | CASING DIAM (IN) | DATE | DEPTH (FT-MP) | 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 |
| R3 | 1534546 | 488196 | 140.0 | 5.0 | 10/28/2020 | 62.64 | 6493.09 | 2.0 | 6555.73 | 88 | 6466 | M 100-140 | Middle |
| | | | | | | | | | | 88 | 6466 | A 60-80 | Alluvium |
| R4 | 1534541 | 488446 | 130.0 | 5.0 | 10/28/2020 | 54.04 | 6504.74 | 2.0 | 6558.78 | 84 | 6473 | M 90-130 | Middle |
| | | | | | | | | | | 84 | 6473 | A 90-130 | Alluvium |
| R5 | 1534560 | 488666 | 125.0 | 5.0 | 10/29/2020 | 54.43 | 6503.32 | 2.0 | 6557.75 | 71 | 6485 | A 65-125 | Alluvium |
| | | | | | | | | | | 71 | 6485 | M 65-125 | Middle |
| R6 | 1534356 | 488448 | 130.0 | 5.0 | 3/25/2019 | 38.42 | 6521.22 | 2.0 | 6559.64 | 68 | 6490 | M 110-130 | Middle |
| | | | | | | | | | | 68 | 6490 | A 50-90 | Alluvium |
| R7 | 1534399 | 488087 | 145.0 | 5.0 | 3/25/2019 | 31.52 | 6523.29 | 2.0 | 6554.81 | 74 | 6479 | M 125-145 | Middle |
| | | | | | | | | | | 74 | 6479 | A 65-105 | Alluvium |
| R11 | 1534320 | 488280 | 120.0 | 4.5 | 12/17/2019 | 62.11 | 6496.34 | 2.0 | 6558.45 | 70 | 6486 | A 60-120 | Alluvium |
| | | | | | | | | | | 70 | 6486 | M 60-120 | Middle |
| R12 | 1534220 | 488360 | 120.0 | 4.5 | 3/25/2019 | 36.82 | 6520.13 | 2.0 | 6556.95 | 66 | 6489 | A 60-120 | Alluvium |
| | | | | | | | | | | 66 | 6489 | M 60-120 | Middle |
| R36 | 1533594 | 486157 | 200.0 | 4.5 | 8/3/2016 | 69.05 | 6476.41 | 2.0 | 6545.46 | 92 | 6451 | A - | --- |
| | | | | | | | | | | 146 | 6397 | L 160-200 | Lower |
| R37 | 1533586 | 486481 | 200.0 | 4.5 | 8/10/2016 | 68.66 | 6478.18 | 2.0 | 6546.84 | 92 | 6453 | A - | --- |
| | | | | | | | | | | 143 | 6402 | L 160-200 | Lower |
| R44 | 1533478 | 486593 | 200.0 | 4.5 | 8/10/2016 | 68.99 | 6478.60 | 2.0 | 6547.59 | 100 | 6446 | A - | --- |
| | | | | | | | | | | 130 | 6416 | L 160-200 | Lower |
| R45 | 1533481 | 486334 | 200.0 | 4.5 | 8/3/2016 | 68.62 | 6477.81 | 2.0 | 6546.43 | 80 | 6464 | A - | --- |
| | | | | | | | | | | 130 | 6414 | L 160-200 | Lower |
| R46 | 1533478 | 486088 | 200.0 | 4.5 | 8/2/2016 | 68.44 | 6477.80 | 2.0 | 6546.24 | --- | --- | L 160-200 | Lower |
| | | | | | | | | | | 90 | 6454 | A - | --- |
| R47 | 1533470 | 485780 | 160.0 | 4.5 | 12/20/2013 | 75.59 | 6471.58 | 2.0 | 6547.17 | 103 | 6442 | L 100-160 | Lower |
| | | | | | | | | | | 103 | 6442 | A 100-160 | Alluvium |
| R48 | 1533345 | 485775 | 160.0 | 4.5 | --- | --- | --- | 2.0 | 6545.24 | 100 | 6443 | A 100-160 | Alluvium |
| | | | | | | | | | | 100 | 6443 | L 100-160 | Lower |
| R49 | 1533407 | 485953 | 200.0 | 4.5 | 11/20/2020 | 71.33 | 6474.66 | 2.0 | 6545.99 | 109 | 6435 | L 160-200 | Lower |
| | | | | | | | | | | 109 | 6435 | A - | --- |
| R50 | 1533362 | 486216 | 200.0 | 4.5 | 4/3/2017 | 66.41 | 6479.21 | 2.0 | 6545.62 | 100 | 6444 | A - | --- |
| | | | | | | | | | | 120 | 6424 | L 160-200 | Lower |
| R51 | 1533284 | 486570 | 200.0 | 4.5 | 8/3/2016 | 68.09 | 6478.41 | 2.0 | 6546.50 | 120 | 6425 | A - | --- |
| | | | | | | | | | | 140 | 6405 | L 160-200 | Lower |
| R52 | 1533377 | 486751 | 200.0 | 4.5 | 5/15/2015 | 69.74 | 6477.95 | 2.5 | 6547.69 | 94 | 6451 | A - | --- |
| | | | | | | | | | | 136 | 6409 | L 160-200 | Lower |
| R56 | 1533244 | 486354 | 180.0 | 4.5 | 8/8/2016 | 67.00 | 6478.38 | 2.0 | 6545.38 | --- | --- | L 140-180 | Lower |
| R57 | 1533260 | 485880 | 135.0 | 4.5 | 12/20/2013 | 74.67 | 6472.40 | 2.0 | 6547.07 | 99 | 6446 | L 75-135 | Lower |
| | | | | | | | | | | 99 | 6446 | A 75-135 | Alluvium |
| R58 | 1533170 | 485710 | 160.0 | 4.5 | 4/8/2014 | 70.98 | 6473.47 | 2.0 | 6544.45 | 98 | 6444 | A 100-160 | Alluvium |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R58 | 1533170 | 485710 | 160.0 | 4.5 | 4/8/2014 | 70.98 | 6473.47 | 2.0 | 6544.45 | 98 | 6444 | L 100-160 | Lower |
| R59 | 1533125 | 485963 | 150.0 | 4.5 | 8/2/2016 | 66.61 | 6478.40 | 2.0 | 6545.01 | 107 | 6436 | L 110-150 | Lower |
| | | | | | | | | | | 107 | 6436 | A 110-150 | Alluvium |
| R60 | 1533149 | 486216 | 180.0 | 4.5 | 8/2/2016 | 67.17 | 6478.13 | 2.0 | 6545.30 | 105 | 6438 | A - | --- |
| | | | | | | | | | | 105 | 6438 | L 140-180 | Lower |
| R61 | 1533157 | 486484 | 180.0 | 4.5 | 8/8/2016 | 67.01 | 6478.78 | 2.0 | 6545.79 | 70 | 6474 | A - | --- |
| | | | | | | | | | | 150 | 6394 | L 140-180 | Lower |
| R62 | 1533186 | 486744 | 180.0 | 4.5 | 8/8/2016 | 67.13 | 6479.57 | 2.0 | 6546.70 | 100 | 6445 | A - | --- |
| | | | | | | | | | | 180 | 6365 | L 140-180 | Lower |
| R65 | 1533068 | 486614 | 180.0 | 4.5 | 5/15/2015 | 69.24 | 6476.86 | 2.3 | 6546.10 | 96 | 6448 | A - | --- |
| | | | | | | | | | | 122 | 6422 | L 140-180 | Lower |
| R66 | 1533048 | 486354 | 180.0 | 4.5 | 5/15/2015 | 69.33 | 6476.18 | 2.0 | 6545.51 | 120 | 6424 | A - | --- |
| | | | | | | | | | | 120 | 6424 | L 140-180 | Lower |
| R67 | 1533041 | 486129 | 180.0 | 4.5 | 11/20/2020 | 69.74 | 6475.79 | 2.0 | 6545.53 | 105 | 6439 | L 140-180 | Lower |
| | | | | | | | | | | 105 | 6439 | A - | --- |
| R67B | 1533000 | 486086 | 145.0 | 4.5 | --- | --- | --- | 2.0 | 6544.87 | 100 | 6443 | L 105-145 | Lower |
| R68 | 1533025 | 485819 | 160.0 | 4.5 | 10/10/2014 | 69.44 | 6475.41 | 2.0 | 6544.85 | 99 | 6444 | A 100-160 | Alluvium |
| | | | | | | | | | | 99 | 6444 | L 100-160 | Lower |
| R69 | 1532987 | 486024 | 160.0 | 4.5 | 4/8/2014 | 70.53 | 6474.82 | 2.0 | 6545.35 | 96 | 6447 | L 100-160 | Lower |
| | | | | | | | | | | 96 | 6447 | A 100-160 | Alluvium |
| R70 | 1532909 | 486258 | 180.0 | 4.5 | 5/15/2015 | 68.01 | 6477.20 | 2.1 | 6545.21 | --- | --- | L 140-180 | Lower |
| | | | | | | | | | | 80 | 6463 | A - | --- |
| R71 | 1532972 | 486481 | 180.0 | 4.5 | 5/15/2015 | 68.36 | 6477.39 | 2.4 | 6545.75 | --- | --- | L 140-180 | Lower |
| | | | | | | | | | | 100 | 6443 | A - | --- |
| R72 | 1532997 | 486762 | 180.0 | 4.5 | 8/8/2016 | 66.02 | 6480.90 | 2.0 | 6546.92 | 100 | 6445 | A - | --- |
| | | | | | | | | | | 120 | 6425 | L 140-180 | Lower |
| R73 | 1533019 | 485560 | 150.0 | 4.5 | 5/13/2015 | 69.92 | 6474.42 | 2.3 | 6544.34 | 99 | 6443 | A 110-150 | Alluvium |
| | | | | | | | | | | 99 | 6443 | L 110-150 | Lower |
| R74 | 1532852 | 485502 | 140.0 | 4.5 | 11/20/2020 | 71.33 | 6472.70 | 2.4 | 6544.03 | 104 | 6438 | L 100-140 | Lower |
| | | | | | | | | | | 104 | 6438 | A 100-140 | Alluvium |
| R75 | 1532922 | 485716 | 140.0 | 4.5 | 5/13/2015 | 69.14 | 6475.74 | 2.3 | 6544.88 | 98 | 6445 | L 100-140 | Lower |
| | | | | | | | | | | 98 | 6445 | A 100-140 | Alluvium |
| R76 | 1532888 | 485891 | 140.0 | 4.5 | 5/13/2015 | 68.37 | 6476.72 | 2.3 | 6545.09 | 106 | 6437 | L 100-140 | Lower |
| | | | | | | | | | | 106 | 6437 | A 100-140 | Alluvium |
| R77 | 1532683 | 485800 | 140.0 | 4.5 | 5/13/2015 | 68.28 | 6476.69 | 2.4 | 6544.97 | 80 | 6463 | A 100-140 | Alluvium |
| | | | | | | | | | | 80 | 6463 | L 100-140 | Lower |
| R78 | 1532683 | 485612 | 140.0 | 4.5 | 5/13/2015 | 69.16 | 6474.87 | 2.0 | 6544.03 | 85 | 6457 | A 100-140 | Alluvium |
| | | | | | | | | | | 85 | 6457 | L 100-140 | Lower |
| R79 | 1532703 | 485379 | 120.0 | 4.5 | --- | --- | --- | 2.0 | 6542.94 | 80 | 6461 | L 80-120 | Lower |
| | | | | | | | | | | 80 | 6461 | A 80-120 | Alluvium |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R80 | 1533169 | 485471 | 120.0 | 4.5 | --- | --- | --- | 2.0 | 6543.72 | --- | --- | A 80-120 | Alluvium |
| | | | | | | | | | | --- | --- | L 80-120 | Lower |
| V1 | 1534527 | 486940 | 270.0 | 4.5 | 11/11/2020 | 77.20 | 6474.91 | 2.0 | 6552.11 | 220 | 6330 | L 230-270 | Lower |
| V2 | 1534339 | 486618 | 270.0 | 4.5 | 11/11/2020 | 75.30 | 6474.79 | 2.0 | 6550.09 | 102 | 6446 | A - | --- |
| | | | | | | | | | | 206 | 6342 | L 230-270 | Lower |
| V3 | 1534192 | 486207 | 260.0 | 4.5 | 8/22/2017 | 74.60 | 6475.55 | 2.2 | 6550.15 | 240 | 6308 | L 220-260 | Lower |
| V4 | 1533890 | 485961 | 240.0 | 4.5 | 8/22/2017 | 70.00 | 6475.43 | 2.1 | 6545.43 | 200 | 6343 | L 200-240 | Lower |
| V6 | 1534156 | 485710 | 260.0 | 4.5 | 11/11/2020 | 75.00 | 6472.43 | 2.4 | 6547.43 | 108 | 6437 | A - | --- |
| | | | | | | | | | | 182 | 6363 | L 220-260 | Lower |
| V7 | 1534208 | 487436 | 270.0 | 4.5 | 11/11/2020 | 79.15 | 6476.08 | 2.0 | 6555.23 | --- | --- | L 230-270 | Lower |
| | | | | | | | | | | 80 | 6473 | A - | --- |
| V8 | 1534183 | 486945 | 260.0 | 4.5 | 11/11/2020 | 74.30 | 6477.19 | 2.0 | 6551.49 | 100 | 6449 | A - | --- |
| | | | | | | | | | | 211 | 6338 | L 220-260 | Lower |
| V9 | 1534298 | 488140 | 280.0 | 4.5 | 11/11/2020 | 79.10 | 6476.59 | 2.0 | 6555.69 | 79 | 6475 | A - | --- |
| | | | | | | | | | | 231 | 6323 | L 240-280 | Lower |
| V11 | 1533919 | 487868 | 270.0 | 4.5 | 11/11/2020 | 78.90 | 6477.00 | 2.0 | 6555.90 | 98 | 6456 | A - | --- |
| | | | | | | | | | | 210 | 6344 | L 230-270 | Lower |
| V14 | 1533638 | 488229 | 240.0 | 4.5 | 11/11/2020 | 79.90 | 6475.79 | 2.0 | 6555.69 | --- | --- | L 200-240 | Lower |
| | | | | | | | | | | 80 | 6474 | A - | --- |
| V16 | 1533402 | 487709 | 220.0 | 4.5 | 11/11/2020 | 74.90 | 6477.08 | 2.0 | 6551.98 | 90 | 6460 | A - | --- |
| | | | | | | | | | | 173 | 6377 | L 180-220 | Lower |
| V17 | 1533896 | 486461 | 240.0 | 4.5 | 11/11/2020 | 75.20 | 6474.95 | 2.0 | 6550.15 | 93 | 6455 | A - | --- |
| | | | | | | | | | | 166 | 6382 | L 200-240 | Lower |
| V18 | 1533819 | 487241 | 240.0 | 4.5 | 11/11/2020 | 75.45 | 6475.93 | 2.0 | 6551.38 | 95 | 6454 | A - | --- |
| | | | | | | | | | | 195 | 6354 | L 200-240 | Lower |

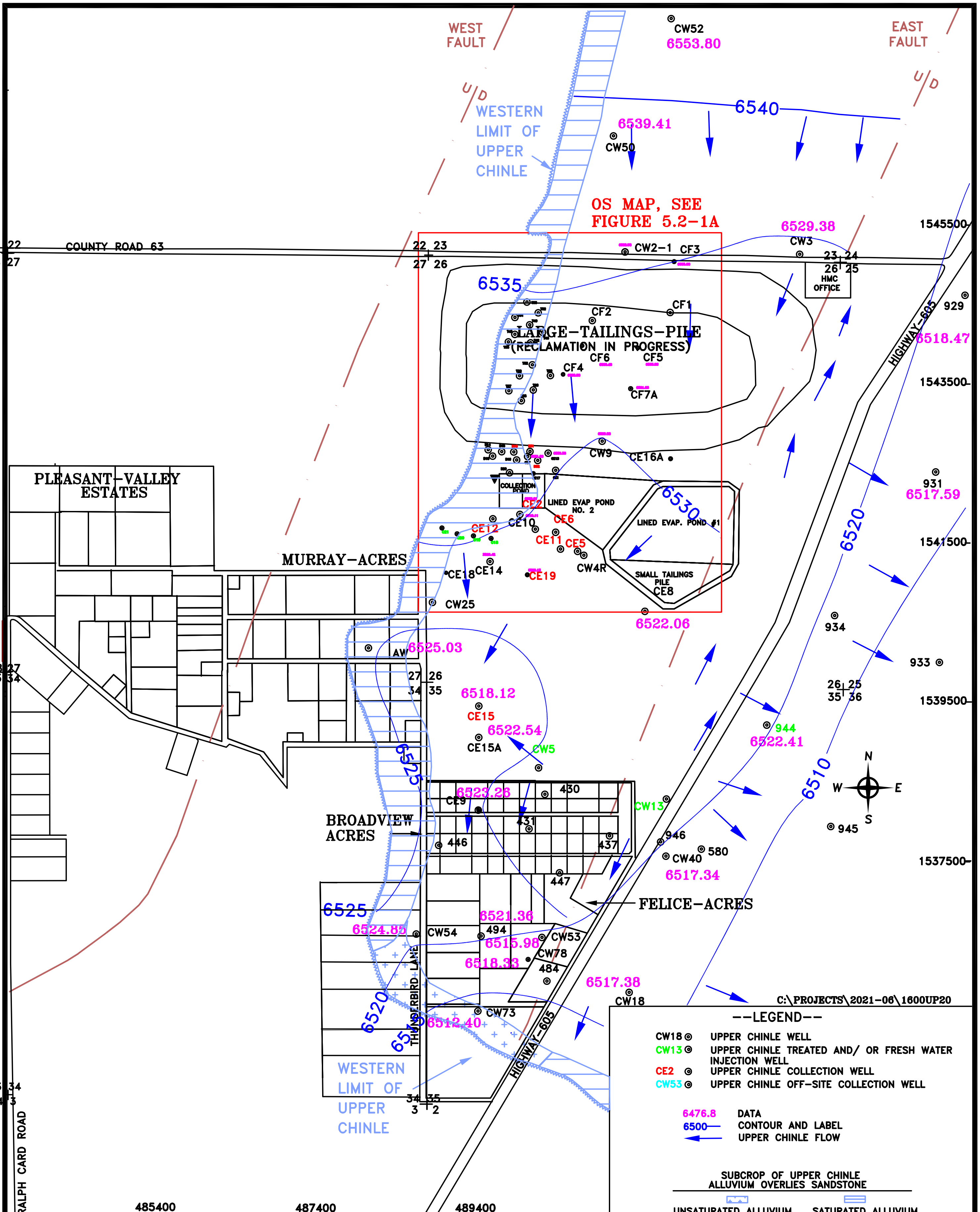
NOTE: A = Alluvial Aquifer, Base
U = Upper Chinle Aquifer,Top
M = Middle Chinle Aquifer,Top
L = Lower Chinle Aquifer,Top
* = Abandoned

## 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. Figures 5.2-1 and 5.2-1A presents water-level elevation contours of the Upper Chinle aquifer during the fall of 2020. The blue arrows on Figure 5.2-1 show the direction of ground-water flow, which is greatly influenced by the treated and/or fresh-water injection into the Upper Chinle at wells 944, C18, C19, C20, C21, CW5 and CW13, and by collection from wells B16, B31, B32, CE2, CE5, CE6, CE11, CE12, CE15 and CE19. 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 parallel and adjacent to the East Fault near well CW18. Injection of fresh water has created a piezometric-surface mound along the east side of the East Fault. 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. The CW13 injection affects water levels on the west side of the East Fault in the area of Upper Chinle wells CW53 and CW78 in Felice Acres. Water level changes in well CW53 occur quickly in response to changes 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 treated and/or 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, CE5, CE6, CE11, CE12, CE15 or CE19. Injection into Upper Chinle well CW25 was started in 2000, and continued through 2019. The naturally occurring flow direction in the Upper Chinle aquifer west of the East Fault is from the north. Well CW3 has not been pumped since January 2007 and therefore does not intercept any of the flow from the north. The recent water-level elevations for wells CF4 and CF6 (see Figure 5.2-1A) are believed to be influenced by leakage resulting from comprised casing and are not representative of the Upper Chinle aquifer. Wells CF4 and CF6 are not used in the contouring of water-level elevation.

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, CE7, CE8, CW3 and CW50. The abrupt water-level elevation changes in well CE2 reflect its usage as a collection well with lower water-level elevations indicating an operating pumping level. Figure 5.2-4 presents the water-level elevation changes for the Upper Chinle wells east of the East Fault. The variation in water levels in wells 929, 931, CW18 and CW53 were due to variations in injection rates into well CW13 during 2019 with relatively steady levels in 2020. Water levels from wells CW53 and CW73 were included on Figure 5.2-4 because the water level response in well CW53 is similar to that of the wells east of the East Fault. The water level in well CW73 in the subcrop area in southern Felice Acres has been steady in 2020 and does not seem to be affected by variations in the CW13 injection.




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

FIGURE 5.2-1. WATER-LEVEL ELEVATIONS OF THE UPPER CHINLE AQUIFER, FALL 2020, FT-MSL

DATE: 12/9/2020

SCALE: 1"= 1600'

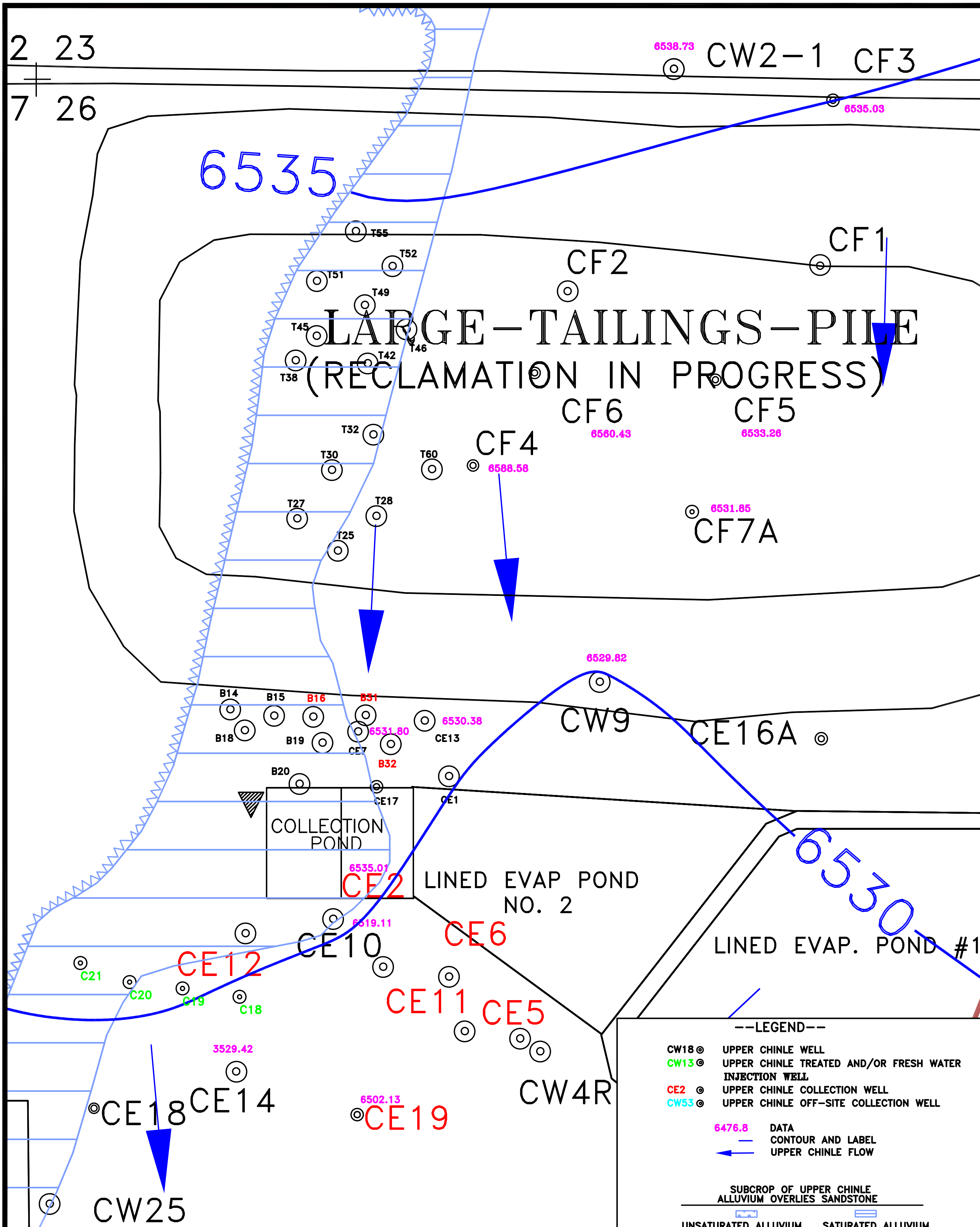



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FIGURE 5.2-1A. WATER LEVEL ELEVATIONS OF THE UPPER CHINLE AQUIFER, OS, FALL 2020, FT-MSL

DATE: 12/9/2020

SCALE: 1"= 500'

PAGE: 5.2-4

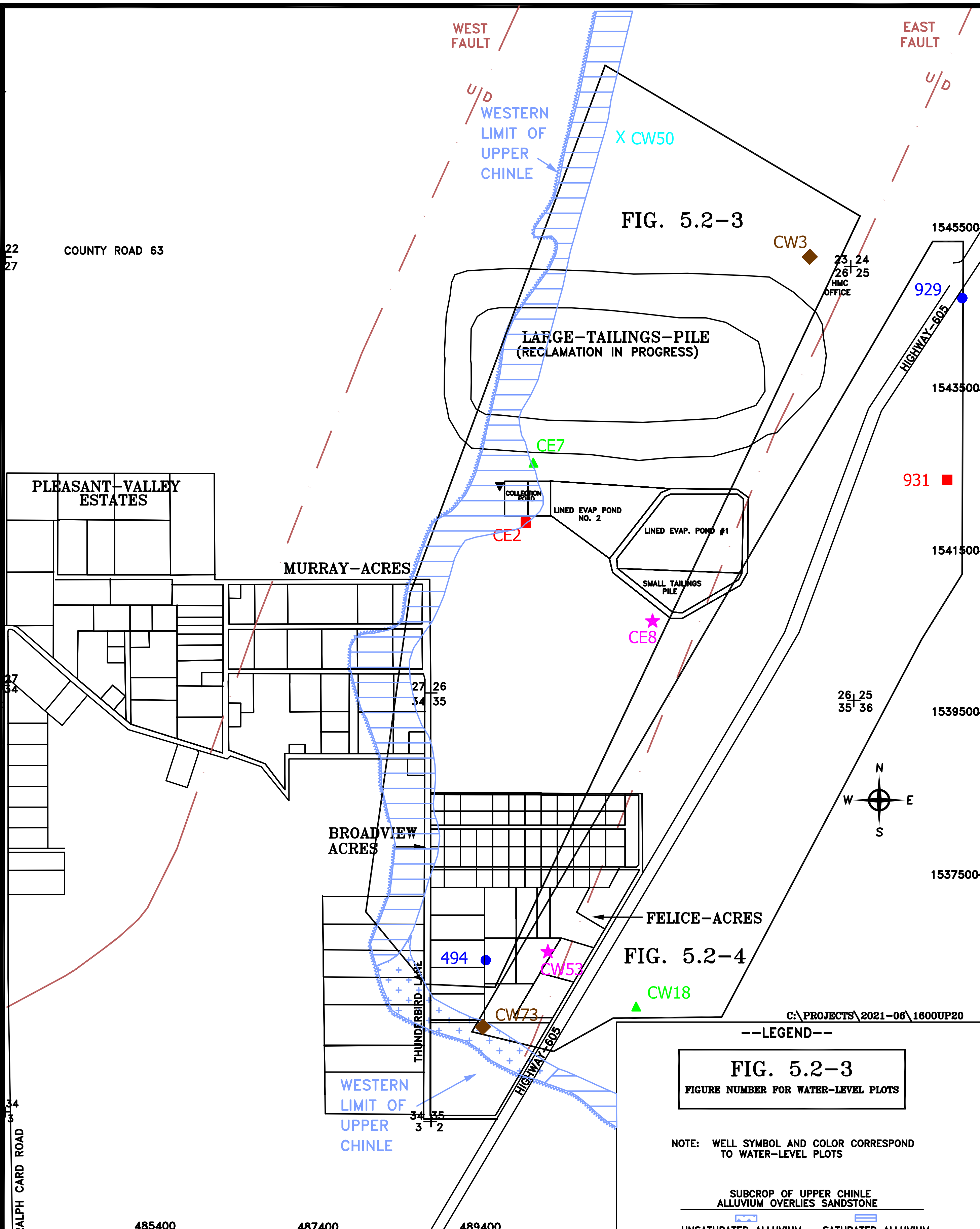


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FIGURE 5.2-2. LOCATION OF UPPER CHINLE WELLS WITH WATER-LEVEL PLOTS, 2020

DATE: 12/9/2020
SCALE: 1"= 1600'

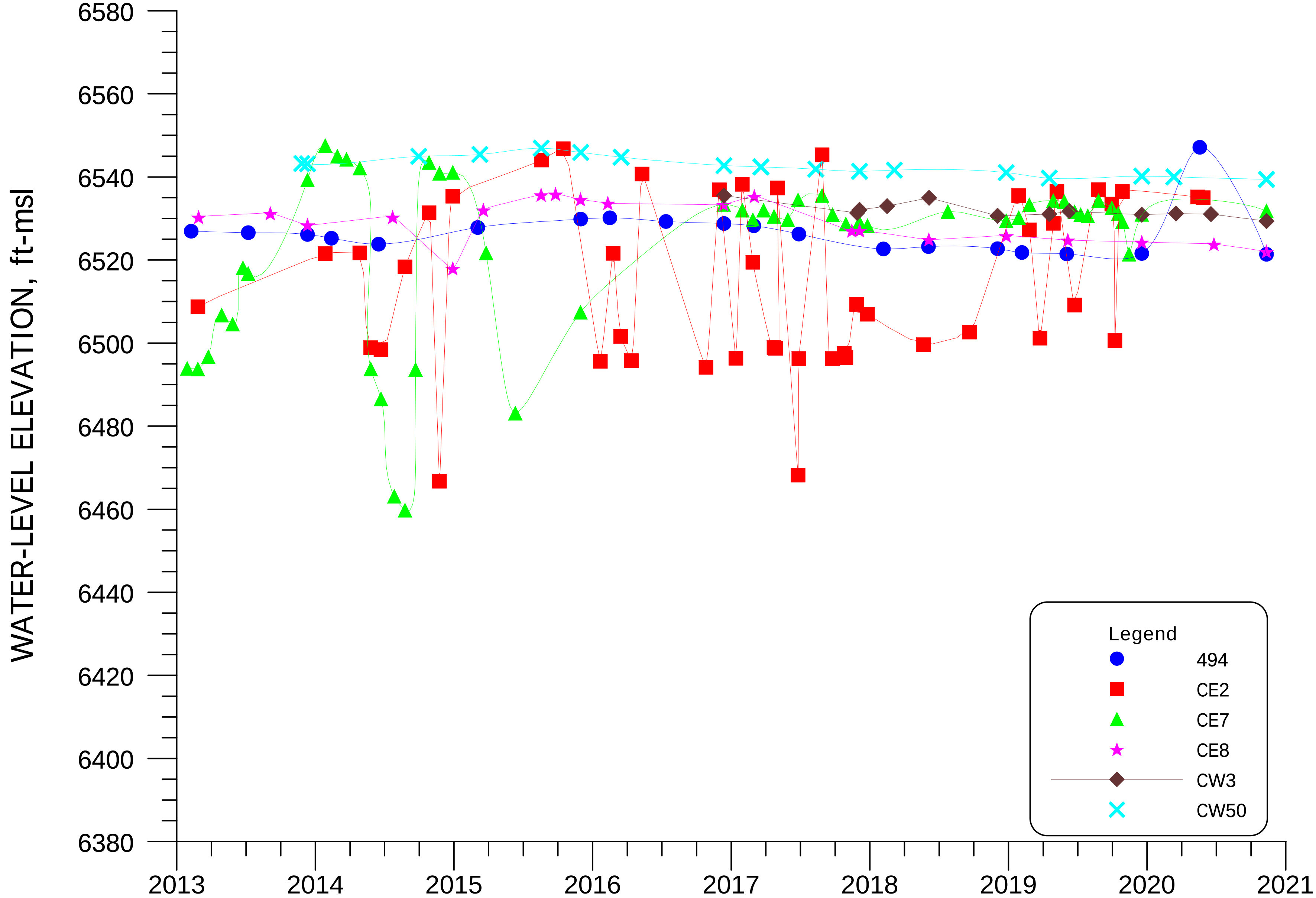



**FIGURE 5.2-3. WATER-LEVEL ELEVATION FOR WELLS 494, CE2, CE7, CE8, CW3 AND CW50**

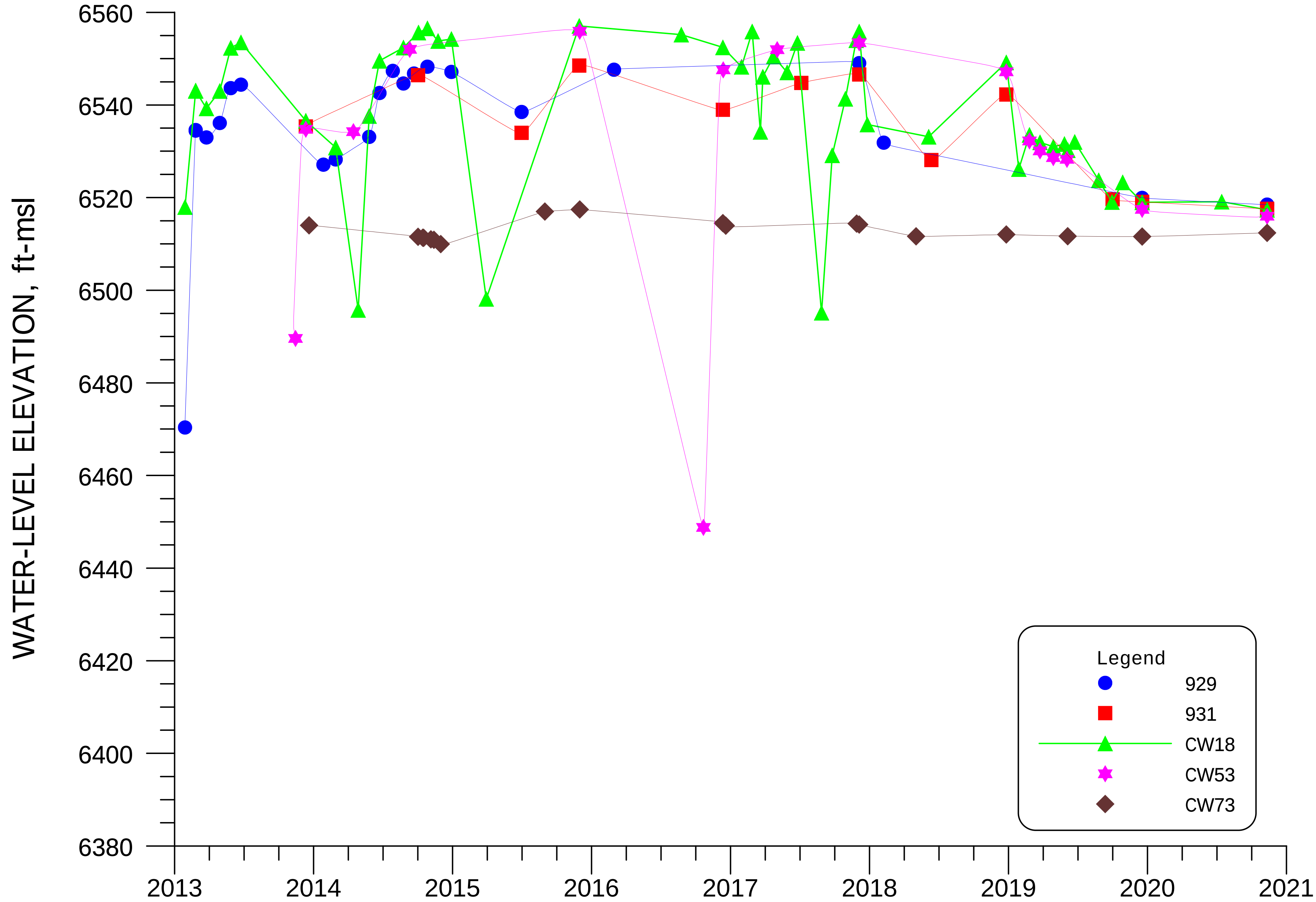



**FIGURE 5.2-4. WATER-LEVEL ELEVATION FOR WELLS 929, 931, CW 18, CW53 AND CW73.**

## 5.3 UPPER CHINLE WATER QUALITY

The Upper Chinle aquifer site standards are initially defined in this subsection because they are useful in evaluating progress in Upper Chinle groundwater restoration and indicate where additional restoration is needed in this aquifer. Water-quality data for 2020 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 Figures 5.1-2 and 5.1-2A show locations of the Upper Chinle wells.

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 site standard values are listed in the legend block of the water-quality figures in this report. The Upper Chinle wells used in establishing the Chinle site standards are shown on Figure 5.3-1 with a blue box around the well name indicating which Upper Chinle wells were used to define the non-mixing zone site standard. The yellow pattern on this figure shows the mixing zone for the Upper Chinle aquifer. The Upper Chinle wells used in conjunction with the Middle and Lower Chinle wells (see Figures 6.3-1 and 7.3-1 for the Middle and Lower Chinle wells used, respectively) in establishing the mixing zone site standards are shown with a red box around their well names. Table 5.3-1 presents Chinle mixing zone site standards and the non-mixing zone Upper Chinle site standards. This table also presents the 2020 data for the Chinle mixing zone wells and the Upper Chinle non-mixing zone wells.

Concentrations of key constituents exceed site standards 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 Large Tailings Pile (LTP). Selenium concentrations during 2020 are less than the site standard in all Upper Chinle wells except for wells near the southern portion of the LTP. Uranium concentrations exceed the site standard in wells near the LTP, in one well north of Broadview Acres and in two wells in Felice Acres. Molybdenum concentrations in the Upper Chinle aquifer exceed the site standard in wells in close proximity to the tailings piles and in the area of well CE15.

### 5.3.1 SULFATE - UPPER CHINLE

Figures 5.3-1A and 5.3-1B present sulfate concentrations in the Upper Chinle aquifer during 2020. Figure 5.3-1B has been added for the presentation of the new wells in the LTP area due to the density of these wells. Therefore Figure 5.3-1B should be used for viewing of the concentrations in the area inside the red box shown on Figure 5.3-1A. Only wells near the LTP area exceeded the site standard for the mixing zone of 1750 mg/L (see Figure 5.3-1 for the mixing zone area). The non-mixing zone site standard of 914 mg/L in the Upper Chinle in 2020 is also exceeded in the eastern portion of the LTP. Upper Chinle site standards based on background data are presented for sulfate in the legend of Figures 5.3-1A and 5.3-1B. These site standards have a greater than sign in front of the numeric value which is associated with the pattern for the particular zone. The references describing the analysis of background results used in developing the site standards are presented previously in this section 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 used for other constituents discussed in this section for the Upper Chinle aquifer. Notations on Figure 5.3-2 indicate that mixing zone Upper Chinle wells 494, CE2, CE8, CE9, CE15 and CF4 are grouped together on the water-quality time plots, whereas the non-mixing zone wells CW3 and CW18 are presented 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 in 2020 are less than the mixing-zone site standard (see Figure 5.3-3) except the higher value in well CF4. Well CF4 is likely affected by leakage from the tailings and the 2020 water-quality results are not considered representative of the Upper Chinle aquifer. A plot of sulfate concentrations versus time for non-mixing zone Upper Chinle wells CW3 and CW18 is presented on Figure 5.3-4 (see Figure 5.3-2 for location of these wells). All of these plotted sulfate concentrations are below the non-mixing zone site standard and none of the concentration changes indicate a consistent trend.

### 5.3.2 TOTAL DISSOLVED SOLIDS - UPPER CHINLE

Figures 5.3-5 and 5.3-5A present contours of total dissolved solids (TDS) concentrations for the Upper Chinle aquifer during 2020. Like the second sulfate figure in the preceding section, Figure 5.3-5A is useful for viewing the TDS concentrations in the LTP area shown inside of the box on Figure 5.3-5. All concentrations are less than the mixing zone site standard except in areas of the Upper Chinle beneath and near the LTP. The non-mixing zone site standard is exceeded in the LTP area and east of State Highway 605 in Sections 25, 26, 35 and 36 where larger concentrations occur naturally. 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 dashed pattern on Figures 5.3-5 and 5.3-5A shows where the Upper Chinle TDS concentrations are greater than 2010 mg/L, which is the non-mixing zone site standard. TDS concentrations in this area east of Highway 605 are natural and not attributable to the activities at the Grants site. The TDS concentrations exceed the mixing zone standard of 3140 mg/L near the LTP and also exceed the non-mixing zone standard in the areas near wells CF1 and CF3.

Figure 5.3-6 presents TDS concentrations for mixing zone Upper Chinle wells 494, CE2, CE8, CE9, CE15 and CF4 and shows much higher concentrations in well CF4 during the last few years. A time plot of TDS concentrations for non-mixing zone wells CW3 and CW18 is presented in Figure 5.3-7. The TDS concentration from well CW18 is near the non-mixing zone standard in 2020 as it has been in the last few years.

### 5.3.3 CHLORIDE – UPPER CHINLE

Chloride concentrations in the Upper Chinle aquifer during 2020 are presented on Figures 5.3-8 and 5.3-8A. In the up-gradient Upper Chinle well CW50, 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. Concentrations near the subcrop located under the LTP and in an area extending to the northeast side of the Collection Ponds exceed 250 mg/L. The highest chloride concentrations exist in the area of the western portion of the LTP near the subcrop. 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 and are not attributable to the Grants site.

The chloride concentrations in water collected from mixing zone Upper Chinle wells 494, CE2, CE8, CE9, CE15 and CF4 are presented on Figure 5.3-9 with all of the recent chloride concentrations below the site standard except for the value in well CF4. The chloride concentrations in the wells in the non-mixing zone are presented on Figure 5.3-10 which shows that these concentrations are well below the non-mixing zone standard.

### 5.3.4 URANIUM - UPPER CHINLE

Uranium is an important constituent for identifying impacts to the Upper Chinle aquifer. Figures 5.3-11 and 5.3-11A presents contours of uranium concentrations in the Upper Chinle aquifer for 2020. Uranium concentrations in the Upper Chinle aquifer also exceed the corresponding mixing or non-mixing zone site standards in the LTP area extending down to the south of the Collection Ponds in 2020. One uranium value exceeds the mixing zone site standard of 0.18 mg/L north of Broadview Acres while two wells in Felice Acres likely also exceeds this site standard.

Plots of uranium concentrations versus time for Upper Chinle wells 494, CE2, CE8, CE9, CE15 and CF4 are presented on Figure 5.3-12 (see Figure 5.3-2 for location of these wells). The 2020 sample from well CF4 was affected by leakage from the tailings and also by sample preservation issues and is considered unrepresentative of the Upper Chinle aquifer. Figure 5.3-13 shows uranium concentration plotted versus time for Upper Chinle wells CW3 and CW18 with an overall gradual decline in concentration in well CW3. This plot shows that uranium concentrations in the CW3 area are still above the site standard while the CW18 concentrations are below the standard.

### 5.3.5 SELENIUM - UPPER CHINLE

Contours of selenium concentrations for 2020 in the Upper Chinle aquifer are presented on Figures 5.3-14 and 5.3-14A. These figures show that the selenium concentrations are less than the mixing-zone site standard of 0.14 mg/L with the exception of wells in and near the subcrop area near the LTP and extending south to the Collection Ponds. The non-mixing zone site standard of 0.06 mg/L is not exceeded in 2020.

Figure 5.3-15 presents selenium concentrations for wells 494, CE2, CE8, CE9, CE15 and CF4. Figure 5.3-16 presents the selenium concentrations for Upper Chinle wells CW3 and CW18 which are all below the non-mixing zone site standard in 2020.

### 5.3.6 MOLYBDENUM - UPPER CHINLE

Figures 5.3-17 and 5.3-17A present the molybdenum concentrations in the Upper Chinle aquifer during 2020. Molybdenum concentrations near and beneath the LTP exceeded both the mixing and non-mixing zone site standards. Concentrations are greater than 1.0 mg/L in a region extending from the Upper Chinle-alluvium subcrop area, below the LTP, toward the east side of the LTP and to the south of Evaporation Pond 2 and the Collection Ponds. The site standard is exceeded in one well just north of Broadview Acres. All molybdenum concentrations from Broadview Acres to the south and east of the East Fault in the Upper Chinle aquifer are equal or below the site standards in 2020.

Figure 5.3-18 presents molybdenum concentrations for Upper Chinle wells from the mixing zone. This plot shows that the 2020 molybdenum concentrations in wells CE2 and CE15 are above the site standard. Figure 5.3-19 contains time plots of molybdenum concentrations for wells CW3 and CW18 and shows an overall decline in molybdenum concentrations in well CW3 since 2014.

### 5.3.7 NITRATE - UPPER CHINLE

Nitrate concentrations for the Upper Chinle aquifer were measured in 2020 to confirm that concentrations are significantly below the site standard of 15 mg/L for the mixing zone. Figures 5.3-20 and 5.3-20A present the nitrate concentrations in the Upper Chinle aquifer during 2020. All measured nitrate concentrations in the Upper Chinle aquifer in 2020 are less than the site standard. Routine monitoring of nitrate concentrations in the Upper Chinle aquifer is only warranted near the LTP because concentrations in the alluvial aquifer are elevated only near the LTP.

Plots of nitrate concentration versus time were not prepared because historic values in Upper Chinle wells are similar to the low concentrations measured in 2020. 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 nitrate site standard for the non-mixing zone for the Upper Chinle aquifer has not been set and is not considered necessary.

### 5.3.8 RADIUM-226 AND RADIUM-228 - UPPER CHINLE

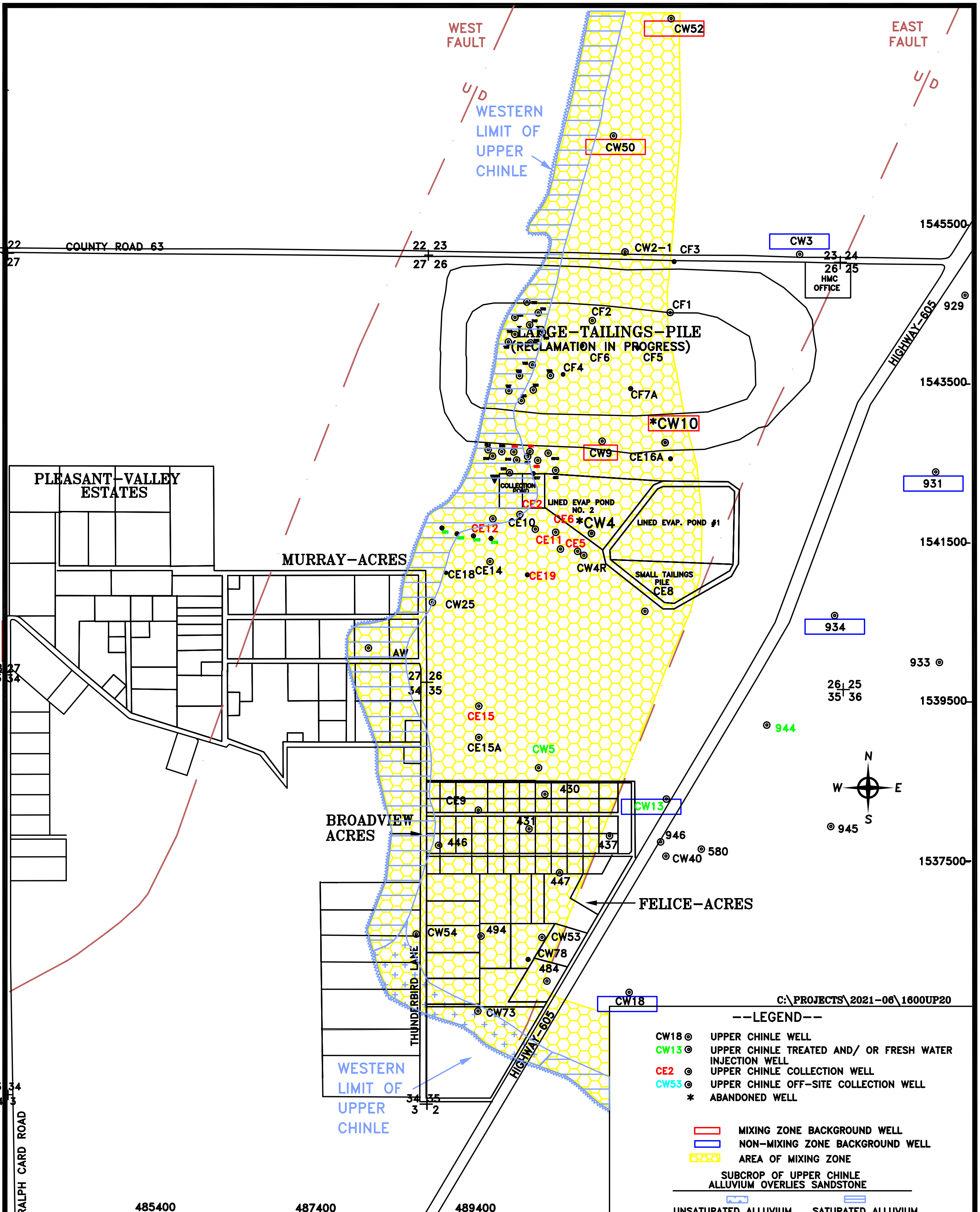
All radium concentrations in the Upper Chinle aquifer have been relatively low at the Grants site except the high values from well CF4. Past radium values have slightly exceeded 5 pCi/L in the Upper Chinle aquifer in the western portion of the LTP. Figures 5.3-21 and 5.3-21A present the radium-226 and the radium-228 values measured in 2020. The measured 2020 values in the Upper Chinle wells are all small and the 2019 and 2020 values in well CW3 shows that a 2018 sample with elevated radium-226 concentration in this well was an outlier. The 2020 radium concentrations for Upper Chinle well CF4, which is located on top of the LTP, are much larger than historical values and are considered the result of leakage from the tailings in the well. Historical data has shown that radium-226 and radium-228 are not present at concentrations that are significant in the Upper Chinle aquifer outside the immediate area of the LTP at the HMC site. No concentration plots were prepared for radium because observed concentrations have been low. A radium site standard for the Upper Chinle aquifer has not been established.

### 5.3.9 VANADIUM - UPPER CHINLE

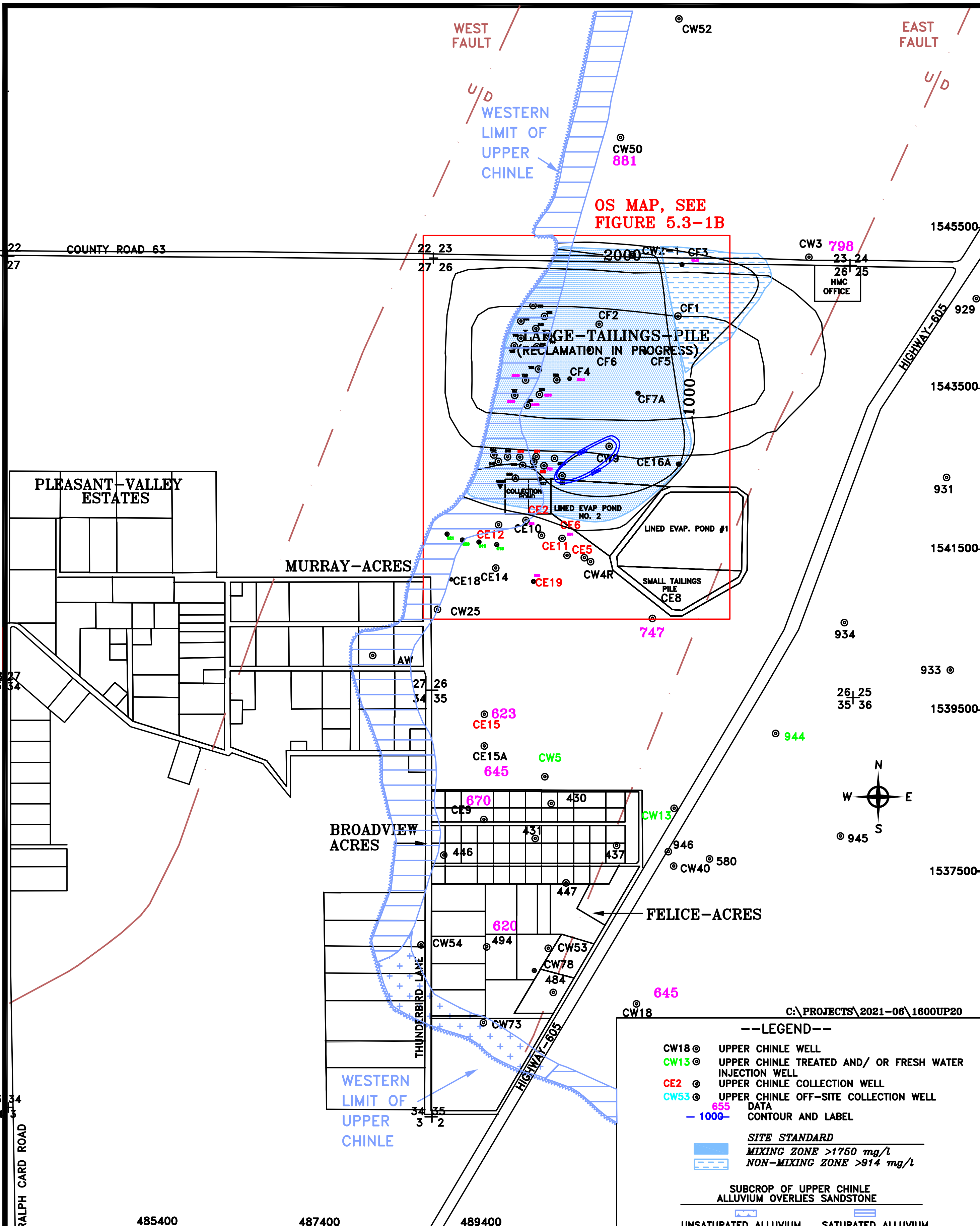
Vanadium concentrations have always been low in the Upper Chinle aquifer except in the area of the LTP where they are slightly above the site standard. The occurrence of significant concentrations in the Upper Chinle aquifer is unlikely because this constituent is not present at elevated concentrations in the alluvial aquifer with the exception of the immediate tailings area. Figure 5.3-22 shows that all of the 2020 measured vanadium concentrations are equal to or less than 0.01 mg/L except for a slightly higher value in well CW3. The 2019 value from background well CW50 indicates the 0.01 mg/L standard may be slightly too small. A site standard was set for vanadium in the Upper Chinle aquifer because of very slightly elevated concentrations in wells close to the LTP.

### 5.3.10 THORIUM-230 - UPPER CHINLE

Thorium-230 concentrations have never been significant in the Upper Chinle aquifer. The values measured in 2020 are presented in Figure 5.3-23. This figure shows that all measured thorium-230 concentrations in 2020 were less than or equal to 0.3 pCi/L except for the large value in well CF4. As noted for other constituents, the most recent sample from well CF4 is likely affected by leakage of water from the tailings into the well, and therefore, the thorium-230 concentration in the sample is not considered representative of the Upper Chinle aquifer. Thorium-230 concentrations are small outside of the immediate LTP area. No plots of the thorium-230 concentration with time were developed due to the low concentrations and lack of any significant change over the period of record.




| | |
|---|---|
| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 12/9/2020 |
| FIGURE 5.3-1. UPPER CHINLE WELLS USED FOR SITE STANDARDS AND UPPER CHINLE MIXING ZONE | SCALE: 1"= 1600' |
| | PAGE: 5.3-8 |

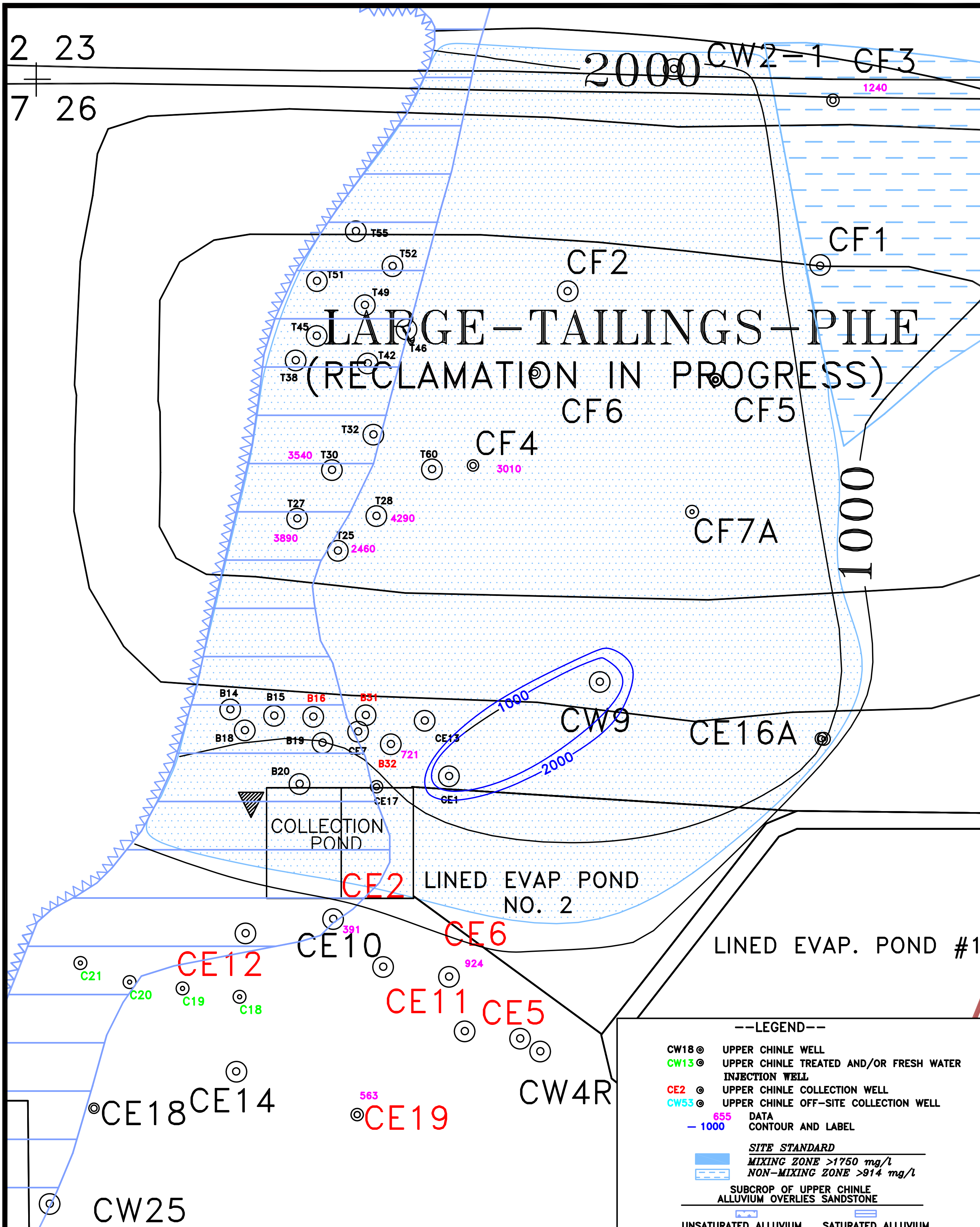



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

DATE: 1/18/2021

FIGURE 5.3-1A. SULFATE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, mg/L

SCALE: 1"= 1600'




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

FIGURE 5.3-1B. SULFATE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, OS, 2020, mg/L

DATE: 1/18/2021
SCALE: 1"= 500'
PAGE: 5.3-10

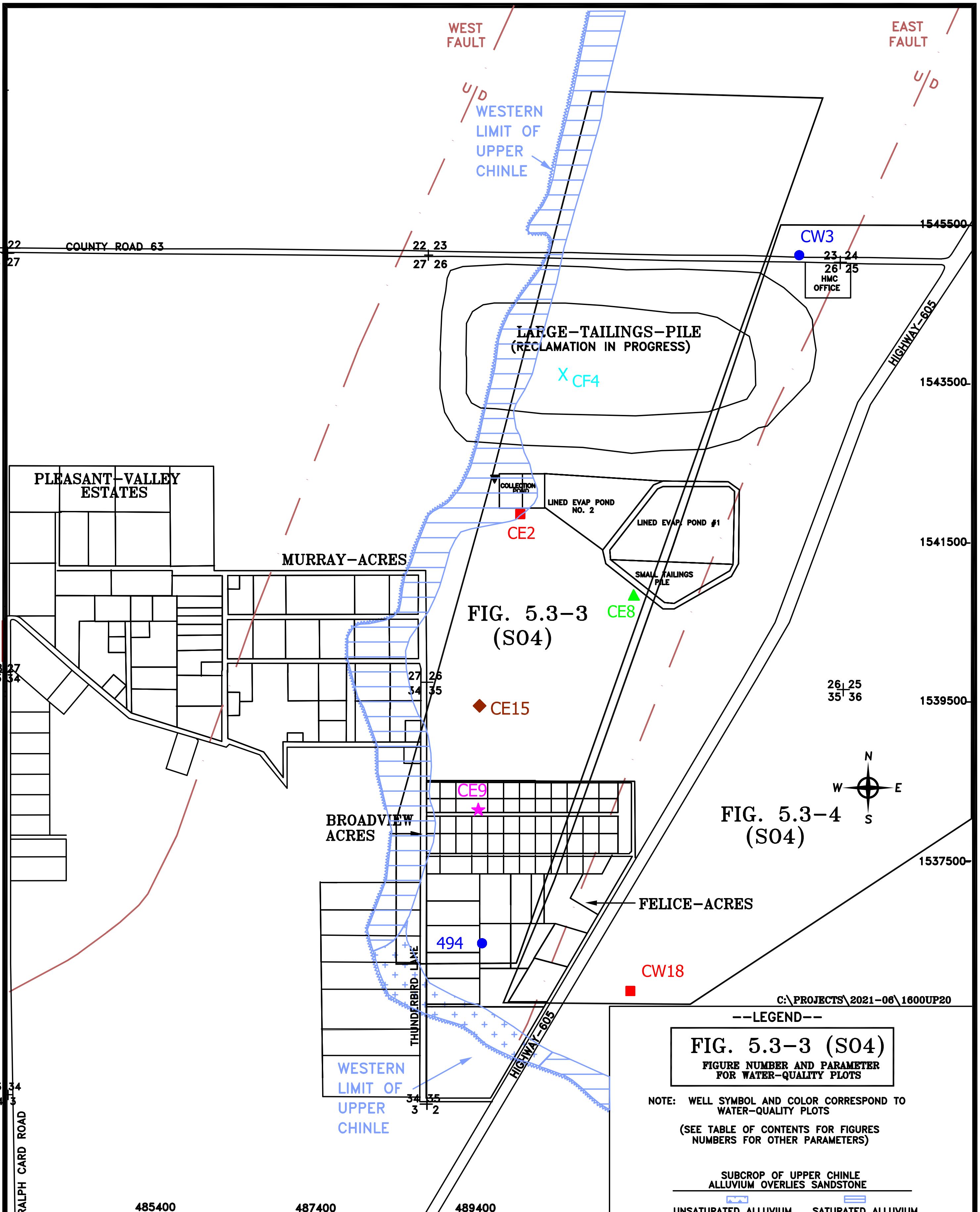



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FIGURE 5.3–2. LOCATION OF UPPER CHINLE WELLS WITH WATER–QUALITY PLOTS, 2020

DATE: 12/9/2020

SCALE: 1"= 1600'

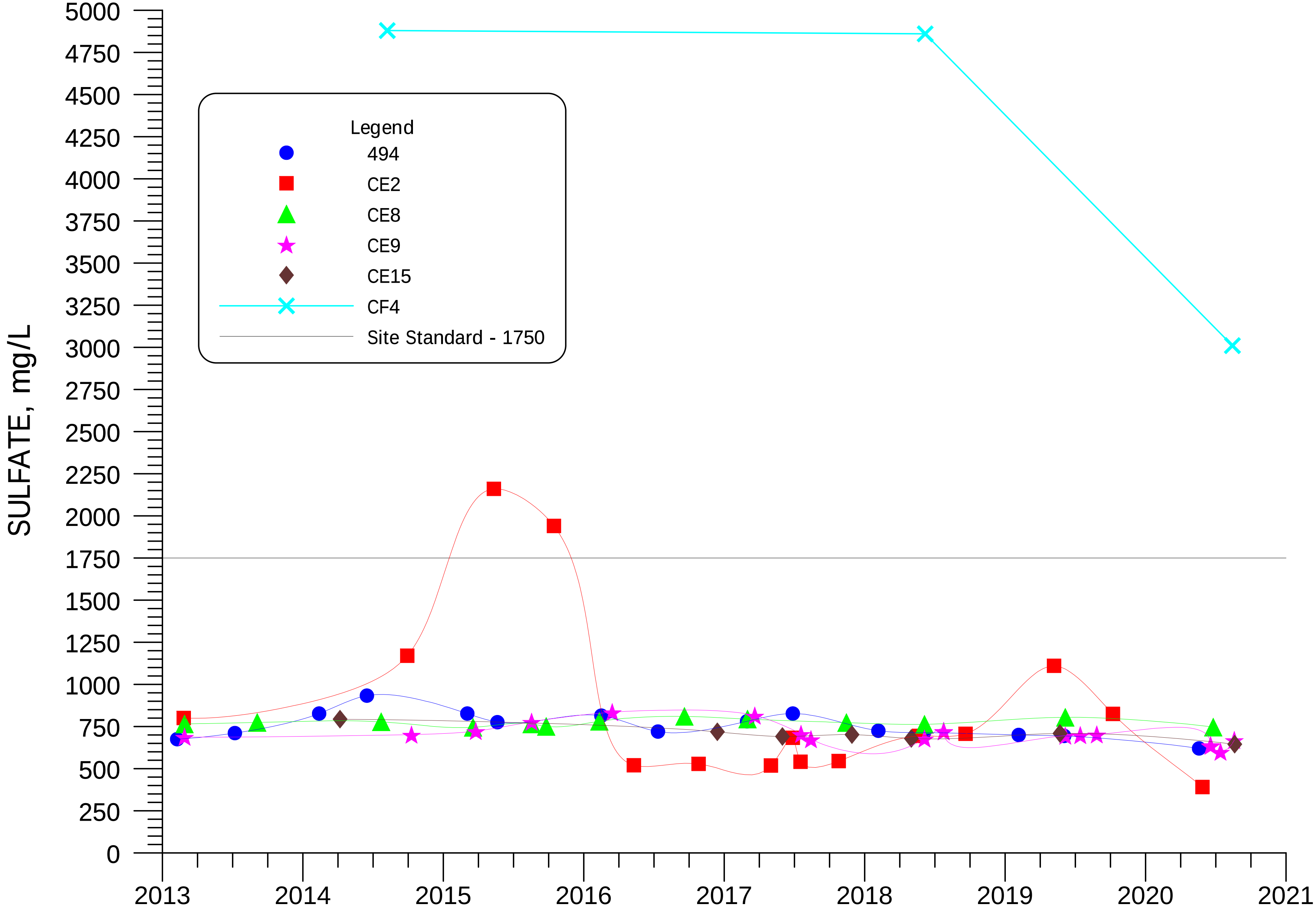



**FIGURE 5.3-3. SULFATE CONCENTRATIONS FOR MIXING ZONE WELLS 494, CE2, CE8, CE9, CE15 AND CF4**

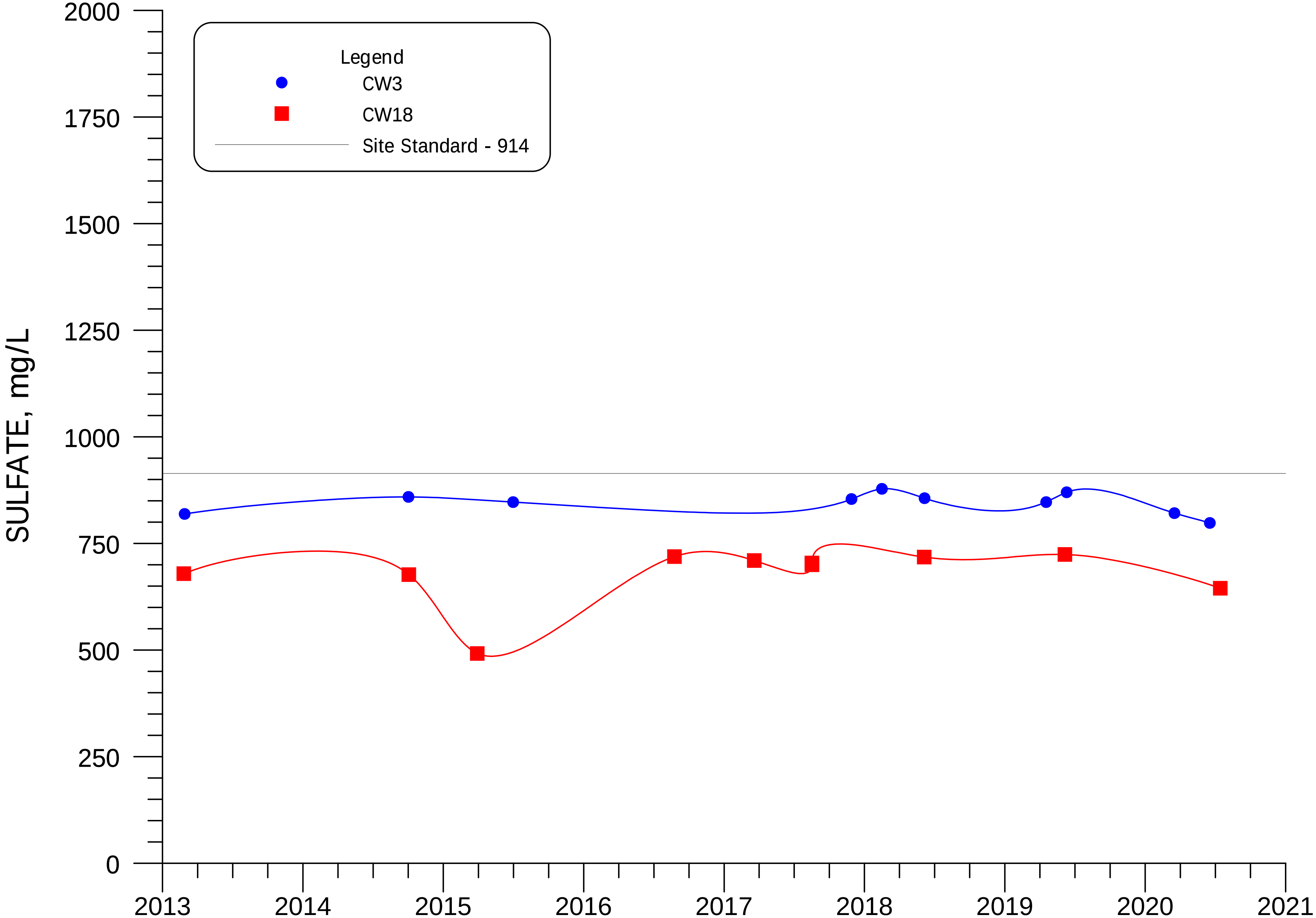
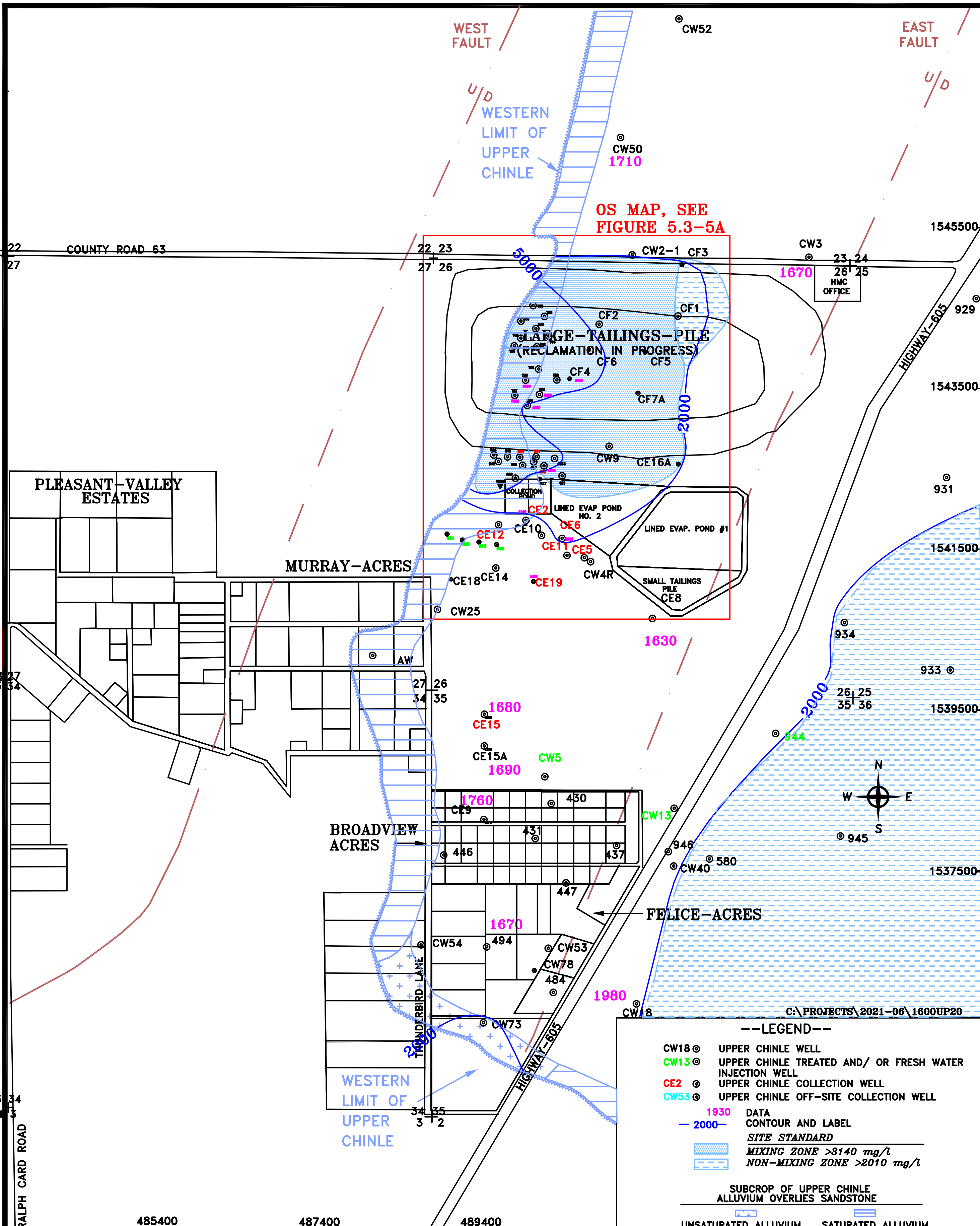



**FIGURE 5.3-4. SULFATE CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW3 AND CW18**



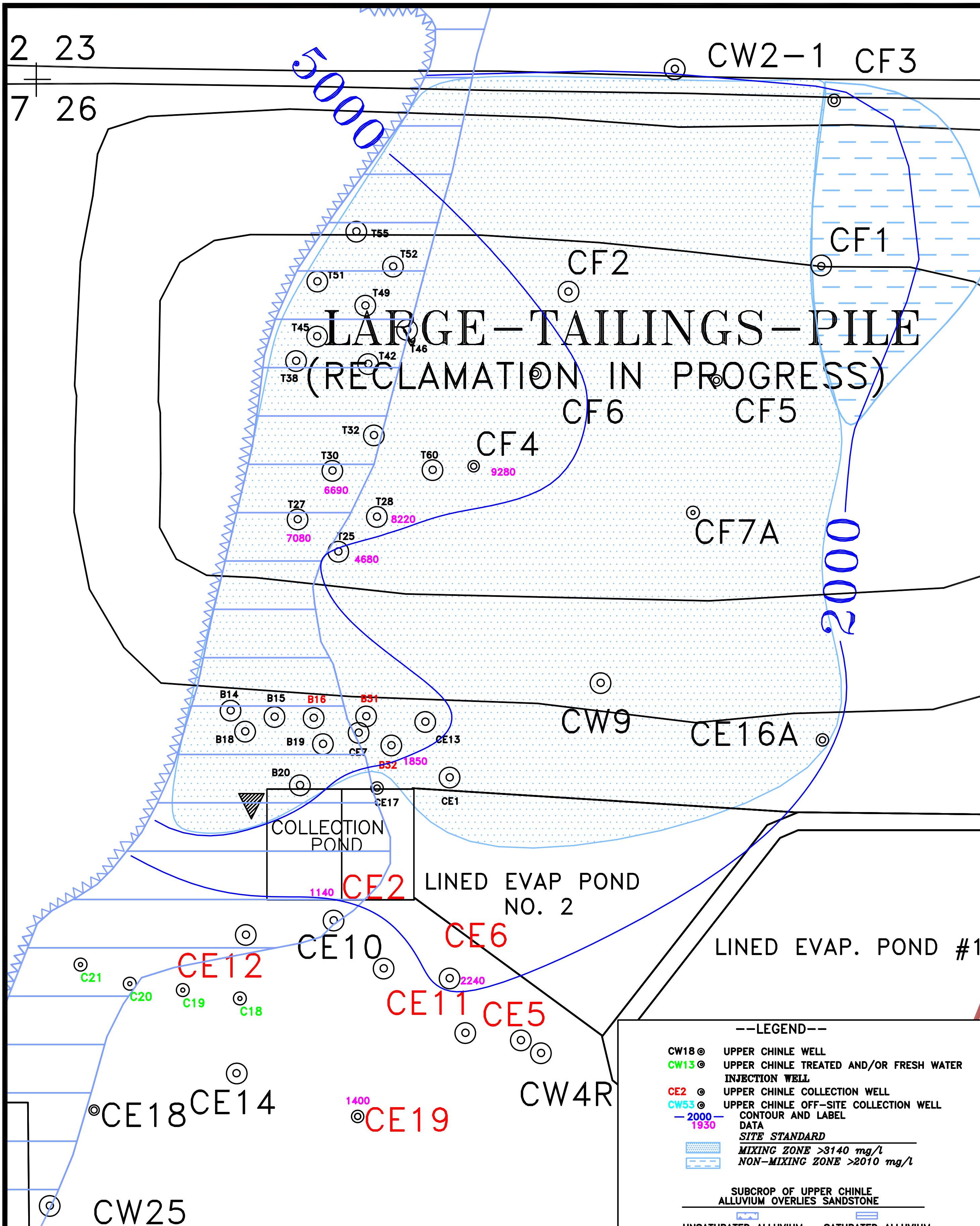

HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

FIGURE 5.3-5. TDS CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, mg/L

DATE: 1/18/2021

SCALE: 1"= 1600'

PAGE: 5.3-14




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

FIGURE 5.3-5A. TDS CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, OS, 2020, mg/L

DATE: 1/18/2021

SCALE: 1"= 500'

PAGE: 5.3-15

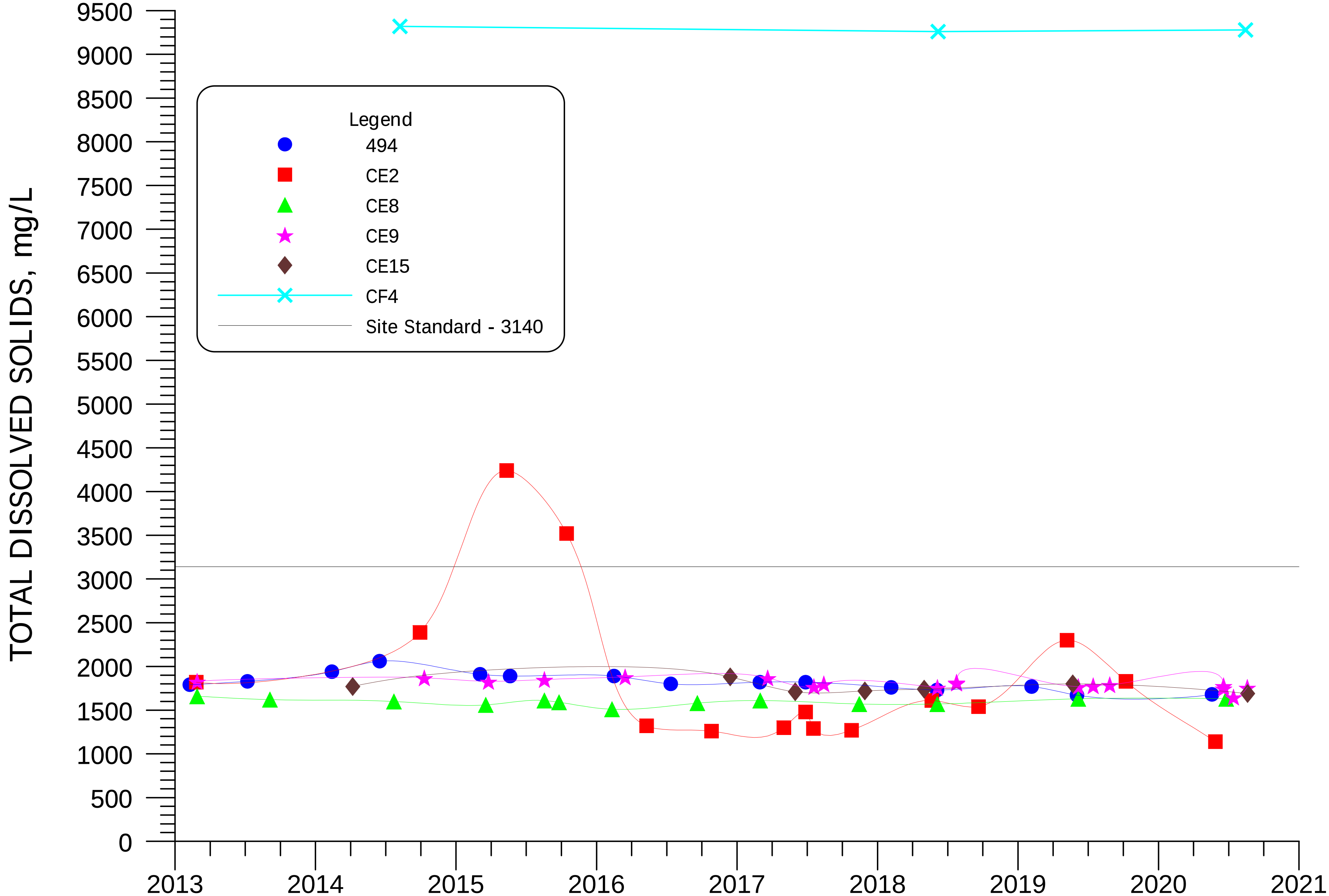



**FIGURE 5.3-6. TDS CONCENTRATIONS FOR MIXING ZONE WELLS 494, CE2, CE8, CE9, CE15 AND CF4**

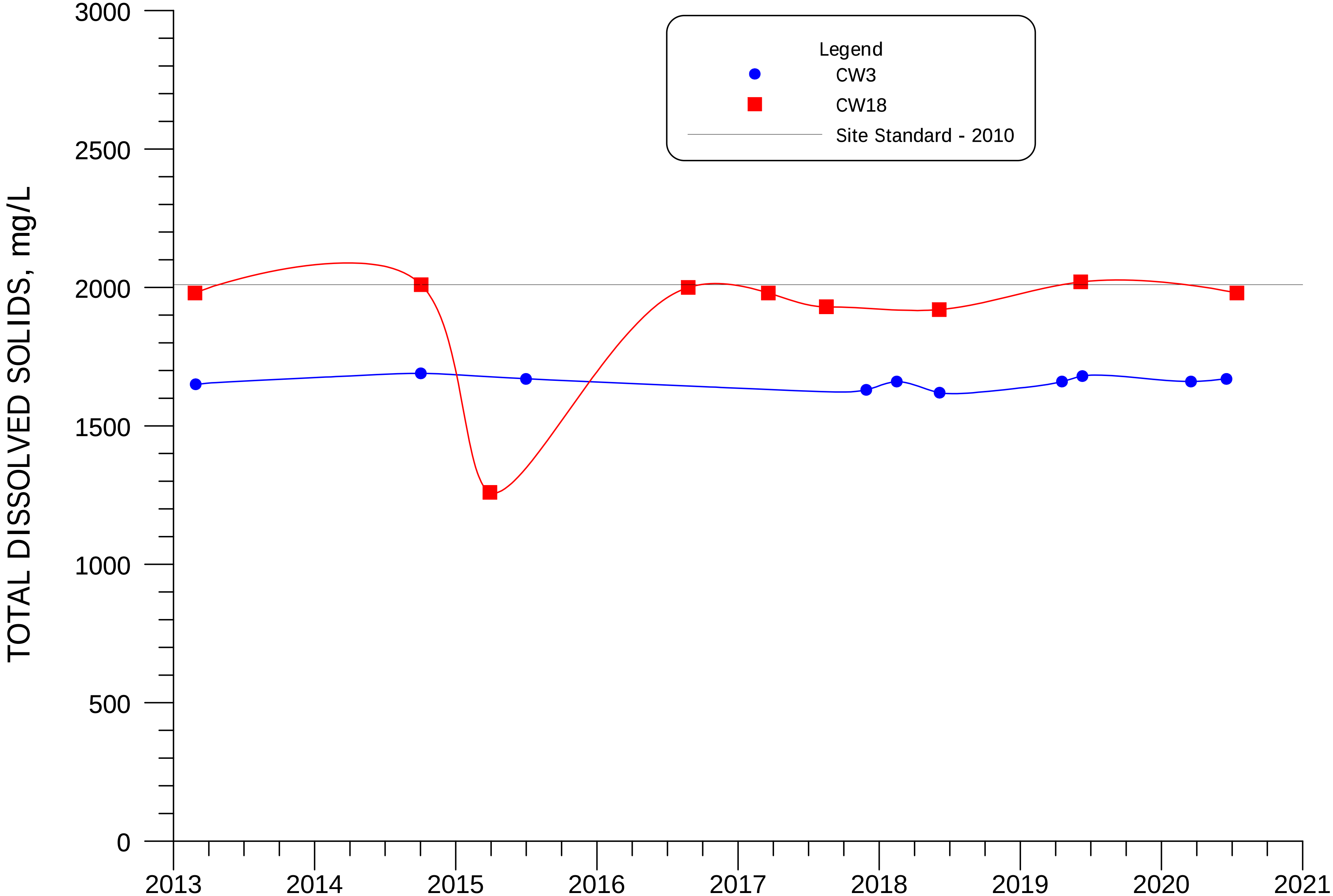
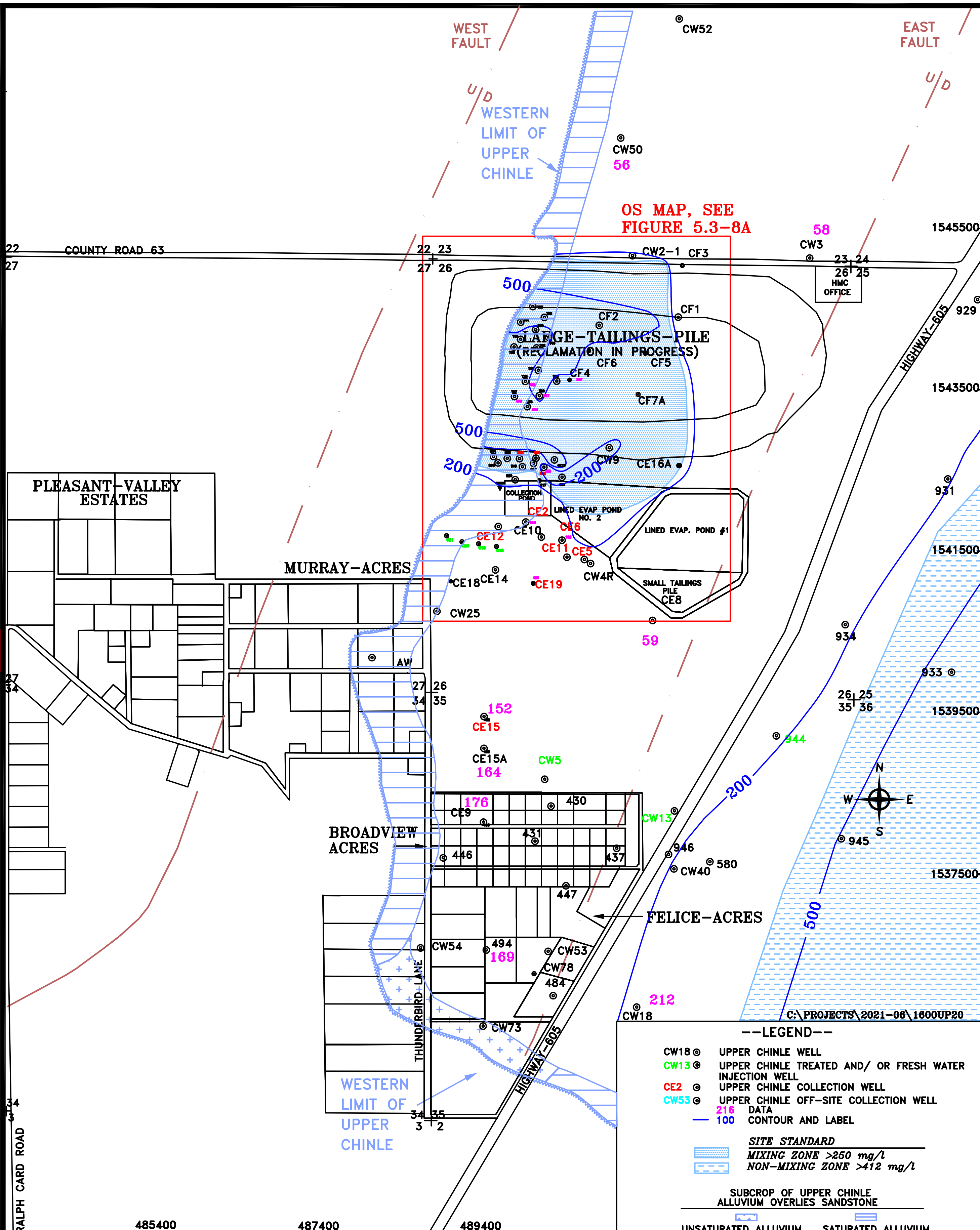



**FIGURE 5.3-7. TDS CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW3 AND CW18**

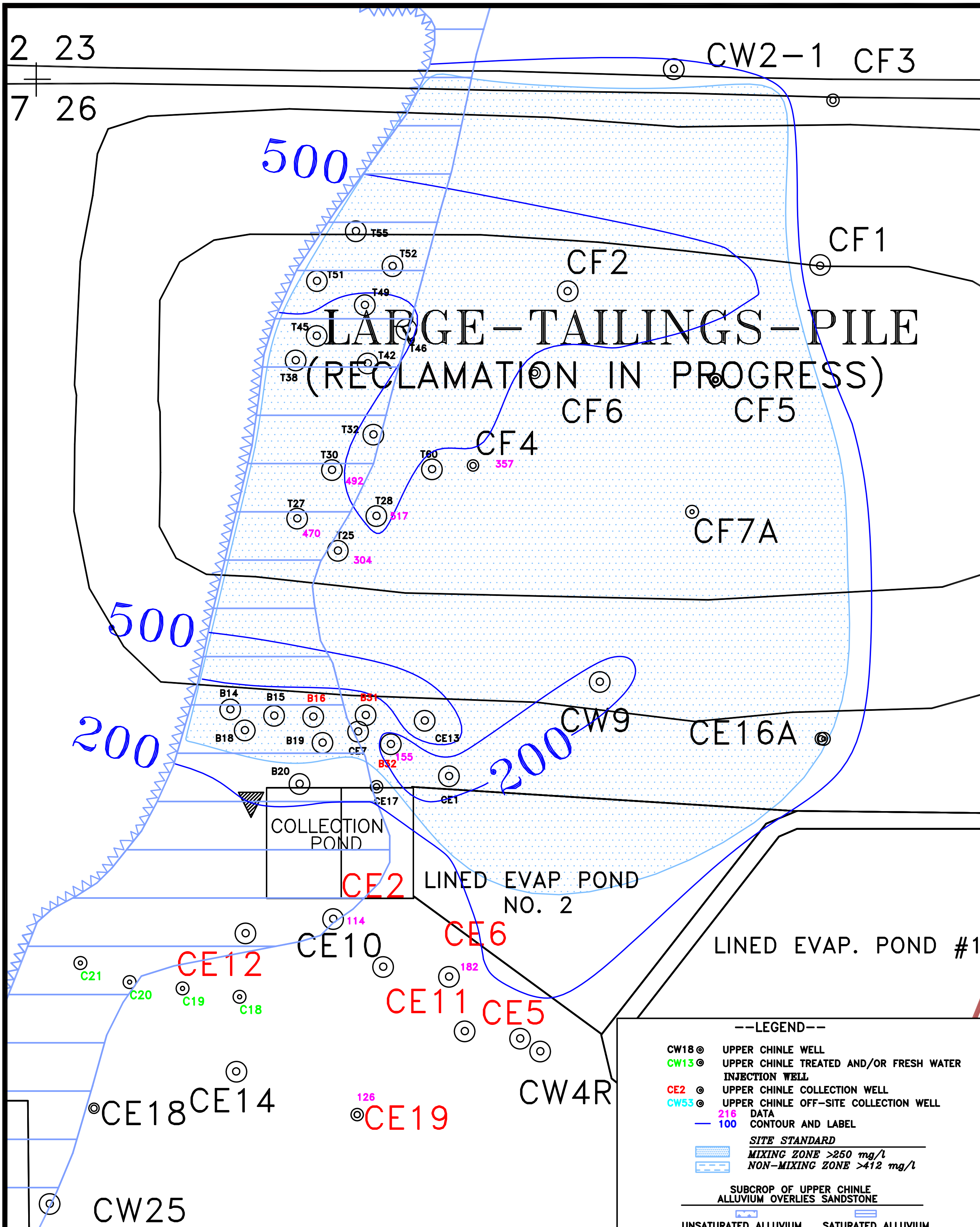



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

FIGURE 5.3-8. CHLORIDE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, mg/L

DATE: 1/18/2021

SCALE: 1"= 1600'




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

**FIGURE 5.3-8A. CHLORIDE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, OS, 2020, mg/L**

**DATE:** 1/18/2021

**SCALE:** 1"= 500'

**PAGE:** 5.3-19

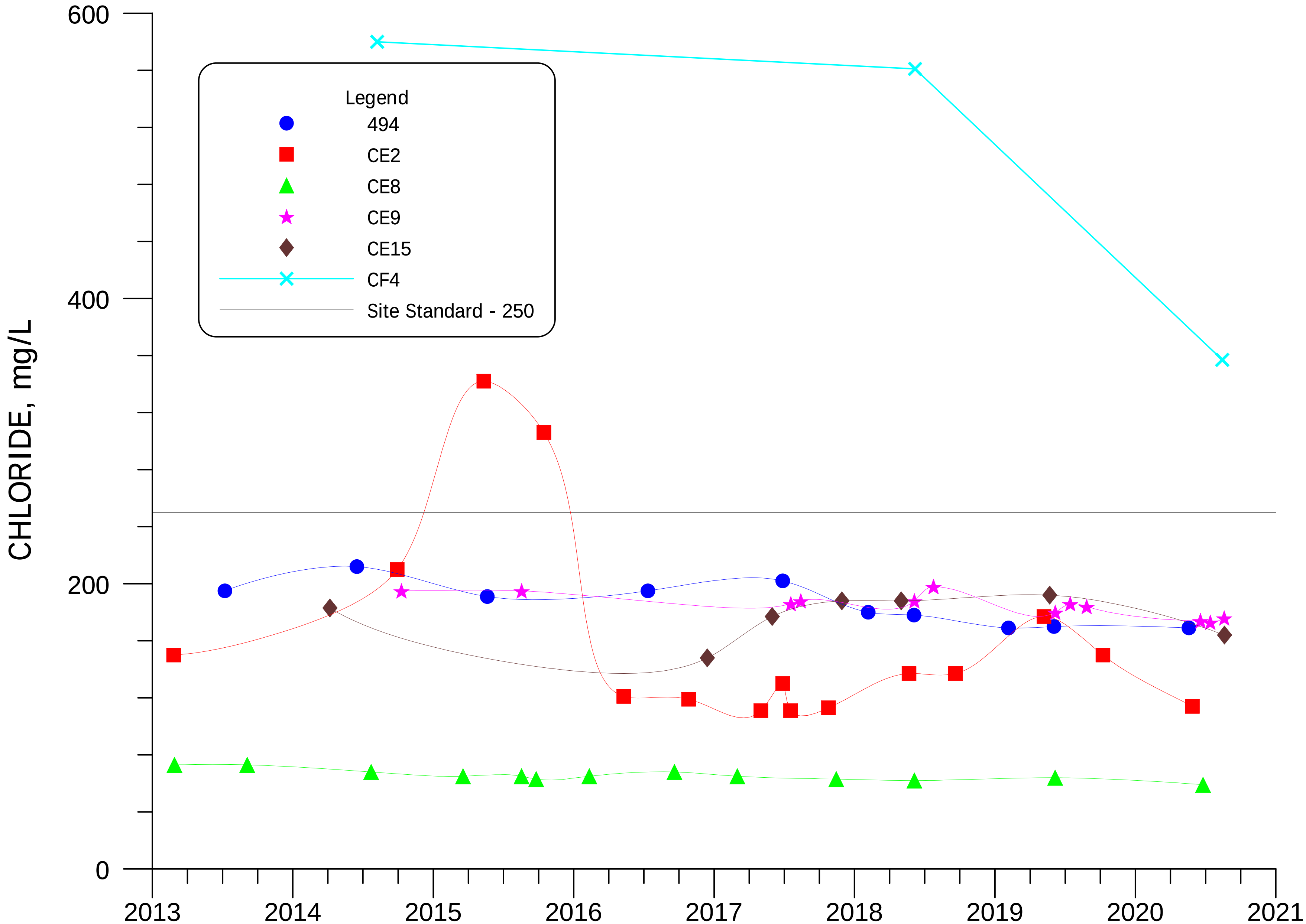



**FIGURE 5.3-9. CHLORIDE CONCENTRATIONS FOR MIXING ZONE WELLS 494, CE2, CE8, CE9, CE15 AND CF4**

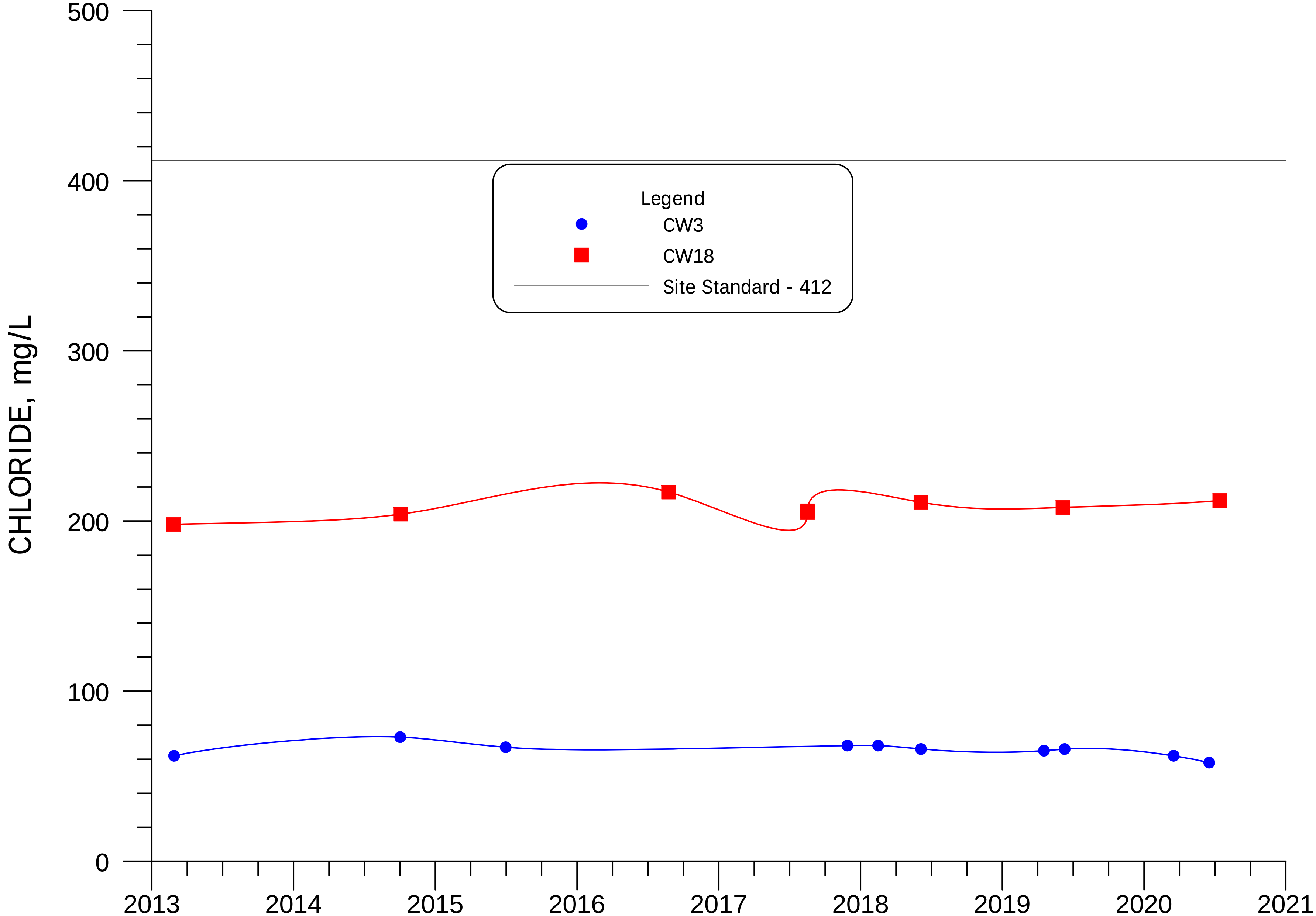
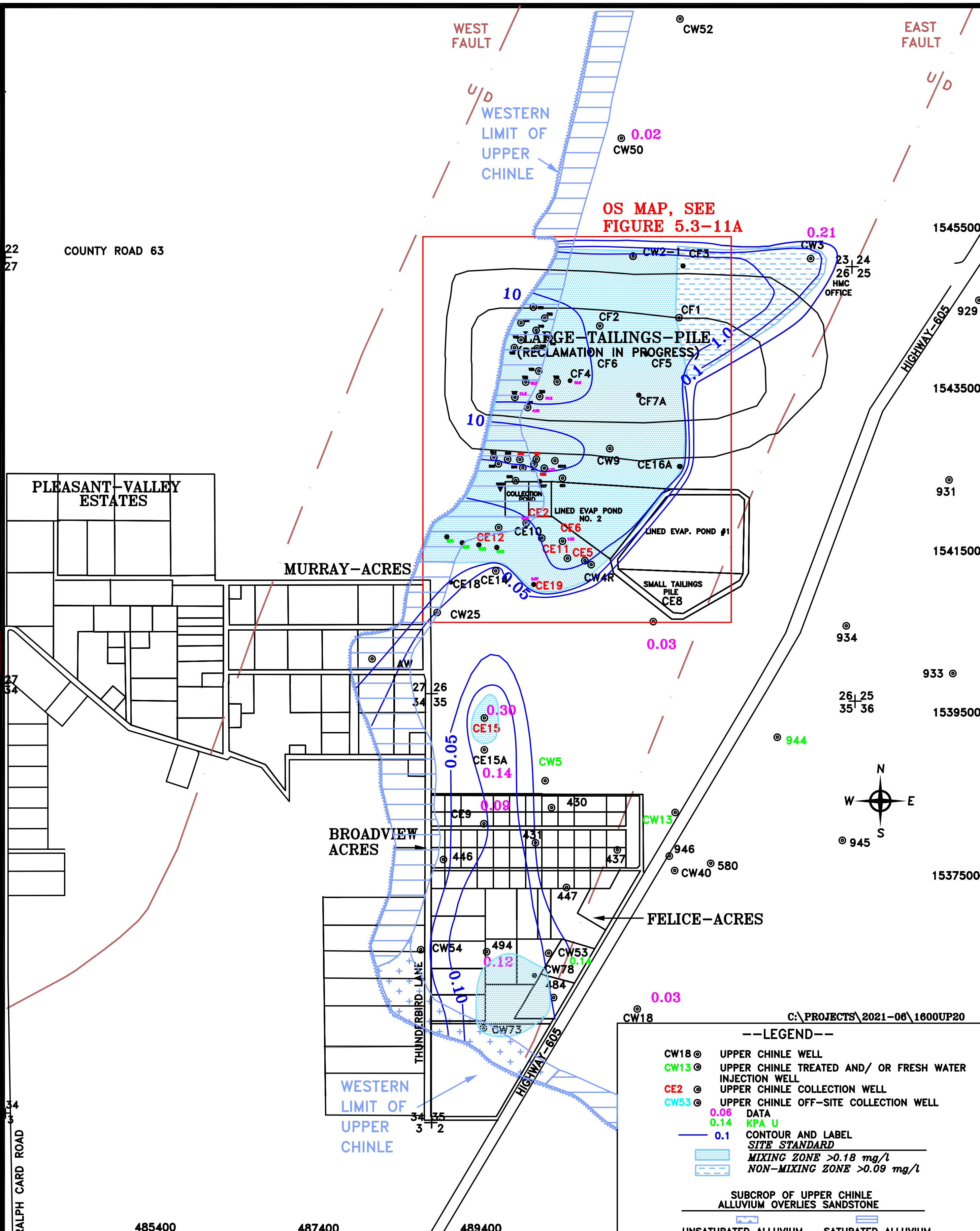



**FIGURE 5.3-10. CHLORIDE CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW3 AND CW18**

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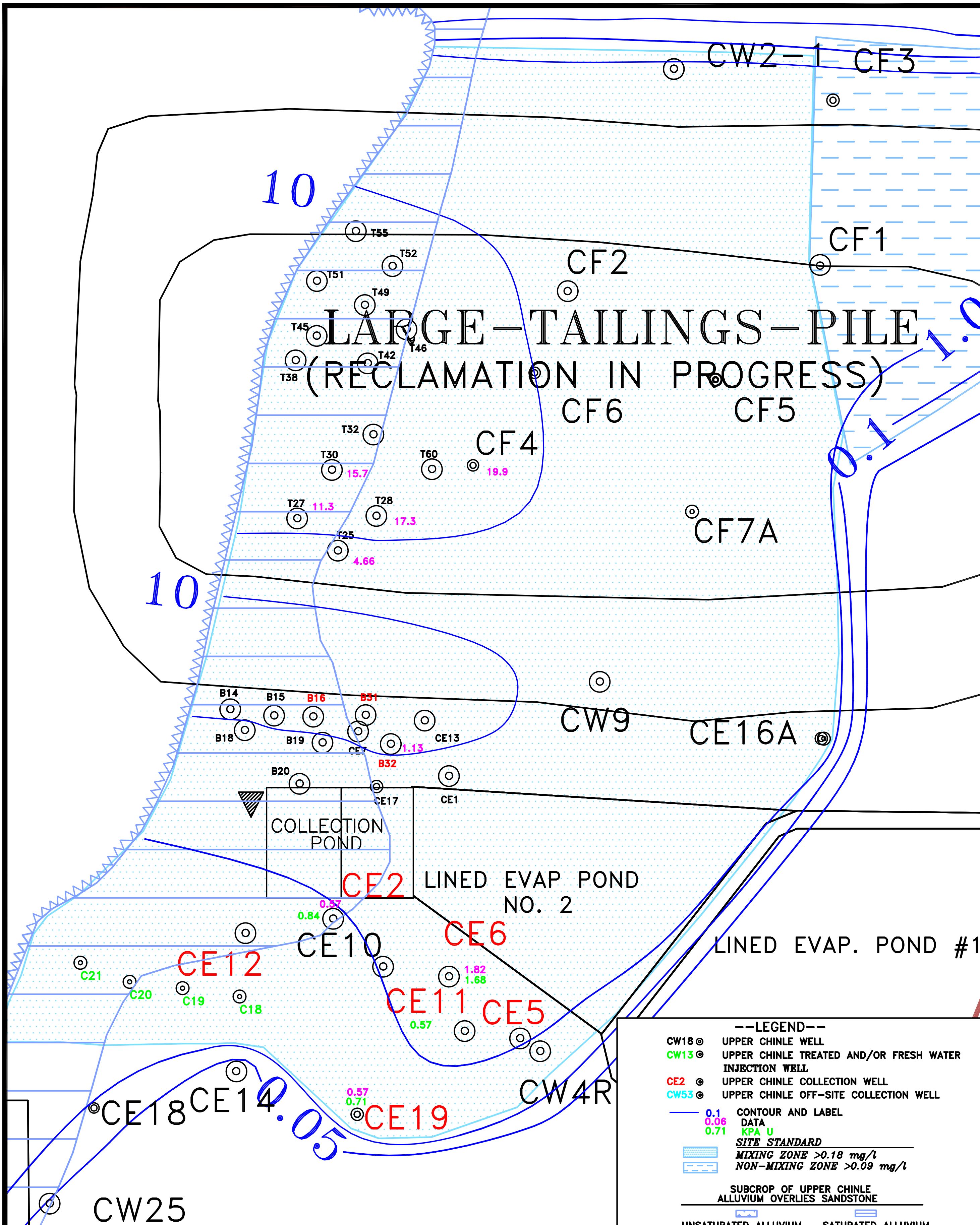
|---|---|
| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 3/2/2021 |
| FIGURE 5.3-11. URANIUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, mg/L | SCALE: 1"= 1600' |
| | PAGE: 5.3-22 |




| | |
|---|---|
| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | **DATE: 3/11/2021** |
| **FIGURE 5.3-11A. URANIUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, OS, 2020, mg/L** | **SCALE: 1"= 500'** |
| | **PAGE: 5.3-23** |

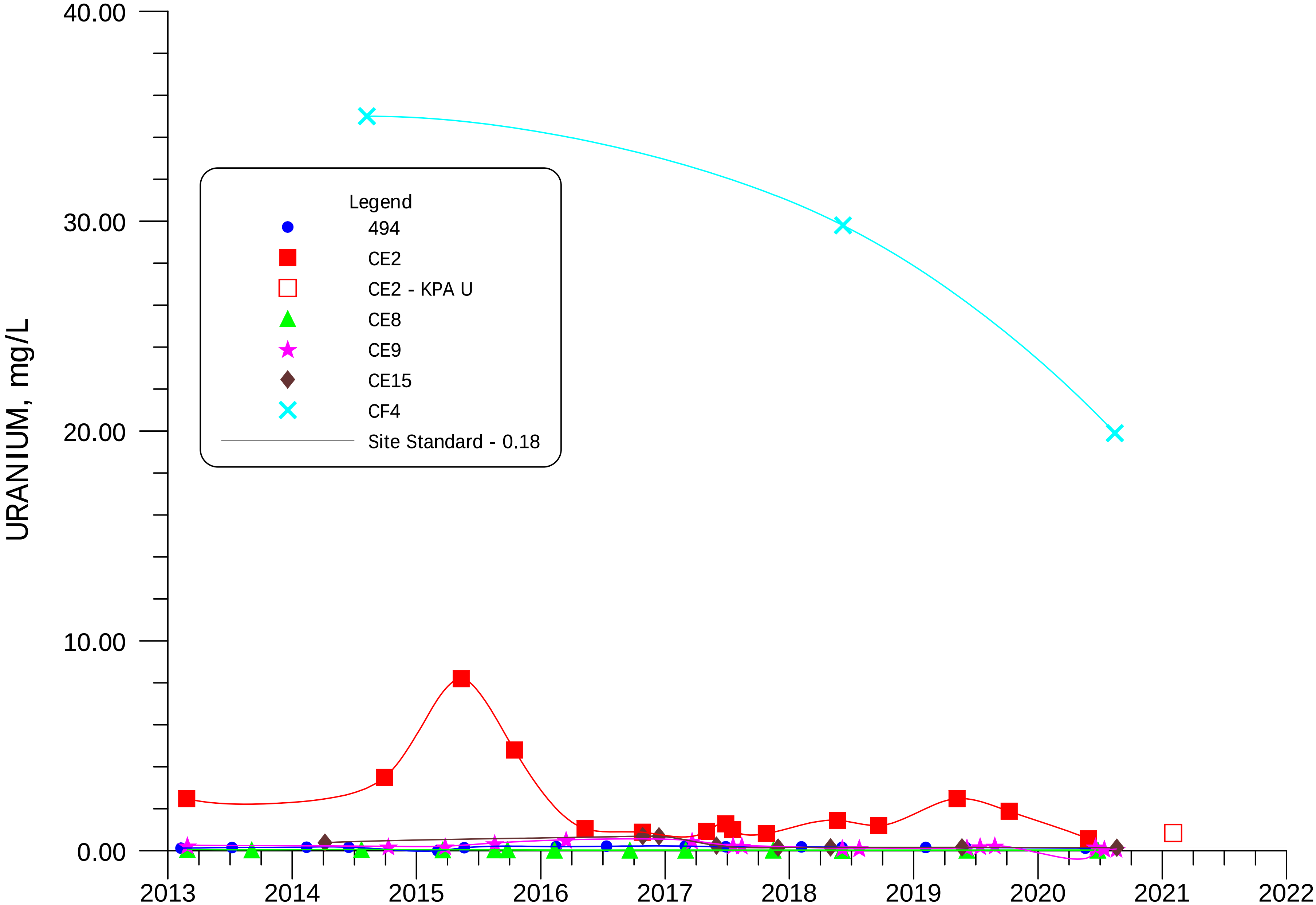



**FIGURE 5.3-12. URANIUM CONCENTRATIONS FOR MIXING ZONE WELLS 494, CE2, CE8, CE9, CE15 AND CF4**

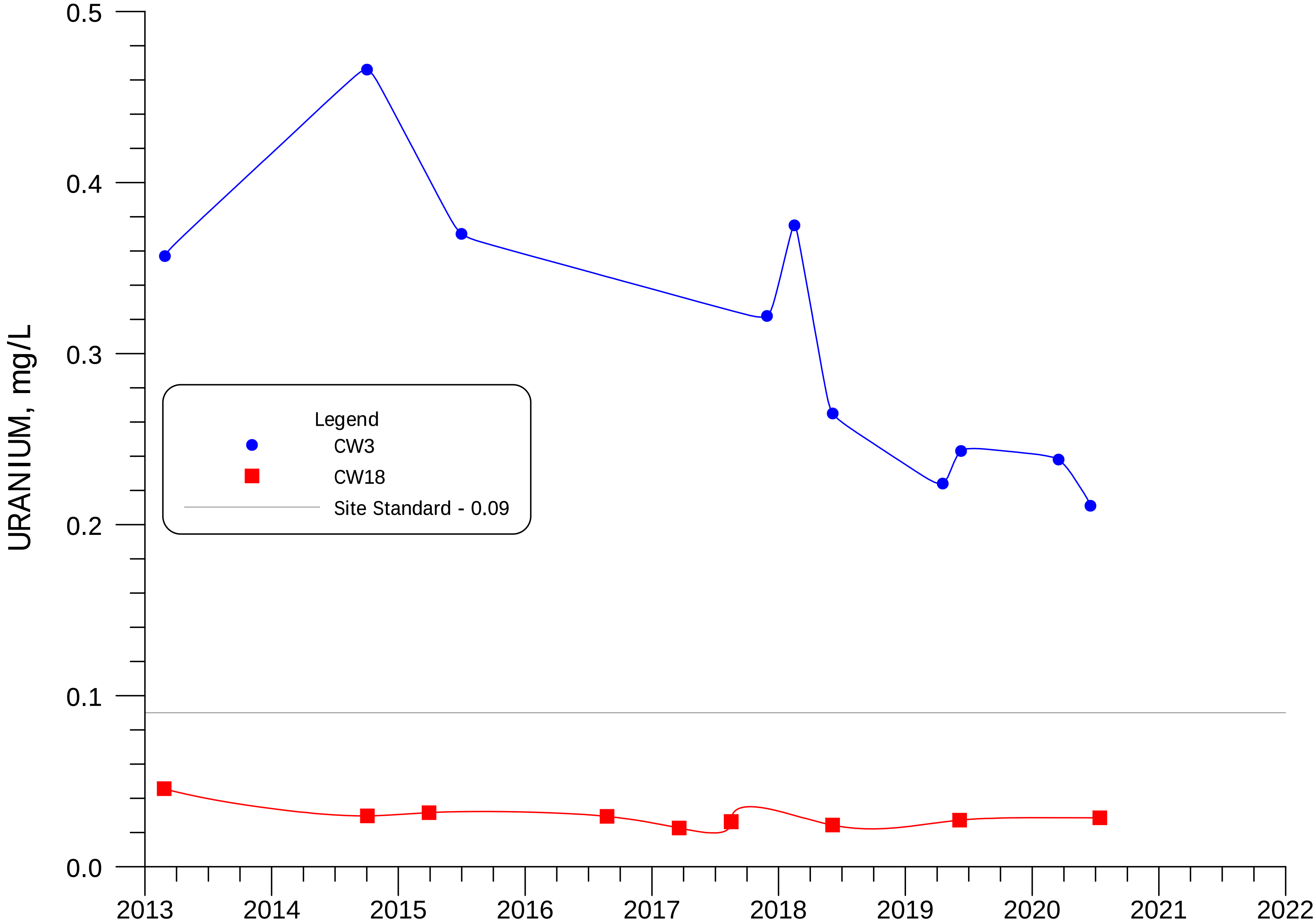
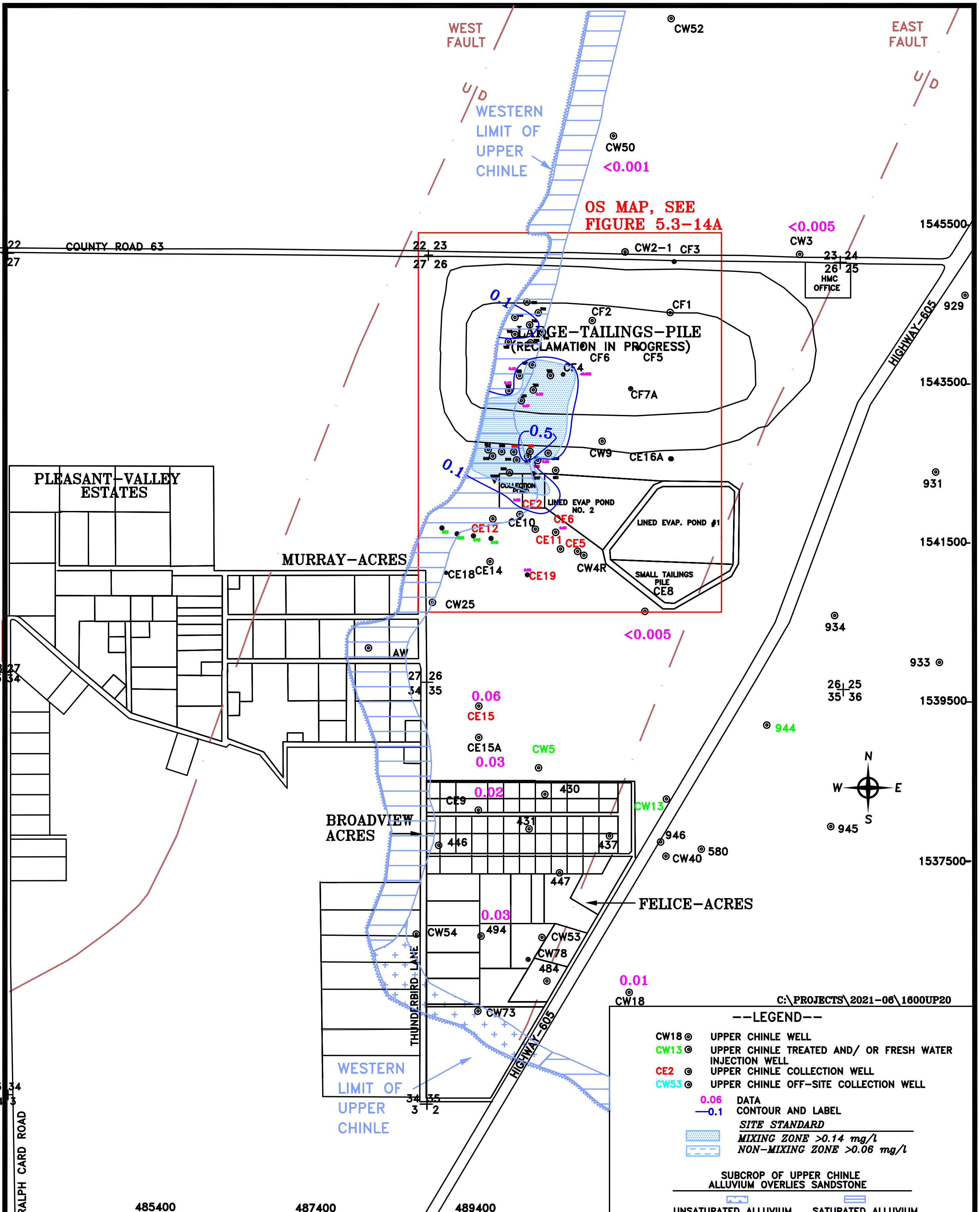



**FIGURE 5.3-13. URANIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW3 AND CW18**

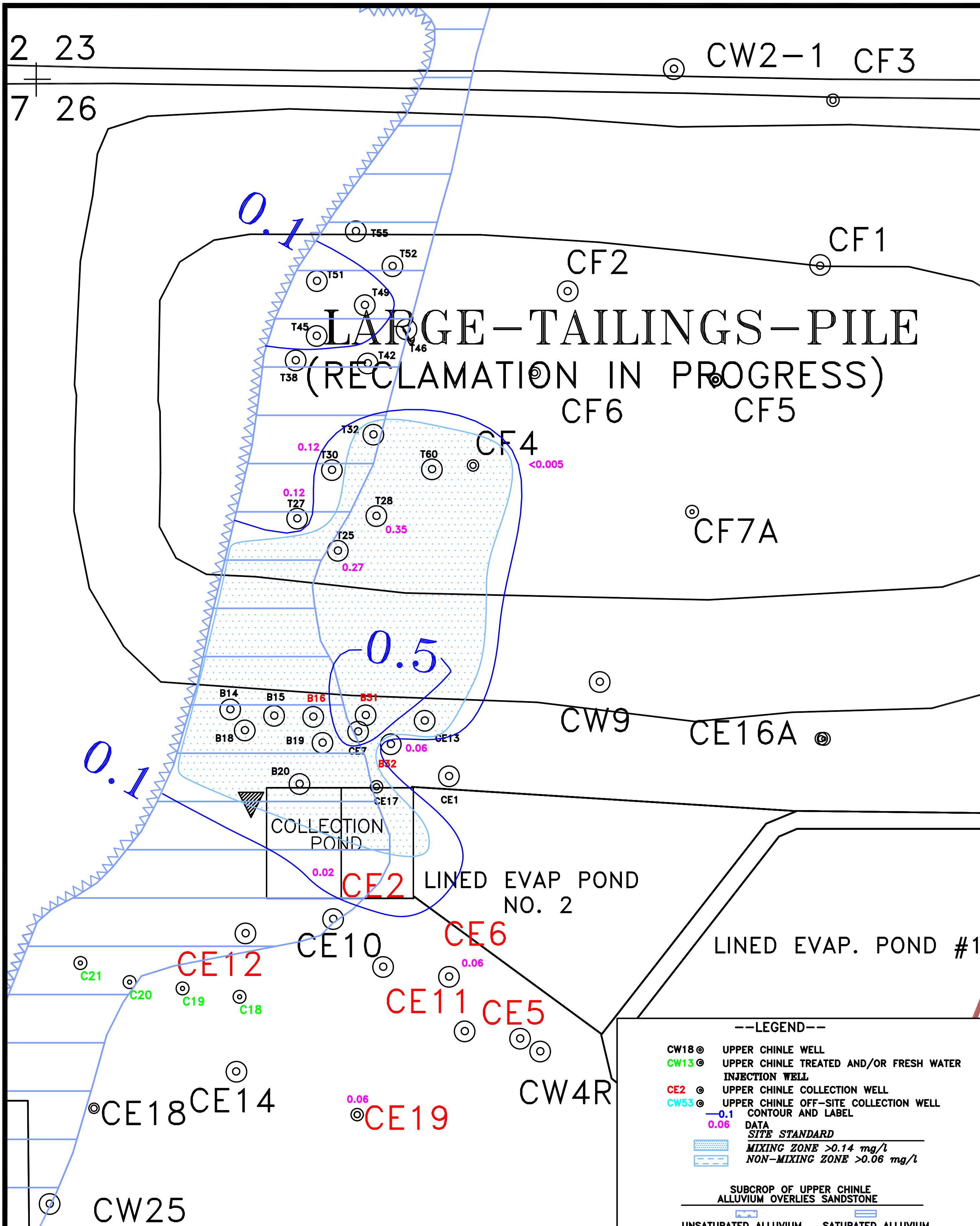



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

FIGURE 5.3-14. SELENIUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, mg/L

DATE: 1/18/2021

SCALE: 1"= 1600'




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

FIGURE 5.3-14A. SELENIUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, OS, 2020, mg/L

DATE: 1/18/2021
SCALE: 1"= 500'

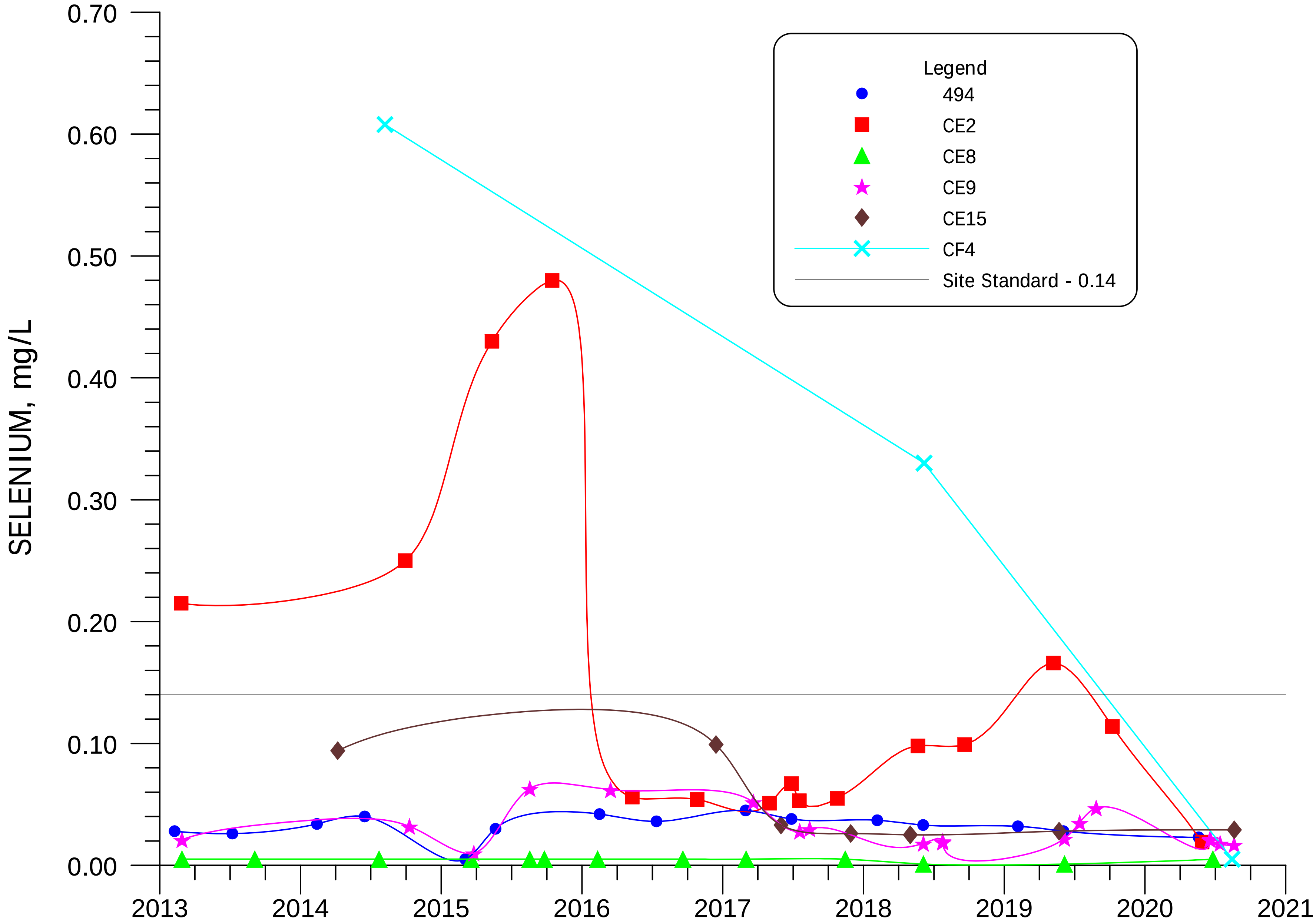



**FIGURE 5.3-15. SELENIUM CONCENTRATIONS FOR MIXING ZONE WELLS 494, CE2, CE8, CE9, CE15 AND CF4**

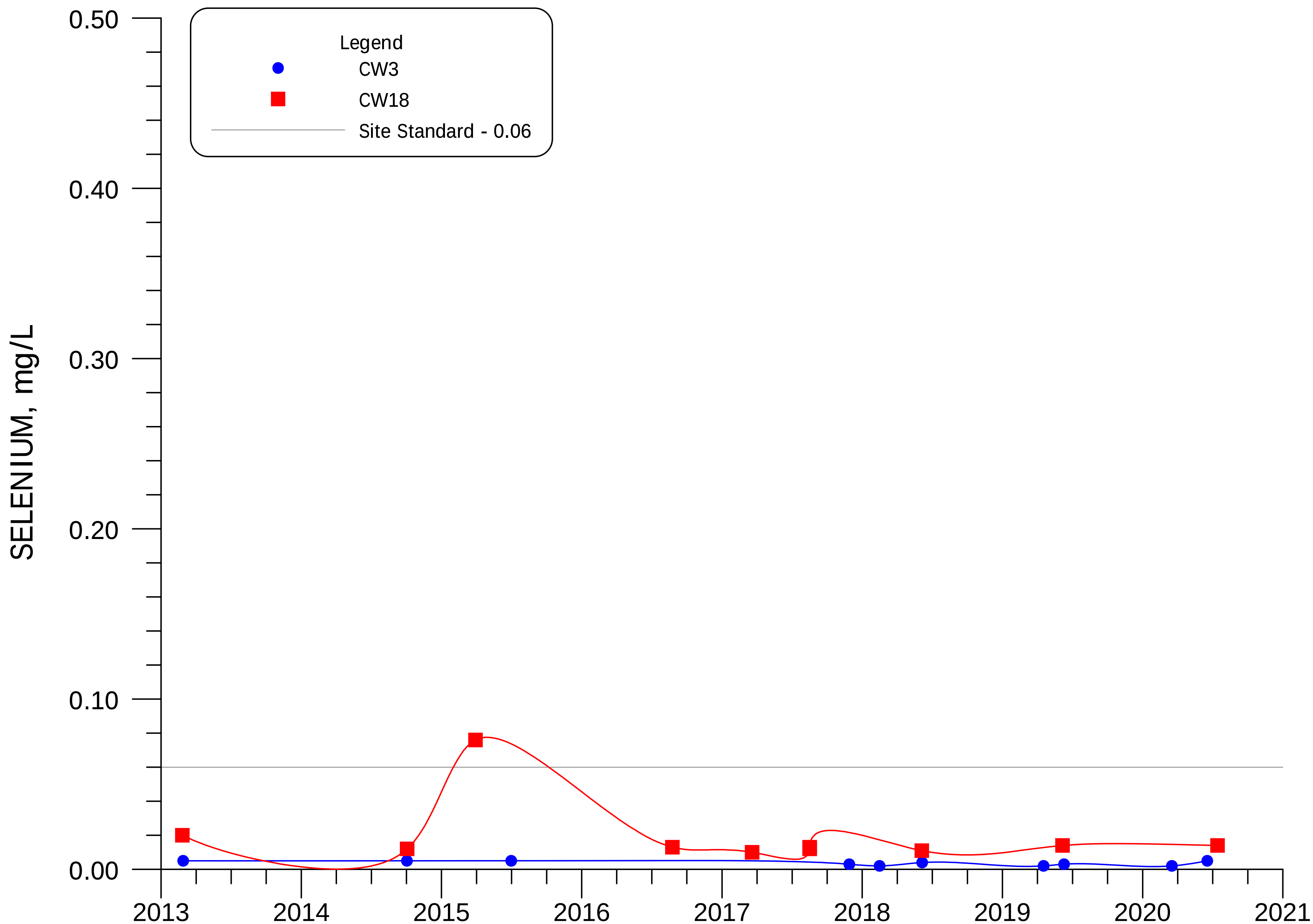
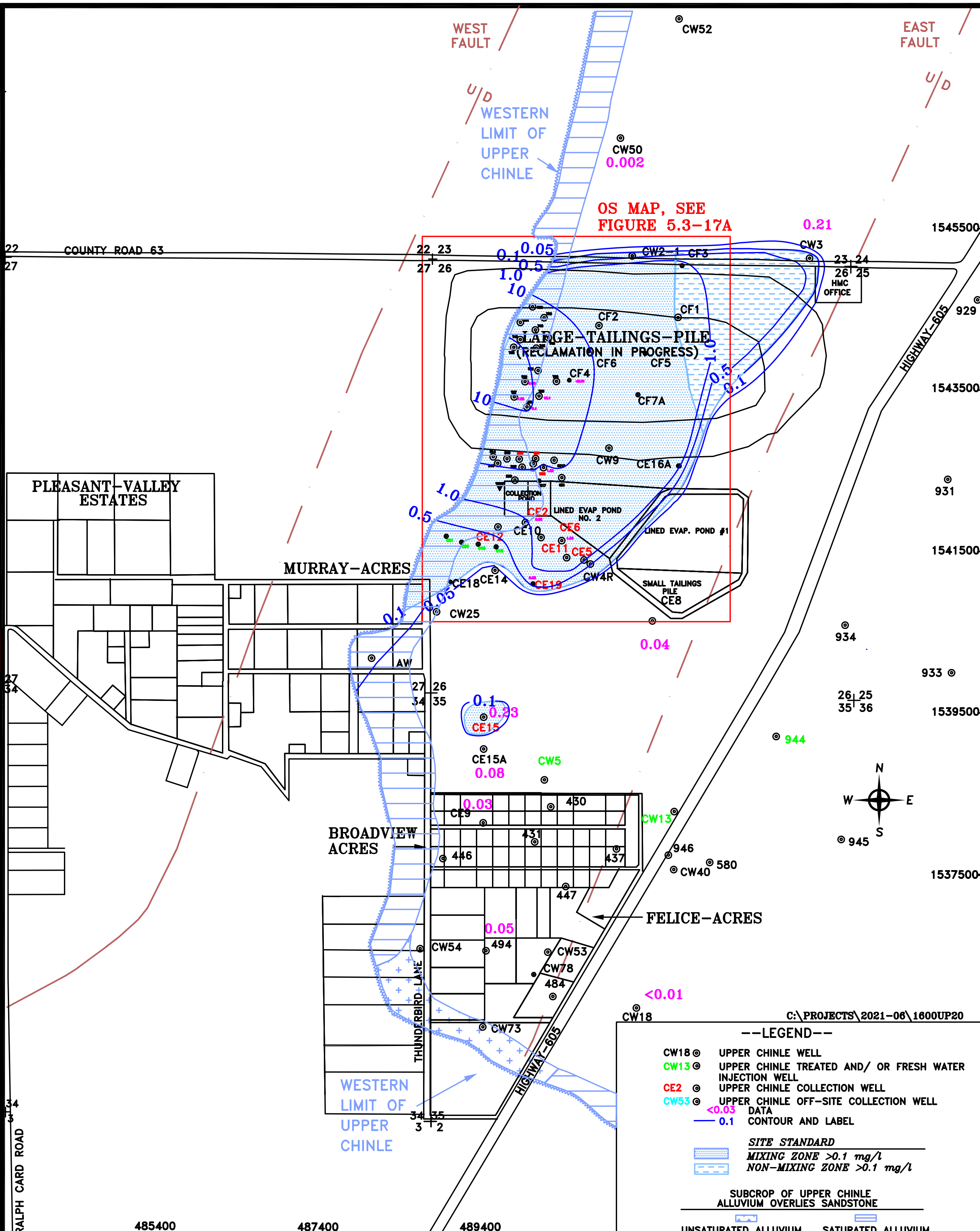


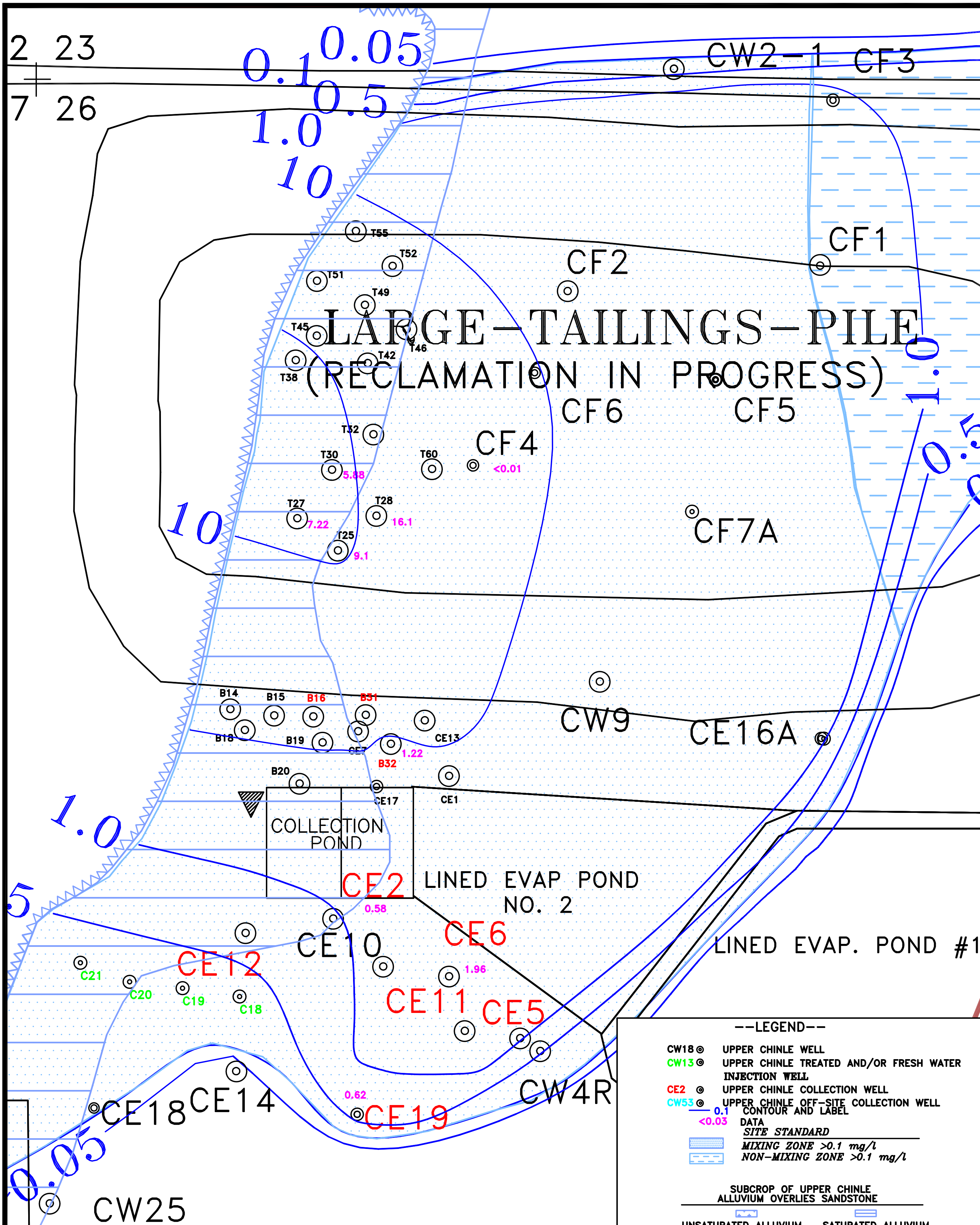

**FIGURE 5.3-16. SELENIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW3 AND CW18**




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

FIGURE 5.3-17. MOLYBDENUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, mg/L

DATE: 1/18/2021
SCALE: 1"= 1600'




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

FIGURE 5.3-17A. MOLYBDENUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, OS, 2020, mg/L

DATE: 1/18/2021

SCALE: 1"= 500'

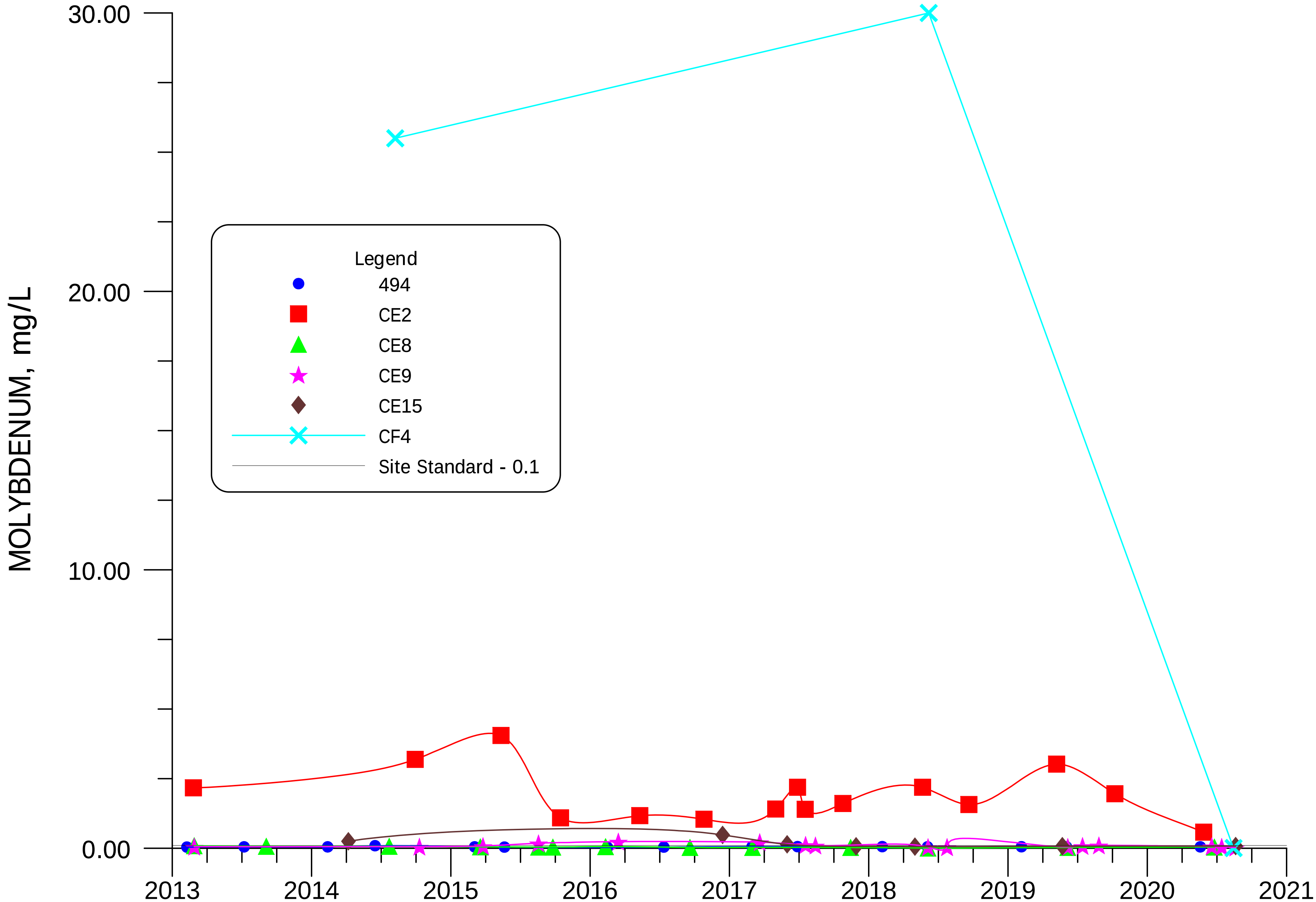



**FIGURE 5.3-18. MOLYBDENUM CONCENTRATIONS FOR MIXING ZONE WELLS 494, CE2, CE8, CE9, CE15 AND CF4**

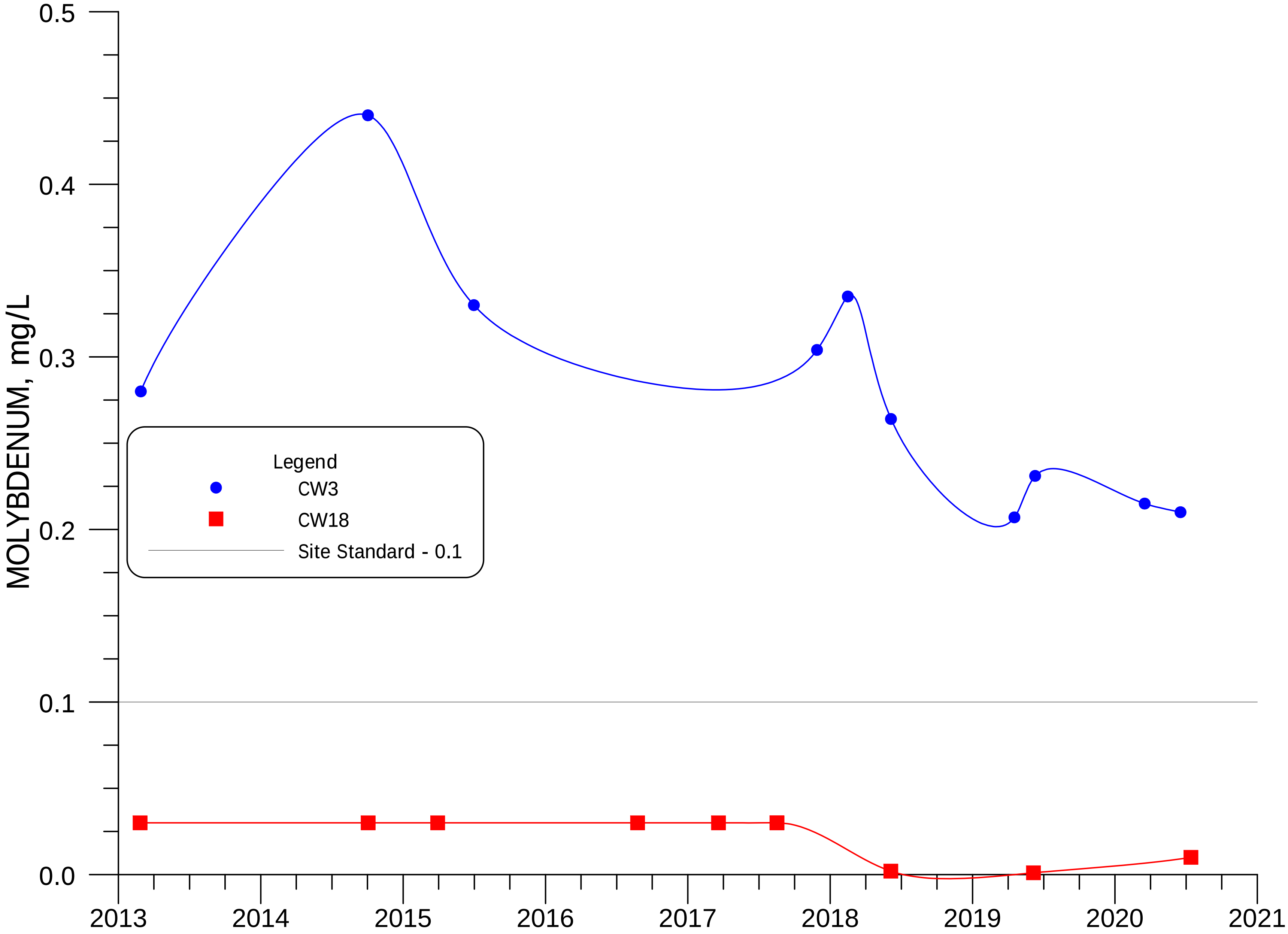
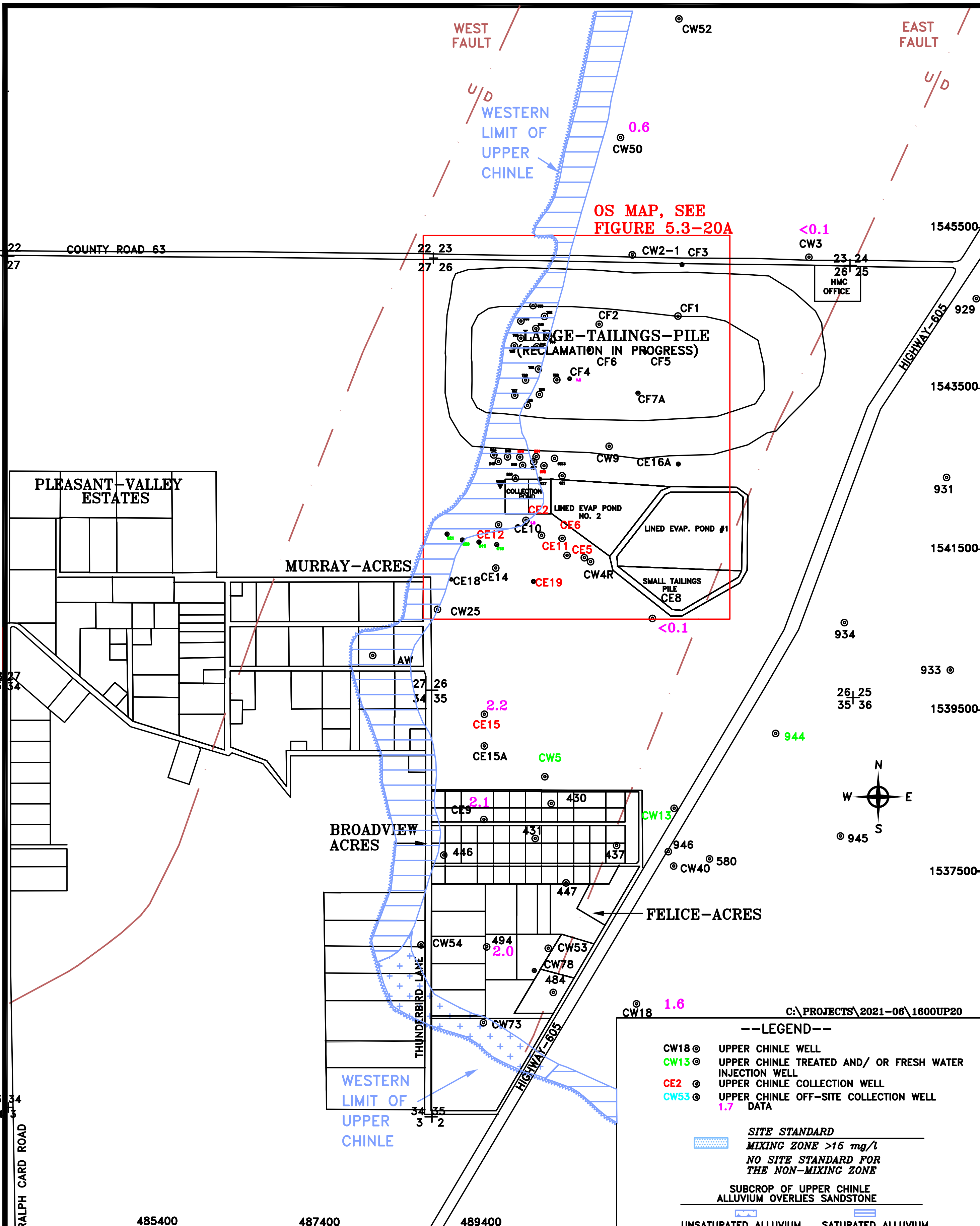



**FIGURE 5.3-19. MOLYBDENUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS CW3 AND CW18**



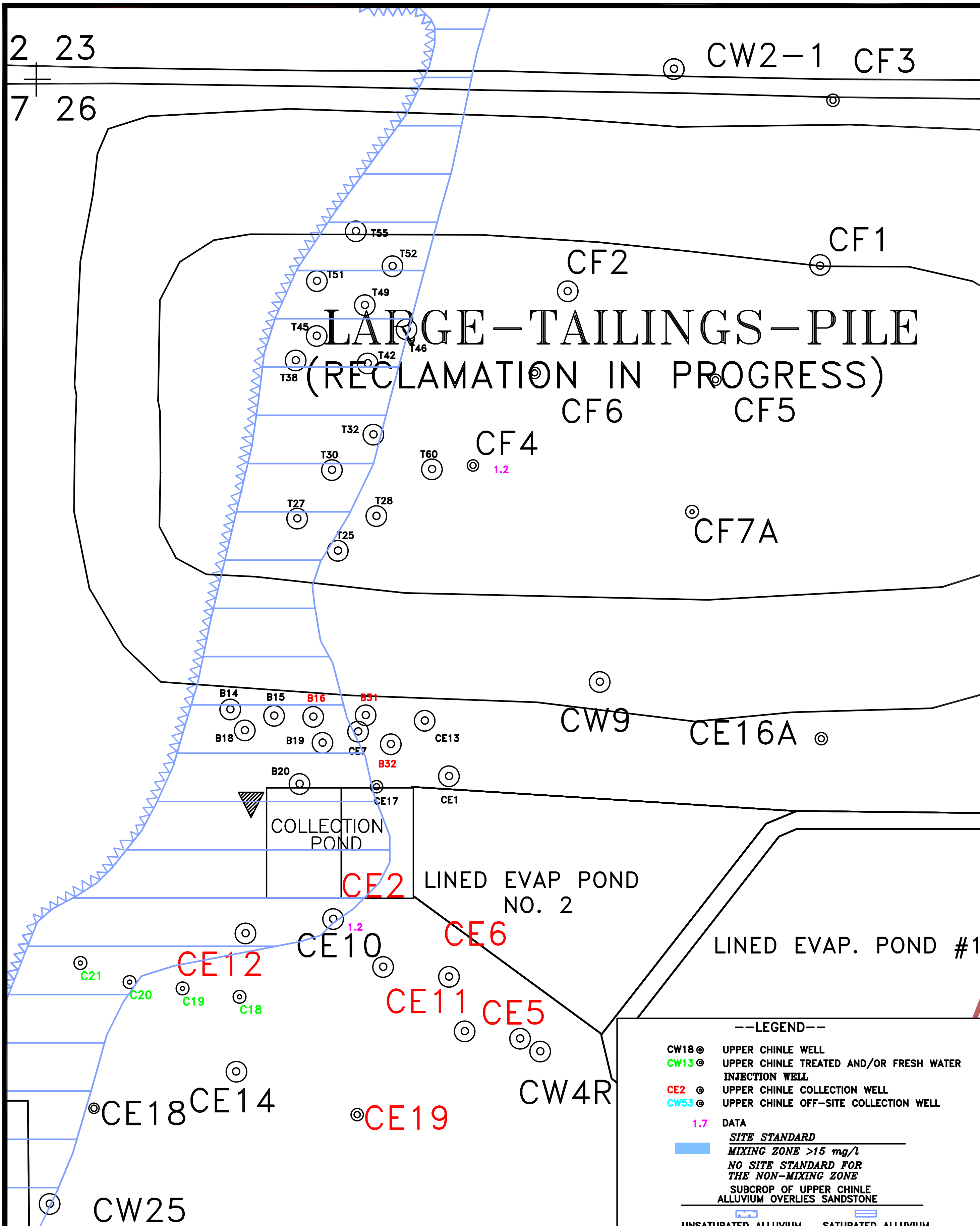

HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

DATE: 12/9/2020

FIGURE 5.3-20. NITRATE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, mg/L

SCALE: 1"= 1600'

PAGE: 5.3-34



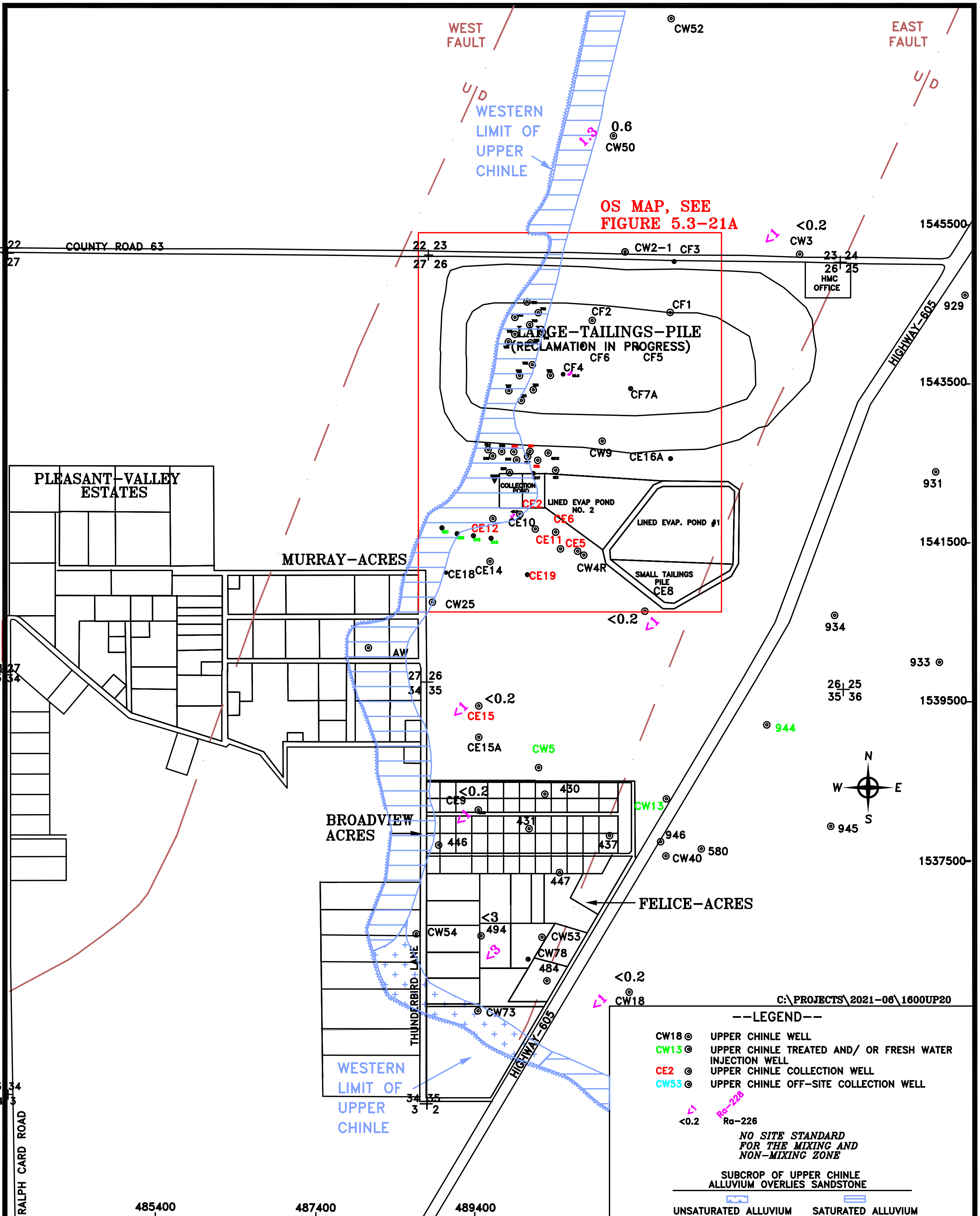

HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

FIGURE 5.3-20A. NITRATE CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, OS, 2020, mg/L

DATE: 12/9/2020

SCALE: 1"= 500'

PAGE: 5.3-35

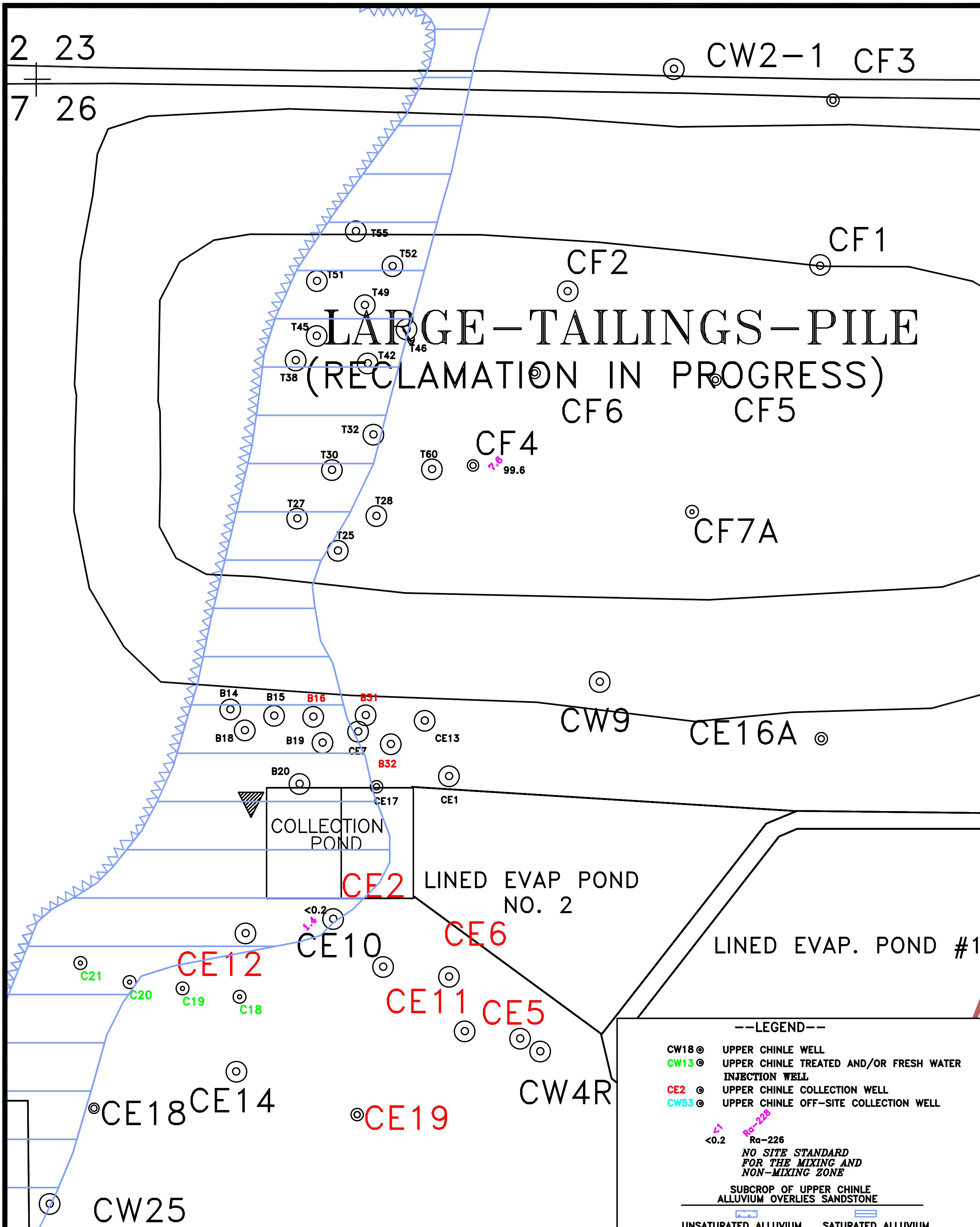



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

FIGURE 5.3-21. RADIUM-226 AND RADIUM-228 CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, pCi/L

DATE: 12/9/2020

SCALE: 1"= 1600'

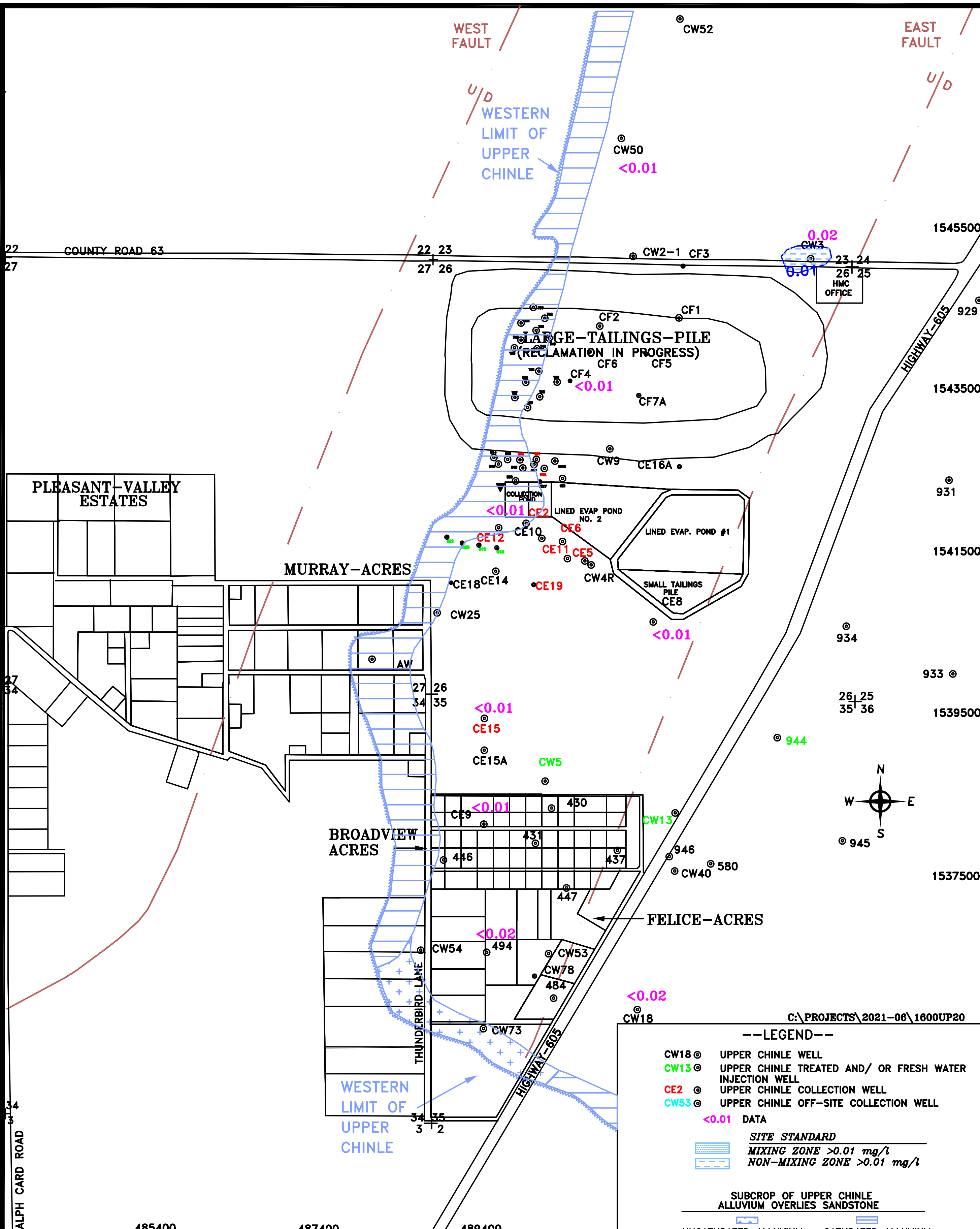



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

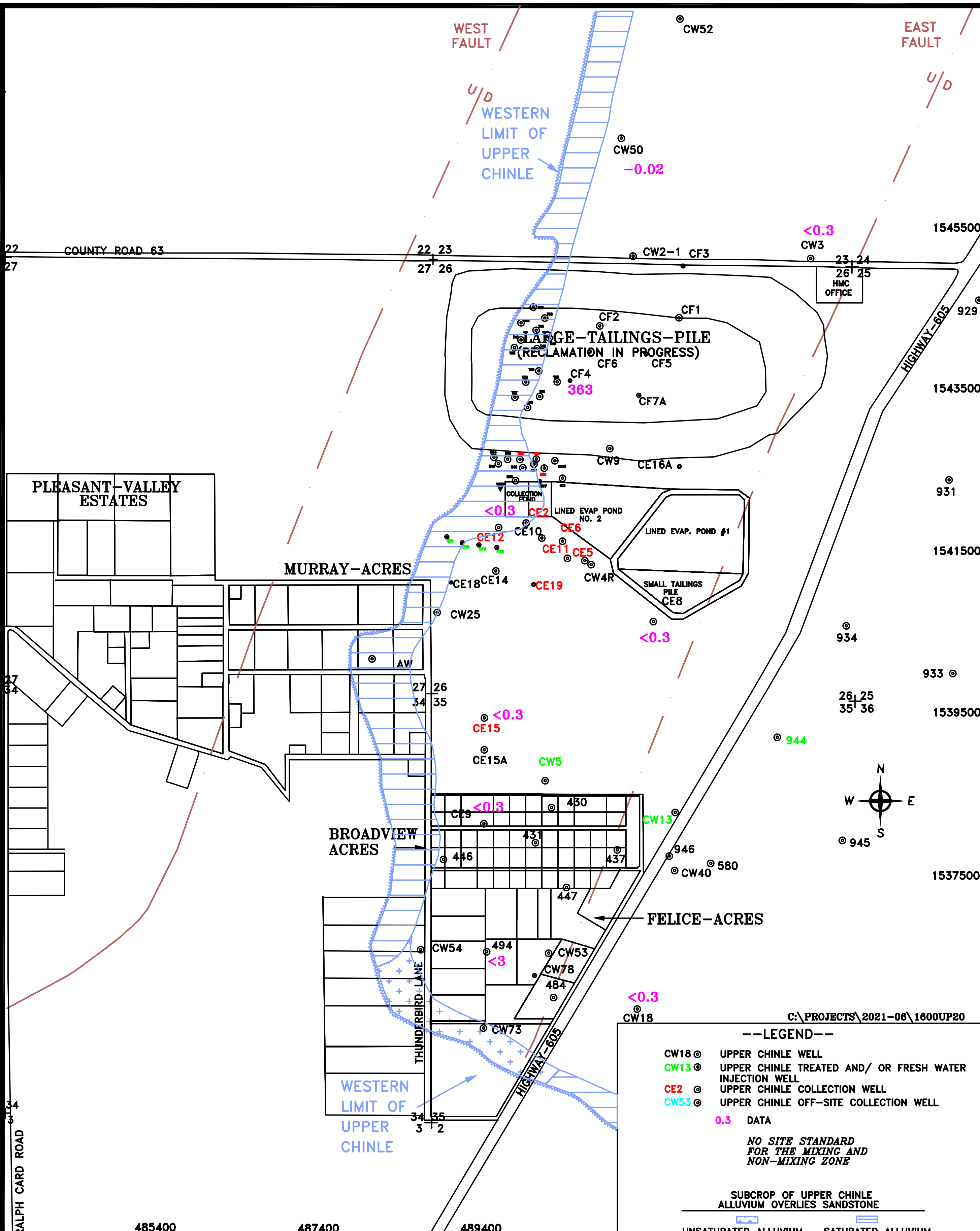
**FIGURE 5.3-21A. RADIUM-226 AND RADIUM-228 CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, OS, 2020, pCi/L**

DATE: 12/9/2020

SCALE: 1"= 500'




| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 12/9/2020 |
|---|---|
| FIGURE 5.3-22. VANADIUM CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, mg/L | SCALE: 1"= 1600' |
| | PAGE: 5.3-38 |




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

FIGURE 5.3−23. THORIUM−230 CONCENTRATIONS OF THE UPPER CHINLE AQUIFER, 2020, pCi/L

DATE: 12/9/2020

SCALE: 1"= 1600'

**TABLE 5.3-1. UPPER CHINLE SITE STANDARDS AND 2020 BACKGROUND UPPER CHINLE DATA**

| | CONSTITUENT, concentrations in mg/L | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aquifer Zone | Selenium | Uranium | Molybdenum | TDS | Sulfate | Chloride | Nitrate | Vanadium |
| CHINLE SITE STANDARDS | | | | | | | | |
| Chinle Mixing | 0.14 | 0.18 | 0.10 | 3140 | 1750 | 250 | 15 | 0.01 |
| Upper Chinle Non-Mixing | 0.06 | 0.09 | 0.10 | 2010 | 914 | 412 | * | 0.01 |
| CHINLE MIXING ZONE WELLS | | | | | | | | |
| CW9 | - | - | - | - | - | - | - | - |
| CW50 | <0.001 | 0.02 | 0.002 | 1710 | 881 | 56 | 0.6 | <0.01 |
| CW52 | - | - | - | - | - | - | - | - |
| CW15 | - | - | - | - | - | - | - | - |
| CW24 | - | - | - | - | - | - | - | - |
| CW35 | 0.06 | 0.17 | 0.001 | 2360 | 1280 | 66 | 3.0 | <0.01 |
| CW36 | - | - | - | - | - | - | - | - |
| CW37 | - | - | - | - | - | - | - | - |
| CW39 | - | - | - | - | - | - | - | - |
| CW43 | 0.04 | 0.048 | <0.01 | 2640 | 1260 | 222 | 7.0 | <0.2 |
| UPPER CHINLE NON-MIXING ZONE WELLS | | | | | | | | |
| 931 | - | - | - | - | - | - | - | - |
| 934 | - | - | - | - | - | - | - | - |
| CW18 | 0.01 | 0.03 | <0.001 | 2020 | 724 | 208 | 1.7 | <0.01 |

* Background water quality analyses for constituent determined that site standard is not necessary.

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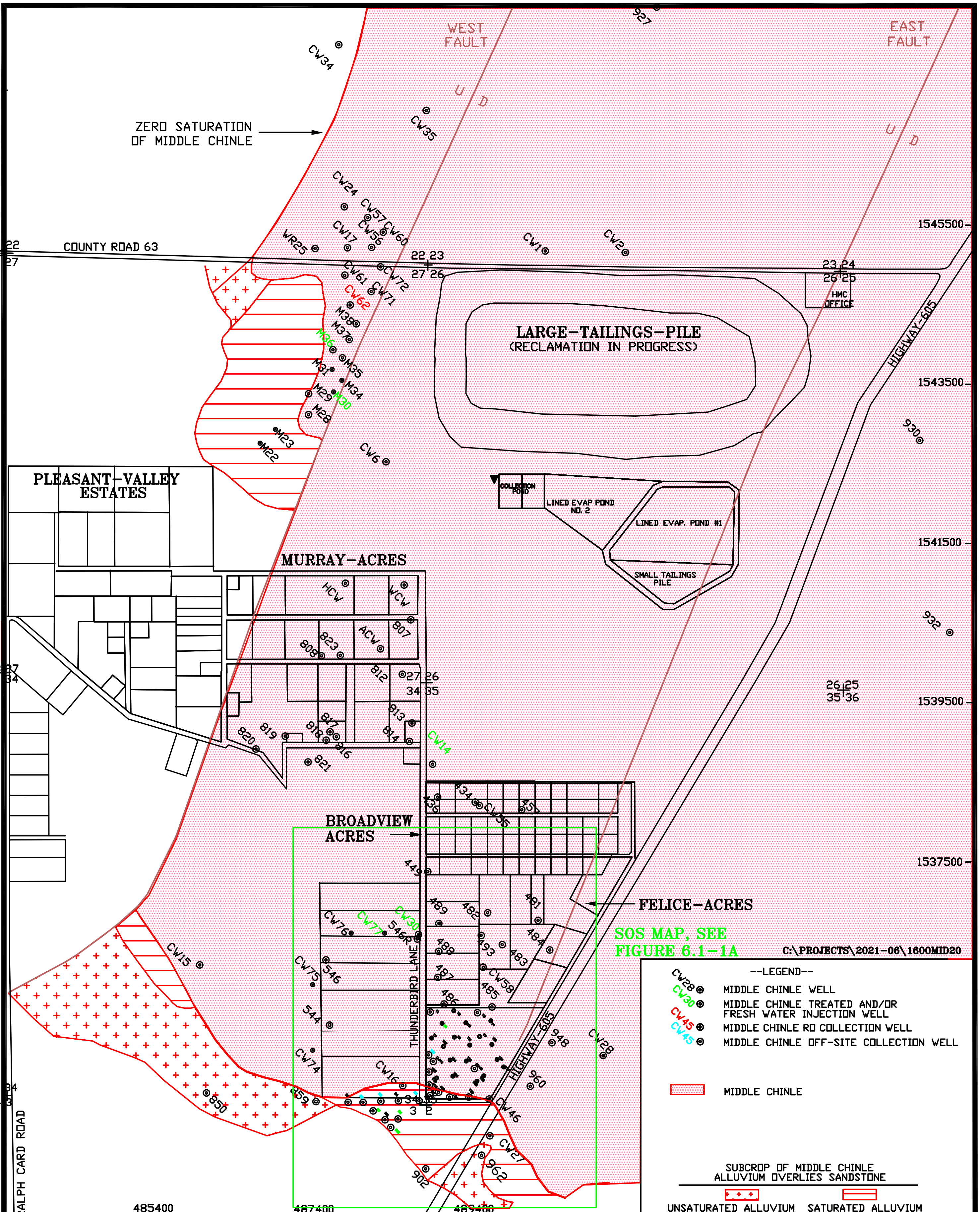
## 6.0 MIDDLE CHINLE AQUIFER MONITORING

## 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. Figures 6.1-1 and 6.1-1A show the locations of the Middle Chinle wells and areas where the Middle Chinle aquifer exists at the Grants Project. Figure 6.1-1A shows the closely spaced wells in South Felice Acres and the northeast portion of Section 3. The area where the alluvium is saturated and has direct contact with the Middle Chinle sandstone is 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. Additional geophysical logging of some of the R wells in the northeast corner of Section 3 has refined the limits of the Middle Chinle aquifer in this area and therefore some of the R wells thought to be within the subcrop area at the time of installation are located south of the subcrop and have been removed from the Middle Chinle mapping and analyses.

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 groundwater systems, except that there is some connection 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. No additional Middle Chinle wells were drilled in 2020.

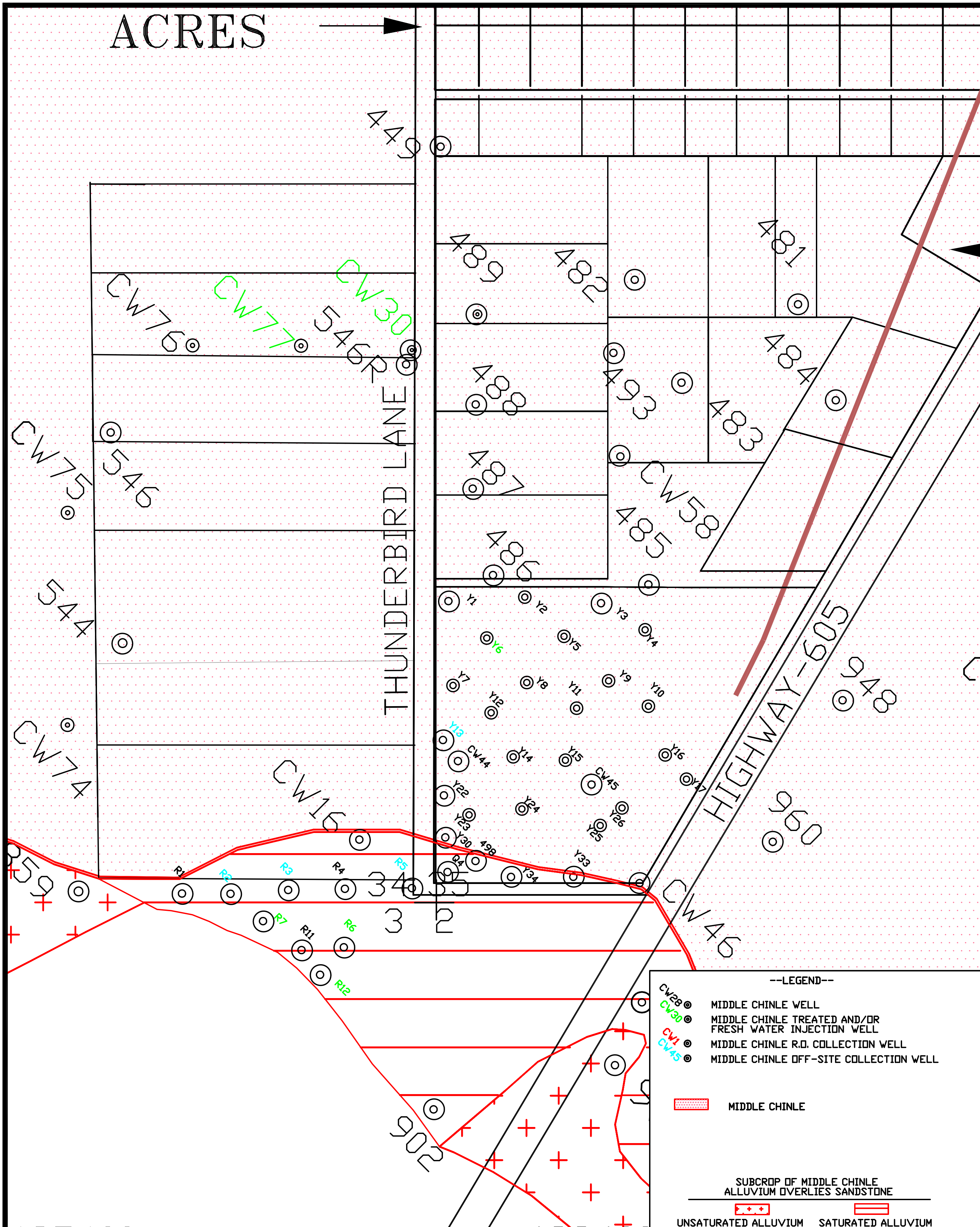
Wells CW14, CW30, CW77, M30, M36, R6, R7, R12 and Y6 were used for treated and/or fresh-water injection in 2020. Middle Chinle wells R2, R3, R5 and Y13 were used as South Off-site collection wells in 2020 for treatment through the zeolite system. Well CW62 was used as an On-site Middle Chinle collection well supply to the R.O. plant in 2020.




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

**6.1-1 LIMITS OF MIDDLE CHINLE AQUIFER AND WELL LOCATIONS, 2020**

| | |
|---|---|
| DATE: 3/9/2021 | SCALE: 1"=1600' |




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

**6.1-1A. LIMITS OF MIDDLE CHINLE AQUIFER AND WELL LOCATIONS, SOS, 2020**

**DATE:** 3/9/2021

**SCALE:** 1"=500'

## 6.2 MIDDLE CHINLE WATER LEVELS

Water levels in HMC's Upper, Middle and Lower Chinle wells are presented in Appendix A. Fall 2020 water-level elevation contours for the Middle Chinle aquifer are presented on Figures 6.2-1 and 6.2-1A. The hydraulic gradient in the Middle Chinle aquifer is steeper in its alluvial subcrop area in the southern portion of Felice Acres in the Y well area. A depression in the potentiometric surface resulting from pumping Middle Chinle South Collection well Y13 in 2020 existed in the Middle Chinle aquifer in this area prior to the November water level measurement. This depression was mainly recovered in the Middle Chinle in this portion of South Felice Acres when the water levels were measured due to the South collection being off just prior to the water level measurements. The higher heads south of this depression in the Middle Chinle aquifer are due to an influx of water to the Middle Chinle aquifer from the alluvial aquifer. The red arrows on Figures 6.2-1 and 6.2-1A show the direction of groundwater flow in the Middle Chinle aquifer. Flow on the east side of the East Fault is toward well CW28 near the East Fault.

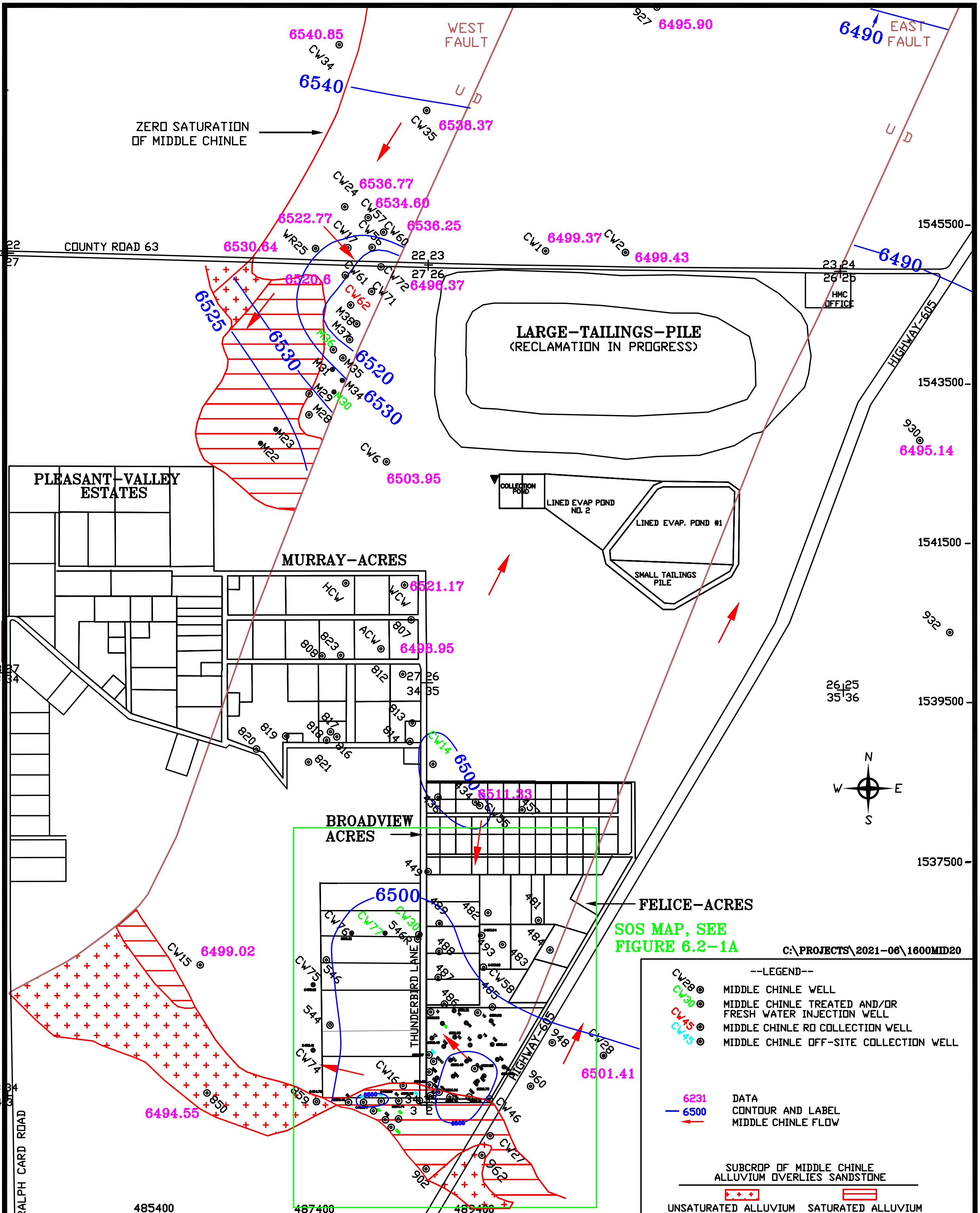
Groundwater flow west of the West Fault in the Middle Chinle aquifer is mainly to the southwest, and it discharges into the alluvial aquifer. The offset of the Middle Chinle sandstone by the faults causes the Middle Chinle aquifers to act as separate aquifers on each side of the faults with significant difference in water-level elevations. The pumping of RO collection well CW62 is pulling Middle Chinle water in this area toward this well. This Middle Chinle water flows from up-gradient of the site into the area west of the LTP. The alluvial injection in the northern portion of Section 27 temporarily had reversed the gradient near well CW17 in 2006 through 2015. This allowed some movement to the north toward well CW17 but the collection at well CW62 is intercepting this flow since collection started in 2016. The remainder of the Middle Chinle aquifer is recharged by the alluvial aquifer south of Felice Acres.

The injection of treated and/or fresh water into wells CW14 (north of Broadview Acres) and wells CW30 and CW77 (west of Felice Acres) has created groundwater mounds in their respective areas. These mounds cause the groundwater to flow both north and south from these three wells. 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 groundwater is not readily connected on each side of these two faults.

Figure 6.2-2 shows the locations of the Middle Chinle wells that are used to monitor 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, CW28, CW45, CW58, CW75 and CW76. Water levels in wells 493, CW28, CW45, CW58, CW75 and CW76 recovered in 2020 due to the smaller rate of collection from the Middle Chinle aquifer in the Felice Acres area.

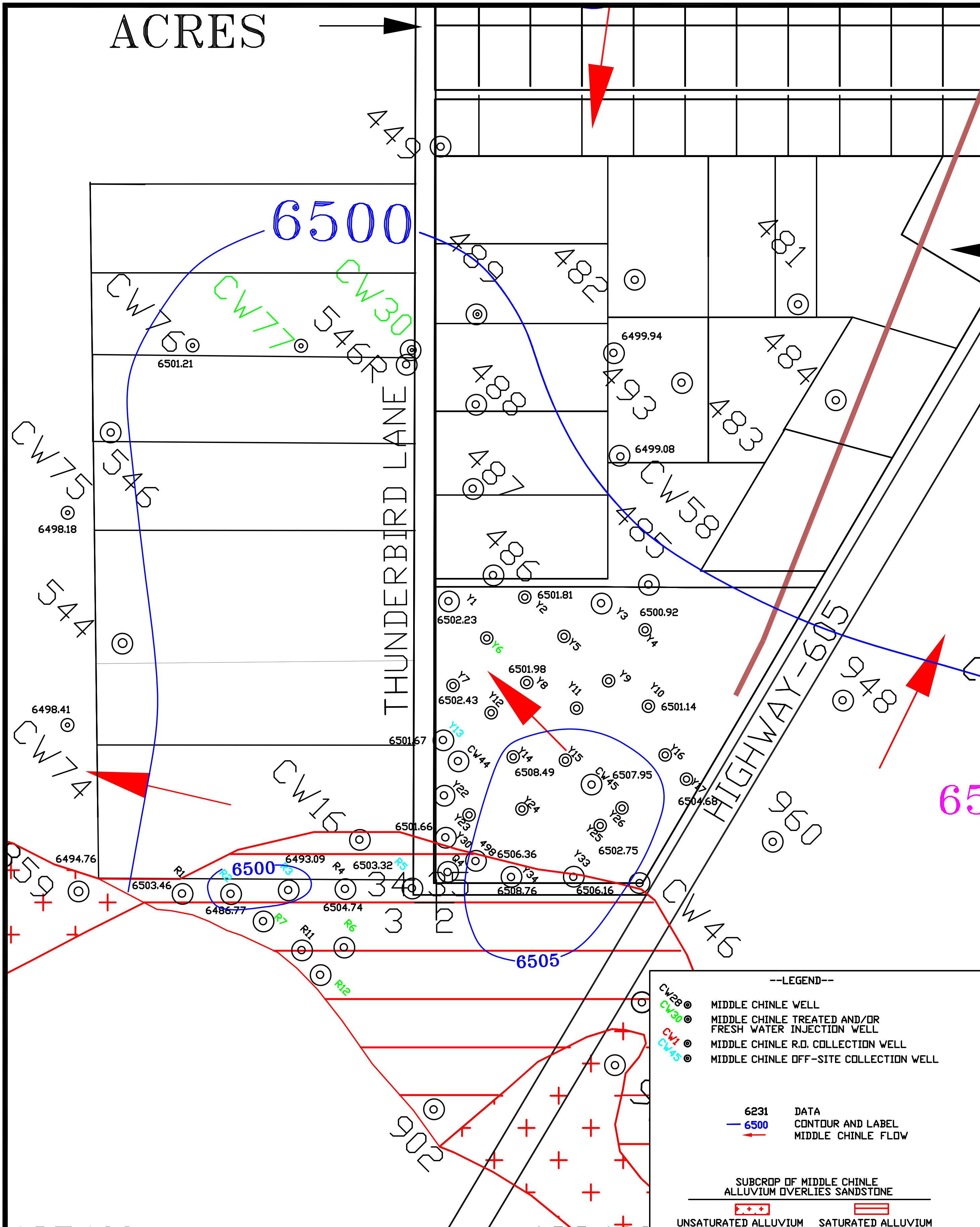
The water-level plots for the Middle Chinle wells located west of the West Fault and wells CW2 and ACW are presented on Figure 6.2-4. Water levels had been gradually increasing in the Middle Chinle aquifer west of the West Fault but the CW62 pumping in 2016 through 2020 caused the water levels in the Middle Chinle aquifer west of the West Fault to become fairly steady in 2020 as shown in water level data for wells CW17 and CW35. Water levels overall rose in Middle Chinle wells ACW and CW2 in 2020, which is thought to be due to variations in the South Felice Acres pumping. As expected, the pumping of well CW62 west of the West Fault did not cause any drawdown in water level in well CW2 which is located east of the West Fault.




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

**FIGURE 6.2-1. WATER-LEVEL ELEVATIONS OF THE MIDDLE CHINLE AQUIFER, FALL 2020, FT-MSL**

| | |
|---|---|
| **DATE:** | **3/9/2021** |
| **SCALE:** | **1"=1600'** |
| **PAGE:** | **6.2-3** |

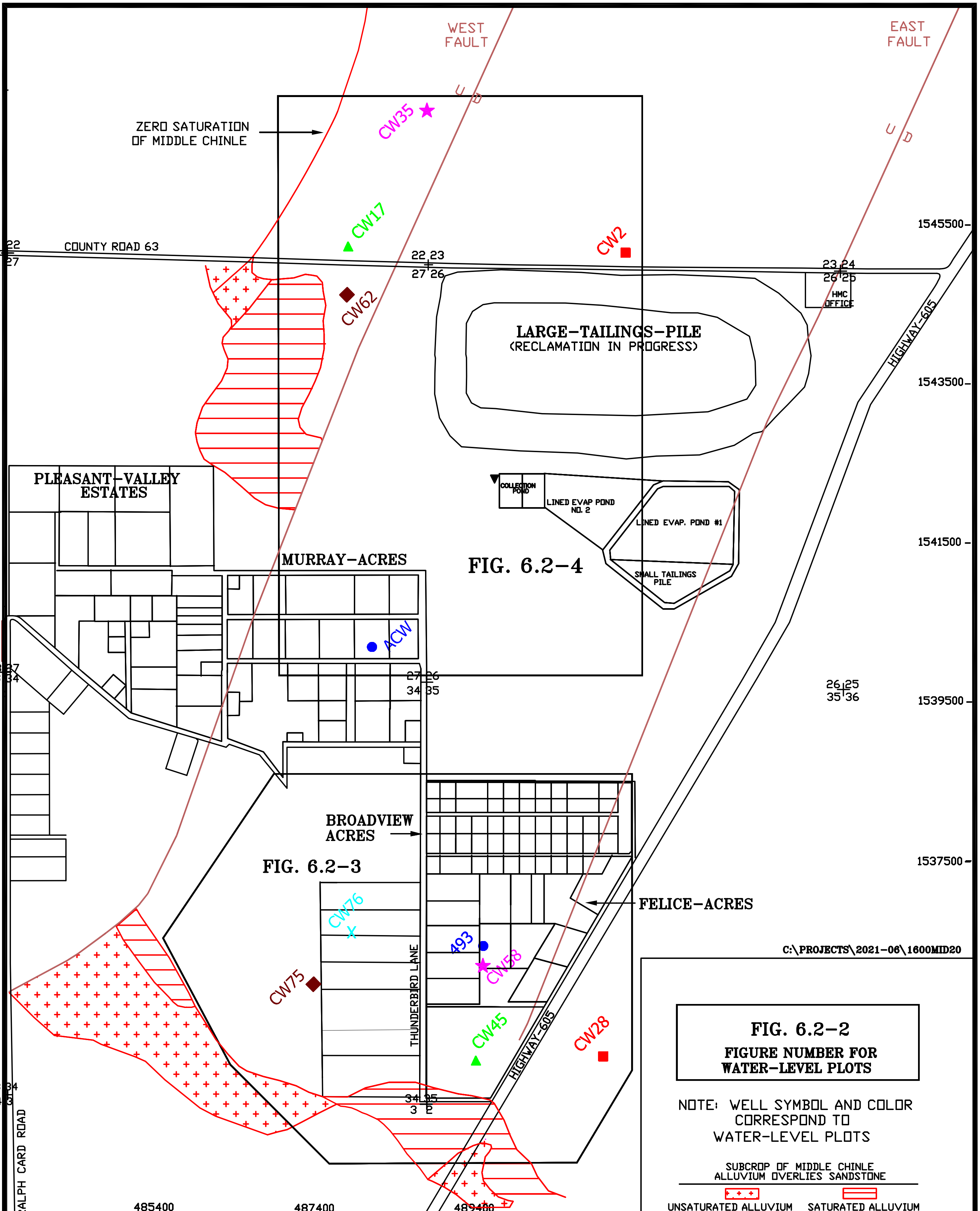



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**FIGURE 6.2-1A. WATER-LEVEL ELEVATIONS OF THE MIDDLE CHINLE AQUIFER, FALL 2020, SOS, FT-MSL**

**DATE: 3/9/2021**

**SCALE: 1"=500'**




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

**FIGURE 6.2-2. LOCATION OF MIDDLE CHINLE WELLS WITH WATER-LEVEL PLOTS, 2020**

**DATE: 12/8/2020**

**SCALE: 1"=1600'**

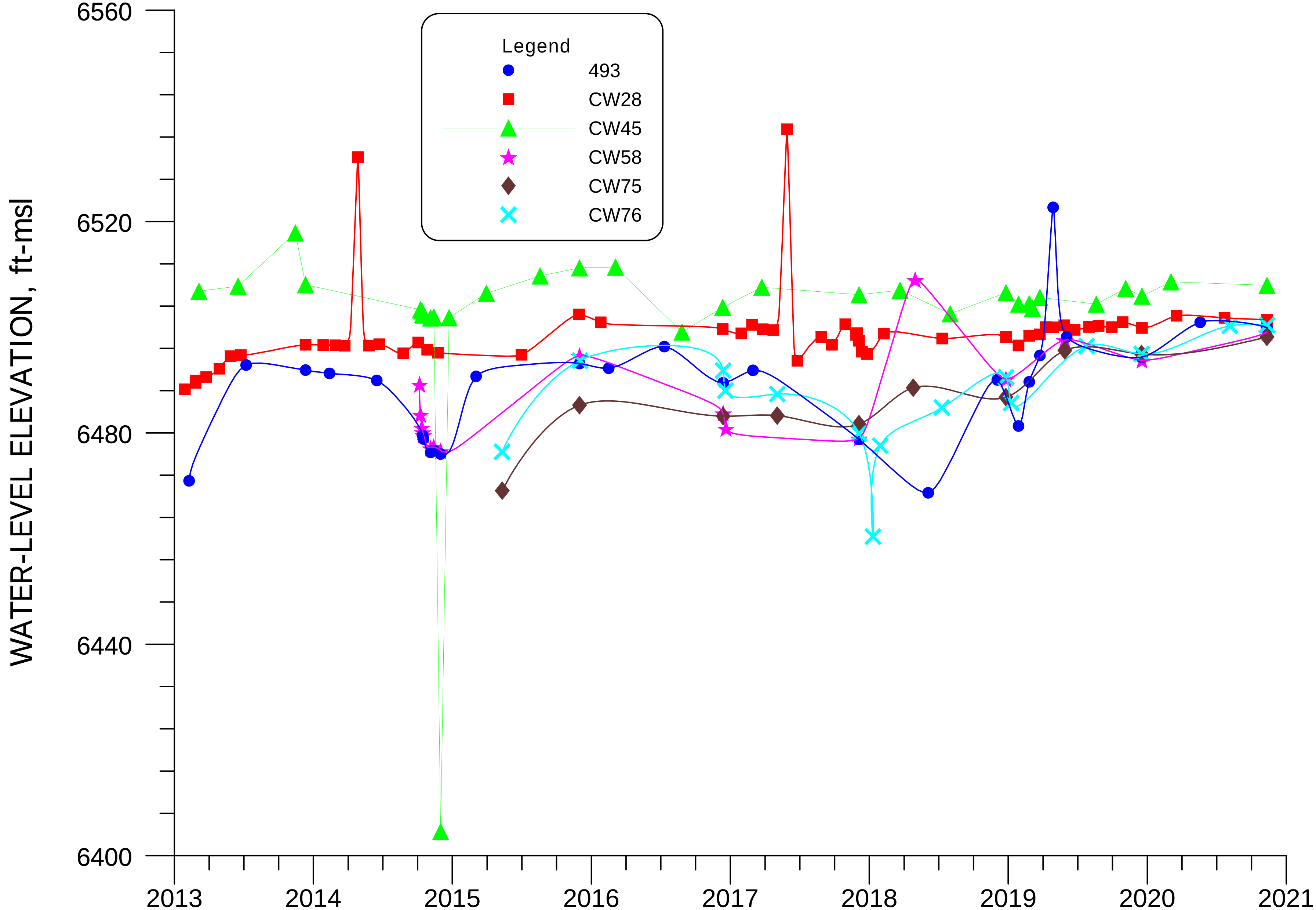



**FIGURE 6.2-3. WATER-LEVEL ELEVATION FOR WELLS 493, CW28, CW45, CW58, CW75 AND CW76**

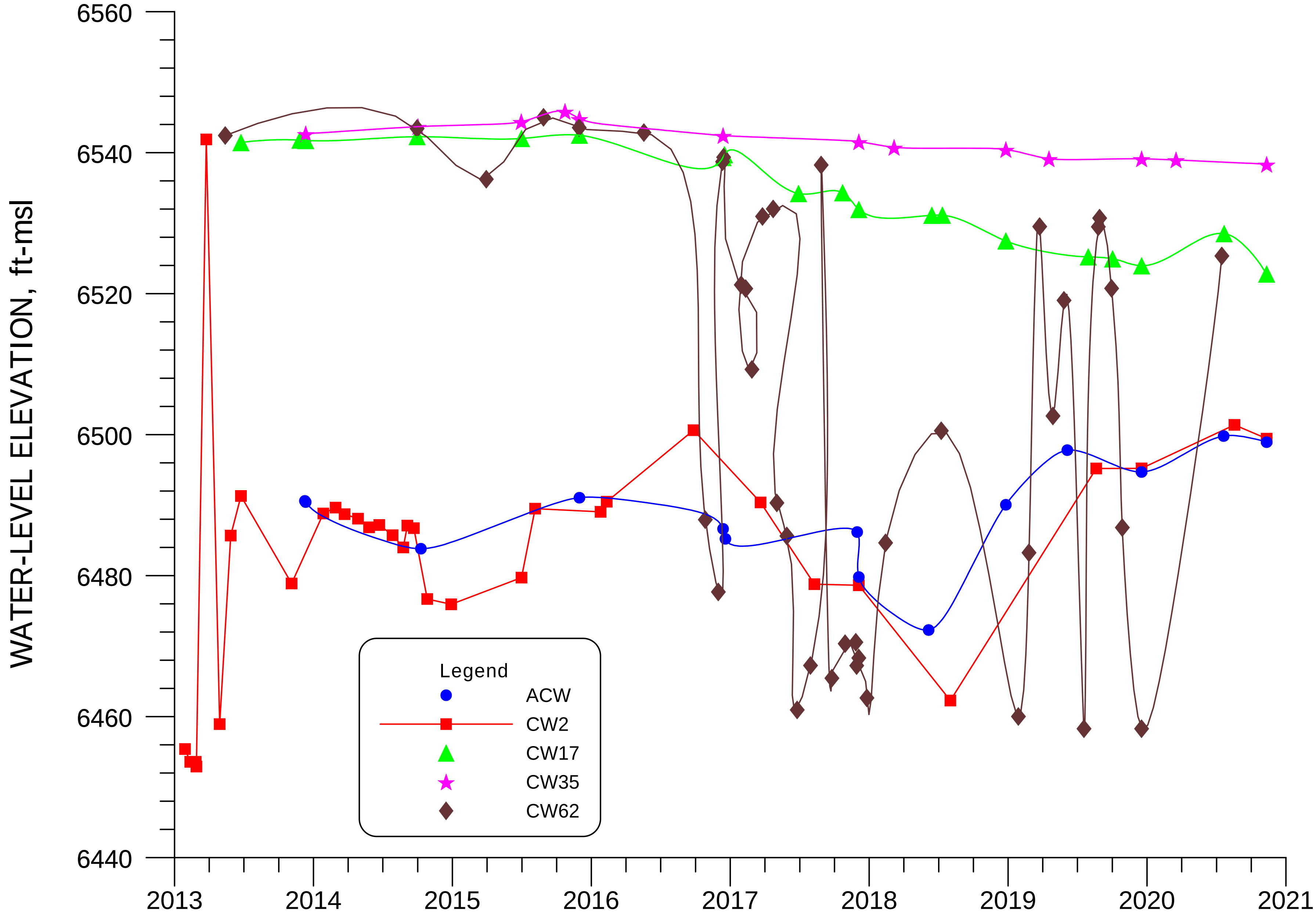



**FIGURE 6.2-4. WATER-LEVEL ELEVATION FOR WELLS ACW, CW2, CW17, CW35 AND CW62**

## 6.3 MIDDLE CHINLE WATER QUALITY

The 2020 water-quality data for HMC's Middle Chinle aquifer wells is presented with 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). Several Middle Chinle wells were sampled in 2020 to further define the constituent concentration changes in the Middle Chinle aquifer.

The Middle Chinle wells used in establishing the Chinle site standards are shown on Figure 6.3-1 with a blue box around the well name indicating which Middle Chinle wells were used to define the non-mixing zone site standard. The yellow pattern on this figure shows the mixing zone for the Middle Chinle aquifer. The Middle Chinle wells used in conjunction with the Upper and Lower Middle Chinle wells (see Figures 5.3-1 and 7.3-1 for the Upper and Lower Chinle wells used, respectively) in establishing the mixing zone site standards are shown with a red box around their well names. Table 6.3-1 presents Chinle mixing zone site standards and the non-mixing zone Middle Chinle site standards. This table also presents the 2020 data for the Chinle mixing zone wells and the Middle Chinle non-mixing zone wells.

The area of water-quality concern in the Middle Chinle aquifer exists in portions of Broadview Acres and Felice Acres and west of Felice Acres. All sulfate concentrations in the Middle Chinle aquifer in 2020 are within the site standards. Likewise, TDS and chloride concentrations in the Middle Chinle aquifer do not exceed the site standards in 2020 except for four TDS values in the non-mixing zone . Uranium concentrations are above site standards in western Broadview Acres and Felice Acres and west of the West Fault. The concentrations in well CW35 in the northern portion of the Middle Chinle west of the West Fault are natural due to the groundwater flow to the south in this area. Uranium concentrations in well CW35 have been slightly above the site standard at times in the past. Selenium concentrations also exceed the site standard in one Felice Acres area well, one well east of Felice Acres and a small area west of the West Fault. The only significant molybdenum concentrations identified in the Middle Chinle aquifer are in wells that are in a small area west of the West Fault.

### 6.3.1 SULFATE - MIDDLE CHINLE

Figures 6.3-1A and 6.3-1B present sulfate concentration contours for the Middle Chinle aquifer for 2020 and the sulfate site standard concentrations are given in the legend of these figures. Figure 6.3-1B presents sulfate concentrations of the Middle Chinle wells in South Felice Acres and the R collection wells in the northeast portion of Section 3. All mixing-zone sulfate concentrations in the Middle Chinle aquifer are below the site standard of 1750 mg/L. Sulfate concentrations in the area of well CW62, which is located west of the West Fault have been restored by the collection of Middle Chinle water from this well for RO treatment. The sulfate levels were naturally occurring in this area, until the increase in the head of the alluvial water in the subcrop area caused the alluvial water to flow into the Middle Chinle. Sulfate concentrations in the non-mixing zone of the Middle Chinle are within the natural background range and meet the site standard. The sulfate concentrations for the R wells in the northeast portion of Section 3 and the Y wells in South Felice Acres are posted on Figures 6.3-1B at a scale of 1" = 500', and all of these values are less than the site standard.

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. Three groups of wells for the Middle Chinle aquifer are presented to show the concentration changes with time. 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 CW17, CW35, CW45 and CW62. All of the 2020 concentrations on this plot are below the mixing zone site standard which is shown on the plot for ease in comparison. The time concentrations for the Middle Chinle mixing zone wells in Felice Acres are shown on Figure 6.3-3A for wells CW76, Y7 and Y13. None of the 2020 sulfate concentrations in these wells exceed the mixing zone site standard in 2020. Figure 6.3-4 presents the sulfate concentrations for non-mixing zone Middle Chinle wells 493, ACW, CW1, CW2 and CW55 which are located between the two faults and well CW28 which is located east of the East Fault. This plot shows that all of the sulfate concentrations in these wells are less than the non-mixing zone site standard of 857 mg/L.

### 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. Figures 6.3-5 and 6.3-5A present contours of TDS concentrations for the Middle Chinle aquifer during 2020 and shows that all values are below 2000 mg/L near the alluvial subcrop area in the southern portion of the map (see Figure 6.3-5A for posting of Y wells in South Felice Acres and the R collection wells in the northeast portion of Section 3) except for wells R1 and R2. None of the wells west of the West Fault exceed the TDS mixing zone site standard while three wells in Broadview, Felice and Murray Acres and one north of the LTP exceed the non-mixing zone standard in 2020.

Background data for the Middle Chinle aquifer were used to determine TDS 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 2020, except for wells 493, ACW and CW55.

Plots of TDS concentrations for Middle Chinle wells CW17, CW35, CW45 and CW62 are presented in Figure 6.3-6. The TDS concentrations are presented for RO collection well CW62 in this figure. The highest TDS measured in wells west of the West Fault in 2020 is below but near the mixing zone site standard. Plots of TDS concentrations for Middle Chinle collection wells Y7 and Y13 and Middle Chinle monitoring well CW76 are presented in Figure 6.3-6A which shows that all of these concentrations are significantly below the site standard. Figure 6.3-7 presents TDS concentration-time plots for non-mixing zone Middle Chinle wells 493, ACW, CW1, CW2, CW28 and CW55. TDS concentrations in wells 493, ACW and CW55 exceed the non-mixing zone site standard. The increase in TDS concentration for well 493 in 2020 should not be given any significance until confirmed in the future because the sulfate and chloride concentrations for this well did not indicate an increase.

### 6.3.3 CHLORIDE - MIDDLE CHINLE

Figures 6.3-8 and 6.3-8A present chloride concentrations in the Middle Chinle aquifer during 2020. None of the concentrations exceeded the 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 because changes in this conservative parameter are useful in analyses of other constituents. Figure 6.3-9 presents the chloride concentrations for Middle Chinle wells CW17, CW35, CW45 and CW62 which show fairly steady concentrations in 2020 except for the decline in well CW17. The plot of chloride concentrations for RO collection well CW62 shows a very gradual declining trend for the last few years. An additional plot of chloride concentrations for the Middle Chinle wells in South Felice Acres was added in Figure 6.3-9A with all concentrations significantly less than 250 mg/L. The third chloride concentration plot for the Middle Chinle aquifer is presented in Figure 6.3-10 for wells 493, ACW, CW1, CW2, CW28 and CW55 with all of these chloride concentrations below the site standard in 2020.

### 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 western Broadview Acres and 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 alluvium flows across a subcrop of the Middle Chinle aquifer just south of Felice Acres, and alluvial groundwater has entered the Middle Chinle aquifer in this area. Figures 6.3-11 and 6.3-11A present contours of uranium concentrations in the Middle Chinle aquifer during 2020. An area of concentrations greater than the mixing-zone site standard exists in the western portion of Felice Acres and the northeast portion of Section 3 (see Figure 6.3-11A). The blowup of South Felice Acres and the northeast portion of Section 3 in Figure 6.3-11A presents the posting of uranium concentration in the Y and R collection wells in this area. Uranium concentrations in the Middle Chinle aquifer west of the West Fault and northwest of the LTP naturally exceed 0.18 mg/L, but values in several wells have increased above this level as a result of movement of alluvial water in the subcrop to these wells. 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 site standard) in an area of the Middle Chinle aquifer in northern Felice Acres and western Broadview Acres.

Figure 6.3-12 presents uranium concentration plots versus time for Middle Chinle wells CW17, CW35, CW45 and CW62 (see Figure 6.3-2 for well locations). This plot shows the decline in uranium concentrations in well CW17 to below the site standard while uranium concentrations in collection well CW62 have been fairly steady after the decline in 2016 from the start of the pumping of this well. Figure 6.3-12A shows the concentrations in pumping South Felice wells Y7 and Y13 and monitoring well CW76 and shows that the uranium concentration is below the site standard in well Y7 but above the standard in well Y13. The uranium concentration plots for the Middle Chinle wells in the non-mixing zone are presented on Figure 6.3-13.

### 6.3.5 SELENIUM - MIDDLE CHINLE

None of the Middle Chinle wells in the mixing zone contained water with selenium concentrations exceeding the 0.14 mg/L site standard in 2020, except for one well west of the West Fault (see Figure 6.3-14). The higher selenium concentrations in this area is caused by movement of alluvial water in the subcrop to this area. None of the R and Y wells in southern Felice Acres or the northeast portion of Section 3 (see Figure 6.3-14A for the posted values) contain water with elevated selenium concentrations. The selenium concentration in the non-mixing zone well 493 currently slightly exceeds the site standard of 0.07 mg/L. This area of elevated concentration has 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 setting site standards of 0.14 and 0.07 mg/L, respectively (see legend of Figures 6.3-14 and 6.3-14A).

Selenium concentrations with time for the mixing zone Middle Chinle wells CW17, CW35, CW45 and CW62 are presented in Figure 6.3-15 which shows that all of these concentrations have been below the site standard for a few years except for collection well CW62. The selenium concentration in well CW62 is presently declining and may be below the site standard next year. Figure 6.3-15A shows that the South Felice Acres Middle Chinle

collection wells contain selenium concentrations that have already been restored to levels below the site standard.

Figure 6.3-16 presents the selenium concentrations for Middle Chinle wells in the non-mixing zone. The connection between the alluvial aquifer and the Middle Chinle aquifer south of Felice Acres is the cause for the elevated concentrations in wells 493 and CW28.

### 6.3.6 MOLYBDENUM - MIDDLE CHINLE

The 2020 molybdenum concentrations in the Middle Chinle aquifer are presented on Figures 6.3-17 and 6.3-17A. None of the molybdenum concentrations for 2020 exceed the site standard of 0.10 mg/L except for a small area west of the West Fault.

Figure 6.3-18 presents the molybdenum concentrations with time for Middle Chinle wells CW17, CW35, CW45 and CW62 and shows a decline in concentrations in well CW17 to below the standard while fairly steady concentration is observed in well CW62. The molybdenum concentrations are below the site standard in the Middle Chinle in the Felice Acres area (see Figure 6.3-18A). Figure 6.3-19 presents the molybdenum concentrations with time for wells ACW, CW1, CW2, CW28 and CW55. The lower concentrations presented for the previous three years are due to the smaller analytical detection limits.

### 6.3.7 NITRATE - MIDDLE CHINLE

Nitrate concentrations have always been low in the Middle Chinle aquifer and Figure 6.3-20 presents the nitrate concentrations in the Middle Chinle aquifer for 2020. All of the Middle Chinle contain nitrate concentrations below the site standard. This constituent does not require a site standard for the non-mixing zone of the Middle Chinle aquifer.

### 6.3.8 RADIUM-226 AND RADIUM-228 - MIDDLE CHINLE

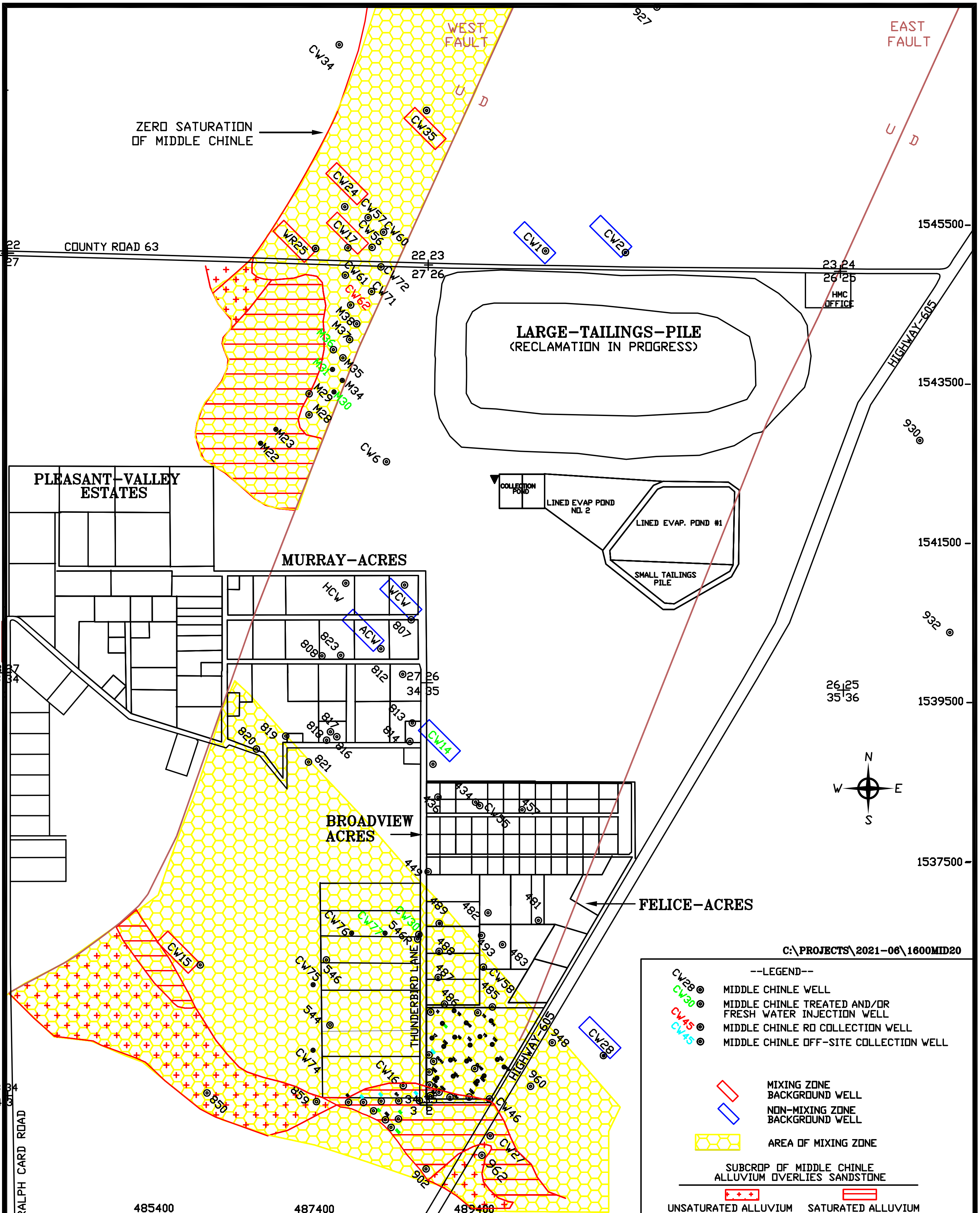
Radium concentrations in the Middle Chinle aquifer have always been low, showing that these two parameters are not important relative to the Middle Chinle aquifer. All of the radium-226 and radium-228 values measured in 2020 were very small. A site standard is not warranted and has not been set for these two constituents.

### 6.3.9 VANADIUM - MIDDLE CHINLE

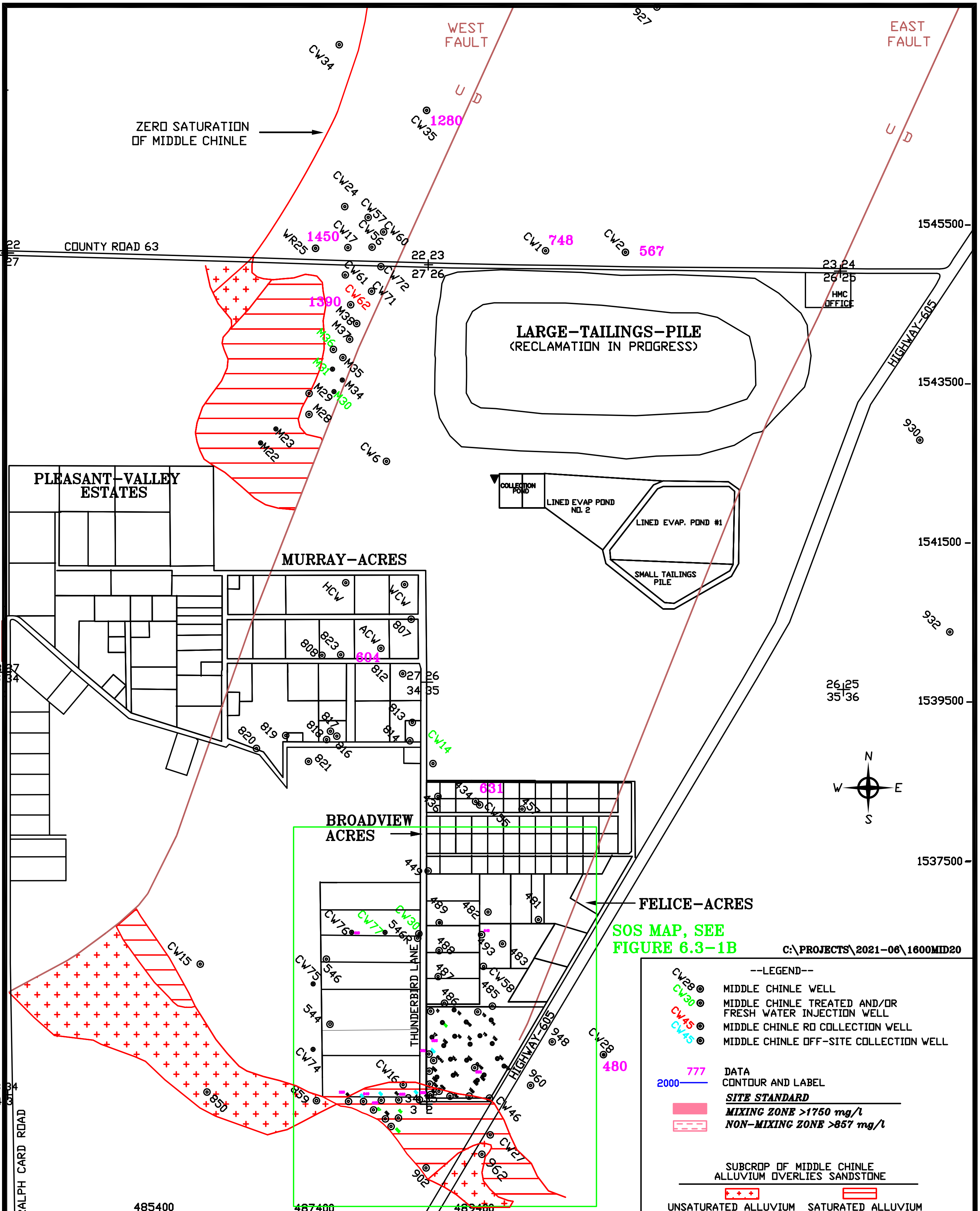
Vanadium concentrations in the Middle Chinle aquifer have always been low. Previous monitoring of vanadium in the Middle Chinle aquifer has demonstrated that vanadium is not a significant constituent in this aquifer. Monitoring of vanadium for the Middle Chinle should be eliminated, because only a few relatively low values have previously been detected in the alluvial aquifer near the tailings piles. All of the 2020 vanadium measurements for the Middle Chinle aquifer are at or below the detection limit. 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 has therefore not been set 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 Pile. Thorium-230 is, therefore, not a significant constituent in the Middle Chinle aquifer and should be eliminated from future monitoring in the Middle Chinle aquifer. All of the thorium-230 values measured in 2020 were very small at values of less than or equal to 0.3 pCi/L except for one higher value of less than 3 pCi/L. The laboratory adjusted its detection level after their initial measurements. 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 a site standard has not been set.




| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 12/8/2020 |
|---|---|
| **FIGURE 6.3-1. MIDDLE CHINLE WELLS USED FOR SITE STANDARDS AND MIDDLE CHINLE MIXING ZONE** | SCALE: 1"=1600' |
| |  |

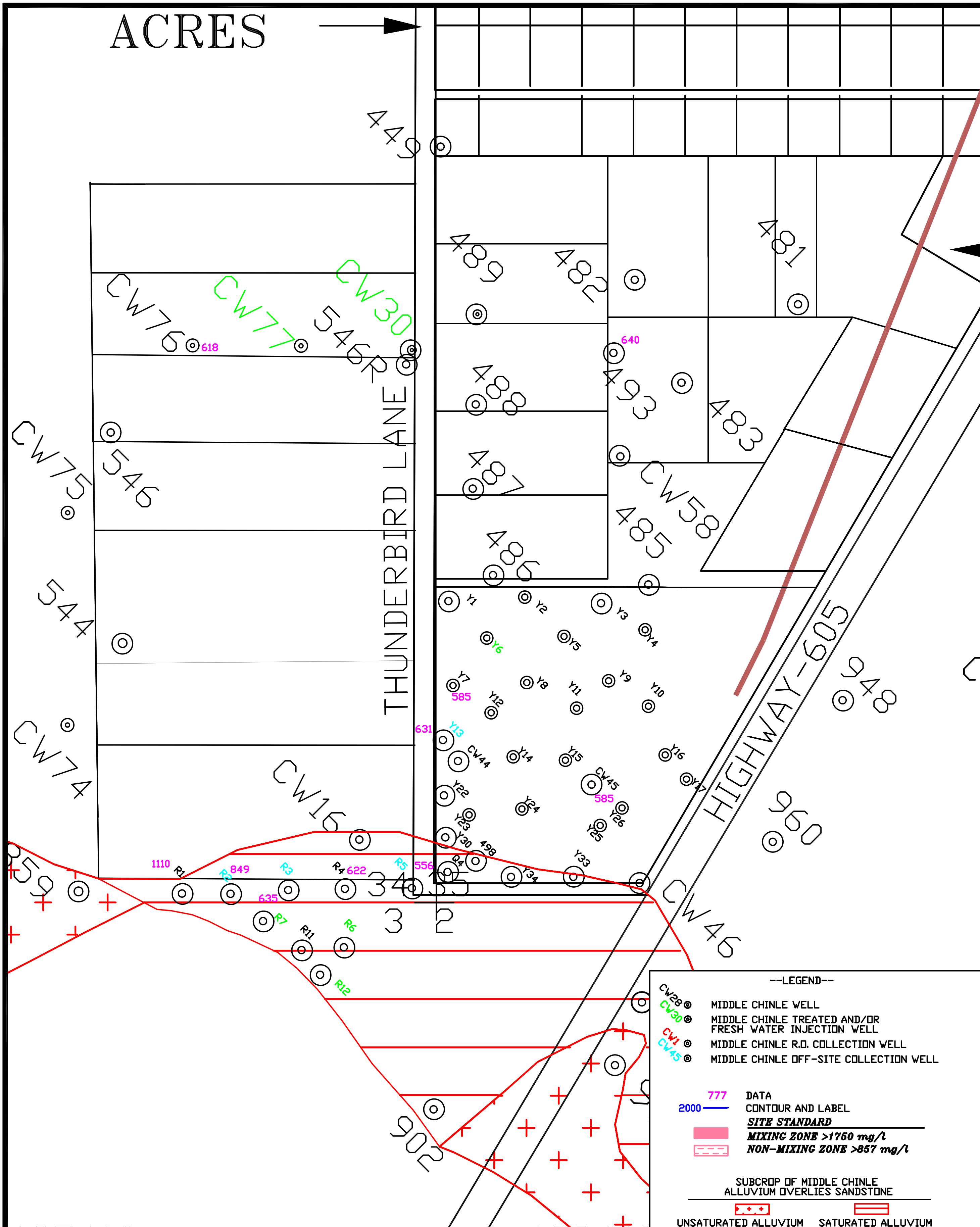



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**FIGURE 6.3-1A. SULFATE CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, mg/L**

**DATE: 12/8/2020**

**SCALE: 1"=1600'**

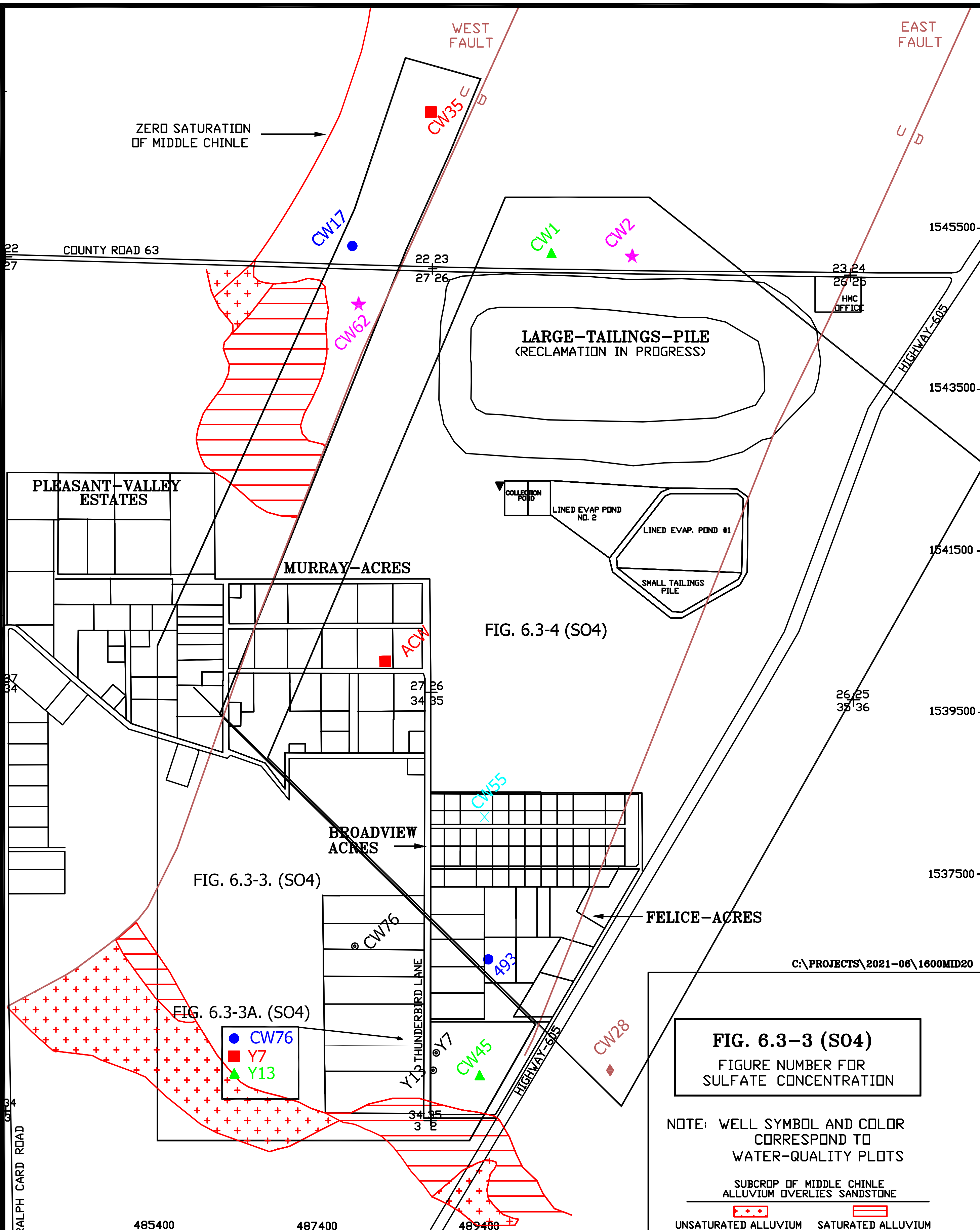



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

FIGURE 6.3-1B. SULFATE CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, SOS, mg/L

DATE: 12/8/2020

SCALE: 1"=500'

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|---|---|
| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | **DATE: 12/8/2020** |
| **FIGURE 6.3-2. LOCATION OF MIDDLE CHINLE WELLS WITH WATER-QUALITY PLOTS, 2020** | **SCALE: 1"=1600'** |
| | **PAGE: 6.3-11** |

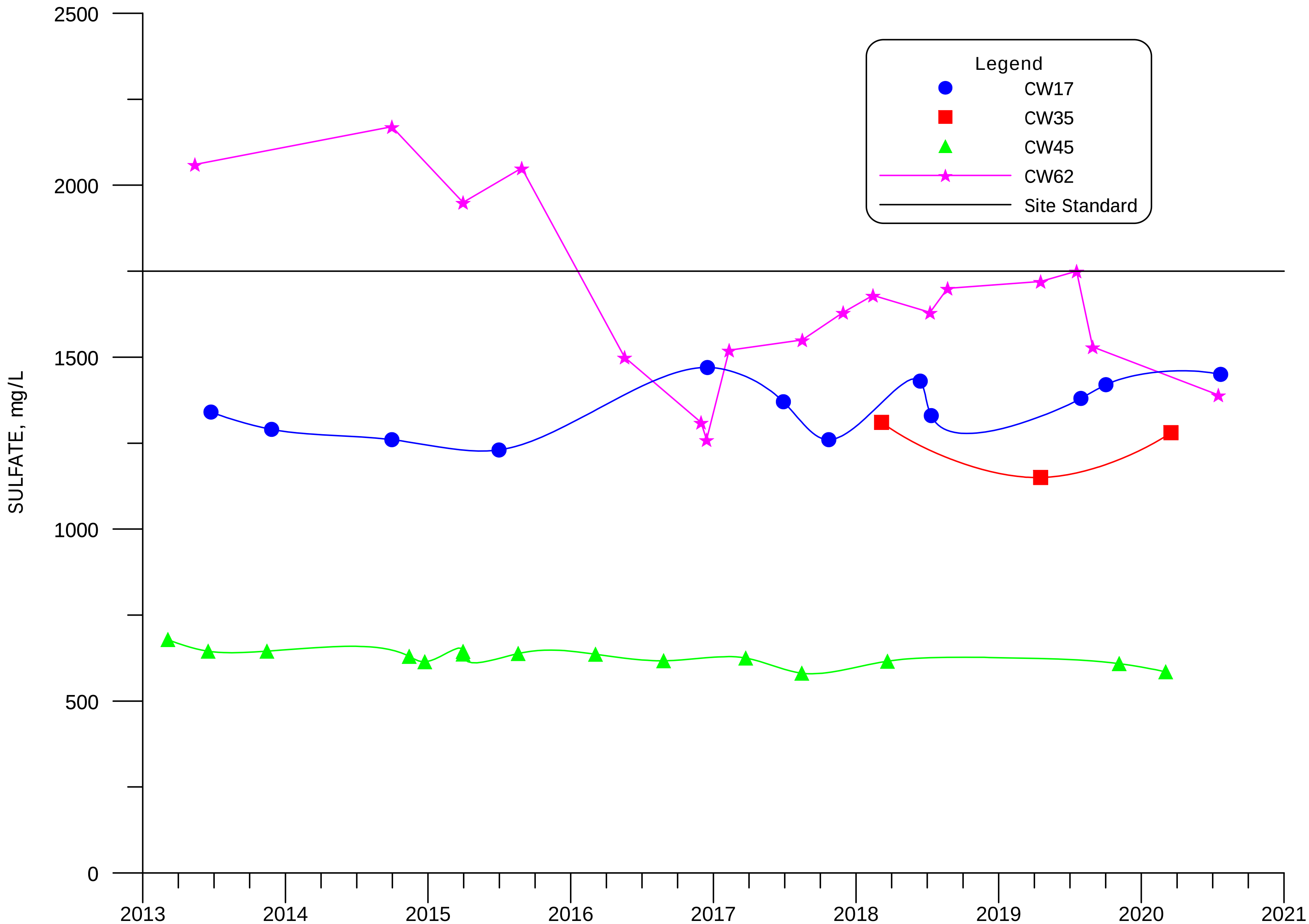



**FIGURE 6.3-3. SULFATE CONCENTRATIONS FOR MIXING ZONE WELLS CW17, CW35, CW45 AND CW62**

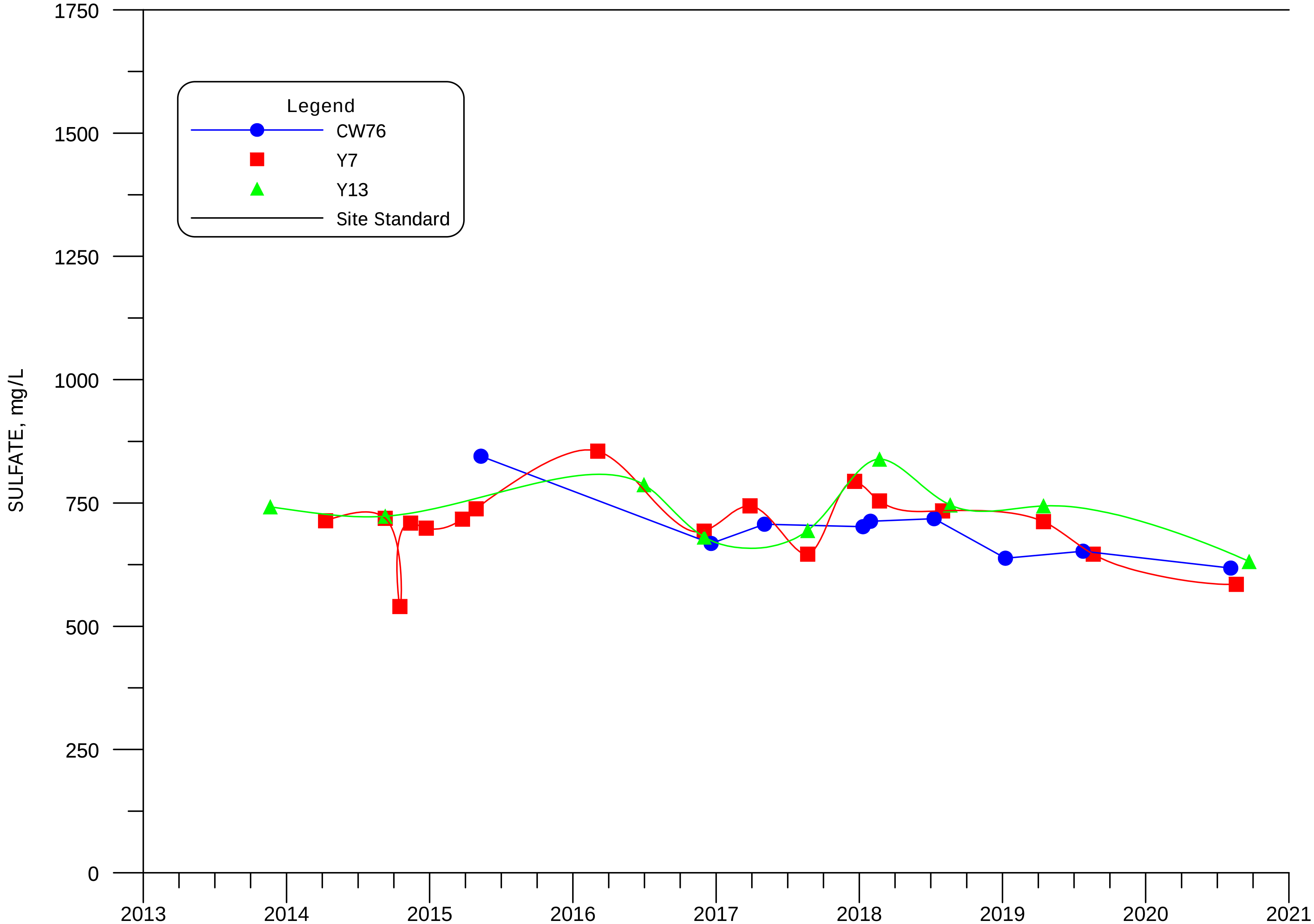



**FIGURE 6.3-3A. SULFATE CONCENTRATIONS FOR MIXING ZONE WELLS CW76, Y7 AND Y13**

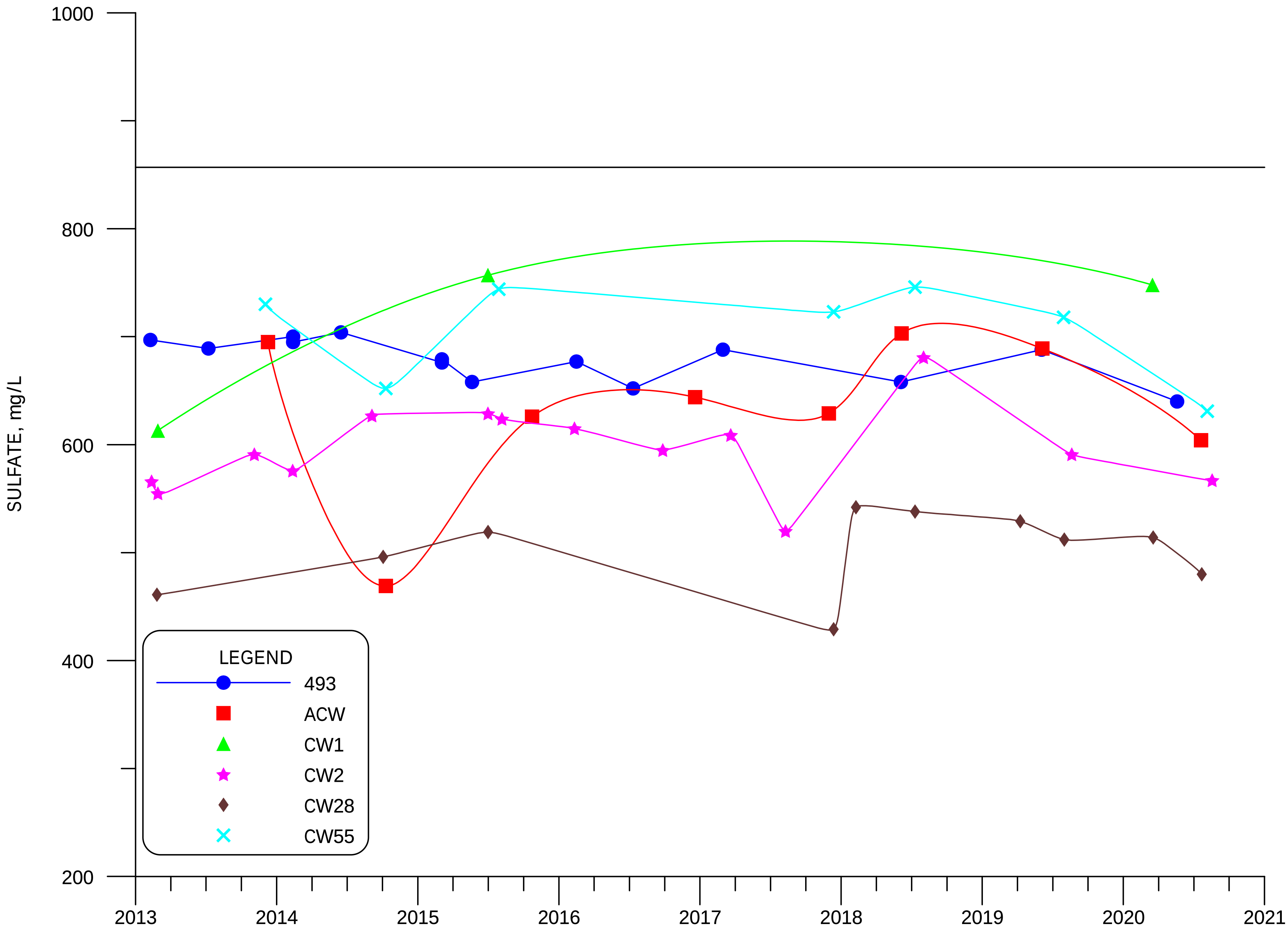
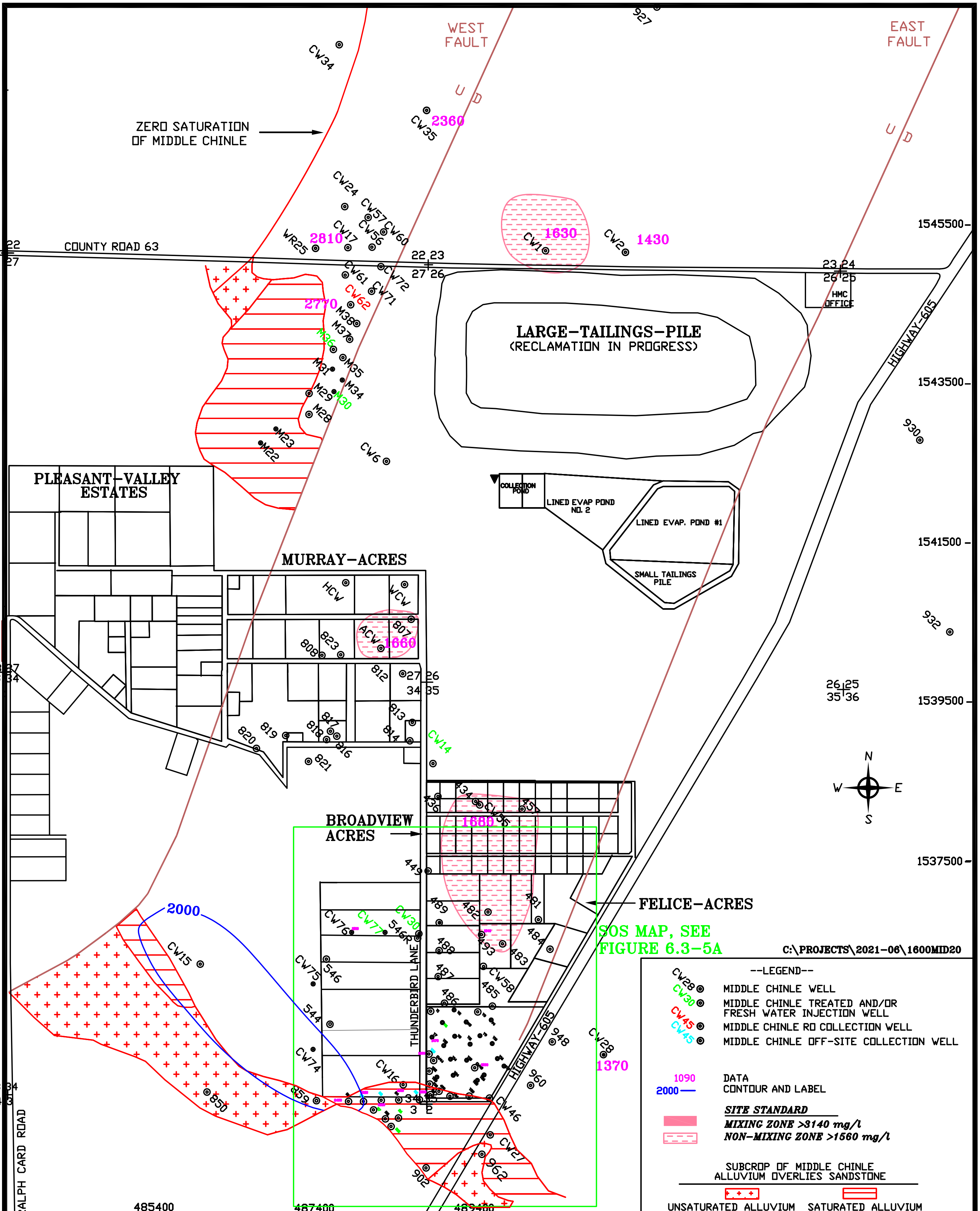



**FIGURE 6.3-4. SULFATE CONCENTRATIONS FOR NON-MIXING ZONE WELLS**
**493, ACW, CW1, CW2, CW28 AND CW55**

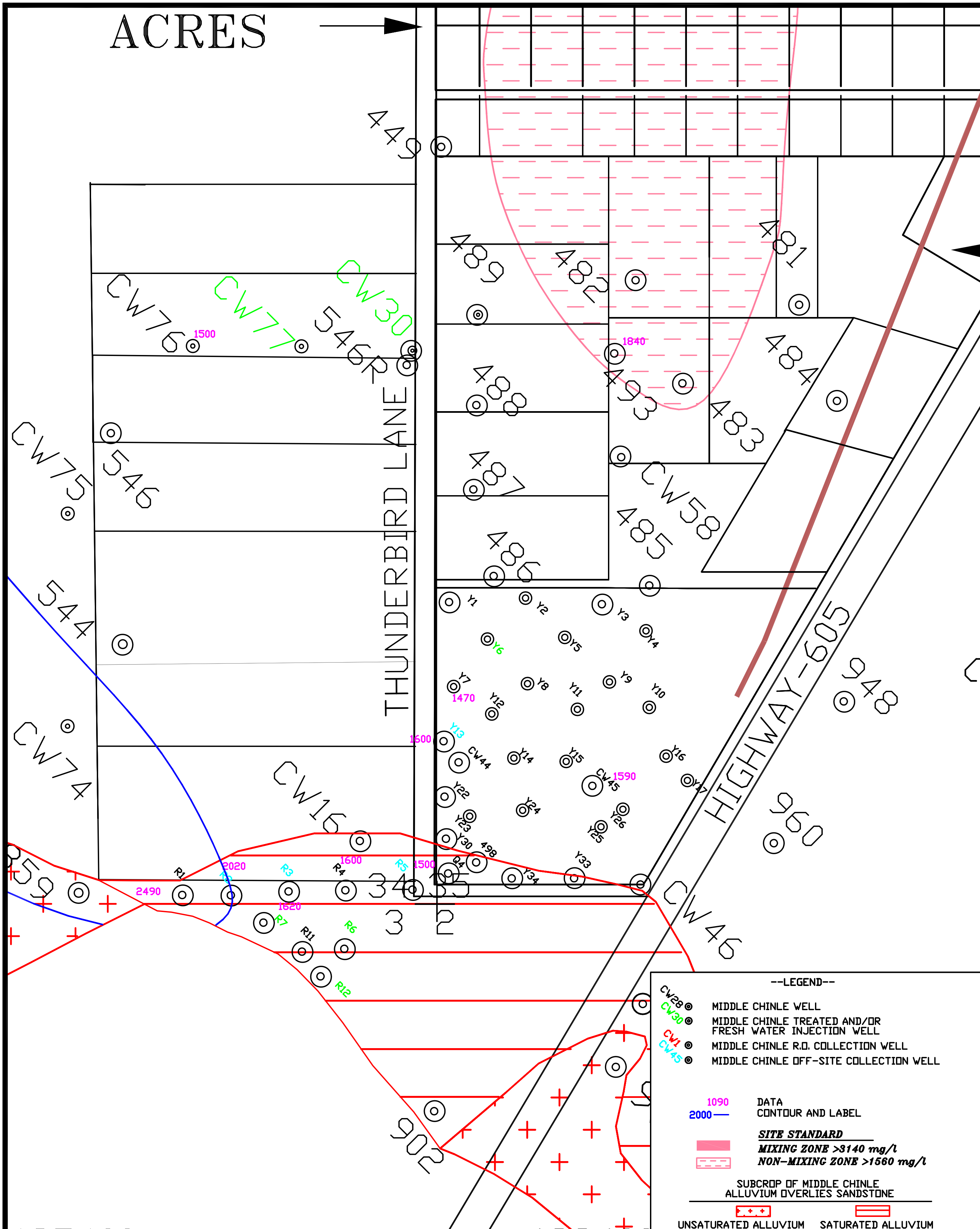



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**DATE: 3/9/2021**

**SCALE: 1"=1600'**

**FIGURE 6.3-5. TDS CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, mg/L**




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

**FIGURE 6.3-5A. TDS CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, SOS, mg/L**

**DATE:** 3/9/2021

**SCALE:** 1"=500'

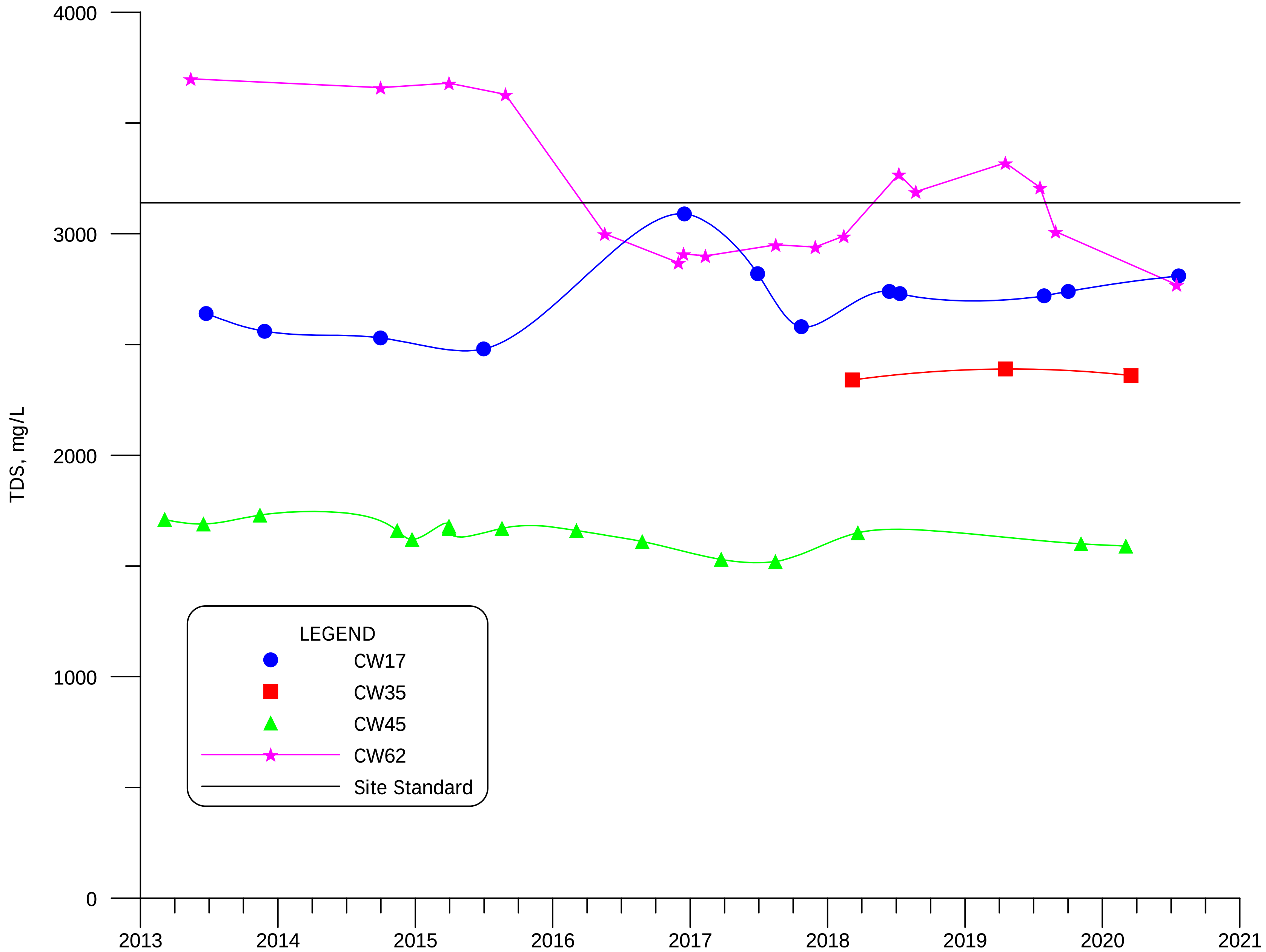



**FIGURE 6.3-6. TDS CONCENTRATIONS FOR MIXING ZONE WELLS CW17, CW35, CW45 AND CW62**

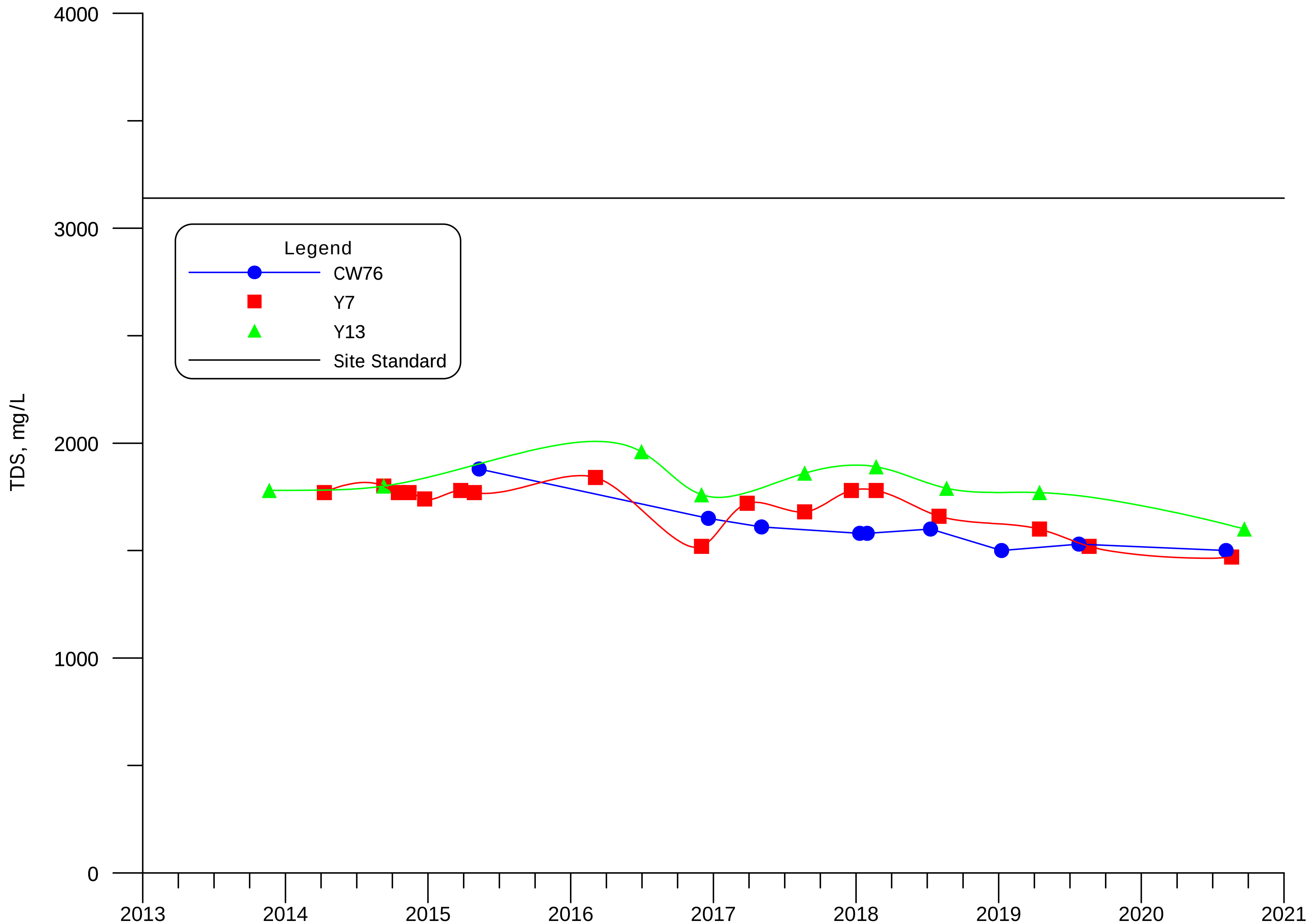



**FIGURE 6.3-6A. TDS CONCENTRATIONS FOR MIXING ZONE WELLS CW76, Y7 AND Y13**

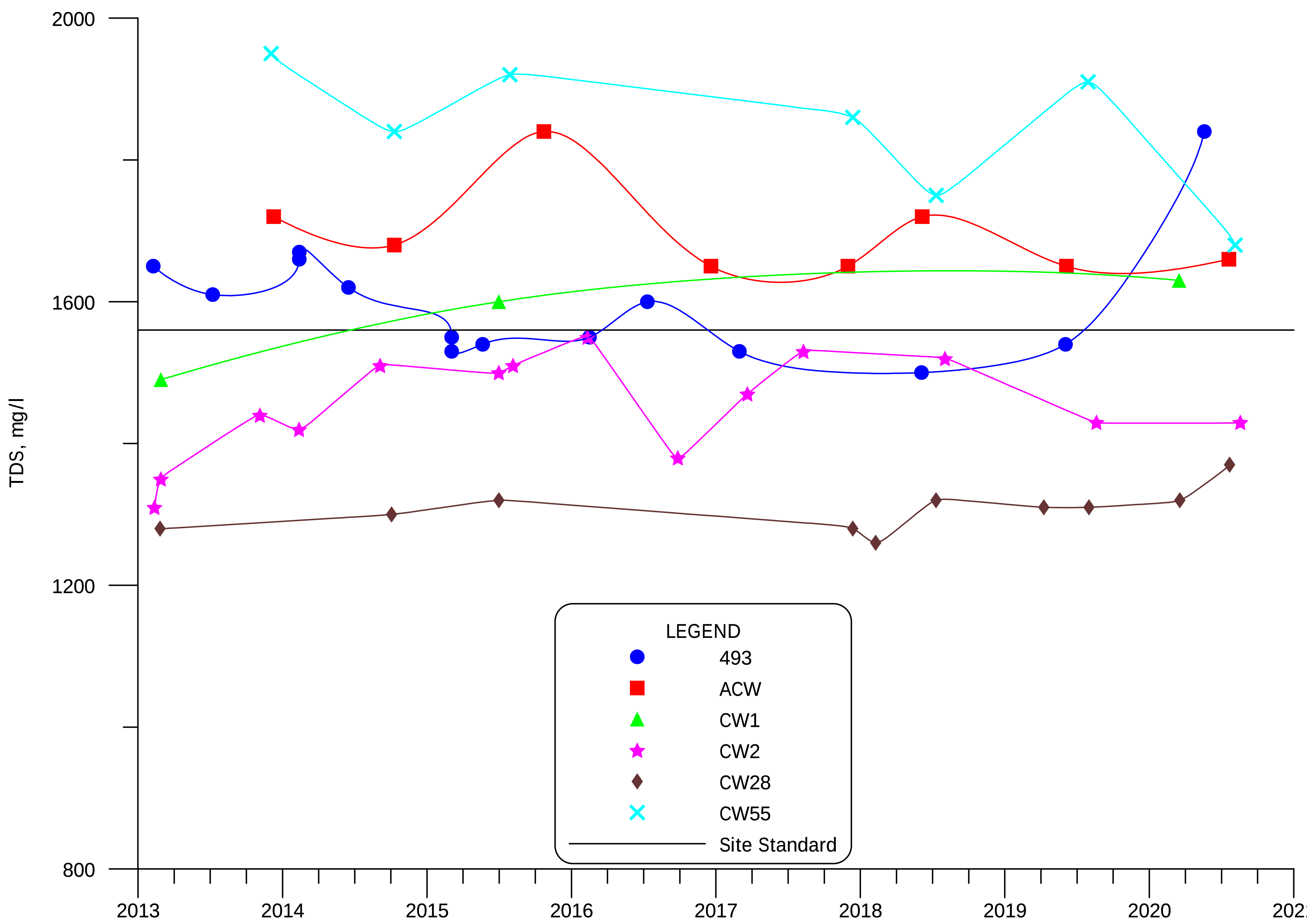
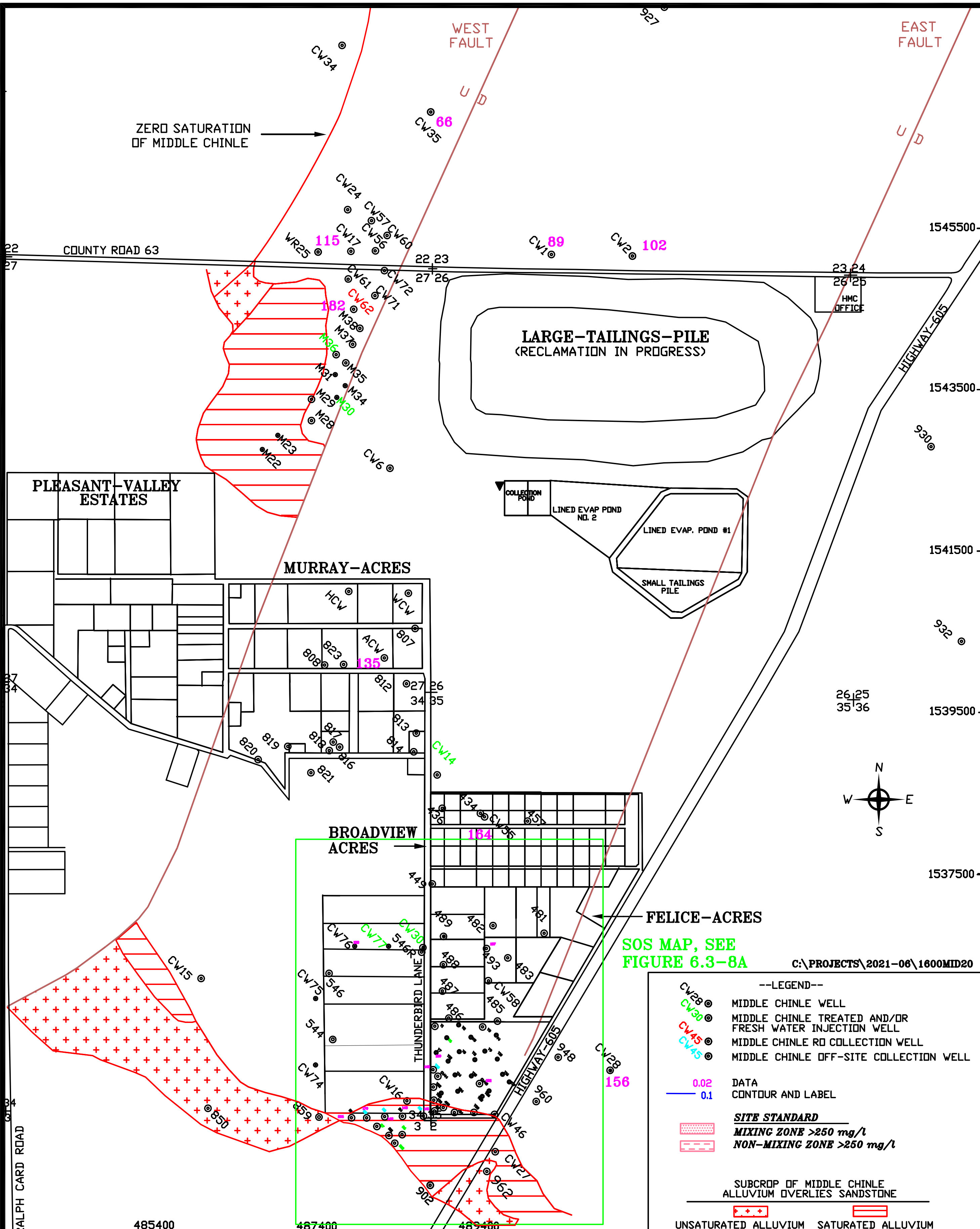



**FIGURE 6.3-7. TDS CONCENTRATIONS FOR NON-MIXING ZONE WELLS 493, ACW, CW1, CW2, CW28 AND CW55**

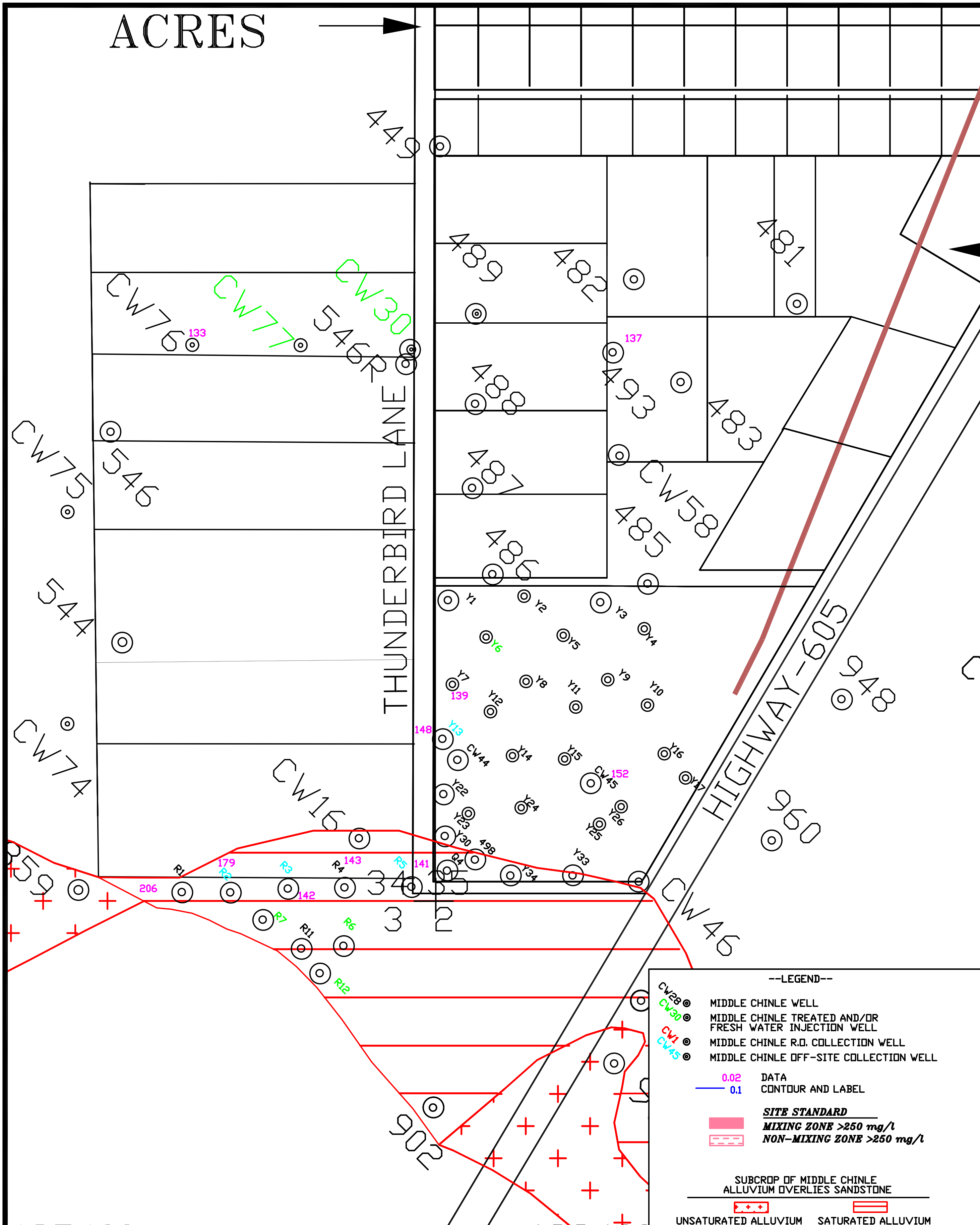



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**DATE: 12/8/2020**

**SCALE: 1"=1600'**

**FIGURE 6.3-8. CHLORIDE CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, mg/L**




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

**DATE: 12/8/2020**

**FIGURE 6.3-8A. CHLORIDE CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, SOS, mg/L**

**SCALE: 1"=500'**

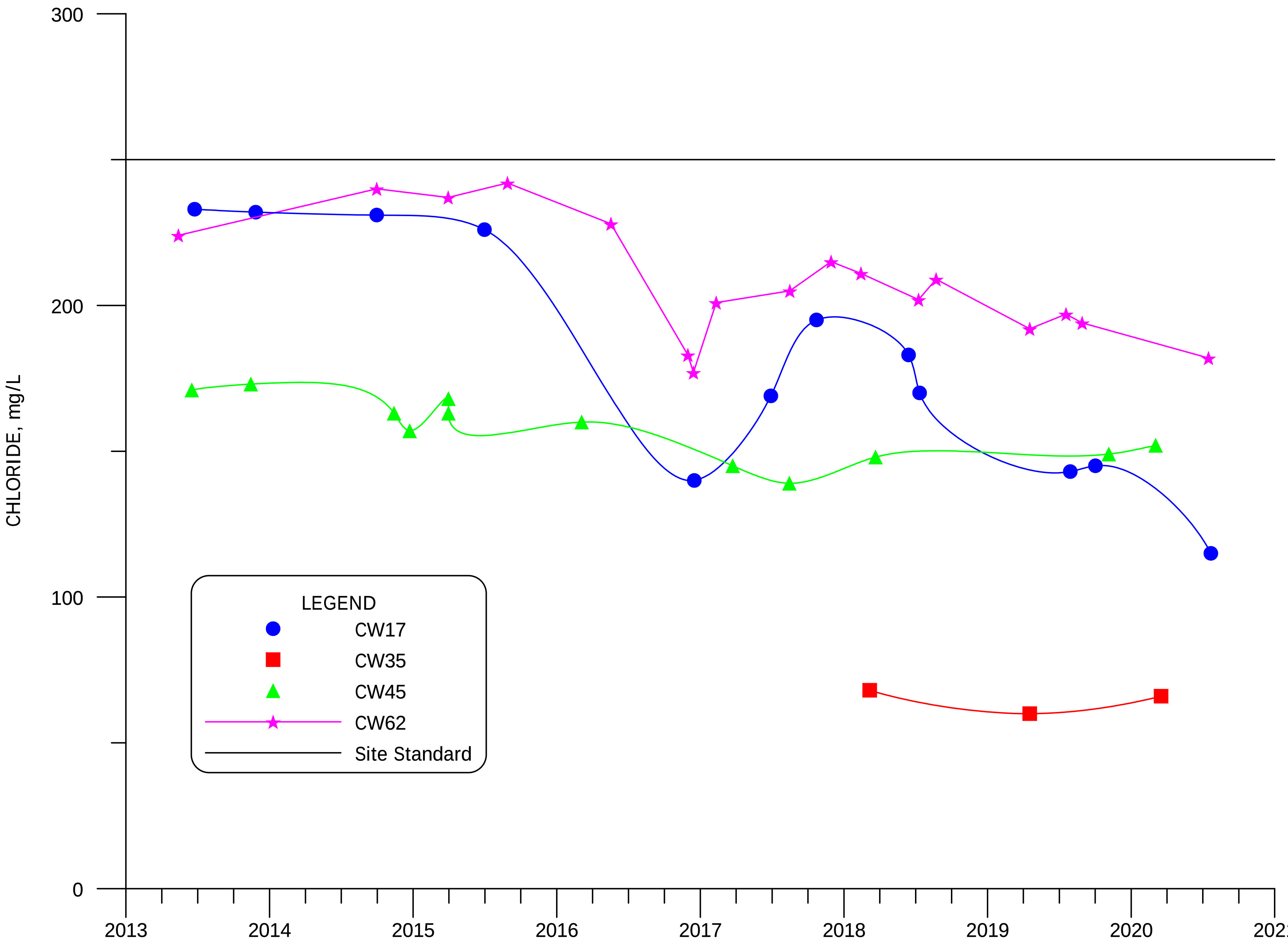



**FIGURE 6.3-9. CHLORIDE CONCENTRATIONS FOR MIXING ZONE WELLS CW17, CW35, CW45 AND CW62**

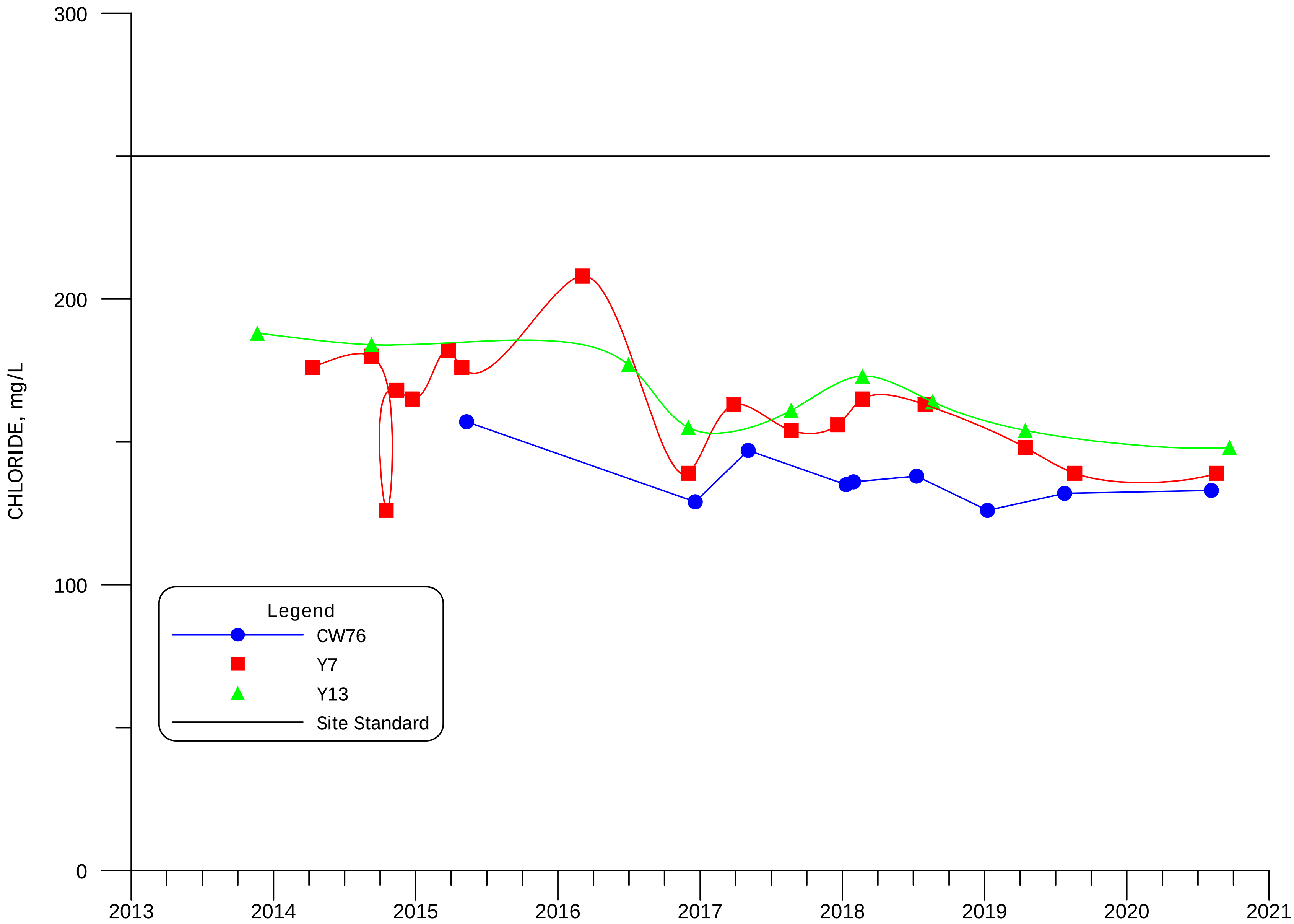



**FIGURE 6.3-9A. CHLORIDE CONCENTRATIONS FOR MIXING ZONE WELLS CW76, Y7 AND Y13**

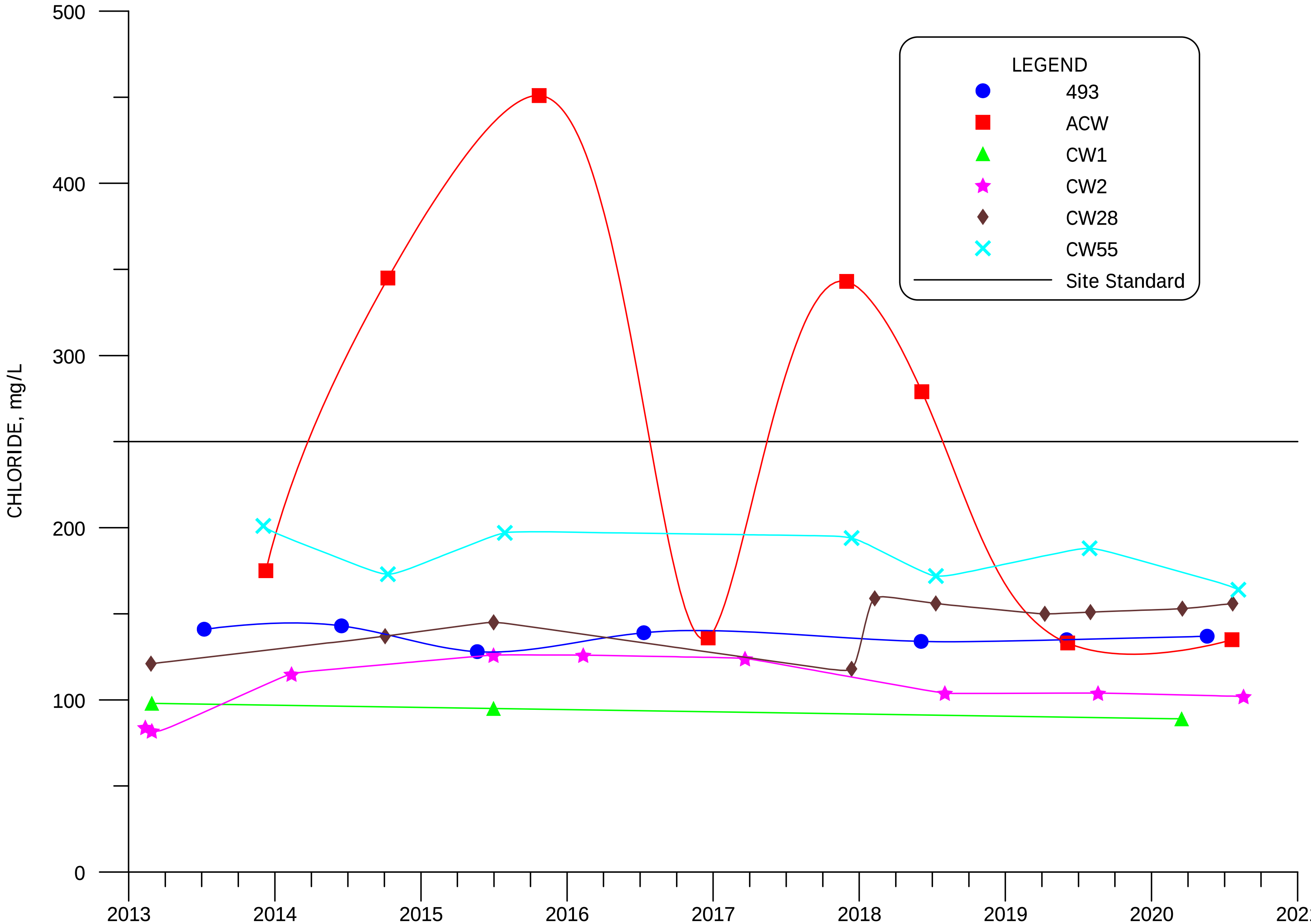
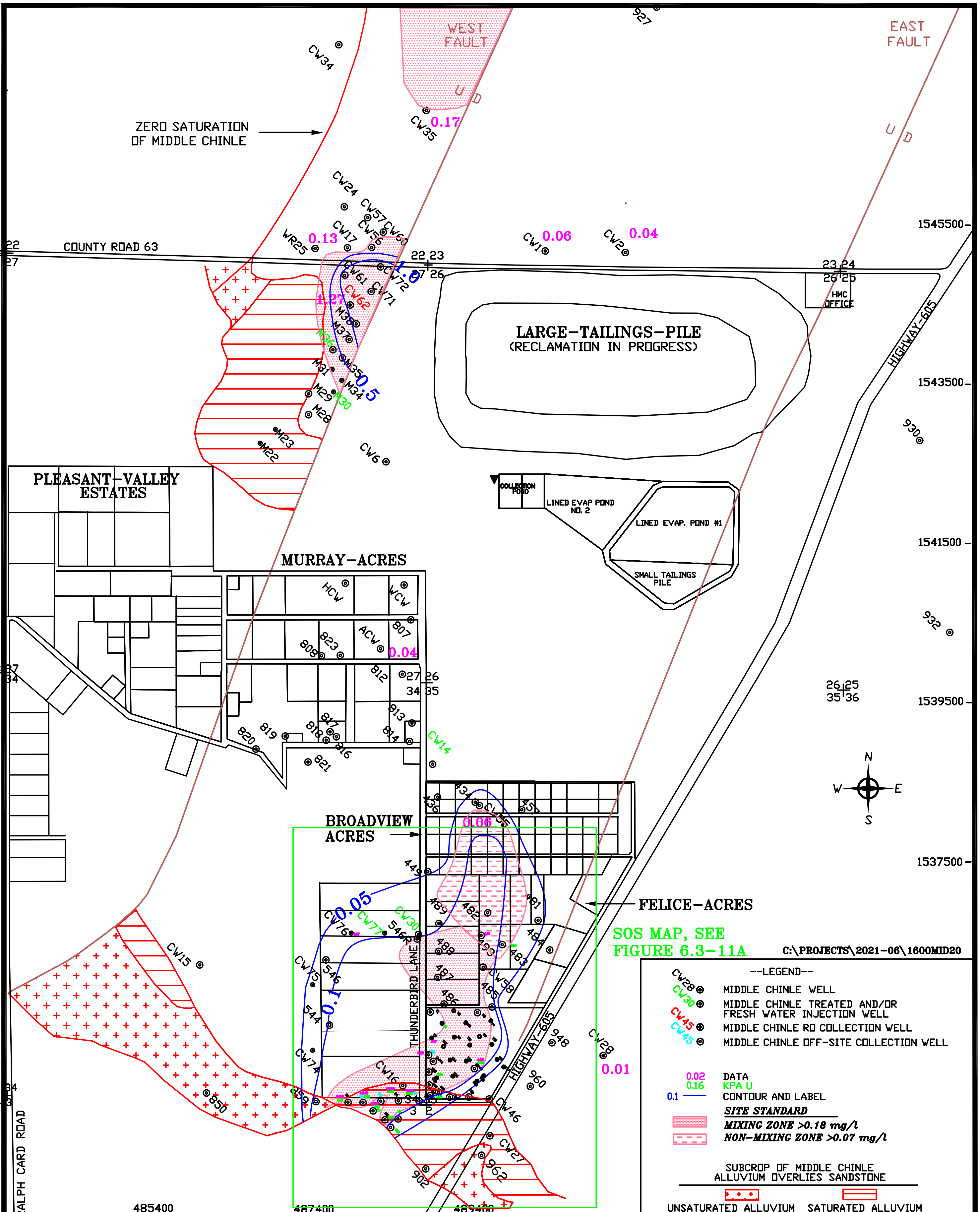



**FIGURE 6.3-10. CHLORIDE CONCENTRATIONS FOR NON-MIXING ZONE WELLS 493, ACW, CW1, CW2, CW28 AND CW55**

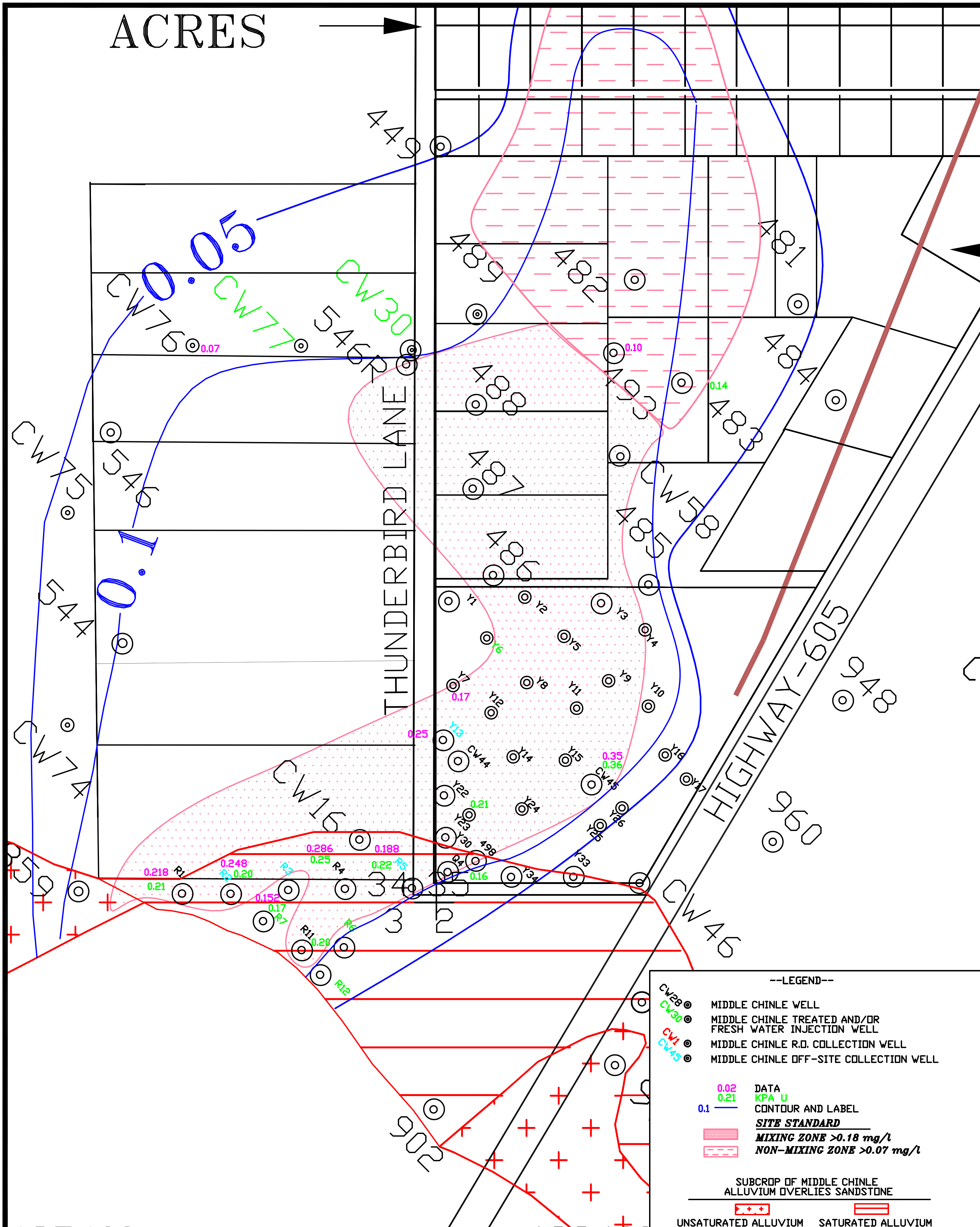



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**DATE: 3/9/2021**

**FIGURE 6.3-11. URANIUM CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, mg/L**

**SCALE: 1"=1600'**




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

**DATE: 3/9/2021**

**FIGURE 6.3-11A. URANIUM CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, SOS, 2020, mg/L**

**SCALE: 1"=500'**

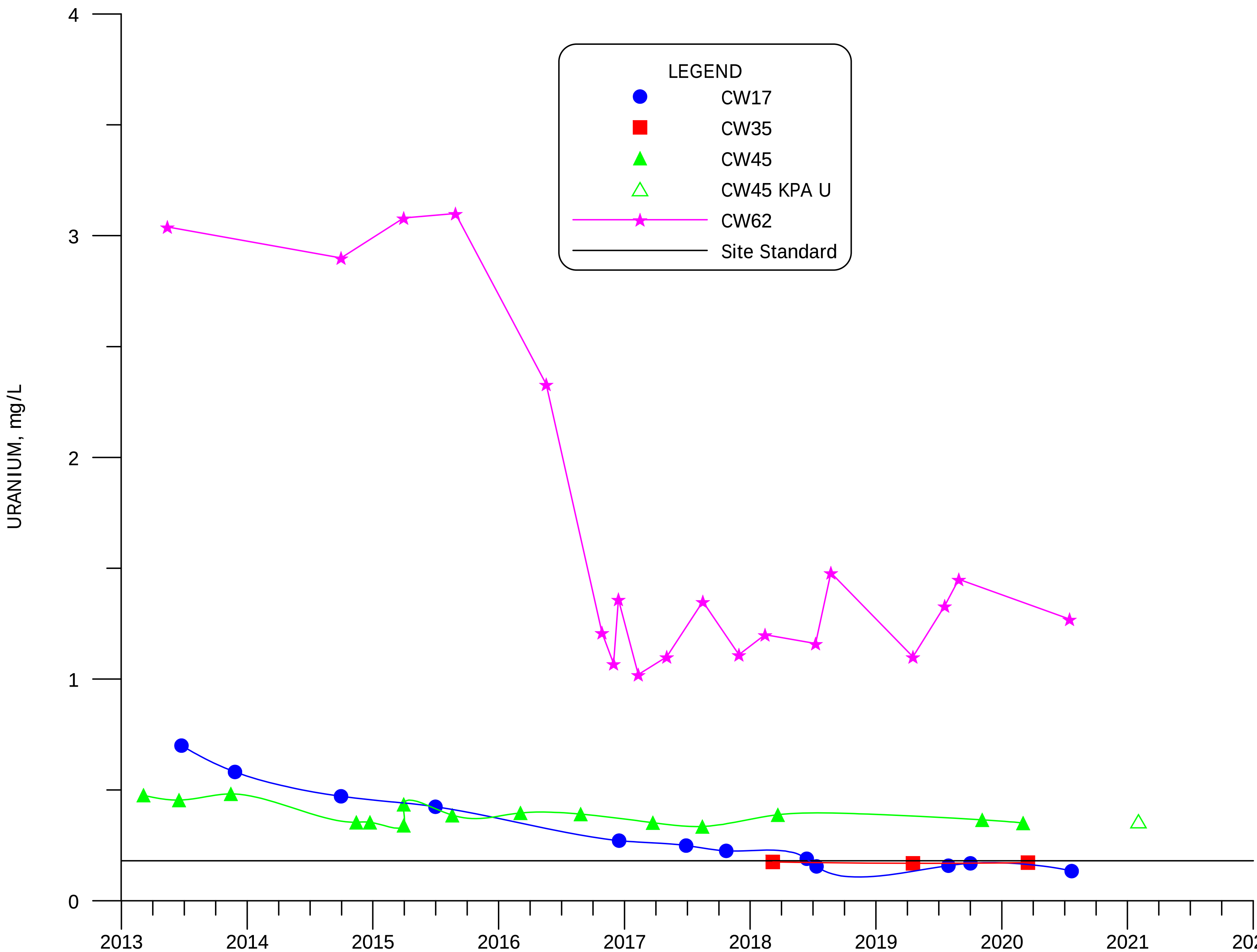



**FIGURE 6.3-12. URANIUM CONCENTRATIONS FOR MIXING ZONE WELLS CW17, CW35, CW45 AND CW62**

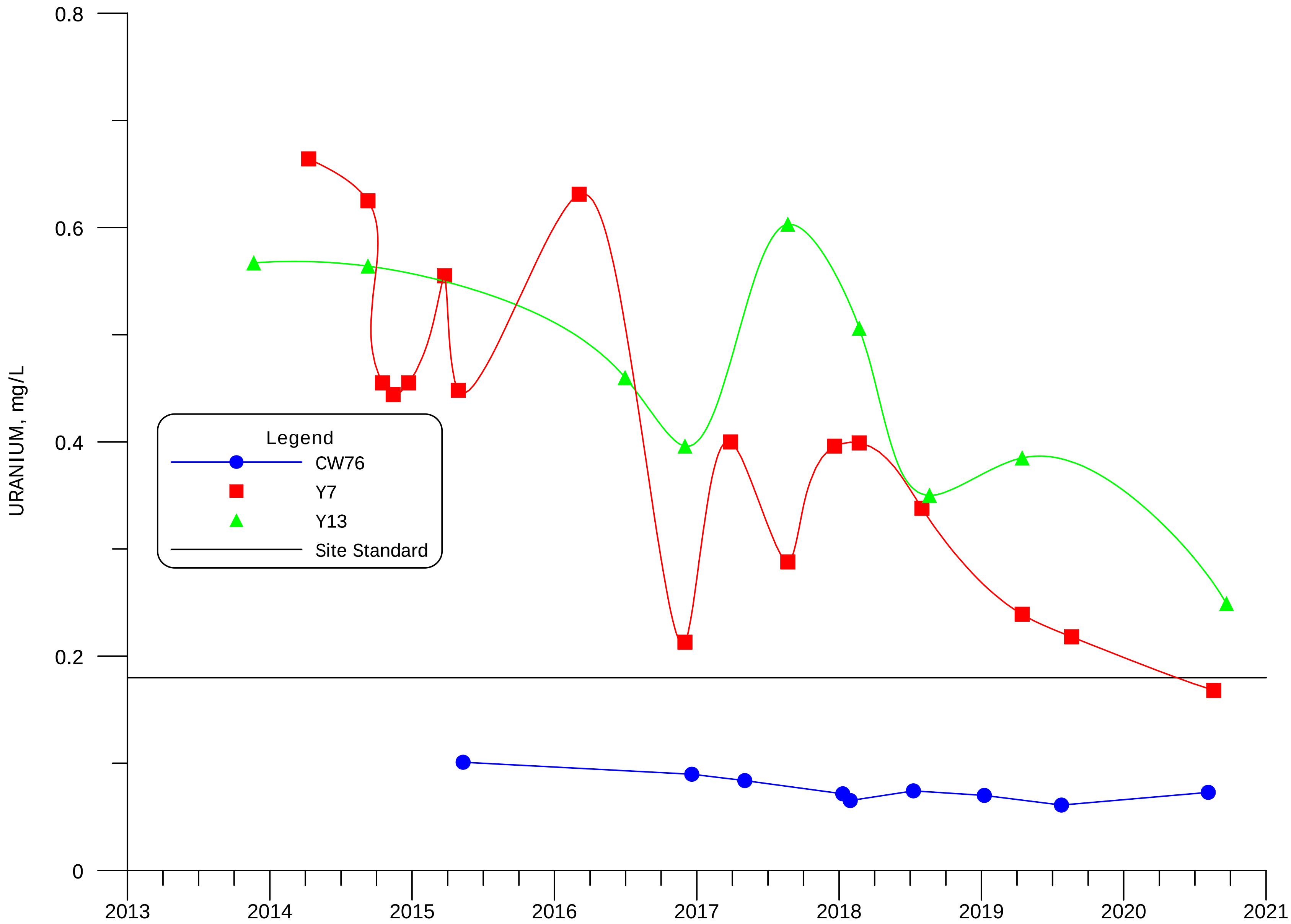



**FIGURE 6.3-12A. URANIUM CONCENTRATIONS FOR MIXING ZONE WELLS CW76, Y7 AND Y13**

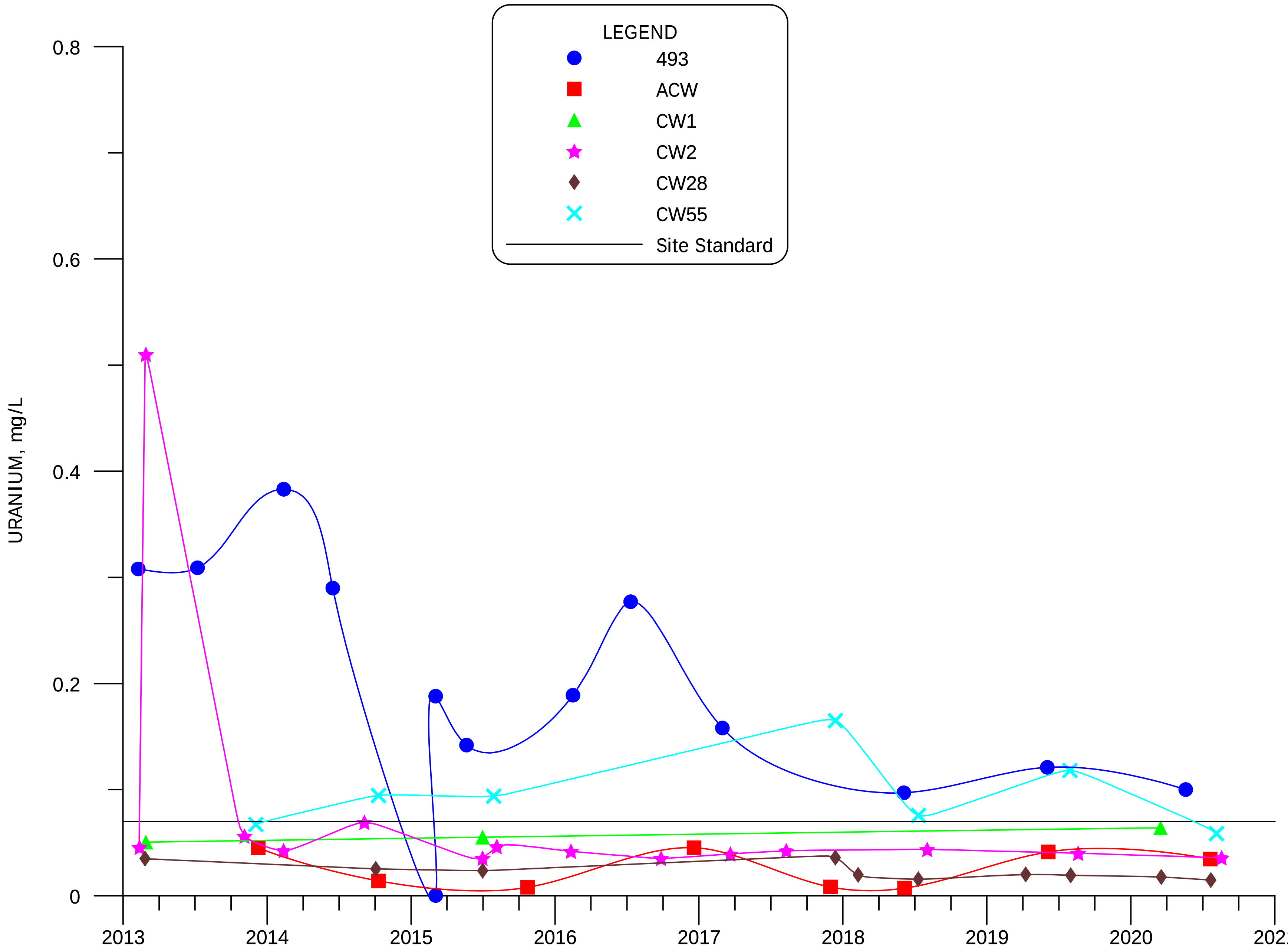
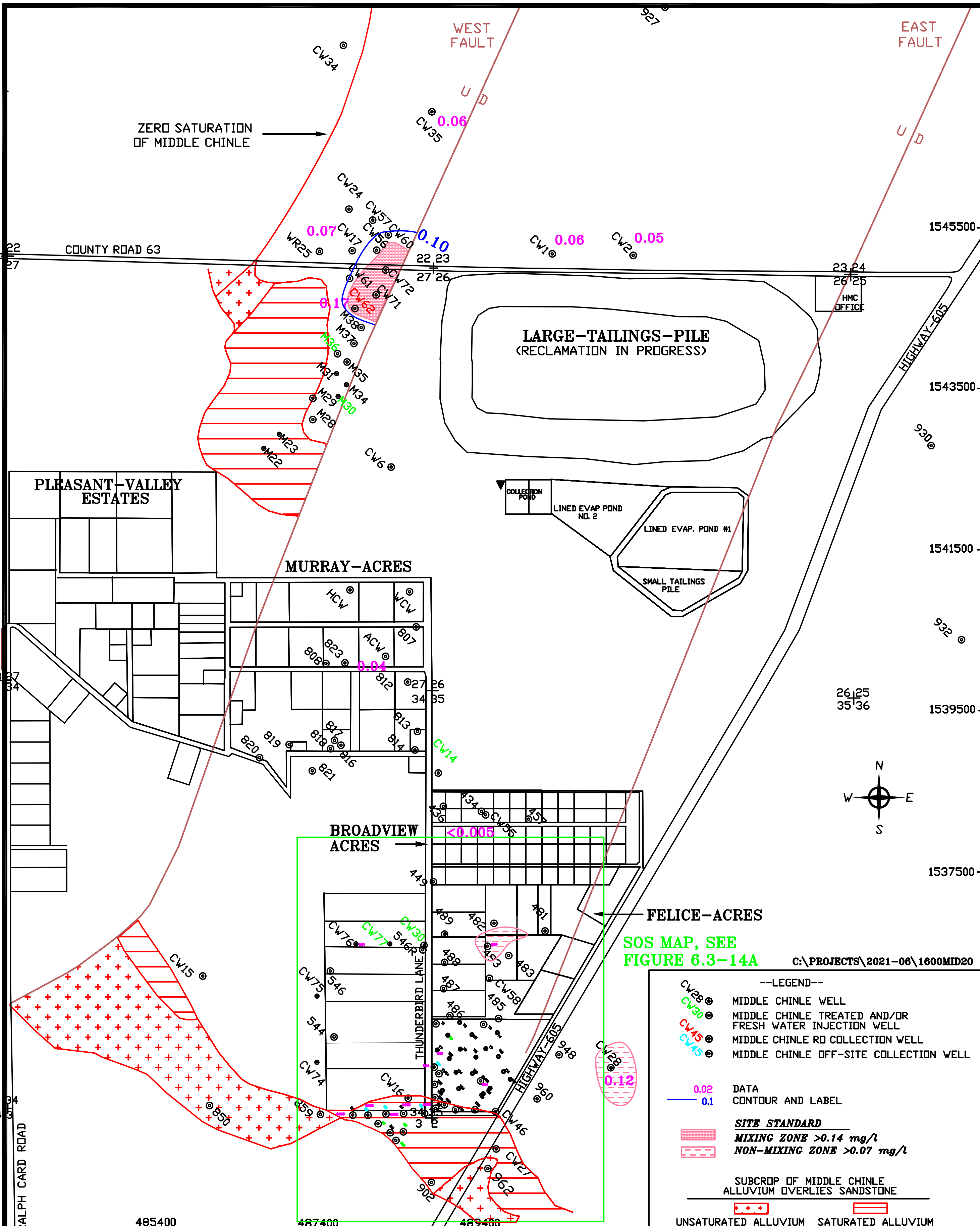



**FIGURE 6.3-13. URANIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 493, ACW, CW1, CW2, CW28 AND CW55**

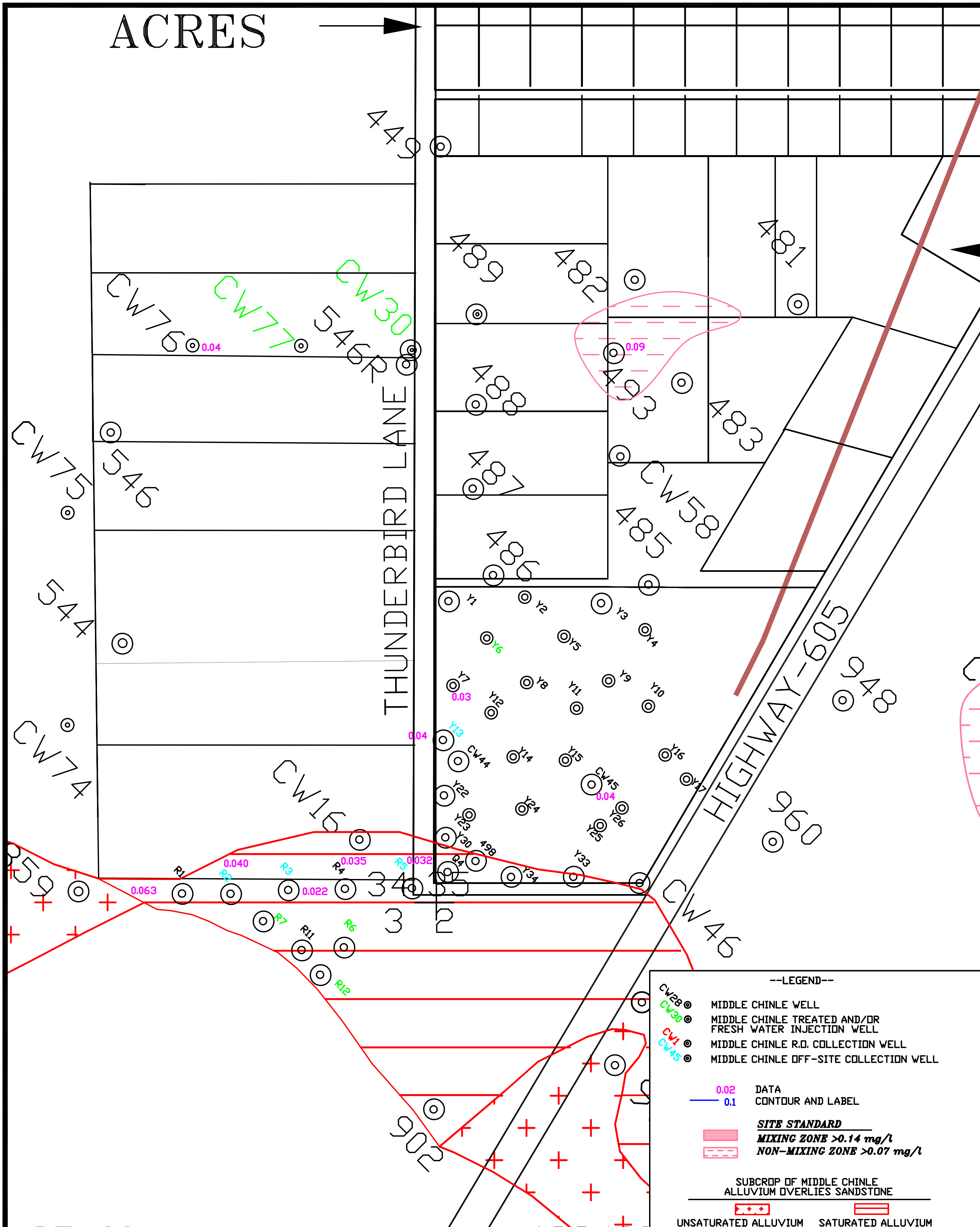



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**DATE: 12/8/2020**

**FIGURE 6.3-14. SELENIUM CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, mg/L**

**SCALE: 1"=1600'**

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**DATE: 12/8/2020**

**FIGURE 6.3-14A. SELENIUM CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, SOS, 2020, mg/L**

**SCALE: 1"=500'**

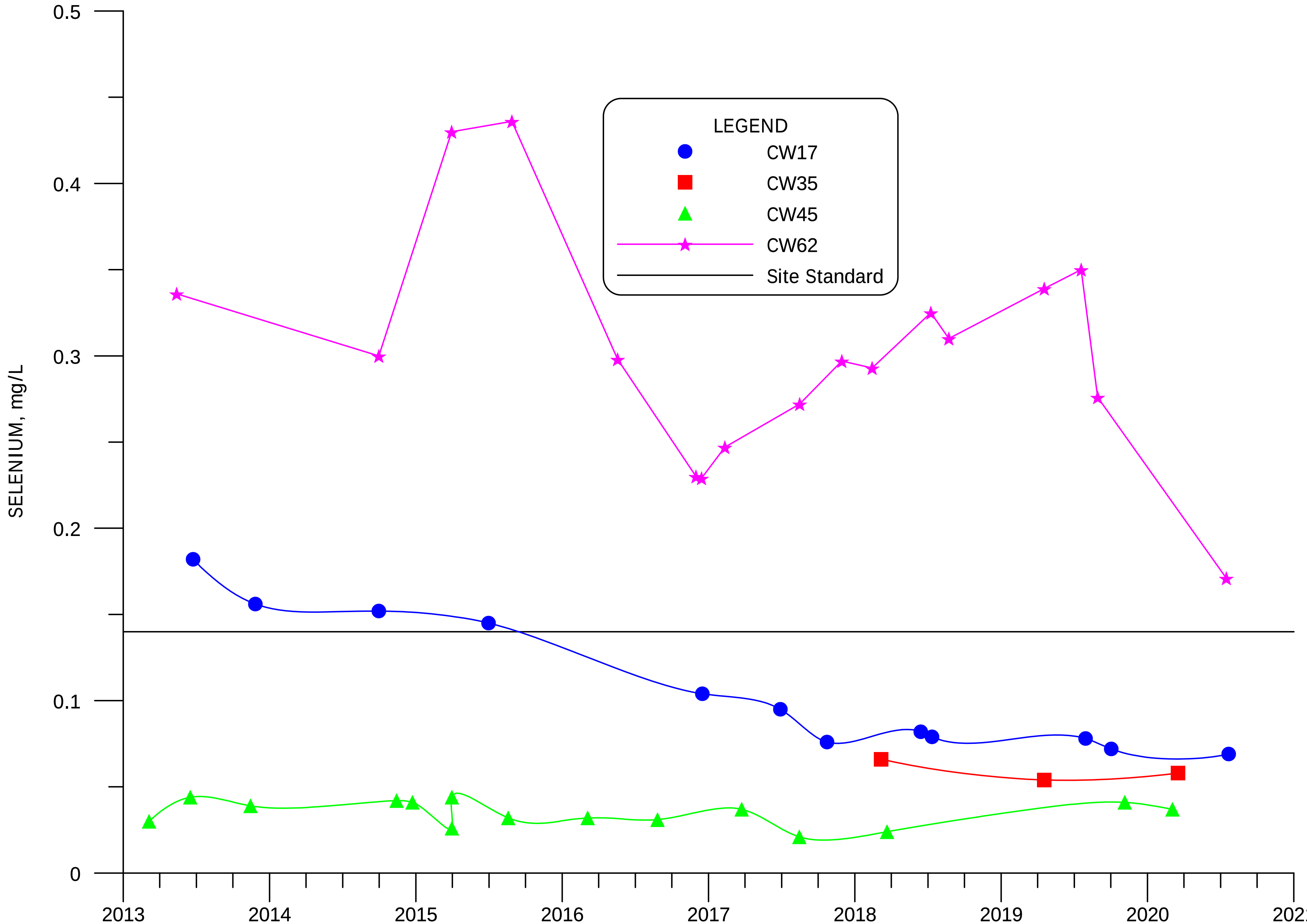



**FIGURE 6.3-15. SELENIUM CONCENTRATIONS FOR MIXING ZONE WELLS CW17, CW35, CW45 AND CW62**

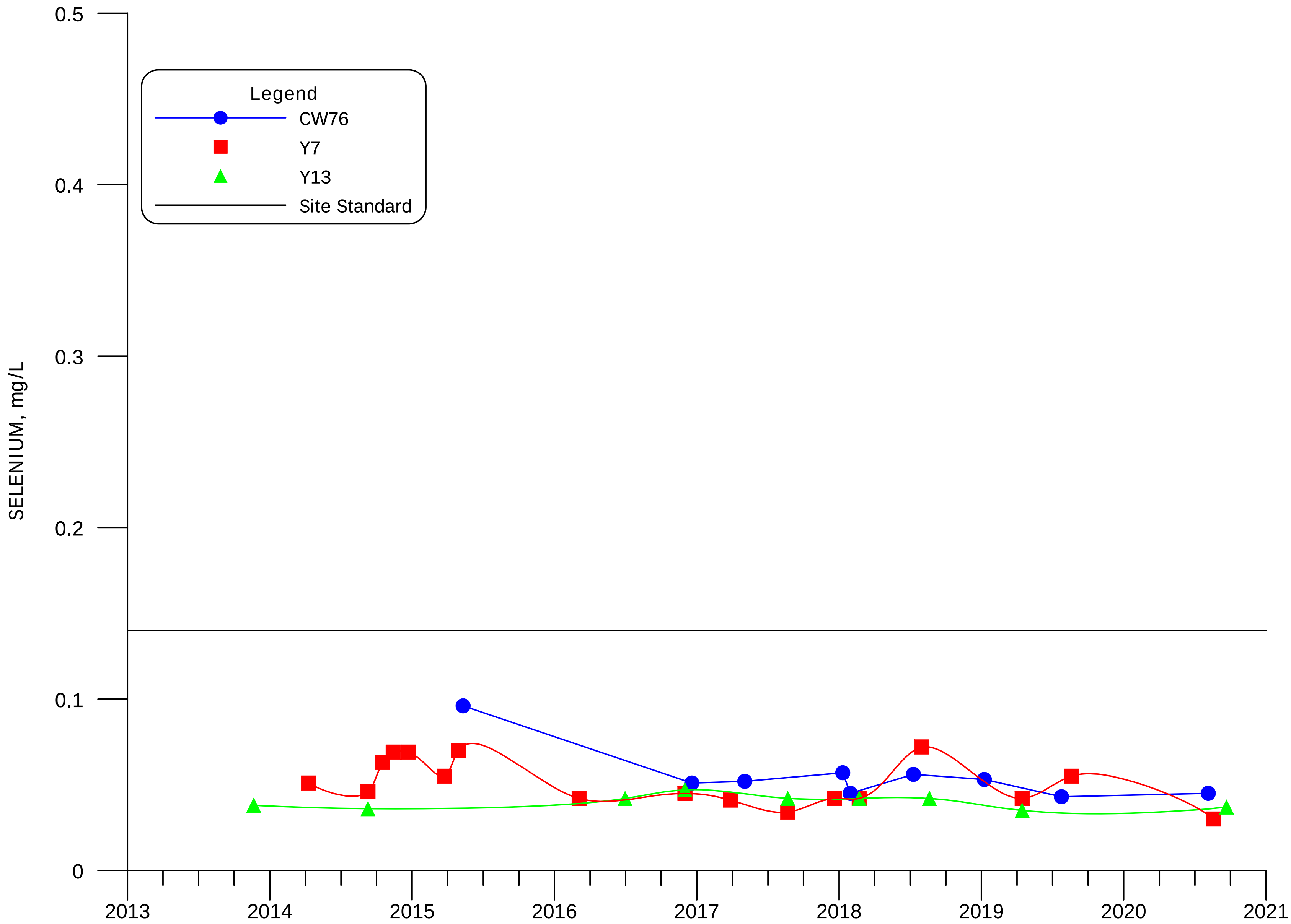



**FIGURE 6.3-15A. SELENIUM CONCENTRATIONS FOR MIXING ZONE WELLS CW76, Y7 AND Y13**

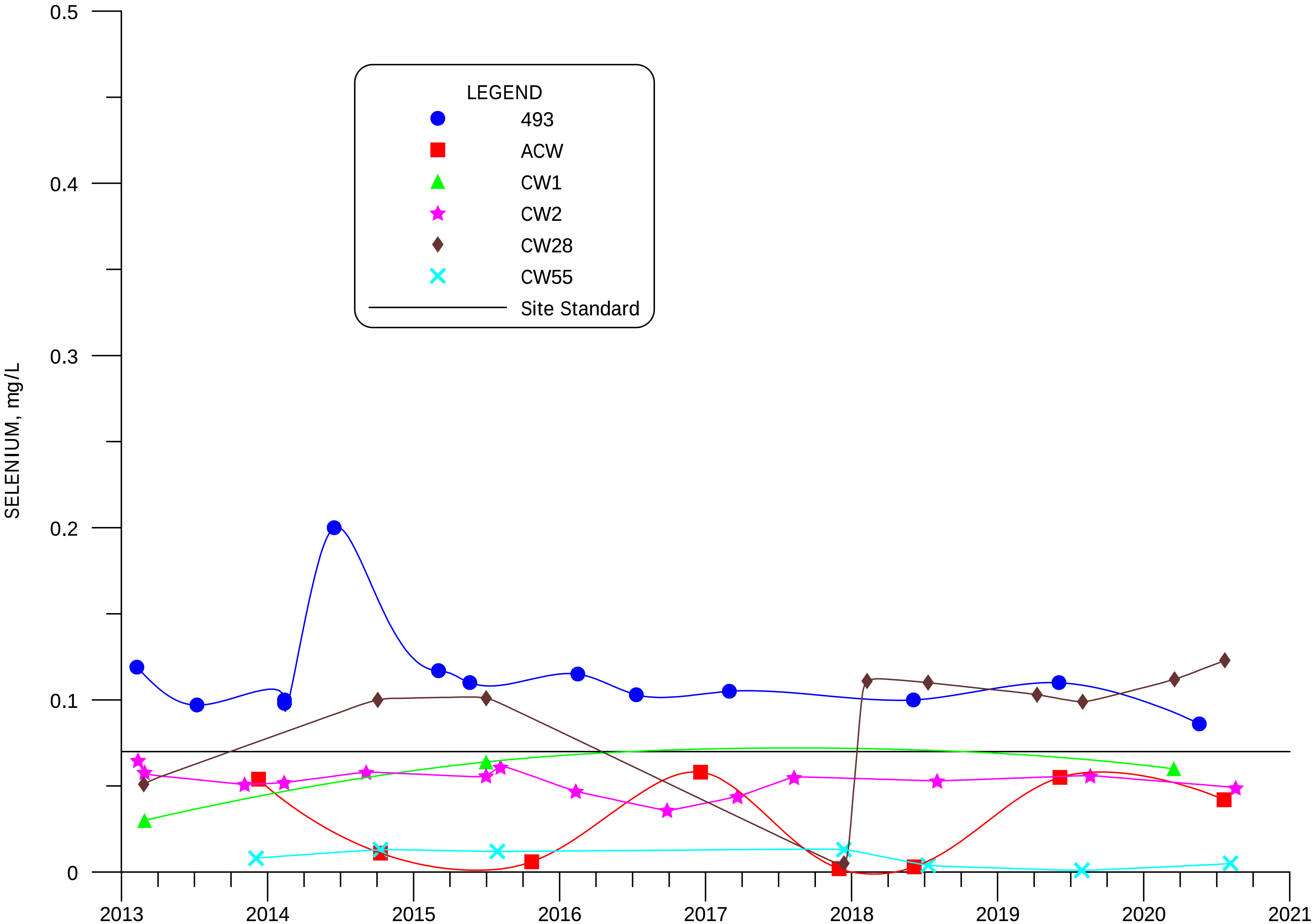
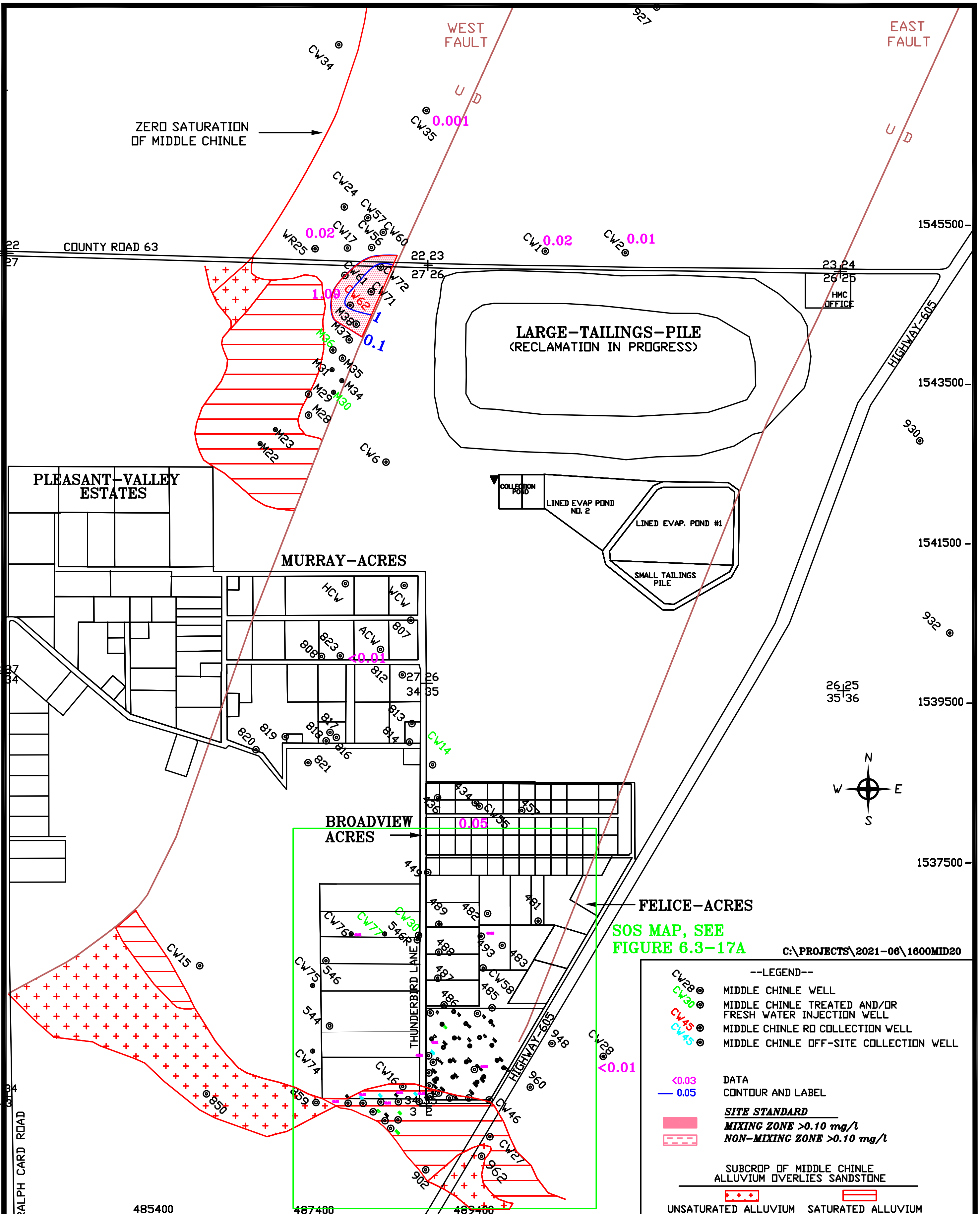
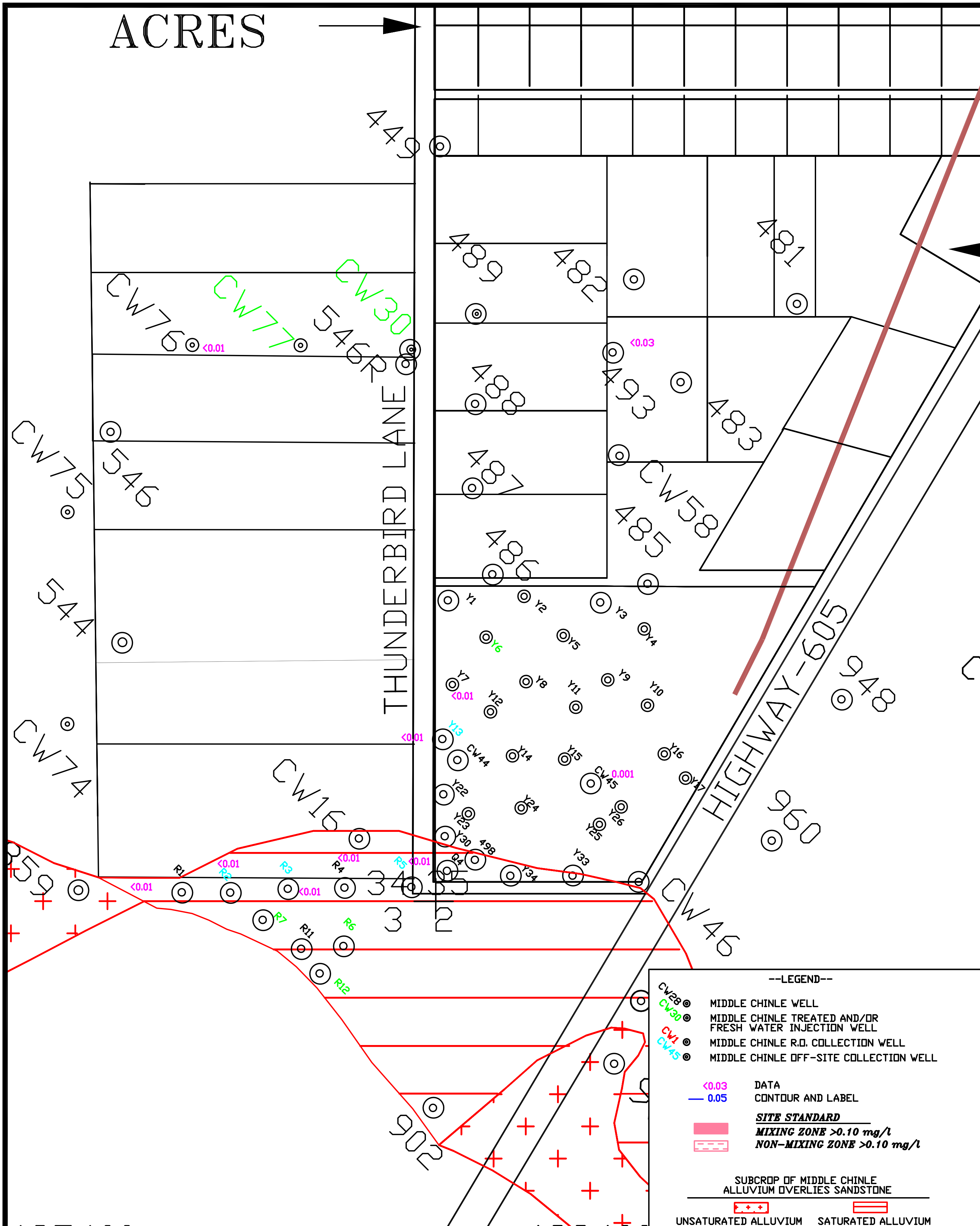



**FIGURE 6.3-16. SELENIUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 493, ACW, CW1, CW2, CW28 AND CW55**




| HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W | DATE: 12/8/2020 |
|---|---|
| FIGURE 6.3-17. MOLYBDENUM CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, mg/L | SCALE: 1"=1600' |
| | PAGE: 6.3-35 |




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

**FIGURE 6.3–17A. MOLYBDENUM OF THE MIDDLE CHINLE AQUIFER, SOS, 2020, mg/L**

**DATE: 12/8/2020**

**SCALE: 1"=500'**

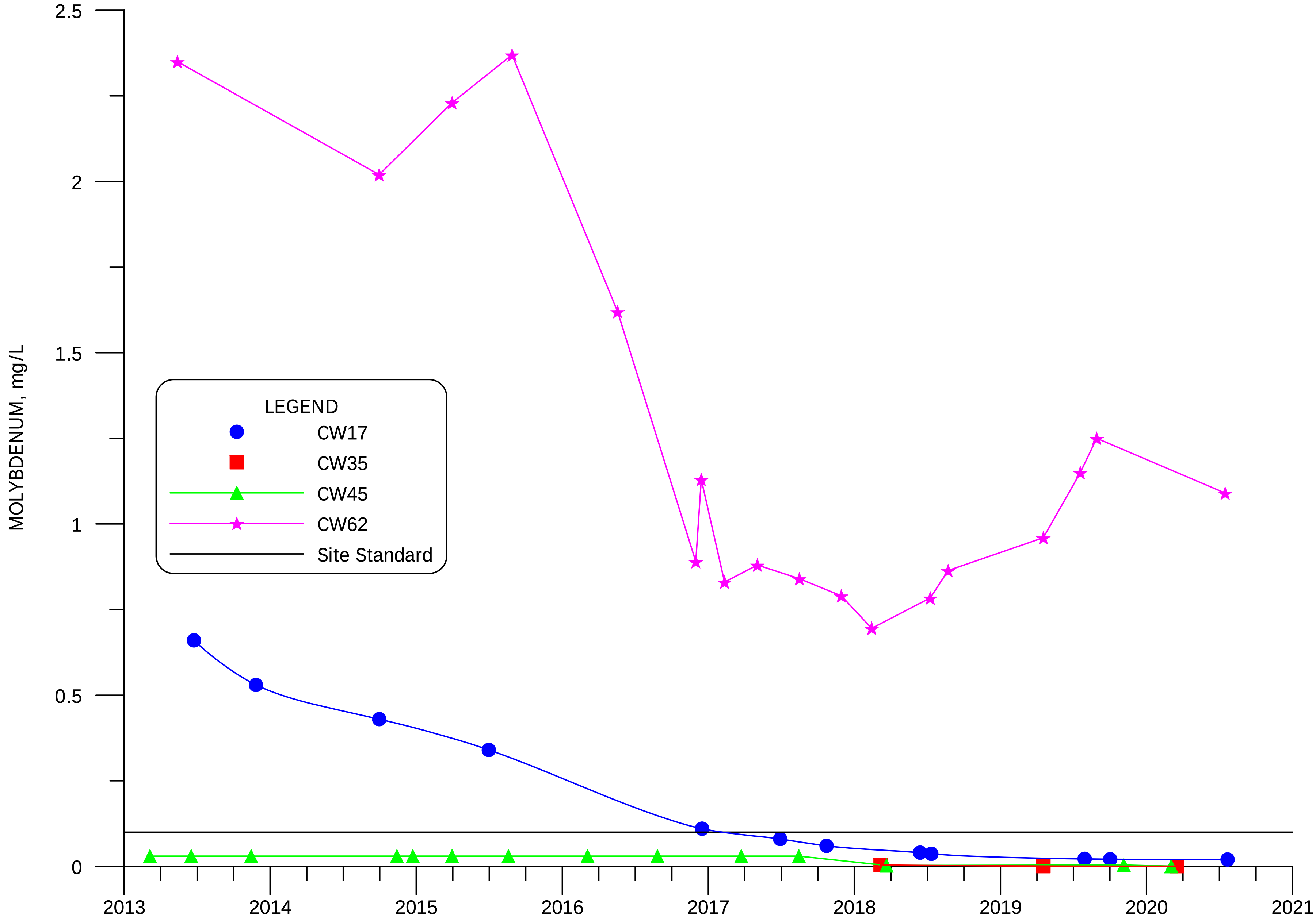



**FIGURE 6.3-18. MOLYBDENUM CONCENTRATIONS FOR MIXING ZONE WELLS CW17, CW35, CW45 AND CW62**

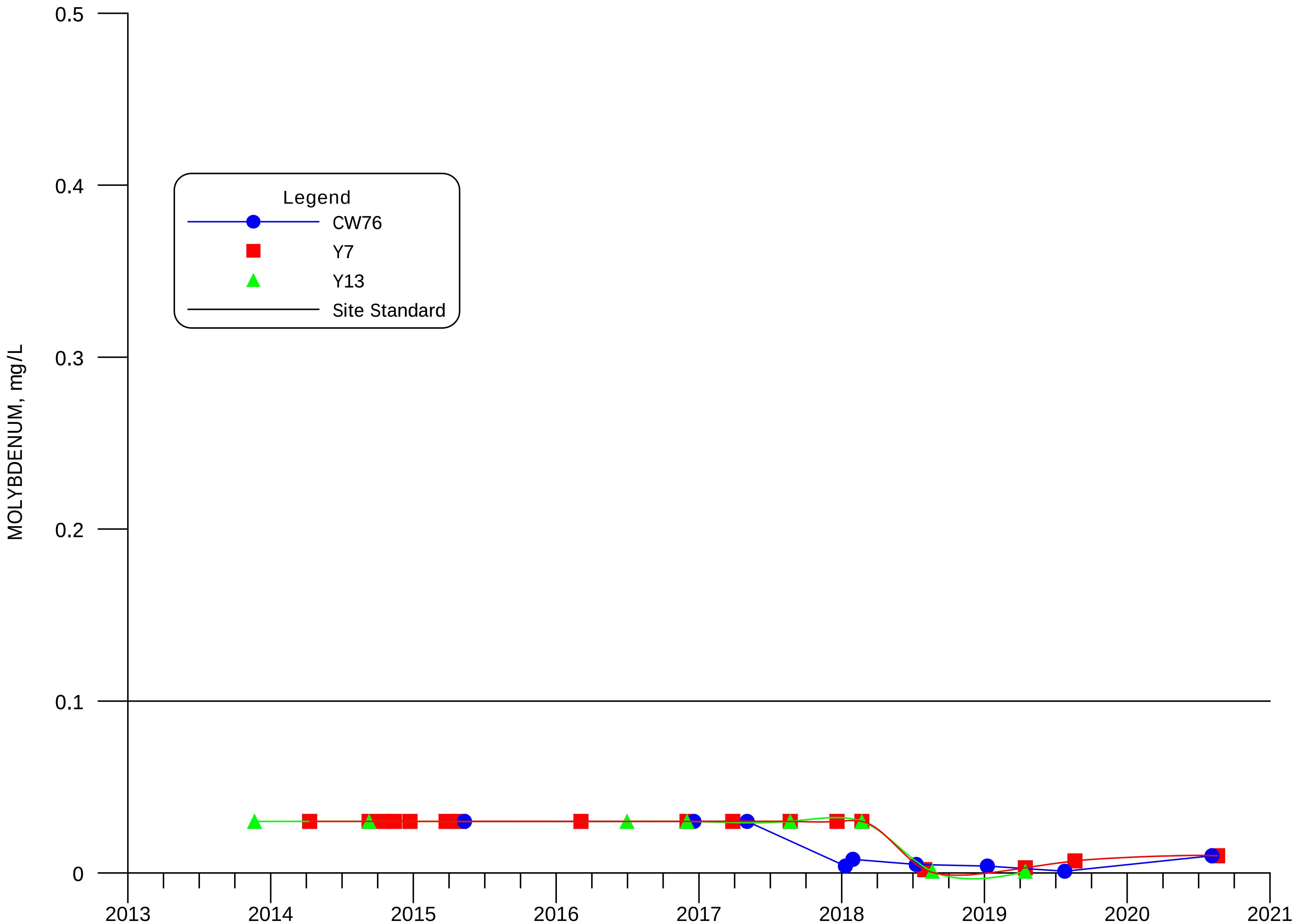



**FIGURE 6.3-18A. MOLYBDENUM CONCENTRATIONS FOR MIXING ZONE WELLS CW76, Y7 AND Y13**

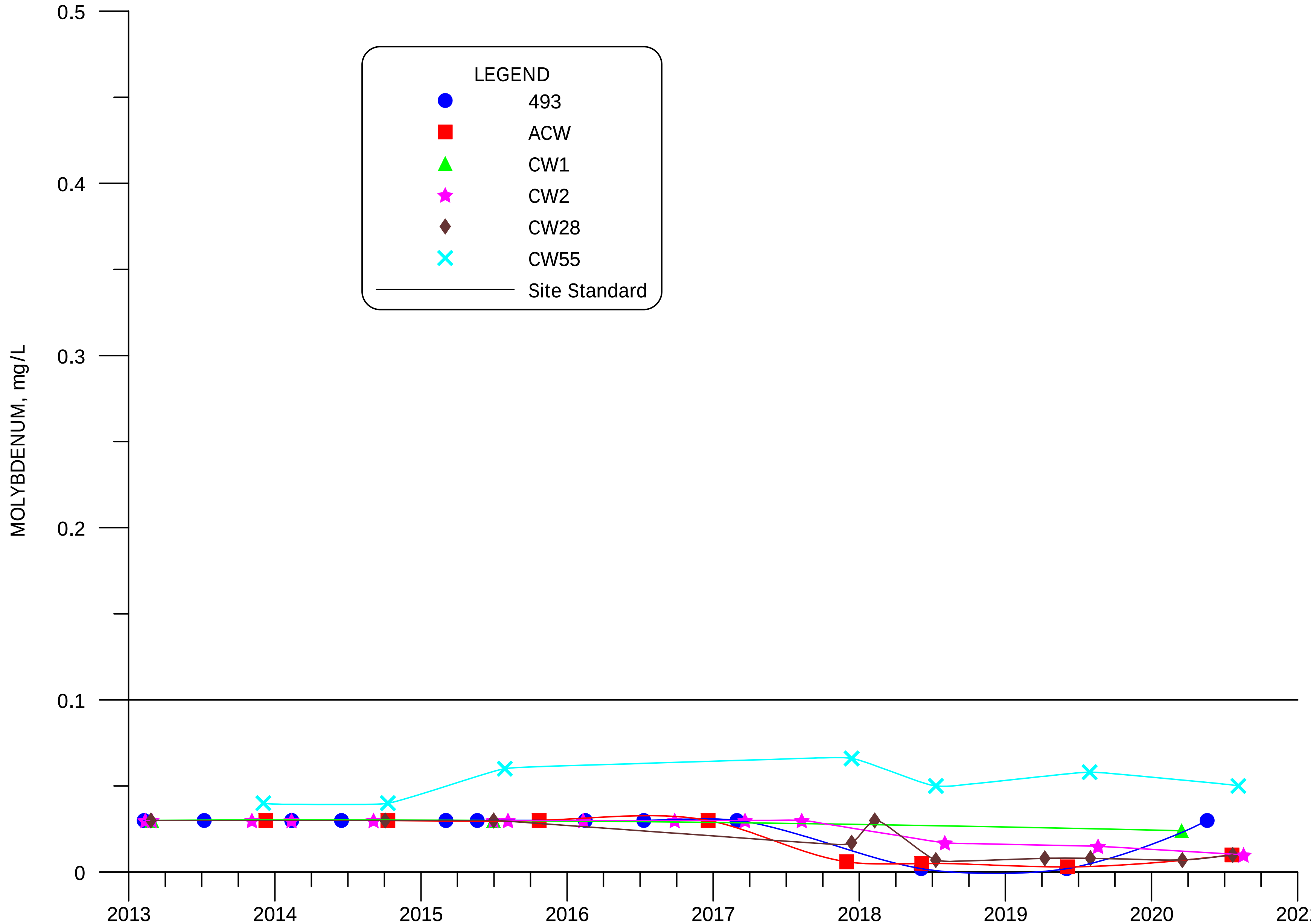
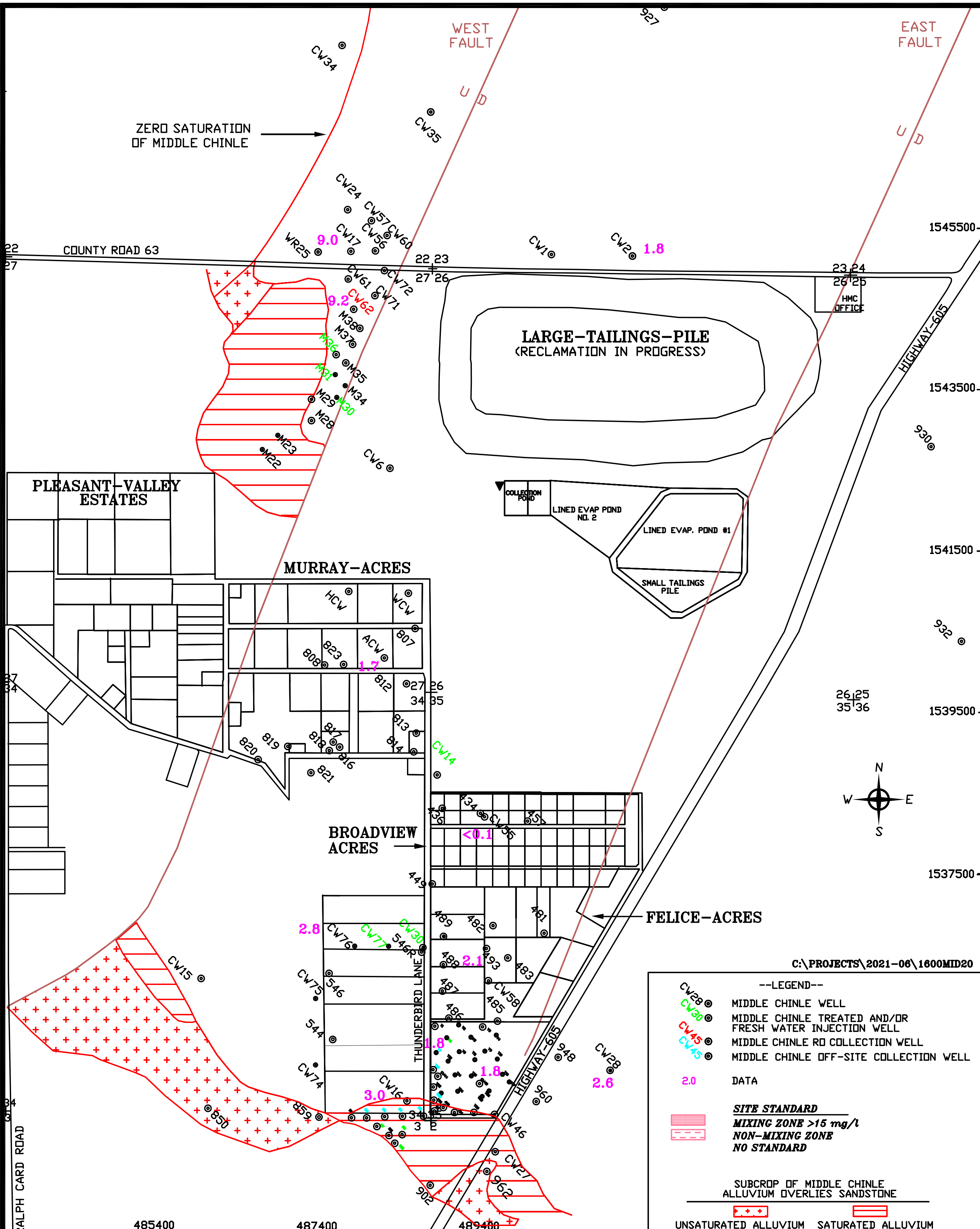



**FIGURE 6.3-19. MOLYBDENUM CONCENTRATIONS FOR NON-MIXING ZONE WELLS 493, ACW, CW1,CW2, CW28 AND CW55**




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

**DATE: 9/29/2020**

**FIGURE 6.3–20. NITRATE CONCENTRATIONS OF THE MIDDLE CHINLE AQUIFER, 2020, mg/L**

**SCALE: 1"=1600'**

**TABLE 6.3-1. MIDDLE CHINLE SITE STANDARDS AND 2020 BACKGROUND MIDDLE CHINLE DATA**

| | CONSTITUENT, concentrations in mg/L | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aquifer Zone | Selenium | Uranium | Molybdenum | TDS | Sulfate | Chloride | Nitrate | Vanadium |
| CHINLE SITE STANDARDS | | | | | | | | |
| Chinle Mixing | 0.14 | 0.18 | 0.10 | 3140 | 1750 | 250 | 15 | 0.01 |
| Middle Chinle Non-Mixing | 0.07 | 0.07 | 0.10 | 1560 | 857 | 250 | * | * |
| CHINLE MIXING ZONE WELLS | | | | | | | | |
| CW9 | - | - | - | - | - | - | - | - |
| CW50 | <0.001 | 0.02 | 0.002 | 1710 | 881 | 56 | 0.6 | <0.01 |
| CW52 | - | - | - | - | - | - | - | - |
| CW15 | - | - | - | - | - | - | - | - |
| CW24 | - | - | - | - | - | - | - | - |
| CW35 | 0.06 | 0.17 | 0.001 | 2360 | 1280 | 66 | 3.0 | <0.01 |
| CW36 | - | - | - | - | - | - | - | - |
| CW37 | - | - | - | - | - | - | - | - |
| CW39 | - | - | - | - | - | - | - | - |
| CW43 | 0.04 | 0.048 | <0.01 | 2640 | 1260 | 222 | 7.0 | <0.2 |
| MIDDLE CHINLE NON-MIXING ZONE WELLS | | | | | | | | |
| ACW | 0.04 | 0.03 | <0.01 | 1660 | 604 | 135 | 1.7 | <0.02 |
| CW1 | 0.06 | 0.06 | 0.02 | 1630 | 748 | 89 | - | - |
| CW2 | 0.05 | 0.04 | 0.01 | 1430 | 567 | 102 | 1.8 | <0.01 |
| CW28 | 0.12 | 0.01 | <0.01 | 1370 | 480 | 156 | 2.6 | <0.02 |
| WCW | - | - | - | - | - | - | - | - |

* Background water quality analyses for constituent determined that site standard is not necessary.

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**FOR HOMESTAKE'S GRANTS PROJECT**

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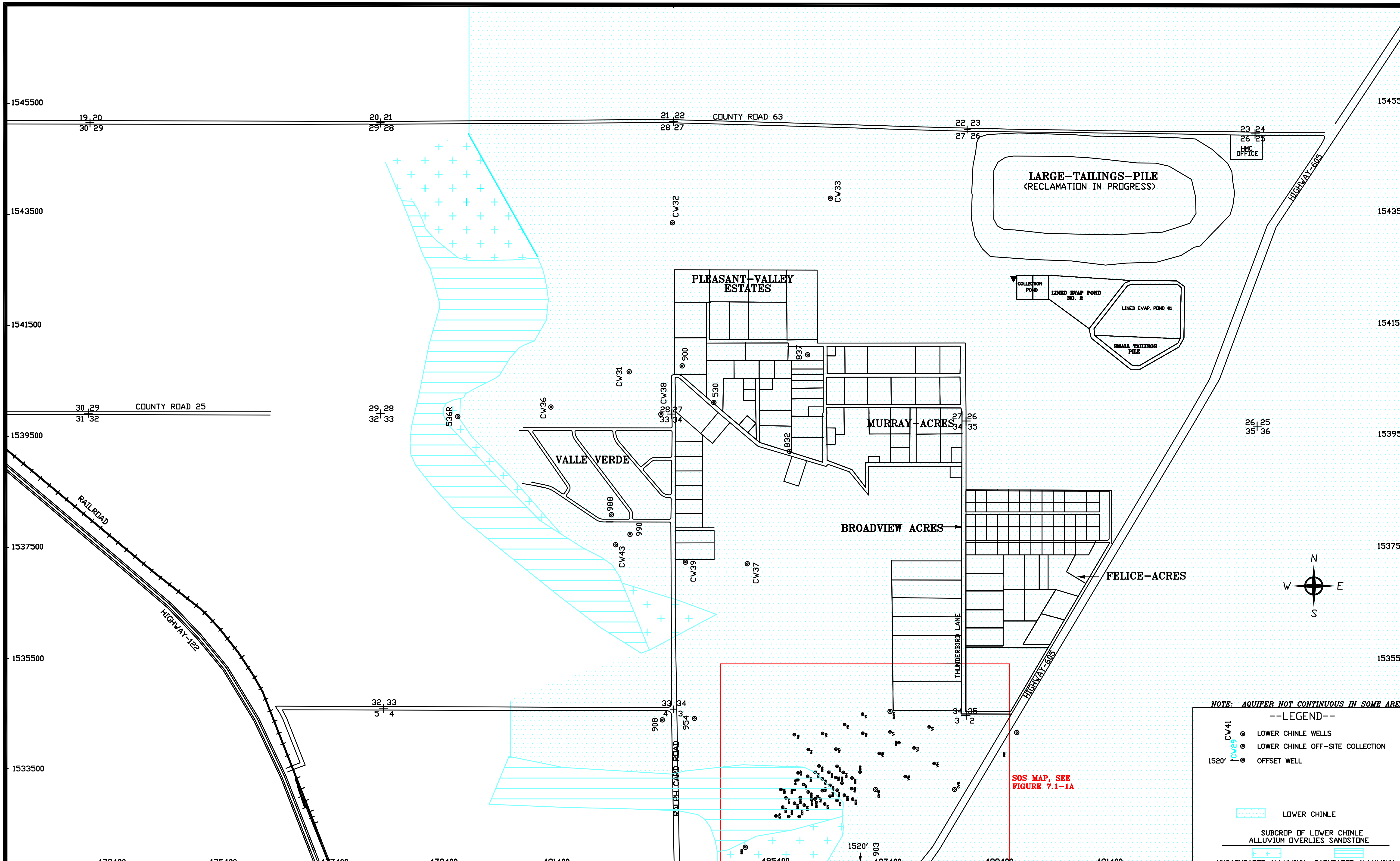
# 7.0 LOWER CHINLE AQUIFER MONITORING

## 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 Figures 7.1-1 and 7.1-1A. 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 2020 and no Lower Chinle wells were used for south collection in 2020.




SCALE: 1" = 1600'

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DATE: 3/10/2021

FIGURE 7.1-1. LIMITS OF LOWER CHINLE AQUIFER AND WELL LOCATIONS, 2020

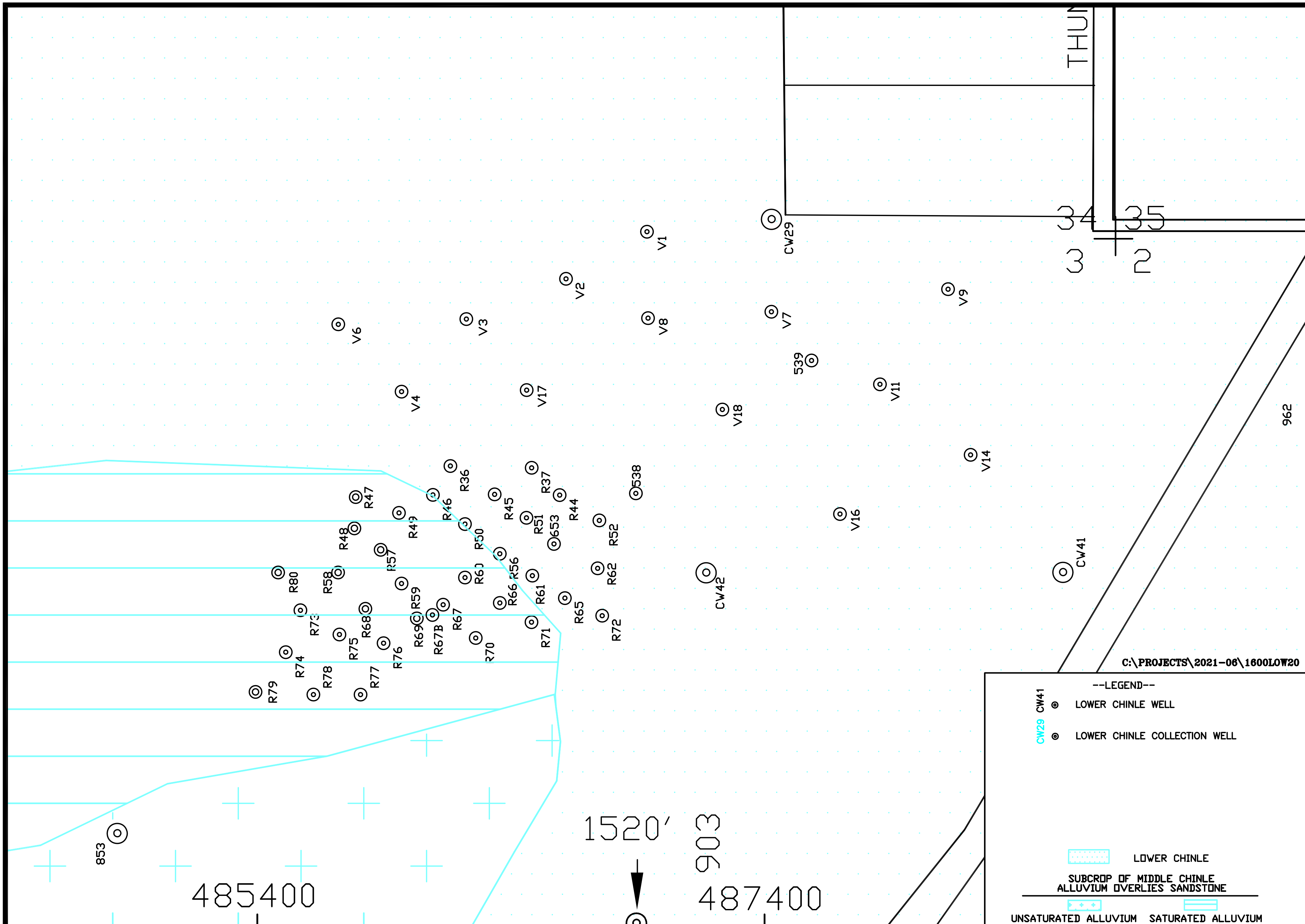


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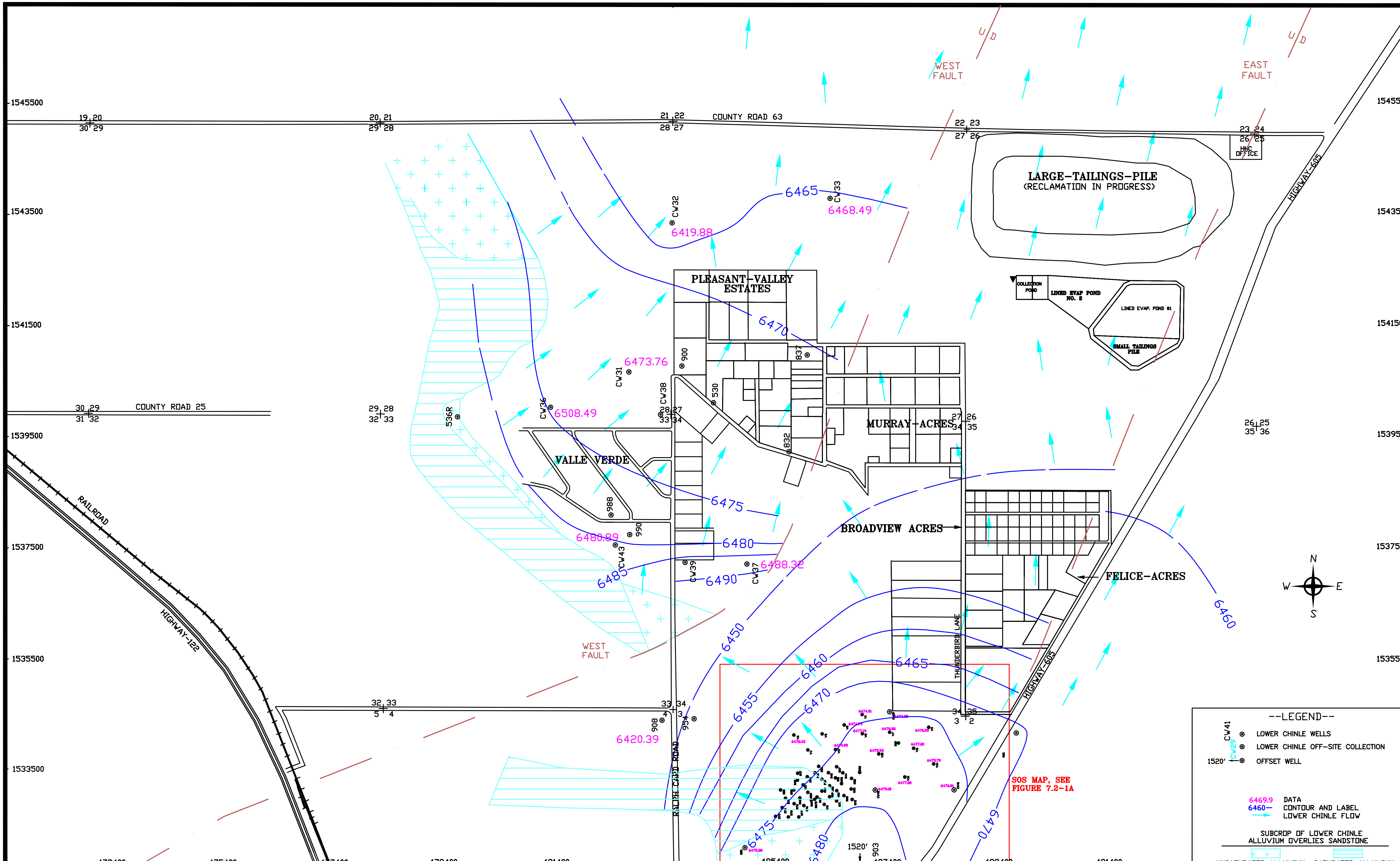
**FIGURE 7.1-1A. LIMITS OF LOWER CHINLE AQUIFER AND WELL LOCATIONS, SOS, 2020**

| | |
|---|---|
| **DATE:** 3/10/2021 | |
| **SCALE:** 1"=500' | |
| **PAGE:** 7.1-3 | |

## 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. Figures 7.2-1 and 7.2-1A present water-level elevations in the Lower Chinle wells and the fall of 2020 water-level elevation contours. The West and East Faults are also shown on Figure 7.2-1. The approximate Lower Chinle subcrop areas beneath the alluvium are also shown on this figure. Groundwater flow west of the West Fault in the Lower Chinle is mainly to the northeast. Groundwater 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. The highest water-level elevations in Section 3 are in or near the subcrop area of the Lower Chinle indicating that the alluvial aquifer is recharging the Lower Chinle aquifer in this area. The water-level elevation in well CW36 was not honored in the contouring in Figure 7.2-1 because the 2020 measurement was not consistent with previous measurements (see Figure 7.2-4).

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 853, CW29, CW41, CW42, V6 and V9 on Figure 7.2-3. The water levels in the wells located in Section 3 showed recovery from 2013 through 2016 that was likely a result of cessation of pumping for the irrigation supply in 2012. After 2016, there is a mild declining water-level trend resulting from collection from alluvial wells in the northeast Section 3 area. Figure 7.2-4 presents water-level elevations versus time for Lower Chinle wells CW31, CW32, CW33, CW36, CW37 and CW43 (see Figure 7.2-2 for location of these wells). This figure shows fairly steady water-level elevations in the Lower Chinle aquifer for the last few years with the exception of an anomalous water-level elevation in well CW36 in 2020.




SCALE: 1" = 1600'

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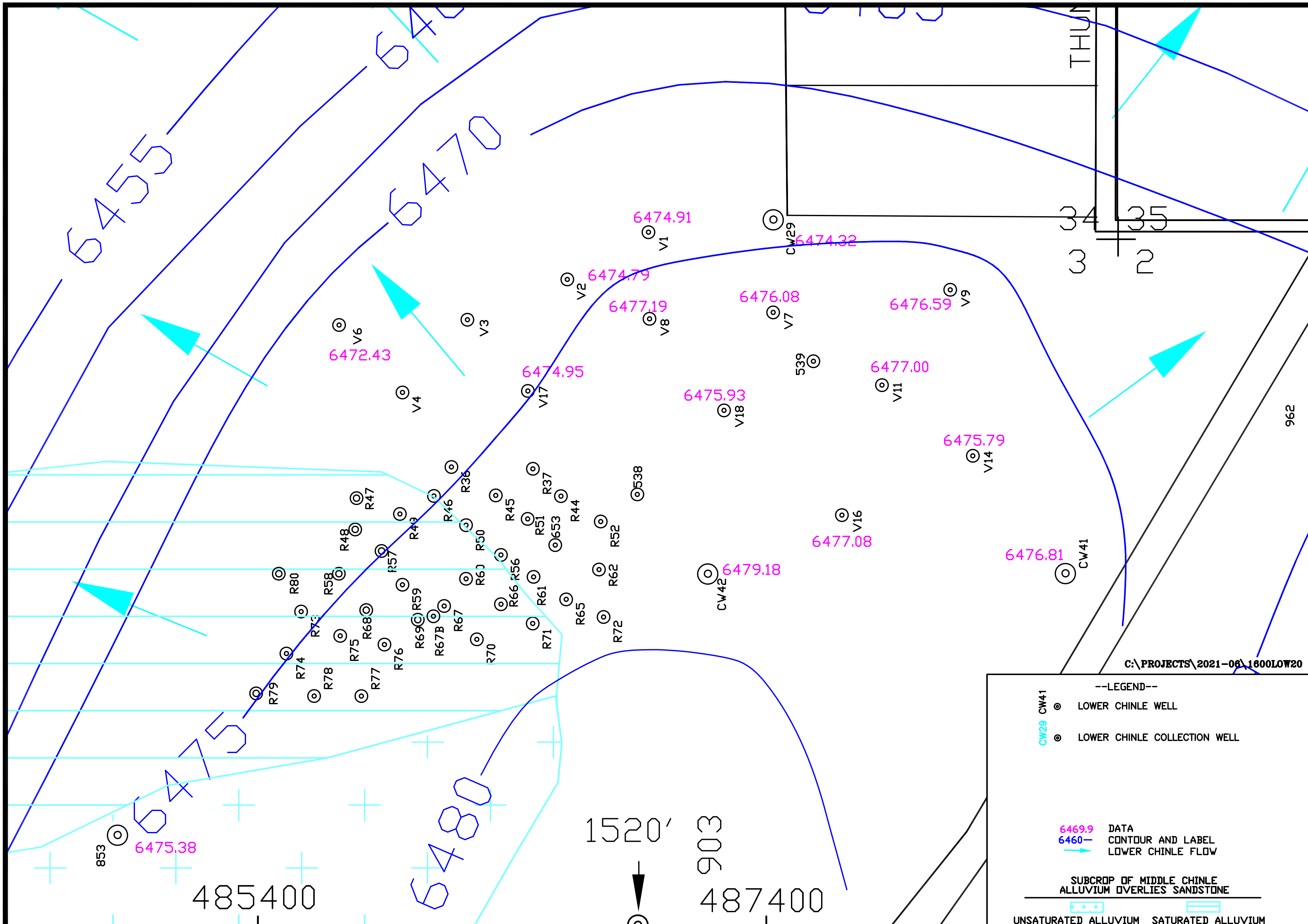
DATE: 3/10/2021

FIGURE 7.2-1 WATER LEVEL ELEVATIONS OF THE LOWER CHINLE AQUIFER, 2020, FT-MSL




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

FIGURE 7.2-1A. WATER LEVEL ELEVATIONS OF THE LOWER CHINLE AQUIFER, SOS, 2020, FT-MSL

DATE: 3/10/2021

SCALE: 1"=500'

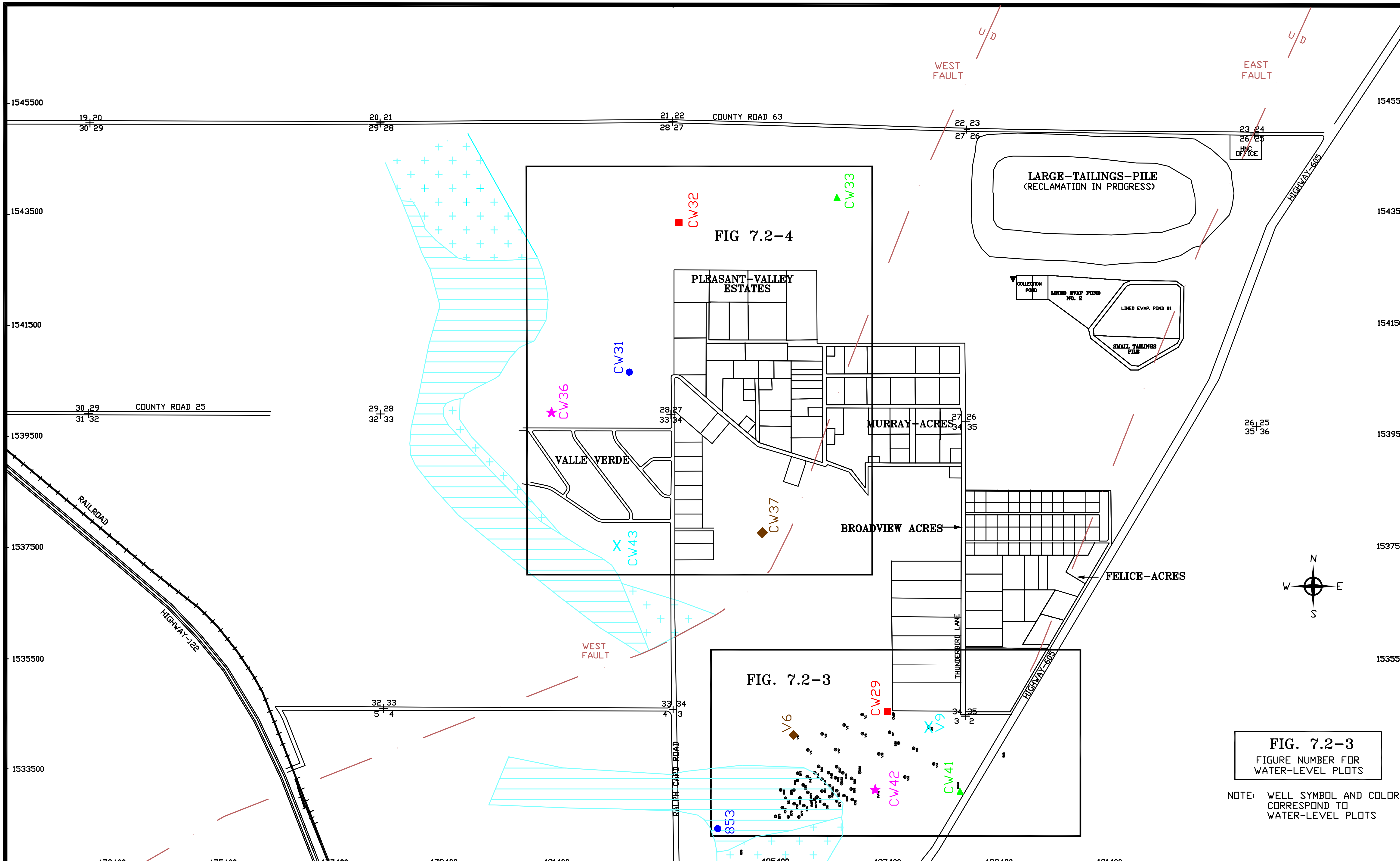



FIG. 7.2-3
FIGURE NUMBER FOR WATER-LEVEL PLOTS

NOTE: WELL SYMBOL AND COLOR CORRESPOND TO WATER-LEVEL PLOTS

SCALE: 1" = 1600'
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DATE: 12/2/2020

FIGURE 7.2-2. LOCATION OF LOWER CHINLE WELLS WITH WATER-LEVEL PLOTS, 2020

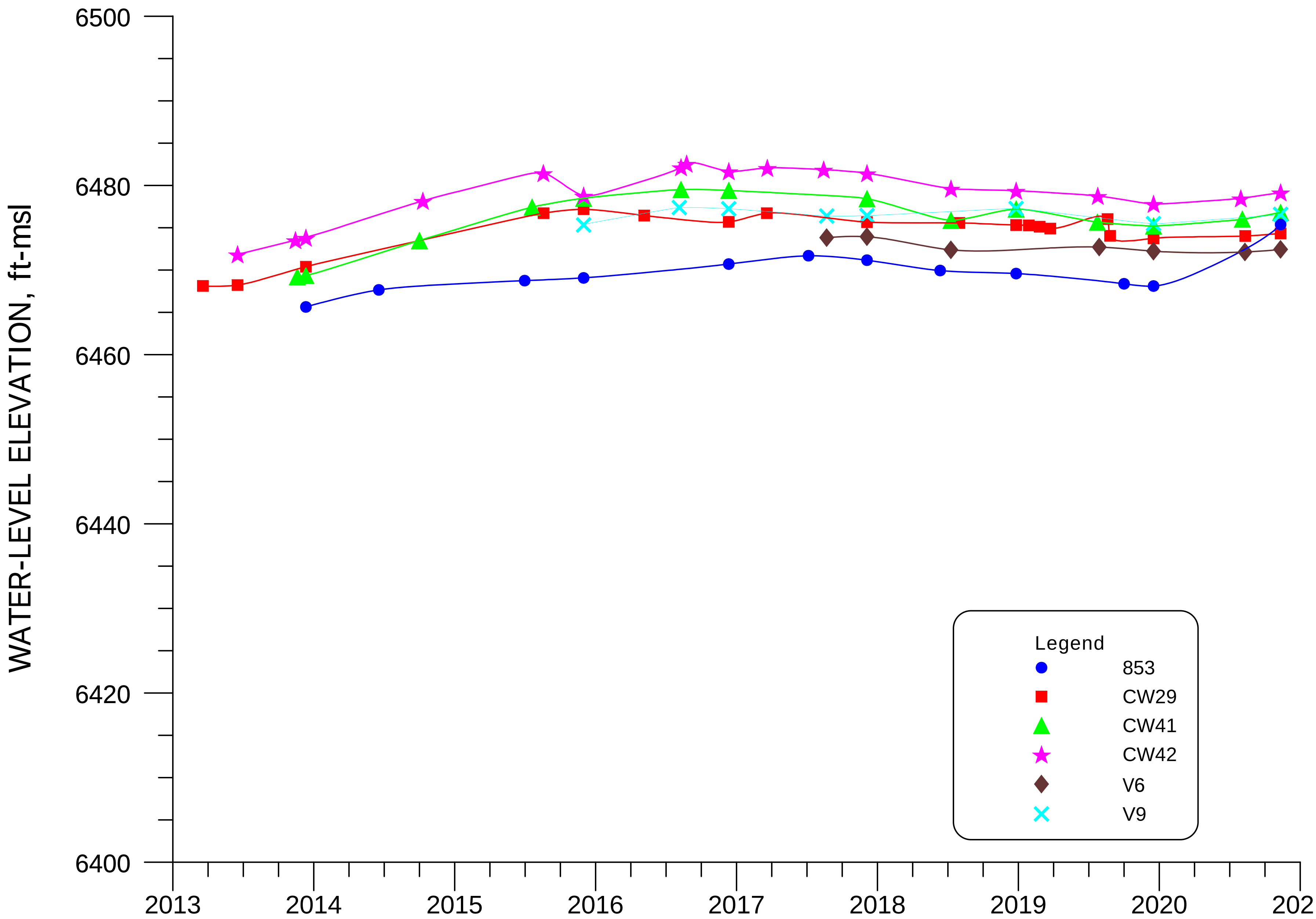



**FIGURE 7.2-3. WATER-LEVEL ELEVATION FOR WELLS 853, CW29, CW41, CW42, V6 AND V9.**

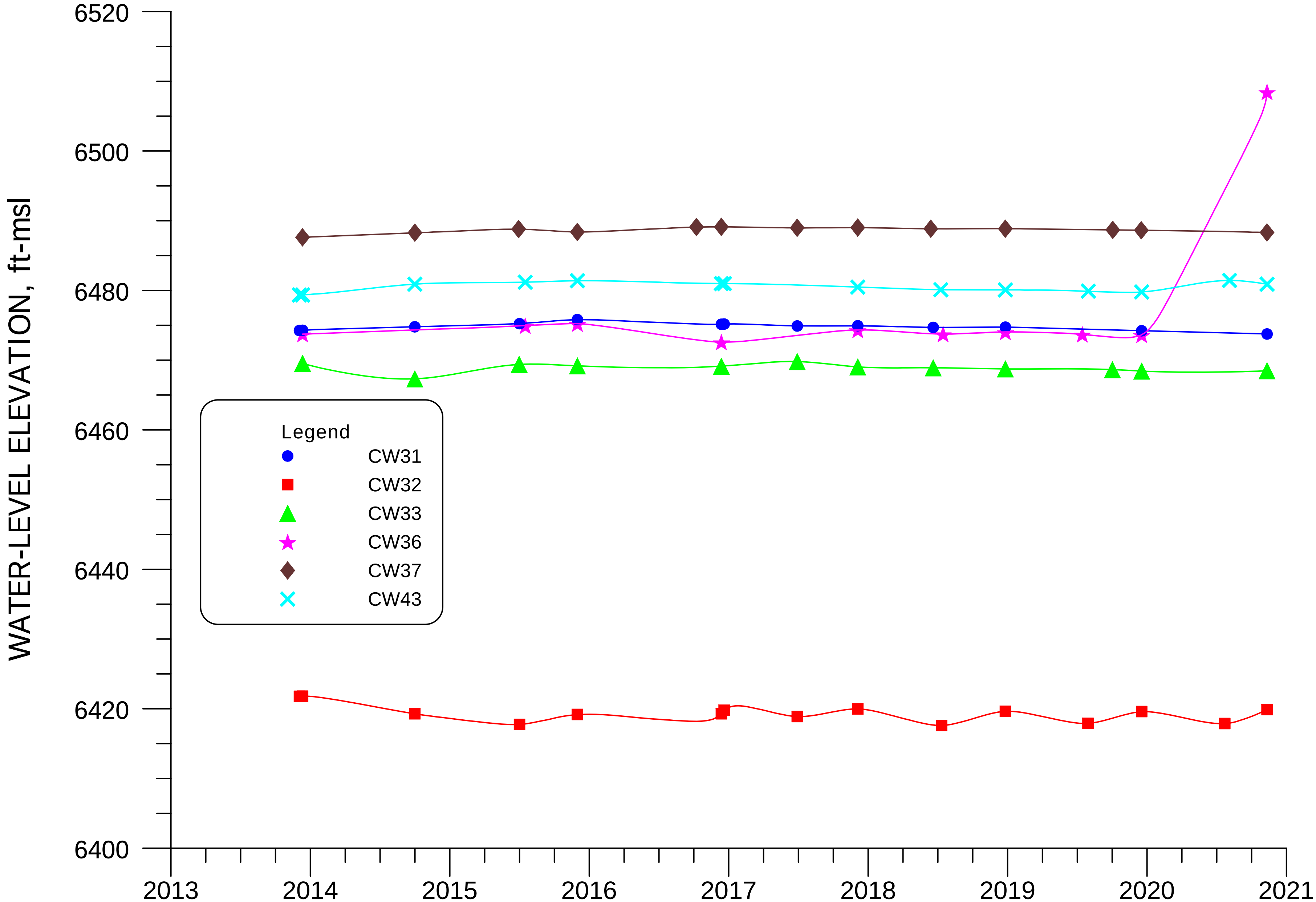



**FIGURE 7.2-4. WATER-LEVEL ELEVATION FOR WELLS CW31, CW32, CW33, CW36, CW37 AND CW43.**

## 7.3 LOWER CHINLE WATER QUALITY

Water-quality data for 2020 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 is presented in Tables 5.1-1 through 5.1-4, and the orientation of the well name on Figures 5.1-1, 5.1-1A and 5.1-1B indicates which of the Chinle wells are completed in the Lower Chinle aquifer.

The Lower Chinle wells used in establishing the Chinle site standards are shown on Figure 7.3-1 with a blue box around the well name showing which Lower Chinle wells were used to define the non-mixing zone site standard. The yellow pattern on this figure shows the mixing zone for the Lower Chinle aquifer. The Lower Chinle wells used in conjunction with the Upper and Middle Chinle wells (see Figures 5.3-1 and 6.3-1 for the Upper and Middle Chinle wells used, respectively) in establishing the mixing zone site standards are shown with a red box around their well names. The wells with a blue box around their well names were used in establishing the non-mixing zone site standards for the Lower Chinle aquifer. Table 7.3-1 presents Chinle mixing zone site standards and the non-mixing zone Lower Chinle site standards. This table also presents the 2020 data for the Chinle mixing zone wells and the Lower Chinle non-mixing zone wells.

Constituent concentrations in the Lower Chinle aquifer exceed site standards only in Section 3 and the very southern portion of Section 34, except for some natural exceedances in the far down-gradient wells. Sulfate concentrations in the Lower Chinle aquifer are not above the NRC site standards except in far down-gradient wells where naturally occurring concentrations exceed the relevant non-mixing zone site standard. Uranium concentrations exceed the NRC site standards only in the northeastern and central portions of Section 3 and the southern portion of Section 34. Molybdenum concentrations in the Lower Chinle aquifer are much less than 0.1 mg/L.

### 7.3.1 SULFATE – LOWER CHINLE

Figures 7.3-1A and 7.3-1B present contours of sulfate concentrations in the Lower Chinle aquifer during 2020. Lower Chinle standards based on background data are presented for sulfate in the legend of Figures 7.3-1A and 7.3-1B. None of the Lower Chinle concentrations in

the mixing zone (see Figure 7.3-1 for the Lower Chinle mixing zone area) exceeded the mixing-zone sulfate site standard of 1750 mg/L. The pattern at well CW33 shows that its past sulfate concentration has been slightly greater than the non-mixing zone standard of 2000 mg/L. This natural exceedance is due to the limited non-mixing zone data set that was used to set the standard, and the natural groundwater quality deterioration with down-gradient movement in the shale.

The locations of wells used in the plots of water quality for the Lower Chinle are presented on Figure 7.3-2 and shows that data for mixing zone Lower Chinle wells 538, CW42, CW43 and V6 are grouped together on the water-quality time plots, and data for non-mixing zone wells CW29, 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 and shows that all of these concentrations are below the mixing zone standard. Plots of sulfate concentration versus time for Lower Chinle wells CW29, CW32 and CW41 are presented on Figure 7.3-4 (see Figure 7.3-2 for location of these wells) with the non-mixing zone standard. This plot shows that the 2020 sulfate concentrations for these wells are below the site standard.

### 7.3.2 TOTAL DISSOLVED SOLIDS – LOWER CHINLE

Figures 7.3-5 and 7.3-5A present the total dissolved solids (TDS) concentrations in the Lower Chinle aquifer during 2020. All TDS concentrations for 2020 were 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. All TDS concentrations on Figure 7.3-5A are less than the mixing zone standard of 3140 mg/L. Figures 7.3-6 and 7.3-7 present TDS concentrations for the mixing zone and non-mixing zone Lower Chinle wells, respectively, and shows that all of the 2020 TDS concentrations in these wells are below the site standards.

### 7.3.3 CHLORIDE – LOWER CHINLE

Chloride concentration data in the Lower Chinle aquifer were reviewed during 2003 to confirm that restoration for this constituent is not necessary in the Lower Chinle aquifer. The chloride concentrations measured during 2020 continue to support this conclusion and are all less than the NRC standard except in the down-gradient area where values naturally exceed the standard. Therefore, chloride concentration maps and time plots are not presented for the Lower Chinle aquifer.

### 7.3.4 URANIUM – LOWER CHINLE

Figures 7.3-8 and 7.3-8A present the uranium concentrations in the Lower Chinle aquifer for 2020. Uranium concentrations in the Lower Chinle exceeded the mixing-zone site standard concentration in the central portion of Section 3, while concentrations in two wells exceeded the non-mixing zone site standard. Uranium concentrations plotted versus time for Lower Chinle wells 538, CW42, CW43 and V6 are presented on Figure 7.3-9. A gradual decline in the uranium concentration in well 538 has been observed, and some restoration is needed at wells CW42 and V6. The uranium concentrations in the Lower Chinle non-mixing zone wells with data presented on Figure 7.3-10 have remained at low levels with the exception of higher concentrations in well CW29. There is a slight declining trend in uranium concentration in well CW29.

### 7.3.5 SELENIUM – LOWER CHINLE

Selenium concentrations in the Lower Chinle aquifer for 2020 are presented on Figures 7.3-11 and 7.3-11A. 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, CW42, CW43 and V6. Figure 7.3-13 presents selenium concentrations plotted versus time for Lower Chinle wells CW29, CW32 and CW41. All of these selenium concentrations in these two plots are less than their corresponding standards.

### 7.3.6 MOLYBDENUM – LOWER CHINLE

Molybdenum concentrations in water samples collected from the Lower Chinle wells in 2020 were generally very small with all values less than or equal to 0.03 mg/L and, therefore, no areal molybdenum concentration figures or time plots were prepared. The 2020 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

Monitoring of nitrate concentration in the Lower Chinle aquifer in 2020 confirms that concentrations remain significantly below the site standard of 15 mg/L for the mixing zone. Therefore, a map of the nitrate values for the Lower Chinle was not developed.

Plots of nitrate concentrations versus time were not prepared, because historically, samples from Lower Chinle wells contained very low nitrate concentrations that are similar to those measured in 2020. Nitrate concentration in the tailings seepage and the majority of the alluvial aquifer is low and therefore there is very little potential for elevated nitrate concentration in the Lower Chinle aquifer resulting from seepage impacts.

### 7.3.8 RADIUM-226 AND RADIUM-228 – LOWER CHINLE

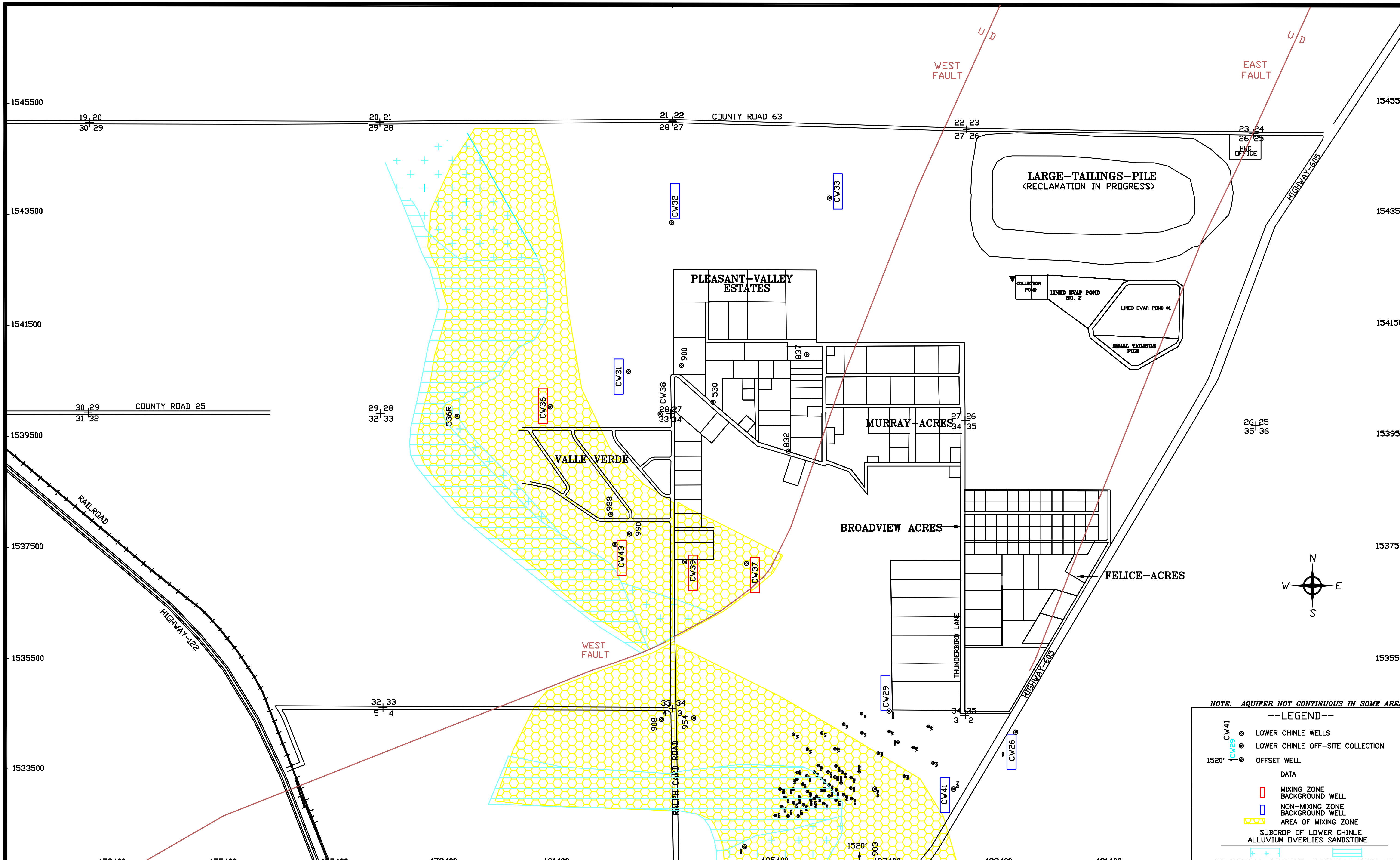
All radium concentrations for 2020 were low in the Lower Chinle aquifer. Because of the typically low concentrations, radium-226 and radium-228 are not important parameters relative to the Lower Chinle aquifer; therefore, a site standard for the Lower Chinle has not been set. These low levels of radium do not warrant the development of a figure presenting areal distribution of radium concentration. A radium-228 concentration of 5.4 pCi/L in a 2020 sample from well CW29 is thought to be a laboratory outlier and is not consistent with past measurements in the well. Radium-228 analysis is typically more erratic than other constituents but the available data shows that radium-226 and radium-228 concentrations are below levels of concern in the Lower Chinle aquifer at the HMC site.

### 7.3.9 VANADIUM - LOWER CHINLE

Vanadium concentrations have historically been low in the Lower Chinle aquifer. Significant vanadium 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 warranting establishment of a site standard. All 2020 vanadium concentrations in the Lower Chinle aquifer were 0.01 mg/L or less.

### 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. No plots of thorium-230 concentrations with time were prepared because concentrations have historically been low. All 2020 thorium-230 levels were less than 0.3 pCi/L.




SCALE: 1" = 1600'

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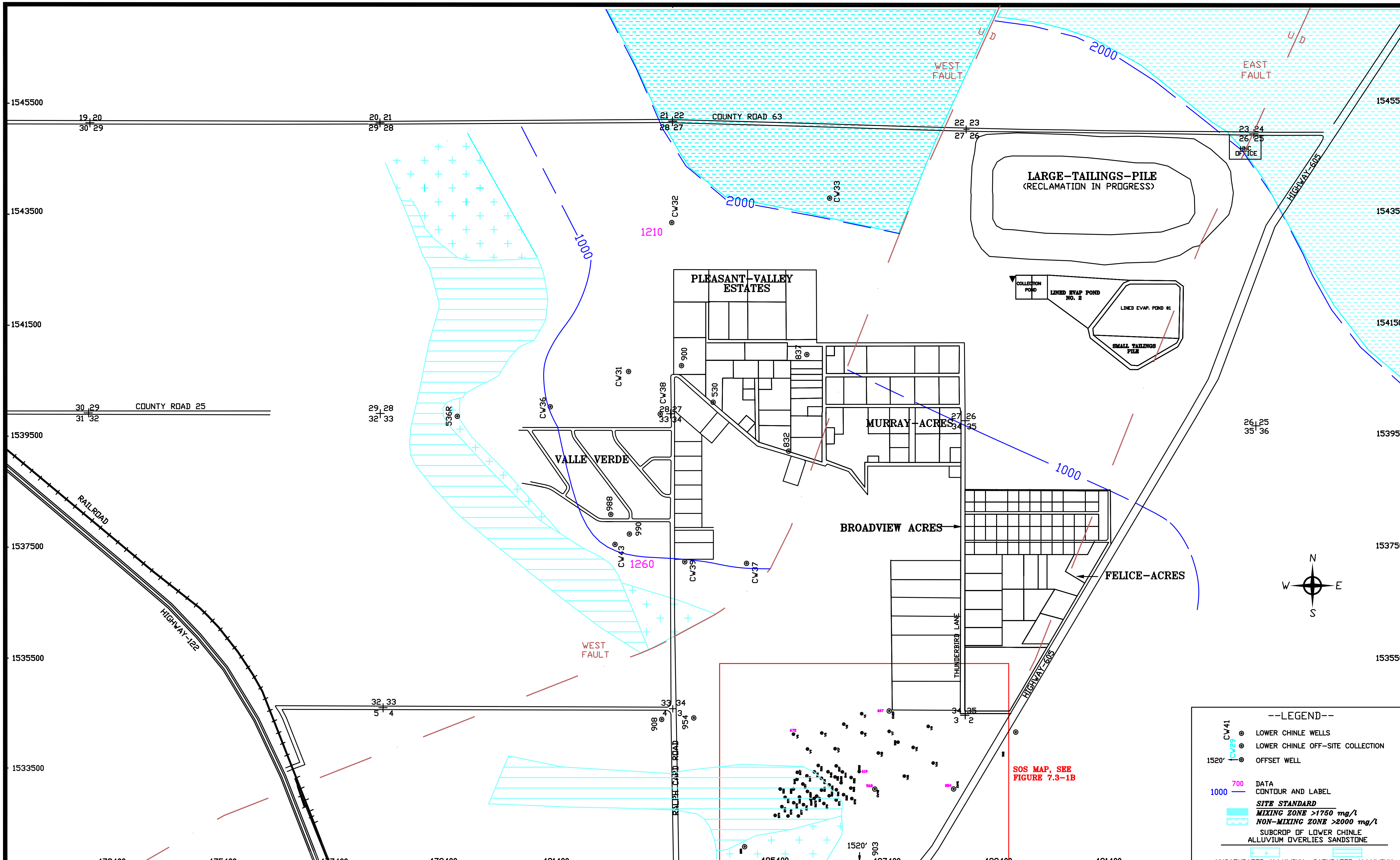
DATE: 9/16/2020

FIGURE 7.3-1. LOCATION OF LOWER CHINLE WELLS USED FOR SITE STANDARDS AND LOWER CHINLE MIXING ZONE




SCALE: 1" = 1600'
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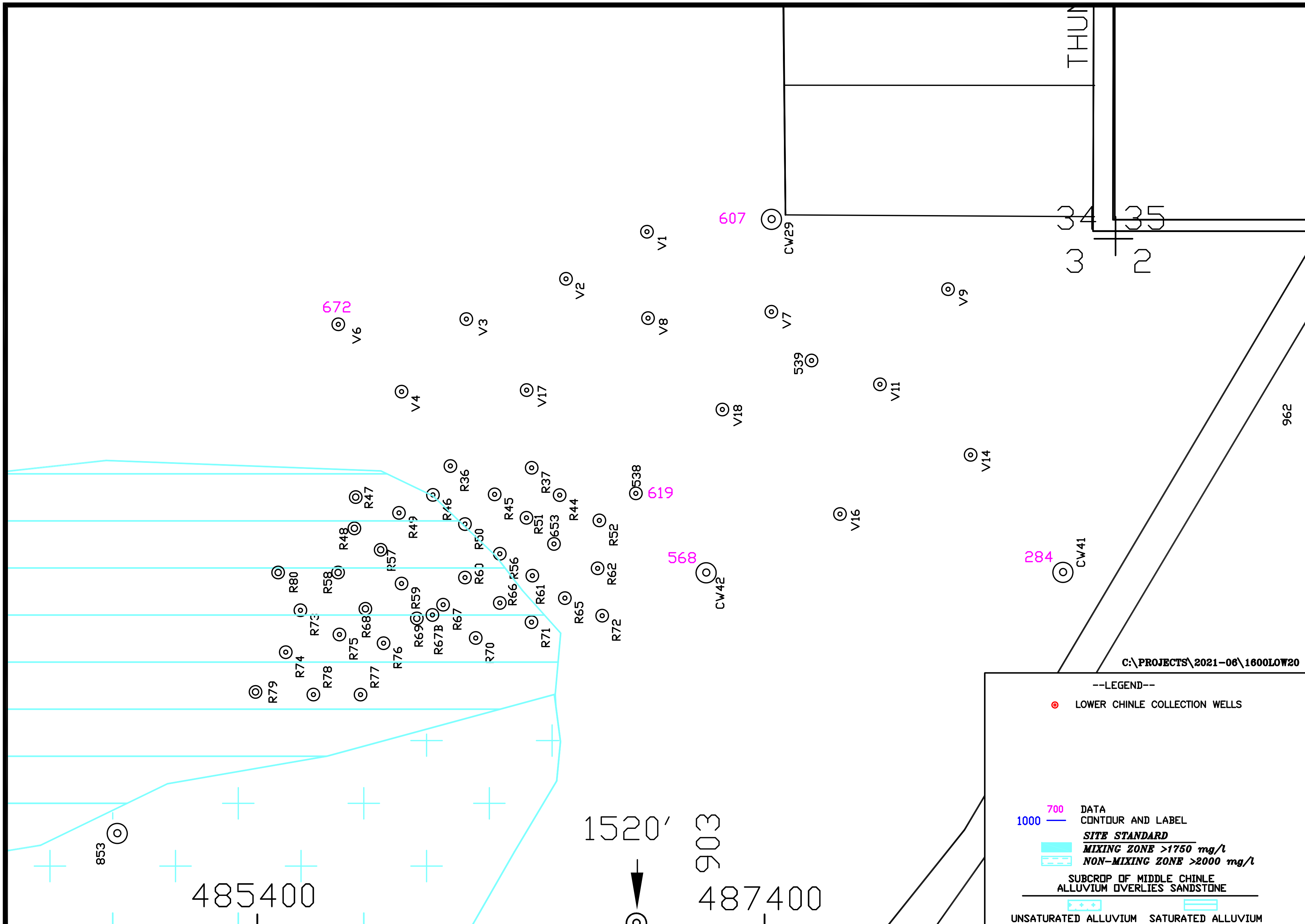
DATE: 9/16/2020

FIGURE 7.3-1A. SULFATE CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2020, mg/L

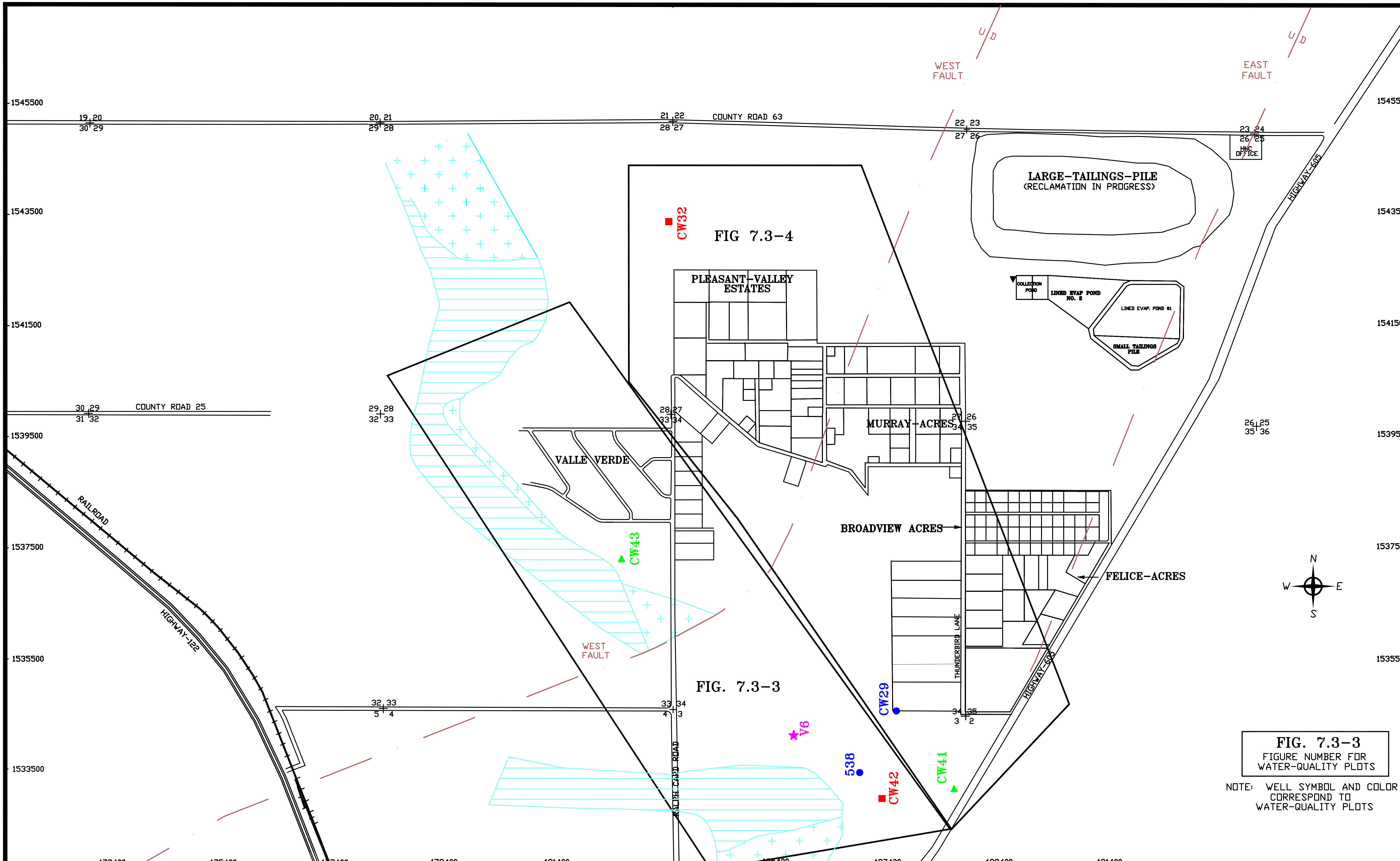



HOMESTAKE MILL AND ADJACENT PROPERTIES ~ GRANTS, NM ~ TOWNSHIP-11&12N, RANGE-10W

**FIGURE 7.3-1B. SULFATE CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, SOS, 2020, mg/L**

**DATE: 9/16/2020**

**SCALE: 1"=500'**




SCALE: 1" = 1600'
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DATE: 12/3/2020

FIGURE 7.3-2. LOCATION OF LOWER CHINLE WELLS WITH WATER-QUALITY PLOTS, 2020

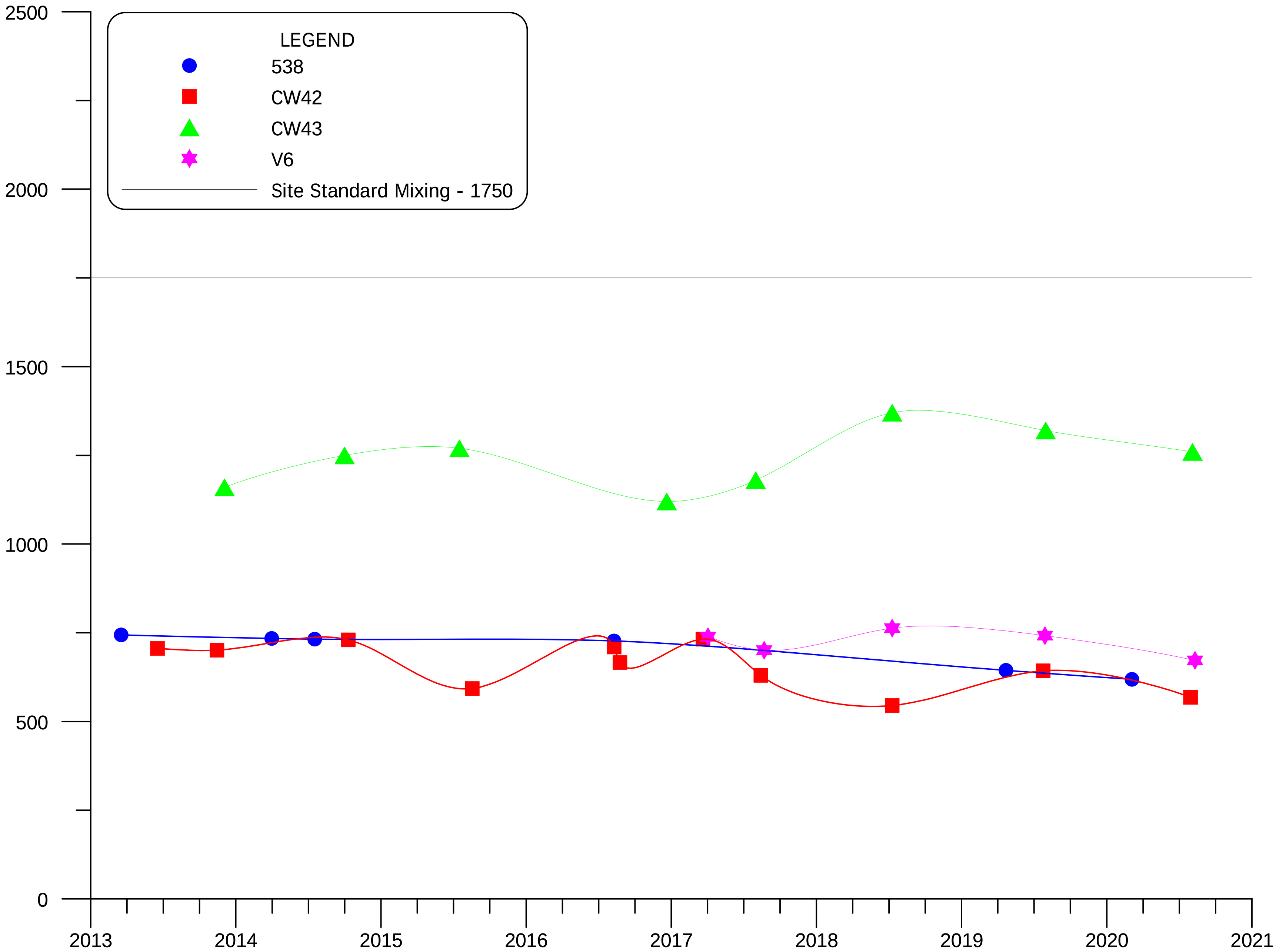



**FIGURE 7.3-3. SULFATE CONCENTRATIONS FOR MIXING ZONE WELLS 538, CW42, CW43 AND V6**

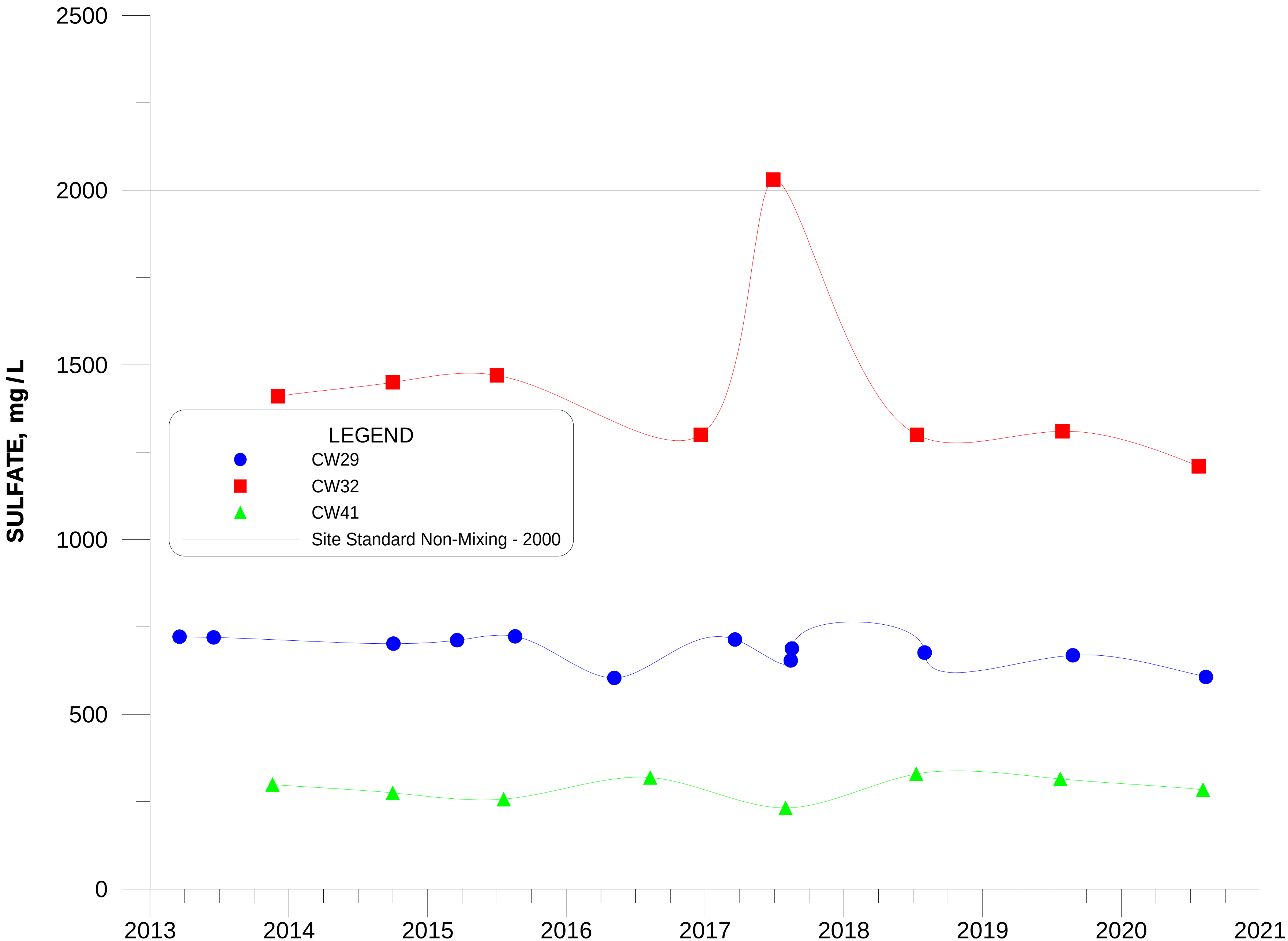
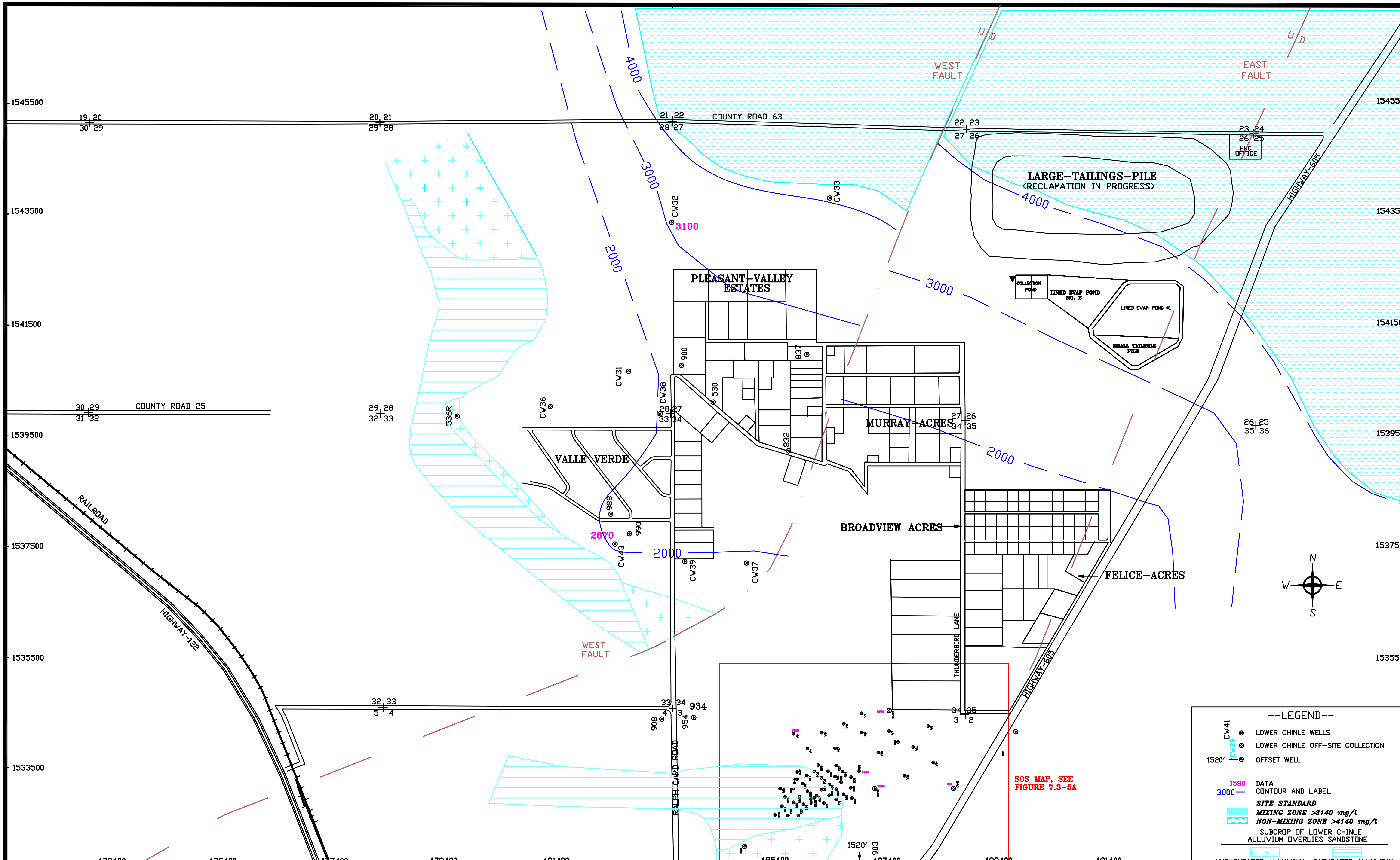



**FIGURE 7.3-4. SULFATE CONCENTRATIONS FOR NON-MIXING WELLS CW29, CW32 AND CW41.**




SCALE: 1" = 1600'

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DATE: 9/16/2020

FIGURE 7.3-5. TDS CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2020, mg/L

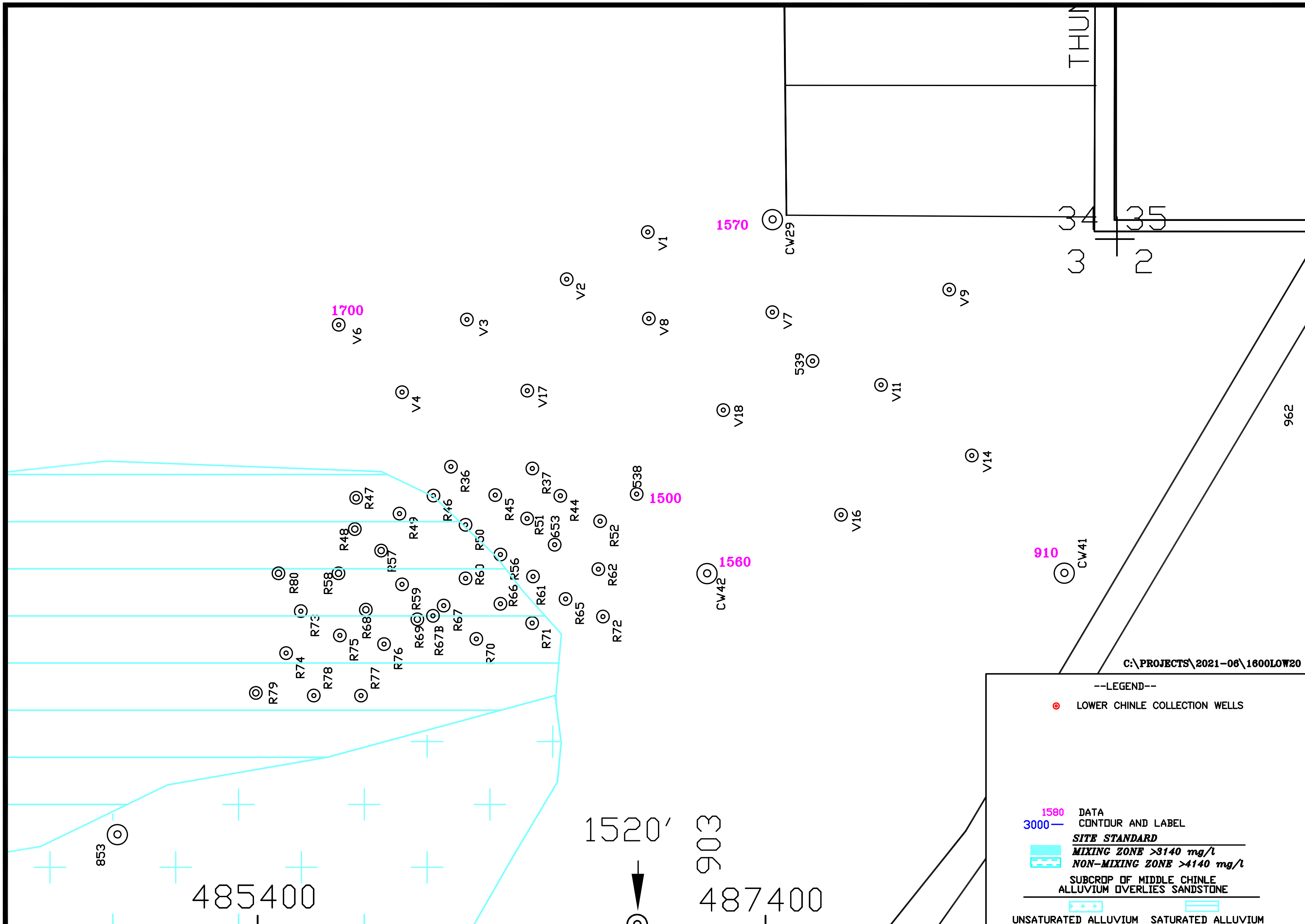


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**FIGURE 7.3-5A. TDS CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, SOS, 2020, mg/L**

| DATE: 9/16/2020 |
|---|
| SCALE: 1"=500' |
| PAGE: 7.3-13 |

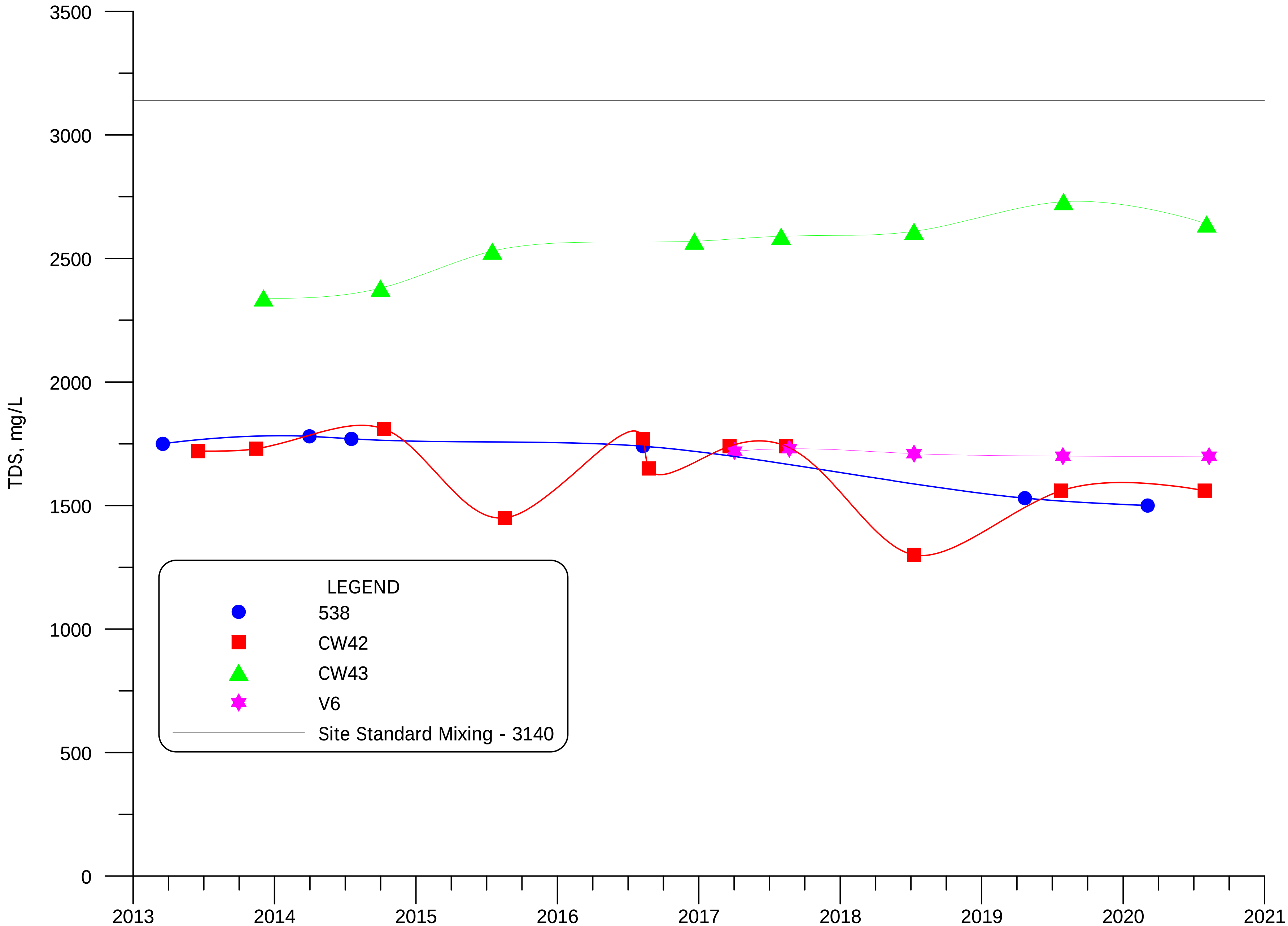



**FIGURE 7.3-6. TDS CONCENTRATIONS FOR MIXING ZONE WELLS 538, CW42, CW43 AND V6**

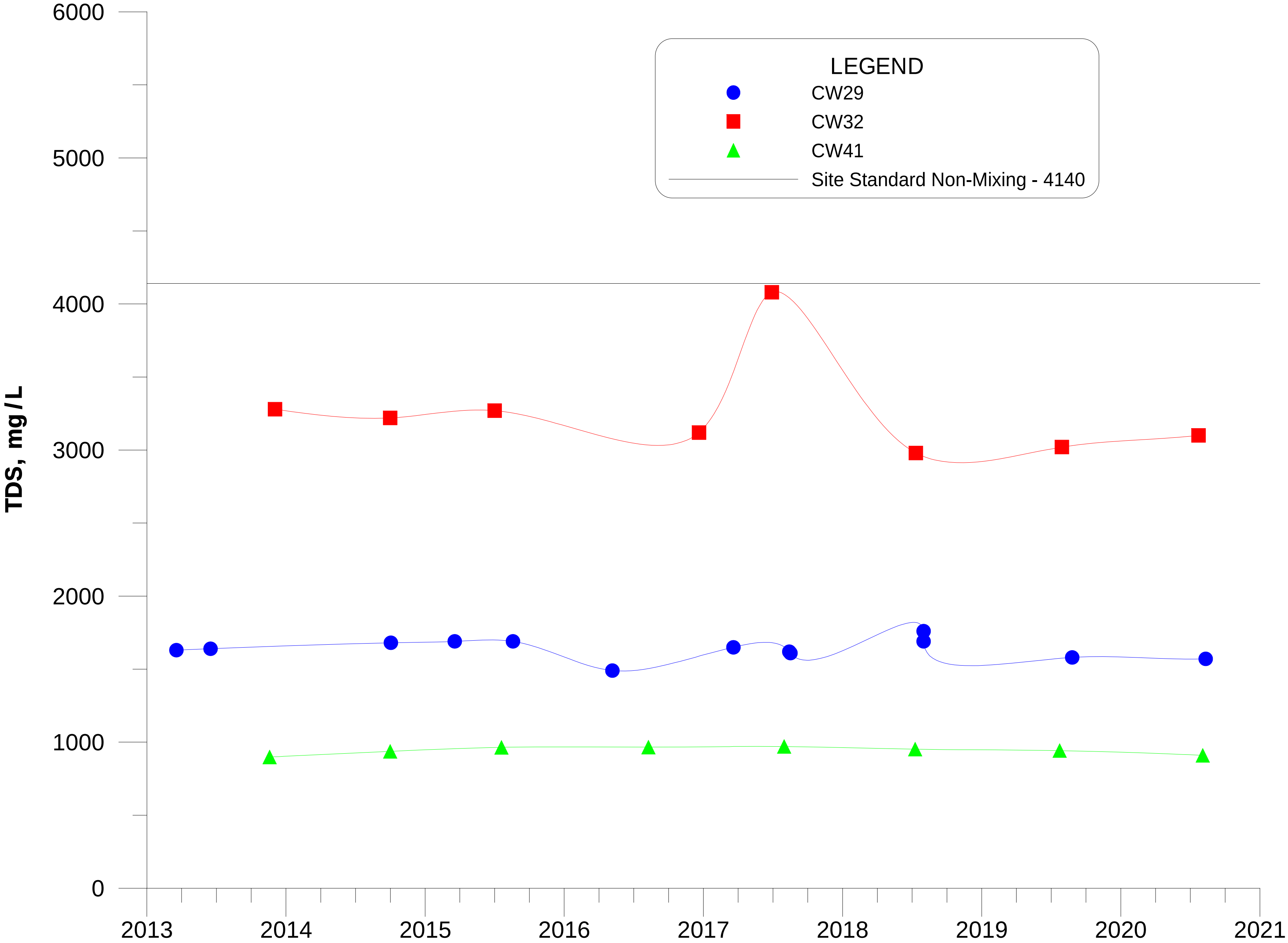
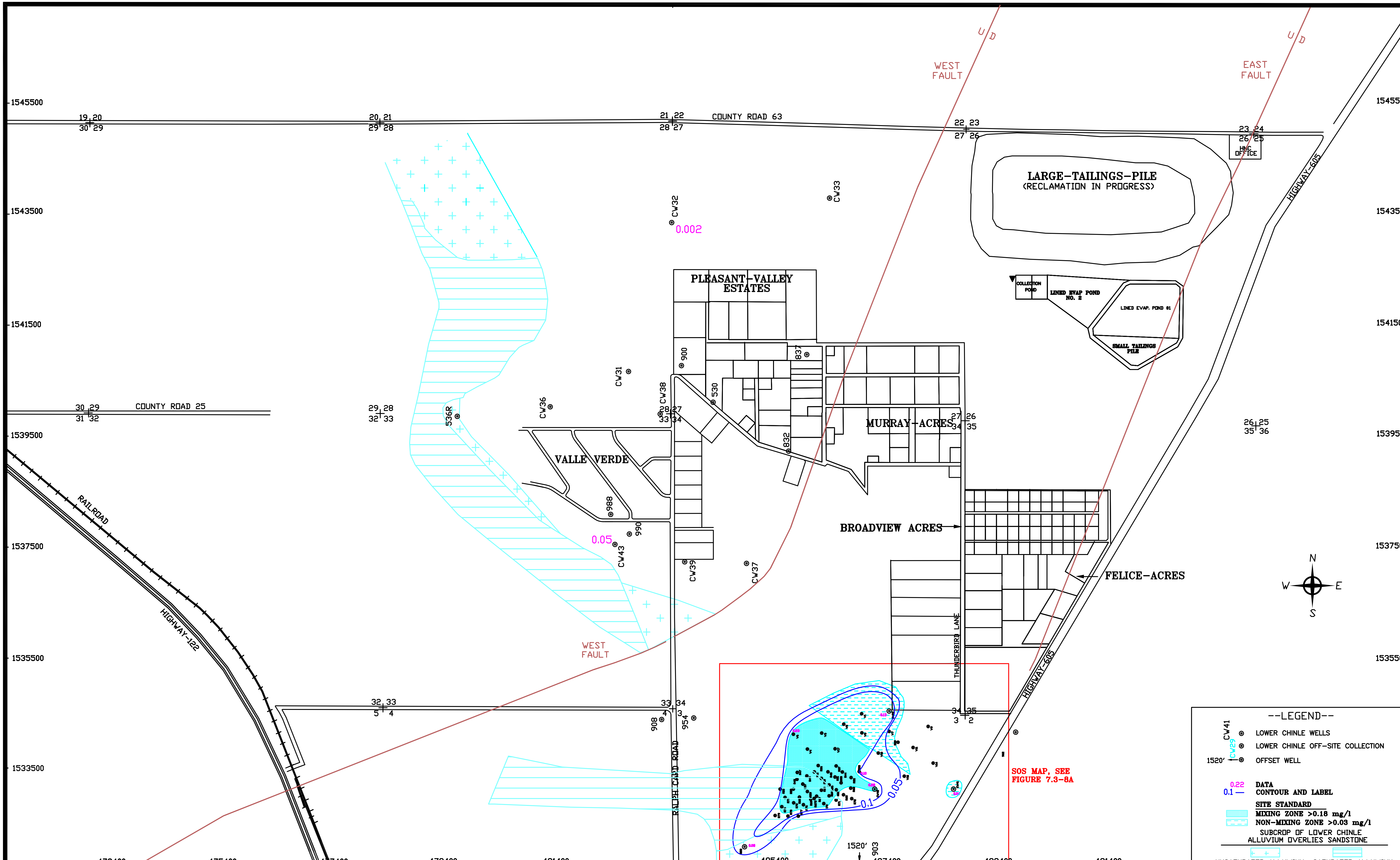



**FIGURE 7.3-7. TDS CONCENTRATIONS FOR NON-MIXING WELLS CW29, CW32 AND CW41.**




SCALE: 1" = 1600'

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DATE: 9/16/2020

FIGURE 7.3-8. URANIUM CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2020, mg/L

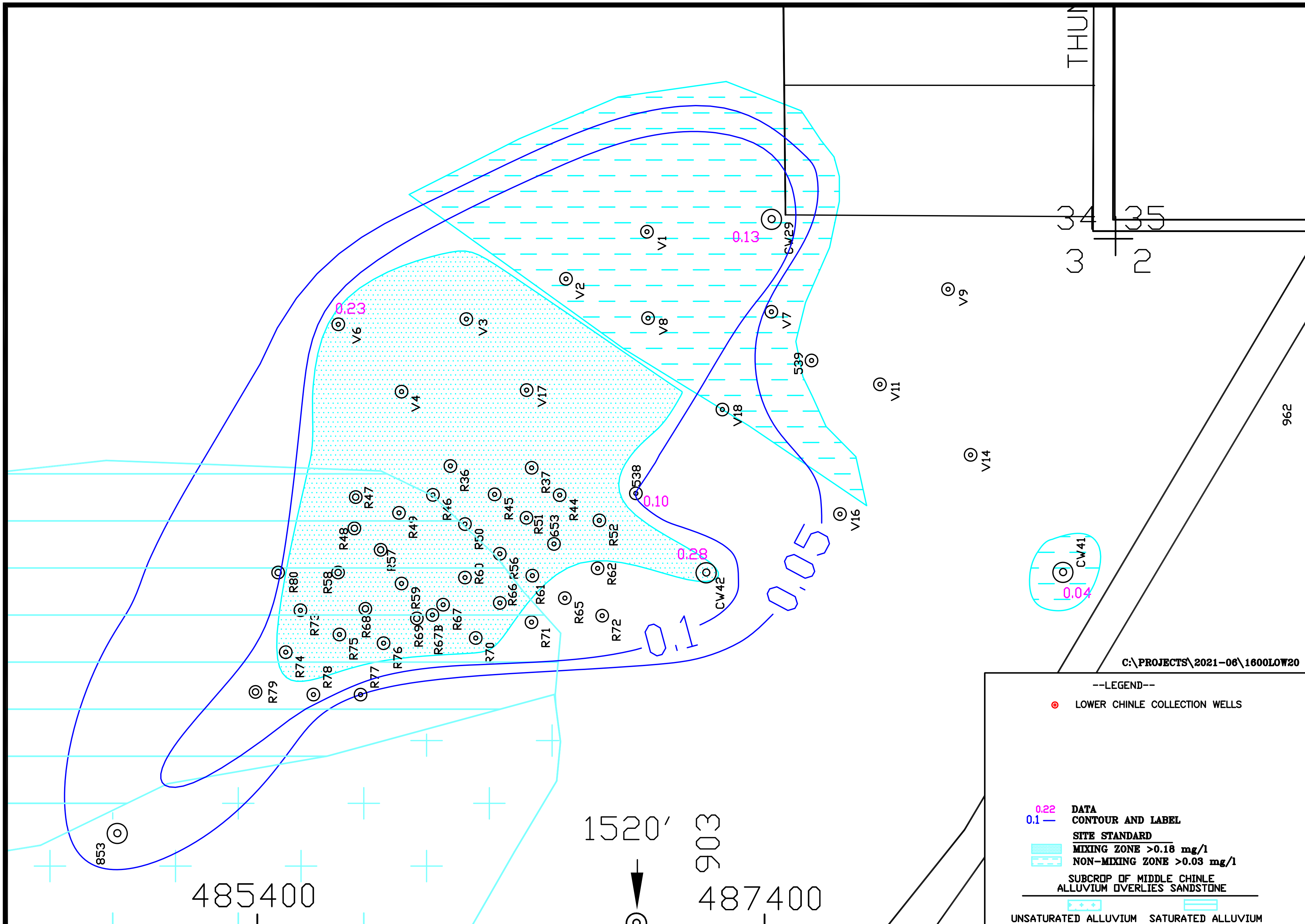


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**FIGURE 7.3-8A. URANIUM CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, SOS, 2020, mg/L**

DATE: 12/2/2020

SCALE: 1"=500'

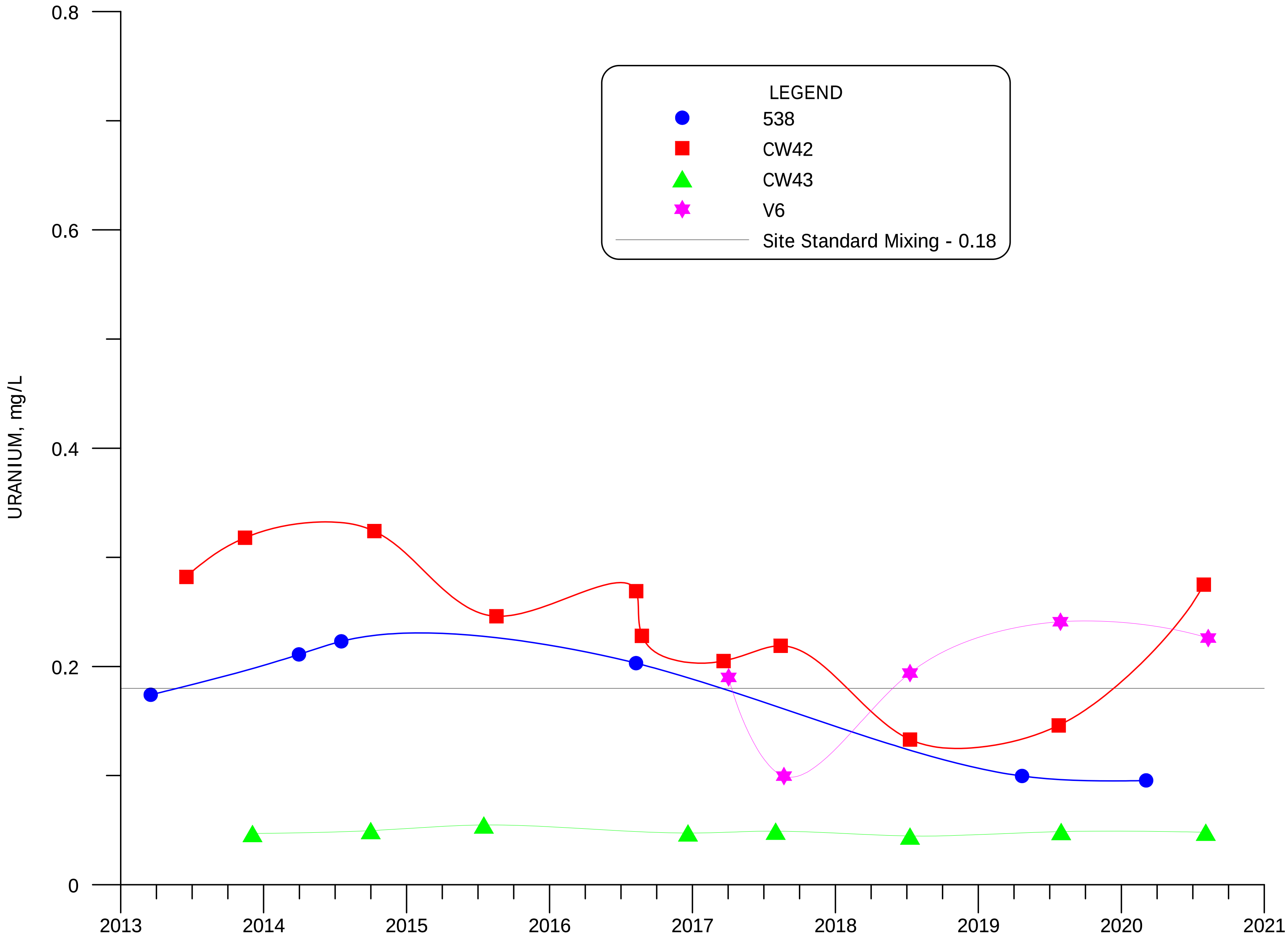



**FIGURE 7.3-9. URANIUM CONCENTRATIONS FOR MIXING ZONE WELLS 538, CW42, CW43 AND V6**

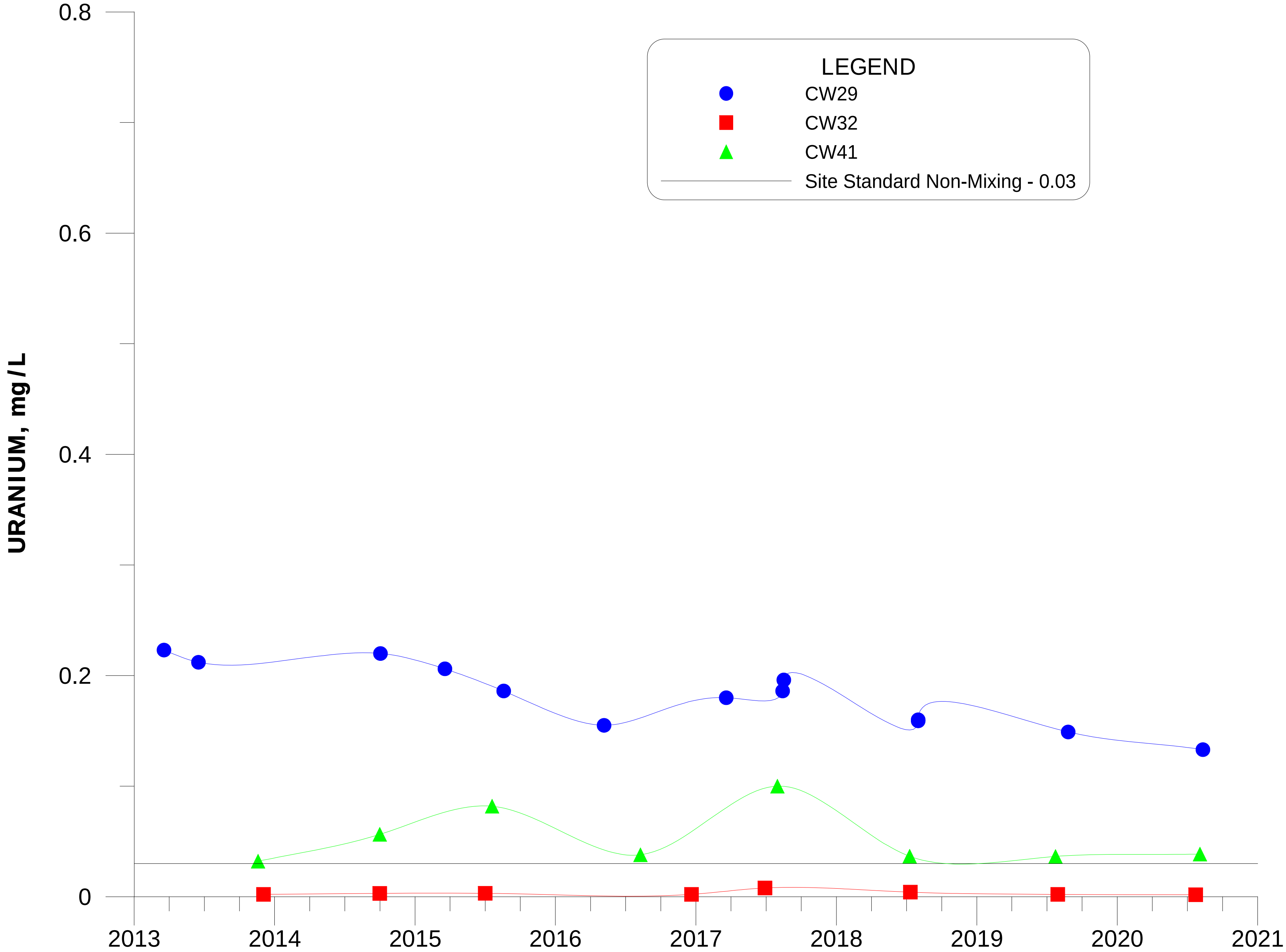
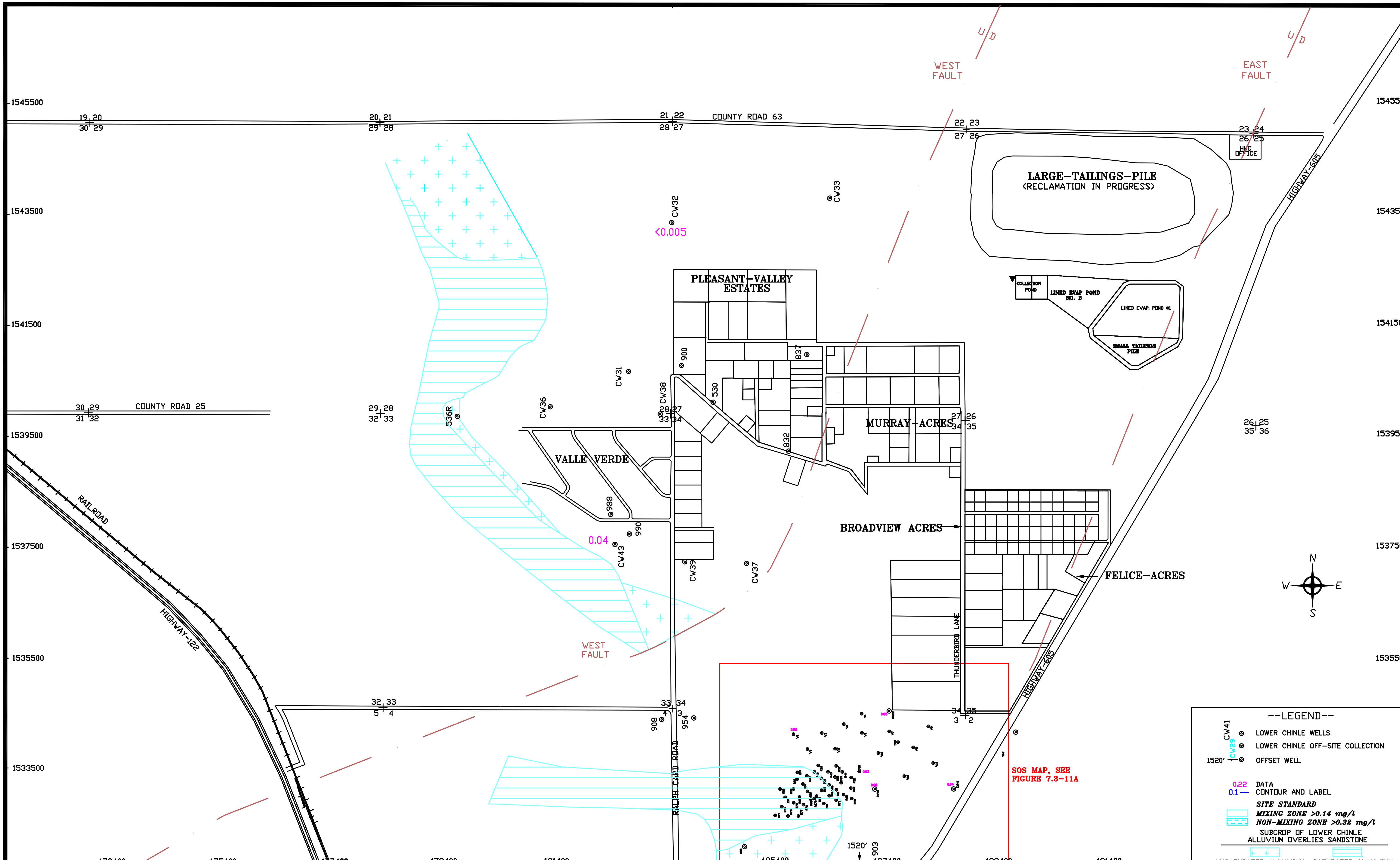



**FIGURE 7.3-10. URANIUM CONCENTRATIONS FOR NON-MIXING WELLS CW29, CW32 AND CW41.**




SCALE: 1" = 1600'
C:\PROJECTS\2021-06\1600LOW20
DATE: 9/16/2020

FIGURE 7.3-11. SELENIUM CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, 2020, mg/L

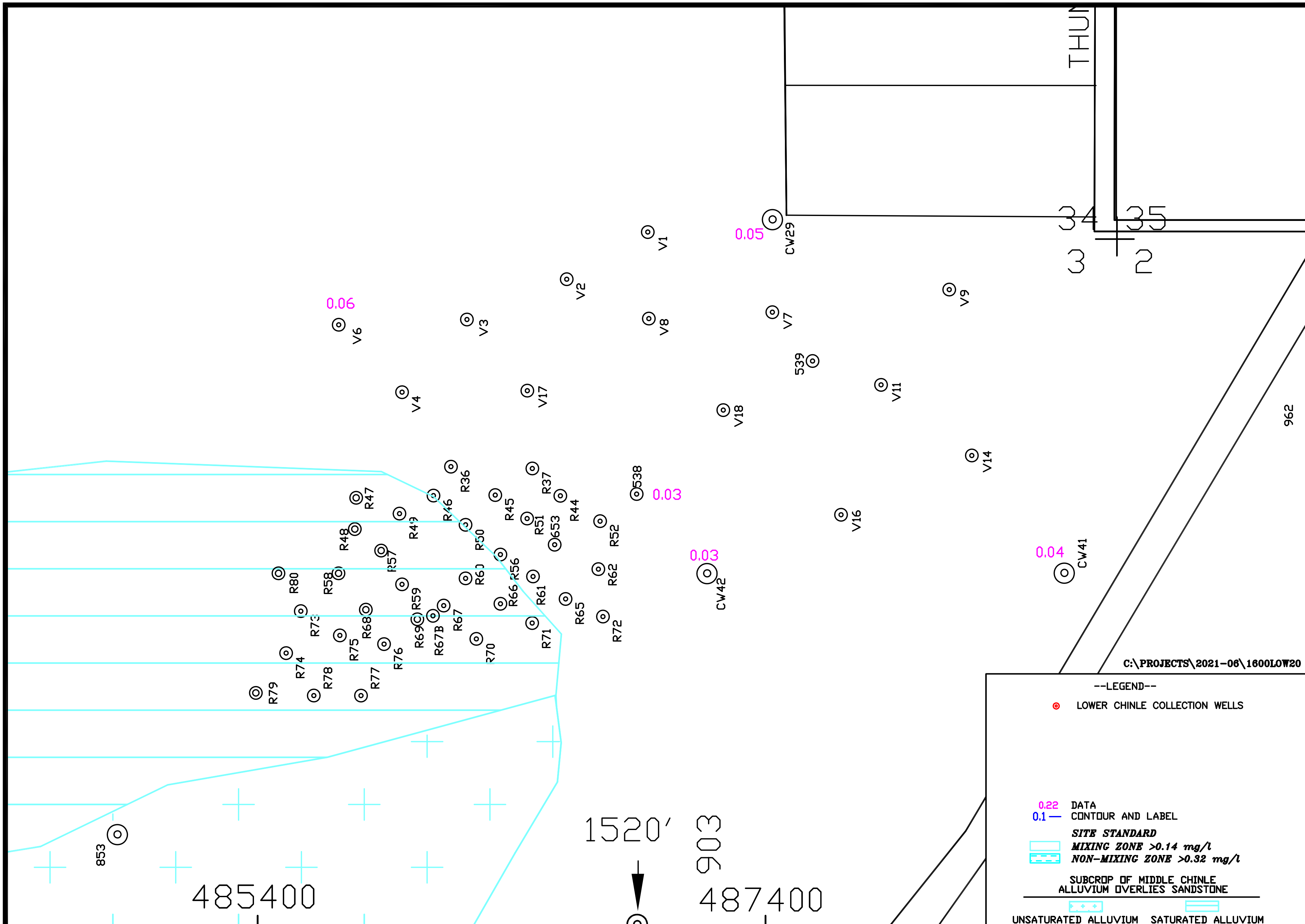



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**FIGURE 7.3-11A. SELENIUM CONCENTRATIONS OF THE LOWER CHINLE AQUIFER, SOS, 2020, mg/L**

**DATE: 9/16/2020**

**SCALE: 1"=500'**

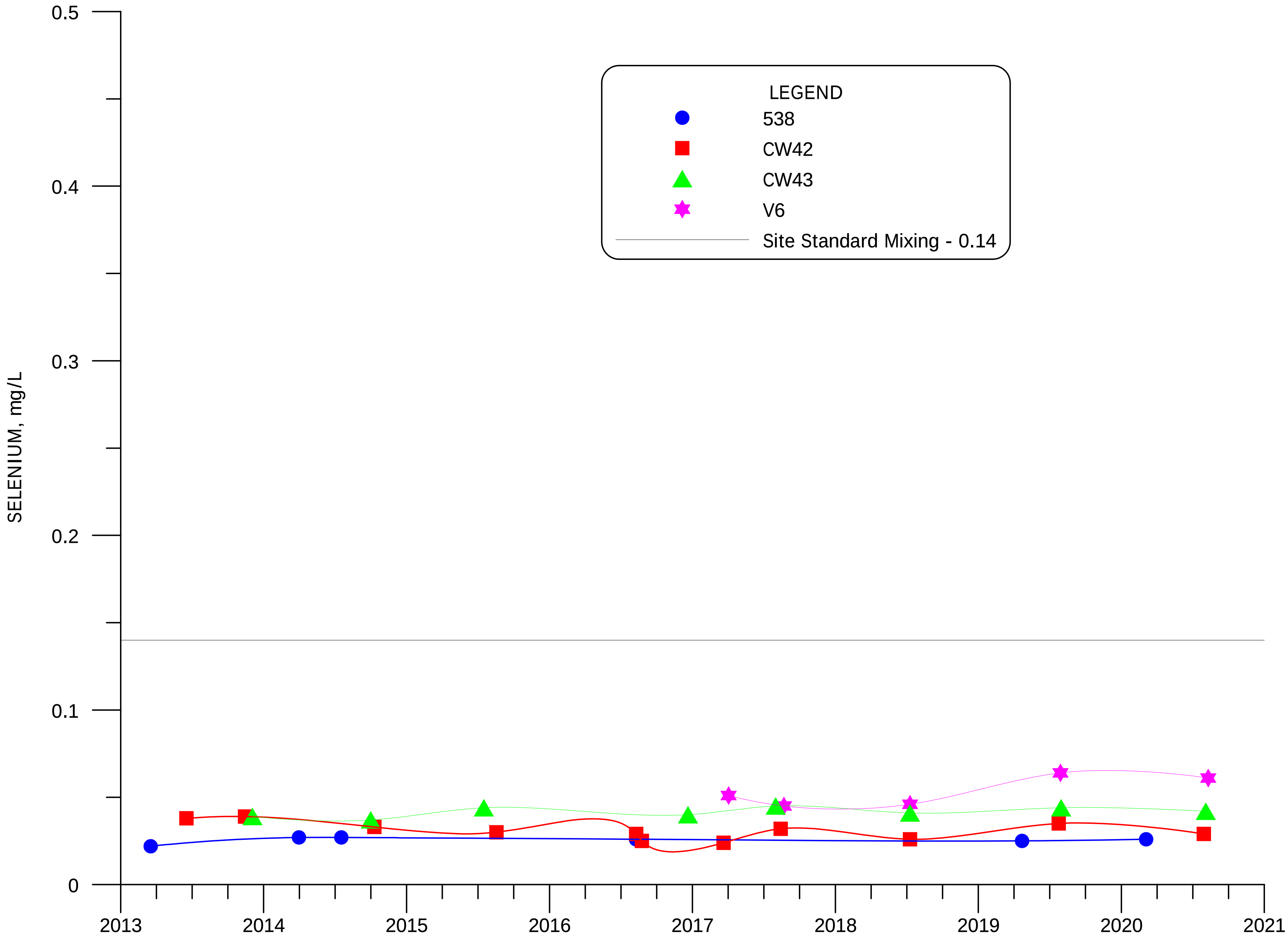


**FIGURE 7.3-12. SELENIUM CONCENTRATIONS FOR MIXING ZONE WELLS 538, CW42, CW43 AND V6**

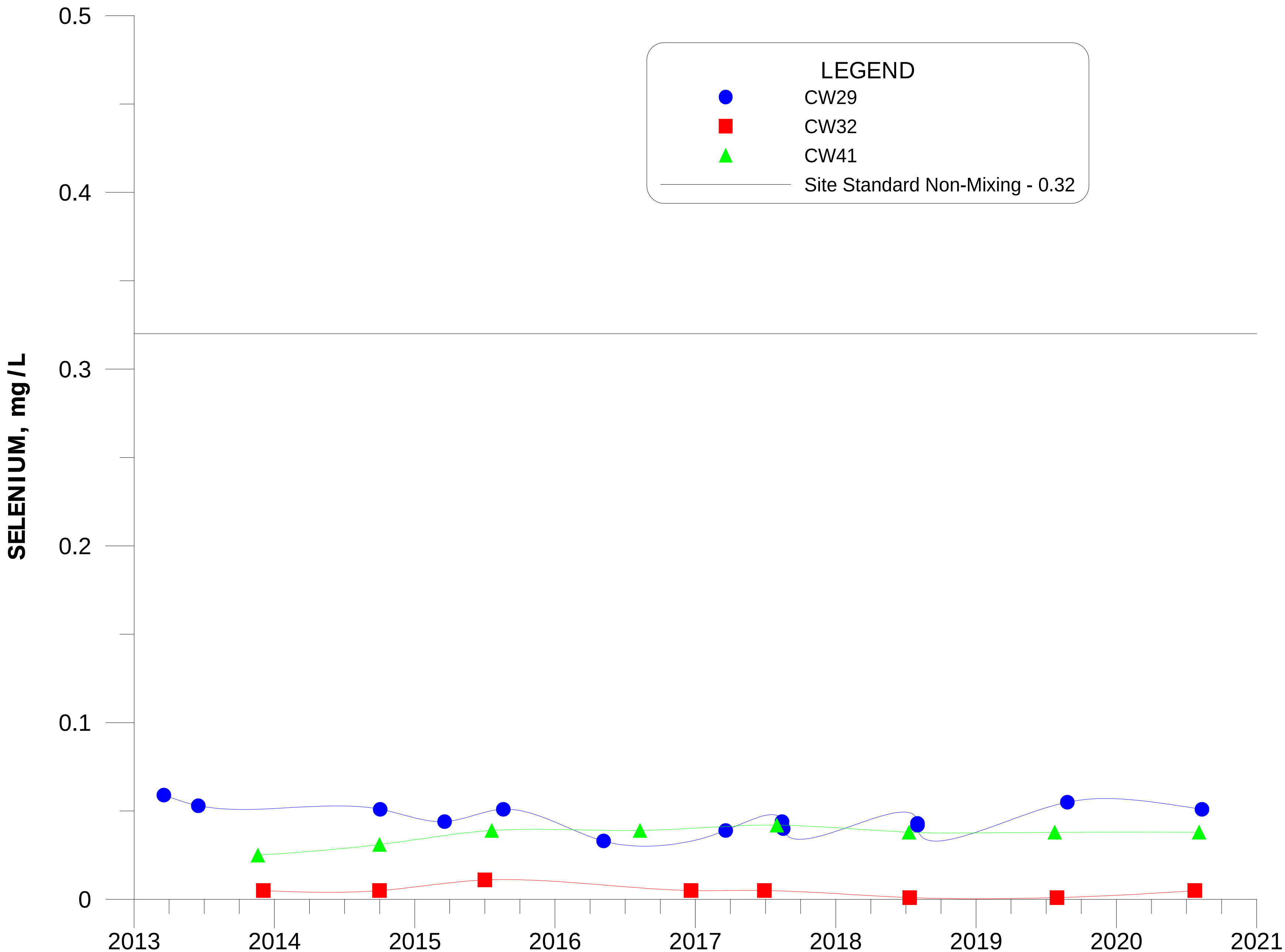


**FIGURE 7.3-13. SELENIUM CONCENTRATIONS FOR NON-MIXING WELLS CW29, CW32 AND CW41.**

**TABLE 7.3-1. LOWER CHINLE SITE STANDARDS AND 2020 BACKGROUND LOWER CHINLE DATA**

| | CONSTITUENT, concentrations in mg/l | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aquifer Zone | Selenium | Uranium | Molybdenum | TDS | Sulfate | Chloride | Nitrate | Vanadium |
| CHINLE SITE STANDARDS | | | | | | | | |
| Chinle Mixing | 0.14 | 0.18 | 0.10 | 3140 | 1750 | 250 | 15 | 0.01 |
| Lower Chinle Non-Mixing | 0.32 | 0.03 | 0.10 | 4140 | 2000 | 634 | * | * |
| CHINLE MIXING ZONE WELLS | | | | | | | | |
| CW9 | - | - | - | - | - | - | - | - |
| CW50 | <0.001 | 0.02 | 0.002 | 1710 | 881 | 56 | 0.6 | <0.01 |
| CW52 | - | - | - | - | - | - | - | - |
| CW15 | - | - | - | - | - | - | - | - |
| CW24 | - | - | - | - | - | - | - | - |
| CW35 | 0.06 | 0.17 | 0.001 | 2360 | 1280 | 66 | 3.0 | <0.01 |
| CW36 | - | - | - | - | - | - | - | - |
| CW37 | - | - | - | - | - | - | - | - |
| CW39 | - | - | - | - | - | - | - | - |
| CW43 | 0.04 | 0.048 | <0.01 | 2640 | 1260 | 222 | 7.0 | <0.2 |
| LOWER CHINLE NON-MIXING ZONE WELLS | | | | | | | | |
| CW26 | - | - | - | - | - | - | - | - |
| CW29 | 0.05 | 0.13 | <0.01 | 1570 | 607 | 140 | 2.6 | <0.02 |
| CW31 | - | - | - | - | - | - | - | - |
| CW32 | <0.005 | 0.002 | <0.01 | 3100 | 1210 | 389 | <0.1 | <0.02 |
| CW33 | - | - | - | - | - | - | - | - |
| CW41 | 0.04 | 0.04 | <0.01 | 910 | 284 | 90 | 3.1 | <0.01 |

* Background water quality analyses for constituent determined that site standard is not necessary.

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## 8.0 SAN ANDRES AQUIFER MONITORING

## 8.1 SAN ANDRES WELL COMPLETIONS AND WATER LEVELS

The San Andres aquifer is the most important regional aquifer in the Grants Project area and is typically referred to as the San Andres-Glorieta (SAG) aquifer due to the connection between the San Andres limestone and Glorieta sandstone. This report refers to only the San Andres aquifer because the monitoring and pumping for the GRP is only from the San Andres limestone and data for the aquifer in this area is mainly from wells completed in the upper portion of the San Andres limestone. 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 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 8.1-1 (see magenta pattern area). With no areas of direct communication within the area where the alluvial aquifer is impacted by seepage from the Homestake tailings, and only very limited hydraulic communication through the Chinle shale, the San Andres aquifer is not affected by the GRP tailings seepage. However, the monitoring of former San Andres supply well 943 indicated that there was leakage from a shallower aquifer occurring in the well annulus, and that the leakage had slightly impacted the San Andres aquifer in the area of the well prior to its abandonment in July of 2018. The San Andres aquifer has been used as the source for fresh-water injection into the alluvium and Chinle aquifers at the GRP, and as a result, a monitoring program was established for the San Andres aquifer. Additional monitoring has been implemented to address the past leakage in abandoned well 943.

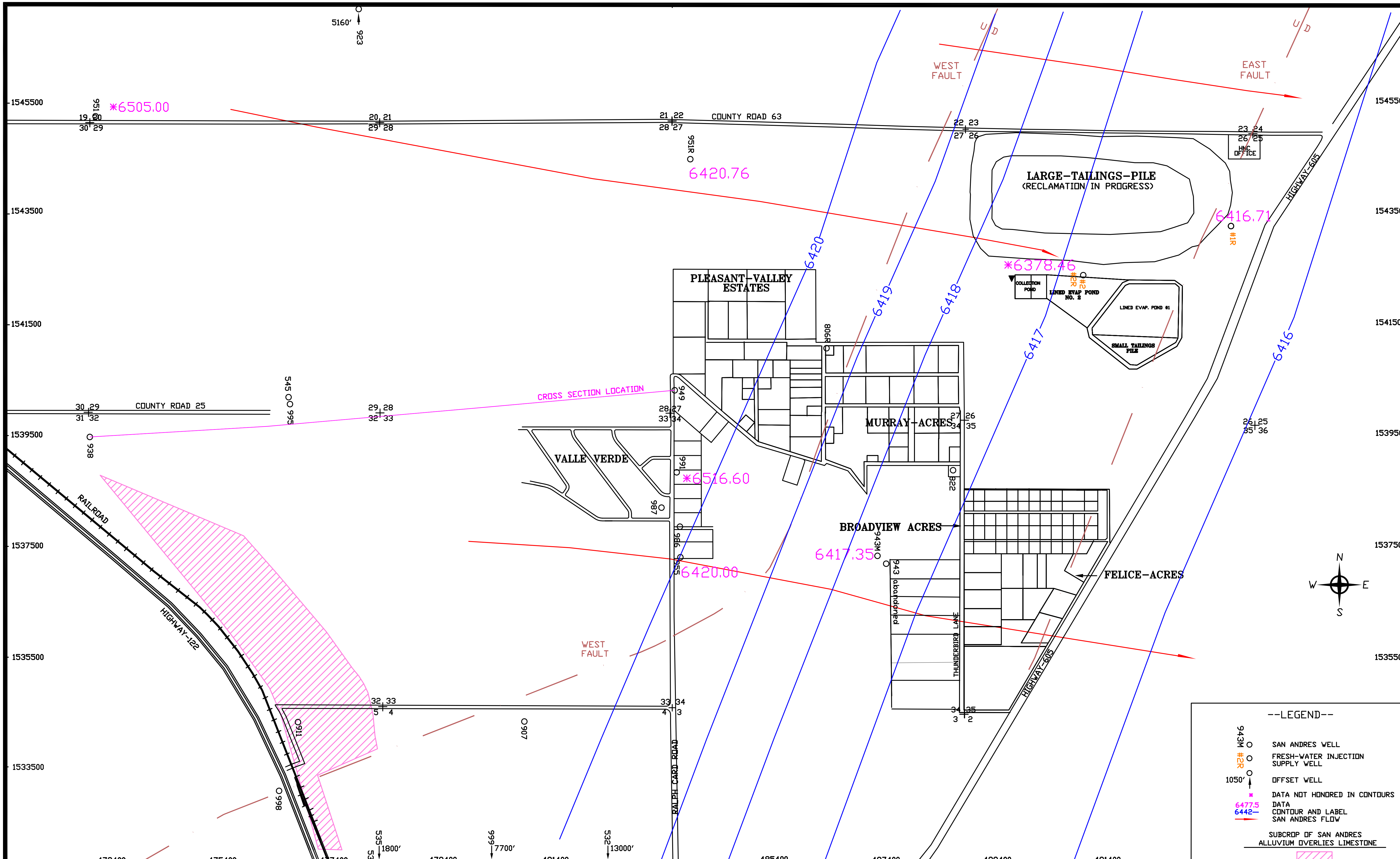
Table 8.1-1 presents well completion information for the San Andres wells in this area. Homestake's two deep water supply wells within the project area were San Andres wells #1 Deep and #2 Deep prior to the abandonment of well #1 Deep in 2019. Well #1 Deep was not used in 2017 through 2019 and drilling of replacement well #1R Deep was started in late 2017 and completed in early 2018. Usage of wells #1R and #2R Deep for water supply is expected to start in 2021. These wells are used to supply the fresh-water to the PTT for the treated water

injection systems within the GRP. 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 has been used starting in July of 2012 and continuing through early 2018 with a limited usage in late 2019. A small usage of water from well 951R during 2020 was for construction purposes in the relining of the West Collection Pond and was not for fresh-water injection supply. San Andres well 943 had been used as the fresh-water injection supply for the injection system in Sections 3 and 34 and in Felice Acres and its use as a fresh-water injection supply ended on May 18, 2017. San Andres monitoring well 943M was drilled in December 2017 and is located 217 feet northwest of former well 943. Abandonment of San Andres well 928 was initiated in late 2017 and completed in 2018 while well 943 was abandoned in July of 2018.

Figure 8.1-1 shows the locations of the San Andres wells within and near the GRP 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 8.1-2 shows a cross section from the west at San Andres well 938 to the east at San Andres well 949 (see Figure 8.1-1 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 limestone.

The water-level elevations measured during 2020 (Figure 8.1-1) 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 groundwater flow in the San Andres aquifer. The displacement at the faults is not large enough to completely offset the entire thickness of this aquifer system. The displacement at the faults would cause the water in the upper portion of the San Andres aquifer to mix with some of the deeper aquifer water prior to continuing to flow to the east. 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. The flow direction from Figure 14 in Baldwin and Anderholm (1992) was taken into account in drawing the water-level elevation contours. An asterisk is added to the water-level elevation values that were not honored in drawing the contours on the map.

The water-level elevation change in the San Andres aquifer with time is shown in Figure 8.1-3 and shows overall fairly steady water levels for 2013 through 2020. Water levels in the San Andres had generally declined at a rate of 3 feet per year from 2000 to 2012, but have been fairly steady since 2012. The water-level elevation measured in 2020 for well 951 is believed to be erroneous.

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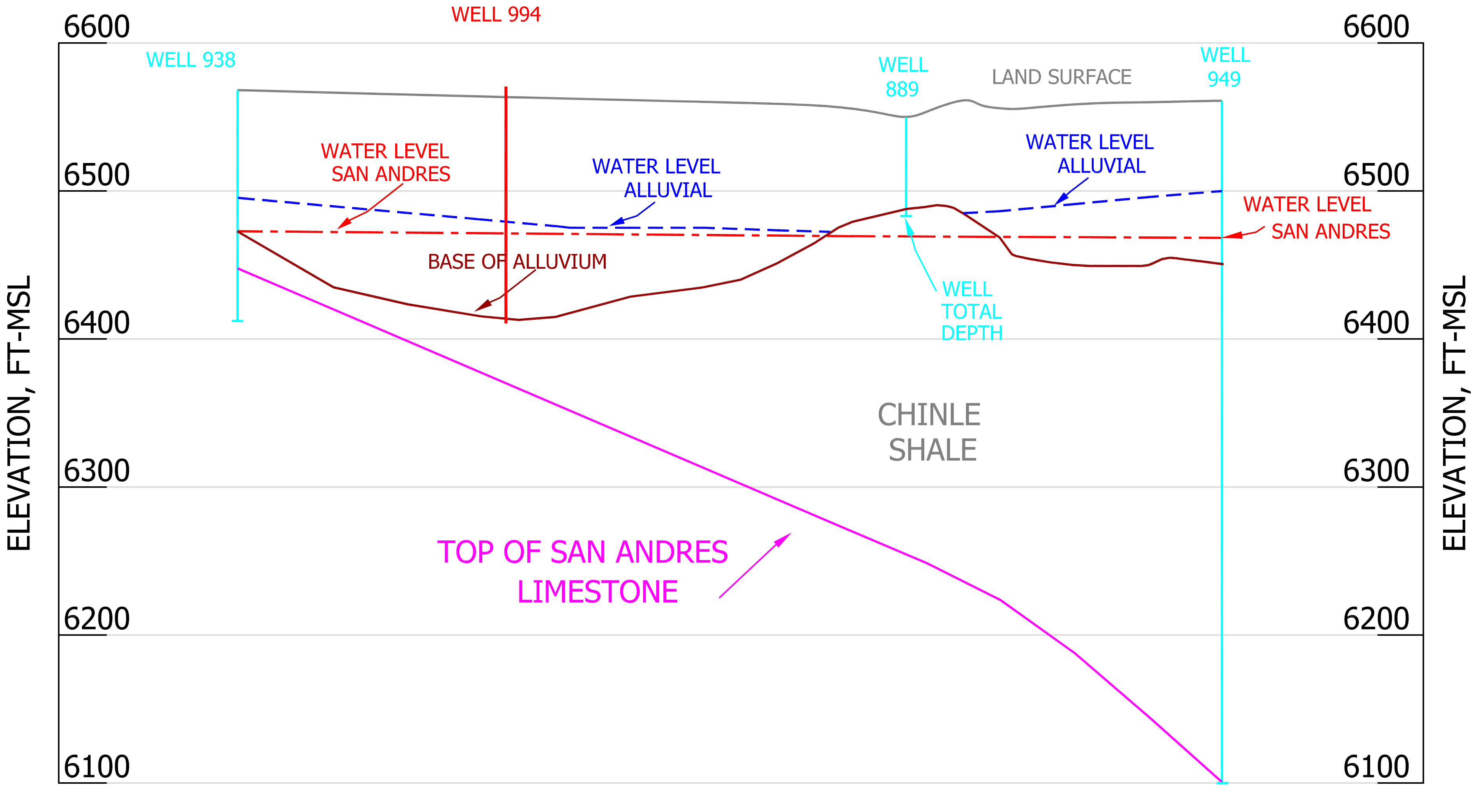
DATE: 12/2/20

FIGURE 8.1-1. LOCATION OF SAN ANDRES WELLS AND WATER-LEVEL ELEVATION FOR SAN ANDRES AQUIFER, 2020, FT-MSL




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

FIGURE 8.1-2. SAN ANDRES CROSS-SECTION ALONG THE NORTHERN BORDER OF SECTIONS 32 AND 33

DATE: 12/2/20

HORIZONTAL SCALE: 1" = 1600'

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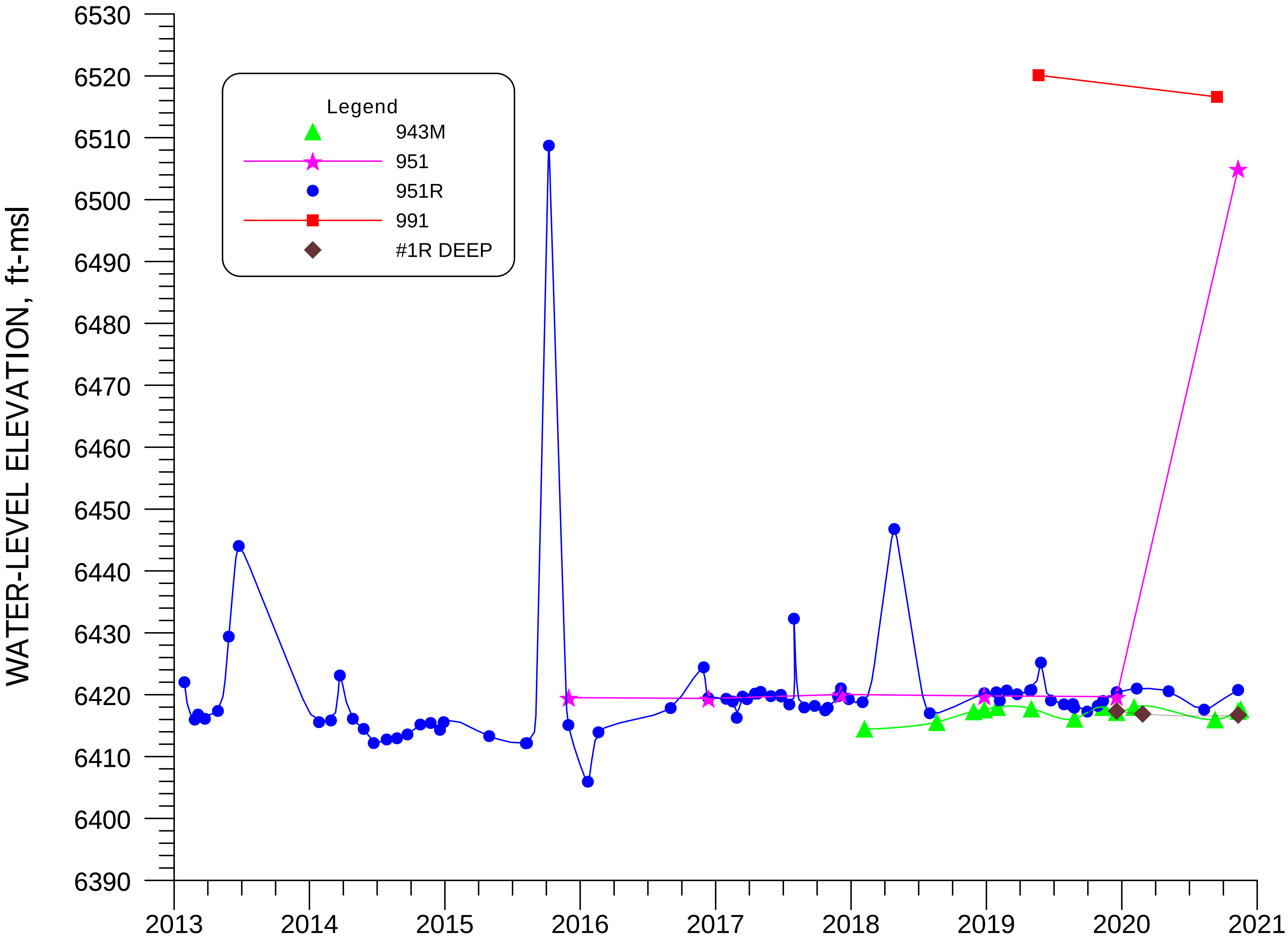



**FIGURE 8.1-3. WATER-LEVEL ELEVATION FOR SAN ANDRES WELLS 943M, 951, 951R, 991 AND #1R DEEP.**

# TABLE 8.1-1. 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 Deepwell | 1543307 | 493633 | 1000.0 | 10.0 | 12/5/2017 | 152.30 | 6431.46 | 0.0 | 6583.76 | 130 | 6454 | A | --- |
| | | | | | | | | | | 303 | 6281 | U | --- |
| | | | | | | | | | | 433 | 6151 | M | --- |
| | | | | | | | | | | 597 | 5987 | L | --- |
| | | | | | | | | | | 955 | 5629 | S | 919-999 |
| #1R Deepwell | 1543270 | 493560 | 1025.0 | 10.0 | 11/11/2020 | 172.68 | 6416.71 | 2.4 | 6589.39 | 955 | 5632 | S | 955-1025 |
| #2 Deepwell | 1542424 | 490972 | 870.0 | --- | 10/7/2020 | 197.20 | 6378.46 | 0.0 | 6575.66 | 110 | 6466 | A | --- |
| | | | | | | | | | | 800 | 5776 | S | - |
| #2R Deepwell | 1542425 | 490934 | 870.0 | 10.0 | 12/18/2019 | 184.91 | 6394.28 | 1.5 | 6579.19 | 800 | 5778 | S | 800-870 |
| 0806R | 1541177 | 486264 | 600.0 | 16.0 | 12/3/2018 | 149.99 | 6416.40 | --- | 6566.39 | 510 | --- | S | 510-580 |
| 0532 | 1518700 | 482400 | 214.0 | 14.0 | --- | --- | --- | 0.0 | 6515.00 | 0 | 6515 | S | - |
| 0534 | 1531814 | 478300 | 1000.0 | 16.0 | 12/16/2010 | 120.01 | 6432.56 | 0.0 | 6552.57 | --- | --- | S | - |
| 0535 | 1530100 | 478450 | 198.0 | 12.0 | 12/17/2010 | 117.85 | 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 | 135.60 | 6421.40 | 0.0 | 6557.00 | 790 | 5767 | S | 790-875 |
| 0907 | 1534250 | 480800 | 360.0 | 16.0 | 12/3/2018 | 124.69 | 6420.91 | 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 | 4/6/1994 | 6464.97 | 157.63 | 0.0 | 6622.60 | 60 | 6563 | A | --- |
| | | | | | | | | | | 229 | 6394 | S | 234-330 |
| * 0928 | 1548250 | 491700 | 864.0 | 18.0 | 12/13/2016 | 132.21 | 6465.39 | 1.2 | 6597.60 | 138 | 6458 | A | --- |
| | | | | | | | | | | 801 | 5795 | S | - |
| 0938 | 1539500 | 473040 | --- | --- | 12/5/2017 | 157.70 | 6411.10 | 0.0 | 6568.80 | 95 | 6474 | A | --- |
| | | | | | | | | | | 120 | 6449 | S | - |
| * 0943 | 1537222 | 487407 | 978.0 | 18.0 | 12/26/2017 | 134.00 | 6421.91 | 0.0 | 6555.91 | 704 | 5852 | S | 703-978 |
| 0943M | 1537358 | 487238 | 800.0 | 6.0 | 11/17/2020 | 138.46 | 6417.64 | 2.3 | 6556.10 | 710 | 5844 | S | 740-800 |
| 0949 | 1540350 | 483600 | 551.0 | 6.0 | 2/13/2008 | 130.60 | 6431.70 | 0.0 | 6562.30 | 112 | 6450 | A | --- |
| | | | | | | | | | | 250 | 6312 | L | --- |
| | | | | | | | | | | 460 | 6102 | S | 400-493 |
| | | | | | | | | | | 460 | 6102 | S | 505-551 |
| 0951 | 1545500 | 473200 | 275.0 | 10.0 | 11/11/2020 | 68.70 | 6505.00 | 0.9 | 6573.70 | 110 | 6463 | A | --- |
| | | | | | | | | | | 227 | 6346 | S | 241-275 |
| 0951R | 1544500 | 484100 | 525.0 | 8.0 | 11/11/2020 | 156.02 | 6420.76 | 1.0 | 6576.78 | 65 | 6511 | A | --- |
| | | | | | | | | | | 420 | 6156 | S | 415-525 |

# TABLE 8.1-1. 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0955 | 1537338 | 483699 | 498.0 | 5.0 | 8/4/2020 | 130.00 | 6420.00 | 0.2 | 6550.00 | 40 | 6510 | A | --- |
| | | | | | | | | | | 420 | 6130 | S | 385-498 |
| 0986 | 1537894 | 483690 | 467.0 | 5.0 | 8/23/2008 | 124.00 | 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 | 54.48 | 6595.52 | 1.0 | 6650.00 | 70 | 6579 | A | --- |
| | | | | | | | | | | 385 | 6264 | S | 425-470 |
| 0991 | 1538873 | 483630 | 500.0 | 6.0 | 9/14/2020 | 134.40 | 6516.60 | 1.4 | 6651.00 | --- | --- | S | - |
| 0995 | 1540115 | 476594 | --- | --- | --- | --- | --- | 0.0 | 6474.00 | --- | --- | S | - |
| 0998 | 1533080 | 476450 | 145.0 | 16.0 | 3/15/2018 | 128.22 | 6521.78 | 0.0 | 6650.00 | --- | --- | S | - |
| 0999 | 1524230 | 480187 | 180.0 | 16.0 | 3/15/2018 | 111.39 | 6415.61 | 0.0 | 6527.00 | 0 | 6527 | S | - |

NOTE: A = Base of Alluvium
L = Lower Chinle
S = San Andres Aquifer
r = Reported
* = Abandoned

## 8.2 SAN ANDRES WATER QUALITY

Figure 8.2-1 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. Additional San Andres monitoring is presented in Figure 8.2-1 and shows the 2020 data for sulfate, TDS, uranium and selenium concentrations in the San Andres aquifer. HMC committed to additional monitoring in the San Andres aquifer to address concerns for the past leakage in well 943 prior to its abandonment in July of 2018. The additional quarterly samples from wells 951R and #2 Deep were obtained in 2020 while one of the 943M quarterly samples and one of the semiannual samples from wells 806R, 955 and 991 were not obtained due to work force limitations resulting from the COVID-19 pandemic. The semiannual samples from well 949 were not collected because the land owner would not give permission to sample this well during 2020.

Sulfate concentrations are typically near 650 mg/L for the area of the Homestake #1R Deep well and the #2 Deep well. Sulfate concentration in the San Andres aquifer generally increases with residence time in the limestone with wells 532, 938, 998 and 999, which are located near the outcrop, typically having lower concentrations than wells located farther to the east. The sulfate concentrations in wells 955 and 991 are less than the sulfate concentrations in wells 806R and 943M because wells 955 and 991 are located closer to the recharge area for the San Andres aquifer. TDS concentrations in the San Andres aquifer have varied from 464 mg/L to approximately 2000 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 major constituent concentrations from the recharge area to the down dip area is expected. Uranium concentrations were generally small in all of the San Andres wells monitored during 2020 with the largest measured value of 0.028 mg/L in well 951R. Selenium concentrations in the San Andres aquifer vary from less than 0.005 to 0.010 mg/L. All measured molybdenum concentrations are less than 0.01 mg/L.

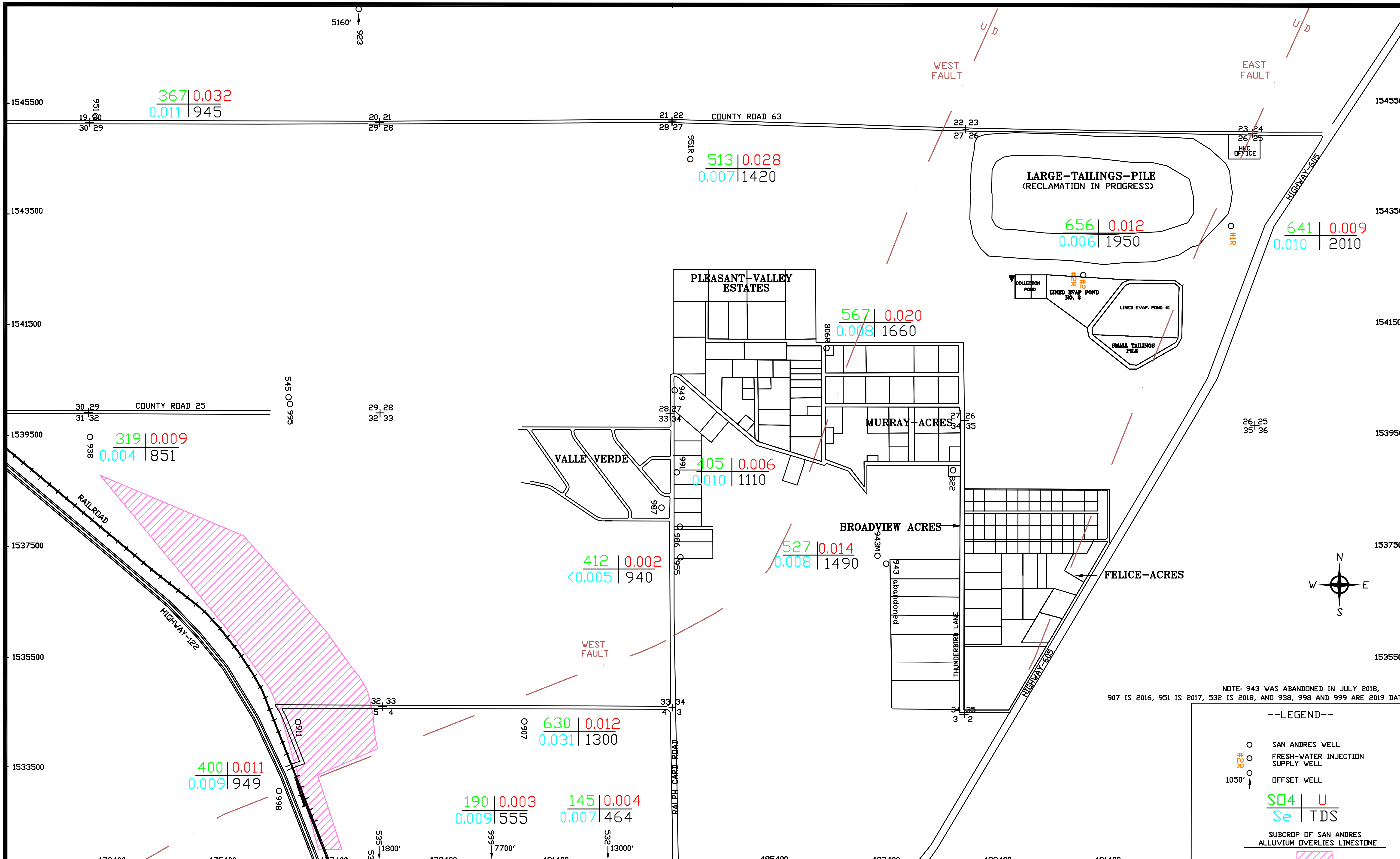
The additional monitoring of the San Andres aquifer in the GRP area relative to the past leakage from well 943 in 2020 does not show an increase in constituent concentrations that could be attributed to the past leakage into well 943 (see Figure 8.2-1 and Figure 8.2-8). The

very small uranium concentration increase of 0.007 mg/L for the late 2020 sample from well 943M is potentially an anomalous point and future sampling will inform that interpretation. Additionally, minor impacts from seepage at the Bluewater site have been observed at other San Andres wells in the GRP area, and the slight uranium concentration increase in well 943M could potentially be a very minor impact from the Bluewater site.

Figure 8.2-2 presents sulfate concentrations with time for Homestake's wells 943M, 951, 951R, #1 Deep, #1R Deep and #2 Deep wells. This data shows that sulfate concentrations in 2020 for these San Andres wells were similar to their historical average since injection water supply has occurred. Figure 8.2-3 presents the sulfate concentrations with time for San Andres wells 532, 806R, 955, 991, 998 and 999. Updated sulfate concentrations for wells 991, 955, 951R, 806R and #2 Deep were obtained and are consistent with previous data.

Figures 8.2-4 through 8.2-7 present TDS and chloride concentrations with time for HMC's and other San Andres wells for these two additional major constituents. The TDS data shows an increase with distance from the San Andres outcrop in the western portion of Figure 8.2-1 with the highest values in the eastern wells.

Uranium and selenium plots were also developed for these two groups of San Andres wells and are presented in Figures 8.2-8 through 8.2-11. The increase in uranium concentration in well 806R in 2017 is not supported by other constituents and is indicated to be anomalous based on comparison with the 2018 through 2020 values. No trends in these constituent concentrations that would indicate impacts from the past well 943 leakage were noted in wells 806R, 943M, 955 or 991.




SCALE: 1" = 1000'
C:\PROJECTS\2021-06\1600SAN20
DATE: 12/2/20

FIGURE 8.2-1. LOCATION OF SAN ANDRES WELLS AND WATER QUALITY DATA FOR THE SAN ANDRES AQUIFER 2020, mg/L

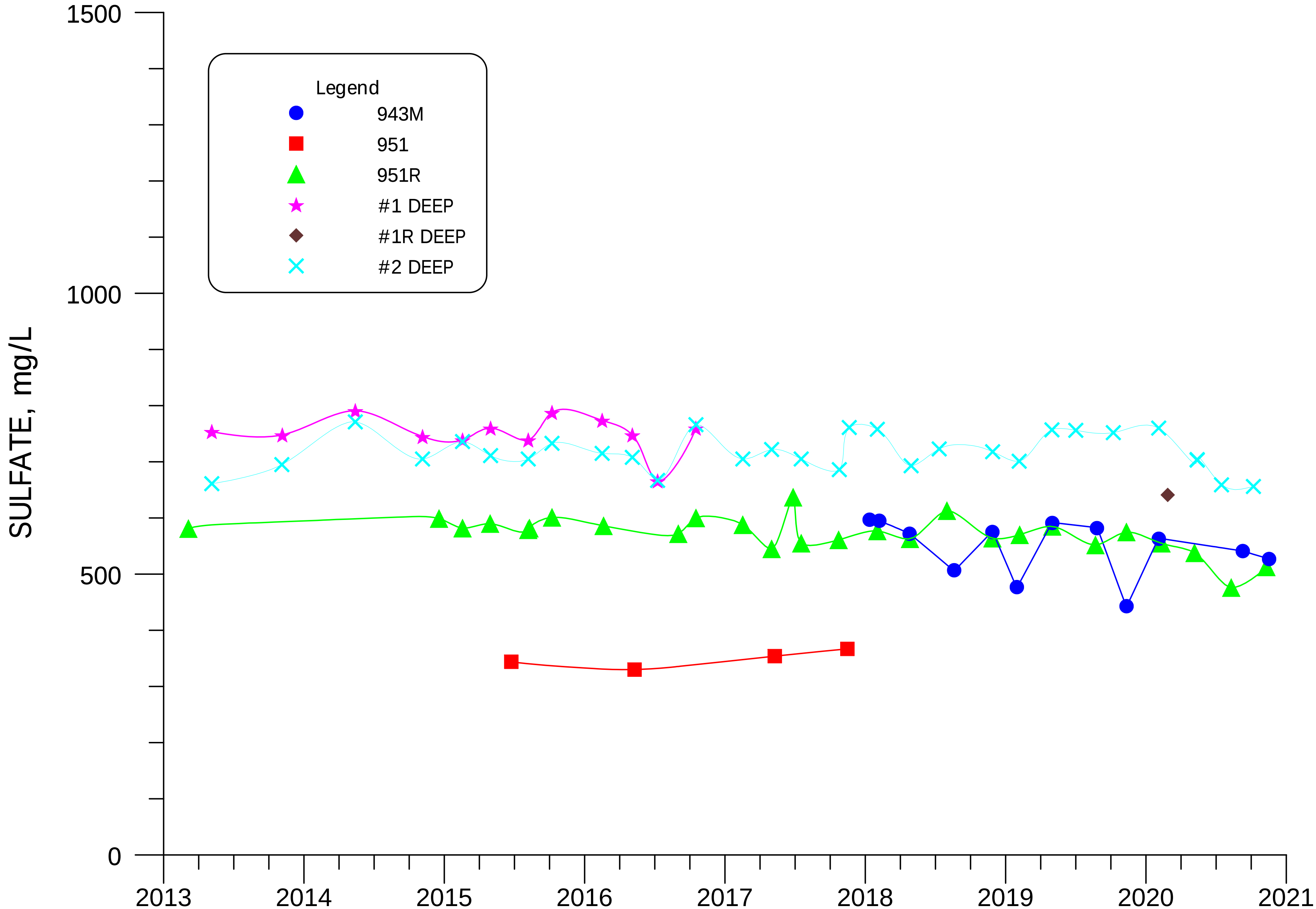



**FIGURE 8.2-2. SULFATE CONCENTRATIONS FOR WELLS 943M, 951, 951R, #1 DEEP, #1R DEEP AND #2 DEEP.**

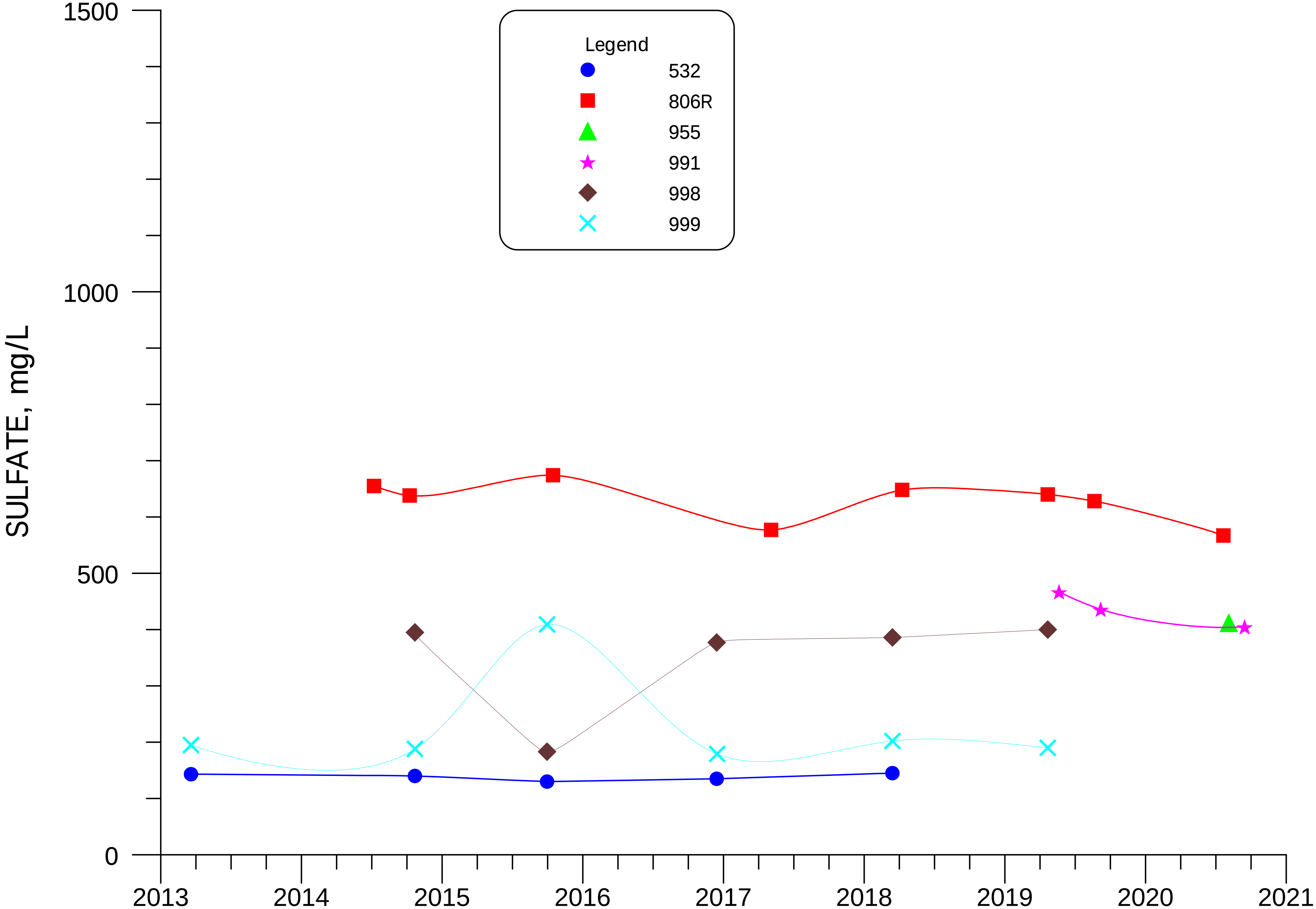



**FIGURE 8.2-3. SULFATE CONCENTRATIONS FOR WELLS 532, 806R, 955, 991, 998 AND 999.**

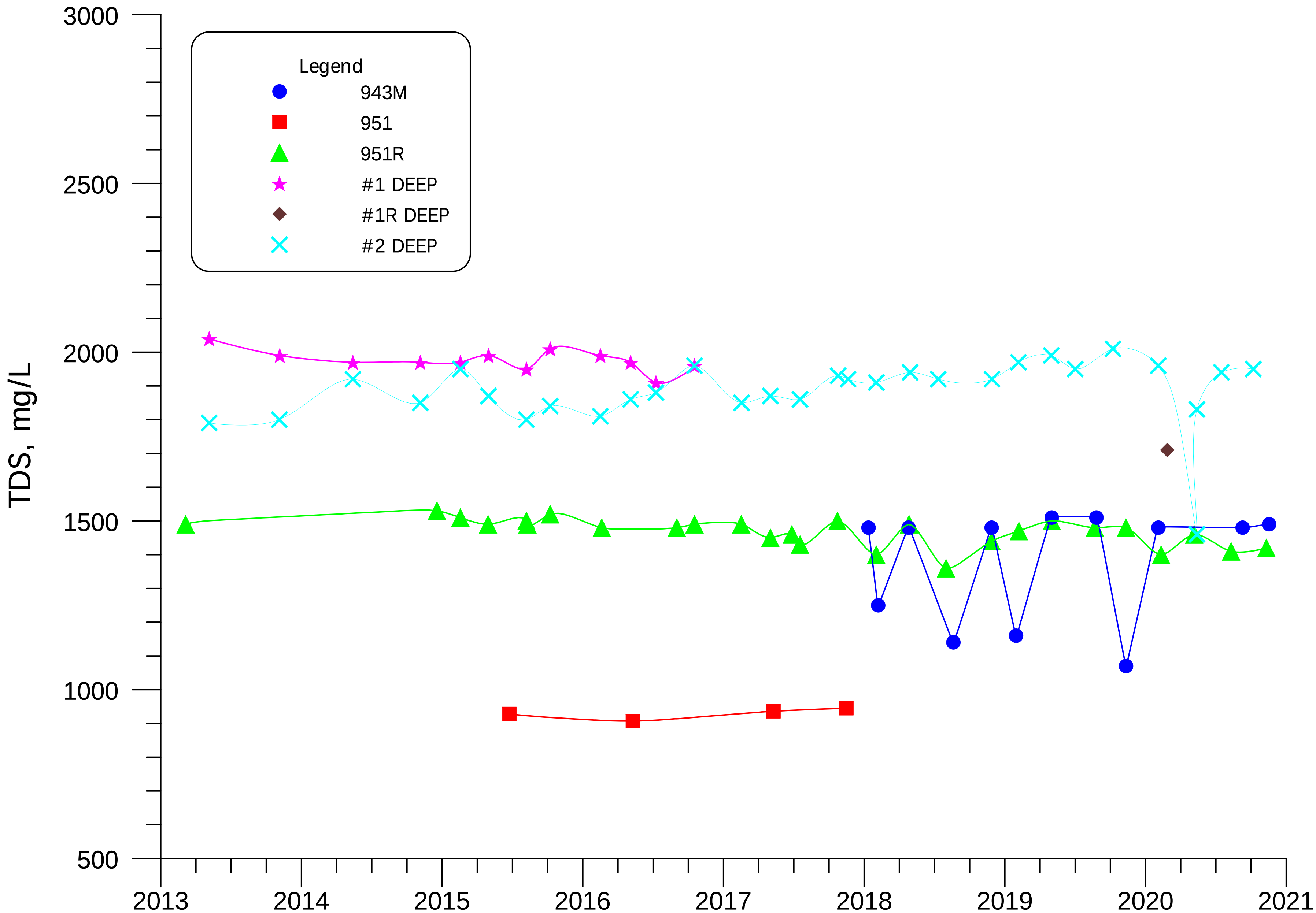



**FIGURE 8.2-4. TDS CONCENTRATIONS FOR WELLS 943M, 951, 951R, #1 DEEP, #1R DEEP AND #2 DEEP.**

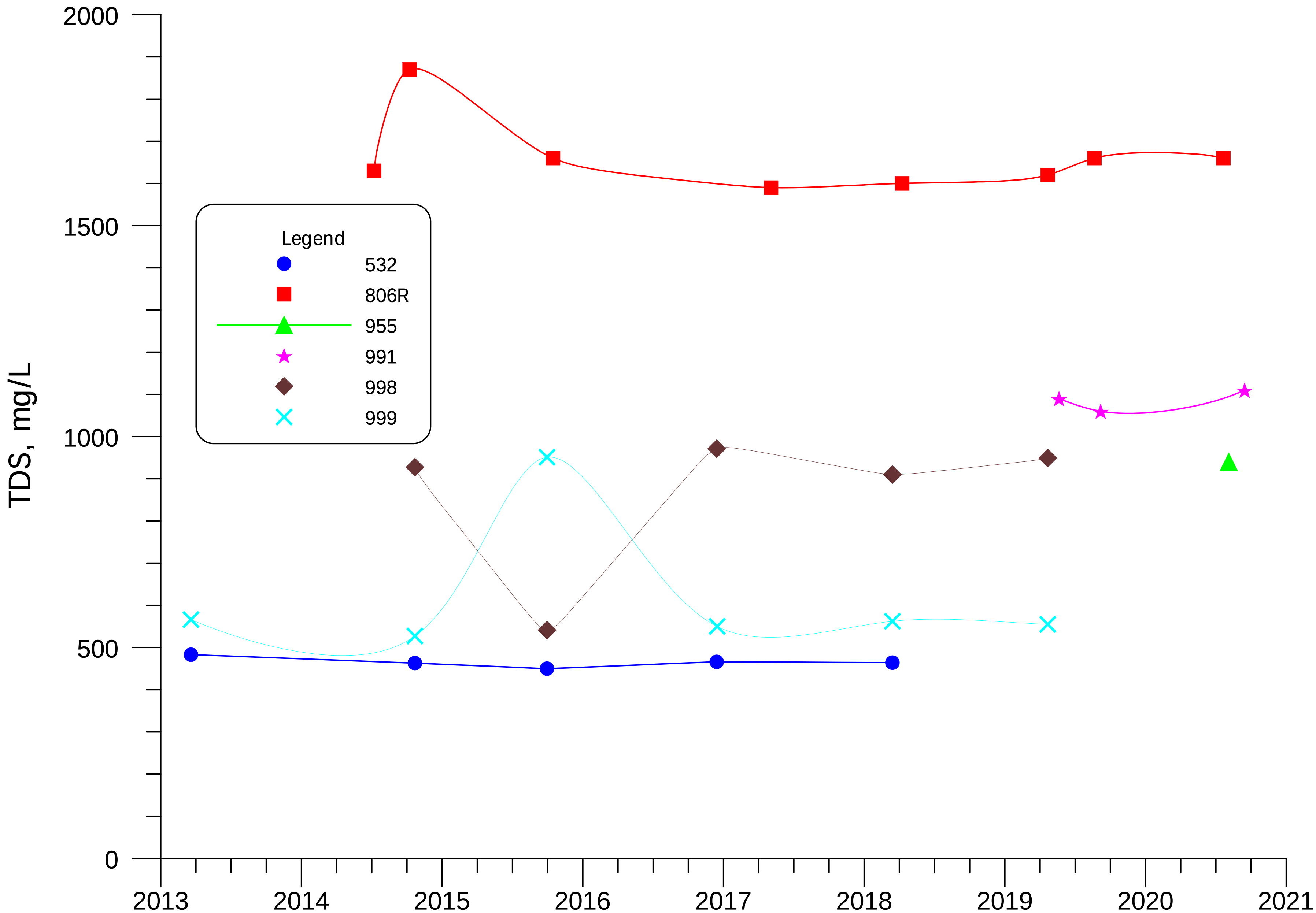



**FIGURE 8.2-5. TDS CONCENTRATIONS FOR WELLS 532, 806R, 955, 991, 998 AND 999.**

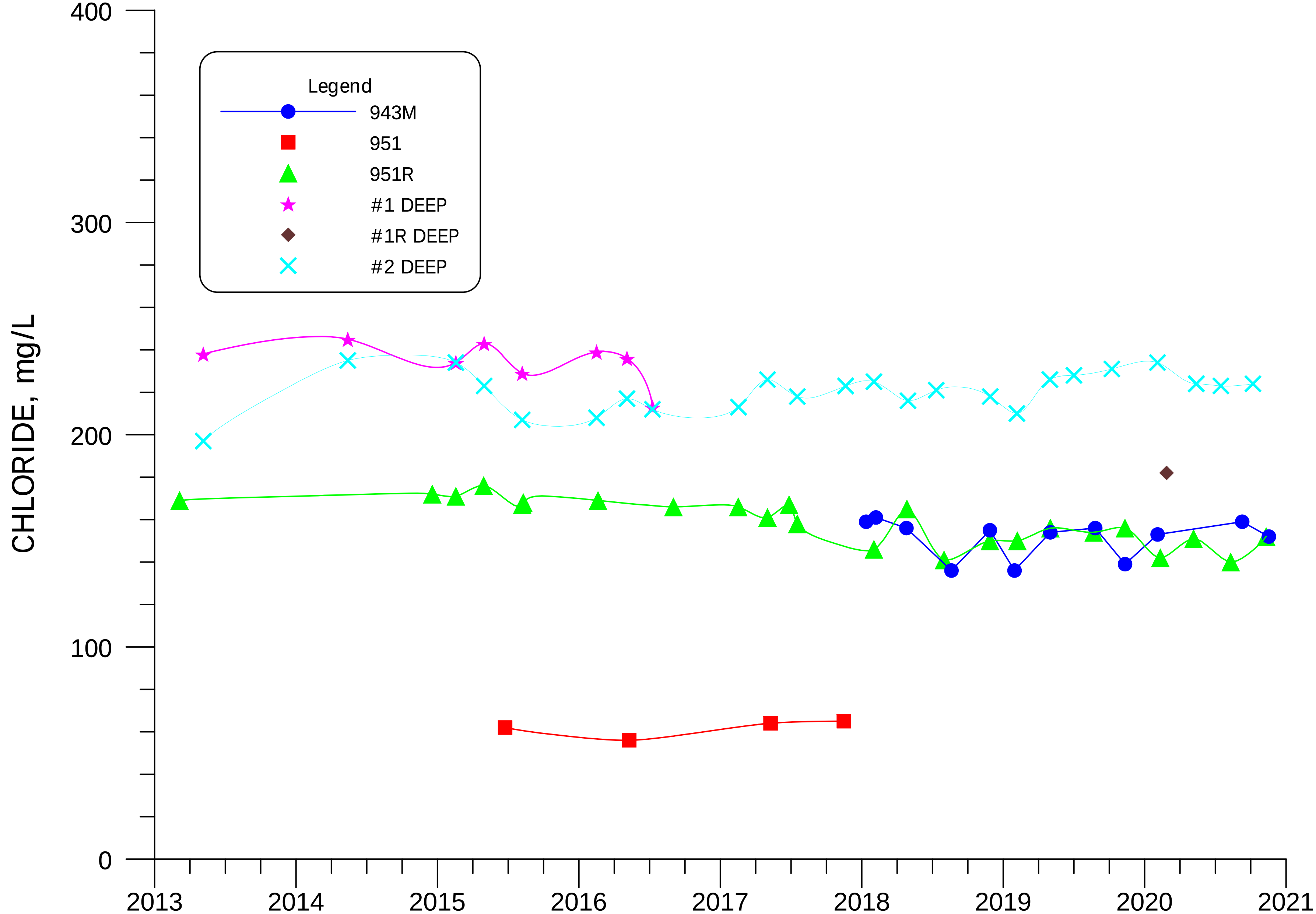



**FIGURE 8.2-6. CHLORIDE CONCENTRATIONS FOR WELLS 943M, 951, 951R, #1 DEEP, #1R DEEP AND #2 DEEP.**

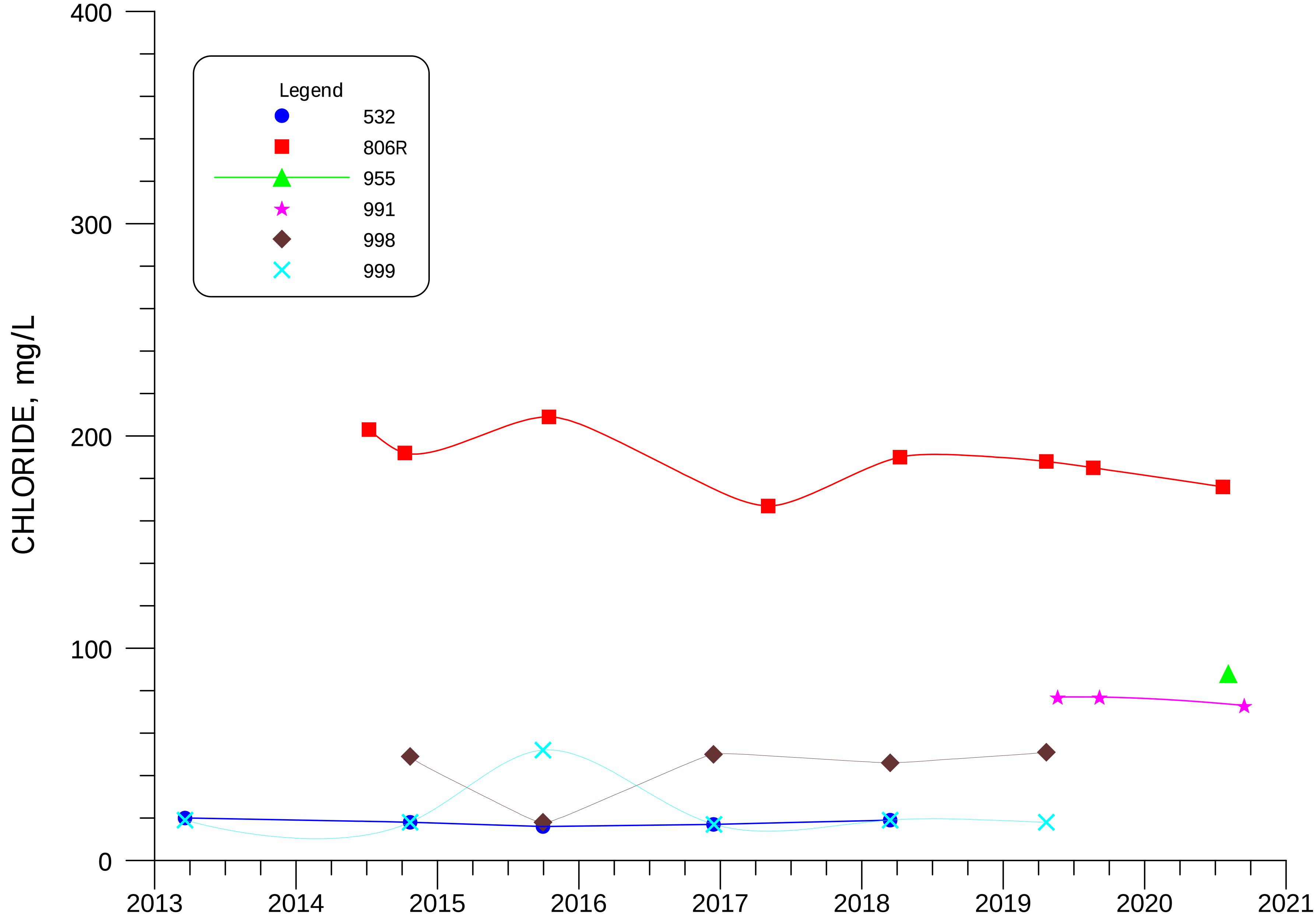



**FIGURE 8.2-7. CHLORIDE CONCENTRATIONS FOR WELLS 532, 806R, 955, 991, 998 AND 999.**

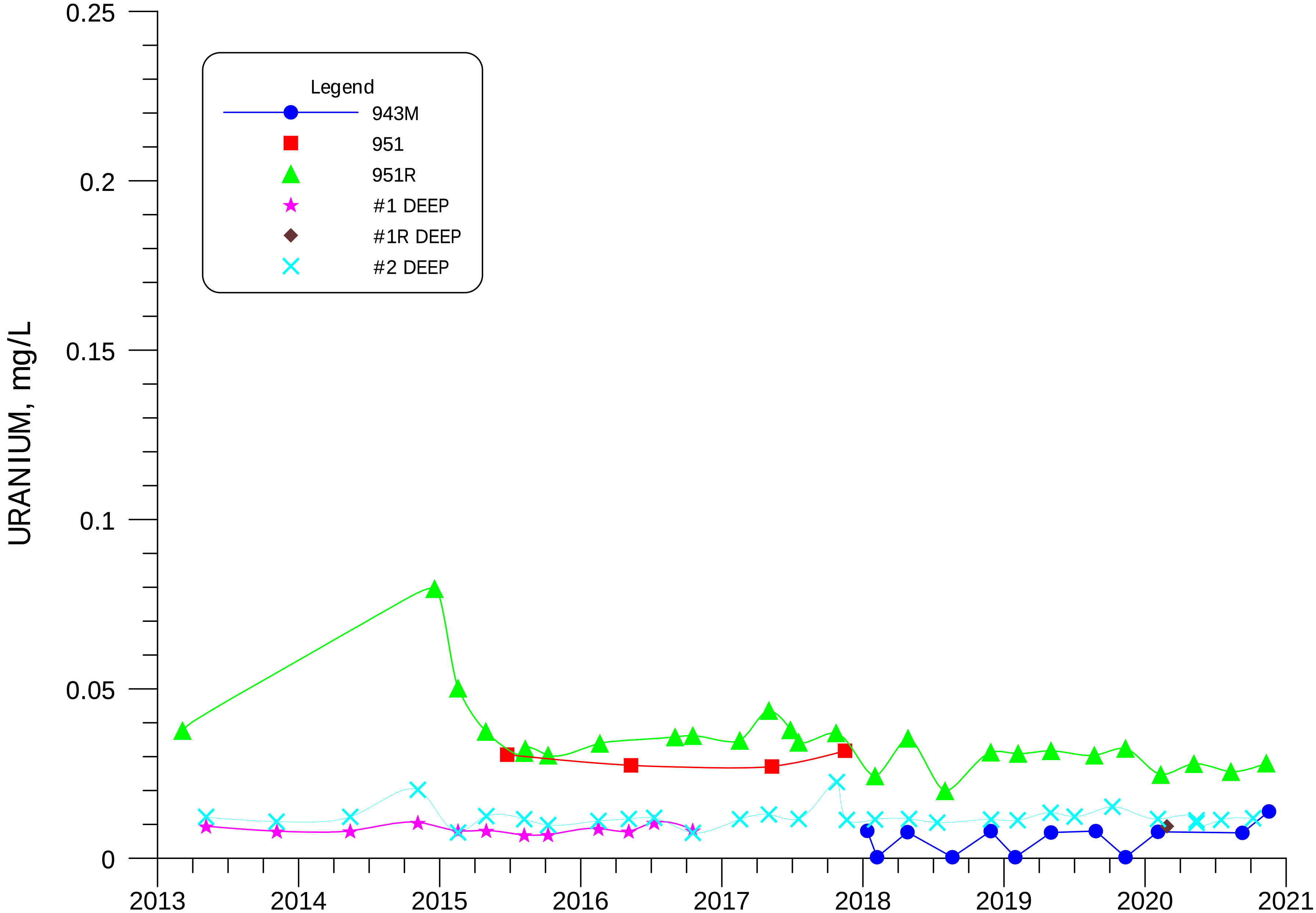



**FIGURE 8.2-8. URANIUM CONCENTRATIONS FOR WELLS 943M, 951, 951R, #1 DEEP, #1R DEEP AND #2 DEEP.**

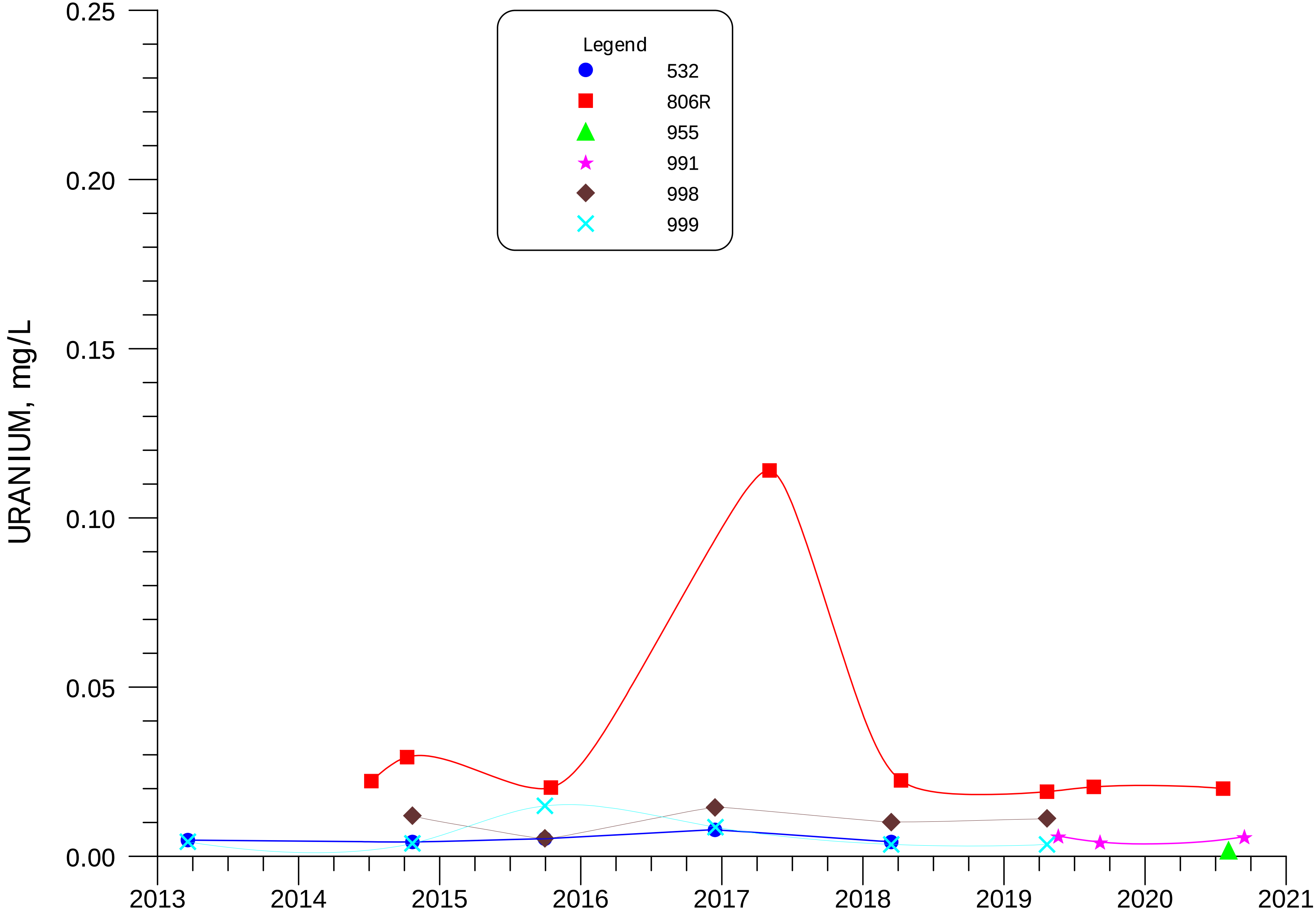



**FIGURE 8.2-9. URANIUM CONCENTRATIONS FOR WELLS 532, 806R, 955, 991, 998 AND 999.**

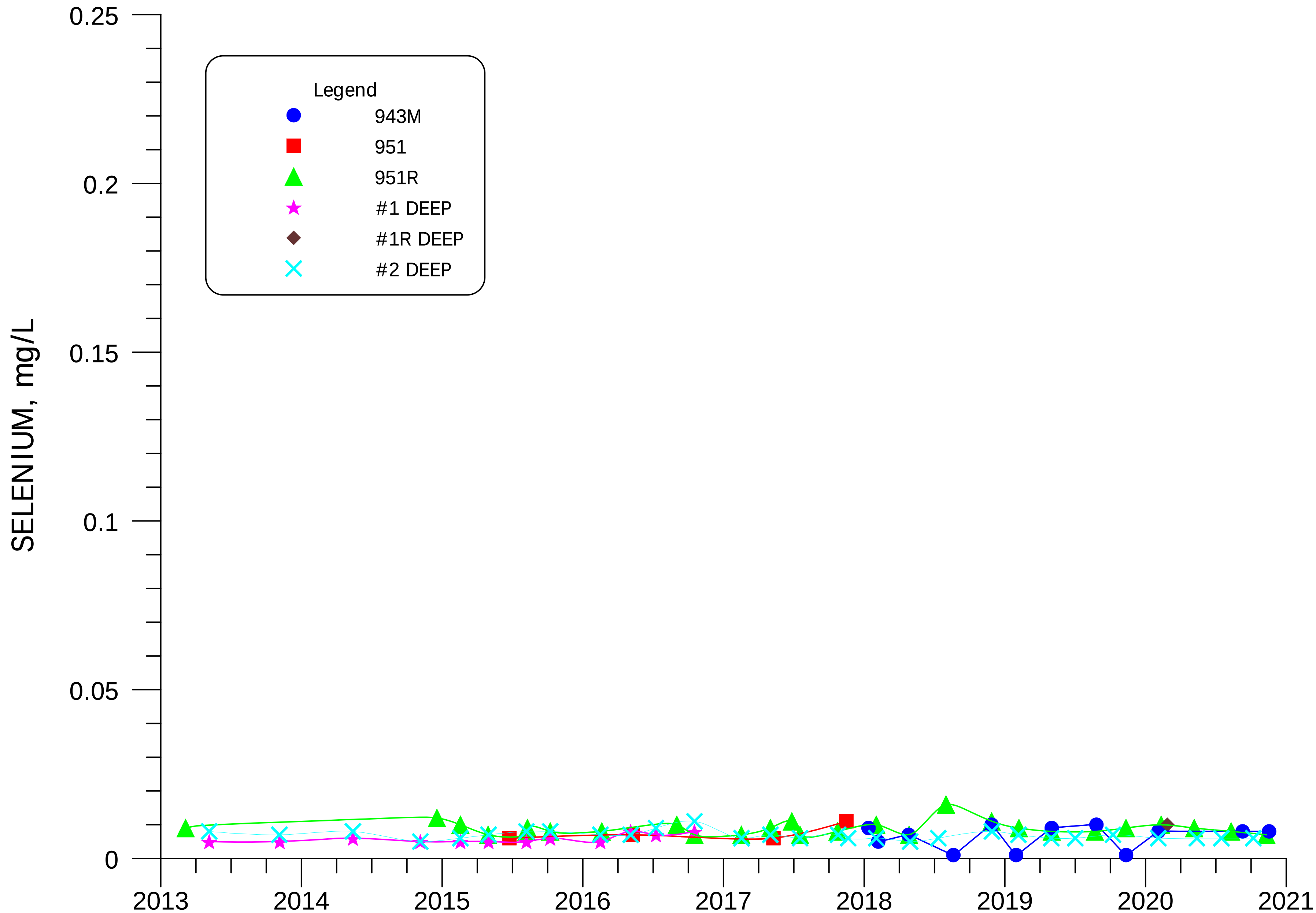



**FIGURE 8.2-10. SELENIUM CONCENTRATIONS FOR WELLS 943M, 951, 951R, #1 DEEP, #1R DEEP AND #2 DEEP.**

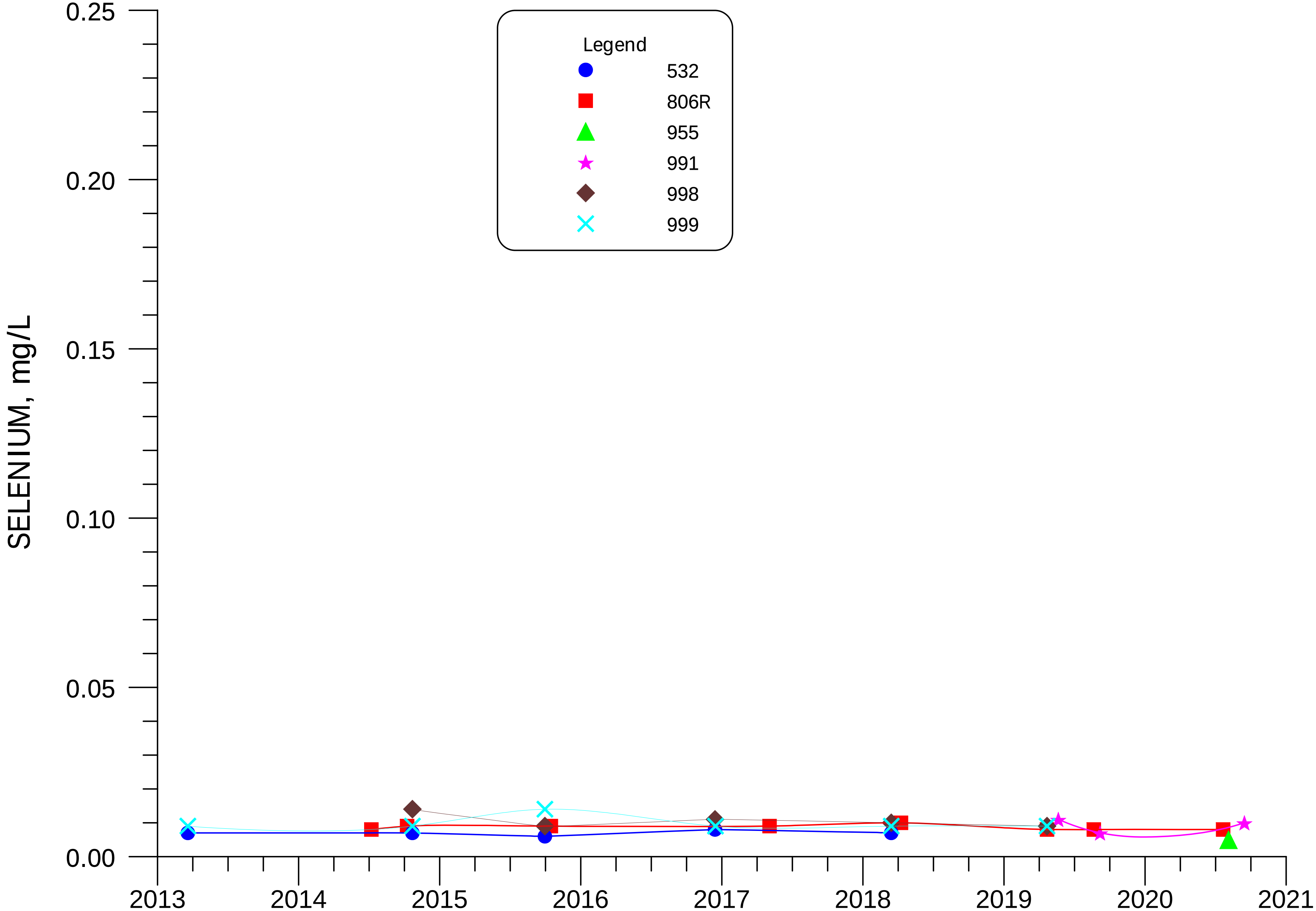



**FIGURE 8.2-11. SELENIUM CONCENTRATIONS FOR WELLS 532, 806R, 955, 991, 998 AND 999.**

**SECTION 9**

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**GROUND WATER MONITORING
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# APPENDIX A

# WATER LEVELS

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## MONITORING/PERFORMANCE REVIEW
## FOR HOMESTAKE'S GRANTS PROJECT

## APPENDIX A

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# Table A.1-1. WATER LEVELS FOR THE TAILINGS WELLS

WATER LEVEL ELEVATION (FT-MSL)

### CN1

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 18.70 | 6596.31 |
| 2/24/2020 | 18.70 | 6596.31 |
| 3/30/2020 | 16.40 | 6598.61 |
| 4/27/2020 | 18.93 | 6596.08 |
| 5/26/2020 | 19.04 | 6595.97 |
| 6/30/2020 | 19.30 | 6595.71 |
| 7/27/2020 | 18.70 | 6596.31 |
| 8/31/2020 | 19.70 | 6595.31 |
| 9/29/2020 | 19.65 | 6595.36 |
| 10/26/2020 | 19.61 | 6595.40 |
| 12/1/2020 | 19.85 | 6595.16 |
| 12/30/2020 | 19.92 | 6595.09 |

### CN2

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 72.20 | 6585.97 |
| 2/24/2020 | 72.40 | 6585.77 |
| 3/30/2020 | 72.70 | 6585.47 |
| 4/27/2020 | 71.11 | 6587.06 |
| 5/26/2020 | 72.79 | 6585.38 |
| 6/30/2020 | 72.80 | 6585.37 |
| 7/27/2020 | 72.40 | 6585.77 |
| 8/31/2020 | 72.90 | 6585.27 |
| 9/29/2020 | 73.03 | 6585.14 |
| 10/26/2020 | 71.26 | 6586.91 |
| 12/1/2020 | 72.90 | 6585.27 |
| 12/30/2020 | 73.00 | 6585.17 |

### CS1

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 32.70 | 6575.60 |

### CS2

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 60.60 | 6591.38 |
| 2/24/2020 | 60.70 | 6591.28 |
| 3/30/2020 | 60.90 | 6591.08 |
| 4/27/2020 | 58.55 | 6593.43 |
| 5/26/2020 | 60.88 | 6591.10 |
| 6/30/2020 | 61.30 | 6590.68 |
| 7/27/2020 | 61.80 | 6590.18 |
| 8/31/2020 | 61.50 | 6590.48 |
| 9/29/2020 | 61.46 | 6590.52 |
| 10/26/2020 | 61.57 | 6590.41 |
| 12/1/2020 | 61.80 | 6590.18 |
| 12/30/2020 | 61.70 | 6590.28 |

### CS7

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 71.50 | 6593.19 |

### EC18

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 66.20 | 6601.08 |

### EE2

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 65.20 | 6602.64 |
| 2/24/2020 | 65.35 | 6602.49 |
| 3/30/2020 | 65.60 | 6602.24 |
| 4/27/2020 | 65.51 | 6602.33 |
| 5/26/2020 | 65.63 | 6602.21 |
| 6/30/2020 | 65.80 | 6602.04 |
| 7/27/2020 | 65.00 | 6602.84 |
| 8/31/2020 | 66.00 | 6601.84 |
| 9/29/2020 | 66.15 | 6601.69 |
| 10/26/2020 | 66.20 | 6601.64 |
| 12/1/2020 | 66.30 | 6601.54 |
| 12/30/2020 | 66.40 | 6601.44 |

### EI4

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 40.60 | 6627.40 |

### EI9

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 63.90 | 6604.10 |

### EN1

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 31.80 | 6587.06 |
| 2/24/2020 | 31.90 | 6586.96 |
| 3/30/2020 | 32.00 | 6586.86 |
| 4/27/2020 | 31.98 | 6586.88 |
| 5/26/2020 | 22.98 | 6595.88 |
| 6/30/2020 | 21.10 | 6597.76 |
| 7/27/2020 | 20.90 | 6597.96 |
| 8/31/2020 | 32.10 | 6586.76 |
| 9/29/2020 | 32.30 | 6586.56 |
| 10/26/2020 | 23.04 | 6595.82 |
| 12/1/2020 | 32.40 | 6586.46 |
| 12/30/2020 | 32.30 | 6586.56 |

### EN2

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 53.10 | 6598.51 |
| 2/24/2020 | 53.40 | 6598.21 |
| 3/30/2020 | 16.80 | 6634.81 |
| 4/27/2020 | 53.54 | 6598.07 |
| 5/26/2020 | 53.70 | 6597.91 |
| 6/30/2020 | 53.95 | 6597.66 |
| 7/27/2020 | 54.10 | 6597.51 |
| 8/31/2020 | 54.20 | 6597.41 |
| 9/29/2020 | 54.23 | 6597.38 |
| 10/26/2020 | 54.53 | 6597.08 |
| 12/1/2020 | 54.56 | 6597.05 |
| 12/30/2020 | 54.65 | 6596.96 |

### EO14

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 7/13/2020 | 58.00 | 6612.00 |
| 10/6/2020 | 57.20 | 6612.80 |

### EO22

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 41.30 | 6625.70 |

### EP23

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 58.70 | 6609.30 |

### EP31

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 52.90 | 6614.10 |

### ES1

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 30.20 | 6584.98 |
| 2/24/2020 | 30.20 | 6584.98 |
| 3/30/2020 | 32.40 | 6582.78 |
| 4/27/2020 | 30.30 | 6584.88 |
| 5/26/2020 | 30.48 | 6584.70 |
| 6/30/2020 | 30.80 | 6584.38 |
| 7/27/2020 | 30.50 | 6584.68 |
| 8/31/2020 | 31.20 | 6583.98 |
| 9/29/2020 | 30.55 | 6584.63 |
| 12/30/2020 | 30.65 | 6584.53 |

### ES2

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | > 76.00 | < 6579.30 |
| 2/24/2020 | > 76.00 | < 6579.30 |
| 3/30/2020 | > 76.00 | < 6579.30 |
| 4/27/2020 | 60.73 | 6594.57 |
| 5/26/2020 | > 76.00 | < 6579.30 |
| 6/30/2020 | > 76.00 | < 6579.30 |
| 7/27/2020 | > 76.00 | < 6579.30 |
| 8/31/2020 | > 76.00 | < 6579.30 |
| 9/29/2020 | > 76.00 | < 6579.30 |
| 10/26/2020 | > 76.00 | < 6579.30 |
| 12/1/2020 | > 76.00 | < 6579.30 |
| 12/30/2020 | > 76.00 | < 6579.30 |

### ES4

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 71.90 | 6593.90 |
| 10/15/2020 | 72.67 | 6593.13 |

### ES6

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | > 97.50 | < 6562.50 |

### ET19

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 7/13/2020 | > 90.00 | < 6576.00 |
| 10/6/2020 | > 90.00 | < 6576.00 |

### ET20

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 7/13/2020 | 67.20 | 6596.80 |
| 10/6/2020 | 67.60 | 6596.40 |

### NE1

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 63.75 | 6585.07 |
| 2/24/2020 | 50.20 | 6598.62 |
| 4/27/2020 | 50.18 | 6598.64 |
| 5/26/2020 | 50.67 | 6598.15 |
| 6/30/2020 | 50.90 | 6597.92 |
| 7/27/2020 | 50.75 | 6598.07 |
| 8/31/2020 | 32.45 | 6616.37 |
| 9/29/2020 | 51.27 | 6597.55 |
| 10/26/2020 | 51.09 | 6597.73 |
| 12/1/2020 | 51.20 | 6597.62 |
| 12/30/2020 | 51.43 | 6597.39 |

### NE2

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 64.95 | 6596.03 |

### NW3

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/6/2020 | 66.30 | 6588.71 |

* Drawdown Tube Pressure, # Transducer Reading

# Table A.1-1. WATER LEVELS FOR THE TAILINGS WELLS (cont.)

WATER LEVEL ELEVATION (FT-MSL)

**NW4**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | > 33.70 | < 6622.45 |
| 2/24/2020 | > 33.70 | < 6622.45 |
| 3/30/2020 | > 33.70 | < 6622.45 |
| 4/27/2020 | > 33.70 | < 6622.45 |
| 5/26/2020 | > 33.70 | < 6622.45 |
| 6/30/2020 | > 33.70 | < 6622.45 |
| 7/27/2020 | > 33.70 | < 6622.45 |
| 8/31/2020 | > 33.70 | < 6622.45 |
| 9/29/2020 | > 33.70 | < 6622.45 |
| 10/26/2020 | > 33.70 | < 6622.45 |
| 12/1/2020 | > 33.70 | < 6622.45 |
| 12/30/2020 | > 33.70 | < 6622.45 |

**SE2**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 71.10 | 6590.27 |
| 2/24/2020 | 70.30 | 6591.07 |
| 3/30/2020 | 71.60 | 6589.77 |
| 4/27/2020 | 71.72 | 6589.65 |
| 5/26/2020 | 71.73 | 6589.64 |
| 6/30/2020 | 72.20 | 6589.17 |
| 7/27/2020 | 71.90 | 6589.47 |
| 8/31/2020 | 72.00 | 6589.37 |
| 9/29/2020 | 71.95 | 6589.42 |
| 10/26/2020 | 71.97 | 6589.40 |
| 12/1/2020 | 71.60 | 6589.77 |
| 12/30/2020 | 71.85 | 6589.52 |

**SW1**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 24.90 | 6574.93 |
| 2/24/2020 | 24.95 | 6574.88 |
| 3/30/2020 | 25.10 | 6574.73 |
| 4/27/2020 | 24.95 | 6574.88 |
| 5/26/2020 | 24.95 | 6574.88 |
| 6/30/2020 | 25.35 | 6574.48 |
| 7/27/2020 | 25.80 | 6574.03 |
| 8/31/2020 | 25.50 | 6574.33 |
| 9/29/2020 | 25.27 | 6574.56 |
| 10/26/2020 | 25.50 | 6574.33 |
| 12/1/2020 | 25.70 | 6574.13 |
| 12/30/2020 | 25.60 | 6574.23 |

**SW2**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 44.90 | 6592.97 |
| 2/24/2020 | 44.95 | 6592.92 |
| 3/30/2020 | 45.10 | 6592.77 |
| 4/27/2020 | 44.66 | 6593.21 |
| 5/26/2020 | 44.70 | 6593.17 |
| 6/30/2020 | 45.20 | 6592.67 |
| 7/27/2020 | 45.60 | 6592.27 |
| 8/31/2020 | 45.30 | 6592.57 |
| 9/29/2020 | 44.93 | 6592.94 |
| 10/26/2020 | 44.98 | 6592.89 |
| 12/1/2020 | 45.40 | 6592.47 |
| 12/30/2020 | 45.10 | 6592.77 |

**WA4**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/8/2020 | 62.20 | 6594.90 |

**WC15**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/8/2020 | 47.40 | 6616.66 |

**WF9**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/9/2020 | 68.50 | 6597.20 |

**WF13**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/8/2020 | 72.10 | 6594.95 |

**WME-1**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/20/2020 | 56.00 | 6603.23 |
| 10/6/2020 | > 57.30 | < 6601.93 |

**WME-2**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/20/2020 | 60.70 | 6600.35 |
| 10/6/2020 | 61.60 | 6599.45 |

**WME-3**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/20/2020 | 64.30 | 6600.01 |
| 10/6/2020 | 64.40 | 6599.91 |

**WME-4**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/20/2020 | 59.40 | 6602.91 |
| 10/6/2020 | 58.40 | 6603.91 |

**WME-5**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/20/2020 | 71.70 | 6600.65 |
| 7/13/2020 | 66.20 | 6606.15 |
| 10/6/2020 | > 77.32 | < 6595.03 |

**WME-6**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/20/2020 | 56.90 | 6614.60 |
| 7/13/2020 | 55.00 | 6616.50 |
| 10/6/2020 | > 67.25 | < 6604.25 |

**WN1**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 20.20 | 6586.48 |
| 2/24/2020 | 20.25 | 6586.43 |
| 3/30/2020 | 20.45 | 6586.23 |
| 4/27/2020 | 20.44 | 6586.24 |
| 5/26/2020 | 20.51 | 6586.17 |
| 6/30/2020 | 20.70 | 6585.98 |
| 7/27/2020 | 20.50 | 6586.18 |
| 8/31/2020 | 20.80 | 6585.88 |
| 9/29/2020 | 20.90 | 6585.78 |
| 10/26/2020 | 20.86 | 6585.82 |
| 12/1/2020 | 20.95 | 6585.73 |
| 12/30/2020 | 21.10 | 6585.58 |

**WN2**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 54.75 | 6589.57 |
| 2/24/2020 | 54.80 | 6589.52 |
| 3/30/2020 | 55.00 | 6589.32 |
| 4/27/2020 | 54.98 | 6589.34 |
| 5/26/2020 | 56.75 | 6587.57 |
| 6/30/2020 | 55.25 | 6589.07 |
| 7/27/2020 | 55.40 | 6588.92 |
| 8/31/2020 | 55.50 | 6588.82 |
| 9/29/2020 | 55.50 | 6588.82 |
| 10/26/2020 | 55.59 | 6588.73 |
| 12/1/2020 | 55.70 | 6588.62 |
| 12/30/2020 | 55.80 | 6588.52 |

**WO5**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/8/2020 | 36.70 | 6623.30 |

**WO10**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/9/2020 | 62.25 | 6594.75 |

**WO15**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/9/2020 | > 90.00 | < 6564.00 |

**WO21**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/9/2020 | 61.80 | 6591.20 |

**WO32**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/8/2020 | 65.10 | 6589.90 |

**WP10**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/9/2020 | 66.30 | 6591.70 |

**WS1**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 10.15 | 6596.96 |
| 2/24/2020 | 10.30 | 6596.81 |
| 3/30/2020 | 10.55 | 6596.56 |
| 4/27/2020 | 10.63 | 6596.48 |
| 5/26/2020 | 10.68 | 6596.43 |
| 6/30/2020 | 10.75 | 6596.36 |
| 7/27/2020 | 10.95 | 6596.16 |
| 8/31/2020 | 10.60 | 6596.51 |
| 9/29/2020 | 10.55 | 6596.56 |
| 10/26/2020 | 10.60 | 6596.51 |
| 12/1/2020 | 10.75 | 6596.36 |
| 12/30/2020 | 10.78 | 6596.33 |

**WS2**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/27/2020 | 58.80 | 6590.64 |
| 2/24/2020 | 58.60 | 6590.84 |
| 3/30/2020 | 59.00 | 6590.44 |
| 4/27/2020 | 58.81 | 6590.63 |
| 5/26/2020 | 60.84 | 6588.60 |
| 6/30/2020 | 59.30 | 6590.14 |
| 7/27/2020 | 59.65 | 6589.79 |
| 8/31/2020 | 59.30 | 6590.14 |
| 9/29/2020 | 59.30 | 6590.14 |
| 10/26/2020 | 59.50 | 6589.94 |
| 12/1/2020 | 59.65 | 6589.79 |
| 12/30/2020 | 59.60 | 6589.84 |

**WS7**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/9/2020 | 74.20 | 6584.92 |

**WT6**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/8/2020 | > 90.00 | < 6567.00 |

**WT15**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 10/8/2020 | 121.40 | 6538.60 |

* Drawdown Tube Pressure, # Transducer Reading

# Table A.1-1. WATER LEVELS FOR THE TAILINGS WELLS (cont.)

WATER LEVEL ELEVATION (FT-MSL)

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| **WT18** | | |
| 10/9/2020 | 50.20 | 6609.80 |
| **WW1** | | |
| 1/27/2020 | 24.70 | 6578.39 |
| 2/24/2020 | 24.70 | 6578.39 |
| 3/30/2020 | 24.90 | 6578.19 |
| 4/27/2020 | 24.95 | 6578.14 |
| 5/26/2020 | 24.98 | 6578.11 |
| 6/30/2020 | 25.15 | 6577.94 |
| 7/27/2020 | 25.35 | 6577.74 |
| 8/31/2020 | 25.40 | 6577.69 |
| 9/29/2020 | 25.42 | 6577.67 |
| 10/26/2020 | 25.60 | 6577.49 |
| 12/1/2020 | 25.65 | 6577.44 |
| 12/30/2020 | 25.68 | 6577.41 |
| **WW2** | | |
| 1/27/2020 | > 64.90 | < 6578.74 |
| 2/24/2020 | > 64.90 | < 6578.74 |
| 3/30/2020 | > 64.90 | < 6578.74 |
| 4/27/2020 | > 64.90 | < 6578.74 |
| 5/26/2020 | > 64.90 | < 6578.74 |
| 6/30/2020 | > 64.90 | < 6578.74 |
| 7/27/2020 | > 64.90 | < 6578.74 |
| 8/31/2020 | > 64.90 | < 6578.74 |
| 9/29/2020 | > 64.90 | < 6578.74 |
| 10/26/2020 | > 64.90 | < 6578.74 |
| 12/1/2020 | > 64.90 | < 6578.74 |
| 12/30/2020 | > 64.90 | < 6578.74 |
| **WW3** | | |
| 10/8/2020 | 51.70 | 6607.84 |

* Drawdown Tube Pressure, # Transducer Reading

# Table A.2-1  WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS

WATER LEVEL ELEVATION (FT-MSL)  1/7/2021

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| **0690** | | |
| 11/11/2020 | 42.10 | 6539.96 |
| **0691** | | |
| 11/11/2020 | 47.18 | 6541.63 |
| **0892** | | |
| 11/11/2020 | 43.65 | 6543.56 |
| **1A** | | |
| 4/9/2020 | 37.91 | 6547.52 |
| **1C** | | |
| 11/20/2020 | 37.32 | 6550.67 |
| **1H** | | |
| 11/20/2020 | > 55.40 | < 6530.99 |
| **1I** | | |
| 11/20/2020 | 34.40 | 6563.95 |
| **1K** | | |
| 4/9/2020 | 43.38 | 6540.75 |
| **1N** | | |
| 11/11/2020 | 32.33 | 6558.52 |
| **1O** | | |
| 11/11/2020 | > 43.95 | < 6550.99 |
| **1P** | | |
| 11/11/2020 | 41.10 | 6544.14 |
| **1U** | | |
| 1/14/2020 | 41.65 | 6544.57 |
| **B** | | |
| 1/6/2020 | 40.15 | 6530.75 |
| 1/13/2020 | 40.10 | 6530.80 |
| 1/20/2020 | 40.23 | 6530.67 |
| 1/27/2020 | 40.30 | 6530.60 |
| 2/3/2020 | 40.14 | 6530.76 |
| 2/10/2020 | 40.39 | 6530.51 |
| 2/17/2020 | 40.43 | 6530.47 |
| 2/24/2020 | 40.50 | 6530.40 |
| 3/2/2020 | 40.38 | 6530.52 |
| 3/9/2020 | 39.51 | 6531.39 |
| 3/16/2020 | 40.60 | 6530.30 |
| 3/23/2020 | 40.47 | 6530.43 |
| 3/30/2020 | 40.47 | 6530.43 |
| 4/13/2020 | 39.89 | 6531.01 |
| 4/20/2020 | 40.10 | 6530.80 |
| 4/27/2020 | 40.24 | 6530.66 |
| 5/4/2020 | 40.23 | 6530.67 |
| 5/11/2020 | 40.22 | 6530.68 |
| 5/18/2020 | 40.27 | 6530.63 |
| 5/25/2020 | 40.33 | 6530.57 |
| 5/31/2020 | 40.37 | 6530.53 |
| 6/8/2020 | 40.32 | 6530.58 |
| 6/15/2020 | 40.28 | 6530.62 |
| 6/22/2020 | 40.28 | 6530.62 |
| 6/29/2020 | 40.43 | 6530.47 |
| 7/6/2020 | 40.80 | 6530.10 |
| 7/13/2020 | 38.80 | 6532.10 |
| 7/20/2020 | 38.40 | 6532.50 |
| 7/27/2020 | 40.69 | 6530.21 |
| 8/3/2020 | 40.80 | 6530.10 |
| 8/10/2020 | 40.85 | 6530.05 |
| 8/17/2020 | 41.60 | 6529.30 |
| 8/24/2020 | 40.80 | 6530.10 |
| 8/31/2020 | 40.52 | 6530.38 |
| 9/8/2020 | 40.23 | 6530.67 |
| 9/14/2020 | 40.22 | 6530.68 |
| 9/21/2020 | 40.40 | 6530.50 |
| 9/28/2020 | 40.41 | 6530.49 |
| 10/5/2020 | 40.50 | 6530.40 |
| 10/12/2020 | 40.50 | 6530.40 |
| 10/19/2020 | 40.37 | 6530.53 |
| 10/26/2020 | 40.20 | 6530.70 |
| 11/2/2020 | 40.50 | 6530.40 |
| 11/9/2020 | 40.32 | 6530.58 |
| 11/16/2020 | 40.45 | 6530.45 |
| 11/23/2020 | 40.26 | 6530.64 |
| 11/30/2020 | 40.34 | 6530.56 |
| 12/7/2020 | 40.44 | 6530.46 |
| 12/14/2020 | 40.24 | 6530.66 |
| 12/21/2020 | 40.40 | 6530.50 |
| 12/28/2020 | 40.36 | 6530.54 |
| **B1** | | |
| 11/20/2020 | 41.35 | 6530.47 |
| **B11** | | |
| 3/2/2020 | 46.10 | 6531.29 |
| **B12** | | |
| 3/8/2020 | 41.00 | 6532.02 |
| 11/25/2020 | 41.47 | 6531.55 |
| **B13** | | |
| 3/8/2020 | 36.50 | 6533.54 |
| 11/20/2020 | 37.70 | 6532.34 |
| **BA** | | |
| 1/6/2020 | 42.20 | 6529.38 |
| 1/13/2020 | 42.13 | 6529.45 |
| 1/20/2020 | 42.53 | 6529.05 |
| 1/27/2020 | 42.30 | 6529.28 |
| 2/3/2020 | 41.92 | 6529.66 |
| 2/10/2020 | 42.13 | 6529.45 |
| 2/17/2020 | 42.13 | 6529.45 |
| 2/24/2020 | 42.20 | 6529.38 |
| 3/2/2020 | 42.01 | 6529.57 |
| 3/9/2020 | 42.23 | 6529.35 |
| 3/16/2020 | 42.20 | 6529.38 |
| 3/30/2020 | 41.21 | 6530.37 |
| 4/13/2020 | 40.48 | 6531.10 |
| 4/20/2020 | 51.68 | 6519.90 |
| 4/27/2020 | 41.33 | 6530.25 |
| 5/4/2020 | 41.40 | 6530.18 |
| 5/11/2020 | 41.39 | 6530.19 |
| 5/18/2020 | 41.46 | 6530.12 |
| 5/25/2020 | 40.60 | 6530.98 |
| 5/31/2020 | 41.68 | 6529.90 |
| 6/8/2020 | 41.54 | 6530.04 |
| 6/15/2020 | 41.06 | 6530.52 |
| 6/22/2020 | 41.60 | 6529.98 |
| 6/29/2020 | 41.96 | 6529.62 |
| 7/6/2020 | 42.15 | 6529.43 |
| 7/13/2020 | 42.30 | 6529.28 |
| 7/20/2020 | 41.50 | 6530.08 |
| 7/27/2020 | 42.16 | 6529.42 |
| 8/3/2020 | 42.40 | 6529.18 |
| 8/10/2020 | 42.20 | 6529.38 |
| 8/17/2020 | 42.40 | 6529.18 |
| 8/24/2020 | 42.27 | 6529.31 |
| 8/31/2020 | 41.70 | 6529.88 |
| 9/8/2020 | 41.48 | 6530.10 |
| 9/14/2020 | 41.40 | 6530.18 |
| 9/21/2020 | 41.40 | 6530.18 |
| 9/28/2020 | 41.66 | 6529.92 |
| 10/5/2020 | 41.70 | 6529.88 |
| 10/12/2020 | 41.60 | 6529.98 |
| 10/19/2020 | 41.56 | 6530.02 |
| 10/26/2020 | 41.44 | 6530.14 |
| 11/2/2020 | 41.72 | 6529.86 |
| 11/9/2020 | 41.54 | 6530.04 |
| 11/16/2020 | 41.68 | 6529.90 |
| 11/23/2020 | 41.43 | 6530.15 |
| 11/30/2020 | 41.53 | 6530.05 |
| 12/7/2020 | 41.68 | 6529.90 |
| 12/14/2020 | 41.43 | 6530.15 |
| 12/21/2020 | 41.60 | 6529.98 |
| 12/28/2020 | 41.55 | 6530.03 |
| **BC** | | |
| 11/23/2020 | 39.89 | 6534.72 |
| **C1** | | |
| 3/26/2020 | 38.54 | 6533.32 |
| **C2** | | |
| 3/26/2020 | 35.11 | 6529.91 |
| **C6** | | |
| 3/26/2020 | 78.36 | 6506.53 |
| **C7** | | |
| 3/26/2020 | 53.85 | 6530.59 |
| **C8** | | |
| 3/26/2020 | 50.13 | 6534.36 |
| **C9** | | |
| 3/26/2020 | 57.28 | 6527.27 |
| **C10** | | |
| 3/26/2020 | 62.67 | 6522.59 |

* Drawdown Tube Pressure, # Transducer Reading

**0690 - C10**

# Table A.2-1 WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS (cont.)

WATER LEVEL ELEVATION (FT-MSL) 1/7/2021

### D1

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 7/22/2020 | 46.20 | 6524.70 |

### DC

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/23/2020 | 42.43 | 6528.88 |

### DD

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/12/2020 | 48.65 | 6543.94 |
| 5/7/2020 | 48.91 | 6543.68 |
| 8/18/2020 | 49.20 | 6543.39 |
| 10/12/2020 | 49.70 | 6542.89 |

### DD2

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/12/2020 | 46.15 | 6547.13 |
| 5/7/2020 | 46.20 | 6547.08 |
| 8/19/2020 | 46.45 | 6546.83 |
| 10/7/2020 | 46.50 | 6546.78 |

### DT

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 49.85 | 6533.96 |
| 1/13/2020 | 56.54 | 6527.27 |
| 1/20/2020 | 56.97 | 6526.84 |
| 1/27/2020 | 57.15 | 6526.66 |
| 2/3/2020 | 49.61 | 6534.20 |
| 2/10/2020 | 50.26 | 6533.55 |
| 2/17/2020 | 50.80 | 6533.01 |
| 2/24/2020 | 56.90 | 6526.91 |
| 3/2/2020 | 57.46 | 6526.35 |
| 3/9/2020 | 57.07 | 6526.74 |
| 3/16/2020 | 52.30 | 6531.51 |
| 3/23/2020 | 57.08 | 6526.73 |
| 3/30/2020 | 52.07 | 6531.74 |
| 4/13/2020 | 51.36 | 6532.45 |
| 4/20/2020 | 56.48 | 6527.33 |
| 4/27/2020 | 56.95 | 6526.86 |
| 5/4/2020 | 57.10 | 6526.71 |
| 5/11/2020 | 57.28 | 6526.53 |
| 5/18/2020 | 54.57 | 6529.24 |
| 5/25/2020 | 57.62 | 6526.19 |
| 5/31/2020 | 56.94 | 6526.87 |
| 6/8/2020 | 56.57 | 6527.24 |
| 6/15/2020 | 51.96 | 6531.85 |
| 6/22/2020 | 56.37 | 6527.44 |
| 6/29/2020 | 56.54 | 6527.27 |
| 7/6/2020 | 50.90 | 6532.91 |
| 7/13/2020 | 56.70 | 6527.11 |
| 7/20/2020 | 51.90 | 6531.91 |
| 7/27/2020 | 56.43 | 6527.38 |
| 8/3/2020 | 50.60 | 6533.21 |
| 8/10/2020 | 56.70 | 6527.11 |
| 8/17/2020 | 56.90 | 6526.91 |
| 8/24/2020 | 56.77 | 6527.04 |
| 8/31/2020 | 56.61 | 6527.20 |
| 9/8/2020 | 56.10 | 6527.71 |
| 9/14/2020 | 56.27 | 6527.54 |
| 9/21/2020 | 56.30 | 6527.51 |
| 9/28/2020 | 56.42 | 6527.39 |
| 10/5/2020 | 56.40 | 6527.41 |
| 10/12/2020 | 56.40 | 6527.41 |
| 10/19/2020 | 49.56 | 6534.25 |
| 10/26/2020 | 56.87 | 6526.94 |
| 11/2/2020 | 56.40 | 6527.41 |
| 11/9/2020 | 56.29 | 6527.52 |
| 11/16/2020 | 56.42 | 6527.39 |
| 11/23/2020 | 56.13 | 6527.68 |
| 11/30/2020 | 49.51 | 6534.30 |
| 12/7/2020 | 48.84 | 6534.97 |
| 12/14/2020 | 48.37 | 6535.44 |
| 12/21/2020 | 48.90 | 6534.91 |
| 12/28/2020 | 48.62 | 6535.19 |

### DZ

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 55.50 | 6535.03 |
| 1/13/2020 | 55.22 | 6535.31 |
| 1/20/2020 | 55.49 | 6535.04 |
| 1/27/2020 | 35.90 | 6554.63 |
| 2/3/2020 | 54.78 | 6535.75 |
| 2/10/2020 | 55.12 | 6535.41 |
| 2/17/2020 | 55.02 | 6535.51 |
| 2/24/2020 | 51.20 | 6539.33 |
| 3/2/2020 | 54.81 | 6535.72 |
| 3/9/2020 | 54.93 | 6535.60 |
| 3/16/2020 | 55.10 | 6535.43 |
| 3/23/2020 | 54.95 | 6535.58 |
| 3/30/2020 | 54.34 | 6536.19 |
| 4/13/2020 | 51.73 | 6538.80 |
| 4/20/2020 | 54.00 | 6536.53 |
| 4/27/2020 | 53.98 | 6536.55 |
| 5/4/2020 | 53.98 | 6536.55 |
| 5/11/2020 | 54.03 | 6536.50 |
| 5/18/2020 | 54.64 | 6535.89 |
| 5/25/2020 | 54.82 | 6535.71 |
| 5/31/2020 | 54.81 | 6535.72 |
| 6/8/2020 | 55.08 | 6535.45 |
| 6/15/2020 | 53.98 | 6536.55 |
| 6/22/2020 | 56.25 | 6534.28 |
| 6/29/2020 | 54.65 | 6535.88 |
| 7/6/2020 | 54.60 | 6535.93 |
| 7/13/2020 | 54.50 | 6536.03 |
| 7/20/2020 | 50.20 | 6540.33 |
| 7/27/2020 | 45.16 | 6545.37 |
| 8/3/2020 | 54.40 | 6536.13 |
| 8/10/2020 | 54.40 | 6536.13 |
| 8/17/2020 | 50.70 | 6539.83 |
| 8/24/2020 | 55.80 | 6534.73 |
| 8/31/2020 | 56.05 | 6534.48 |
| 9/8/2020 | 55.92 | 6534.61 |
| 9/14/2020 | 55.86 | 6534.67 |
| 9/21/2020 | 56.10 | 6534.43 |
| 9/28/2020 | 59.32 | 6531.21 |
| 10/5/2020 | 55.35 | 6535.18 |
| 10/12/2020 | 56.10 | 6534.43 |
| 10/19/2020 | 55.28 | 6535.25 |
| 10/26/2020 | 54.98 | 6535.55 |
| 11/2/2020 | 55.40 | 6535.13 |
| 11/9/2020 | 54.96 | 6535.57 |
| 11/16/2020 | 55.34 | 6535.19 |
| 11/23/2020 | 54.88 | 6535.65 |
| 11/30/2020 | 56.04 | 6534.49 |
| 12/7/2020 | 55.43 | 6535.10 |
| 12/14/2020 | 54.96 | 6535.57 |
| 12/21/2020 | 55.25 | 6535.28 |
| 12/28/2020 | 54.82 | 6535.71 |

### F

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 9/16/2020 | 36.90 | 6527.92 |
| 11/20/2020 | 37.21 | 6527.61 |

### FB

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 9/23/2020 | 38.50 | 6527.16 |

### GA

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/20/2020 | 38.72 | 6524.07 |

### GF

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/20/2020 | 40.13 | 6525.88 |

### GH

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 9/15/2020 | 37.70 | 6525.06 |

### GN

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 3/2/2020 | 40.00 | 6527.97 |

### GV

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/20/2020 | 52.79 | 6524.59 |

### GW1

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/20/2020 | 38.49 | 6526.78 |

### GW2

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/20/2020 | 38.95 | 6527.13 |

### I

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/20/2020 | 38.82 | 6528.38 |

### K4

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 3/9/2020 | 58.75 | 6543.27 |

### K5

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 3/5/2020 | 76.05 | 6525.68 |

### K7

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 3/10/2020 | 61.50 | 6540.03 |

### K9

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 2/27/2020 | 64.45 | 6535.89 |

### K11

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 3/8/2020 | 65.85 | 6534.76 |

### KEB

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 3/8/2020 | 42.10 | 6527.63 |

### KF

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 3/10/2020 | 34.80 | 6535.41 |

* Drawdown Tube Pressure, # Transducer Reading

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| **KZ** | | |
| 1/6/2020 | 36.15 | 6535.57 |
| 1/13/2020 | 36.18 | 6535.54 |
| 1/20/2020 | 36.12 | 6535.60 |
| 1/27/2020 | 55.20 | 6516.52 |
| 2/3/2020 | 36.14 | 6535.58 |
| 2/10/2020 | 36.30 | 6535.42 |
| 2/17/2020 | 36.33 | 6535.39 |
| 2/24/2020 | 36.40 | 6535.32 |
| 3/2/2020 | 36.26 | 6535.46 |
| 3/9/2020 | 36.29 | 6535.43 |
| 3/16/2020 | 36.30 | 6535.42 |
| 3/23/2020 | 36.30 | 6535.42 |
| 3/30/2020 | 36.34 | 6535.38 |
| 4/13/2020 | 36.26 | 6535.46 |
| 4/20/2020 | 36.15 | 6535.57 |
| 4/27/2020 | 36.10 | 6535.62 |
| 5/4/2020 | 36.07 | 6535.65 |
| 5/11/2020 | 36.07 | 6535.65 |
| 5/18/2020 | 36.04 | 6535.68 |
| 5/25/2020 | 36.07 | 6535.65 |
| 5/31/2020 | 36.09 | 6535.63 |
| 6/8/2020 | 36.10 | 6535.62 |
| 6/15/2020 | 36.21 | 6535.51 |
| 6/22/2020 | 36.05 | 6535.67 |
| 6/29/2020 | 36.00 | 6535.72 |
| 7/6/2020 | 36.05 | 6535.67 |
| 7/13/2020 | 36.10 | 6535.62 |
| 7/20/2020 | 34.65 | 6537.07 |
| 7/27/2020 | 36.04 | 6535.68 |
| 8/3/2020 | 36.20 | 6535.52 |
| 8/10/2020 | 36.10 | 6535.62 |
| 8/17/2020 | 36.10 | 6535.62 |
| 8/24/2020 | 36.09 | 6535.63 |
| 8/31/2020 | 35.92 | 6535.80 |
| 9/8/2020 | 35.73 | 6535.99 |
| 9/14/2020 | 35.72 | 6536.00 |
| 9/21/2020 | 35.80 | 6535.92 |
| 9/28/2020 | 35.93 | 6535.79 |
| 10/5/2020 | 36.00 | 6535.72 |
| 10/12/2020 | 36.00 | 6535.72 |
| 10/19/2020 | 36.06 | 6535.66 |
| 11/2/2020 | 36.25 | 6535.47 |
| 11/9/2020 | 49.36 | 6522.36 |
| 11/16/2020 | 36.14 | 6535.58 |
| 11/23/2020 | 36.11 | 6535.61 |
| 11/30/2020 | 36.02 | 6535.70 |
| 12/7/2020 | 35.87 | 6535.85 |
| 12/14/2020 | 35.71 | 6536.01 |
| 12/21/2020 | 35.50 | 6536.22 |
| 12/28/2020 | 35.60 | 6536.12 |
| **L** | | |
| 4/9/2020 | 45.37 | 6529.60 |
| **L5** | | |
| 4/9/2020 | 41.64 | 6534.43 |
| **L6** | | |
| 10/14/2020 | 33.64 | 6541.00 |
| **L7** | | |
| 10/14/2020 | 41.41 | 6535.20 |
| **M3** | | |
| 4/29/2020 | 59.96 | 6516.14 |
| **M5** | | |
| 11/20/2020 | 44.12 | 6531.22 |
| **M6** | | |
| 3/8/2020 | 61.65 | 6513.39 |
| 11/23/2020 | 62.93 | 6512.11 |
| **M7** | | |
| 3/9/2020 | 57.55 | 6515.30 |
| 11/23/2020 | 58.43 | 6514.42 |
| **M9** | | |
| 3/8/2020 | 64.70 | 6512.11 |
| 10/19/2020 | 65.81 | 6511.00 |
| 11/23/2020 | 66.37 | 6510.44 |
| **M10** | | |
| 3/10/2020 | 62.60 | 6510.76 |
| 11/23/2020 | 64.10 | 6509.26 |
| **MA** | | |
| 11/23/2020 | 44.90 | 6527.32 |
| **MB** | | |
| 3/3/2020 | 45.15 | 6526.91 |
| **MC** | | |
| 11/23/2020 | 46.45 | 6525.61 |
| **MF** | | |
| 11/23/2020 | 49.11 | 6523.17 |
| **MH** | | |
| 11/23/2020 | 53.40 | 6520.52 |
| **MJ** | | |
| 11/23/2020 | 54.30 | 6518.64 |
| **ML** | | |
| 3/10/2020 | 54.70 | 6518.00 |
| 11/23/2020 | 55.11 | 6517.59 |
| **MN** | | |
| 11/23/2020 | 63.92 | 6513.64 |
| **MQ** | | |
| 3/3/2020 | 64.60 | 6509.70 |
| **MU** | | |
| 10/15/2020 | 45.62 | 6528.57 |
| 11/23/2020 | 45.01 | 6529.18 |
| **MW** | | |
| 3/11/2020 | 56.40 | 6518.51 |
| 11/23/2020 | 64.80 | 6510.11 |
| **MX** | | |
| 8/19/2020 | 52.25 | 6516.36 |
| **MY** | | |
| 10/14/2020 | 57.72 | 6515.84 |
| **MZ** | | |
| 3/11/2020 | 65.10 | 6511.54 |
| 11/23/2020 | 66.92 | 6509.72 |
| **NC** | | |
| 4/9/2020 | 41.54 | 6544.29 |
| 11/11/2020 | 41.97 | 6543.86 |
| **ND** | | |
| 11/11/2020 | 40.40 | 6552.49 |
| **P** | | |
| 11/17/2020 | 40.33 | 6546.93 |
| **P1** | | |
| 11/11/2020 | 40.32 | 6552.15 |
| **P2** | | |
| 3/11/2020 | 42.45 | 6547.34 |
| 3/16/2020 | 42.40 | 6547.39 |
| **P3** | | |
| 3/11/2020 | 42.60 | 6547.35 |
| **P4** | | |
| 3/16/2020 | 39.10 | 6550.42 |
| **Q** | | |
| 5/13/2020 | 41.78 | 6552.04 |
| **R** | | |
| 3/17/2020 | 39.60 | 6564.43 |
| **S** | | |
| 11/23/2020 | 46.10 | 6535.07 |

* Drawdown Tube Pressure, # Transducer Reading

# Table A.2-1 WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS (cont.)

WATER LEVEL ELEVATION (FT-MSL) 1/7/2021

**S1**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 41.30 | 6533.89 |
| 1/13/2020 | 41.25 | 6533.94 |
| 1/20/2020 | 41.33 | 6533.86 |
| 1/27/2020 | 41.40 | 6533.79 |
| 2/3/2020 | 41.28 | 6533.91 |
| 2/10/2020 | 41.44 | 6533.75 |
| 2/17/2020 | 41.50 | 6533.69 |
| 2/24/2020 | 41.70 | 6533.49 |
| 3/2/2020 | 41.56 | 6533.63 |
| 3/9/2020 | 41.63 | 6533.56 |
| 3/16/2020 | 46.10 | 6529.09 |
| 3/23/2020 | 41.70 | 6533.49 |
| 3/30/2020 | 41.73 | 6533.46 |
| 4/13/2020 | 41.48 | 6533.71 |
| 4/20/2020 | 41.65 | 6533.54 |
| 4/27/2020 | 41.71 | 6533.48 |
| 5/4/2020 | 41.72 | 6533.47 |
| 5/11/2020 | 41.87 | 6533.32 |
| 5/18/2020 | 41.81 | 6533.38 |
| 5/25/2020 | 41.84 | 6533.35 |
| 5/31/2020 | 41.84 | 6533.35 |
| 6/8/2020 | 41.80 | 6533.39 |
| 6/15/2020 | 41.82 | 6533.37 |
| 6/22/2020 | 41.78 | 6533.41 |
| 6/29/2020 | 41.79 | 6533.40 |
| 7/6/2020 | 42.20 | 6532.99 |
| 7/13/2020 | 41.90 | 6533.29 |
| 7/20/2020 | 41.90 | 6533.29 |
| 7/27/2020 | 41.90 | 6533.29 |
| 8/3/2020 | 41.95 | 6533.24 |
| 8/10/2020 | 42.00 | 6533.19 |
| 8/17/2020 | 42.00 | 6533.19 |
| 8/24/2020 | 41.93 | 6533.26 |
| 8/31/2020 | 41.85 | 6533.34 |
| 9/8/2020 | 41.69 | 6533.50 |
| 9/14/2020 | 41.68 | 6533.51 |
| 9/21/2020 | 41.65 | 6533.54 |
| 9/28/2020 | 41.65 | 6533.54 |
| 10/5/2020 | 41.75 | 6533.44 |
| 10/12/2020 | 41.80 | 6533.39 |
| 10/19/2020 | 41.74 | 6533.45 |
| 10/26/2020 | 41.63 | 6533.56 |
| 11/2/2020 | 41.77 | 6533.42 |
| 11/9/2020 | 41.62 | 6533.57 |
| 11/16/2020 | 41.62 | 6533.57 |
| 11/23/2020 | 41.49 | 6533.70 |
| 11/30/2020 | 41.54 | 6533.65 |
| 12/7/2020 | 41.56 | 6533.63 |
| 12/14/2020 | 41.56 | 6533.63 |
| 12/21/2020 | 41.60 | 6533.59 |
| 12/28/2020 | 41.53 | 6533.66 |

**S2**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 43.80 | 6529.92 |
| 1/13/2020 | 41.23 | 6532.49 |
| 1/20/2020 | 41.29 | 6532.43 |
| 2/3/2020 | 41.26 | 6532.46 |
| 2/10/2020 | 41.45 | 6532.27 |
| 2/17/2020 | 41.49 | 6532.23 |
| 2/24/2020 | 41.75 | 6531.97 |
| 3/2/2020 | 41.55 | 6532.17 |
| 3/9/2020 | 41.62 | 6532.10 |
| 3/23/2020 | 41.65 | 6532.07 |
| 3/30/2020 | 41.69 | 6532.03 |
| 4/13/2020 | 41.41 | 6532.31 |
| 4/20/2020 | 41.68 | 6532.04 |
| 4/27/2020 | 41.70 | 6532.02 |
| 5/4/2020 | 41.69 | 6532.03 |
| 5/11/2020 | 41.71 | 6532.01 |
| 5/18/2020 | 41.76 | 6531.96 |
| 5/25/2020 | 41.79 | 6531.93 |
| 5/31/2020 | 41.77 | 6531.95 |
| 6/8/2020 | 41.78 | 6531.94 |
| 6/15/2020 | 41.83 | 6531.89 |
| 6/22/2020 | 41.72 | 6532.00 |
| 6/29/2020 | 41.73 | 6531.99 |
| 7/27/2020 | 41.88 | 6531.84 |
| 8/10/2020 | 41.80 | 6531.92 |
| 8/17/2020 | 41.95 | 6531.77 |
| 8/24/2020 | 41.85 | 6531.87 |
| 8/31/2020 | 41.70 | 6532.02 |
| 9/8/2020 | 41.52 | 6532.20 |
| 9/14/2020 | 41.50 | 6532.22 |
| 9/21/2020 | 41.50 | 6532.22 |
| 9/28/2020 | 41.56 | 6532.16 |
| 10/5/2020 | 40.85 | 6532.87 |
| 10/12/2020 | 40.50 | 6533.22 |
| 10/19/2020 | 41.66 | 6532.06 |
| 10/26/2020 | 41.50 | 6532.22 |
| 11/2/2020 | 41.65 | 6532.07 |
| 11/9/2020 | 41.44 | 6532.28 |
| 11/16/2020 | 41.42 | 6532.30 |
| 11/23/2020 | 41.36 | 6532.36 |
| 11/30/2020 | 41.39 | 6532.33 |
| 12/7/2020 | 41.43 | 6532.29 |
| 12/14/2020 | 41.37 | 6532.35 |
| 12/21/2020 | 41.50 | 6532.22 |
| 12/28/2020 | 41.44 | 6532.28 |

**S3**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/23/2020 | 40.93 | 6533.85 |

**S4**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 7/30/2020 | 42.95 | 6532.34 |
| 9/15/2020 | 42.70 | 6532.59 |
| 11/23/2020 | 42.45 | 6532.84 |

**S5**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 46.20 | 6528.49 |
| 1/13/2020 | 46.21 | 6528.48 |
| 1/20/2020 | 46.39 | 6528.30 |
| 1/27/2020 | 46.50 | 6528.19 |
| 2/3/2020 | 46.21 | 6528.48 |
| 2/10/2020 | 46.43 | 6528.26 |
| 2/17/2020 | 46.49 | 6528.20 |
| 2/24/2020 | 46.70 | 6527.99 |
| 3/2/2020 | 46.52 | 6528.17 |
| 3/9/2020 | 46.62 | 6528.07 |
| 3/16/2020 | 38.60 | 6536.09 |
| 3/23/2020 | 46.74 | 6527.95 |
| 3/30/2020 | 46.59 | 6528.10 |
| 4/13/2020 | 46.22 | 6528.47 |
| 4/20/2020 | 46.34 | 6528.35 |
| 4/27/2020 | 46.51 | 6528.18 |
| 5/4/2020 | 46.61 | 6528.08 |
| 5/11/2020 | 46.69 | 6528.00 |
| 5/18/2020 | 46.77 | 6527.92 |
| 5/25/2020 | 46.81 | 6527.88 |
| 5/31/2020 | 46.75 | 6527.94 |
| 6/8/2020 | 46.60 | 6528.09 |
| 6/15/2020 | 46.47 | 6528.22 |
| 6/22/2020 | 46.51 | 6528.18 |
| 6/29/2020 | 46.60 | 6528.09 |
| 7/6/2020 | 47.05 | 6527.64 |
| 7/13/2020 | 46.80 | 6527.89 |
| 7/20/2020 | 46.65 | 6528.04 |
| 7/27/2020 | 46.71 | 6527.98 |
| 8/3/2020 | 46.90 | 6527.79 |
| 8/10/2020 | 46.95 | 6527.74 |
| 8/17/2020 | 46.90 | 6527.79 |
| 8/24/2020 | 46.75 | 6527.94 |
| 8/31/2020 | 46.77 | 6527.92 |
| 9/8/2020 | 46.45 | 6528.24 |
| 9/14/2020 | 46.56 | 6528.13 |
| 9/21/2020 | 46.70 | 6527.99 |
| 9/28/2020 | 46.57 | 6528.12 |
| 10/5/2020 | 39.75 | 6534.94 |
| 10/12/2020 | 46.70 | 6527.99 |
| 10/19/2020 | 46.58 | 6528.11 |
| 10/26/2020 | 46.46 | 6528.23 |
| 11/2/2020 | 46.63 | 6528.06 |
| 11/9/2020 | 46.42 | 6528.27 |
| 11/16/2020 | 46.56 | 6528.13 |
| 11/23/2020 | 46.43 | 6528.26 |
| 11/30/2020 | 46.50 | 6528.19 |
| 12/7/2020 | 46.43 | 6528.26 |
| 12/14/2020 | 46.33 | 6528.36 |
| 12/21/2020 | 46.50 | 6528.19 |
| 12/28/2020 | 46.21 | 6528.48 |

**S11**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/29/2020 | 41.60 | 6536.79 |
| 11/23/2020 | 43.16 | 6535.23 |

**S12**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/29/2020 | 46.05 | 6532.80 |

**S19**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/23/2020 | 42.93 | 6535.04 |

**S21**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 11/23/2020 | 41.92 | 6538.36 |

* Drawdown Tube Pressure, # Transducer Reading

# Table A.2-1 WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS (cont.)

WATER LEVEL ELEVATION (FT-MSL) 1/7/2021

### SA

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 47.70 | 6532.61 |
| 1/13/2020 | 47.92 | 6532.39 |
| 1/20/2020 | 48.05 | 6532.26 |
| 2/3/2020 | 47.79 | 6532.52 |
| 2/10/2020 | 41.42 | 6538.89 |
| 2/17/2020 | 48.19 | 6532.12 |
| 2/24/2020 | 48.30 | 6532.01 |
| 3/2/2020 | 48.23 | 6532.08 |
| 3/9/2020 | 48.33 | 6531.98 |
| 3/16/2020 | 48.40 | 6531.91 |
| 3/23/2020 | 48.36 | 6531.95 |
| 3/30/2020 | 48.18 | 6532.13 |
| 4/13/2020 | 47.83 | 6532.48 |
| 4/20/2020 | 48.03 | 6532.28 |
| 4/27/2020 | 48.20 | 6532.11 |
| 5/4/2020 | 48.22 | 6532.09 |
| 5/11/2020 | 48.27 | 6532.04 |
| 5/18/2020 | 48.56 | 6531.75 |
| 5/25/2020 | 48.42 | 6531.89 |
| 5/31/2020 | 48.26 | 6532.05 |
| 6/8/2020 | 48.14 | 6532.17 |
| 6/15/2020 | 48.12 | 6532.19 |
| 6/22/2020 | 48.03 | 6532.28 |
| 6/29/2020 | 48.15 | 6532.16 |
| 7/6/2020 | 48.40 | 6531.91 |
| 7/13/2020 | 48.25 | 6532.06 |
| 7/20/2020 | 48.15 | 6532.16 |
| 7/27/2020 | 48.30 | 6532.01 |
| 8/3/2020 | 48.40 | 6531.91 |
| 8/10/2020 | 48.40 | 6531.91 |
| 8/17/2020 | 48.50 | 6531.81 |
| 8/24/2020 | 48.28 | 6532.03 |
| 8/31/2020 | 48.17 | 6532.14 |
| 9/8/2020 | 47.91 | 6532.40 |
| 9/14/2020 | 47.99 | 6532.32 |
| 9/21/2020 | 48.10 | 6532.21 |
| 9/28/2020 | 48.10 | 6532.21 |
| 10/5/2020 | 48.20 | 6532.11 |
| 10/12/2020 | 48.20 | 6532.11 |
| 10/19/2020 | 48.08 | 6532.23 |
| 10/26/2020 | 47.98 | 6532.33 |
| 11/2/2020 | 48.12 | 6532.19 |
| 11/9/2020 | 48.00 | 6532.31 |
| 11/16/2020 | 48.04 | 6532.27 |
| 11/23/2020 | 47.81 | 6532.50 |
| 11/30/2020 | 47.87 | 6532.44 |
| 12/7/2020 | 47.90 | 6532.41 |
| 12/14/2020 | 47.69 | 6532.62 |
| 12/21/2020 | 47.90 | 6532.41 |
| 12/28/2020 | 47.77 | 6532.54 |

### SB

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 3/17/2020 | 49.05 | 6532.04 |

### SE6

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/29/2020 | 41.70 | 6537.21 |

### SM

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 44.35 | 6534.39 |
| 1/13/2020 | 44.29 | 6534.45 |
| 1/20/2020 | 44.37 | 6534.37 |
| 1/27/2020 | 44.40 | 6534.34 |
| 2/3/2020 | 44.29 | 6534.45 |
| 2/10/2020 | 44.51 | 6534.23 |
| 2/17/2020 | 44.59 | 6534.15 |
| 2/24/2020 | 44.70 | 6534.04 |
| 3/2/2020 | 44.60 | 6534.14 |
| 3/9/2020 | 44.70 | 6534.04 |
| 3/16/2020 | 44.80 | 6533.94 |
| 3/23/2020 | 44.74 | 6534.00 |
| 3/30/2020 | 44.78 | 6533.96 |
| 4/13/2020 | 44.70 | 6534.04 |
| 4/20/2020 | 44.74 | 6534.00 |
| 4/27/2020 | 44.77 | 6533.97 |
| 5/4/2020 | 44.78 | 6533.96 |
| 5/11/2020 | 44.53 | 6534.21 |
| 5/18/2020 | 44.89 | 6533.85 |
| 5/25/2020 | 44.95 | 6533.79 |
| 5/31/2020 | 44.96 | 6533.78 |
| 6/8/2020 | 44.93 | 6533.81 |
| 6/15/2020 | 44.99 | 6533.75 |
| 6/22/2020 | 44.95 | 6533.79 |
| 6/29/2020 | 44.95 | 6533.79 |
| 7/6/2020 | 48.90 | 6529.84 |
| 7/13/2020 | 45.20 | 6533.54 |
| 7/20/2020 | 45.10 | 6533.64 |
| 7/27/2020 | 45.06 | 6533.68 |
| 8/3/2020 | 45.20 | 6533.54 |
| 8/10/2020 | 45.20 | 6533.54 |
| 8/17/2020 | 45.25 | 6533.49 |
| 8/24/2020 | 45.19 | 6533.55 |
| 8/31/2020 | 45.11 | 6533.63 |
| 9/8/2020 | 44.97 | 6533.77 |
| 9/14/2020 | 45.02 | 6533.72 |
| 9/21/2020 | 45.00 | 6533.74 |
| 9/28/2020 | 44.97 | 6533.77 |
| 10/5/2020 | 45.00 | 6533.74 |
| 10/12/2020 | 45.10 | 6533.64 |
| 10/19/2020 | 45.03 | 6533.71 |
| 10/26/2020 | 44.95 | 6533.79 |
| 11/2/2020 | 45.08 | 6533.66 |
| 11/9/2020 | 44.98 | 6533.76 |
| 11/16/2020 | 45.01 | 6533.73 |
| 11/23/2020 | 44.85 | 6533.89 |
| 11/30/2020 | 44.92 | 6533.82 |
| 12/7/2020 | 44.96 | 6533.78 |
| 12/14/2020 | 44.86 | 6533.88 |
| 12/21/2020 | 45.00 | 6533.74 |
| 12/28/2020 | 44.93 | 6533.81 |

### SN

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 44.2 | 6535.06 |
| 1/13/2020 | 44.14 | 6535.12 |
| 1/20/2020 | 44.23 | 6535.03 |
| 1/27/2020 | 44.3 | 6534.96 |
| 2/3/2020 | 44.13 | 6535.13 |
| 2/10/2020 | 44.34 | 6534.92 |
| 2/17/2020 | 44.41 | 6534.85 |
| 2/24/2020 | 44.5 | 6534.76 |
| 3/2/2020 | 44.41 | 6534.85 |
| 3/9/2020 | 44.49 | 6534.77 |
| 3/16/2020 | 44.5 | 6534.76 |
| 3/23/2020 | 44.48 | 6534.78 |
| 3/30/2020 | 44.53 | 6534.73 |
| 4/13/2020 | 44.39 | 6534.87 |
| 4/20/2020 | 44.4 | 6534.86 |
| 4/27/2020 | 44.76 | 6534.5 |
| 5/4/2020 | 44.51 | 6534.75 |
| 5/11/2020 | 44.55 | 6534.71 |
| 5/18/2020 | 44.62 | 6534.64 |
| 5/25/2020 | 44.66 | 6534.6 |
| 5/31/2020 | 44.67 | 6534.59 |
| 6/8/2020 | 44.64 | 6534.62 |
| 6/15/2020 | 44.67 | 6534.59 |
| 6/22/2020 | 44.63 | 6534.63 |
| 6/29/2020 | 44.64 | 6534.62 |
| 7/6/2020 | 45.05 | 6534.21 |
| 7/13/2020 | 44.9 | 6534.36 |
| 7/20/2020 | 44.85 | 6534.41 |
| 7/27/2020 | 44.76 | 6534.5 |
| 8/3/2020 | 44.85 | 6534.41 |
| 8/10/2020 | 45 | 6534.26 |
| 8/17/2020 | 44.9 | 6534.36 |
| 8/24/2020 | 44.83 | 6534.43 |
| 8/31/2020 | 44.8 | 6534.46 |
| 9/8/2020 | 44.65 | 6534.61 |
| 9/14/2020 | 44.72 | 6534.54 |
| 9/21/2020 | 44.7 | 6534.56 |
| 9/28/2020 | 44.7 | 6534.56 |
| 10/5/2020 | 44.8 | 6534.46 |
| 10/12/2020 | 44.8 | 6534.46 |
| 10/19/2020 | 44.7 | 6534.56 |
| 10/26/2020 | 44.63 | 6534.63 |
| 11/2/2020 | 44.8 | 6534.46 |
| 11/9/2020 | 44.66 | 6534.6 |
| 11/16/2020 | 44.72 | 6534.54 |
| 11/23/2020 | 44.63 | 6534.63 |
| 11/30/2020 | 44.61 | 6534.65 |
| 12/7/2020 | 44.66 | 6534.6 |
| 12/14/2020 | 44.53 | 6534.73 |
| 12/21/2020 | 44.65 | 6534.61 |
| 12/28/2020 | 44.53 | 6534.73 |

* Drawdown Tube Pressure, # Transducer Reading

# Table A.2-1 WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS (cont.)

WATER LEVEL ELEVATION (FT-MSL) 1/7/2021

**SO**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 45.15 | 6533.64 |
| 1/13/2020 | 45.06 | 6533.73 |
| 1/20/2020 | 45.16 | 6533.63 |
| 1/27/2020 | 45.20 | 6533.59 |
| 2/3/2020 | 45.04 | 6533.75 |
| 2/10/2020 | 45.28 | 6533.51 |
| 2/17/2020 | 45.37 | 6533.42 |
| 2/24/2020 | 45.50 | 6533.29 |
| 3/2/2020 | 45.36 | 6533.43 |
| 3/9/2020 | 45.48 | 6533.31 |
| 3/16/2020 | 45.55 | 6533.24 |
| 3/23/2020 | 45.50 | 6533.29 |
| 3/30/2020 | 45.54 | 6533.25 |
| 4/13/2020 | 45.46 | 6533.33 |
| 4/20/2020 | 45.50 | 6533.29 |
| 4/27/2020 | 45.02 | 6533.77 |
| 5/4/2020 | 45.56 | 6533.23 |
| 5/11/2020 | 45.58 | 6533.21 |
| 5/18/2020 | 45.63 | 6533.16 |
| 5/25/2020 | 45.69 | 6533.10 |
| 5/31/2020 | 45.70 | 6533.09 |
| 6/8/2020 | 45.62 | 6533.17 |
| 6/15/2020 | 45.74 | 6533.05 |
| 6/22/2020 | 45.66 | 6533.13 |
| 6/29/2020 | 45.64 | 6533.15 |
| 7/6/2020 | 46.00 | 6532.79 |
| 7/13/2020 | 45.80 | 6532.99 |
| 7/20/2020 | 45.75 | 6533.04 |
| 7/27/2020 | 45.86 | 6532.93 |
| 8/3/2020 | 45.85 | 6532.94 |
| 8/10/2020 | 45.90 | 6532.89 |
| 8/17/2020 | 45.90 | 6532.89 |
| 8/24/2020 | 45.82 | 6532.97 |
| 8/31/2020 | 45.71 | 6533.08 |
| 9/8/2020 | 45.53 | 6533.26 |
| 9/14/2020 | 45.60 | 6533.19 |
| 9/21/2020 | 45.60 | 6533.19 |
| 9/28/2020 | 45.65 | 6533.14 |
| 10/5/2020 | 45.70 | 6533.09 |
| 10/12/2020 | 45.70 | 6533.09 |
| 10/19/2020 | 45.70 | 6533.09 |
| 10/26/2020 | 45.57 | 6533.22 |
| 11/2/2020 | 45.72 | 6533.07 |
| 11/9/2020 | 45.54 | 6533.25 |
| 11/16/2020 | 45.63 | 6533.16 |
| 11/23/2020 | 45.43 | 6533.36 |
| 11/30/2020 | 45.52 | 6533.27 |
| 12/7/2020 | 45.58 | 6533.21 |
| 12/14/2020 | 45.50 | 6533.29 |
| 12/21/2020 | 45.60 | 6533.19 |
| 12/28/2020 | 45.53 | 6533.26 |

**SP**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 44.95 | 6533.71 |
| 1/13/2020 | 44.87 | 6533.79 |
| 1/20/2020 | 44.95 | 6533.71 |
| 1/27/2020 | 45.00 | 6533.66 |
| 2/3/2020 | 44.88 | 6533.78 |
| 2/10/2020 | 45.07 | 6533.59 |
| 2/17/2020 | 45.13 | 6533.53 |
| 2/24/2020 | 45.25 | 6533.41 |
| 3/2/2020 | 45.16 | 6533.50 |
| 3/9/2020 | 45.24 | 6533.42 |
| 3/16/2020 | 45.40 | 6533.26 |
| 3/23/2020 | 45.27 | 6533.39 |
| 3/30/2020 | 45.29 | 6533.37 |
| 4/13/2020 | 45.21 | 6533.45 |
| 4/20/2020 | 45.22 | 6533.44 |
| 4/27/2020 | 45.27 | 6533.39 |
| 5/4/2020 | 45.23 | 6533.43 |
| 5/11/2020 | 45.36 | 6533.30 |
| 5/18/2020 | 45.42 | 6533.24 |
| 5/25/2020 | 45.45 | 6533.21 |
| 5/31/2020 | 45.47 | 6533.19 |
| 6/8/2020 | 43.40 | 6535.26 |
| 6/15/2020 | 45.46 | 6533.20 |
| 6/22/2020 | 45.40 | 6533.26 |
| 6/29/2020 | 45.41 | 6533.25 |
| 7/6/2020 | 45.55 | 6533.11 |
| 7/13/2020 | 45.60 | 6533.06 |
| 7/20/2020 | 45.50 | 6533.16 |
| 7/27/2020 | 45.52 | 6533.14 |
| 8/3/2020 | 45.60 | 6533.06 |
| 8/10/2020 | 45.65 | 6533.01 |
| 8/17/2020 | 45.70 | 6532.96 |
| 8/24/2020 | 45.60 | 6533.06 |
| 8/31/2020 | 45.53 | 6533.13 |
| 9/8/2020 | 45.40 | 6533.26 |
| 9/14/2020 | 45.42 | 6533.24 |
| 9/21/2020 | 45.40 | 6533.26 |
| 9/28/2020 | 45.40 | 6533.26 |
| 10/5/2020 | 45.45 | 6533.21 |
| 10/12/2020 | 45.50 | 6533.16 |
| 10/19/2020 | 45.44 | 6533.22 |
| 10/26/2020 | 45.37 | 6533.29 |
| 11/2/2020 | 45.50 | 6533.16 |
| 11/9/2020 | 45.35 | 6533.31 |
| 11/16/2020 | 45.41 | 6533.25 |
| 11/23/2020 | 45.24 | 6533.42 |
| 11/30/2020 | 45.32 | 6533.34 |
| 12/7/2020 | 45.36 | 6533.30 |
| 12/14/2020 | 45.27 | 6533.39 |
| 12/21/2020 | 45.30 | 6533.36 |
| 12/28/2020 | 45.27 | 6533.39 |

**SS**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/6/2020 | 47.20 | 6531.18 |
| 1/13/2020 | 47.13 | 6531.25 |
| 1/20/2020 | 47.23 | 6531.15 |
| 1/27/2020 | 47.30 | 6531.08 |
| 2/3/2020 | 47.12 | 6531.26 |
| 2/10/2020 | 47.34 | 6531.04 |
| 2/17/2020 | 47.41 | 6530.97 |
| 2/24/2020 | 47.60 | 6530.78 |
| 3/2/2020 | 47.44 | 6530.94 |
| 3/9/2020 | 49.55 | 6528.83 |
| 3/16/2020 | 47.65 | 6530.73 |
| 3/23/2020 | 47.60 | 6530.78 |
| 3/30/2020 | 47.59 | 6530.79 |
| 4/13/2020 | 47.37 | 6531.01 |
| 4/20/2020 | 47.45 | 6530.93 |
| 4/27/2020 | 47.54 | 6530.84 |
| 5/4/2020 | 47.58 | 6530.80 |
| 5/11/2020 | 47.63 | 6530.75 |
| 5/18/2020 | 46.67 | 6531.71 |
| 5/25/2020 | 47.76 | 6530.62 |
| 5/31/2020 | 47.71 | 6530.67 |
| 6/8/2020 | 47.65 | 6530.73 |
| 6/15/2020 | 47.66 | 6530.72 |
| 6/22/2020 | 47.60 | 6530.78 |
| 6/29/2020 | 47.62 | 6530.76 |
| 7/6/2020 | 47.85 | 6530.53 |
| 7/13/2020 | 47.80 | 6530.58 |
| 7/20/2020 | 47.80 | 6530.58 |
| 7/27/2020 | 47.75 | 6530.63 |
| 8/3/2020 | 47.85 | 6530.53 |
| 8/10/2020 | 47.90 | 6530.48 |
| 8/17/2020 | 47.90 | 6530.48 |
| 8/24/2020 | 47.80 | 6530.58 |
| 8/31/2020 | 47.72 | 6530.66 |
| 9/8/2020 | 47.54 | 6530.84 |
| 9/14/2020 | 47.55 | 6530.83 |
| 9/21/2020 | 47.60 | 6530.78 |
| 9/28/2020 | 47.87 | 6530.51 |
| 10/5/2020 | 47.65 | 6530.73 |
| 10/12/2020 | 47.70 | 6530.68 |
| 10/19/2020 | 47.60 | 6530.78 |
| 10/26/2020 | 47.53 | 6530.85 |
| 11/2/2020 | 47.68 | 6530.70 |
| 11/9/2020 | 42.52 | 6535.86 |
| 11/16/2020 | 47.55 | 6530.83 |
| 11/23/2020 | 47.39 | 6530.99 |
| 11/30/2020 | 47.42 | 6530.96 |
| 12/7/2020 | 47.47 | 6530.91 |
| 12/14/2020 | 47.36 | 6531.02 |
| 12/21/2020 | 47.50 | 6530.88 |
| 12/28/2020 | 47.38 | 6531.00 |

**SSR**

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| 1/29/2020 | 47.30 | 6531.67 |
| 3/17/2020 | 47.60 | 6531.37 |

* Drawdown Tube Pressure, # Transducer Reading

# Table A.2-1 WATER LEVELS FOR HOMESTAKE'S ALLUVIAL WELLS (cont.)

WATER LEVEL ELEVATION (FT-MSL) 1/7/2021

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| **ST** | | |
| 1/6/2020 | 46.40 | 6532.91 |
| 1/13/2020 | 47.02 | 6532.29 |
| 1/20/2020 | 47.11 | 6532.20 |
| 1/27/2020 | 42.15 | 6537.16 |
| 2/3/2020 | 46.99 | 6532.32 |
| 2/10/2020 | 47.22 | 6532.09 |
| 2/17/2020 | 47.32 | 6531.99 |
| 2/24/2020 | 47.45 | 6531.86 |
| 2/27/2020 | 47.00 | 6532.31 |
| 3/2/2020 | 47.35 | 6531.96 |
| 3/9/2020 | 47.42 | 6531.89 |
| 3/16/2020 | 46.15 | 6533.16 |
| 3/18/2020 | 47.50 | 6531.81 |
| 3/23/2020 | 47.47 | 6531.84 |
| 3/30/2020 | 47.42 | 6531.89 |
| 4/13/2020 | 47.19 | 6532.12 |
| 4/20/2020 | 47.26 | 6532.05 |
| 4/27/2020 | 47.40 | 6531.91 |
| 5/4/2020 | 47.45 | 6531.86 |
| 5/11/2020 | 47.50 | 6531.81 |
| 5/18/2020 | 47.56 | 6531.75 |
| 5/25/2020 | 47.63 | 6531.68 |
| 5/31/2020 | 47.56 | 6531.75 |
| 6/8/2020 | 47.48 | 6531.83 |
| 6/15/2020 | 47.48 | 6531.83 |
| 6/22/2020 | 47.56 | 6531.75 |
| 6/29/2020 | 47.45 | 6531.86 |
| 7/6/2020 | 47.60 | 6531.71 |
| 7/13/2020 | 47.65 | 6531.66 |
| 7/20/2020 | 47.50 | 6531.81 |
| 7/27/2020 | 51.39 | 6527.92 |
| 8/3/2020 | 47.70 | 6531.61 |
| 8/10/2020 | 45.60 | 6533.71 |
| 8/17/2020 | 47.75 | 6531.56 |
| 8/24/2020 | 47.63 | 6531.68 |
| 8/31/2020 | 47.35 | 6531.96 |
| 9/8/2020 | 47.33 | 6531.98 |
| 9/14/2020 | 47.36 | 6531.95 |
| 9/21/2020 | 47.45 | 6531.86 |
| 9/28/2020 | 47.38 | 6531.93 |
| 10/5/2020 | 47.45 | 6531.86 |
| 10/12/2020 | 47.50 | 6531.81 |
| 10/19/2020 | 47.41 | 6531.90 |
| 10/26/2020 | 47.32 | 6531.99 |
| 11/2/2020 | 47.30 | 6532.01 |
| 11/9/2020 | 47.20 | 6532.11 |
| 11/16/2020 | 47.36 | 6531.95 |
| 11/23/2020 | 47.16 | 6532.15 |
| 11/30/2020 | 47.24 | 6532.07 |
| 12/7/2020 | 47.24 | 6532.07 |
| 12/14/2020 | 47.12 | 6532.19 |
| 12/21/2020 | 47.20 | 6532.11 |
| 12/28/2020 | 47.12 | 6532.19 |
| **SV** | | |
| 3/17/2020 | 46.70 | 6532.55 |
| **SZ** | | |
| 2/27/2020 | 48.15 | 6533.32 |
| 11/23/2020 | 43.91 | 6537.56 |
| **T2** | | |
| 6/24/2020 | 98.00 | 6566.82 |
| **T7** | | |
| 3/25/2020 | 121.10 | 6538.57 |
| **T8** | | |
| 3/25/2020 | 122.12 | 6539.49 |
| **T9** | | |
| 3/26/2020 | 121.07 | 6542.88 |
| **T10** | | |
| 3/25/2020 | 104.61 | 6555.35 |
| **T12** | | |
| 3/25/2020 | 106.14 | 6551.09 |
| **T15** | | |
| 3/25/2020 | 120.91 | 6544.38 |
| **T19** | | |
| 6/24/2020 | 128.20 | 6539.56 |
| **T22** | | |
| 3/17/2020 | 124.10 | 6543.09 |
| **T23** | | |
| 6/25/2020 | 113.00 | 6548.11 |
| **T24** | | |
| 1/14/2020 | 122.60 | 6534.43 |
| **T25** | | |
| 1/14/2020 | 122.80 | 6534.54 |
| **T26** | | |
| 1/15/2020 | 121.90 | 6534.76 |
| **T27** | | |
| 1/15/2020 | 121.80 | 6535.34 |
| **T28** | | |
| 1/15/2020 | 121.75 | 6536.96 |
| **T29** | | |
| 1/15/2020 | 119.20 | 6537.51 |
| **T30** | | |
| 1/16/2020 | 123.00 | 6536.62 |
| **T31** | | |
| 1/15/2020 | 122.10 | 6536.93 |
| **T33** | | |
| 1/28/2020 | 79.45 | 6576.34 |
| **T36** | | |
| 1/28/2020 | 119.30 | 6536.14 |
| **T41** | | |
| 6/24/2020 | 102.95 | 6557.01 |
| **T43** | | |
| 1/28/2020 | 119.85 | 6537.67 |
| **T47** | | |
| 1/29/2020 | 118.75 | 6538.46 |
| **T48** | | |
| 1/28/2020 | 119.50 | 6538.06 |
| **T53** | | |
| 1/28/2020 | 121.50 | 6535.48 |
| **T54** | | |
| 1/28/2020 | 118.60 | 6538.50 |
| 2/13/2020 | 138.70 | 6518.40 |
| 6/24/2020 | 123.80 | 6533.30 |
| **WR12** | | |
| 11/23/2020 | 29.45 | 6538.74 |
| **X** | | |
| 2/18/2020 | 33.40 | 6538.21 |
| 4/9/2020 | 33.79 | 6537.82 |
| 7/20/2020 | 34.10 | 6537.51 |
| 10/12/2020 | 33.10 | 6538.51 |

* Drawdown Tube Pressure, # Transducer Reading

# TABLE A.2-2 WATER LEVELS FOR THE SUBDIVISION ALLUVIAL WELLS

WATER LEVEL ELEVATION (FT-MSL) 1/7/2021

| Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|
| **0497** | | |
| 5/19/2020 | 49.78 | 6512.84 |
| 11/25/2020 | 49.80 | 6512.82 |
| **0688** | | |
| 8/11/2020 | 60.50 | 6502.12 |
| 11/20/2020 | 60.88 | 6501.74 |
| **0802** | | |
| 8/18/2020 | 41.40 | 6521.32 |
| **0844** | | |
| 2/12/2020 | 38.45 | 6517.68 |
| 11/20/2020 | 39.04 | 6517.09 |
| **0845** | | |
| 2/12/2020 | 38.25 | 6518.80 |
| 2/25/2020 | 36.90 | 6520.15 |
| 11/20/2020 | 37.43 | 6519.62 |
| **AW** | | |
| 11/11/2020 | 38.40 | 6525.03 |
| **Q2** | | |
| 9/21/2020 | 73.20 | 6488.48 |
| 10/29/2020 | 72.10 | 6489.58 |
| **Q5** | | |
| 5/6/2020 | 51.91 | 6509.57 |
| **Q8** | | |
| 11/25/2020 | 50.08 | 6510.72 |
| **Q11** | | |
| 9/21/2020 | 71.30 | 6489.72 |
| 10/29/2020 | 53.55 | 6507.47 |
| **Q23** | | |
| 11/25/2020 | 62.45 | 6501.81 |
| **Q29** | | |
| 11/25/2020 | 51.70 | 6514.76 |
| **Q44** | | |
| 11/25/2020 | 51.53 | 6509.80 |
| **Q48** | | |
| 11/25/2020 | 51.22 | 6516.62 |
| **SUB2** | | |
| 7/20/2020 | 42.90 | 6524.67 |
| **SUB3** | | |
| 5/12/2020 | 40.03 | 6517.04 |

* Drawdown Tube Pressure, # Transducer Reading

# TABLE A.2-3 WATER LEVELS FOR REGIONAL ALLUVIAL WELLS

WATER LEVEL ELEVATION (FT-MSL) 1/7/2021

| Well | Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|---|
| 0520 | 3/18/2020 | 54.70 | 6531.32 |
| 0520 | 11/11/2020 | 55.38 | 6530.64 |
| 0521 | 3/18/2020 | 54.25 | 6530.19 |
| 0522 | 3/18/2020 | 52.60 | 6527.93 |
| 0538 | 3/4/2020 | 67.80 | 6481.14 |
| 0539 | 11/20/2020 | > 210.00 | < 6345.32 |
| 0540 | 5/6/2020 | 58.16 | 6497.75 |
| 0540 | 11/20/2020 | 57.08 | 6498.83 |
| 0541 | 1/7/2020 | 91.00 | 6464.62 |
| 0541 | 1/13/2020 | 91.00 | 6464.62 |
| 0541 | 11/25/2020 | 91.80 | 6463.82 |
| 0551 | 1/8/2020 | 99.15 | 6448.15 |
| 0551 | 11/20/2020 | 99.48 | 6447.82 |
| 0553 | 11/20/2020 | 104.44 | 6443.04 |
| 0554 | 11/20/2020 | > 140.00 | < 6407.17 |
| 0555 | 2/4/2020 | 42.40 | 6514.74 |
| 0556 | 2/4/2020 | 42.90 | 6513.12 |
| 0557 | 2/5/2020 | 43.00 | 6510.77 |
| 0631 | 11/20/2020 | 84.39 | 6456.71 |
| 0632 | 3/4/2020 | 85.30 | 6456.00 |
| 0632 | 11/20/2020 | 83.20 | 6458.10 |
| 0634 | 11/25/2020 | 70.48 | 6489.59 |
| 0638 | 3/18/2020 | 50.10 | 6535.46 |
| 0638 | 11/11/2020 | 52.10 | 6533.46 |
| 0639 | 2/27/2020 | 58.10 | 6529.78 |
| 0639 | 3/8/2020 | 56.20 | 6531.68 |
| 0639 | 5/12/2020 | 56.16 | 6531.72 |
| 0639 | 7/15/2020 | 57.20 | 6530.68 |
| 0640 | 11/11/2020 | > 47.70 | < 6532.27 |
| 0644 | 5/5/2020 | 71.11 | 6472.79 |
| 0644 | 11/20/2020 | 70.85 | 6473.05 |
| 0646 | 3/12/2020 | 74.30 | 6469.05 |
| 0646 | 11/20/2020 | 74.15 | 6469.20 |
| 0647 | 1/8/2020 | 104.25 | 6447.66 |
| 0647 | 11/20/2020 | 105.33 | 6446.58 |
| 0648 | 11/20/2020 | > 120.00 | < 6427.79 |
| 0649 | 1/8/2020 | 84.25 | 6459.04 |
| 0649 | 11/20/2020 | 103.11 | 6440.18 |
| 0650 | 11/11/2020 | 82.15 | 6464.96 |
| 0652 | 11/20/2020 | 84.60 | 6453.55 |
| 0653 | 11/20/2020 | 65.93 | 6479.04 |
| 0654 | 1/9/2020 | 74.20 | 6476.30 |
| 0654 | 11/25/2020 | 74.64 | 6475.86 |
| 0657 | 11/20/2020 | 100.52 | 6451.29 |
| 0658 | 11/20/2020 | 107.61 | 6442.57 |
| 0659 | 3/2/2020 | 70.00 | 6490.17 |
| 0659 | 11/25/2020 | 70.35 | 6489.82 |
| 0680 | 11/25/2020 | 73.10 | 6485.77 |
| 0681 | 11/11/2020 | 64.80 | 6495.72 |
| 0685 | 11/25/2020 | 97.50 | 6459.07 |
| 0687 | 11/25/2020 | > 102.00 | < 6453.96 |
| 0846 | 8/17/2020 | 44.20 | 6504.72 |
| 0846 | 11/20/2020 | 44.23 | 6504.69 |
| 0851 | 11/11/2020 | 82.50 | 6463.94 |
| 0852 | 11/11/2020 | 69.95 | 6520.19 |
| 0855 | 11/20/2020 | 82.99 | 6458.12 |
| 0862 | 11/20/2020 | 52.63 | 6503.55 |
| 0864 | 4/30/2020 | 67.60 | 6479.12 |
| 0867 | 11/20/2020 | 58.98 | 6496.92 |
| 0869 | 4/30/2020 | 68.97 | 6475.52 |
| 0869 | 11/20/2020 | 68.50 | 6475.99 |
| 0876 | 11/20/2020 | > 95.00 | < 6449.26 |
| 0877 | 11/20/2020 | 62.56 | 6490.52 |
| 0879 | 11/20/2020 | 67.64 | 6476.91 |
| 0881 | 2/25/2020 | 73.00 | 6492.04 |
| 0881 | 11/25/2020 | 73.73 | 6491.31 |

* Drawdown Tube Pressure, # Transducer Reading

# TABLE A.2-3 WATER LEVELS FOR REGIONAL ALLUVIAL WELLS (cont.)

WATER LEVEL ELEVATION (FT-MSL) 1/7/2021

| Well | Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|---|
| 0882 | 2/5/2020 | 64.90 | 6496.26 |
| 0883 | 2/5/2020 | 59.85 | 6497.28 |
| 0884 | 2/6/2020 | 72.35 | 6493.75 |
| 0885 | 11/25/2020 | 66.50 | 6498.14 |
| 0886 | 2/25/2020 | 71.30 | 6493.25 |
| | 11/25/2020 | 69.93 | 6494.62 |
| 0887 | 11/25/2020 | 61.80 | 6505.93 |
| 0888 | 2/6/2020 | 77.20 | 6480.13 |
| | 11/25/2020 | 77.90 | 6479.43 |
| 0890 | 10/20/2020 | 74.81 | 6483.62 |
| 0893 | 2/10/2020 | 68.85 | 6495.12 |
| | 11/25/2020 | 70.02 | 6493.95 |
| 0897 | 11/25/2020 | 79.25 | 6483.00 |
| 0899 | 1/9/2020 | 101.60 | 6469.24 |
| 0921 | 2/10/2020 | 41.70 | 6582.30 |
| 0994 | 10/6/2020 | 92.10 | 6462.90 |
| 0996 | 1/9/2020 | 80.20 | 6472.32 |
| H2A | 3/2/2020 | 52.45 | 6507.42 |
| H7 | 10/20/2020 | 72.21 | 6487.33 |
| H7A | 11/25/2020 | 71.83 | 6487.26 |
| H7B | 10/20/2020 | 70.78 | 6488.60 |
| H16 | 10/20/2020 | 66.20 | 6491.78 |
| H17 | 10/20/2020 | 71.81 | 6491.55 |
| H24 | 10/20/2020 | 73.53 | 6492.34 |
| H55 | 3/3/2020 | 63.50 | 6505.75 |
| H95 | 11/25/2020 | 65.92 | 6502.99 |
| M16 | 11/25/2020 | 63.40 | 6507.19 |
| MO | 3/4/2020 | 62.60 | 6510.29 |
| | 11/25/2020 | 64.40 | 6508.49 |
| MP | 11/25/2020 | 64.85 | 6509.63 |
| MR | 2/13/2020 | 68.30 | 6497.96 |
| | 11/25/2020 | 69.35 | 6496.91 |
| MT | 11/25/2020 | > 60.50 | < 6506.93 |
| MV | 3/11/2020 | 62.40 | 6507.38 |
| | 11/25/2020 | 67.94 | 6501.84 |
| R1 | 10/28/2020 | 51.66 | 6503.46 |
| | 11/20/2020 | 50.78 | 6504.34 |
| R2 | 10/28/2020 | 67.39 | 6486.77 |
| R3 | 5/12/2020 | 51.29 | 6504.44 |
| | 10/28/2020 | 62.64 | 6493.09 |
| R4 | 10/28/2020 | 54.04 | 6504.74 |
| R5 | 10/12/2020 | 97.90 | 6459.85 |
| | 10/29/2020 | 54.43 | 6503.32 |
| R18 | 3/12/2020 | 61.10 | 6494.90 |
| R20 | 3/12/2020 | 59.90 | 6496.44 |
| R22 | 3/12/2020 | 61.70 | 6495.44 |
| R74 | 11/20/2020 | 71.33 | 6472.70 |

* Drawdown Tube Pressure, # Transducer Reading

# TABLE A.3-1 WATER LEVELS FOR CHINLE AQUIFERS

WATER LEVEL ELEVATION (FT-MSL)

3/1/2021

| Well | Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|---|
| 0493 | 5/19/2020 | 59.34 | 6500.94 |
| 0493 | 11/11/2020 | 60.34 | 6499.94 |
| 0494 | 5/19/2020 | 13.00 | 6547.14 |
| 0494 | 11/11/2020 | 38.78 | 6521.36 |
| 0538 | 3/4/2020 | 67.80 | 6481.14 |
| 0539 | 11/20/2020 | > 210.00 | < 6345.32 |
| 0653 | 11/20/2020 | 65.93 | 6479.04 |
| 0850 | 11/11/2020 | 54.60 | 6494.55 |
| 0853 | 11/11/2020 | 66.00 | 6475.38 |
| 0859 | 11/11/2020 | 58.00 | 6494.76 |
| 0908 | 11/11/2020 | 123.98 | 6420.39 |
| 0927 | 11/11/2020 | 99.10 | 6495.90 |
| 0927 | 11/11/2020 | 99.10 | 6495.90 |
| 0929 | 11/11/2020 | 74.10 | 6518.47 |
| 0930 | 11/11/2020 | 103.40 | 6495.14 |
| 0931 | 11/11/2020 | 92.97 | 6517.59 |
| ACW | 7/20/2020 | 64.00 | 6499.80 |
| ACW | 11/11/2020 | 64.85 | 6498.95 |
| AW | 11/11/2020 | 38.40 | 6525.03 |
| B32 | 12/22/2020 | 56.52 | 6518.87 |
| CE1 | 11/11/2020 | 14.03 | 6556.16 |
| CE2 | 5/13/2020 | 41.16 | 6535.19 |
| CE2 | 5/28/2020 | 41.34 | 6535.01 |
| CE6 | 12/22/2020 | 95.72 | 6469.47 |
| CE7 | 11/11/2020 | 44.19 | 6531.80 |
| CE8 | 6/25/2020 | 45.85 | 6523.85 |
| CE8 | 11/11/2020 | 47.64 | 6522.06 |
| CE9 | 6/18/2020 | 35.57 | 6527.55 |
| CE9 | 7/14/2020 | 38.05 | 6525.07 |
| CE9 | 8/19/2020 | 39.80 | 6523.32 |
| CE9 | 11/11/2020 | 39.86 | 6523.26 |
| CE10 | 11/11/2020 | 51.75 | 6519.11 |
| CE13 | 11/11/2020 | 44.26 | 6530.38 |
| CE14 | 11/11/2020 | 40.03 | 6529.42 |
| CE15 | 6/17/2020 | 44.02 | 6522.06 |
| CE15 | 11/11/2020 | 47.96 | 6518.12 |
| CE15A | 8/20/2020 | 43.00 | 6521.81 |
| CE15A | 11/11/2020 | 42.27 | 6522.54 |
| CE19 | 8/20/2020 | 66.70 | 6502.13 |
| CF3 | 11/11/2020 | 51.76 | 6535.03 |
| CF4 | 2/27/2020 | 63.00 | 6600.69 |
| CF4 | 7/15/2020 | 75.50 | 6588.19 |
| CF4 | 8/14/2020 | 75.31 | 6588.38 |
| CF4 | 11/11/2020 | 75.11 | 6588.58 |
| CF5 | 11/29/2020 | 138.20 | 6533.26 |
| CF6 | 11/29/2020 | 107.00 | 6560.43 |
| CF7A | 11/11/2020 | 136.26 | 6531.85 |
| CW1 | 3/11/2020 | 83.60 | 6501.62 |
| CW1 | 3/16/2020 | 125.60 | 6459.62 |
| CW1 | 11/11/2020 | 85.85 | 6499.37 |
| CW2 | 8/18/2020 | 84.10 | 6501.38 |
| CW2 | 11/11/2020 | 86.05 | 6499.43 |
| CW2-1 | 11/11/2020 | 46.75 | 6538.73 |
| CW3 | 3/17/2020 | 56.00 | 6531.18 |
| CW3 | 6/17/2020 | 56.13 | 6531.05 |
| CW3 | 11/11/2020 | 57.80 | 6529.38 |
| CW6 | 11/11/2020 | 71.69 | 6503.95 |
| CW9 | 11/11/2020 | 62.01 | 6529.82 |
| CW15 | 11/11/2020 | 52.30 | 6499.02 |
| CW17 | 7/22/2020 | 60.80 | 6528.52 |
| CW17 | 11/11/2020 | 66.55 | 6522.77 |
| CW18 | 7/14/2020 | 53.55 | 6519.10 |
| CW18 | 11/11/2020 | 55.27 | 6517.38 |
| CW24 | 11/11/2020 | 51.90 | 6536.77 |
| CW28 | 3/18/2020 | 69.50 | 6502.18 |
| CW28 | 7/22/2020 | 69.90 | 6501.78 |
| CW28 | 11/11/2020 | 70.27 | 6501.41 |
| CW29 | 8/11/2020 | 78.20 | 6474.02 |
| CW29 | 11/11/2020 | 77.90 | 6474.32 |

* Drawdown Tube Pressure, # Transducer Reading

# TABLE A.3-1 WATER LEVELS FOR CHINLE AQUIFERS (cont.)

WATER LEVEL ELEVATION (FT-MSL) 3/1/2021

| Well | Date | Water Level (ft-MP) | Water Level Elevation (ft+MSL) |
|---|---|---|---|
| CW31 | 11/11/2020 | 86.50 | 6473.76 |
| CW32 | 7/23/2020 | 149.40 | 6417.88 |
| CW32 | 11/11/2020 | 147.40 | 6419.88 |
| CW33 | 11/11/2020 | 106.40 | 6468.49 |
| CW34 | 11/11/2020 | 53.55 | 6540.85 |
| CW35 | 3/17/2020 | 52.20 | 6538.97 |
| CW35 | 11/11/2020 | 52.80 | 6538.37 |
| CW36 | 11/11/2020 | 42.60 | 6508.49 |
| CW37 | 11/11/2020 | 62.85 | 6488.32 |
| CW40 | 11/11/2020 | 61.60 | 6517.34 |
| CW41 | 8/3/2020 | 79.40 | 6476.01 |
| CW41 | 11/11/2020 | 78.60 | 6476.81 |
| CW42 | 7/30/2020 | 70.30 | 6478.48 |
| CW42 | 11/11/2020 | 69.60 | 6479.18 |
| CW43 | 8/4/2020 | 67.35 | 6481.44 |
| CW43 | 11/11/2020 | 67.90 | 6480.89 |
| CW45 | 3/3/2020 | 52.70 | 6508.61 |
| CW45 | 11/11/2020 | 53.36 | 6507.95 |
| CW50 | 3/11/2020 | 48.55 | 6540.01 |
| CW50 | 11/11/2020 | 49.15 | 6539.41 |
| CW52 | 11/11/2020 | 38.60 | 6553.80 |
| CW53 | 11/11/2020 | 48.96 | 6515.98 |
| CW54 | 11/11/2020 | 33.70 | 6524.85 |
| CW55 | 8/5/2020 | 53.55 | 6510.61 |
| CW55 | 11/11/2020 | 52.83 | 6511.33 |
| CW57 | 11/11/2020 | 50.30 | 6534.60 |
| CW58 | 11/11/2020 | 61.72 | 6499.08 |
| CW60 | 11/11/2020 | 47.95 | 6536.25 |
| CW61 | 11/11/2020 | 62.23 | 6520.60 |
| CW62 | 7/16/2020 | 54.50 | 6525.36 |
| CW72 | 11/11/2020 | 83.76 | 6496.37 |
| CW73 | 11/11/2020 | 51.05 | 6512.40 |
| CW74 | 11/11/2020 | 55.00 | 6498.41 |
| CW75 | 11/11/2020 | 55.40 | 6498.18 |
| CW76 | 8/5/2020 | 56.35 | 6500.26 |
| CW76 | 11/11/2020 | 56.20 | 6500.41 |
| CW78 | 11/11/2020 | 48.82 | 6518.33 |
| Q48 | 11/25/2020 | 51.22 | 6516.62 |
| R1 | 10/28/2020 | 51.66 | 6503.46 |
| R1 | 11/20/2020 | 50.78 | 6504.34 |
| R2 | 10/28/2020 | 67.39 | 6486.77 |
| R3 | 5/12/2020 | 51.29 | 6504.44 |
| R3 | 10/28/2020 | 62.64 | 6493.09 |
| R4 | 10/28/2020 | 54.04 | 6504.74 |
| R5 | 10/12/2020 | 97.90 | 6459.85 |
| R5 | 10/29/2020 | 54.43 | 6503.32 |
| R49 | 11/20/2020 | 71.33 | 6474.66 |
| R67 | 11/20/2020 | 69.74 | 6475.79 |
| R74 | 11/20/2020 | 71.33 | 6472.70 |
| T25 | 1/14/2020 | 122.80 | 6534.54 |
| T27 | 1/15/2020 | 121.80 | 6535.34 |
| T28 | 1/15/2020 | 121.75 | 6536.96 |
| T30 | 1/16/2020 | 123.00 | 6536.62 |
| V1 | 11/11/2020 | 77.20 | 6474.91 |
| V2 | 11/11/2020 | 75.30 | 6474.79 |
| V6 | 8/10/2020 | 75.30 | 6472.13 |
| V6 | 11/11/2020 | 75.00 | 6472.43 |
| V7 | 11/11/2020 | 79.15 | 6476.08 |
| V8 | 11/11/2020 | 74.30 | 6477.19 |
| V9 | 11/11/2020 | 79.10 | 6476.59 |
| V11 | 11/11/2020 | 78.90 | 6477.00 |
| V14 | 11/11/2020 | 79.90 | 6475.79 |

* Drawdown Tube Pressure, # Transducer Reading

# TABLE A.3-1 WATER LEVELS FOR CHINLE AQUIFERS (cont.)

WATER LEVEL ELEVATION (FT-MSL) 3/1/2021

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| V16 | | | Y17 | | | | | | | | |
| 11/11/2020 | 74.90 | 6477.08 | 11/11/2020 | 59.95 | 6504.68 | | | | | | |
| V17 | | | Y25 | | | | | | | | |
| 11/11/2020 | 75.20 | 6474.95 | 11/11/2020 | 59.92 | 6502.75 | | | | | | |
| V18 | | | Y30 | | | | | | | | |
| 11/11/2020 | 75.45 | 6475.93 | 11/11/2020 | 58.39 | 6501.66 | | | | | | |
| WCW | | | | | | | | | | | |
| 11/11/2020 | 46.20 | 6521.17 | | | | | | | | | |
| WR25 | | | | | | | | | | | |
| 11/11/2020 | 55.82 | 6530.64 | | | | | | | | | |
| Y1 | | | | | | | | | | | |
| 11/11/2020 | 59.21 | 6502.23 | | | | | | | | | |
| Y2 | | | | | | | | | | | |
| 11/11/2020 | 59.80 | 6501.81 | | | | | | | | | |
| Y3 | | | | | | | | | | | |
| 11/11/2020 | 62.46 | 6500.92 | | | | | | | | | |
| 11/11/2020 | 62.46 | 6500.92 | | | | | | | | | |
| Y7 | | | | | | | | | | | |
| 8/19/2020 | 58.00 | 6502.43 | | | | | | | | | |
| Y8 | | | | | | | | | | | |
| 11/11/2020 | 59.49 | 6501.98 | | | | | | | | | |
| Y10 | | | | | | | | | | | |
| 11/11/2020 | 65.04 | 6501.14 | | | | | | | | | |
| Y13 | | | | | | | | | | | |
| 11/11/2020 | 59.17 | 6501.67 | | | | | | | | | |
| Y14 | | | | | | | | | | | |
| 11/11/2020 | 52.53 | 6508.49 | | | | | | | | | |

* Drawdown Tube Pressure, # Transducer Reading

# TABLE A.4-1 WATER LEVELS FOR THE SAN ANDRES AQUIFER

WATER LEVEL ELEVATION (FT-MSL) 3/1/2021

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **#1R Deepwell** | | | | | | | | | | | |
| 2/26/2020 | 172.50 | 6416.89 | | | | | | | | | |
| 11/11/2020 | 172.68 | 6416.71 | | | | | | | | | |
| **#2 DEEPWELL** | | | | | | | | | | | |
| 10/7/2020 | 197.20 | 6378.46 | | | | | | | | | |
| **0943M** | | | | | | | | | | | |
| 2/3/2020 | 138.10 | 6418.00 | | | | | | | | | |
| 9/9/2020 | 140.10 | 6416.00 | | | | | | | | | |
| 11/11/2020 | 138.75 | 6417.35 | | | | | | | | | |
| 11/17/2020 | 138.46 | 6417.64 | | | | | | | | | |
| **0951** | | | | | | | | | | | |
| 11/11/2020 | 68.70 | 6505.00 | | | | | | | | | |
| **0951R** | | | | | | | | | | | |
| 2/10/2020 | 155.80 | 6420.98 | | | | | | | | | |
| 5/6/2020 | 156.21 | 6420.57 | | | | | | | | | |
| 8/10/2020 | 159.20 | 6417.58 | | | | | | | | | |
| 11/10/2020 | 156.03 | 6420.75 | | | | | | | | | |
| 11/11/2020 | 156.02 | 6420.76 | | | | | | | | | |
| **0955** | | | | | | | | | | | |
| 8/4/2020 | 130.00 | 6420.00 | | | | | | | | | |
| **0991** | | | | | | | | | | | |
| 9/14/2020 | 134.40 | 6516.60 | | | | | | | | | |

* Drawdown Tube Pressure, # Transducer Reading

# APPENDIX B

# WATER QUALITY

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## MONITORING/PERFORMANCE REVIEW FOR HOMESTAKE'S GRANTS PROJECT

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# TABLE B.1-1 WATER QUALITY ANALYSES FOR THE TAILINGS WELLS

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES4 | 10/15/2020 | PACE | --- | --- | --- | --- | --- | --- | 300 | 2180 | 5740 | 7926 | --- | 9.76 |
| WME-2 | 2/20/2020 | ENER | --- | --- | --- | --- | --- | --- | --- | --- | --- | 4330 | --- | 9.84 |
| WME-3 | 2/20/2020 | ENER | 1 | 0.2 | 6.0 | 1350 | 646 | 474 | 154 | 1270 | --- | 4277 | 1.03 | 10.63 |
| WME-4 | 2/20/2020 | ENER | 5 | 0.5 | 32.0 | 10700 | 3870 | 5200 | 573 | 9850 | --- | 27600 | 1.02 | 10.83 |
| WME-5 | 2/20/2020 | ENER | 2 | 0.3 | 29.0 | 3360 | 849 | 1880 | 264 | 3060 | --- | 10601 | 1.00 | 11.17 |
| WME-6 | 2/20/2020 | ENER | 2 | 0.9 | 13.0 | 3060 | 1280 | 1470 | 355 | 2670 | --- | 10940 | 0.99 | 10.84 |

# TABLE B.1-2 WATER QUALITY ANALYSES FOR THE TAILINGS WELLS

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES4 | 10/15/2020 | PACE | 7.370 | --- | 18.600 | 0.070 | --- | --- | --- | --- | --- | --- | --- | --- |
| WME-3 | 2/20/2020 | ENER | 1.960 | --- | 3.690 | 0.023 | 0.2 | --- | --- | --- | --- | 0.05 | --- | --- |
| WME-4 | 2/20/2020 | ENER | 41.300 | --- | 146.000 | 0.240 | 0.4 | --- | --- | --- | --- | < 0.01 | --- | --- |
| WME-5 | 2/20/2020 | ENER | 14.200 | --- | 51.700 | 0.073 | 1.7 | --- | --- | --- | --- | 0.08 | --- | --- |
| WME-6 | 2/20/2020 | ENER | 6.660 | --- | 19.900 | 0.044 | 0.1 | --- | --- | --- | --- | 0.01 | --- | --- |

# TABLE B.2-1 WATER QUALITY ANALYSES FOR THE TOE DRAIN SUMPS

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East 1 Sump | 2/19/2020 | ENER | --- | --- | --- | --- | --- | --- | 802 | --- | --- | 14809 | --- | 10.30 |
| East 2 Sump | 2/19/2020 | ENER | --- | --- | --- | --- | --- | --- | 680 | --- | --- | 12769 | --- | 10.26 |
| North 1 Sump | 2/18/2020 | ENER | --- | --- | --- | --- | --- | --- | 620 | --- | --- | 11682 | --- | 10.12 |
| North 3 Sump | 2/19/2020 | ENER | --- | --- | --- | --- | --- | --- | 544 | --- | --- | 8146 | --- | 9.13 |
| South 1 Sump | 2/19/2020 | ENER | --- | --- | --- | --- | --- | --- | 396 | --- | --- | 6044 | --- | 8.91 |
| West 1 Sump | 2/19/2020 | ENER | --- | --- | --- | --- | --- | --- | 528 | --- | --- | 10465 | --- | 10.33 |

## TABLE B.2-2 WATER QUALITY ANALYSES FOR THE TOE DRAIN SUMPS

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East 1 Sump | 2/19/2020 | ENER | 20.500 | --- | 46.900 | 0.332 | --- | --- | --- | --- | --- | --- | --- | --- |
| East 2 Sump | 2/19/2020 | ENER | 14.100 | --- | 36.500 | 0.596 | --- | --- | --- | --- | --- | --- | --- | --- |
| North 1 Sump | 2/18/2020 | ENER | 16.200 | --- | 36.400 | 0.365 | --- | --- | --- | --- | --- | --- | --- | --- |
| North 3 Sump | 2/19/2020 | ENER | 6.660 | --- | 18.300 | 0.058 | --- | --- | --- | --- | --- | --- | --- | --- |
| South 1 Sump | 2/19/2020 | ENER | 8.660 | --- | 12.200 | 0.023 | --- | --- | --- | --- | --- | --- | --- | --- |
| West 1 Sump | 2/19/2020 | ENER | 14.300 | --- | 32.000 | 0.275 | --- | --- | --- | --- | --- | --- | --- | --- |

# TABLE B.3-1 WATER QUALITY ANALYSES FOR THE LINED PONDS

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E Coll Pond | 2/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 347 | 2940 | 5540 | 7465 | --- | 8.37 |
| | 5/11/2020 | PACE | --- | --- | --- | --- | --- | --- | 383 | 3230 | 5450 | 7480 | --- | 8.64 |
| | 7/29/2020 | PACE | 22 | 78.0 | 13.0 | 1710 | 312 | 32 | 381 | 2930 | 5760 | 7810 | 1.06 | 8.80 |
| | 10/7/2020 | PACE | --- | --- | --- | --- | --- | --- | 550 | 4160 | 8660 | 11150 | --- | 9.39 |
| Evap Pond 1 | 2/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 2500 | 22200 | 39800 | 39210 | --- | 9.25 |
| | 5/11/2020 | PACE | --- | --- | --- | --- | --- | --- | 4930 | 35600 | 55800 | 59230 | --- | 9.36 |
| | 7/29/2020 | PACE | 39 | 627.0 | 117.0 | 19500 | 1340 | 626 | 3680 | 35500 | 48800 | 45860 | 1.02 | 9.24 |
| | 10/7/2020 | PACE | --- | --- | --- | --- | --- | --- | 5560 | 57600 | 88700 | 70980 | --- | 9.40 |
| Evap Pond 2 | 2/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 1260 | 10400 | 18900 | 19880 | --- | 9.36 |
| | 5/11/2020 | PACE | --- | --- | --- | --- | --- | --- | 1680 | 14100 | 22600 | 25620 | --- | 9.28 |
| | 7/29/2020 | PACE | 65 | 391.0 | 57.0 | 10200 | 856 | 251 | 1830 | 15500 | 26400 | 28080 | 1.21 | 9.10 |
| | 7/29/2020 | PACE | # 62 | # 377.0 | # 50.0 | # 9760 | # 982 | # 265 | # 1810 | # 15400 | # 26300 | --- | # 1.16 | # 9.10 |
| | 10/7/2020 | PACE | --- | --- | --- | --- | --- | --- | 1490 | 12300 | 20400 | 22180 | --- | 9.40 |
| EVAP POND 3A | 2/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 14900 | 22700 | 68900 | 67510 | --- | 9.52 |
| | 5/11/2020 | PACE | --- | --- | --- | --- | --- | --- | 18200 | 18300 | 66600 | 84330 | --- | 9.39 |
| | 7/29/2020 | PACE | 9 | 815.0 | 615.0 | 48800 | < 5 | < 5 | 25100 | 38600 | 117000 | 102900 | 1.46 | 9.21 |
| | 10/7/2020 | PACE | --- | --- | --- | --- | --- | --- | 41300 | 26500 | 132000 | 121800 | --- | 8.89 |
| EVAP POND 3B | 2/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 15500 | 24100 | 69600 | 98290 | --- | 9.56 |
| | 5/11/2020 | PACE | --- | --- | --- | --- | --- | --- | 17300 | 22400 | 76400 | 82530 | --- | 9.40 |
| | 7/29/2020 | PACE | 9 | 818.0 | 564.0 | 49200 | < 5 | < 5 | 20300 | 57700 | 125000 | 97730 | 1.25 | 9.22 |
| | 10/7/2020 | PACE | --- | --- | --- | --- | --- | --- | 27200 | 25200 | 112000 | 114200 | --- | 9.19 |
| W Coll Pond | 10/7/2020 | PACE | --- | --- | --- | --- | --- | --- | 313 | 2480 | 4780 | 6172 | --- | 8.64 |

# Signifies Quality Control Sample

# TABLE B.3-2 WATER QUALITY ANALYSES FOR THE LINED PONDS

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E Coll Pond | 2/12/2020 | ENER | 6.630 | --- | 15.500 | 0.480 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/11/2020 | PACE | 5.780 | --- | 15.300 | 0.459 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7/29/2020 | PACE | 6.240 | --- | 18.900 | 0.489 | 4.9 | 0.9 | 0.100 | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| | 10/7/2020 | PACE | 12.200 | --- | 24.000 | 0.645 | --- | --- | --- | --- | --- | --- | --- | --- |
| Evap Pond 1 | 2/12/2020 | ENER | 44.300 | --- | 57.300 | 0.593 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/11/2020 | PACE | 76.700 | --- | 114.000 | 0.488 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7/29/2020 | PACE | 54.300 | --- | 109.000 | 0.768 | < 0.1 | 3.9 | 0.500 | < 1.00 | --- | < 0.01 | 1.60 | 0.90 |
| | 10/7/2020 | PACE | 93.200 | --- | 106.000 | < 0.025 | --- | --- | --- | --- | --- | --- | --- | --- |
| Evap Pond 2 | 2/12/2020 | ENER | 20.500 | --- | 43.200 | 0.717 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/11/2020 | PACE | 24.400 | --- | 51.300 | 0.657 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7/29/2020 | PACE | 26.700 | --- | 76.300 | 0.633 | < 0.1 | 2.7 | 0.300 | < 1.00 | --- | < 0.01 | 1.20 | 0.70 |
| | 7/29/2020 | PACE | # 26.400 | --- | # 70.800 | # 0.619 | # < 0.1 | # 2.4 | # 0.200 | # 4.60 | # 4.90 | # 0.02 | # 1.10 | # 0.70 |
| | 10/7/2020 | PACE | 20.900 | --- | 48.700 | 0.757 | --- | --- | --- | --- | --- | --- | --- | --- |
| EVAP POND 3A | 2/12/2020 | ENER | 184.000 | --- | 286.000 | 0.680 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/11/2020 | PACE | 210.000 | --- | 464.000 | 0.743 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7/29/2020 | PACE | 269.000 | --- | 471.000 | 1.120 | < 0.1 | 2.3 | 0.200 | < 1.00 | --- | 0.09 | 40.30 | 9.60 |
| | 10/7/2020 | PACE | 489.000 | --- | 850.000 | 1.110 | --- | --- | --- | --- | --- | --- | --- | --- |
| EVAP POND 3B | 2/12/2020 | ENER | 186.000 | --- | 378.000 | 0.680 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/11/2020 | PACE | 207.000 | --- | 428.000 | 0.735 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7/29/2020 | PACE | 304.000 | --- | 581.000 | 1.170 | < 0.1 | 4.7 | 0.300 | < 1.00 | --- | 0.08 | 63.90 | 8.10 |
| | 10/7/2020 | PACE | 405.000 | --- | 594.000 | 1.490 | --- | --- | --- | --- | --- | --- | --- | --- |
| W Coll Pond | 10/7/2020 | PACE | 4.900 | --- | 10.900 | 0.506 | --- | --- | --- | --- | --- | --- | --- | --- |

# TABLE B.4-1 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS

Ca THROUGH Ph(f)

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 4/9/2020 | ENER | 138 | 41.7 | 6.0 | 573 | 480 | < 5 | 276 | 1010 | 2410 | 3451 | 0.96 | 7.24 |
| 1K | 4/9/2020 | ENER | 88 | 18.0 | 2.4 | 264 | 336 | < 5 | 109 | 419 | 1160 | 1718 | 1.00 | 7.16 |
| B11 | 3/2/2020 | ENER | 263 | 57.6 | 8.8 | 908 | 561 | < 5 | 352 | 2000 | 4090 | 5531 | 0.95 | 7.19 |
| B12 | 3/8/2020 | ENER | --- | --- | --- | --- | --- | --- | 225 | 880 | 2120 | 2875 | --- | 7.07 |
| B13 | 3/8/2020 | ENER | --- | --- | --- | --- | --- | --- | 100 | 364 | 1060 | 1576 | --- | 7.28 |
| B16 | 12/22/2020 | PACE | --- | --- | --- | --- | --- | --- | 380 | 2930 | 5990 | 7594 | --- | 7.49 |
| B32 | 12/22/2020 | PACE | --- | --- | --- | --- | --- | --- | 155 | 721 | 1850 | 2529 | --- | 7.49 |
| B42 | 12/22/2020 | PACE | --- | --- | --- | --- | --- | --- | 644 | 5310 | 10100 | 12000 | --- | 7.31 |
| C2 | 3/26/2020 | ENER | --- | --- | --- | --- | --- | --- | 113 | 444 | 1200 | 1807 | --- | 7.41 |
| C6 | 3/26/2020 | ENER | --- | --- | --- | --- | --- | --- | 136 | 876 | 1970 | 2733 | --- | 7.35 |
| C8 | 3/26/2020 | ENER | --- | --- | --- | --- | --- | --- | 190 | 778 | 1980 | 2823 | --- | 7.55 |
| C9 | 3/26/2020 | ENER | --- | --- | --- | --- | --- | --- | 180 | 713 | 1760 | 2661 | --- | 7.57 |
| D1 | 7/22/2020 | PACE | 202 | 46.0 | 6.0 | 354 | 450 | < 5 | 144 | 773 | 1920 | 2531 | 1.06 | 7.06 |
| DD | 2/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 74 | 2030 | 3530 | 3957 | --- | 7.01 |
| | 5/7/2020 | PACE | 460 | 111.0 | 10.0 | 381 | 353 | < 5 | 73 | 2010 | 3490 | 3914 | 0.98 | 6.99 |
| | 8/18/2020 | PACE | --- | --- | --- | --- | --- | --- | 71 | 1840 | 3480 | 3795 | --- | 7.01 |
| | 10/12/2020 | PACE | --- | --- | --- | --- | --- | --- | 71 | 1850 | 3420 | 3794 | --- | 7.00 |
| DD2 | 2/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 59 | 1520 | 2780 | 3183 | --- | 6.90 |
| | 5/7/2020 | PACE | 334 | 85.0 | 8.0 | 303 | 356 | < 5 | 60 | 1540 | 2660 | 3167 | 0.93 | 7.04 |
| | 8/19/2020 | PACE | --- | --- | --- | --- | --- | --- | 59 | 1570 | 2680 | 3123 | --- | 6.90 |
| | 10/7/2020 | PACE | --- | --- | --- | --- | --- | --- | 56 | 1530 | 2700 | 3124 | --- | 6.94 |
| F | 9/16/2020 | PACE | 219 | 56.0 | 6.0 | 283 | 475 | < 5 | 185 | 683 | 1780 | 2520 | 1.02 | 7.06 |
| FB | 9/23/2020 | PACE | 235 | 60.0 | 7.0 | 289 | 415 | < 5 | 196 | 685 | 1820 | 2481 | 1.10 | 6.97 |
| GH | 9/15/2020 | PACE | 194 | 50.0 | 5.0 | 273 | 489 | < 5 | 162 | 631 | 1630 | 2319 | 1.00 | 6.95 |

# TABLE B.4-1 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS (cont'd.)

Ca THROUGH Ph(f)

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GN | 3/2/2020 | ENER | 165 | 52.5 | 8.5 | 237 | 375 | < 5 | 159 | 577 | 1460 | 2113 | 1.01 | 7.04 |
| K4 | 3/9/2020 | ENER | --- | --- | --- | --- | --- | --- | 68 | 336 | 997 | 1477 | --- | 7.55 |
| K5 | 3/5/2020 | ENER | --- | --- | --- | --- | --- | --- | 115 | 634 | 1610 | 4273 | --- | 7.14 |
| K7 | 3/10/2020 | ENER | --- | --- | --- | --- | --- | --- | 104 | 450 | 1230 | 1783 | --- | 7.27 |
| K9 | 2/27/2020 | ENER | 123 | 31.3 | 3.6 | 396 | 475 | < 5 | 116 | 611 | 1610 | 2352 | 1.09 | 7.27 |
| K11 | 3/8/2020 | ENER | --- | --- | --- | --- | --- | --- | 114 | 515 | 1390 | 2073 | --- | 7.13 |
| KEB | 3/8/2020 | ENER | --- | --- | --- | --- | --- | --- | 59 | 244 | 714 | 1101 | --- | 7.42 |
| KF | 3/10/2020 | ENER | --- | --- | --- | --- | --- | --- | 52 | 225 | 647 | 1010 | --- | 7.52 |
| L | 4/9/2020 | ENER | 142 | 34.1 | 4.1 | 248 | 379 | < 5 | 147 | 496 | 1370 | 1971 | 1.00 | 7.11 |
| L5 | 4/9/2020 | ENER | 81 | 18.6 | 3.5 | 258 | 368 | < 5 | 128 | 352 | 1080 | 1690 | 0.98 | 7.26 |
| | 4/9/2020 | ENER | # 81 | # 19.4 | # 3.3 | # 256 | # 370 | # < 5 | # 128 | # 353 | # 1090 | --- | # 0.98 | --- |
| L6 | 10/14/2020 | PACE | --- | --- | --- | --- | --- | --- | 192 | 440 | 1330 | 1978 | --- | 7.40 |
| L7 | 10/14/2020 | PACE | --- | --- | --- | --- | --- | --- | 110 | 308 | 990 | 1487 | --- | 7.44 |
| M3 | 4/29/2020 | PACE | 385 | 112.0 | 11.0 | 2110 | 1610 | < 5 | 415 | 3800 | 8420 | 9526 | 1.03 | 7.03 |
| M6 | 3/8/2020 | ENER | --- | --- | --- | --- | --- | --- | 183 | 1030 | 2240 | 3018 | --- | 7.01 |
| M9 | 3/8/2020 | ENER | --- | --- | --- | --- | --- | --- | 168 | 1110 | 2350 | 3123 | --- | 7.01 |
| | 10/19/2020 | PACE | --- | --- | --- | --- | --- | --- | 162 | 1050 | 2290 | 3022 | --- | 7.24 |
| M10 | 3/10/2020 | ENER | --- | --- | --- | --- | --- | --- | 224 | 1470 | 2920 | 3545 | --- | 7.02 |
| MB | 3/3/2020 | ENER | 229 | 60.4 | 8.2 | 256 | 524 | < 5 | 180 | 678 | 1770 | 2487 | 0.99 | 6.91 |
| ML | 3/10/2020 | ENER | --- | --- | --- | --- | --- | --- | 231 | 1930 | 3710 | 4298 | --- | 6.99 |
| MQ | 3/3/2020 | ENER | 306 | 68.1 | 6.4 | 307 | 449 | < 5 | 189 | 1110 | 2350 | 3040 | 0.96 | 7.18 |
| MU | 10/15/2020 | PACE | --- | --- | --- | --- | --- | --- | 217 | 1610 | 3150 | 3714 | --- | 7.13 |
| MX | 8/19/2020 | PACE | 189 | 51.0 | 10.0 | 254 | 500 | < 5 | 158 | 559 | 1540 | 2183 | 1.02 | 6.95 |

# Signifies Quality Control Sample

# TABLE B.4-1 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS (cont'd.)

Ca THROUGH Ph(f)

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MY | 10/14/2020 | PACE | --- | --- | --- | --- | --- | --- | 141 | 496 | 1350 | 2008 | --- | 7.21 |
| MZ | 3/11/2020 | ENER | --- | --- | --- | --- | --- | --- | 247 | 1480 | 2920 | 3537 | --- | 6.96 |
| NC | 4/9/2020 | ENER | 173 | 30.3 | 3.2 | 228 | 181 | < 5 | 52 | 794 | 1480 | 1973 | 1.00 | 7.38 |
| P | 11/17/2020 | PACE | 234 | 46.0 | 7.0 | 274 | 251 | < 5 | 47 | 1010 | 1860 | 2335 | 1.03 | 7.61 |
| P2 | 3/16/2020 | ENER | --- | --- | --- | --- | --- | --- | 63 | 1330 | 2340 | 2796 | --- | 7.30 |
| P3 | 3/11/2020 | ENER | --- | --- | --- | --- | --- | --- | 72 | 1380 | 2420 | 2885 | --- | 7.40 |
| P4 | 3/16/2020 | ENER | --- | --- | --- | --- | --- | --- | 45 | 881 | 1620 | 2098 | --- | 7.52 |
| Q | 5/13/2020 | PACE | 429 | 78.0 | 12.0 | 321 | 230 | < 5 | 66 | 1630 | 2670 | 3167 | 1.06 | 7.31 |
| R | 3/17/2020 | ENER | --- | --- | --- | --- | --- | --- | 57 | 1410 | 2370 | 2873 | --- | 7.50 |
| S4 | 9/15/2020 | PACE | 344 | 86.0 | 6.0 | 347 | 404 | < 5 | 252 | 1250 | 2630 | 3321 | 0.99 | 6.89 |
| S11 | 1/29/2020 | ENER | --- | --- | --- | --- | --- | --- | 150 | 546 | 1430 | 2066 | --- | 7.15 |
| SE6 | 1/29/2020 | ENER | --- | --- | --- | --- | --- | --- | 156 | 684 | 1800 | 2473 | --- | 6.95 |
| SSR | 1/29/2020 | ENER | --- | --- | --- | --- | --- | --- | 939 | 7070 | 13900 | 16240 | --- | 7.68 |
|  | 3/17/2020 | ENER | --- | --- | --- | --- | --- | --- | 959 | 7240 | 14600 | 16840 | --- | 7.60 |
| ST | 2/27/2020 | ENER | --- | --- | --- | --- | --- | --- | 607 | 4430 | 8900 | 11000 | --- | 7.53 |
|  | 3/18/2020 | ENER | --- | --- | --- | --- | --- | --- | 621 | 4280 | 9140 | 11130 | --- | 7.56 |
| SZ | 2/27/2020 | ENER | --- | --- | --- | --- | --- | --- | 1430 | 11600 | 24600 | 26440 | --- | 8.30 |
| T2 | 6/24/2020 | PACE | 75 | 64.0 | 5.0 | 3110 | 1880 | 11 | 503 | 3720 | 8700 | 11160 | 1.18 | 8.00 |
| T7 | 3/25/2020 | ENER | --- | --- | --- | --- | --- | --- | 548 | 5200 | 10300 | 12720 | --- | 7.17 |
| T8 | 3/25/2020 | ENER | --- | --- | --- | --- | --- | --- | 786 | 6360 | 14400 | 17370 | --- | 9.37 |
| T9 | 3/26/2020 | ENER | --- | --- | --- | --- | --- | --- | 446 | 3960 | 11400 | 14610 | --- | 9.93 |
| T10 | 3/25/2020 | ENER | --- | --- | --- | --- | --- | --- | 1200 | 8740 | 25400 | 28220 | --- | 9.80 |
| T12 | 3/25/2020 | ENER | --- | --- | --- | --- | --- | --- | 427 | 2880 | 7060 | 9472 | --- | 8.99 |

# TABLE B.4-1 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS (cont'd.)

Ca THROUGH Ph(f)

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T15 | 3/25/2020 | ENER | --- | --- | --- | --- | --- | --- | 649 | 5270 | 11200 | 13320 | --- | 7.29 |
| T19 | 6/24/2020 | PACE | 246 | 100.0 | 6.0 | 3300 | 2160 | < 5 | 561 | 4110 | 9440 | 11320 | 1.20 | 7.31 |
| T22 | 3/17/2020 | ENER | --- | --- | --- | --- | --- | --- | 591 | 5640 | 10900 | 13080 | --- | 7.23 |
| T23 | 6/25/2020 | PACE | 102 | 175.0 | 14.0 | 6970 | 3670 | < 5 | 1470 | 10800 | 18600 | 24850 | 0.99 | 7.37 |
| T24 | 1/14/2020 | ENER | --- | --- | --- | --- | --- | --- | 445 | 3890 | 7630 | 9189 | --- | 7.06 |
| T25 | 1/14/2020 | ENER | --- | --- | --- | --- | --- | --- | 304 | 2460 | 4660 | 6120 | --- | 7.06 |
| T26 | 1/15/2020 | ENER | --- | --- | --- | --- | --- | --- | 469 | 4340 | 8320 | 10130 | --- | 7.01 |
| T27 | 1/15/2020 | ENER | --- | --- | --- | --- | --- | --- | 470 | 3890 | 7080 | 8593 | --- | 6.91 |
| T28 | 1/15/2020 | ENER | --- | --- | --- | --- | --- | --- | 517 | 4290 | 8220 | 9836 | --- | 6.81 |
| T29 | 1/15/2020 | ENER | --- | --- | --- | --- | --- | --- | 858 | 6570 | 13800 | 16890 | --- | 8.77 |
| | 1/15/2020 | ENER | --- | --- | --- | --- | --- | --- | # 830 | # 6460 | # 13700 | --- | --- | --- |
| T30 | 1/16/2020 | ENER | --- | --- | --- | --- | --- | --- | 492 | 3540 | 6690 | 8157 | --- | 6.85 |
| T31 | 1/15/2020 | ENER | --- | --- | --- | --- | --- | --- | 544 | 4510 | 8670 | 9872 | --- | 7.06 |
| T33 | 1/28/2020 | ENER | --- | --- | --- | --- | --- | --- | 624 | 4980 | 11200 | 13930 | --- | 8.81 |
| T36 | 1/28/2020 | ENER | --- | --- | --- | --- | --- | --- | 300 | 2490 | 5020 | 6452 | --- | 7.41 |
| T41 | 6/24/2020 | PACE | < 2 | < 2.0 | 11.0 | 3100 | 840 | 1180 | 356 | 2510 | 7680 | 10350 | 1.17 | 10.05 |
| T43 | 1/28/2020 | ENER | --- | --- | --- | --- | --- | --- | 535 | 4730 | 9970 | 12460 | --- | 9.01 |
| T47 | 1/29/2020 | ENER | --- | --- | --- | --- | --- | --- | 487 | 3870 | 8940 | 11550 | --- | 9.40 |
| T48 | 1/28/2020 | ENER | --- | --- | --- | --- | --- | --- | 492 | 3830 | 8380 | 10960 | --- | 9.03 |
| T53 | 1/28/2020 | ENER | --- | --- | --- | --- | --- | --- | 167 | 1890 | 3820 | 4710 | --- | 8.09 |
| T54 | 1/28/2020 | ENER | --- | --- | --- | --- | --- | --- | 289 | 2740 | 6010 | 8196 | --- | 9.42 |
| | 2/13/2020 | ENER | 10 | 10.0 | 5.3 | 2030 | 924 | 338 | 284 | 2690 | 6130 | 8273 | 0.99 | 9.48 |
| | 6/24/2020 | PACE | 7 | 9.0 | 4.0 | 2240 | 926 | 338 | 280 | 2440 | 5840 | 8138 | 1.16 | 9.51 |

# Signifies Quality Control Sample

# TABLE B.4-1 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS (cont'd.)

Ca THROUGH Ph(f)

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | 2/18/2020 | ENER | --- | --- | --- | --- | --- | --- | 76 | 331 | 907 | 1350 | --- | 7.40 |
| | 4/9/2020 | ENER | --- | --- | --- | --- | --- | --- | 63 | 283 | 815 | 1231 | --- | 7.11 |
| | 7/20/2020 | PACE | 106 | 22.0 | 5.0 | 126 | 311 | < 5 | 83 | 246 | 780 | 1196 | 1.00 | 7.27 |
| | 7/20/2020 | PACE | # 105 | # 22.0 | # 5.0 | # 126 | # 289 | # < 5 | # 82 | # 242 | # 780 | --- | # 1.03 | # 7.27 |
| | 10/12/2020 | PACE | --- | --- | --- | --- | --- | --- | 108 | 317 | 960 | 1473 | --- | 7.13 |

# Signifies Quality Control Sample

## TABLE B.4-2 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 4/9/2020 | ENER | 3.500 | --- | 1.640 | 0.556 | 6.2 | 0.3 | 0.100 | 0.90 | 0.90 | < 0.01 | 0.20 | 0.10 |
| 1K | 4/9/2020 | ENER | 0.604 | --- | 0.386 | 0.026 | 2.5 | 0.2 | 0.100 | 0.40 | 0.90 | < 0.01 | 0.05 | 0.07 |
| B11 | 3/2/2020 | ENER | 5.400 | --- | 4.930 | 2.900 | 22.4 | 0.5 | 0.200 | 0.40 | 0.80 | < 0.01 | 0.20 | 0.40 |
| B12 | 3/8/2020 | ENER | 0.697 | --- | 0.209 | 0.070 | --- | --- | --- | --- | --- | --- | --- | --- |
| B13 | 3/8/2020 | ENER | 0.529 | --- | 0.276 | 0.012 | --- | --- | --- | --- | --- | --- | --- | --- |
| B16 | 12/22/2020 | PACE | 9.270 | --- | 14.800 | 0.335 | --- | --- | --- | --- | --- | --- | --- | --- |
| B32 | 12/22/2020 | PACE | 1.130 | --- | 1.220 | 0.064 | --- | --- | --- | --- | --- | --- | --- | --- |
| B42 | 12/22/2020 | PACE | 24.700 | --- | 38.300 | 0.953 | --- | --- | --- | --- | --- | --- | --- | --- |
| C2 | 3/26/2020 | ENER | 0.359 | --- | 0.192 | 0.022 | --- | --- | --- | --- | --- | --- | --- | --- |
| C6 | 3/26/2020 | ENER | 2.680 | --- | 6.540 | 0.769 | --- | --- | --- | --- | --- | --- | --- | --- |
| C8 | 3/26/2020 | ENER | 4.360 | --- | 5.970 | 0.811 | --- | --- | --- | --- | --- | --- | --- | --- |
| C9 | 3/26/2020 | ENER | 3.660 | --- | 5.530 | 0.386 | --- | --- | --- | --- | --- | --- | --- | --- |
| D1 | 7/22/2020 | PACE | 1.500 | --- | 1.760 | 0.064 | 1.5 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| DD | 2/12/2020 | ENER | 0.116 | --- | 0.002 | 0.066 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/7/2020 | PACE | 0.101 | --- | < 0.030 | 0.050 | 8.7 | < 3.0 | --- | 3.80 | 2.60 | < 0.02 | < 3.00 | --- |
| | 8/18/2020 | PACE | 0.106 | --- | < 0.010 | 0.060 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/12/2020 | PACE | 0.111 | --- | < 0.010 | 0.064 | --- | --- | --- | --- | --- | --- | --- | --- |
| DD2 | 2/12/2020 | ENER | 0.237 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/7/2020 | PACE | 0.189 | --- | < 0.030 | < 0.005 | < 0.1 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| | 8/19/2020 | PACE | 0.213 | --- | < 0.010 | < 0.005 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/7/2020 | PACE | 0.233 | --- | < 0.010 | < 0.005 | --- | --- | --- | --- | --- | --- | --- | --- |
| F | 9/16/2020 | PACE | 0.041 | --- | < 0.010 | 0.031 | 2.6 | < 0.2 | --- | 1.30 | 1.70 | < 0.01 | < 0.30 | --- |
| FB | 9/23/2020 | PACE | 0.060 | --- | < 0.010 | 0.042 | 2.0 | 0.2 | 0.100 | 1.30 | 1.90 | < 0.01 | < 0.30 | --- |
| GH | 9/15/2020 | PACE | 0.057 | --- | < 0.010 | 0.019 | 4.4 | < 0.2 | --- | 1.50 | 1.80 | < 0.01 | < 0.30 | --- |

## TABLE B.4-2 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GN | 3/2/2020 | ENER | 0.040 | --- | 0.001 | 0.035 | 2.0 | 0.6 | 0.300 | 0.40 | 0.80 | < 0.01 | 0.06 | 0.05 |
| K4 | 3/9/2020 | ENER | 0.832 | --- | 1.980 | 0.426 | --- | --- | --- | --- | --- | --- | --- | --- |
| K5 | 3/5/2020 | ENER | 1.770 | --- | 4.910 | 0.809 | --- | --- | --- | --- | --- | --- | --- | --- |
| K7 | 3/10/2020 | ENER | 0.224 | --- | 0.377 | 0.327 | --- | --- | --- | --- | --- | --- | --- | --- |
| K9 | 2/27/2020 | ENER | 1.850 | --- | 4.650 | 0.746 | 1.6 | 0.1 | 0.100 | 0.70 | 1.10 | 0.04 | 0.05 | 0.05 |
| K11 | 3/8/2020 | ENER | 0.947 | --- | 2.250 | 0.414 | --- | --- | --- | --- | --- | --- | --- | --- |
| KEB | 3/8/2020 | ENER | 0.054 | --- | 0.206 | 0.010 | --- | --- | --- | --- | --- | --- | --- | --- |
| KF | 3/10/2020 | ENER | 0.035 | --- | 0.193 | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- |
| L | 4/9/2020 | ENER | 0.332 | --- | 0.420 | 0.109 | 1.7 | 0.2 | 0.100 | 1.20 | 0.70 | < 0.01 | 0.08 | 0.07 |
| L5 | 4/9/2020 | ENER | 0.435 | --- | 0.729 | 0.132 | 1.4 | 0.1 | 0.100 | 1.10 | 0.80 | < 0.01 | 0.30 | 0.08 |
| | 4/9/2020 | ENER | # 0.435 | --- | # 0.698 | # 0.131 | # 1.4 | # 0.2 | # 0.100 | # 1.50 | # 0.80 | # < 0.01 | # 0.10 | # 0.06 |
| L6 | 10/14/2020 | PACE | 0.258 | --- | 0.400 | 0.194 | --- | --- | --- | --- | --- | --- | --- | --- |
| L7 | 10/14/2020 | PACE | 0.145 | --- | 0.150 | 0.073 | --- | --- | --- | --- | --- | --- | --- | --- |
| M3 | 4/29/2020 | PACE | 15.100 | --- | 22.200 | 0.556 | 2.4 | < 3.0 | --- | < 3.00 | --- | < 0.01 | < 3.00 | --- |
| M6 | 3/8/2020 | ENER | 2.120 | --- | 2.370 | 0.149 | --- | --- | --- | --- | --- | --- | --- | --- |
| M9 | 3/8/2020 | ENER | 2.470 | --- | 2.400 | 0.140 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/19/2020 | PACE | 2.290 | --- | 2.380 | 0.117 | --- | --- | --- | --- | --- | --- | --- | --- |
| M10 | 3/10/2020 | ENER | 0.149 | --- | 0.013 | 0.039 | --- | --- | --- | --- | --- | --- | --- | --- |
| MB | 3/3/2020 | ENER | 0.034 | --- | < 0.001 | 0.014 | 2.0 | 0.3 | 0.100 | 0.50 | 0.90 | < 0.01 | 0.60 | 0.20 |
| ML | 3/10/2020 | ENER | 0.104 | --- | 0.002 | 0.024 | --- | --- | --- | --- | --- | --- | --- | --- |
| MQ | 3/3/2020 | ENER | 0.814 | --- | 0.565 | 0.087 | 3.7 | 0.4 | 0.200 | 0.60 | 0.90 | < 0.01 | 0.10 | 0.10 |
| MU | 10/15/2020 | PACE | 0.110 | --- | < 0.010 | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- |
| MX | 8/19/2020 | PACE | 0.030 | --- | < 0.010 | 0.012 | 1.2 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |

# TABLE B.4-2 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MY | 10/14/2020 | PACE | 0.030 | --- | < 0.010 | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- |
| MZ | 3/11/2020 | ENER | 0.110 | --- | 0.008 | 0.046 | --- | --- | --- | --- | --- | --- | --- | --- |
| NC | 4/9/2020 | ENER | 0.019 | --- | 0.005 | 0.137 | 5.4 | 0.2 | 0.100 | 1.30 | 0.80 | < 0.01 | 0.07 | 0.05 |
| P | 11/17/2020 | PACE | 0.032 | --- | < 0.010 | 0.137 | 5.2 | 0.5 | 0.100 | 1.30 | 1.70 | < 0.01 | < 0.30 | --- |
| P2 | 3/16/2020 | ENER | 0.028 | --- | 0.001 | 0.348 | --- | --- | --- | --- | --- | --- | --- | --- |
| P3 | 3/11/2020 | ENER | 0.024 | --- | 0.001 | 0.444 | --- | --- | --- | --- | --- | --- | --- | --- |
| P4 | 3/16/2020 | ENER | 0.019 | --- | 0.002 | 0.177 | --- | --- | --- | --- | --- | --- | --- | --- |
| Q | 5/13/2020 | PACE | 0.046 | --- | < 0.030 | 0.367 | 12.4 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| R | 3/17/2020 | ENER | 0.022 | --- | 0.002 | 0.665 | --- | --- | --- | --- | --- | --- | --- | --- |
| S4 | 9/15/2020 | PACE | 0.331 | --- | 0.410 | < 0.005 | < 0.1 | 0.2 | 0.100 | 2.00 | 2.00 | < 0.01 | < 0.30 | --- |
| S11 | 1/29/2020 | ENER | 0.113 | --- | 0.154 | 0.013 | --- | --- | --- | --- | --- | --- | --- | --- |
| SE6 | 1/29/2020 | ENER | 0.775 | --- | 1.250 | 0.083 | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR | 1/29/2020 | ENER | 23.500 | --- | 37.900 | 1.830 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 3/17/2020 | ENER | 23.500 | --- | 35.400 | 1.480 | --- | --- | --- | --- | --- | --- | --- | --- |
| ST | 2/27/2020 | ENER | 15.300 | --- | 27.800 | 0.918 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 3/18/2020 | ENER | 15.400 | --- | 27.600 | 0.982 | --- | --- | --- | --- | --- | --- | --- | --- |
| SZ | 2/27/2020 | ENER | 49.700 | --- | 79.000 | 4.240 | --- | --- | --- | --- | --- | --- | --- | --- |
| T2 | 6/24/2020 | PACE | 12.300 | --- | 27.700 | 0.260 | 1.4 | 0.7 | 0.100 | 1.80 | 3.30 | 0.02 | < 0.30 | --- |
| T7 | 3/25/2020 | ENER | 22.600 | --- | 35.800 | 0.926 | --- | --- | --- | --- | --- | --- | --- | --- |
| T8 | 3/25/2020 | ENER | 32.800 | --- | 43.700 | 4.040 | --- | --- | --- | --- | --- | --- | --- | --- |
| T9 | 3/26/2020 | ENER | 22.600 | --- | 45.200 | 0.047 | --- | --- | --- | --- | --- | --- | --- | --- |
| T10 | 3/25/2020 | ENER | 41.000 | --- | 79.600 | 0.070 | --- | --- | --- | --- | --- | --- | --- | --- |
| T12 | 3/25/2020 | ENER | 5.460 | --- | 13.000 | 0.113 | --- | --- | --- | --- | --- | --- | --- | --- |

# TABLE B.4-2 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T15 | 3/25/2020 | ENER | 25.800 | --- | 30.200 | 0.726 | --- | --- | --- | --- | --- | --- | --- | --- |
| T19 | 6/24/2020 | PACE | 19.500 | --- | 33.100 | 0.078 | 1.2 | 5.5 | 0.300 | < 1.00 | --- | 0.02 | 3.60 | 3.20 |
| T22 | 3/17/2020 | ENER | 18.500 | --- | 33.900 | 0.530 | --- | --- | --- | --- | --- | --- | --- | --- |
| T23 | 6/25/2020 | PACE | 56.400 | --- | 71.000 | 0.618 | 90.5 | 1.0 | 0.100 | < 1.00 | --- | 0.06 | 0.40 | 0.50 |
| T24 | 1/14/2020 | ENER | 13.600 | --- | 22.600 | 0.070 | --- | --- | --- | --- | --- | --- | --- | --- |
| T25 | 1/14/2020 | ENER | 4.660 | --- | 9.060 | 0.271 | --- | --- | --- | --- | --- | --- | --- | --- |
| T26 | 1/15/2020 | ENER | 16.700 | --- | 32.700 | 0.047 | --- | --- | --- | --- | --- | --- | --- | --- |
| T27 | 1/15/2020 | ENER | 11.300 | --- | 7.220 | 0.113 | --- | --- | --- | --- | --- | --- | --- | --- |
| T28 | 1/15/2020 | ENER | 17.300 | --- | 16.100 | 0.351 | --- | --- | --- | --- | --- | --- | --- | --- |
| T29 | 1/15/2020 | ENER | 20.300 | --- | 39.500 | 0.518 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 1/15/2020 | ENER | 22.000 | --- | # 44.100 | # 0.571 | --- | --- | --- | --- | --- | --- | --- | --- |
| T30 | 1/16/2020 | ENER | 13.500 | --- | 5.880 | 0.118 | --- | --- | --- | --- | --- | --- | --- | --- |
| T31 | 1/15/2020 | ENER | 15.900 | --- | 17.900 | 0.129 | --- | --- | --- | --- | --- | --- | --- | --- |
| T33 | 1/28/2020 | ENER | 15.000 | --- | 41.300 | 0.115 | --- | --- | --- | --- | --- | --- | --- | --- |
| T36 | 1/28/2020 | ENER | 5.860 | --- | 14.500 | 0.160 | --- | --- | --- | --- | --- | --- | --- | --- |
| T41 | 6/24/2020 | PACE | 5.080 | --- | 29.800 | 0.024 | < 0.1 | 123.0 | 1.200 | < 1.00 | --- | 0.44 | 15.00 | 3.60 |
| T43 | 1/28/2020 | ENER | 14.100 | --- | 25.500 | 0.934 | --- | --- | --- | --- | --- | --- | --- | --- |
| T47 | 1/29/2020 | ENER | 10.400 | --- | 22.100 | 0.779 | --- | --- | --- | --- | --- | --- | --- | --- |
| T48 | 1/28/2020 | ENER | 11.800 | --- | 25.400 | 0.294 | --- | --- | --- | --- | --- | --- | --- | --- |
| T53 | 1/28/2020 | ENER | 2.750 | --- | 5.480 | 0.305 | --- | --- | --- | --- | --- | --- | --- | --- |
| T54 | 1/28/2020 | ENER | 6.630 | --- | 11.700 | 0.306 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 2/13/2020 | ENER | 6.220 | --- | 11.400 | 0.309 | 6.4 | 1.6 | 0.400 | 2.00 | 0.70 | 0.05 | 0.03 | 0.06 |
| | 6/24/2020 | PACE | 6.020 | --- | 11.700 | 0.356 | 5.6 | 1.8 | 0.200 | 1.80 | 3.30 | 0.06 | 16.50 | 19.00 |

# TABLE B.4-2 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | 2/18/2020 | ENER | 0.044 | --- | 0.112 | 0.015 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 4/9/2020 | ENER | 0.045 | --- | 0.128 | 0.017 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7/20/2020 | PACE | 0.034 | --- | 0.120 | 0.011 | 0.9 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| | 7/20/2020 | PACE | # 0.034 | --- | # 0.130 | # 0.010 | # 1.0 | # < 0.2 | --- | # < 1.00 | --- | # < 0.02 | # < 0.30 | --- |
| | 10/12/2020 | PACE | 0.046 | --- | 0.120 | 0.013 | --- | --- | --- | --- | --- | --- | --- | --- |

# TABLE B.4-3 WATER QUALITY ANALYSES FOR THE SUBDIVISION ALLUVIAL WELLS

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0423 | 8/3/2020 | PACE | 182 | 51.0 | 20.0 | 265 | 486 | < 5 | 155 | 497 | 1450 | 3262 | 1.11 | 7.04 |
| 0490 | 11/17/2020 | PACE | 202 | 51.0 | 7.0 | 323 | 430 | < 5 | 169 | 755 | 1850 | 2500 | 1.03 | 7.45 |
| 0497 | 5/19/2020 | PACE | 238 | 65.0 | 10.0 | 360 | 475 | < 5 | 175 | 847 | 1960 | 2779 | 1.09 | 7.09 |
| | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2707 | --- | --- |
| 0688 | 8/11/2020 | PACE | 256 | 55.0 | 8.0 | 309 | 540 | < 5 | 179 | 610 | 1780 | 2453 | 1.16 | 7.00 |
| 0802 | 8/18/2020 | PACE | 167 | 44.0 | 6.0 | 234 | 390 | < 5 | 118 | 470 | 1310 | 1874 | 1.13 | 7.12 |
| 0844 | 2/12/2020 | ENER | 287 | 101.0 | 4.1 | 523 | 457 | < 5 | 314 | 1360 | 2980 | 3854 | 1.01 | 7.32 |
| 0845 | 2/25/2020 | ENER | 239 | 67.5 | 5.3 | 375 | 482 | < 5 | 239 | 1010 | 2290 | 3082 | 0.95 | 7.06 |
| Q2 | 9/21/2020 | PACE | --- | --- | --- | --- | --- | --- | 144 | 642 | 1620 | 2291 | --- | 7.12 |
| | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2193 | --- | --- |
| | 10/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2058 | --- | 7.45 |
| Q5 | 5/6/2020 | PACE | 198 | 52.0 | 9.0 | 334 | 468 | < 5 | 154 | 711 | 1780 | 2503 | 1.07 | 7.24 |
| | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2359 | --- | --- |
| Q9 | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2045 | --- | --- |
| Q11 | 9/21/2020 | PACE | --- | --- | --- | --- | --- | --- | 158 | 721 | 1800 | 2491 | --- | 7.11 |
| | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2473 | --- | --- |
| | 10/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2468 | --- | 7.32 |
| Q19 | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2749 | --- | --- |
| Q27 | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2070 | --- | --- |
| Q28 | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2090 | --- | --- |
| Q30 | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2212 | --- | --- |
| SUB2 | 7/20/2020 | PACE | 175 | 47.0 | 6.0 | 254 | 429 | < 5 | 156 | 496 | 1460 | 2049 | 1.09 | 7.01 |
| SUB3 | 5/12/2020 | PACE | 128 | 56.0 | 10.0 | 437 | 131 | < 5 | 183 | 999 | 1780 | 2563 | 1.07 | 7.06 |

# TABLE B.4-4 WATER QUALITY ANALYSES FOR THE SUBDIVISION ALLUVIAL WELLS

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0423 | 8/3/2020 | PACE | 0.176 | --- | < 0.010 | 0.023 | 1.7 | < 0.2 | --- | 2.60 | 4.00 | < 0.02 | < 0.30 | --- |
| 0490 | 11/17/2020 | PACE | 0.282 | --- | 0.040 | 0.043 | 2.7 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| 0497 | 5/19/2020 | PACE | 0.581 | --- | < 0.030 | 0.050 | 2.8 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| | 10/8/2020 | HMC | --- | 0.51 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0688 | 8/11/2020 | PACE | 0.047 | --- | < 0.010 | 0.008 | 1.1 | 0.2 | 0.100 | 4.80 | 4.10 | < 0.02 | < 0.30 | --- |
| 0802 | 8/18/2020 | PACE | 0.101 | --- | 0.020 | 0.011 | 1.2 | 0.2 | 0.100 | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| 0844 | 2/12/2020 | ENER | 0.097 | --- | < 0.001 | 0.057 | 7.6 | 0.4 | 0.200 | 0.10 | 0.70 | < 0.01 | 0.07 | 0.09 |
| 0845 | 2/25/2020 | ENER | 0.069 | --- | < 0.001 | 0.034 | 3.9 | 0.3 | 0.200 | 0.20 | 1.20 | < 0.01 | 0.05 | 0.04 |
| Q2 | 9/21/2020 | PACE | 0.346 | --- | < 0.010 | 0.033 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/8/2020 | HMC | --- | 0.26 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q5 | 5/6/2020 | PACE | 0.403 | --- | < 0.030 | 0.036 | 3.2 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| | 10/8/2020 | HMC | --- | 0.38 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q9 | 10/8/2020 | HMC | --- | 0.16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q11 | 9/21/2020 | PACE | 0.498 | --- | < 0.010 | 0.043 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/8/2020 | HMC | --- | 0.47 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q19 | 10/8/2020 | HMC | --- | 0.44 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q27 | 10/8/2020 | HMC | --- | 0.29 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q28 | 10/8/2020 | HMC | --- | 0.50 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q29 | 10/8/2020 | HMC | --- | 0.46 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q30 | 10/8/2020 | HMC | --- | 0.42 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUB2 | 7/20/2020 | PACE | 0.024 | --- | < 0.010 | 0.019 | 3.9 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| SUB3 | 5/12/2020 | PACE | 0.003 | --- | < 0.030 | < 0.005 | 0.2 | < 3.0 | --- | 4.50 | 2.90 | < 0.02 | < 3.00 | --- |

# TABLE B.4-5 WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0520 | 3/18/2020 | ENER | --- | --- | --- | --- | --- | --- | 235 | 738 | 1880 | 2598 | --- | 7.11 |
| 0521 | 3/18/2020 | ENER | --- | --- | --- | --- | --- | --- | 249 | 802 | 1840 | 2651 | --- | 7.36 |
| 0522 | 3/18/2020 | ENER | --- | --- | --- | --- | --- | --- | 235 | 751 | 1890 | 2671 | --- | 7.18 |
| 0538 | 3/4/2020 | ENER | --- | --- | --- | --- | --- | --- | 139 | 619 | 1500 | 2107 | --- | 7.08 |
| 0540 | 5/6/2020 | PACE | 132 | 36.0 | 8.0 | 206 | 326 | < 5 | 110 | 429 | 1140 | 1683 | 1.07 | 7.30 |
| 0541 | 1/13/2020 | ENER | 201 | 55.4 | 7.9 | 213 | 367 | < 5 | 158 | 728 | 1670 | 2295 | 0.93 | 7.26 |
| 0551 | 1/8/2020 | ENER | 281 | 63.1 | 5.8 | 287 | 388 | < 5 | 211 | 1020 | 2160 | 8220 | 0.94 | 7.23 |
| 0555 | 2/4/2020 | ENER | 329 | 82.6 | 5.7 | 579 | 416 | < 5 | 344 | 1560 | 3290 | 4337 | 0.99 | 7.18 |
| 0556 | 2/4/2020 | ENER | 294 | 76.5 | 5.3 | 514 | 390 | < 5 | 294 | 1450 | 3010 | 3979 | 0.96 | 7.11 |
| 0557 | 2/5/2020 | ENER | 230 | 60.8 | 4.4 | 468 | 416 | < 5 | 213 | 1160 | 2490 | 3717 | 0.99 | 7.47 |
| 0631 | 5/6/2020 | PACE | 157 | 39.0 | 9.0 | 353 | 366 | < 5 | 155 | 646 | 1600 | 2357 | 1.11 | 7.59 |
| 0632 | 3/4/2020 | ENER | --- | --- | --- | --- | --- | --- | 146 | 641 | 1560 | 2214 | --- | 7.56 |
| 0638 | 3/18/2020 | ENER | --- | --- | --- | --- | --- | --- | 229 | 703 | 1790 | 2566 | --- | 7.43 |
| 0639 | 3/8/2020 | ENER | 185 | 37.9 | 7.6 | 255 | 272 | < 5 | 202 | 672 | 1650 | 2324 | 0.97 | 7.27 |
| | 7/15/2020 | PACE | 172 | 39.0 | 9.0 | 279 | 270 | < 5 | 213 | 647 | 1610 | 2230 | 1.00 | 7.29 |
| 0644 | 5/5/2020 | PACE | 177 | 44.0 | 10.0 | 343 | 397 | < 5 | 177 | 681 | 1740 | 2441 | 1.07 | 7.37 |
| 0646 | 3/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 172 | 741 | 1760 | 2414 | --- | 7.35 |
| 0647 | 1/8/2020 | ENER | 212 | 58.9 | 6.6 | 213 | 398 | < 5 | 162 | 689 | 1630 | 2250 | 0.97 | 7.22 |
| 0649 | 1/8/2020 | ENER | 234 | 55.3 | 5.2 | 229 | 356 | < 5 | 178 | 791 | 1790 | 2427 | 0.96 | 7.17 |
| 0654 | 1/9/2020 | ENER | 216 | 60.1 | 8.2 | 251 | 383 | < 5 | 169 | 804 | 1780 | 2459 | 0.96 | 7.02 |
| 0659 | 3/2/2020 | ENER | 242 | 63.0 | 8.2 | 284 | 478 | < 5 | 185 | 778 | 1870 | 2563 | 1.01 | 7.03 |
| | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2483 | --- | --- |
| 0846 | 8/17/2020 | PACE | 303 | 82.0 | 9.0 | 674 | 379 | < 5 | 212 | 1770 | 3540 | 4333 | 1.04 | 7.33 |

# TABLE B.4-5 WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS (cont'd.)

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0864 | 4/30/2020 | PACE | 147 | 41.0 | 9.0 | 285 | 329 | < 5 | 135 | 591 | 1470 | 2095 | 1.08 | 7.43 |
| 0869 | 4/30/2020 | PACE | 158 | 41.0 | 9.0 | 336 | 366 | < 5 | 143 | 623 | 1530 | 2234 | 1.13 | 7.48 |
| 0881 | 2/25/2020 | ENER | 248 | 60.5 | 8.6 | 261 | 475 | < 5 | 192 | 811 | 1910 | 2632 | 0.96 | 7.12 |
| 0882 | 2/5/2020 | ENER | 221 | 54.2 | 6.6 | 270 | 482 | < 5 | 178 | 730 | 1800 | 2475 | 0.97 | 7.27 |
| 0883 | 2/5/2020 | ENER | 256 | 51.0 | 5.6 | 309 | 523 | < 5 | 203 | 735 | 1880 | 2628 | 1.03 | 7.09 |
| 0884 | 2/6/2020 | ENER | 100 | 28.5 | 5.2 | 299 | 304 | < 5 | 106 | 613 | 1390 | 2052 | 0.98 | 7.46 |
| 0886 | 2/25/2020 | ENER | 291 | 71.0 | 8.3 | 289 | 448 | < 5 | 185 | 1030 | 2220 | 2917 | 0.97 | 7.14 |
| 0888 | 2/6/2020 | ENER | 211 | 57.4 | 7.8 | 238 | 336 | < 5 | 151 | 780 | 1740 | 2387 | 0.99 | 7.16 |
| 0890 | 10/20/2020 | PACE | --- | --- | --- | --- | --- | --- | 174 | 744 | 1840 | 2458 | --- | 7.46 |
| 0893 | 2/10/2020 | ENER | 227 | 53.6 | 7.8 | 247 | 490 | < 5 | 183 | 670 | 1730 | 2449 | 0.98 | 7.10 |
| 0899 | 1/9/2020 | ENER | 174 | 56.7 | 6.3 | 173 | 312 | < 5 | 143 | 583 | 1370 | 1931 | 0.98 | 7.33 |
| 0921 | 2/10/2020 | ENER | 400 | 66.0 | 9.0 | 323 | 228 | < 5 | 65 | 1670 | 2800 | 3312 | 0.98 | 7.16 |
| | 2/10/2020 | ENER | # 393 | # 66.8 | # 8.6 | # 356 | # 230 | # < 5 | # 64 | # 1660 | # 2790 | --- | # 1.01 | --- |
| 0994 | 10/6/2020 | PACE | 245 | 57.0 | 8.0 | 179 | 312 | < 5 | 149 | 611 | 1500 | 2125 | 1.12 | 7.19 |
| | 10/6/2020 | PACE | # 243 | # 57.0 | # 8.0 | # 179 | # 337 | # < 5 | # 150 | # 612 | # 1440 | --- | # 1.09 | # 7.19 |
| 0996 | 1/9/2020 | ENER | 195 | 55.1 | 6.5 | 199 | 364 | < 5 | 153 | 643 | 1550 | 2160 | 0.97 | 7.40 |
| H2A | 3/2/2020 | ENER | 231 | 61.1 | 7.9 | 246 | 447 | < 5 | 177 | 770 | 1840 | 2517 | 0.96 | 7.20 |
| H7 | 10/20/2020 | PACE | --- | --- | --- | --- | --- | --- | 160 | 861 | 1860 | 2510 | --- | 7.38 |
| H7B | 10/20/2020 | PACE | --- | --- | --- | --- | --- | --- | 153 | 740 | 1710 | 2317 | --- | 7.30 |
| H16 | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2768 | --- | --- |
| | 10/20/2020 | PACE | --- | --- | --- | --- | --- | --- | 171 | 944 | 2140 | 2771 | --- | 7.63 |
| H17 | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2414 | --- | --- |
| | 10/20/2020 | PACE | --- | --- | --- | --- | --- | --- | 175 | 699 | 1790 | 2430 | --- | 7.26 |
| H24 | 1/28/2020 | ENER | 270 | 72.0 | 8.0 | 305 | --- | --- | 190 | 972 | --- | --- | --- | --- |

# Signifies Quality Control Sample

## TABLE B.4-5 WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS (cont'd.)

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H24 | 9/24/2020 | PACE | --- | --- | --- | --- | --- | --- | 172 | 928 | 2080 | 2815 | --- | 7.26 |
| | 10/8/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2738 | --- | --- |
| | 10/20/2020 | PACE | --- | --- | --- | --- | --- | --- | 178 | 906 | 2130 | 2739 | --- | 7.38 |
| H55 | 3/3/2020 | ENER | 265 | 69.9 | 8.0 | 301 | 478 | < 5 | 187 | 896 | 2040 | 2700 | 1.01 | 7.04 |
| MO | 3/4/2020 | ENER | 353 | 87.4 | 8.4 | 354 | 377 | < 5 | 200 | 1330 | 2650 | 3316 | 1.02 | 7.03 |
| | 3/4/2020 | ENER | # 357 | # 87.4 | # 8.5 | # 361 | # 378 | # < 5 | # 201 | # 1340 | # 2660 | --- | # 1.02 | --- |
| MR | 2/13/2020 | ENER | 289 | 70.1 | 8.6 | 295 | 464 | < 5 | 190 | 968 | 2200 | 2891 | 1.00 | 7.06 |
| MV | 3/11/2020 | ENER | --- | --- | --- | --- | --- | --- | 158 | 612 | 1610 | 2261 | --- | 7.11 |
| R1 | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | 206 | 1110 | 2490 | 3180 | --- | 7.22 |
| | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | # 207 | # 1120 | # 2490 | --- | --- | # 7.22 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 3211 | --- | 7.44 |
| R2 | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | 179 | 849 | 2020 | 2667 | --- | 7.35 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2645 | --- | 7.62 |
| R3 | 5/12/2020 | PACE | 196 | 54.0 | 8.0 | 325 | 386 | < 5 | 150 | 751 | 1610 | 2399 | 1.08 | 7.22 |
| | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | 142 | 635 | 1620 | 2140 | --- | 7.45 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2269 | --- | 7.83 |
| R4 | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | 143 | 622 | 1600 | 2177 | --- | 7.48 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2230 | --- | 7.46 |
| R5 | 10/12/2020 | PACE | --- | --- | --- | --- | --- | --- | 141 | 556 | 1500 | 2102 | --- | 7.28 |
| | 10/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2121 | --- | 7.37 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2316 | --- | 7.46 |
| R11 | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2153 | --- | 7.70 |
| R18 | 3/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 114 | 464 | 1190 | 1725 | --- | 7.25 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1813 | --- | 7.56 |
| R20 | 3/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 130 | 598 | 1470 | 2072 | --- | 7.25 |

# Signifies Quality Control Sample

## TABLE B.4-5 WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS (cont'd.)

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R20 | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1968 | --- | 7.68 |
| R22 | 3/12/2020 | ENER | --- | --- | --- | --- | --- | --- | 135 | 592 | 1470 | 2073 | --- | 7.21 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2038 | --- | 7.78 |

# TABLE B.4-6 WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0520 | 3/18/2020 | ENER | 0.032 | --- | 0.008 | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0521 | 3/18/2020 | ENER | 0.530 | --- | 1.090 | 0.240 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0522 | 3/18/2020 | ENER | 0.340 | --- | 0.604 | 0.062 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0538 | 3/4/2020 | ENER | 0.096 | --- | < 0.001 | 0.026 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0540 | 5/6/2020 | PACE | 0.070 | --- | < 0.030 | 0.011 | 1.5 | < 3.0 | --- | 4.80 | --- | < 0.02 | < 3.00 | --- |
| 0541 | 1/13/2020 | ENER | 0.118 | --- | 0.008 | 0.029 | 2.7 | 0.3 | 0.200 | 1.70 | 0.90 | < 0.01 | 0.06 | 0.06 |
| 0551 | 1/8/2020 | ENER | 0.036 | --- | 0.003 | 0.041 | 3.6 | 0.4 | 0.200 | 0.90 | 0.60 | < 0.01 | 0.01 | 0.08 |
| 0555 | 2/4/2020 | ENER | 0.066 | --- | 0.001 | 0.061 | 10.9 | 0.2 | 0.200 | 0.70 | 1.00 | < 0.01 | 0.08 | 0.20 |
| 0556 | 2/4/2020 | ENER | 0.071 | --- | 0.001 | 0.063 | 8.4 | 0.2 | 0.100 | 0.30 | 0.90 | < 0.01 | 0.01 | 0.06 |
| 0557 | 2/5/2020 | ENER | 0.052 | --- | < 0.001 | 0.062 | 6.7 | 0.4 | 0.100 | 0.50 | 0.60 | < 0.01 | 0.04 | 0.10 |
| 0631 | 5/6/2020 | PACE | 0.091 | --- | < 0.030 | 0.038 | 2.9 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| 0632 | 3/4/2020 | ENER | 0.091 | --- | 0.003 | 0.058 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0638 | 3/18/2020 | ENER | 0.031 | --- | 0.016 | 0.100 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0639 | 3/8/2020 | ENER | 0.057 | --- | 0.672 | 0.135 | 2.2 | 0.3 | 0.200 | -0.01 | 0.90 | < 0.01 | 0.10 | 0.10 |
| | 7/15/2020 | PACE | 0.025 | --- | 0.320 | 0.154 | 1.1 | 0.3 | 0.100 | 1.30 | 1.90 | < 0.02 | < 0.30 | --- |
| 0644 | 5/5/2020 | PACE | 0.117 | --- | < 0.030 | 0.025 | 3.4 | < 3.0 | --- | 4.60 | 3.10 | < 0.02 | < 3.00 | --- |
| 0646 | 3/12/2020 | ENER | 0.061 | --- | 0.001 | 0.036 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0647 | 1/8/2020 | ENER | 0.067 | --- | < 0.001 | 0.025 | 3.0 | 0.2 | 0.200 | 1.00 | 0.60 | < 0.01 | 0.30 | 0.20 |
| 0649 | 1/8/2020 | ENER | 0.026 | --- | 0.004 | 0.023 | 2.0 | 0.2 | 0.200 | 0.80 | 0.60 | < 0.01 | 0.04 | 0.09 |
| 0654 | 1/9/2020 | ENER | 0.146 | --- | 0.017 | 0.032 | 3.4 | 0.1 | 0.100 | 1.00 | 0.60 | < 0.01 | 0.08 | 0.10 |
| 0659 | 3/2/2020 | ENER | 0.178 | --- | 0.021 | 0.035 | 2.9 | 0.3 | 0.200 | -0.20 | 0.80 | < 0.01 | 0.10 | 0.06 |
| | 10/8/2020 | HMC | --- | 0.15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0846 | 8/17/2020 | PACE | 0.027 | --- | < 0.010 | 0.041 | 13.1 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |

# TABLE B.4-6 WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0864 | 4/30/2020 | PACE | 0.083 | --- | < 0.030 | 0.020 | 2.8 | < 3.0 | --- | < 3.00 | --- | < 0.01 | < 3.00 | --- |
| 0869 | 4/30/2020 | PACE | 0.166 | --- | < 0.030 | 0.022 | 2.5 | < 3.0 | --- | 4.00 | 3.80 | < 0.02 | < 0.30 | --- |
| 0881 | 2/25/2020 | ENER | 0.203 | --- | 0.025 | 0.035 | 2.1 | 0.3 | 0.200 | 1.10 | 1.10 | < 0.01 | 0.03 | 0.04 |
| 0882 | 2/5/2020 | ENER | 0.063 | --- | 0.002 | < 0.001 | 0.7 | 0.5 | 0.100 | 0.90 | 0.60 | < 0.01 | 0.04 | 0.09 |
| 0883 | 2/5/2020 | ENER | 0.049 | --- | < 0.001 | 0.017 | 2.5 | 0.4 | 0.100 | 1.00 | 0.60 | < 0.01 | 0.02 | 0.07 |
| 0884 | 2/6/2020 | ENER | 0.023 | --- | 0.001 | 0.035 | 5.0 | 0.2 | 0.100 | 0.70 | 0.60 | < 0.01 | 0.50 | 0.20 |
| 0886 | 2/25/2020 | ENER | 0.308 | --- | 0.045 | 0.052 | 4.9 | 0.5 | 0.200 | 0.20 | 1.20 | < 0.01 | 0.07 | 0.05 |
| 0888 | 2/6/2020 | ENER | 0.101 | --- | 0.008 | 0.037 | 3.0 | 0.4 | 0.100 | 0.90 | 0.60 | < 0.01 | 0.30 | 0.20 |
| 0890 | 10/20/2020 | PACE | 0.155 | --- | 0.020 | 0.030 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0893 | 2/10/2020 | ENER | 0.071 | --- | 0.003 | 0.023 | 1.6 | 0.2 | 0.100 | 0.60 | 0.50 | < 0.01 | 0.04 | 0.07 |
| 0899 | 1/9/2020 | ENER | 0.058 | --- | < 0.001 | 0.016 | 3.2 | 0.2 | 0.100 | 1.20 | 0.70 | < 0.01 | 0.02 | 0.10 |
| 0921 | 2/10/2020 | ENER | 0.204 | --- | 0.003 | 0.541 | 15.6 | 0.2 | 0.100 | 0.50 | 0.50 | < 0.01 | 0.03 | 0.07 |
| | 2/10/2020 | ENER | # 0.190 | --- | # 0.003 | # 0.512 | # 15.0 | # 0.4 | # 0.100 | # -0.06 | # 0.40 | # < 0.01 | # 0.02 | # 0.06 |
| 0994 | 10/6/2020 | PACE | 0.006 | --- | < 0.010 | 0.029 | 3.9 | 0.2 | 0.100 | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| | 10/6/2020 | PACE | # 0.006 | --- | # < 0.010 | # 0.030 | # 3.9 | # < 0.2 | --- | # 1.20 | # 1.80 | # < 0.01 | # < 0.30 | --- |
| 0996 | 1/9/2020 | ENER | 0.065 | --- | 0.007 | 0.025 | 2.8 | 0.3 | 0.200 | 0.80 | 0.60 | < 0.01 | 0.09 | 0.10 |
| H2A | 3/2/2020 | ENER | 0.170 | --- | 0.020 | 0.033 | 2.2 | 0.4 | 0.200 | 0.10 | 0.90 | < 0.01 | -0.02 | 0.09 |
| H7 | 10/20/2020 | PACE | 0.199 | --- | 0.030 | 0.039 | --- | --- | --- | --- | --- | --- | --- | --- |
| H7B | 10/20/2020 | PACE | 0.168 | --- | 0.020 | 0.030 | --- | --- | --- | --- | --- | --- | --- | --- |
| H16 | 10/8/2020 | HMC | --- | 0.22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/20/2020 | PACE | 0.281 | --- | 0.040 | 0.052 | --- | --- | --- | --- | --- | --- | --- | --- |
| H17 | 10/8/2020 | HMC | --- | 0.09 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/20/2020 | PACE | 0.123 | --- | 0.010 | 0.028 | --- | --- | --- | --- | --- | --- | --- | --- |
| H24 | 1/28/2020 | ENER | 0.294 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

# TABLE B.4-6 WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H24 | 9/24/2020 | PACE | 0.295 | --- | 0.050 | 0.047 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/8/2020 | HMC | --- | 0.24 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/20/2020 | PACE | 0.291 | --- | 0.050 | 0.043 | --- | --- | --- | --- | --- | --- | --- | --- |
| H55 | 3/3/2020 | ENER | 0.461 | --- | 0.095 | 0.055 | 2.5 | 0.5 | 0.200 | 1.70 | 1.00 | < 0.01 | 0.06 | 0.10 |
| MO | 3/4/2020 | ENER | 0.185 | --- | 0.015 | 0.064 | 7.6 | 0.4 | 0.200 | 1.60 | 1.00 | < 0.01 | 0.08 | 0.10 |
| | 3/4/2020 | ENER | # 0.178 | --- | # 0.014 | # 0.062 | # 7.5 | # 0.3 | # 0.200 | # -0.50 | # 1.00 | # < 0.01 | # 0.07 | # 0.10 |
| MR | 2/13/2020 | ENER | 0.426 | --- | 0.052 | 0.059 | 3.1 | 0.2 | 0.200 | 0.50 | 0.60 | < 0.01 | 0.04 | 0.05 |
| MV | 3/11/2020 | ENER | 0.168 | --- | 0.015 | 0.028 | --- | --- | --- | --- | --- | --- | --- | --- |
| R1 | 10/28/2020 | PACE | 0.218 | --- | < 0.010 | 0.063 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/28/2020 | PACE | # 0.212 | --- | # < 0.010 | # 0.063 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.19 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R2 | 10/28/2020 | PACE | 0.248 | --- | < 0.010 | 0.040 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R3 | 5/12/2020 | PACE | 0.143 | --- | < 0.030 | 0.024 | 3.0 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| | 10/28/2020 | PACE | 0.152 | --- | < 0.010 | 0.022 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R4 | 10/28/2020 | PACE | 0.286 | --- | < 0.010 | 0.035 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R5 | 10/12/2020 | PACE | 0.188 | --- | < 0.010 | 0.032 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R11 | 11/29/2020 | HMC | --- | 0.20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R18 | 3/12/2020 | ENER | 0.063 | --- | 0.004 | 0.014 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.06 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R20 | 3/12/2020 | ENER | 0.162 | --- | 0.007 | 0.026 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

## TABLE B.4-6 WATER QUALITY ANALYSES FOR THE REGIONAL ALLUVIAL WELLS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R22 | 3/12/2020 | ENER | 0.131 | --- | 0.003 | 0.024 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

# TABLE B.5-1 WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0493 | 5/19/2020 | PACE | 12 | 2.0 | 3.0 | 581 | 347 | 10 | 137 | 640 | 1840 | 2410 | 1.13 | 8.40 |
| 0494 | 5/19/2020 | PACE | 207 | 58.0 | 9.0 | 290 | 476 | < 5 | 169 | 620 | 1680 | 2372 | 1.09 | 7.03 |
| 0538 | 3/4/2020 | ENER | --- | --- | --- | --- | --- | --- | 139 | 619 | 1500 | 2107 | --- | 7.08 |
| ACW | 7/20/2020 | PACE | 6 | < 2.0 | 2.0 | 603 | 435 | 20 | 135 | 604 | 1660 | 2572 | 1.11 | 8.77 |
| B16 | 12/22/2020 | PACE | --- | --- | --- | --- | --- | --- | 380 | 2930 | 5990 | 7594 | --- | 7.49 |
| B32 | 12/22/2020 | PACE | --- | --- | --- | --- | --- | --- | 155 | 721 | 1850 | 2529 | --- | 7.49 |
| CE2 | 5/28/2020 | PACE | 125 | 33.0 | 5.0 | 227 | 359 | < 5 | 114 | 391 | 1140 | 1671 | 1.09 | 7.72 |
| CE6 | 12/22/2020 | PACE | --- | --- | --- | --- | --- | --- | 182 | 924 | 2240 | 3000 | --- | 7.40 |
| CE8 | 6/25/2020 | PACE | 10 | < 2.0 | < 2.0 | 633 | 383 | 8 | 59 | 747 | 1630 | 2434 | 1.19 | 8.32 |
| CE9 | 6/18/2020 | PACE | 200 | 53.0 | 8.0 | 304 | 581 | < 5 | 174 | 640 | 1780 | 2412 | 0.99 | 7.31 |
| | 6/18/2020 | PACE | # 202 | # 53.0 | # 8.0 | # 304 | # 555 | # < 5 | # 174 | # 636 | # 1750 | --- | # 1.02 | # 7.31 |
| | 7/14/2020 | PACE | 181 | 52.0 | 8.0 | 278 | 510 | < 5 | 173 | 601 | 1650 | 2336 | 0.99 | 6.94 |
| | 8/19/2020 | PACE | 204 | 61.0 | 10.0 | 300 | 506 | < 5 | 176 | 670 | 1760 | 2385 | 1.04 | 6.90 |
| CE15 | 6/17/2020 | PACE | 181 | 44.0 | 6.0 | 290 | 470 | < 5 | 152 | 623 | 1680 | 2246 | 1.01 | 6.74 |
| CE15A | 8/20/2020 | PACE | --- | --- | --- | --- | --- | --- | 164 | 645 | 1690 | 2373 | --- | 7.15 |
| CE19 | 8/20/2020 | PACE | --- | --- | --- | --- | --- | --- | 126 | 563 | 1400 | 2016 | --- | 7.30 |
| | 8/20/2020 | PACE | --- | --- | --- | --- | --- | --- | # 124 | # 552 | # 1400 | --- | --- | # 7.30 |
| CF4 | 8/14/2020 | PACE | < 2 | < 2.0 | 16.0 | 3430 | 1450 | 1300 | 357 | 3010 | 9280 | 11880 | 1.07 | 10.19 |
| CW1 | 3/16/2020 | ENER | --- | --- | --- | --- | --- | --- | 89 | 748 | 1630 | 2481 | --- | 8.54 |
| CW2 | 8/18/2020 | PACE | 7 | < 2.0 | 2.0 | 537 | 307 | 10 | 102 | 567 | 1430 | 2193 | 1.19 | 8.59 |
| CW3 | 3/17/2020 | ENER | --- | --- | --- | --- | --- | --- | 62 | 821 | 1660 | 2481 | --- | 7.84 |
| | 6/17/2020 | PACE | 35 | 8.0 | 2.0 | 562 | 375 | < 5 | 58 | 798 | 1670 | 2424 | 1.10 | 8.03 |
| CW17 | 7/22/2020 | PACE | 365 | 94.0 | 10.0 | 373 | 364 | < 5 | 115 | 1450 | 2810 | 3310 | 1.07 | 7.03 |
| CW18 | 7/14/2020 | PACE | 39 | 7.0 | 4.0 | 709 | 650 | 6 | 212 | 645 | 1980 | 2980 | 1.11 | 7.38 |

# Signifies Quality Control Sample

## TABLE B.5-1 WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS (cont'd.)

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CW28 | 3/18/2020 | ENER | --- | --- | --- | --- | --- | --- | 153 | 514 | 1320 | 2115 | --- | 8.48 |
| | 7/22/2020 | PACE | 8 | < 2.0 | 2.0 | 477 | 251 | < 5 | 156 | 480 | 1370 | 2083 | 1.14 | 8.43 |
| CW29 | 8/11/2020 | PACE | 144 | 39.0 | 8.0 | 369 | 344 | < 5 | 140 | 607 | 1570 | 2181 | 1.19 | 7.28 |
| CW32 | 7/23/2020 | PACE | 137 | 48.0 | 12.0 | 789 | 532 | < 5 | 389 | 1210 | 3100 | 4221 | 1.01 | 7.06 |
| CW35 | 3/17/2020 | ENER | 285 | 73.6 | 5.6 | 347 | 419 | < 5 | 66 | 1280 | 2360 | 2961 | 1.00 | 7.03 |
| CW41 | 8/3/2020 | PACE | 14 | 4.0 | 4.0 | 334 | 328 | < 5 | 90 | 284 | 910 | 1467 | 1.12 | 8.08 |
| CW42 | 7/30/2020 | PACE | 146 | 35.0 | 10.0 | 319 | 360 | < 5 | 133 | 568 | 1560 | 2071 | 1.12 | 7.58 |
| CW43 | 8/4/2020 | PACE | 337 | 83.0 | 8.0 | 416 | 371 | < 5 | 222 | 1260 | 2640 | 3295 | 1.08 | 7.09 |
| CW45 | 3/3/2020 | ENER | 164 | 40.6 | 5.0 | 294 | 517 | < 5 | 152 | 585 | 1590 | 2335 | 0.97 | 7.22 |
| CW50 | 3/11/2020 | ENER | 194 | 46.7 | 3.6 | 265 | 317 | < 5 | 56 | 881 | 1710 | 2194 | 0.99 | 7.62 |
| CW55 | 8/5/2020 | PACE | 43 | 9.0 | 6.0 | 604 | 502 | < 5 | 164 | 631 | 1680 | 2625 | 1.12 | 7.71 |
| CW62 | 7/16/2020 | PACE | 302 | 75.0 | 7.0 | 367 | 391 | < 5 | 182 | 1390 | 2770 | 3412 | 0.92 | 7.17 |
| CW76 | 8/5/2020 | PACE | 9 | < 2.0 | 3.0 | 572 | 377 | 8 | 133 | 618 | 1500 | 2375 | 1.11 | 8.30 |
| R1 | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | 206 | 1110 | 2490 | 3180 | --- | 7.22 |
| | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | # 207 | # 1120 | # 2490 | --- | --- | # 7.22 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 3211 | --- | 7.44 |
| R2 | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | 179 | 849 | 2020 | 2667 | --- | 7.35 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2645 | --- | 7.62 |
| R3 | 5/12/2020 | PACE | 196 | 54.0 | 8.0 | 325 | 386 | < 5 | 150 | 751 | 1610 | 2399 | 1.08 | 7.22 |
| | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | 142 | 635 | 1620 | 2140 | --- | 7.45 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2269 | --- | 7.83 |
| R4 | 10/28/2020 | PACE | --- | --- | --- | --- | --- | --- | 143 | 622 | 1600 | 2177 | --- | 7.48 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2230 | --- | 7.46 |
| R5 | 10/12/2020 | PACE | --- | --- | --- | --- | --- | --- | 141 | 556 | 1500 | 2102 | --- | 7.28 |

# Signifies Quality Control Sample

# TABLE B.5-1 WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS (cont'd.)

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R5 | 10/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2121 | --- | 7.37 |
| | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2316 | --- | 7.46 |
| R11 | 11/29/2020 | PACE | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2153 | --- | 7.70 |
| T25 | 1/14/2020 | ENER | --- | --- | --- | --- | --- | --- | 304 | 2460 | 4660 | 6120 | --- | 7.06 |
| T27 | 1/15/2020 | ENER | --- | --- | --- | --- | --- | --- | 470 | 3890 | 7080 | 8593 | --- | 6.91 |
| T28 | 1/15/2020 | ENER | --- | --- | --- | --- | --- | --- | 517 | 4290 | 8220 | 9836 | --- | 6.81 |
| T30 | 1/16/2020 | ENER | --- | --- | --- | --- | --- | --- | 492 | 3540 | 6690 | 8157 | --- | 6.85 |
| V6 | 8/10/2020 | PACE | 175 | 40.0 | 10.0 | 396 | 368 | < 5 | 154 | 672 | 1700 | 2345 | 1.20 | 7.43 |
| Y7 | 8/19/2020 | PACE | 84 | 22.0 | 7.0 | 410 | 319 | < 5 | 139 | 585 | 1470 | 2113 | 1.12 | 7.30 |
| Y13 | 9/21/2020 | PACE | --- | --- | --- | --- | --- | --- | 148 | 631 | 1600 | 2675 | --- | 7.44 |

# TABLE B.5-2 WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0493 | 5/19/2020 | PACE | 0.100 | --- | < 0.030 | 0.086 | 2.1 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| 0494 | 5/19/2020 | PACE | 0.120 | --- | 0.050 | 0.023 | 2.0 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| 0538 | 3/4/2020 | ENER | 0.096 | --- | < 0.001 | 0.026 | --- | --- | --- | --- | --- | --- | --- | --- |
| ACW | 7/20/2020 | PACE | 0.035 | --- | < 0.010 | 0.042 | 1.7 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| B16 | 12/22/2020 | PACE | 9.270 | --- | 14.800 | 0.335 | --- | --- | --- | --- | --- | --- | --- | --- |
| B32 | 12/22/2020 | PACE | 1.130 | --- | 1.220 | 0.064 | --- | --- | --- | --- | --- | --- | --- | --- |
| CE2 | 5/28/2020 | PACE | 0.567 | --- | 0.580 | 0.019 | 1.2 | < 0.2 | --- | 1.40 | 2.30 | < 0.01 | < 0.30 | --- |
| CE6 | 12/22/2020 | PACE | 1.820 | --- | 1.960 | 0.065 | --- | --- | --- | --- | --- | --- | --- | --- |
| CE8 | 6/25/2020 | PACE | 0.032 | --- | 0.040 | < 0.005 | < 0.1 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| CE9 | 6/18/2020 | PACE | 0.191 | --- | 0.070 | 0.021 | 1.0 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| | 6/18/2020 | PACE | # 0.205 | --- | # 0.070 | # 0.022 | # 1.3 | # < 0.2 | --- | # < 1.00 | --- | # < 0.01 | # < 0.30 | --- |
| | 7/14/2020 | PACE | 0.100 | --- | 0.050 | 0.018 | 1.9 | 1.1 | 0.100 | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| | 8/19/2020 | PACE | 0.091 | --- | 0.030 | 0.017 | 2.1 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| CE15 | 6/17/2020 | PACE | 0.296 | --- | 0.230 | 0.062 | 2.2 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| CE15A | 8/20/2020 | PACE | 0.142 | --- | 0.080 | 0.029 | --- | --- | --- | --- | --- | --- | --- | --- |
| CE19 | 8/20/2020 | PACE | 0.570 | --- | 0.620 | 0.059 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 8/20/2020 | PACE | # 0.584 | --- | # 0.620 | # 0.057 | --- | --- | --- | --- | --- | --- | --- | --- |
| CF4 | 8/14/2020 | PACE | 19.900 | --- | < 0.010 | < 0.005 | 1.2 | 99.6 | 1.100 | 7.60 | 4.20 | < 0.01 | 363.00 | 72.70 |
| CW1 | 3/16/2020 | ENER | 0.064 | --- | 0.024 | 0.060 | --- | --- | --- | --- | --- | --- | --- | --- |
| CW2 | 8/18/2020 | PACE | 0.036 | --- | 0.010 | 0.049 | 1.8 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| CW3 | 3/17/2020 | ENER | 0.238 | --- | 0.215 | 0.002 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 6/17/2020 | PACE | 0.211 | --- | 0.210 | < 0.005 | < 0.1 | < 0.2 | --- | < 1.00 | --- | 0.02 | < 0.30 | --- |
| CW17 | 7/22/2020 | PACE | 0.134 | --- | 0.020 | 0.069 | 9.0 | 0.2 | 0.200 | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| CW18 | 7/14/2020 | PACE | 0.029 | --- | < 0.010 | 0.014 | 1.6 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |

## TABLE B.5-2 WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CW28 | 3/18/2020 | ENER | 0.018 | --- | 0.007 | 0.112 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 7/22/2020 | PACE | 0.015 | --- | < 0.010 | 0.123 | 2.6 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| CW29 | 8/11/2020 | PACE | 0.133 | --- | < 0.010 | 0.051 | 2.6 | < 0.2 | --- | 5.40 | 4.80 | < 0.02 | < 0.30 | --- |
| CW32 | 7/23/2020 | PACE | 0.002 | --- | < 0.010 | < 0.005 | < 0.1 | 0.8 | 0.300 | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| CW35 | 3/17/2020 | ENER | 0.172 | --- | 0.001 | 0.058 | 3.0 | 0.8 | 0.200 | 1.20 | 0.80 | < 0.01 | 0.10 | 0.06 |
| CW41 | 8/3/2020 | PACE | 0.039 | --- | < 0.010 | 0.038 | 3.1 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| CW42 | 7/30/2020 | PACE | 0.275 | --- | < 0.005 | 0.029 | 2.0 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| CW43 | 8/4/2020 | PACE | 0.048 | --- | < 0.010 | 0.042 | 7.0 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| CW45 | 3/3/2020 | ENER | 0.351 | --- | 0.001 | 0.037 | 1.8 | 0.3 | 0.100 | 0.01 | 0.90 | < 0.01 | 0.10 | 0.10 |
| CW50 | 3/11/2020 | ENER | 0.022 | --- | 0.002 | < 0.001 | 0.6 | 0.6 | 0.200 | 1.30 | 0.70 | < 0.01 | -0.02 | 0.09 |
| CW55 | 8/5/2020 | PACE | 0.059 | --- | 0.050 | < 0.005 | < 0.1 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| CW62 | 7/16/2020 | PACE | 1.270 | --- | 1.090 | 0.171 | 9.2 | 0.2 | 0.100 | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| CW76 | 8/5/2020 | PACE | 0.073 | --- | < 0.010 | 0.045 | 2.8 | < 0.2 | --- | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| R1 | 10/28/2020 | PACE | 0.218 | --- | < 0.010 | 0.063 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/28/2020 | PACE | # 0.212 | --- | # < 0.010 | # 0.063 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.19 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R2 | 10/28/2020 | PACE | 0.248 | --- | < 0.010 | 0.040 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R3 | 5/12/2020 | PACE | 0.143 | --- | < 0.030 | 0.024 | 3.0 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| | 10/28/2020 | PACE | 0.152 | --- | < 0.010 | 0.022 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R4 | 10/28/2020 | PACE | 0.286 | --- | < 0.010 | 0.035 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/29/2020 | HMC | --- | 0.25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R5 | 10/12/2020 | PACE | 0.188 | --- | < 0.010 | 0.032 | --- | --- | --- | --- | --- | --- | --- | --- |

## TABLE B.5-2 WATER QUALITY ANALYSES FOR THE CHINLE AQUIFERS (cont'd.)

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R5 | 11/29/2020 | HMC | --- | 0.22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R11 | 11/29/2020 | HMC | --- | 0.20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| T25 | 1/14/2020 | ENER | 4.660 | --- | 9.060 | 0.271 | --- | --- | --- | --- | --- | --- | --- | --- |
| T27 | 1/15/2020 | ENER | 11.300 | --- | 7.220 | 0.113 | --- | --- | --- | --- | --- | --- | --- | --- |
| T28 | 1/15/2020 | ENER | 17.300 | --- | 16.100 | 0.351 | --- | --- | --- | --- | --- | --- | --- | --- |
| T30 | 1/16/2020 | ENER | 13.500 | --- | 5.880 | 0.118 | --- | --- | --- | --- | --- | --- | --- | --- |
| V6 | 8/10/2020 | PACE | 0.226 | --- | < 0.010 | 0.061 | 2.8 | 0.2 | 0.100 | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| Y7 | 8/19/2020 | PACE | 0.168 | --- | < 0.010 | 0.030 | 1.8 | < 0.2 | --- | < 1.00 | --- | < 0.01 | < 0.30 | --- |
| Y13 | 9/21/2020 | PACE | 0.249 | --- | < 0.010 | 0.037 | --- | --- | --- | --- | --- | --- | --- | --- |

# TABLE B.6-1 WATER QUALITY ANALYSES FOR THE SAN ANDRES AQUIFER

Ca THROUGH pH

| 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(f) (µmhos/cm) | Ion_B (ratio) | pH(f) (std. units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #1R Deepwell | 2/26/2020 | ENER | --- | --- | --- | --- | --- | --- | 182 | 641 | 1710 | 2432 | --- | 6.89 |
| #2 DEEPWELL | 2/3/2020 | ENER | --- | --- | --- | --- | --- | --- | 234 | 760 | 1960 | 2794 | --- | 6.66 |
| | 5/13/2020 | PACE | 241 | 81.0 | 18.0 | 301 | 574 | < 5 | 224 | 703 | 1460 | 2684 | 1.06 | 6.89 |
| | 5/13/2020 | PACE | # 244 | # 82.0 | # 18.0 | # 300 | # 560 | # < 5 | # 224 | # 704 | # 1830 | --- | # 1.07 | --- |
| | 7/16/2020 | PACE | --- | --- | --- | --- | --- | --- | 223 | 659 | 1940 | 2670 | --- | 6.70 |
| | 10/7/2020 | PACE | --- | --- | --- | --- | --- | --- | 224 | 656 | 1950 | 2708 | --- | 6.75 |
| 0806R | 7/21/2020 | PACE | 210 | 72.0 | 14.0 | 228 | 445 | < 5 | 176 | 567 | 1660 | 2319 | 1.10 | 6.89 |
| 0943M | 2/3/2020 | ENER | --- | --- | --- | --- | --- | --- | 153 | 563 | 1480 | 2125 | --- | 7.20 |
| | 9/9/2020 | PACE | 200 | 61.0 | 11.0 | 185 | 417 | < 5 | 159 | 541 | 1480 | 2113 | 1.03 | 7.05 |
| | 11/17/2020 | PACE | --- | --- | --- | --- | --- | --- | 152 | 527 | 1490 | 2055 | --- | 7.21 |
| 0951R | 2/10/2020 | ENER | --- | --- | --- | --- | --- | --- | 142 | 555 | 1400 | 2008 | --- | 6.95 |
| | 5/6/2020 | PACE | 184 | 62.0 | 11.0 | 187 | 394 | < 5 | 151 | 538 | 1460 | 2020 | 1.03 | 7.08 |
| | 8/10/2020 | PACE | --- | --- | --- | --- | --- | --- | 140 | 476 | 1410 | 1932 | --- | 6.91 |
| | 11/10/2020 | PACE | --- | --- | --- | --- | --- | --- | 152 | 513 | 1420 | 1931 | --- | 7.25 |
| 0955 | 8/4/2020 | PACE | 98 | 41.0 | 8.0 | 166 | 234 | < 5 | 88 | 412 | 940 | 1453 | 1.04 | 7.64 |
| 0991 | 9/14/2020 | PACE | 152 | 49.0 | 8.0 | 108 | 338 | < 5 | 73 | 405 | 1110 | 1548 | 1.02 | 7.38 |

# Signifies Quality Control Sample

# TABLE B.6-2 WATER QUALITY ANALYSES FOR THE SAN ANDRES AQUIFER

Unat Through Th-230

| Sample Point Name | Date | Lab | Unat (mg/L) | KPA U (mg/L) | Mo (mg/L) | Se (mg/L) | NO3 (mg/L) | Ra226 (pCi/L) | Ra226(e) (pCi/L) | Ra228 (pCi/L) | Ra228(e) (pCi/L) | V (mg/L) | Th230 (pCi/L) | Th230(e) (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #1R Deepwell | 2/26/2020 | ENER | 0.009 | --- | < 0.001 | 0.010 | --- | --- | --- | --- | --- | --- | --- | --- |
| #2 DEEPWELL | 2/3/2020 | ENER | 0.012 | --- | 0.002 | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/13/2020 | PACE | 0.011 | --- | < 0.030 | 0.006 | 1.6 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| | 5/13/2020 | PACE | # 0.010 | --- | # < 0.030 | # 0.006 | # 1.6 | # < 3.0 | --- | # < 3.00 | --- | # < 0.02 | # < 3.00 | --- |
| | 7/16/2020 | PACE | 0.011 | --- | < 0.050 | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10/7/2020 | PACE | 0.012 | --- | < 0.010 | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0806R | 7/21/2020 | PACE | 0.020 | --- | < 0.010 | 0.008 | 4.0 | 0.5 | 0.200 | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| 0943M | 2/3/2020 | ENER | 0.008 | --- | < 0.001 | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 9/9/2020 | PACE | 0.008 | --- | < 0.010 | 0.008 | 3.5 | 0.8 | 0.100 | 1.90 | 2.00 | < 0.01 | < 0.30 | --- |
| | 11/17/2020 | PACE | 0.014 | --- | < 0.010 | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0951R | 2/10/2020 | ENER | 0.025 | --- | 0.003 | 0.010 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5/6/2020 | PACE | 0.028 | --- | < 0.030 | 0.009 | 3.4 | < 3.0 | --- | < 3.00 | --- | < 0.02 | < 3.00 | --- |
| | 8/10/2020 | PACE | 0.026 | --- | < 0.010 | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11/10/2020 | PACE | 0.028 | --- | < 0.010 | 0.007 | --- | --- | --- | --- | --- | --- | --- | --- |
| 0955 | 8/4/2020 | PACE | 0.002 | --- | < 0.010 | < 0.005 | < 0.1 | 0.8 | 0.100 | < 1.00 | --- | < 0.02 | < 0.30 | --- |
| 0991 | 9/14/2020 | PACE | 0.006 | --- | < 0.010 | 0.010 | 3.3 | 0.9 | 0.100 | < 1.00 | --- | < 0.01 | < 0.30 | --- |

# APPENDIX C

# ANNUAL ALARA AUDIT

Sopris Environmental, LLC

Date: March 17, 2021

To: Mr. Brad Bingham
Closure Manager
Homestake Mining Company, Grants Operations
PO Box 98
Grants, New Mexico 87020

CC Mr. Randy Whicker
Radiation Safety Officer

From: Janet A. Johnson, PhD, CHP (Emeritus) Janet A. Johnson

RE: ALARA Audit Report for 2020

I have attached the ALARA Audit Report for 2020. It was a bit of a challenge this year due to the COVID-19 restrictions on travel. Thanks to your patience and the co-operation of your staff and consultants, I received all of the information I believe was necessary to complete the audit. Unfortunately, a site visit was not possible this year due to the pandemic. However, I believe this report is an accurate reflection of the status of the Homestake Mining Company, Grants Operations, radiation safety program. Radiation doses to Homestake employees and contractors are very low, and in most cases, indistinguishable from background. Estimated radiation doses to members of the public attributable to the site activities are below all regulatory requirements. The records I examined were clear and available remotely.

Thank you for the opportunity to perform this audit. I appreciate the help I received from your radiation safety staff as well as your consultants. I wish you all well as we emerge from this very stressful year.

# ANNUAL ALARA AUDIT REPORT FOR 2020

**Grants Operations**
**Homestake Mining Company**
**P. O. Box 98**
**Grants, New Mexico 87020**

Prepared by:

Janet A. Johnson, PhD, CHP
Sopris Environmental
1001 Painted Lady Lane
Carbondale, Colorado 81623

**March 17, 2021**

# ABSTRACT

The Annual ALARA Audit for 2020 was conducted remotely by Janet Johnson, PhD, CHP (emeritus) during January and February, 2021. A virtual opening meeting was held using Microsoft Teams on January 19, 2021. Documents were provided in an FTP share file transmitted to Dr. Johnson on January 19, 2021 by the Assistant Radiation Safety Officer (ARSO). Additional materials, including the Monthly ALARA Reports (HMC, 2020a), were sent by email by the Radiation Safety Officer (RSO), ARSO, and the Radiation Safety Technician (RST). Updated reports were posted on the FTP site as they became available and in preparation for the February 2021 Nuclear Regulatory Commission virtual inspection. The audit was conducted in accordance with Section 2.3.3 of U. S. Nuclear Regulatory Guide 8.31 (RG 8.31) (USNRC, 2002a) and License Condition 42 of Radioactive Materials License SUA-1471, Amendments 54, 55, and 56. Amendment 56 was signed on June 24, 2020, thus was the applicable document for most of the year.

The areas reviewed included personal monitoring data, bioassay data, worker dose reports, training records, inspection records, monthly ALARA reports, environmental data, Radiation Work Permits (RWPs) and instrument calibrations. The maximum radiation dose to a worker in 2020 was 22 mrem, including internal doses calculated for workers monitored using lapel samplers as required under specific Radiation Work Permits (RWPs). Radiation doses to members of the public during 2020 are included in the Semi-Annual monitoring report for July through December, 2020 (HMC, 2021). The estimated maximum annual dose to a member of the public, attributable to Homestake operations, was 46 mrem, consistent with doses calculated for previous years. Measured particulate and radon air concentrations for 2020 were also consistent with data from previous years. All records reviewed were found to be in substantial compliance with the RG 8.31 guidance. The records were easily available from the FTP site, and were clear and transparent. The restrictions placed on the audit procedure due to COVID-19 precluded a site visit and tour. Therefore, the auditor did not evaluate the physical conditions at the site. However, based on the virtual meeting and the records review, the Radiation Safety Program at the Homestake facility is well-organized and implemented. There were no findings resulting from this ALARA audit.

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# 1.0 INTRODUCTION

The Annual ALARA Audit (the Audit) for 2020, required by License Condition 42 (LC 42) of Homestake Mining Company of California's (HMC) Grants Uranium Mill facility (NRC Materials License Number SUA-1471, Amendments 54, 55, and 56), was conducted remotely during January and February 2021 by Janet A. Johnson, PhD, Certified Health Physicist (CHP) emeritus in accordance with the provisions of the U. S. Nuclear Regulatory Commission's Regulatory Guide 8.31 (NRC, 2002a). The following individuals were present at the virtual audit opening meeting on January 19, 2021: Homestake employees Mr. Brad Bingham, site Closure Manager (CM), Ms. Jennifer Ortega, Health, Safety and Environment Supervisor (HSE) and Mr. Kyle Martinez, Radiation Safety Technician (RST) as well as Mr. Randy Whicker, Radiation Safety Officer (RSO) and Mr. Chuck Farr, Alternate Radiation Safety Officer (ARSO) contracted through Environmental Restoration Group (ERG).

Mr. Brad Bingham, formerly Safety, Health and Environmental Compliance Officer, has been the CM since the fourth quarter of 2020, replacing Mr. David Pierce. Mr. Randy Whicker, CHP, assumed the position of RSO in March 2017 through the Safety and Environmental Review Panel (SERP) process documented in March 2017. The Homestake facility has undergone a self-assessment as required by the Confirmatory Order modifying NRC License Number SUA-1471 issued by the NRC on March 28, 2017. License Amendment 54 was issued in April, 2019. License Amendment 55 signed on February 2, 2020, added the zeolite water treatment system to License Condition No. 35. License Amendment 56, issued on June 24, 2020, approved the training and use of a qualified designee to conduct the daily site inspections in the absence of the RSO, ARSO, and RST.

Homestake submitted an application for an updated license amendment in November 2018. The changes that were requested in that amendment application include (but are not limited to) deleting or amending conditions that are out of date such as revising the title of the Radiation Protection Administrator in the license to Radiation Safety Officer consistent with current usage and Regulatory Guide 8.31. The license amendment application noted that the Regulatory Guides referenced in the current license are designed to be applicable to operating uranium recovery facilities whereas the Homestake facility is no longer an operating milling facility. The Radiation Protection Program (RPP) should be commensurate with current radiological conditions at the site. The amendment request was not accepted for review by NRC and HMC has not attempted to resubmit the application. Revision 3 of the Radiation Protection Program Manual (RPPM) (HMC, 2019) included minor updates to the RPP in 2019, but the basic requirements for occupational monitoring and contamination surveys have not changed since License Amendment 21 in 1995 (NRC, 1995), based on completion of mill facilities demolition and decommissioning and completion of windblown soil cleanup in off-pile areas. Amendment 21 reduced license requirements for the occupational RPP, including removal of the requirement for routine personal contamination surveys when leaving Controlled Areas of the facility, limiting equipment release surveys to items subject to contact with mill tailings, and modification or elimination of other occupational RPP elements related to removal of the mill.

As of the end of 2020, Homestake employed a total of 11 permanent staff members with two positions vacant[1]. Contractors periodically perform temporary work on site to support and

[1] One of the positions had been filled as of the date of this report. The second open position is pending.

maintain facility operations. Contractors are responsible for abiding by Homestake radiation protection policies and procedures.

## 1.1 Site History

The HMC Grants Uranium Mill facility is located in the Grants Mining District, 5.5 miles northeast of Milan in Cibola County, New Mexico. Milling operations were conducted at the site from 1958 to 1990. The environmental restoration program began in 1977.

The facility consists of the decommissioned mill site, two tailings impoundments, three evaporation ponds a reverse osmosis plant and a zeolite groundwater treatment facility. The mill buildings were demolished and disposed to backfilled trenches on site in 1995. Soil cleanup has been mostly completed except for areas near the evaporation impoundments. A radon barrier has been installed on the large tailings pile (LTP) embankments and an interim cover installed on top of the impoundment. A pilot zeolite treatment facility for impacted groundwater was constructed on top of the LTP in 2014 and augmented with additional units in 2015 and 2016. The zeolite treatment facility was added to License Condition No. 35 with License Amendment No. 55 in February 2020. A reverse osmosis (RO) facility was also constructed at the site to treat groundwater. Additional capacity was constructed in the RO facility in 2015 and 2016.

Homestake property in the vicinity of the facility covers approximately 14,000 acres. The "Controlled Area" boundary, as defined in the RPPM (HMC, 2019), covers 1,556 acres and includes the LTP, Small Tailings Pile (STP), three Evaporation Ponds (EP-1, EP-2, and EP-3), two collection ponds (East and West), the RO facility, and two Zeolite systems as well as maintenance, warehouse and office areas. Appropriate signage is posted at major access points to the Controlled Area (e.g. radioactive materials caution signs and no trespassing warnings). Additional security to limit access to the site has been implemented in response to the COVID-19 pandemic. The "Restricted Area" is not defined in previously existing Site documentation; however, the RPPM (HMC, 2019) defines "restricted areas" in association with Radiation Work Permits (RWP) as areas that require temporary restricted access for specific projects as warranted at the discretion of the RSO.

## 1.2 ALARA Audit Requirements

NRC Regulatory Guide 8.31 (NRC, 2002a) and License Condition 42 require an annual review of the radiation protection program (ALARA Audit) including following data:

- Employee exposure records
- Bioassay results
- Inspection log entries
- Training program activities
- Radiation safety meeting reports
- Radiological survey and sampling data
- Reports on overexposure of workers
- Operating procedures reviewed during the period covered by the audit.

In addition, the ALARA audit includes reviews of the following:

- Trends in personnel exposures, for identifiable categories of workers and types of operation activities

- Use, maintenance, and inspection of equipment for exposure control
- Recommendations to further reduce personnel exposures.

The qualifications and training of the health physics staff were also reviewed during the audit.

## 1.3 2020 Activities

Activities conducted in 2020 included continued groundwater collection and treatment, operation of the RO system and operation of zeolite treatment units as well as general site maintenance and environmental and radiological monitoring. Additional non-routine activities were conducted under specific RWPs (See Section 2.5).

Groundwater remediation is a three-pronged process. The evaporation ponds receive liquid waste streams from groundwater treatment processes at the site. Water from groundwater extraction wells is pumped to either the reverse osmosis (RO) treatment plant or to the zeolite treatment facility. The RO facility treats impacted on-site groundwater for a number of constituents of potential concern. The zeolite units remove uranium from impacted off-site groundwater. The RO plant has a nominal treatment capacity of 1,200 gallons per minute. The clarifier was rebuilt in 2019 and 2020 under RWP 12-2019. Clarifier #2 was out of service at the time of the audit awaiting additional maintenance. The RO plant treats impacted groundwater for compliance with Site groundwater protection standards as indicated in RML Condition 35(B).

An initial pilot zeolite water treatment facility operating at a rate of 50 gallons per minute was upgraded with a 300 gallon per minute facility but is not currently in use. A new zeolite treatment unit with four additional treatment trains was added in 2016, theoretically increasing the total capacity by 1,200 gallons per minute; however, in practice, if all zeolite units are in normal operation, approximately 600 gallons of water per minute are treated. One of the zeolite treatment trains is normally undergoing regeneration at any given time. The Zeolite Facility removes uranium only.

A Final Status Survey (FSS) of former offsite land application irrigation areas was conducted by ERG in July 2018 on behalf of HMC (ERG, 2018). Results indicate compliance with release criteria for Ra-226 as defined in the approved Decommissioning Plan (AKG and Jenkins, 1993a and 1993b) under 10 CFR 40, Appendix A, Criterion 6(6). Criteria for other constituents of potential concern (uranium and selenium) were proposed in the Land Application Impact Assessment under the Confirmatory Order (HMC, 2017) as well as in the FSS Plan for the land application areas (ERG, 2017). Oak Ridge Institute for Science and Education (ORISE) performed an independent confirmatory survey on behalf of the NRC. Results appear to confirm HMC's FSS results. The FSS and Confirmatory Survey reports are currently under NRC review.

Other non-routine activities conducted on site in 2020 are covered under specific Radiation Work Permits (RWPs), listed in Section 2.5, and are described in the monthly ALARA reports.

## 1.4 Occupational Dose Summary

The personal monitoring protocol was modified in 2016, partially in response to a recommendation from the 2015 ALARA Audit. The protocol, defined in the RPPM, requires badging of all Homestake employees with the exception of administrative staff. Contractors spending more than five consecutive days on site inside Controlled Areas, are badged. Internal doses are calculated for workers who were monitored using lapel samplers worn by representative workers under RWPs. Internal committed effective doses from intake of

radionuclides had not been calculated in previous years because there has been limited potential for airborne radionuclide sources remaining on the site as demonstrated by investigations conducted in 2017 and 2018 and described in the Annual ALARA Audit Report for 2018 (Sopris, 2019). The maximum annual internal dose calculated for a worker in 2020 was 17 mrem.

Nearly all badges show doses below the reporting limit of 1 mrem in a quarter. Doses reported as M (less than the reporting limit) were assigned a value of 1 mrem for the purpose of calculating the annual dose. The measured deep dose has, in the past, been considered equivalent to the total effective dose equivalent (TEDE) for the year. In 2018, 2019, and 2020 internal doses incurred during activities conducted under specific RWPs (based on breathing zone air monitoring) were included in calculated TEDE values for the year where applicable (i.e. for workers involved with RWPs where air monitoring was required by the RSO). Reported shallow and eye doses were generally the same as deep doses. A review of the data showed no anomalies. The maximum TEDE for a worker in 2020 was 22 mrem.

## 1.5 Public Dose Summary

Radon concentrations, direct gamma radiation doses, and air particulate concentrations are measured at the site boundary and at locations representative of the nearest resident (HMC-4 and HMC-5). Net differences between measured annual average values at background monitoring stations (HMC-6 for gamma and air particulates and HMC-16 for radon) and the nearest resident (HMC-4 and HMC-5, whichever is higher) are assumed representative of radiological effluent emissions from Site facilities/operations. The net differences are used to calculate public dose to the nearest resident. The maximum annual effective dose equivalent to a member of the public is reported in the Semi-Annual Environmental Monitoring Report for the second half of each year.

The dose is calculated assuming a residential scenario at 75 percent total occupancy, 200 equivalent days per year indoors and 71 days per year outdoors (based on default values cited in NUREG/CR-5512). The dose from 0.1 pCi/L radon gas continuous occupancy at an equilibrium fraction of 100% is assumed to be equal to 50 mrem/year (10CFR20, Appendix B, Table 2 effluent concentration limits). Based on the results provided in the 2020 2$^{nd}$ half Semi-Annual Environmental Report, the calculated total effective dose equivalents (TEDEs) at HMC4 and HMC5, assumed to be representative of the nearest residents, were 46 mrem/y and 43 mrem/y, respectively (HMC, 2021). The 2019 calculated total effective dose equivalents (TEDEs) at HMC4 and HMC5 were 50 mrem/y and 31 mrem/y, respectively; the 2018 calculated doses were 52 mrem/y and 50 mrem/y respectively. The 2020 calculated doses are consistent with previous calculated doses. There is no discernable trend.

The TEDE is calculated by summing the committed effective dose equivalents (CEDEs) from inhalation of radionuclides in airborne particulates and inhalation of radon decay products with the direct gamma radiation dose. The concentration of radon decay products at each location is estimated based on the incremental annual average radon gas concentration (background subtracted) assuming an equilibrium factor of 0.2 for site-derived radon. The dose from direct gamma radiation is calculated by subtracting the measured annual background dose from the measured annual dose at each of the nearest resident location. The net dose is adjusted for occupancy but not for shielding indoors. The doses from inhalation of radionuclides in airborne particulate material are negligible at the nearest resident locations. The calculated total doses are well within the 10 CFR 20.1301(a)(1) public dose limit of 100 mrem per year and the doses

from airborne radionuclides, excluding radon, meet the ALARA constraint limit of 10 mrem per year (10 CFR 20.1101(d)). The calculated total annual effective dose, excluding radon, was less than 25 mrem per year.

The 2020 dose calculations, reported in the 2020 Semi-Annual Report for July through December (HMC, 2021), were reviewed and found to be accurate. Approximately 59% of the dose at HMC4 and 79% of the dose at HMC5 are attributable to radon with direct gamma radiation accounting for the remainder. The air particulates contribute a negligible amount to the annual dose, less than 1 mrem/yr. There are no apparent trends in public doses.

# 2.0 AUDIT RESULTS

The following sections describe the results of the on-site ALARA audit and review of documents, including the monthly ALARA reports (HMC, 2020a).

## 2.1 Routine Operations

Routine operations at the HMC mill site in 2020 involved water treatment and maintenance of treatment systems and environmental monitoring. Bioassay and direct radiation monitoring programs for workers are conducted in accordance with the Homestake RPPM, Version 3 (HMC, 2019 and associated SOPs) and, where applicable, with the requirements of specific RWPs issued by the RSO (Section 2.5).

### 2.1.1 Bioassay Data

Homestake Mining Company collects routine urine bioassay samples semi-annually from Homestake employees and as needed from contractors who spend more than five consecutive days working inside the Controlled Area as defined in the RPPM. In addition, bioassay samples mandated by RWPs are collected at the start of the activity and at termination. The samples collected during the first quarter of 2020 were sent to Energy Laboratories, Inc. (ELI) and to Pace Analytical (formerly Inter-Mountain Laboratories) thereafter. Urine bioassay samples were analyzed only for uranium. The reporting limit for both contract laboratories is 5.0 micrograms per liter (μ/L).

A total of 43 bioassay samples from employees and contractors were submitted to ELI from January through March 2020 and 51 submitted to Pace Analytical from July through December. Homestake discontinued the previous practice of submitting a blank and a spiked sample with each batch of samples in 2019 in accordance with Revision 2 of Regulatory Guide 8.22 (NRC, 2014) which no longer requires this practice. The samples were accompanied by appropriate Chain of Custody forms. None of the bioassay samples submitted in 2020 exceeded the laboratory reporting limit of 5.0 μg/L. Workers are notified of their results if their bioassay exceeds the laboratory reporting limit.

### 2.1.2 Internal Doses

Aside from individuals working under RWPs that require air monitoring, internal doses are not assessed because there is little potential for inhalation or ingestion of radioactive materials for routine operations. Essentially, all potential sources of airborne particulate releases have been covered with radon barrier materials on tailings or water in the evaporation ponds. Radon concentrations in the RO Building and the Mill Office Building are within the range of normal indoor values and less than the 4 pCi/L EPA guidance level for residences (See Section 2.6, Table 4b). Radon decay product concentrations are not routinely measured in these areas.

Studies conducted by the RSO in 2017 on the Large Tailings Pile (LTP), zeolite facilities and the surface ponds to assess potential worker exposures showed that radon and particulate concentrations are well below the 10 CFR 20 derived air concentrations (DACs). The RSO conducted a long-term study from December 2017 through May 2018 demonstrating that the maximum potential dose to a worker would be 53 mrem in a year, approximately 10% of the annual dose that would require monitoring (Whicker, 2018). However, breathing zone sampling is conducted and internal doses calculated based on the requirements of individual RWPs. The spreadsheet for calculating concentrations based on BZ samples was reviewed and found to be accurate.

### 2.1.3 External Doses

All HMC employees (other than administrative staff) are badged using OSL dosimeters obtained from Landauer, Inc. Badges are exchanged quarterly. The protocol requires badging of HMC employees and contractors who are on site in the Controlled Area for more than five consecutive days. Thirteen quarterly badges were issued to Homestake employees in 2020. Badges were issued to contractors as necessary. The number of badges used in 2020 varied by quarter according to how many contractors were on site for more than five days. Most contractor badges are stored on a badge board in the main office. Contractors sign their badges out each day and log them back in at the end of the work shift. (Because this audit was performed remotely it was not possible to review the badge log forms.)

Contractors are often only on site for short periods of time, or only one quarter. Contractor personnel from Environmental Radiation Group (ERG) track the OSL results and badge assignment forms in a database that “allows them to relate and query the results of all personnel based on the badges they use” (Alecksen, 2020).

Previously, the TEDE assigned to workers was limited to contributions from external deep dose equivalent as measured with OSL dosimeters. The CEDE has, in the past, been reported as zero since airborne radionuclide concentrations to which workers may be exposed are not expected to be elevated. The occupational exposures study conducted in 2018, described in Whicker (2018) and the 2018 ALARA Audit Report (Sopris, 2019), verified this expectation. However, doses to workers monitored using lapel or area air samplers under specific RWPs are included in the 2018, 2019 and 2020 annual TEDEs.

The maximum quarterly deep doses reported by the OSL vendor for the years 2012 through 2020 was 23 mrem (in 2014) and 11 (in 2015). In all other years the maximum was 8 mrem or less. The 2020 deep doses for most OSL badges have been reported as non-detect, i.e., less than 1 mrem.

Since 2018 annual worker doses have been calculated using the detection limit as the quarterly dose rather than zero for reported non-detect doses. Therefore, a worker badged for any quarter would have a calculated annual deep dose of at least 1 mrem, with workers badged for all four quarters having a calculated annual dose of at least 4 mrem. In addition, the 2018, 2019 and 2020 worker TEDEs include calculated internal dose based on air monitoring data. The 2018, 2019 and 2020 worker doses are shown in Table 1.

Table 1: Annual Worker Deep Doses

| Year | Number of badged workers | Maximum Annual Deep Dose | Maximum CEDE | Maximum TEDE | Percent of reported doses <4 mrem |
|---|---|---|---|---|---|
| 2018 | 108 | 6 | 13 | 19 | 89 |
| 2019 | 105 | 8 | 39 | 40 | 72 |
| 2020 | 87 | 9 | 17 | 22 | 75 |

The individual worker doses are recorded and filed annually on a form comparable to the NRC Form 5. Results are provided to workers upon request. Shallow and lens doses are also reported on the form but are not included in the assigned TEDE value. Individual Dose Reports are not required under 10CFR19.13(b)(1) since no worker doses exceeded 100 mrem per year; however, such notification of monitored workers is a good practice.

Due to the very low reported doses and the change in the method of calculating annual dose, it is not practical to determine any significant trends. However, given that the maximum annual TEDE for any individual worker in 2020 was less than 25 mrem, or 25% of the maximum allowable dose to a member of the public, and less than 5% of the annual dose that would require monitoring for workers, an analysis of trends, either as a whole or by occupation, would not be meaningful.

## 2.2 Safety Meetings and Training Programs

The training records for the radiation safety staff were reviewed. The contract RSO, Mr. Randy Whicker, CHP, attended 40-hour RSO refresher training for uranium recovery facilities in June 2017 and in May 2019 to fulfill the biennial refresher training specified in NRC Regulatory Guide 8.31 (NRC, 2002a). The RST, Kyle Martinez, along with all HMC employees, attended annual Radiation Worker Refresher Training on December 9, 2020 at the Grants site. The training was presented by the RSO. (The auditor attended the training remotely.) In addition, between May 2017 and July 2020 Mr. Martinez received 120.5 hours of individualized formal training presented by the RSO and ARSO to address the qualifications recommended in Reg Guide 8.31 for Radiation Safety Technicians. The individualized training included but was not limited to: site walkover, general radiation worker training, review of past site activities, hands on instrument training, discussion of dose calculations, etc. Training conducted in 2020 included discussion of 11.e(2) by-product material and specific characteristics of the Ludlum Model 43-93 detector. Mr. Martinez, along with Mr. Farr (ARSO), ERG contractor, attended a 40-hour Refresher Training Course conducted by RSCS in December 2019. Therefore, the radiation safety staff meets the training and biennial refresher training requirement.

Qualified designees who will perform daily site inspections in accordance with License Amendment 56 received training starting in April 2020. The training program was approved by the NRC in June 2020 as documented in a cover letter the accompanied License Amendment 56.

Contractors receive annual radiation safety orientation through a video with additional information provided by ERG or Homestake radiation safety personnel. A total of 66 contractors were trained by video in 2020. Contractors and new employees complete a test prior to receiving a dosimeter. A sample of the tests was reviewed. The test questions are appropriate

for the potential hazard present at the site. The trainer grades the test and initials the grade. **Based on the number of lost badges among contractors it is recommended that additional emphasis be placed on badge security during training.**

The ARSO completed documented hazardous materials transportation training in May 2019. Kyle Martinez, RST, received transportation training on 7/19/19. Billy Archuleta, Senior Shift Supervisor, received transportation training on 7/24/19.Homestake occasionally ships samples to laboratories under the “excepted package” (UN 2910) designation which does require following most of the Class 7 radioactive materials requirements except for triennial training and contamination limits. Five coolers with environmental samples were shipped to either ELI or Pace Analytical in 2020. The coolers were surveyed to document that they met the contamination requirements. The ARSO or RST performed the surveys. All contaminated media samples originating from the site are considered 11.e(2) material.

Safety meetings are held weekly and are attended by all available Homestake staff. Meeting subjects are not limited to radiation safety but may cover any aspect of occupational or environmental safety. A sample of safety meeting logs was reviewed. The subjects were appropriate, and attendees signed the log sheet. The Safety Meeting on 9/25/20 included a fire drill. The ARSO meets with the RST and other staff on a weekly basis to tour the site and review operations. The site tours are documented in the monthly ALARA Reports (HMC, 2020a). The RSO tours the site on a monthly basis, though in 2020 COVID-19 circumstances curtailed these site visits to some extent.

## 2.3 Inspection Reports

Daily site inspections are conducted primarily by the RST and by his designee in the absence of the RST or the ARSO. License Amendment 56 (6/24/20) approved the use of a designee to conduct daily inspections. A view of the records showed a few gaps in the daily inspection reports in the first half of the year due to lack of personnel on some holidays and weekends. There were no gaps in daily inspections from mid-July, after qualified designees had been trained, through the end of 2020. The designee training was reviewed and found to be appropriate. A sample of the daily inspection reports was reviewed. The inspection reports were helpful in documenting work on site, identifying problems and follow up. **The detail in the daily site inspection reports is a best practice.**

Weekly site inspections are conducted by the RSO and/or the ARSO. The observations are documented in the monthly ALARA Reports submitted by the ARSO. The narrative in the reports is complete and very useful. (There was no documented weekly inspection on April 1, 2020 due to COVID-19 restrictions.) **This is a best practice**.

The NRC conducted a remote routine on-site inspection from July 22-30, 2020. There were no violations identified. Two violations from the previous inspection were reviewed by the NRC and closed. One previous violation related to the procedures for the reverse osmosis system remained open pending a walkdown of the procedure during a subsequent inspection. A supplemental on-site inspection was conducted on September 16, 2020 at which time the inspector walked down the reverse osmosis procedure and closed out the previous violation. No violations were identified.

## 2.4 Contamination Surveys

Personal contamination surveys are conducted by contractors trained by the radiation safety staff to perform the surveys in accordance with the requirements of specific RWPs. When personnel exit surveys are required under an RWP, workers are required to scan out at the boundary of the corresponding temporary restricted area. Previously, workers scanned out at the radiation safety office. Contractors working on the LTP project (RWP 10-2020) scanned out in a shed in that area. The scan station located by the RO plant is still present but not used unless there is a project at that facility or nearby ponds. The alpha count rate is recorded by hand on Form EDF-15, Personal Contamination Survey Log. According to Procedure SOP 12, the release limit for personal contamination is background. The scan records are included with specific RWPs.

The HMC Personnel Contamination Survey Form (EDF-15) is somewhat ambiguous in that it lists the instrument used (Ludlum Model 2360/43-93 probe) and the calibration date but does not specifically state that the counts recorded are alpha counts. The ARSO corrected this issue during the audit. The forms will now state that the measurement is alpha activity. The daily background measurement is recorded on each form. On many of the forms, the recorded background was unusually high, in the range of 10 to more than 40 counts per minute while the survey measurements were generally less than 10 c/m. This is not reasonable. The issue was discussed, by email, with the ARSO. Background measurements taken in the morning prior to work tend to be unusually high. Moving forward, background measurements will be taken twice a day to obtain a more reasonable value to compare with the survey measurements. The calibration dates listed on a portion of the personnel contamination survey forms (EDF-15) and found to be consistent with the instrument calibration data.

Equipment release surveys are generally conducted by the RST using a Ludlum Model 43-93 alpha/beta probe coupled to a Model 2360 meter as part of specific RWPs. In some instances, as deemed advisable, the RSO or ARSO may require equipment release surveys for activities that didn't warrant an RWP (as a conservative ALARA protocol). Wipe tests are not necessary unless the measured surface activity exceeds the removable activity limit. The administrative limit is 200 disintegrations per minute (d/m) alpha or beta per 100 square centimeters (d/m-100 $cm^2$). Monitoring data are recorded on Form EDF-5 and are included in the documentation for the RWP, or in a "miscellaneous surveys" folder. The method for determining the counting efficiency for alphas was clarified in that the count per $2\pi$ disintegration, i.e., efficiency, is multiplied by a factor of 0.25 to account for geometry and actual scan efficiency in the field, as per ISO 7503-1 Annex. The equipment scan records are generally included with the RWPs.

Contamination surveys in clean areas have been conducted weekly since late 2018. A total of 52 clean area surveys were documented in 2020. All areas met the required contamination limit. Results of clean area surveys are recorded on EDF-4 or EDF-5, Radiological Contamination Survey Form.

## 2.5 Radiation Work Permits

Work areas under RWPs are designated as restricted areas with requirements for personal contamination and equipment release surveys unless otherwise specified. Eleven RWPs were issued in 2020. Two additional work permits were carried over from previous years. RWPs include a field level risk assessment (FLRA) to cover general safety issues. The 2020 and open 2019 RWPs remaining open in 2020 are listed in Table 2, below:

Table 2. Radiation Work Permits Issued in 2020 and Carried Over From 2019

| ID | Issue Date | Subject | Bioassay | Other Monitoring | Workers trained | Date Closed Out |
|---|---|---|---|---|---|---|
| 1-2020 | 1/13/20 | Collection Pond sludge and liner removal | yes | Breathing zone monitoring | 8 | 3/18/20 |
| 2-2020 | 4/1/20 | Sludge cleanup from leaking blowdown pump seal | No | personal and equipment surveys | 3 | 4/16/20 |
| 3-2020 | 5/4/20 | Earthwork and relining collection pond | No | contamination surveys | 16 | 6/11/20 |
| 4-2020 | 6/8/20 | Placement of soil liner over exposed EP-1 liner damage | No | Contamination surveys | 1 | 6/25/20 |
| 5-2020 | 7/8/20 | Annual RO maintenance | yes | BZ sampling | 6 | 7/22/20 |
| 6-2020 | 7/16/20 | Prepare clean fill for EP-1 south berm | No | contamination surveys | 6 | 8/12/20 |
| 7-2020 | 7/15/20 | Clean out weeds inn 1200 GPM zeolite trains | no | Contamination surveys | 4 | 8/12/20 |
| 8-2020 | 8/14/20 | Inspection of clarifier 2 | yes | Contamination surveys | 5 | 9/10/20 |
| 9-2020 | 8/19/20 | Removal of columns in LTP shed | no | Contamination surveys | 3 | 8/26/20 |
| 10-2020 | 8/25/20 | Well abandonment in LTP | yes | Scanning – issue of improper scanning by crew addressed and documented | 12 | still active in 2021 |
| 11-2020 | 12/04/20 | Pipe removal on LTP | Yes | BZ monitoring for worker cutting pipe Contamination surveys | 6 | 1/13/21 |
| 10-2019 | 8/8/18 | Annual RO Maintenance | Yes | Contamination surveys | 4 | 8/27/19 |
| 11-2019 | 9/20/19 | Collection pond and liner removal | Yes | Contamination surveys | 5 | terminated 10/10/19 for re-evaluation |
| 12-2019 | 10/13/18 extended to 1/31/21 | RO Plant Clarifier rebuild | yes | self-frisking exceedance covered in 2019 ALARA audit | 10 | 1/27/20 |

## 2.6 Radiological Effluent and Environmental Monitoring Data

Applicable sections of the Semi-Annual Environmental Monitoring Report for January through June (HMC,2020b), as well as the Semi-Annual Environmental Monitoring Report for July through December 2020 (HMC, 2021) were reviewed. The public dose calculations were

reviewed and found to be accurate. Calculated effective doses from all three pathways, radon, direct gamma, and air particulates, were less than half of the 100 mrem annual dose limit. The doses from direct gamma radiation and air particulates were less than 25 mrem/y.

Air monitoring data, radionuclide concentrations in airborne particulates and radon gas, as well as environmental gamma radiation dose rates are provided in the monthly ALARA Reports (HMC, 2020a). The laboratory reports were reviewed as well. Radionuclide concentrations in airborne particulate matter are monitored at seven locations around the site, including four locations at the property boundary in the predominant downwind directions, two locations at the boundary representing the nearest occupied residences, and one background location. Filters are exchanged weekly and composited quarterly for analysis by a contract laboratory for U-nat, Th-230, and Ra-226. ELI was used for the first quarter of the year with Pace Analytical for the remaining quarters. The radionuclide data for 2020 were reviewed. No trends or anomalous results were observed. With the exception of uranium in the third quarter and fourth quarter, all concentrations were less than 1 % of the 10CFR20, Appendix B effluent limits. Uranium concentrations in the third and fourth quarter were 3% and 1.4% of the applicable effluent limit, respectively. The required flow rate was not attained in the third quarter of 2020 for air monitoring stations HMC1and HMC1A due to air sampler power issues and calibration down time (as per December ALARA Report).

The environmental gamma dose rates for 2017 through 2020 are shown in Table 3. There are no obvious trends in the data. (Measurements have been taken at HMC 1OFF routinely in the past but not reported.)

Table 3: Environmental Gamma Monitoring Results

| Location | 2017 Total | 2018 Total | Q1-Q2 2019 | Q3-Q4 2019 | 2019 Total | Q1-Q2 2020 | Q3-Q4 2020 | 2020 Total |
|---|---|---|---|---|---|---|---|---|
| | mrem | mrem | Mrem | mrem | Mrem | mrem | mrem | Mrem |
| HMC 1 | 112 | 115.5 | 57.5 | 58.0 | 124 | 65.3 | 62.9 | 128.2 |
| HMC 1A | 112 | 118.7 | 56.8 | 59.9 | 117 | 61.2 | 63.5 | 124.7 |
| HMC 1 OFF | | | | | | 66.2 | | |
| HMC 2 | 121 | 133.8 | 70.3 | 63.5 | 132 | 64.1 | 70.3 | 134.1 |
| HMC 3 | 110 | 123.6 | 58.0 | 65.6 | 130 | 59.8 | 65.2 | 125.0 |
| HMC 4 | 128 | 129.9 | 61.1 | 68.8 | 150 | 66.4 | 74.6 | 141.0 |
| HMC 5 | 125 | 130.7 | 65.6 | 65.1 | 136 | 65.5 | 62.9 | 128.4 |
| HMC 6 | 120 | 129.6 | 67.3 | 62.3 | 129 | 65.3 | 67.6 | 132.9 |
| HMC 16 Bkgd | 108* | 116.8 | 59.5 | 57.3 | 124 | Lost badge | 58.0 | 116.0* |

*The 2017 Q1-Q2 dose was pro-rated for the entire year due to the loss of the Q1 environmental dosimeter; the 2020 dose was also pro-rated for the entire year due to loss of the Q1 environmental dosimeter.

Environmental radon gas concentrations have been monitored at ten locations on the site or at the site perimeter as well as in the RO Building and the Mill Office Building using alpha track detectors supplied by Radonova Laboratories (Rapidos) since 2017. Landauer alpha track detectors were deployed prior to 2017. Two detectors are currently co-located at each outdoor monitoring station with the measured concentrations averaged. Single detectors are deployed in the RO Building and the Mill Office Building.

The quarterly radon concentrations for 2019 and 2020 are shown Table 4a. Annual average concentrations for the years 2016 through 2020 are shown in Table 4b. As expected, the highest indoor radon concentrations in the office tend to occur during the first and fourth quarters (fall/winter months) most likely due to reduced ventilation during colder months. The annual average radon concentrations in the RO plant have decreased over the past four years. This may represent a trend or normal fluctuations due to differing weather conditions. The annual average concentrations in 2020 increased somewhat above the previous average concentrations almost entirely due to a general increase in radon concentrations in the fourth quarter of 2020 at all locations, including background indicating that this increase was due to atmospheric conditions rather than being site-related. The Environmental Monitoring Program is described in detail in the Semi-Annual Environmental Monitoring Reports (HMC, 2020b, 2021).

Table 4a: Quarterly Radon Gas Concentrations

| Location | **Quarterly and Annual Average Radon Concentrations (pCi/L)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2019 Q1 | 2019 Q2 | 2019 Q3 | 2019 Q4 | **2019 Ave.** | 2020 Q1 | 2020 Q2 | 2020 Q3` | 2020 Q4 | **2020 Ave.** |
| HMC1 | 0.51 | 0.54 | 0.81 | 0.95 | **0.70** | 0.67 | 0.78* | 0.65 | 1.2 | **0.83** |
| HMC1A | 0.56 | 0.45 | 0.77 | 0.75 | **0.63** | 0.58 | 0.60 | 0.62 | 1.1 | **0.73** |
| HMC1OFF | 0.61 | 0.49 | 0.77 | 0.88 | **0.68** | 0.68 | 0.46 | 0.61 | 1.15 | **0.73** |
| HMC2 | 0.62 | 0.59 | 0.77 | 1.1 | **0.77** | 0.79 | 0.62 | 0.76 | 1.25 | **0.86** |
| HMC3 | 0.49 | 0.43 | 0.56 | 0.81 | **0.57** | 0.56 | 0.44 | 0.54 | 0.99 | **0.63** |
| HMC4 | 0.68 | 0.51 | 0.75 | 1.0 | **0.73** | 0.65 | 0.53 | 0.58 | 1.3 | **0.77** |
| HMC5 | 0.59 | 0.42 | 0.64 | 0.87 | **0.63** | 0.64 | 0.91* | 0.71 | 1.15 | **0.76** |
| HMC6 | 0.47 | 0.38 | 0.75 | 0.71 | **0.58** | 0.57 | 0.49 | 0.58 | 0.96 | **0.65** |
| HMC7 | 0.65 | 0.45 | 0.73 | 0.79 | **0.65** | 0.70 | 0.53 | 0.67 | 1.05 | **0.74** |
| HMC16 | 0.28 | 0.22 | 0.42 | 0.42 | **0.34** | 0.37 | 0.30 | 0.34 | 0.61 | **0.41** |
| HMC Office | 2.2 | 1.80 | 1.5 | 1.6 | **1.78** | 2.4 | 1.4 | 1.4 | 2.7 | **1.98** |
| R. O. Plant | 0.68 | 0.57 | 0.95 | 1.0 | **0.80** | 0.68 | 0.97 | 1.0 | 1.5 | **1.04** |

*Co-located detectors showed significant difference.

Table 4b: Annual Average Radon Gas Concentrations

| **Location** | **Annual Average Radon Gas Concentration (pCi $L^{-1}$)** | | | | |
|---|---|---|---|---|---|
| | **2016 Ave.** | **2017 Ave.** | **2018 Ave.** | **2019 Ave.** | **2020 Ave.** |
| HMC1 | 0.91 | 0.73 | 0.80 | 0.70 | 0.83 |
| HMC1A | 0.94 | 0.62 | 0.73 | 0.63 | 0.73 |
| HMC1OFF | 0.95 | 0.68 | 0.79 | 0.68 | 0.73 |
| HMC2 | 0.97 | 0.72 | 0.93 | 0.77 | 0.86 |
| HMC3 | 0.72 | 0.57 | 0.71 | 0.57 | 0.63 |
| HMC4 | 0.1.1 | 0.71 | 0.89 | 0.73 | 0.77 |
| HMC5 | 0.91 | 0.68 | 0.84 | 0.63 | 0.76 |
| HMC6 | 0.92 | 0.69 | 0.69 | 0.58 | 0.65 |
| HMC7 | 0.85 | 0.69 | 0.81 | 0.65 | 0.74 |
| HMC16 | 0.49 | 0.32 | 0.35 | 0.34 | 0.41 |
| HMC Office | 1.46 | 1.57 | 2.05 | 1.78 | 1.98 |
| R. O. Plant | 2.03 | 1.58 | 1.28 | 0.80 | 1.04 |

Radon flux from the LTP and STP were measured in May and June 2020. Canisters were placed on the STP on May 5-6, 2020 and on the LTP on June 8-9, 2020 as described in a report prepared by ERG for Homestake (ERG, 2020). The radon flux on the STP averaged over the entire area was 4.62 pCi $m^{-2}$-$s^{-1}$. The radon flux on the LTP was 22.45 pCi $m^{-2}$ $s^{-1}$ The average measured flux ion the STP in 2019 was 10.5 pCi $m^{-2}$ $s^{-1}$. The average measured flux on the LTP was 35.4 pCi $m^{-2}$ $s^{-1}$in 2019. The measured flux for both tailings impoundments were significantly lower than for 2019.

## 2.7 Instrument Calibration Record

Instruments are calibrated semi-annually in accordance with license conditions and previous license commitments. NRC Regulatory Guide 8.30 guidelines require annual calibration (NRC, 2002b). Calibration records were reviewed.

The instruments are checked for reproducibility daily when in use in accordance with Regulatory Guide 8.30. The Model 19 microR meters are checked against a Cs-137 source; alpha meters against a Th-230 source; and beta meters, against a Tc-99 source. Two Cs-137 sources have been used in the past for the daily checks. The initial activities for the sources at the time of calibration were 4.44 µCi and 1.275 µCi. The sources are both more than 25 years old; however, the activities were corrected for decay in 2016. The current exposure rate from the lower activity source (initially 1.275 µCi) has decreased significantly due to decay to the point where it is no longer useful so the daily checks are performed with the higher activity source only. The exposure rate check is used only to demonstrate reproducibility from day to day so the actual activity is not a critical factor.

Table 5: Instrument Current Calibration Dates

| Instrument Type | Meter - Ludlum Model # (Serial #) | Probe - Ludlum Model # (serial #) | Most recent Calibration Dates |
|---|---|---|---|
| Alpha/beta scaler | 3030 (210768) | NA* | 7'22/19 1/21/20 8/24/20 |
| MicroR meter | Model 19 (310400) | NA | 8/29/19 3/10/20 9/15/20 |
| MicroR meter | Model 19 (82709) | NA | 9/17/19 3/25/20 8/26/20 |
| Alpha | 12 (102859) | 43-5 (082781) | 9/17/19 3/25/20<br>No longer in use |
| Alpha | 12 (87919) | 43-5 (077534) | 9/3/19 3/10/20<br>No longer in use |
| Alpha/Beta scaler | 3030 (245268) | NA | 8/30/19 2/28/20 9/8/20 |
| Alpha/Beta survey meter | 2360 (334038) | 43-93 (372633) | 8/29/29 3/10/20 9/15/20 |
| Alpha/Beta survey meter | 2360 (184920) | 43-93 (199831) | Initial calibration 9/25/19<br>4/21/20<br>No longer in use |
| Alpha/Beta survey meter | 2360(334005) | 43-93 (372636) | 9/17/19 3/25/20 8/26/20 |

*NA = not applicable

## 2.8 Review of Standard Operating Procedures and SERPs

Standard Operating Procedures are contained in the RPPM (HMC, 2019) and the Homestake Manual of Standard Practices Policy Guidance Documents and Standard Operating

Procedures. A single controlled copy of these documents is maintained in the office of the CM. All procedures were reviewed as part of the self-assessment required under the 2017 NRC Confirmatory Order. The RPPM was last revised in 2019 (Revision 3).

There were no Safety and Environmental Review Panel (SERP) evaluations conducted in 2020. In 2019, a SERP document was prepared for liner replacement in EP1; however, the project was postponed and has not been implemented. HMC is not authorized to perform SERPS at this time..

## 2.9 Source Leak Tests

Three sources used for instrument calibrations (Th-230, Tc-99, and Cs-137) are leak tested annually. The most recent leak tests were conducted on June 11, 2020. All leak tests showed removable activity below the required 0.0005 µCi limit.

Sources that are not currently in use are stored in a locked source cabinet with “Caution, Radioactive Materials” signage. As noted in previous ALARA Audit reports, the exposure rates at the surface of the source cabinet, measured in January 2017, ranged from approximately 75 µR/hr at the front to a maximum of 250 µR/hr at the side. A wipe test performed on the source cabinet at that time showed alpha and beta counts in the range of background levels. Because of COVID-19 restrictions it was not possible to check the source cabinet during this audit.

A total of 59 sources are listed in the June 6, 2019 inventory. The source inventory was checked in August, 2018. All sources were accounted for. The four sources currently in use, (Th-230 [15,520 d/m], Tc-99 [12,670 d/m], Cs-137 [1.275 µCi as of 10/6/80] and Cs-137 [4.44 µCi as of 10/26/90]), are stored in the source cabinet. (Note: The lower activity Cs-137 source is no longer routinely in use.)

## 2.10 Review of Radiation Protection Data and Exposure Control

Radiation protection data, including personal dosimetry, bioassay results, and RWPs, indicate that the program is protective of worker radiation health. No deficiencies were found. The results of the bioassay and personal dosimetry monitoring are described in Sections 2.1.1 and 2.1.3, respectively.

Radon concentrations were measured in two occupied or potentially occupied locations on the site using alpha track detectors. The results are shown in Table 6. Radtrak detectors supplied by Landauer were used until third quarter 2016 when Landauer discontinued that line. Since that time, Rapidos detectors supplied by Radonova Laboratories have been used for both indoor and outdoor radon concentration measurements. The Rapidos detectors are more sensitive than the previously used Radtrak detectors and tend to be more consistent. As a result, rather than three detectors, as was the case previously, two radon detectors are deployed at the outdoor environmental monitoring locations and one each at indoor locations within the HMC office and RO plant. Measurements in the occupied indoor locations, are in the range of average indoor values for the United States, i.e. approximately 1 pCi/L to 3 pCi/L. All annual average radon concentrations were less than the EPA guideline for residences. Ventilation in the RO Building appears to be operating properly to control radon concentrations. The radon concentrations in the RO plant have decreased slightly over the past five years. It is not clear whether this is a trend or simply due to normal variation.

Table 6: Radon Concentrations for Monitored Indoor Locations

| | HMC office (pCi/L) | RO Plant (pCi/L) |
|---|---|---|
| 2015 | 2.0 | 2.5 |
| 2016 | 1.46 | 2.03 |
| 2017 | 1.57 | 1.58 |
| 2018 | 2.05 | 1.28 |
| 2019 | 1.77 | 0.88 |
| 2020 | 1.98 | 1.04 |

## 2.11 Unusual Events

There were no unusual events reported in 2020.

## 2.12 Review of 2019 Audit Findings and Recommendations

The 2019 ALARA Audit contained one recommendation as follows (Sopris, 2020):

Recommendation: All laboratory results should be reviewed for consistency with previous data and apparent discrepancies investigated as soon as practicable after receipt at HMC.

The recommendation was followed. For example: an error was discovered in the Q3 air particulate concentration report from Pace Analytical shortly after receipt. It was corrected and resolved within a few weeks after receipt of the initial report.

# 3.0 SUMMARY OF AUDIT

## 3.1 Findings

There were no Findings from this ALARA Audit. A few minor suggestions were addressed during the audit. The ALARA program at the Homestake facility complies with license conditions, regulatory requirements and the guidance provided by US NRC Regulatory Guide 8.31 (NRC, 2002a). Regulatory Guide 8.31 requires the ALARA Audit to review of trends in personnel exposure. Quarterly doses for badged workers are very low, generally below the reporting limit of 1 mrem, and have been consistent for the last seven years. The annual worker TEDEs for 2018, 2019 and 2020 were calculated assuming a value of 1 mrem for OSL deep doses reported as “M” or non-detect. The TEDE includes the calculated internal dose as well. Due to the current inclusion of estimated internal doses based on RWP air monitoring, it is not possible to compare the data from previous years to current worker dose estimates. However, the doses are so low (in most cases OSL deep doses reported as non-detect), there are no trends to report. The maximum worker annual TEDE for 2021 was 22 mrem, somewhat less than for 2019 and approximately the same as for 2018. There are no discernable trends in environmental radon, air particulates or direct radiation measurements except for indoor radon in the RO building where average annual concentrations appear to be decreasing. Calculated public doses have been generally consistent for the past few years.

## 3.2 Summary of Recommendations

Minor recommendations, addressed during the Audit, include: (1) clarification on the personal survey (form to specify that the measurement is alpha count and (2) ensure that background counts are representative of the conditions that exist at the time of the personnel surveys.

Based on the number of lost badges recorded in 2020, it is recommended that use and care of badges be stressed in training as long as such personal monitoring is required.

## 3.3 Significant Improvements in 2020

Documentation of daily and weekly site inspections continue to show improvement.

**Best practice: As with 2019, the Monthly ALARA reports include a helpful narrative of the weekly ARSO site inspection.**

**Best practice: The daily site walk-over inspections, now conducted by a qualified designee when the RSO, ARSO or RST is not present on site, include observations of potential radiological or safety issues as well as, in some cases, commentary on actions that had been taken to mitigate previously identified conditions.**

Based on the records review, the radiation protection program at the Homestake facility is well-designed and continues to operate at a high level of competence. The current COVID-19 pandemic did not allow for a site tour so the actual on-site conditions could not be evaluated. However, the narratives in the monthly ALARA Reports allowed the auditor to conclude that the site is operating in a way that protects workers and the environment.

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# APPENDIX D

# INSPECTION OF TAILINGS PILES AND PONDS

# AND

# ELEVATION SURVEY OF THE SETTLEMENT MONUMENTS ON TOP OF THE LARGE TAILINGS PILE SETTLE

Stantec

# Grants Reclamation Project
# 2020 Annual EOR Inspection

Annual Inspection of Tailings and Evaporation Ponds

March 24, 2021

Prepared for:

Homestake Mining Company of California

Prepared by:

Stantec Consulting Services Inc.

# Revision Record

| Rev. | Description | Author | | Quality Check | | Independent Review | |
|---|---|---|---|---|---|---|---|
| 0 | Draft for HMC review | S. Downey | 01/27/21 | M. Davis | 3/17/21 | C. Strachan | 3/17/21 |
| 1 | Final for HMC | | | M. Davis | 3/24/21 | | |
| | | | | | | | |

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# Executive Summary

This report documents the 2020 site visit and annual Engineer of Record (EOR) inspection of the tailings impoundments and evaporation ponds at the Homestake Mining Company of California (HMC) Grants Reclamation Project (GRP) site, near Grants, New Mexico. Stantec Consulting Services Inc. (Stantec) serves as the EOR for the tailings impoundments and evaporation ponds. The site visit for this inspection was conducted by HMC and Stantec personnel on November 20, 2020.

Stantec visually inspected the crests, toes, slopes, and liners along the crests of the three evaporation ponds (Evaporation Pond-1, Evaporation Pond-2, Evaporation Pond-3) as well as the tops and outslopes of both tailings impoundments (Small Tailings Pile and Large Tailings Pile). The weather was sunny to partly cloudy with temperatures in the low-50s to mid-60s during the site visit. The ground surface was dry. The inspection observations are summarized below by facility.

***Large Tailings Pile***

Stantec personnel walked the Large Tailings Pile (LTP) toe and crest during the inspection and observed the side slopes from both the toe and crest. There was evidence of animal burrows or damage from wildlife along the slopes of the LTP. The downdrains installed around the LTP perimeter appeared in good working condition along the side slopes and toe of the LTP. The buried French drains and sumps in the slopes and at the toe of the LTP continue to collect interstitial water draining from the LTP tailings. The top surface and crest of the LTP appeared in stable condition. Rilling was present (up to 6 inches deep) in a few areas on north portions of the LTP top cover surface. Stantec observed the repairs made by HMC to the recurring sinkholes on the south crest of the LTP. The repairs included filling the sinkholes with grout and construction of a berm adjacent to the north side of the road. A low spot between downdrains 11 and 2, where sinkholes have been recurring, is still present.

Plugging and abandonment of injection, recovery, and monitoring wells on top of the LTP began in 2018 and is scheduled for completion in 2021. HMC plugged and abandoned 394 tailings wells on the top surface of the LTP in 2020. Six permitted wells will remain in place after well abandonment is complete, in addition to a few other existing well locations to be agreed upon with the regulatory agencies in 2021.

The water levels within the tailings are trending as expected. The majority of piezometers show a downward trend and overall decrease in water elevation. Stantec recommends continued monitoring of the piezometers that remain in place after the well abandonment program is complete.

The 2020 settlement monument survey indicates that, of the 46 settlement monuments found and surveyed, 45 showed either no change or minor settlement ranging from 0.01 to 0.20 feet, compared with the 2019 survey. The E5 monument showed a minor rise in elevation (0.01 feet) since 2019. Five settlement monuments were reported missing (B3, B10, C8, C11, and D8). These monuments have been missing or have no data reported since 2008 or earlier. B4 and B11 have been listed as damaged since 2018. Two instruments were reported as damaged (B7 and C7) in 2020.

***Small Tailings Pile***

Stantec personnel walked the Small Tailings Pile (STP) toe and crest during the inspection and observed the side slopes from both the toe and crest. HMC conducted annual maintenance in August on the STP side slopes by grading and compacting the side slopes. The rills on the north slope are becoming deeper under the erosion control blanket and Stantec recommends repairing the rills. HMC started a new trash pit on the south triangle area to the west of the previous location. Stantec also observed windblown salts on the west and north outslopes, as well as in some areas near the south toe of the STP.

Evaporation Pond 1 (EP-1) is on top of the STP. Stantec personnel walked portions of the toe and crest of EP-1 during the inspection. The evaporators were operating during the visit. The pond is operating at a reduced capacity due to damage on the liner on the south interior embankment slope from placing the West Collection Pond sludge. There are also five holes (less than 2-inch in diameter) that developed in the liner on the north interior embankment slope in 2020. Stantec recommends that HMC continue to operate EP-1 at reduced capacity . The operating water level should be kept at a minimum of 2 feet below the damaged liner area at the south embankment and below the holes in liner at north embankment.

***Evaporation Pond 2***

The toe and crest of Evaporation Pond 2 (EP-2) were walked during the inspection. The upstream embankment slopes are lined with a dual HDPE liner system. The upstream embankment slopes and liner were in stable condition during the inspection. The pond crest and crest road were also in good condition during the inspection. The downstream embankment slopes are covered with 2-inch sized basalt gravel and were stable, with no major rilling observed. Stantec reviewed the leak detection and removal system (LDRS) pumping records for EP-2.

***Evaporation Pond 3***

Stantec personnel walked portions of the toe of Evaporation Pond 3 (EP-3) and the crest during the inspection. The upstream embankment slopes are lined with a dual HDPE liner system. The upstream embankment slopes and liner were in good condition during the inspection. The pond crest and crest road were in good condition during the inspection. A metal bollard near on the pond crest near the northeast corner had been damaged during evaporator maintenance and was slated by HMC for repair. Rill management was performed on the outer slopes in August 2020 and the embankments were in good condition. Stantec reviewed the LDRS pumping records for EP-3.

***Recommended Action Items***

Stantec identified ten recommendations from the 2020 site inspection, primarily related to erosion control and drainage management. Four recommendations are carryover action items from 2018 and 2019, three recommendations are updated from 2018, and three recommendations are new. One action item is rated as “high” priority; to continue to operate EP-1 at reduced capacity. Seven action items are rated as “medium” priority and two action items are rated as “low” priority.

Stantec recommends that annual tailings inspections continue on the current schedule, with the next inspection in November 2021. HMC site personnel should continue regular facility inspection and should report changing

conditions to the EOR. The action items in this report should be tracked throughout the year by HMC and the EOR for progress and reviewed during the 2021 inspection.

# Abbreviations

| | |
|---|---|
| ACL | Alternate Concentration Limit |
| ALR | action leakage rate |
| COC | constituent of concern |
| DOE | Department of Energy |
| DP | discharge permit |
| EAP | Emergency Action Plan |
| EOR | Engineer of Record |
| EP-1 | Evaporation Pond 1 |
| EP-2 | Evaporation Pond 2 |
| EP-3 | Evaporation Pond 3 |
| EPA | Environmental Protection Agency |
| gpd | gallons per day |
| gpm | gallons per minute |
| GRP | Grants Reclamation Project |
| HDPE | high density polyethylene |
| HMC | Homestake Mining Company |
| LDRS | leak detection removal system |
| LTP | Large Tailings Pile |
| NM | New Mexico |
| NMAC | New Mexico Administrative Code |
| NMED | New Mexico Environment Department |
| NMOSE | New Mexico Office of the State Engineer |
| NMPM | New Mexico Principal Meridian |
| NPL | National Priority List |
| NRC | Nuclear Regulatory Commission |

| | |
|---|---|
| O&M | operations and maintenance |
| PE | Professional Engineer |
| RO | reverse osmosis |
| SOP | standard operation procedure |
| STP | Small Tailings Pile |
| TDS | total dissolved solids |
| tpd | tons per day |
| UMTRCA | Uranium Mill Tailings Radiation Control Act |
| WCP | West Collection Pond |

# 1.0 INTRODUCTION

This report documents the 2020 site visit and annual Engineer of Record (EOR) inspection of the tailings impoundments and evaporation ponds at the Homestake Mining Company of California (HMC) Grants Reclamation Project (GRP) site. As EOR for the Site, Stantec is required to annually inspect the stability and functionality of the tailings impoundments and evaporation ponds per Nuclear Regulatory Commission (NRC) Radioactive Materials License SUA-1471, Condition 12 and New Mexico Environment Department (NMED) Discharge Permit (DP) DP-200, Condition 52i. HMC and Stantec personnel conducted the site visit and inspection on November 20, 2020.

The GRP site is approximately 4.5 miles north of the Village of Milan, Cibola County, New Mexico, USA. New Mexico State Highway (NM) 605 is located east of the site and United States Route 66 is located south-southwest of the site. The main area of the site falls within Sections 22, 23, and 26 of Township 12 North, Range 10 West. HMC owns approximately 14,000 acres over 22 Township Sections (over 22 square miles), which includes the GRP site and surrounding areas.

This is the third annual inspection conducted by Stantec. Stantec has reviewed previous inspection documentation for inspections conducted by the previous EOR (Alan Kuhn) from 2002 to 2017.

For reference purposes, the site typically operates in a modified NAVGD29 elevation datum. References to elevation in this document are based on the HMC control network. NAVD88 elevations are 3.25 feet above the elevations presented in this report.

## 1.1 OPERATIONAL INFORMATION

Uranium milling operations occurred at the Homestake Facility from 1958 until 1990. Homestake's milling facilities were constructed and originally operated as two distinct partnerships, with Homestake Mining Company acting as the managing partner of both. The larger mill was organized as Homestake-Sapin Partners, with a nominal milling capacity of 1,750 tons per day (tpd). The smaller mill was organized as Homestake-New Mexico Partners with a nominal milling capacity of 1,650 tpd. Both mills were designed to be alkaline leach-caustic precipitation processes for concentrating uranium oxide from ores with average grades of 0.05 to 0.30 percent $U_3O_8$. The mills operated independently, each with its own tailings impoundment, until 1961, when the partnerships were merged. Homestake-Sapin Partners was the surviving organization. In 1968, United Nuclear Corporation acquired an interest in the partnership, which was bought out in 1981, leaving HMC as the sole owner. In 2001, Barrick Gold Corporation of North America purchased HMC.

The majority of the mill structures were decommissioned between 1993 and 1995, with some structures left in place to support the continuing groundwater restoration program that initiated in 1977. The current structures at the project site are related to the operation and maintenance (O&M) of the continuing groundwater restoration program and the tailings impoundments.

The groundwater restoration program utilizes two zeolite treatment systems and a reverse osmosis (RO) treatment plant. Treatment residuals are managed in three evaporation ponds, which remove water and leave behind constituents of concern (COCs) as salts in the bottom of the ponds. The site COCs are uranium, selenium, molybdenum, sulfate, chloride, total dissolved solids (TDS), nitrate, vanadium, thorium-230, radium-226, and radium-

228. The 2020 Groundwater Corrective Action Program (HMC, 2020) shows that long-term groundwater correction action to restore aquifers to groundwater protection standards is not practical. HMC is in the process of developing and submitting an application to the NRC for Alternate Concentration Limits (ACLs) for affected aquifers. Conclusion of groundwater restoration activities depends on regulatory approval of ACLs.

## 1.2 TAILINGS PILE AND EVAPORATION POND DESCRIPTIONS

Two tailings impoundments were constructed on the GRP site. The first and smaller of the two impoundments, the Small Tailings Pile (STP), contains 1.22 million tons of tailings from ore milled under contracts with the federal government. It is located in the SE ¼ and SW ¼ of Section 26, Township 12 North, Range 10 West, NMPM.

The second and larger of the two impoundments, the Large Tailings Pile (LTP), located in the N ½, Section 26, Township 12 North, Range 10 West, NMPM, contains comingled tailings from ore milled under both federal government (11.41 million tons) and commercial contracts (10.89 million tons). Until 1966, HMC deposited tailings into only one cell of the LTP. Subsequently, HMC added a cell adjacent to and west of the first cell. From 1966 until 1990, tailings disposal alternated between the two cells (east and west) as necessary to maintain optimal operating conditions. Figure 1 shows the locations of the tailings impoundments and the other site features.

Three evaporation ponds (EP-1, EP-2, and EP-3) were built on site between 1990 and2010 to contain treated water from the groundwater restoration activities. The evaporation ponds were constructed to hold and evaporate water pumped from the collection wells of the groundwater restoration system. Water is transferred between the three ponds as part of the overall water and management system. Additional information on the design and construction of the tailings impoundments and evaporation ponds is included in Section 6.0.

# 2.0 DOCUMENT AND DATA REVIEW

HMC provided Stantec with reports and data prepared for the site since the previous EOR inspection. Data and documents received in 2020 include:

- Piezometer readings
- LTP collection wells and drainage sumps data
- Historic LTP collection well and drainage sump data
- Leak detection sump discharge monitoring for EP-2 and EP-3 recorded weekly by HMC
- Pond levels recorded weekly by HMC
- Settlement monitoring survey of the LTP by Hammon Enterprises, Inc.

Stantec personnel reviewed these documents prior to and following the site visit.

# 3.0 SITE VISIT

Melanie Davis of Stantec and EOR for the tailings impoundments and evaporation ponds conducted the inspection. Reginald Shirley, HMC's Site Engineer, accompanied Melanie during the site visit.

Following the annual inspection, Melanie Davis discussed observations and action items with Reginald Shirley and Brad Bingham of HMC. Stantec and HMC agreed on the deficiencies found during the inspection and the necessary corrective actions. Section 9 summarizes these observations and recommended actions.

# 4.0 ANNUAL INSPECTIONS

Stantec personnel visually inspected the crests, toes, slopes, and liners along the crests of the three evaporation ponds (EP-1, EP-2, and EP-3) as well as the tops and outslopes of both tailings piles (STP and LTP). The weather during the site visit was sunny to partly cloudy with temperatures ranging from the low-50 to mid-60 degrees Fahrenheit. The ground surface was dry. Appendix A includes tailings pile and pond inspection safety checklist forms.

## 4.1 SAFETY INSPECTION FORMS AND PHOTO LOG

Stantec recorded observations and other findings during the inspection on a standard dam safety inspection form. The inspection categories and items in the form provide a comprehensive evaluation in accordance with internationally-accepted industry practice. A form was completed for each structure listed above (Appendix A). Select photographs taken during the site visit are included in a photo log (Appendix B).

## 4.2 LARGE TAILINGS PILE

### 4.2.1 Inspection

Stantec personnel walked the LTP toe and crest during the inspection and observed the side slopes from both the toe and crest. The tailings side slopes are covered with riprap ($D_{50}$ = 8 inches) and natural vegetation, and were in stable condition during the inspection. Windblown sediments existed near the top of the outslopes of the LTP, likely from the top of the LTP. The windblown sediments cause the slopes to appear uneven or vary in grade from the top to the bottom of the slope. There was evidence of animal burrows or damage from wildlife along the slopes of the LTP.

The downdrains installed around the LTP perimeter appeared in good condition along the side slopes and toe of the LTP. Water injection into the LTP ceased in 2015 (AKA, 2016). The buried French drains and sumps in the slopes and at the toe of the LTP continue to collect interstitial water draining from the LTP tailings. At the time of the inspection, the ground surface at the toe around the LTP was dry. Salt precipitate was observed along the north toe and the southwest toe of the LTP (near the RO Plant).

The top surface and crest of the LTP was generally in stable condition. Rilling present during the 2019 inspection on the south and north side of the LTP top surface was repaired by HMC in August 2020. Rilling was present (up to 6 inches deep) in a few areas on north portions of the LTP top cover surface during the 2020 inspection. HMC repaired the sinkhole on the south side of the LTP near the crest by downdrain 11 that was present during the 2019 inspection, as well as three other sinkholes that appeared in September 2020. The area between downdrains 11 and 12 where the sinkholes have been recurring remains to be a low spot. Stantec recommends HMC add and compact material between these downdrains to mitigate pooling of water and recurring sinkholes in this area. HMC constructed a berm on the inside edge of the access road and Stantec suggested to make a cut in a few locations along the berm to allow the water to flow across the road and into the downdrains and not pond on the upgradient edge of the berm.

The zeolite plant facilities on the LTP appear stable with no apparent impact on the stability of the LTP. HMC installed new piping near the southwest corner of the 1200 gpm zeolite plant facilities in 2018 and partially repaired the berm at the toe and side slope above the installed piping (see Appendix B, Photo 13) where the berm material was partially

removed. Stantec recommended in 2018 that HMC complete repairs to the berm so that slope stability is not compromised.

HMC's subcontractor was on site performing well abandonment on the LTP. Photos of well abandonment activities are included in Appendix B. HMC plugged and abandoned 156 tailings wells on the top surface of the LTP in 2020. Plugging and abandonment of injection, recovery, and monitoring wells on top of the LTP began in 2018 and is scheduled for completion in 2021. Six permitted wells will remain in place after well abandonment is complete, in addition to a few additional well locations to be agreed upon with the regulatory agencies in 2021.

### 4.2.2 Settlement Monitoring

The 2020 settlement monument survey was conducted by Hammon Enterprises, Inc. (Hammon) on November 16, 2020. Of the 46 settlement monuments found and surveyed, 45 showed either no change or minor settlement ranging from 0.01 to 0.20 feet, compared with the 2019 survey. The E5 monument showed minor increase in elevation (0.01 feet) since 2019. This increase is within the survey accuracy. Five settlement monuments were reported missing (B3, B10, C8, C11, and D8). These monuments have been missing or have no data reported since 2008 or earlier. B4 and B11 have been listed as damaged since 2018. Two instruments were reported as damaged (B7 and C7) in 2020. Monument B7 had a 4.14-foot-section of drill stem broken off from the monument and appeared to have been run over. The PVC casing was demolished leaving the monument 0.5 feet below grade. Monument B7 had a 2.22-foot-section of drill stem broken off from the monument. The monument appears to have been run over and the PVC casing demolished leaving the monument 0.5 feet below grade. Stantec understands that Hammon returned to site and installed new PVC casing at these two locations.

Stantec plotted settlement monitoring data from 1993 to present for the settlement monitoring locations on the LTP. The complete set of survey monument elevations is included in Appendix C, along with plots grouping the settlement points together by lines (A through E). Settlement contours on Figure 2 show the cumulative settlement (in feet) measured to date.

Stantec consolidated and analyzed the data by plotting the cumulative settlement versus log time. The monument location with the largest and most consistent cumulative settlement was selected within each quadrant of the LTP (NW-A4, SW-D3, NE-B9, and SE-D7), as well as three locations from the C-line monuments (C3, C7, and X1). The C-line monuments show the highest cumulative settlement and lie along the centerline dividing the LTP into north and south. One monument was selected from each the east and west quadrants along this line along with X1. Based on review of the settlement data and comparison with the water level elevation contours provided by HMC, the greatest amounts of settlement have occurred in or near areas with the largest remaining thickness of tailings saturation. The maximum cumulative settlements have been recorded near X1 and near C7. The trends in the dataset are inconsistent, potentially due to the past reinjection program. In general, the settlement data appears to indicate primary consolidation of the tailings is complete, but long-term secondary consolidation (creep) continues in multiple locations within the LTP.

A systematic survey error likely occurred in 2016 that carried through all the settlement measurements. This error resulted in the majority of the settlement monuments showing an increase in elevation (up to 0.53 feet), rather than settlement (AKA, 2018). There has been minimal additional settlement (approximately 0.1 feet per year or less) since 1999, excluding the 2016 data. Settlement monitoring data and plots are included in Appendix C.

### 4.2.3 Piezometer Monitoring

HMC measures water levels for the wells on top of the LTP monthly, biannually, or annually, depending on the location. Figure 1 shows the LTP monitoring well locations.

Stantec plotted the water level elevations from 2015, when water injection into the LTP ceased, through 2020 for 52 locations, although several locations do not have data starting until 2016 or later. The piezometer data and plots are provided in Appendix D. Piezometer water levels were compared from the first reading (ranging from January 2015 to late 2016) to the most current reading, typically December 2020. There is some scatter and abnormalities within the data; however, the majority of piezometers show a downward trend and overall decrease in water elevation. Of the 52 piezometers on LTP, one location (EG9) has only one reading and was not analyzed. Of the remaining 51 locations, 47 showed no change or a decrease in water level elevation, ranging in an overall change of 0.0 feet to -70.8 feet. The other four locations (EP31, ES1, NW3, and WT18) showed an increase in overall water level elevation, ranging from 1 to 6.2 feet. 2020 water levels were within the range of measured water levels for nearby wells. EP31 and WT18 are screened in tailings slimes and located on the top of the LTP, and NW3 is screened in tailings sands and located on the LTP crest. ES1 is screened in tailings sands and located on the south slope. ES1 increased from May 2018 to November 2018 but then decreased and has stayed at a fairly consistent water level with fluctuations of less than 1 foot. ES1 decreased by 0.5 feet since the 2019 water level.

The water levels within the tailings are trending as expected. Stantec recommends continued monitoring of the piezometers that remain in place after the well abandonment program is complete.

### 4.2.4 French and Toe Drain Tailings Sumps

HMC provided Stantec with the flow rate data for the sumps from January 2011 to December 2020. The sumps are connected to the French and toe drains located at the base of the tailings, near the near toe of the LTP. Figure 1 shows the sump locations, including E-1, E-2, East Reclaim, N-1, S-1, W-1, and West Reclaim. Seepage has been observed by Stantec at the north and northwest toe of the LTP during the 2018 and 2019 annual inspection, and evidence of seepage (i.e., precipitate) was observed during the 2020 inspection. This area has had observed seepage since 2006 and was mitigated by HMC in 2008 with the installation of additional sumps to collect the drainage. Wet soil in the area reappeared in 2016. Evidence of seepage (i.e., precipitate) has also been observed by HMC in 2019 and by Stantec in 2020 along the southwest toe of the LTP.

The average pumping rates from the sumps has ranged from approximately 45 gpm in early 2011 to 5 gpm in December 2020. Several pump locations (E-2, W-1, S-1, N-1 and West Reclaim) have pumped very little flow since early 2017. The decreasing trend in sump pumping rates is consistent with a decrease in water levels in the tailings. Collection from the French and drains is expected to continue until pumping rates are too small for continued sump pump operation.

## 4.3 SMALL TAILINGS PILE

### 4.3.1 Inspection

HMC conducted annual maintenance in August 2020 on the STP side slopes by grading and compacting the side slopes. Rills existed underneath the erosion control blanket on the north embankment. The rills on the north slope are

becoming deeper under the erosion control blanket and Stantec recommends repairing the rills. HMC would need to cut out portions of the erosion mat, fill in the rilling and compact the material, then patch in new erosion mat. HMC started a new trash pit on the south triangle area to the west of the previous location. Stantec also observed windblown salts on the west and north outslopes, as well as in some areas near the south toe of the STP.

### 4.3.2 Evaporation Pond 1

Stantec personnel walked portions of the toe and crest of EP-1 during the inspection. The evaporators were operating during the visit. EP-1 (on top of the STP) is in operational condition although it is operating at a reduced capacity due to the liner areas damaged in 2020. The West Collection Pond (WCP) relining project in 2020 transported spent lime sludge from the WCP to EP-1 with the material placed along the south interior slope and covered with 6 inches of clean fill. The liner was damaged in this area during placement of the WCP sludge. There are also five hole (less than 2-inches in diameter) that developed in the liner on the north slope in the spring of 2020 while transferring water from EP-2 to EP-1. Additionally, there are significant slumps and benching under the EP-1 liner along the upstream slope near the southeast corner. This appears to be a result of wave action over time. The slumps and benching continue from the southeast corner to the north (along the east embankment) and to the west (along the south embankment). Weathering cracks are present along most of the liner. The slumps, benching, and weathering cracks were observed in previous inspections (Stantec, 2019, 2020). Stantec completed a feasibility study to re-line EP-1, which was submitted to NMOSE and NMED on behalf of HMC for approval in December 2018 (Stantec, 2018). HMC is re-evaluating the EP-1 re-lining plan in 2021 due to the new strategy outlined in the Groundwater Corrective Action Program (HMC, 2020) that could result in decommissioning the evaporation ponds sooner than previously planned.

The pond depth in EP-1 from bottom to crest is assumed to be 15 feet, and the minimum freeboard requirement is 2 feet. Therefore, the maximum operational water depth is 13 feet . The freeboard measurements for 2020 ranged from 9.8 to 12.9 feet, well below the freeboard requirement of 2 feet.

Stantec recommends that HMC continue to operate EP-1 at reduced capacity and at an operating level a minimum of 2 feet below the damaged liner area at the south embankment and below the holes in liner at north embankment. Per HMC, the lowest depth of the liner damaged in 2020 is located on the south embankment at 8 feet in depth from the crest. Therefore, a minimum freeboard of 10 feet and corresponding maximum water level of 5 feet are recommended for EP-1 for current conditions.

## 4.4 EVAPORATION POND 2

### 4.4.1 Inspection

Stantec personnel walked the crest and portions of the toe EP-2 during the inspection. The upstream embankment slopes are lined with a dual HDPE liner system. The upstream embankment slopes and liner were in good condition during the inspection. The pond was operating at a lower level as compared to previous inspections. The pond crest and crest road were in good condition during the inspection. The downstream embankment slopes are protected with a 2-inch size basalt gravel and were in good condition, with no major rilling observed. There were small shrubs and vegetation growing on the downstream slopes.

### 4.4.2 Data Review

In 2020, HMC recorded weekly leakage rates through the LDRS. The water may leak through the primary liner, which is then collected in sumps between the primary and secondary liners, and then pumped out from each sump. The water pumped out is discharged directly back into the pond. Water volume removed through the collection sumps are recorded weekly and records are maintained on site.

LDRS Zones 1 and 4 show zero water collected in 2020. The data from Zones 2, 3, and 5 show that most water was collected between January and June 2020. The Action Leakage Rate (ALR) of 775 gpd/acre was exceeded in both Zones 2 and 5. Zone 2 exceeded the ALR for several readings between February 10 and April 13, ranging from 813 to 1,423 gpd/acre. Zone 5 exceeded the ALR for several readings between January and April, ranging from 776 to 1,125 gpd/acre.

For freeboard calculations, the EP-2 pond depth from bottom to crest is assumed to be 25 feet, and the minimum freeboard requirement is 2 feet. Therefore, the maximum operational water depth is 23 feet. The freeboard measurements for 2020 ranged from 2.72 to 9.8 feet, below the freeboard requirement of 2 feet.

## 4.5 EVAPORATION POND 3

### 4.5.1 Inspection

Stantec personnel walked the crest and portions of the toe of EP-3 during the inspection. The upstream embankment slopes are lined with a dual HDPE liner system. The upstream embankment slopes and liner were in good condition during the inspection. The pond crest and crest road were in good condition during the inspection. Rill management was performed on the outer slopes in August 2020 and the embankments were in good condition. Stantec was informed by HMC during the site visit that a metal pole on the pond crest near the northeast corner of the pond had been hit and damaged by HMC personnel while pulling an APEX evaporator unit out of EP-3 for maintenance. HMC plans to repair the pole and place it back in the same location. Stantec recommended that HMC use caution while performing repair so as not to get close to the liner.

### 4.5.2 Data Review

HMC recorded weekly leakage rates through the LDRS. The pumps in each of the cells A-1, A-3, and A-4 were removed for general maintenance in 2018, and the casing pipe collapsed in these cells. The sump pumps were re-installed as deep as possible and are functional but could not be placed at the bottom of the pipes due to the collapsed casing. HMC does not plan to repair the collapsed pipes.

The EP-3A and EP-3B sub-cells showed no readings above the ALR of 775 gpd/acre in 2020. Sub-cells A-1, A-3, and A-4 showed zero pumping for the duration of 2020. HMC noted that the pump for sub-cell A-3 was connected and working, but is not at the bottom of the sump. Sub-cells A-2 and A-5 show pumping rates at the beginning of 2020 (January through March in A-5 and January through June in A-2), but show minimal or zero pumping for the remainder of the year. Sub-cells B-2, B-3, and B-5 showed minimal or zero pumping for the duration of 2020. Sub-cells B-1, and B-4 show pumping rates in 2020 with a maximum rate of 410 gpd/acre in B-4.

For freeboard calculations, the EP-3 pond depth from bottom to crest is assumed to be 13.4 feet, and the minimum freeboard requirement is 2 feet. Therefore, the maximum operating water depth is 11.4 feet. The freeboard for EP-3 was below the requirement of 2 feet in 2020. Freeboard measurements ranged from 2.2 to 5.15 feet for EP-3A and from 2.5 to 5.15 feet for EP-3B.

# 5.0 REGULATORY REQUIREMENTS AND DESIGN CRITERIA

The GRP site is a Title II Uranium Mill Tailings Radiation Control Act (UMTRCA) site licensed by the NRC under NRC License SUA-1471. The site also has a Discharge Permit (DP-200) with the State of New Mexico Environment Department and is a Federal Superfund site on the National Priority List (NPL) with the Environmental Protection Agency (EPA). The EOR is responsible for the geotechnical stability of the tailings and evaporation ponds. The NMOSE changed the status of the evaporation ponds from Low to Significant hazard potential in 2018, requiring the completion of Emergency Action Plans (EAP), Operations & Maintenance (O&M) manuals, dam breach and flood routing analysis. General conditions and applicable design criteria are listed below.

**General Strategy**

- Tailings are enclosed in covered impoundments.
- Water treatment process water is contained on site in a series of lined evaporation ponds.

**Dam Safety and Stability**

- Meet current dam safety standards at time of design and construction per NRC, New Mexico Administrative Code (NMAC), and US Department of Energy (DOE).
- Barrick Tailings and Heap Leach Standards (Barrick, 2016) apply to the current configuration.
- Provide stability under unfavorable conditions caused by seepage, gravitational and earthquake stresses. Calculated Factors of Safety under these conditions to exceed the following NMAC, 2010; NRC, 2003; NRC, 2008; Barrick, 2016; and DOE, 1989 guidelines for the design of ponds or dams:
  - Long-term Static Stability = 1.5
  - End of Construction = 1.3
  - Post-Construction Liner Failure = 1.3
  - Pseudo-static Factor of Safety = 1.1
- NMOSE/NMED guidelines (NMAC, 2010) recommend design for a seismic event return period for water storage dams of approximately 2,500 years for dams classified as significant hazard potential and 5,000 years for dams classified as high hazard potential. From HMC requirements (Barrick, 2016) the seismic event return period for low and high consequence of failure is 2,500 and 5,000 years, respectively.

**Operations and Closure**

- Construction of outer cover slopes is partially completed on the STP without erosion protection and completed with erosion protection for the LTP.
- Regular maintenance is conducted to repair erosional issues.
- Use of erosion protection on outside tailings pile slopes to protect against surface runoff, where required. Drainage ditches are also included to limit surface erosion.
- Integrity of pond liners inspected on a regular basis to prevent loss of containment.

Stantec understands that Barrick is in the process of updating their corporate standards and guidelines for tailings management to align with the Global Industry Standard on Tailings Management (GISTM) released in August 2020

(GTR, 2020). Barrick, as member of the International Council on Mining and Metals, has committed that their tailings impoundments will comply with the GISTM within three years, for sites classified per the GISTM as “Very High” or “Extreme” and within five years for all other sites.

# 6.0 DESIGN AND CONSTRUCTION

## 6.1 SITE GEOLOGY

The site is located in the southeastern part of the Colorado Plateau physiographic province and is mostly on the south flank of the San Juan Basin. This region experienced a minor degree of structural deformation (regional folding and block uplift) associated with formation of the Zuni Uplift, which is characterized by a northwest-trending anticline composed of Precambrian crystalline basement rocks overlain by Permian to Jurassic sedimentary rocks. These sedimentary rocks were uplifted during the Laramide Orogeny near the end of the Late Cretaceous through the Eocene, approximately 80 to 40 million years before present (Arcadis, 2013). Bedrock units at the site consist of the Glorietta Sandstone (Early Permian), San Andres Limestone (Early Permian), and Chinle Formation (Late Triassic). As a result of Laramide deformation, these bedrock units have a shallow northeastern dip direction of approximately 3 to 10 degrees (Kelley, 1967).

The surficial soils underlying the site consist of clay underlain by silty sand to sand with silt to a depth of 7 feet. The clay is low in plasticity, whereas the silty sand was non-plastic (CH2M, 2018). Geologic logs from wells installed on site indicate the alluvium thickness underneath the main area of the site, where the LTP is located, is up to 100 feet thick (CH2M, 2018). The alluvial aquifer consists of discontinuous layers of clay, silt, and sand.

## 6.2 LARGE TAILINGS PILE

The LTP contains an estimated 21 million tons of tailings in two cells. Tailings were discharged into the LTP with cyclone separation. The coarse fraction (mostly sand) was deposited along the embankment crest, and the fine fraction (mostly silt and clay) was deposited within the cells. Process water was recovered by gravity through two decant towers and returned to the mill for re-use. From 1966 until 1990, tailings disposal alternated between the two cells as necessary to maintain optimal operating conditions.

The starter dike for the LTP was constructed with natural soils excavated from within the tailings impoundment area and compacted. The dike was constructed to a height of approximately 10 feet, a width of approximately 10-15 feet at the top, and 25-30 feet at the bottom. The impoundment's perimeter embankment was raised by the centerline method. The LTP includes a series of eight sumps around the perimeter of the pile, connected to a toe drain and French drain that collect tailings seepage.

Interim reclamation of the LTP was completed in 1995. This work consisted of regrading the side slopes to 5:1 (horizontal: vertical) and covering these slopes with 3 feet of compacted radon barrier material (sandy clay) and 8 inches of rock. The top surface of the impoundment was covered with a minimum of 0.5 feet of interim soil cover. Additional interim soil cover has been added over the years to reduce radon emanation in specific areas. Numerous groundwater collection and monitoring wells are installed in the top of the LTP for remediating the underlying alluvial aquifer. The LTP presently covers approximately 170 acres and is approximately 100 feet high.

## 6.3 SMALL TAILINGS PILE

The STP contains an estimated 1.22 million tons of tailings. Tailings deposited within this impoundment were contained entirely by an embankment composed of compacted natural soils. The embankment was compacted and

raised to a height of 20-25 feet. The embankment crest had a minimum 10-foot width and a width of approximately 40 feet at the base. The STP covers approximately 40 acres.

In 1987, HMC committed to contaminated soil cleanup of windblown tailings on site. From 1988 to 1994, the surficial six inches (15 centimeters) of approximately 1,200 acres were excavated, with a portion was placed on the southern sides and top of the STP. EP-1 was constructed on top of the STP in 1990 and all visible tailings slimes were excavated and placed in the south portion of the STP. The pentagon-shaped STP holds EP-1 on the northern two-thirds of the pile and a contaminated soil and debris disposal area on the southern portion of the pile. After the off-pile soil cleanup was completed, the STP was partially reclaimed between 1993 and 1995 per the NRC-approved closure plan (AK Geoconsult, 1991). An average 1-foot thickness of clean borrow material was placed as an interim cover on the southern portion of the STP, outside of EP-1.

## 6.4 EVAPORATION POND 1

EP-1 was built in 1990 on top of the STP to assist in the dewatering of the LTP and to hold and evaporate water pumped from the collection wells of the groundwater restoration plan. The pond design was prepared by AK Geoconsult and submitted to the NRC, NMED and NMOSE in June 1990, with approval granted thereafter (AK Geoconsult, 1990). NRC License Amendment No. 7 of SUA-1471 revised License Condition 35 and granted approval by the NRC for construction and operation of EP-1. Operation of the pond began in November 1990.

Construction and performance testing of the liner was completed in November 1990. AK GeoConsult, Inc., submitted a Certificate of Construction to the NMOSE on December 5, 1990 stating that the evaporation pond construction was complete. A Completion Report for the construction of EP-1 was transmitted to the NRC, NMED and NMOSE by letters dated April 5, 1991. Stantec has not reviewed as-built drawings of EP-1.

EP-1 is lined with a single liner composed of a Deery Oil Liner/fabric, a non-woven fabric impregnated and then overlain with a layer of No. 6 Deery Oil. No. 6 Deery Oil is a petroleum-based asphaltic blend that is applied after being heated to 370 to 400 ºF, and is the same oil commonly used for sealing cracks in road asphalt. The total constructed area of EP-1, including bottom and side slopes, is 26.2 acres, with a capacity of approximately 285 acre-feet, allowing for 2 feet of freeboard. The maximum depth is 15 feet. Currently water can be transferred from EP-1 to EP-2 or EP-3, when necessary.

HMC has performed repairs on the EP-1 liner over time, where holes or tears were identified in sub-aerial portions of the liner. In 2017, significant wear and tear was identified on the liner due to the age of the pond (28 years) beyond its design life expectancy (20 years). Due to this, HMC contracted Stantec to complete a feasibility study to re-line EP-1, which was submitted to NMOSE and NMED for approval in December 2018 (Stantec, 2018). HMC is currently re-evaluating the EP-1 re-lining plan based on new strategy outlined in the Groundwater Corrective Action Program (HMC, 2020).

The pond is currently operating at a reduced capacity due to damage on the liner on the south slope from placing the West Collection Pond sludge in 2020. There is also a hole less than 1-foot in diameter that developed in the liner on the north slope in 2020.

EP-1 is the designated final disposal location for all classified 11.e(2) uranium impacted material on site during final decommissioning and reclamation activities.

## 6.5 EVAPORATION POND 2

EP-2 was designed in 1994 by Bateman Engineering and AK GeoConsult, Inc. and constructed in 1995 by Nielsons, Inc. to increase storage and treatment capacity for contaminated groundwater as part of HMC's ongoing groundwater restoration program. Additional surface storage and evaporation capacity was required to increase contaminated groundwater pumping rates to shorten the overall time required for groundwater restoration. The pond and liner designs were prepared and submitted for approval to the NRC, NMED, and NMOSE. The NRC authorized construction and operation of the evaporation pond per License Amendment 19 and the associated new License Condition 39.

EP-2 is located between the STP on the east and the RO collection ponds on the west. The total constructed area of the evaporation pond, including bottom and side slopes, is approximately 17.5 acres with a maximum storage capacity of approximately 317.4 acre-feet. The maximum depth is 25 feet, and the freeboard requirement is a minimum of 2 feet. The pond has compacted earthen embankments created from the alluvial soil excavated from the pond area. The earthen embankment along the southern side of the pond, at its highest, is 20 feet above native ground surface. Water is transferred from the East Collection Pond to EP-2 and from EP-2 to EP-1 as needed. Water can also be transferred back to EP-2 from EP-1.

A two-part HDPE lining system was installed in the pond with a leak detection/drainage layer between the two HDPE liners. There are five leak detection cells. The HDPE liner consisted of an upper primary liner of 60 mil (0.060 inch) thickness and a secondary liner of 40-mil thickness. All seams were wedge-welded (hot-shoe welded) except for the corner and west tie-in seams. After installation, performance testing identified leak points in the primary liner and repairs were made before the pond was put in service.

HMC notified the NRC and the NMED on November 14, 2017 of identified pumping rates in portions of EP-2 leak detection system were pumping higher than the ALR of 775 gallons per day per acre foot of storage. This ALR is per the NRC License Condition 35D. Also, as per Condition 35D, the pumps are required to be activated whenever water levels within the leak detection sumps rises above one foot of hydraulic head. HMC indicated that, with respect to the exceedances, the secondary liner had remained effective and there was no discharge to the environment. HMC completed an investigation of the leak detection cells in EP-2 which determined that some submersible pumps and/or the hydraulic sensors to control pumping had failed. Replacement pumps and sensors were installed and HMC modified the Standard Operating Procedure (SOP) for the evaporation ponds to include manual water level measurements of the leak detection cells to confirm water levels are remaining below one foot of hydraulic head as per License Condition 35D.

## 6.6 EVAPORATION POND 3

EP-3 was designed by Kleinfelder in October 2006 and approved by the NRC in August 2008 (Kleinfelder, 2006). Construction was completed for EP-3 in November 2010 and it was placed into operation January 2011. EP-3 consists of two cells (A and B) each with an approximate size of 13.3 acres (total of 26.6 acres). The maximum depth of EP-3 is 13.4 feet with a minimum freeboard requirement of 2 feet. The two cells provide a storage capacity of approximately 286 acre-feet for temporary retention and evaporation of contaminated groundwater. The pond is lined with a dual HDPE liner and a HDPE geonet interstitial leak detection system. There are five leak detection systems for Basin A and five systems for Basin B. The primary liner is 60 mils thick and the secondary liner is 40 mils thick.

The NRC-licensed boundary was extended to include EP-3. EP-3 will be decommissioned once site restoration activities are completed and the pond liner and any salts/sediments will be disposed of in the final closure cell of EP-1.

HMC notified the NRC and the NMED on November 14, 2017 of identified pumping rates in portions of EP-3 leak detection system were pumping higher than the ALR of 775 gallons per day per acre-foot of storage. This ALR is per the NRC License Condition 35D. Also, as per Condition 35D, the pumps must be activated whenever water levels within the leak detection sumps rises above one foot of hydraulic head. HMC indicated that, with respect to the exceedances, the secondary liner remained effective and there was no discharge to the environment. HMC completed an investigation of the leak detection cells in EP-3 which determined that some submersible pumps and/or the hydraulic sensors to control pumping failed. Replacement pumps and sensors were installed and HMC modified the SOP for the evaporation ponds to include manual water level measurements of the leak detection cells to confirm water levels remain below 1 foot of hydraulic head as per License Condition 35D.

# 7.0 DAM HAZARD CLASSIFICATION REVIEW

The three evaporation ponds were re-classified by the NMOSE from low hazard to significant hazard in 2018. Due to this reclassification, NMOSE requires HMC to submit a dam breach analysis report, an Operation and Maintenance Manual, and Emergency Action Plan for each pond. HMC submitted these documents for EP-1 and are under review by NMOSE. The documents will be submitted for EP-2 and EP-3 after NMOSE completes review for EP-1. The significant hazard classification for the dams may change dependent upon final NMOSE approval of the dam breach analyses.

The NMOSE recommends that dams classified as significant or high hazard be inspected at least every 5 years by a professional engineer licensed in the state of New Mexico. NMOSE does not specify dam inspection requirements for dams classified as *low*. For dams classified as low or significant, NMOSE requires that the owner re-evaluate the hazard classification if a downstream development occurs. HMC has had dam safety inspections conducted annually by the EOR since 2002.

For the tailings impoundments, HMC requested that Stantec classify the structures in 2020 according to the GISTM (GTR, 2020). The STP and LTP dams were classified as significant hazard based on results of a failure modes and effects workshop Stantec facilitated with HMC and Stantec personnel in October 2020.

# 8.0 RECOMMENDED ACTION ITEMS

The tailings impoundments and three evaporation ponds are generally in stable condition, with the exceptions and recommendations described in the above sections. Table 1 shows recommendations from the 2020 site visit and inspection organized by priority. The timeframes for addressing items within each of the priority designations are:

- **Extreme** - 0 to 3 months
- **High** - 3 to 12 months
- **Medium** - 12 to 18 months
- **Low** - greater than 18 months, or when budgeted

## Table 1. Recommended Action Items

| Action Item No. | Recommendation | Priority | Status |
|---|---|---|---|
| 1 | Continue to operate EP-1 at reduced capacity. The operating water level should be kept at a minimum of 2 feet below the damaged liner area at the south embankment and below the holes in liner at north embankment (i.e., minimum freeboard of 10 feet). | High | 2020 safety inspection recommendation. |
| 2 | Regrade LTP interim cover access road to drain to downdrains in all locations around perimeter to prevent ponding and erosion, specifically between Downdrains 11 and 12 where sinkholes have been recurring. | Medium | 2018 safety inspection recommendation updated in 2019 to specify area between Downdrains 11 and 12. |
| 3 | Fill and compact additional soil over cover rilling on LTP to prevent tailings exposure. Follow existing reclamation plan specifications. | Medium | Recommendation renewed in 2020 for new areas requiring repair. |
| 4 | Continue site-wide rill management and grade control to minimize erosion. | Medium | 2018 safety inspection recommendation updated for 2020. Currently done on an annual basis. |
| 5 | Protect existing settlement monuments on the LTP to prevent equipment damage. Repair monuments damaged in 2020 during LTP well abandonment. | Medium | 2018 safety inspection recommendation updated for 2020 to include repairs to damaged equipment. |
| 6 | Add and compact material to match grade at concrete near inlets for LTP Downdrains to prevent clogging. | Medium | 2019 safety inspection recommendation. |
| 7 | Repair damaged pole that was hit while pulling out APEX unit in EP-3. Stantec recommends HMC use caution during repairs so as not to damage the liner. | Medium | 2020 safety inspection recommendation. |
| 8 | Repair rilling under erosion control blanket on STP north slope. | Medium | 2020 safety inspection recommendation. |
| 9 | Maintain perimeter berms on STP and LTP to prevent concentrated runoff and provide safe vehicle access. | Low | 2018 safety inspection recommendation. |
| 10 | Consider repairs to damaged LDRS piping for EP-2 and EP-3. | Low | 2018 safety inspection recommendation. |

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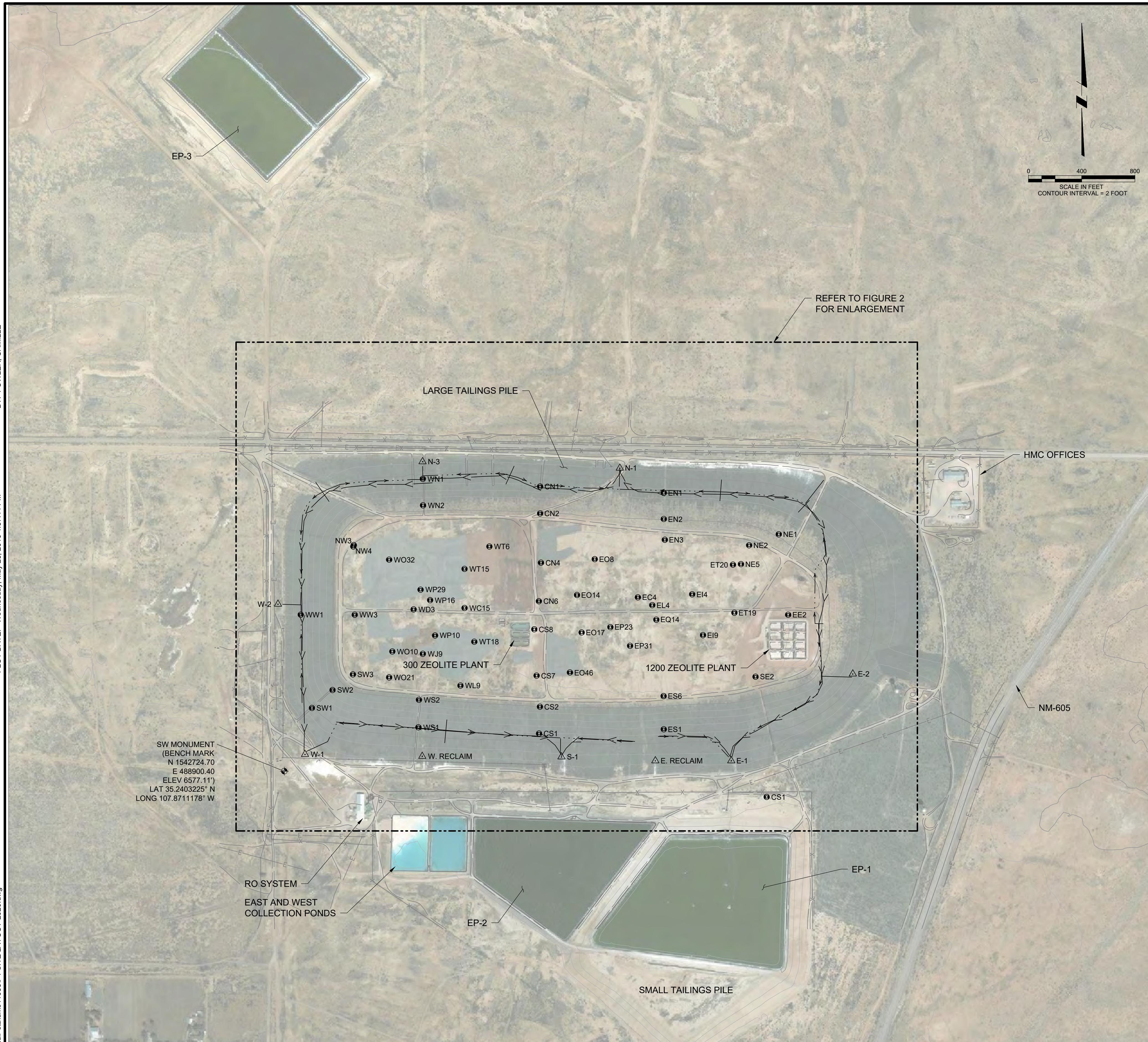
# FIGURES




## LEGEND

- EXISTING GROUND CONTOURS
- EXISTING PIPE
- TOE-DRAIN
- FRENCH DRAIN
- WN2 — SAND AND SLIME WATER LEVEL WELL LOCATION AND IDENTIFICATION
- N-1 — SUMP LOCATION AND IDENTIFICATION

## NOTES

1. EXISTING GROUND SURVEY FROM DECEMBER 12 & 13, 2017. CONTROL RE-ESTABLISHED MAY 23, 2018.
2. COORDINATES ARE REFERENCED TO THE N.M. WEST ZONE STATE PLANE GRID NAD27 AND ADJUSTED TO THE HSMC CONTROL NETWORK.
3. ELEVATIONS ARE REFERENCED TO NGVD29 AND ADJUSTED TO THE HSMC CONTROL NETWORK. ADD 3.25 TO REACH NAVD88.

BY: FOWLER, CAMILLE

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwworkdir-sta\dms41053\F1 SITE LAYOUT-2020.dwg

| REV | DATE | BY | DESCRIPTION |
|---|---|---|---|
| A | 12/20 | CF | ISSUED FOR CLIENT REVIEW |

SCALE: 1" = 400'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED S. DOWNEY

DRAWN C. FOWLER

CHECKED J. CUMBERS

Stantec

HOMESTAKE — Doing it right... ...Right to the end. — Grants Reclamation Project

GRANTS RECLAMATION PROJECT

2020 ANNUAL EOR INSPECTION
SITE LAYOUT

SHEET 1 OF 2

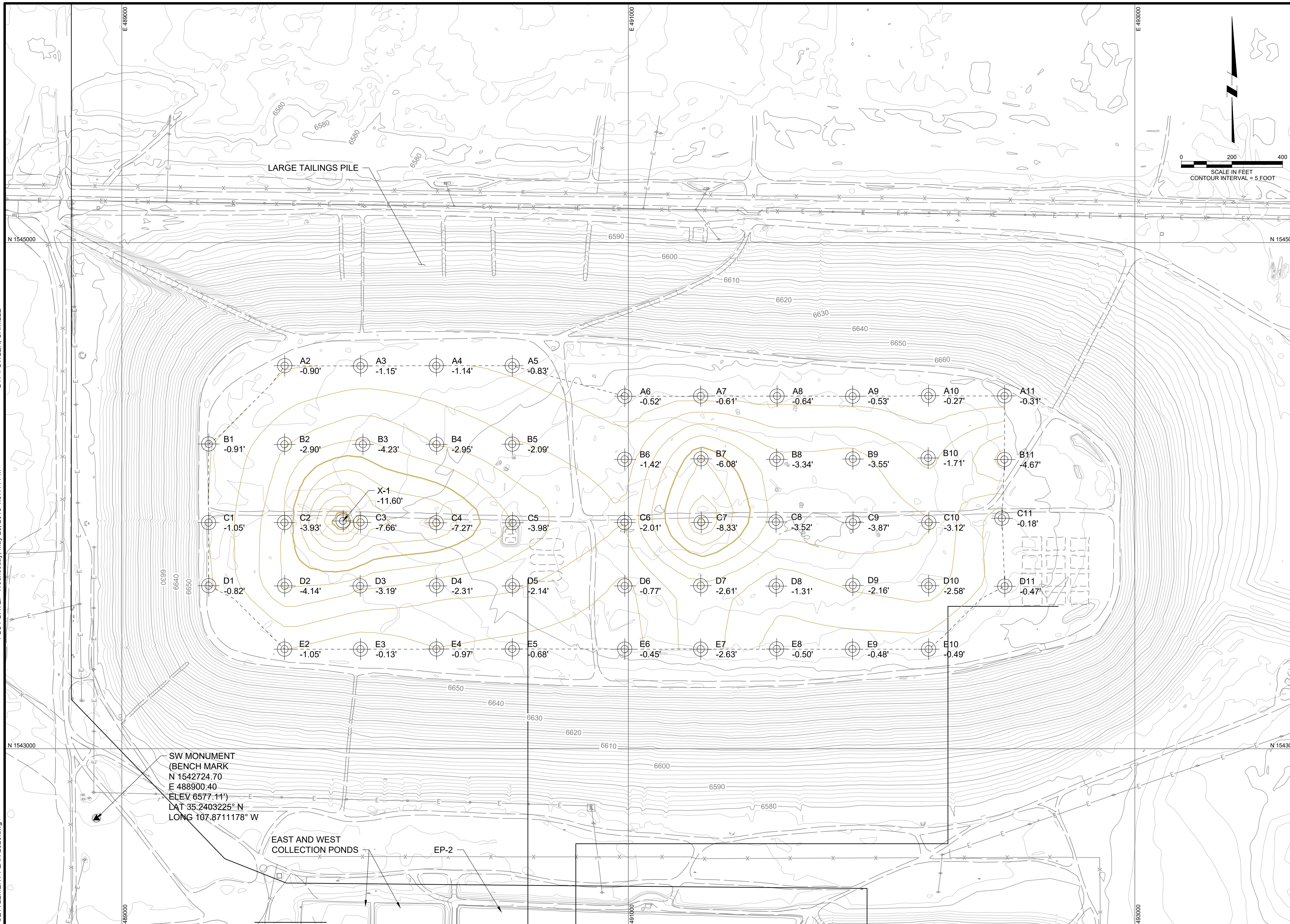
1

233001293

BY: FOWLER, CAMILLE

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwworkdir-sta\dms41053\F2 SETTLEMENT PLAN-2020.dwg




## CUMULATIVE TOTAL SETTLEMENT CONTOURS

## LEGEND

| | |
|---|---|
| 6630 | EXISTING GROUND CONTOURS |
| -1 | CUMULATIVE SETTLEMENT CONTOURS |
| | EXISTING PIPE |
| E | EXISTING POWER LINES |
| X | EXISTING FENCE |
| A1 | SETTLEMENT MONUMENT |
| -0.83' | CUMULATIVE SETTLEMENT IN FEET, FROM 1993 TO 2020 |

## NOTES

1. EXISTING GROUND SURVEY FROM DECEMBER 12 & 13, 2017. CONTROL RE-ESTABLISHED MAY 23, 2018.
2. COORDINATES ARE REFERENCED TO THE N.M. WEST ZONE STATE PLANE GRID NAD27 AND ADJUSTED TO THE HSMC CONTROL NETWORK.
3. ELEVATIONS ARE REFERENCED TO NGVD29 AND ADJUSTED TO THE HSMC CONTROL NETWORK. ADD 3.25 TO REACH NAVD88.

| REV | DATE | BY | DESCRIPTION |
|---|---|---|---|
| A | 12/20 | RW | ISSUED FOR CLIENT REVIEW |

SCALE: 1" = 200'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED S. DOWNEY

DRAWN S. JONES

CHECKED J. CUMBERS

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GRANTS RECLAMATION PROJECT

2020 ANNUAL EOR INSPECTION
CUMULATIVE TOTAL SETTLEMENT CONTOURS

SHEET 2 OF 2

2

233001293

# APPENDICES

# Appendix A SAFETY INSPECTION FORMS

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# TAILINGS SAFETY INSPECTION

Routine Visual Inspection Checklist for Tailings Storage Facility

Facility: Grants Reclamation Project | Structure (circle one): STP [LTP] | Inspection Date: November 20, 2020

Inspector(s): M. Davis | Weather Conditions: Partly Cloudy, 50s° | Ground Conditions: Dry

Reason for Inspection: Annual EOR Inspection | Photos Taken: : ☐ NO ☒ YES

Additional Comments:

## 1. Tailings Top Cover

| Item | N/A | NO | YES | Comment |
|---|---|---|---|---|
| Is the general condition of cover inadequate? | ☐ | ☒ | ☐ | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ | ☒ | ☐ | |
| Evidence of rills, gullies, or other surface erosion? | ☐ | ☐ | ☒ | Rilling on north side of top of pile (see comment) |
| Evidence of animal burrows or damage from wildlife? | ☐ | ☒ | ☐ | |
| Evidence of debris accumulation along the slope? | ☐ | ☒ | ☐ | |
| Vegetation? | ☐ | ☐ | ☒ | limited |

Additional Comments: Rilling (up to 6 inches deep) was present in a few areas on north portions of the LTP top cover surface in the same area where rilling was present in 2020. The 2020 rills were repaired by grading and compaction in August 2020.

## 2. Tailings Crest/Crest Road

| Item | N/A | NO | YES | Comment |
|---|---|---|---|---|
| Is the general condition of crest surface/road inadequate? | ☐ | ☒ | ☐ | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ | ☐ | ☒ | Low spot along road (see comment) |
| Evidence of rills, gullies, or other surface erosion? | ☐ | ☒ | ☐ | |
| Evidence of animal burrows or damage from wildlife? | ☐ | ☒ | ☐ | |
| Evidence of surface cracks? Direction? Offset? | ☐ | ☒ | ☐ | |
| Evidence of lateral movement? | ☐ | ☒ | ☐ | |
| Vegetation? | ☐ | ☒ | ☐ | |

Additional Comments: A low spot between downdrains #11 and #12 is still present, where sinkholes have been recurring. Area will need to be regraded to drain to the downdrains and mitigate recurrence of sinkholes.

## 3. Tailings Side Slopes

Slope protection material: Riprap D50=6 inches; natural vegetation | Uniform or benched slope: Uniform

Slope height: 80 vertical feet | Slope gradient: 5:1

| Item | N/A | NO | YES | Comment |
|---|---|---|---|---|
| Is the general condition of slope protection inadequate? | ☐ | ☒ | ☐ | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ | ☒ | ☐ | Sinkholes observed in 2020 were repaired. |
| Evidence of rills, gullies, or other surface erosion? | ☐ | ☒ | ☐ | |
| Evidence of animal burrows or damage from wildlife? | ☐ | ☐ | ☒ | |
| Evidence of debris accumulation along the slope? | ☐ | ☒ | ☐ | |
| Evidence of seepage? | ☐ | ☐ | ☒ | See comment |

Location(s)? 1. 2. 3. 4.

Measurable flow rate? 1. 2. 3. 4.

Clarity of seepage? 1. ☐ Clear ☐ Muddy 2. ☐ Clear ☐ Muddy 3. ☐ Clear ☐ Muddy 4. ☐ Clear ☐ Muddy

Evidence of wet areas? Location(s)? ☐ N/A ☒ NO ☐ YES

Additional Comments: Windblown sediment present along top of slope, near crest. Precipitate present at toe of north slope and toe of southwest slope. Evidence of seepage where repaired sinkholes had daylighted on the south slope.

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# TAILINGS SAFETY INSPECTION

Routine Visual Inspection Checklist for Tailings Storage Facility

Facility: Grants Reclamation Project Structure (circle one): STP [LTP] Inspection Date: November 20, 2020

## 4. Downdrain Structures

Outlet type: HDPE pipe dissipated by large riprap Other water removal systems: N/A

| | | | | |
|---|---|---|---|---|
| Observed wet areas adjacent to outlet structure? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of displacement or potential disruption of flow in downstream channel? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of debris accumulation or vegetation growth in downstream channel? | ☐ N/A | ☒ NO | ☐ YES | |

Additional Comments:

## 5. Instrumentation

Observed: Piezometers: ☒ NO ☐ YES Monitoring Wells: ☒ NO ☐ YES Inclinometers: ☒ NO ☐ YES

Other/Notes: Settlement monuments, wells, piping, zeolite treatment plants located on LTP top surface

## 6. General Observations and Recommendations

LTP in stable condition during inspection. Recommendation to fix surface water drainage issues near downdrains 11 and 12, where sinkholes have been recurring (2018 inspection recommendation).

Fill and compact additional soil over cover rilling on LTP (2019 inspection recommendation renewed for new areas requiring repair)

Recommend repairing berm at toe of 1200 zeolite facility near where new piping was installed (2018 inspection recommendation).

Add and compact material to match grade at concrete near inlets for LTP downdrains to prevent clogging (2018 inspection recommendation)

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# TAILINGS SAFETY INSPECTION

Routine Visual Inspection Checklist for Tailings Storage Facility

Facility: Grants Reclamation Project | Structure (circle one): [STP] LTP | Inspection Date: November 20, 2020

Inspector(s): M. Davis | Weather Conditions: Partly cloudy, 60- 65° | Ground Conditions: Dry

Reason for Inspection: Annual EOR Inspection | Photos Taken: : ☐ NO ☒ YES

Additional Comments:

## 1. Tailings Top Cover

| | | | | |
|---|---|---|---|---|
| Is the general condition of cover inadequate? | ☐ N/A | ☒ NO | ☐ YES | See comment |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of rills, gullies, or other surface erosion? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of animal burrows or damage from wildlife? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of debris accumulation along the slope? | ☐ N/A | ☒ NO | ☐ YES | |
| Vegetation? | ☐ N/A | ☒ NO | ☐ YES | |

Additional Comments: Evaporation Pond 1 is located on the STP and covers the majority of the STP top surface (see EP-1 DSI Form)

## 2. Tailings Crest/Crest Road

| | | | | |
|---|---|---|---|---|
| Is the general condition of crest surface/road inadequate? | ☐ N/A | ☒ NO | ☐ YES | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of rills, gullies, or other surface erosion? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of animal burrows or damage from wildlife? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of surface cracks? Direction? Offset? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of lateral movement? | ☐ N/A | ☒ NO | ☐ YES | |
| Vegetation? | ☐ N/A | ☒ NO | ☐ YES | |

Additional Comments:

## 3. Tailings Side Slopes

Slope protection material: Sandy clay fill | Uniform or benched slope: Uniform

Slope height: 20 to 25 feet | Slope gradient: 5H:1V

| | | | | |
|---|---|---|---|---|
| Is the general condition of slope protection inadequate? | ☐ N/A | ☒ NO | ☐ YES | No slope protection in place, except north slope |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of rills, gullies, or other surface erosion? | ☐ N/A | ☐ NO | ☒ YES | Rilling present along north side slopes (see comment) |
| Evidence of animal burrows or damage from wildlife? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of debris accumulation along the slope? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of seepage? | ☐ N/A | ☒ NO | ☐ YES | |

Location(s)? 1. 2. 3. 4.

Measurable flow rate? 1. 2. 3. 4.

Clarity of seepage? 1. ☐ Clear ☐ Muddy 2. ☐ Clear ☐ Muddy 3. ☐ Clear ☐ Muddy 4. ☐ Clear ☐ Muddy

Evidence of wet areas? Location(s)? ☐ N/A ☒ NO ☐ YES

Additional Comments: Rilling present under erosion mat on north embankment. Windblown salts observed on the west and north outslopes, as well as in some areas near the south toe of the STP.

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# TAILINGS SAFETY INSPECTION

## Routine Visual Inspection Checklist for Tailings Storage Facility

Facility: Grants Reclamation Project Structure (circle one): [STP] LTP Inspection Date: November 20, 2020

### 4. Downdrain Structures

Outlet type: HDPE pipe dissipated by large riprap Other water removal systems: ______

Observed wet areas adjacent to outlet structure? ☐ N/A ☒ NO ☐ YES

Evidence of displacement or potential disruption of flow in downstream channel? ☐ N/A ☒ NO ☐ YES

Evidence of debris accumulation or vegetation growth in downstream channel? ☐ N/A ☒ NO ☐ YES

Additional Comments: ______

### 5. Instrumentation

Observed: Piezometers: ☒ NO ☐ YES Monitoring Wells: ☒ NO ☐ YES Inclinometers: ☒ NO ☐ YES

Other/Notes: ______

### 6. General Observations and Recommendations

Rill maintenance was conducted in August 2020.

HMC has started a new trash pit on the south triangle area to the west of the previous location.

# DAM SAFETY INSPECTION

Routine Visual Inspection Checklist for Embankment Dam

Facility: Grants Reclamation Project Structure: EP-1 Inspection Date: November 20, 2020

Inspector(s): M. Davis Weather Conditions: Partly cloudy, 60-65° Ground Conditions: Dry

Reason for Inspection: Annual EOR Inspection Photos Taken: : ☐ NO ☒ YES

Additional Comments: Single-lined pond

## 1. Upstream Slopes of Pond Embankments

Slope protection material: Liner Uniform or benched slope: Uniform

Slope height: 15-20 feet Slope gradient: 4H:1V, 10H:1V (north embankment)

| | | | | |
|---|---|---|---|---|
| Is the general condition of slope protection inadequate? | ☐ N/A | ☐ NO | ☒ YES | Tears/holes in liner (see comments) |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☐ NO | ☒ YES | Sloughing and benching |
| Evidence of rills, gullies, or other surface erosion? | ☐ N/A | ☐ NO | ☒ YES | Sloughing under liner on NE and SE corners |
| Evidence of animal burrows or damage from wildlife? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of debris accumulation along the slope? | ☐ N/A | ☐ NO | ☒ YES | Salts at and above water elevation |
| Evidence of operational activity in upstream area? | ☐ N/A | ☐ NO | ☒ YES | Evaporators in operation |
| Vegetation? | ☐ N/A | ☒ NO | ☐ YES | |

Additional Comments: EP-1 currently operating at reduced capacity due to damage on liner on south embankment from placement of WCP sludge and from tear in liner on north embankment.

## 2. Pond Crest/Crest Road

Dam crest surface material: Road base, 1” minus gravel Crest width: 10-25 feet Safety berms: No

| | | | | |
|---|---|---|---|---|
| Dam constructed in stages? | ☐ N/A | ☒ NO | ☐ YES | |
| Is the general condition of crest surface inadequate? | ☐ N/A | ☒ NO | ☐ YES | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of rills, gullies, or other surface erosion? | ☐ N/A | ☐ NO | ☒ YES | Rilling on north crest |
| Evidence of animal burrows or damage from wildlife? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of surface cracks? Direction? Offset? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of lateral movement? | ☐ N/A | ☒ NO | ☐ YES | |
| Vegetation? | ☐ N/A | ☒ NO | ☐ YES | |

Additional Comments: Rilling at north crest and eroding through safety berm, continuing down slope

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# DAM SAFETY INSPECTION

Facility: Grants Reclamation Project Structure: EP-1 Inspection Date: November 20, 2020

## 3. Downstream Slopes of Pond Embankments

Slope protection material: Sandy clean fill Uniform or benched slope: Uniform

Slope height: 20-25 feet Slope gradient: 5H:1V

Is the general condition of slope protection inadequate? ☐ N/A ☒ NO ☐ YES

Observed sinkholes, depressions, or unusual settlement? ☐ N/A ☒ NO ☐ YES

Evidence of rills, gullies, or other surface erosion? ☐ N/A ☐ NO ☒ YES Rilling present on north DS slope (see comment)

Evidence of animal burrows or damage from wildlife? ☐ N/A ☒ NO ☐ YES

Evidence of debris accumulation along the slope? ☐ N/A ☒ NO ☐ YES

Evidence of operational activity in downstream area? ☐ N/A ☒ NO ☐ YES

Evidence of seepage? ☐ N/A ☒ NO ☐ YES

Location(s)? 1. 2. 3. 4.

Measurable flow rate? 1. 2. 3. 4.

Clarity of seepage? 1. ☐ Clear ☐ Muddy 2. ☐ Clear ☐ Muddy 3. ☐ Clear ☐ Muddy 4. ☐ Clear ☐ Muddy

Evidence of wet areas? Location(s)? ☐ N/A ☒ NO ☐ YES

Additional Comments: Rilling present under erosion mat on downstream slope of north embankment

## 4. Instrumentation

Observed: LDRS Sump Pumps: ☒ NO ☐ YES Staff Gauge: ☒ NO ☐ YES

Other/Notes:

## 5. General Observations and Recommendations

Stantec

# DAM SAFETY INSPECTION

Routine Visual Inspection Checklist for Embankment Dam

Facility: Grants Reclamation Project Structure: EP-2 Inspection Date: November 20, 2020

Inspector(s): M. Davis Weather Conditions: Partly cloudy 60-65° Ground Conditions: Dry

Reason for Inspection: Annual EOR Inspection Photos Taken: : ☐ NO ☒ YES

Additional Comments:

## 1. Upstream Slopes of Pond Embankments

Slope protection material: HDPE Liner Uniform or benched slope: Uniform

Slope height: 25 feet Slope gradient: 3H:1V; 5H:1V (east embankment)

| | | | | |
|---|---|---|---|---|
| Is the general condition of slope protection inadequate? | ☐ N/A | ☒ NO | ☐ YES | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of rills, gullies, or other surface erosion? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of animal burrows or damage from wildlife? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of debris accumulation along the slope? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of operational activity in upstream area? | ☐ N/A | ☒ NO | ☐ YES | |
| Vegetation? | ☐ N/A | ☒ NO | ☐ YES | |

Additional Comments:

## 2. Pond Crest/Crest Road

Dam crest surface material: Road base, 1" minus gravel Crest width: 15-20 feet* Safety berms: No

| | | | | |
|---|---|---|---|---|
| Dam constructed in stages? | ☐ N/A | ☒ NO | ☐ YES | |
| Is the general condition of crest surface inadequate? | ☐ N/A | ☒ NO | ☐ YES | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of rills, gullies, or other surface erosion? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of animal burrows or damage from wildlife? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of surface cracks? Direction? Offset? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of lateral movement? | ☐ N/A | ☒ NO | ☐ YES | |
| Vegetation? | ☐ N/A | ☒ NO | ☐ YES | |

Additional Comments: *Crest width is 20 feet on the east embankment (shared with EP-1) and 15 feet on the other embankments.

Stantec

# DAM SAFETY INSPECTION

Facility: Grants Reclamation Project Structure: EP-2 Inspection Date: November 20, 2020

## 3. Downstream Slopes of Pond Embankments

Slope protection material: 2-inch gravel (basalt) Uniform or benched slope: Uniform

Slope height: Varies ~7 ft to 19 ft Slope gradient: 3H:1V

Is the general condition of slope protection inadequate? ☐ N/A ☒ NO ☐ YES

Observed sinkholes, depressions, or unusual settlement? ☐ N/A ☒ NO ☐ YES

Evidence of rills, gullies, or other surface erosion? ☐ N/A ☒ NO ☐ YES

Evidence of animal burrows or damage from wildlife? ☐ N/A ☒ NO ☐ YES

Evidence of debris accumulation along the slope? ☐ N/A ☒ NO ☐ YES

Evidence of operational activity in downstream area? ☐ N/A ☒ NO ☐ YES

Evidence of seepage? ☐ N/A ☒ NO ☐ YES

Location(s)? 1. 2. 3. 4.

Measurable flow rate? 1. 2. 3. 4.

Clarity of seepage? 1. ☐ Clear ☐ Muddy 2. ☐ Clear ☐ Muddy 3. ☐ Clear ☐ Muddy 4. ☐ Clear ☐ Muddy

Evidence of wet areas? Location(s)? ☐ N/A ☒ NO ☐ YES

Additional Comments:

## 4. Instrumentation

Observed: LDRS Sump Pumps: ☐ NO ☒ YES Staff Gauge: ☐ NO ☒ YES

Other/Notes:

## 5. General Observations and Recommendations

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# DAM SAFETY INSPECTION

Routine Visual Inspection Checklist for Embankment Dam

Facility: Grants Reclamation Project  Structure: EP-3  Inspection Date: November 20, 2020

Inspector(s): M. Davis  Weather Conditions: Partly cloudy, 50s°  Ground Conditions: Dry

Reason for Inspection: Annual EOR Inspection  Photos Taken: : ☐ NO ☒ YES

Additional Comments: Double-lined HDPE pond

## 1. Upstream Slopes of Pond Embankments

Slope protection material: HDPE Liner  Uniform or benched slope: Uniform

Slope height: 14 feet  Slope gradient: 3H:1V

| | | | | |
|---|---|---|---|---|
| Is the general condition of slope protection inadequate? | ☐ N/A | ☒ NO | ☐ YES | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of rills, gullies, or other surface erosion? | ☒ N/A | ☐ NO | ☐ YES | |
| Evidence of animal burrows or damage from wildlife? | ☒ N/A | ☐ NO | ☐ YES | |
| Evidence of debris accumulation along the slope? | ☒ N/A | ☐ NO | ☐ YES | |
| Evidence of operational activity in upstream area? | ☐ N/A | ☐ NO | ☒ YES | Salt deposition, generally on East half |
| Vegetation? | ☒ N/A | ☐ NO | ☐ YES | |

Additional Comments:

## 2. Pond Crest/Crest Road

Dam crest surface material: Road base, 1” minus gravel  Crest width: 15 ft  Safety berms: No

| | | | | |
|---|---|---|---|---|
| Dam constructed in stages? | ☐ N/A | ☒ NO | ☐ YES | |
| Is the general condition of crest surface inadequate? | ☐ N/A | ☒ NO | ☐ YES | |
| Observed sinkholes, depressions, or unusual settlement? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of rills, gullies, or other surface erosion? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of animal burrows or damage from wildlife? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of surface cracks? Direction? Offset? | ☐ N/A | ☒ NO | ☐ YES | |
| Evidence of lateral movement? | ☐ N/A | ☒ NO | ☐ YES | |
| Vegetation? | ☐ N/A | ☒ NO | ☐ YES | |

Additional Comments: Crest width between two cells in pond is approximately 10 feet.

Stantec

# DAM SAFETY INSPECTION

Facility: Grants Reclamation Project     Structure: EP-3     Inspection Date: November 20, 2020

## 3. Downstream Slopes of Pond Embankments

Slope protection material: None     Uniform or benched slope: Uniform

Slope height: ~10 feet     Slope gradient: 5H:1V

Is the general condition of slope protection inadequate? ☒ N/A ☐ NO ☐ YES

Observed sinkholes, depressions, or unusual settlement? ☐ N/A ☒ NO ☐ YES

Evidence of rills, gullies, or other surface erosion? ☐ N/A ☒ NO ☐ YES See additional comments.

Evidence of animal burrows or damage from wildlife? ☐ N/A ☒ NO ☐ YES

Evidence of debris accumulation along the slope? ☐ N/A ☒ NO ☐ YES

Evidence of operational activity in downstream area? ☐ N/A ☒ NO ☐ YES

Evidence of seepage? ☐ N/A ☒ NO ☐ YES

Location(s)? 1. 2. 3. 4.

Measurable flow rate? 1. 2. 3. 4.

Clarity of seepage? 1. ☐ Clear ☐ Muddy 2. ☐ Clear ☐ Muddy 3. ☐ Clear ☐ Muddy 4. ☐ Clear ☐ Muddy

Evidence of wet areas? Location(s)? ☐ N/A ☒ NO ☐ YES

Additional Comments: Downstream slopes were graded for rill management in August 2020.

## 4. Instrumentation

Observed: LDRS Sump Pumps: ☐ NO ☒ YES     Staff Gauge: ☐ NO ☒ YES

Other/Notes:

## 5. General Observations and Recommendations

Metal pole (bollard) near the northeast corner had been damaged while HMC was removing an evaporator unit from the pond for maintenance. Stantec recommended that HMC use caution during repairs so as not to damage or get too close to the liner.

# Appendix B PHOTO LOG

**Photo 1: LTP, downstream toe along north side slope (looking west)**

**Photo 2: LTP, precipitate build up along downstream toe of north side slope**

**Photo 3: LTP, downdrain outlet on north side slope**


**Photo 4: LTP, French drain/sump system at downstream toe of north side slope**

**Photo 5: LTP, east slope where diversion levee ties in to LTP**

**Photo 6: LTP, precipitate on southwest slope of the LTP**

**Photo 7: LTP, precipitate buildup on southwest toe and road between LTP and RO plant**

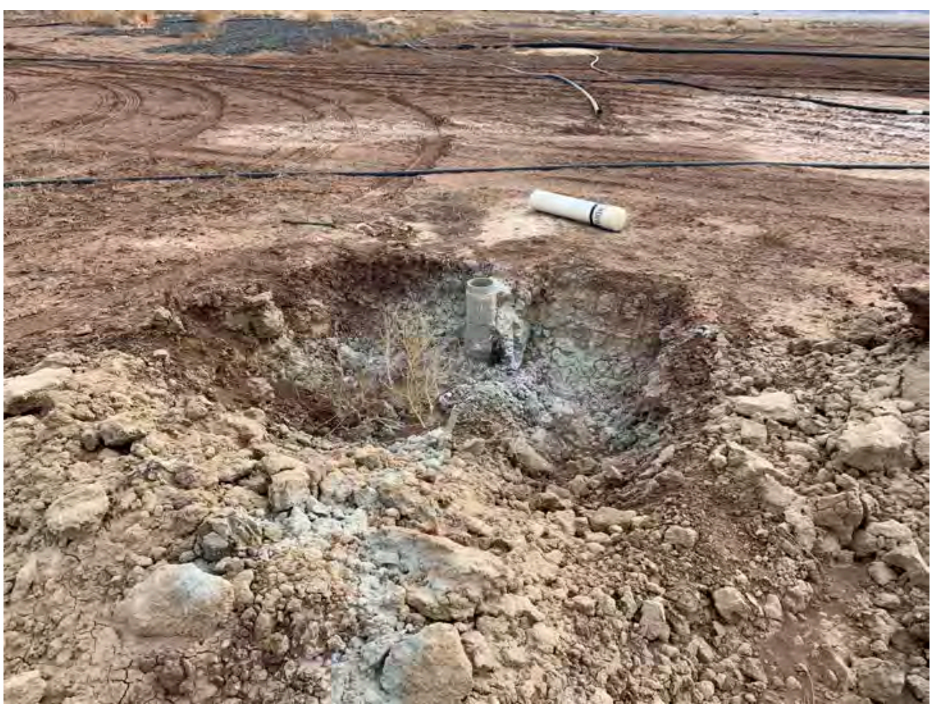


**Photo 8: LTP, well abandonment on top surface**


**Photo 9: LTP, current dry conditions of downdrains 5 and 6**

**Photo 10: LTP, crest road of south side slope**

**Photo 11: LTP, berm constructed to help divert stormwater on LTP top surface at the north side of road**

**Photo 12: LTP, top surface of regraded area near south slope crest road**

**Photo 13: LTP, zeolite 1200 piping and berm**

**Photo 14: LTP, scour or damage to top surface interim cover**

**Photo 15: EP-1, precipitate buildup on slopes, operating at reduced capacity (looking north)**

**Photo 16: EP-1, precipitate buildup on southwest corner, looking northwest**

**Photo 17: EP-1, erosion mat on north embankment, rilling present under mat**

**Photo 18: EP-1, erosion mat on the north embankment downslope**

**Photo 19: EP-1, downstream slopes of STP/EP-1 after annual regrading**

**Photo 20: STP/EP-1, drainage feature on the southwest corner**

**Photo 21: STP/EP-1, toe of slope along the east embankment**

**Photo 22: STP/EP-1, south triangle area, looking east**

**Photo 23: EP-1, north crest of EP-1, looking east**

**Photo 24: EP-1, general conditions of downstream slope after annual regrading**

**Photo 25: EP-1/EP-2, crest road between EP-1 and EP-2**

**Photo 26: EP-2, general conditions of EP-2 liner and crest**

**Photo 27: EP-2, evaporators in operation, looking west towards RO plant**

**Photo 28: EP-2, general conditions, precipitate on northwest corner**

**Photo 29: EP-3, general conditions of downstream slope after annual regrading**

**Photo 30: EP-3, general conditions of downstream slope after annual regrading**

**Photo 31: EP-3, general conditions of pond and liner**

**Photo 32: EP-3, evaporator unit pulled out of EP-3 with precipitate buildup**

**Photo 33: EP-3, general conditions of crest road and liner**

**Photo 34: EP-3, damaged pole at northeast corner**

# Appendix C LTP SETTLEMENT DATA AND PLOTS

| Date | 10/23/1993 | 10/23/1993 | 10/24/1993 | 10/31/1993 | 11/8/1993 | 11/15/1993 | 11/18/1993 | 11/20/1993 | 11/22/1993 | 11/28/1993 | 12/5/1993 | 12/12/1993 | 12/20/1993 | 12/26/1993 | 1/3/1994 | 1/11/1994 | 1/17/1994 | 1/24/1994 | 2/8/1994 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A2** | 6657.15 | | 6657.15 | 6657.16 | 6657.11 | 6657.12 | 6657.15 | 6657.15 | 6657.16 | 6657.17 | 6657.16 | 6657.11 | 6657.17 | 6657.15 | 6657.13 | 6657.13 | 6657.02 | 6657.07 | 6657.09 |
| **A3** | 6657.80 | | 6657.80 | 6657.67 | 6657.63 | 6657.62 | 6657.80 | 6657.64 | 6657.66 | 6657.66 | 6657.64 | 6657.60 | 6657.65 | 6657.70 | 6657.60 | 6657.58 | 6657.67 | 6657.54 | 6657.54 |
| **A4** | 6658.06 | | 6658.06 | 6657.96 | 6657.93 | 6657.93 | 6657.88 | 6658.06 | 6658.13 | 6658.01 | 6657.96 | 6657.91 | 6658.00 | 6657.97 | 6657.94 | 6657.93 | 6658.02 | 6657.86 | 6657.90 |
| **A5** | 6659.67 | | 6659.67 | 6659.57 | 6659.55 | 6659.55 | 6659.67 | 6659.67 | 6659.59 | 6659.63 | 6659.58 | 6659.53 | 6659.72 | 6659.60 | 6659.57 | 6659.56 | 6659.64 | 6659.50 | 6659.53 |
| **A6** | 6665.79 | | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.79 | 6665.84 | 6665.71 | 6665.72 |
| **A7** | 6666.18 | | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 | 6666.18 |
| **A8** | 6666.68 | | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 | 6666.68 |
| **A9** | 6666.41 | | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 | 6666.41 |
| **A10** | 6666.16 | | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 | 6666.16 |
| **A11** | 6663.97 | | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 | 6663.97 |
| **B1** | 6656.99 | | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 |
| **B2** | 6660.66 | | 6660.66 | 6660.66 | 6660.66 | 6660.66 | 6660.66 | 6660.66 | 6660.62 | 6660.60 | 6660.55 | 6660.48 | 6660.40 | 6660.32 | 6660.23 | 6660.15 | 6660.22 | 6660.05 | 6660.01 |
| **B3** | 6663.21 | | 6663.21 | 6663.21 | 6663.21 | 6663.21 | 6663.21 | 6663.21 | 6663.17 | 6663.11 | 6662.99 | 6662.87 | 6662.82 | 6662.67 | 6662.50 | 6662.34 | 6662.47 | 6662.18 | 6661.97 |
| **B4** | 6664.78 | | 6664.78 | 6664.78 | 6664.78 | 6664.78 | 6664.78 | 6664.78 | 6664.75 | 6664.70 | 6664.60 | 6664.66 | 6664.64 | 6664.52 | 6664.34 | 6664.21 | 6664.19 | 6663.90 | 6663.78 |
| **B5** | 6666.77 | | 6666.77 | 6666.68 | 6666.63 | 6666.63 | 6666.77 | 6666.77 | 6666.69 | 6666.67 | 6666.60 | 6666.48 | 6666.51 | 6666.45 | 6666.27 | 6666.16 | 6666.13 | 6665.93 | 6665.89 |
| **B6** | 6669.34 | | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.34 | 6669.40 | 6669.26 | 6669.27 |
| **B7** | 6673.15 | | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 |
| **B8** | 6671.24 | | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 | 6671.24 |
| **B9** | 6671.79 | | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 | 6671.79 |
| **B10** | 6671.75 | | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 | 6671.75 |
| **B11** | 6666.00 | | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 | 6666.00 |
| **C1** | 6657.40 | | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 |
| **C2** | 6663.53 | | 6663.53 | 6663.53 | 6663.53 | 6663.53 | 6663.53 | 6663.53 | 6663.51 | 6663.46 | 6663.34 | 6663.28 | 6663.13 | 6662.90 | 6662.85 | 6662.69 | 6662.62 | 6662.54 | 6662.40 |
| **C3** | 6671.82 | | 6671.82 | 6671.82 | 6671.82 | 6671.82 | 6671.82 | 6671.82 | 6671.82 | 6671.82 | 6671.60 | 6671.45 | 6671.43 | 6671.31 | 6671.18 | 6671.04 | 6671.10 | 6670.84 | 6670.63 |
| **C4** | 6671.49 | | 6671.49 | 6671.49 | 6671.49 | 6671.49 | 6671.49 | 6671.49 | 6671.47 | 6671.39 | 6671.25 | 6671.32 | 6671.34 | 6671.18 | 6670.99 | 6670.85 | 6670.85 | 6670.62 | 6670.37 |
| **C5** | 6674.67 | | 6674.67 | 6674.53 | 6674.44 | 6674.40 | 6674.67 | 6674.67 | 6674.43 | 6674.35 | 6674.23 | 6673.99 | 6673.94 | 6673.80 | 6673.59 | 6673.37 | 6673.30 | 6673.08 | 6672.90 |
| **C6** | 6672.27 | | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.27 | 6672.78 | 6672.60 | 6672.54 |
| **C7** | 6676.13 | | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 | 6676.13 |
| **C8** | 6675.39 | | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 | 6675.39 |
| **C9** | 6674.67 | | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 | 6674.67 |
| **C10** | 6675.00 | | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 | 6675.00 |
| **C11** | 6666.81 | | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 | 6666.81 |
| **D1** | 6658.78 | | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 |
| **D2** | 6659.19 | | 6659.19 | 6659.19 | 6659.19 | 6659.19 | 6659.19 | 6659.19 | 6659.18 | 6659.16 | 6659.08 | 6659.05 | 6659.00 | 6658.96 | 6658.89 | 6658.80 | 6658.76 | 6658.73 | 6658.70 |
| **D3** | 6661.70 | | 6661.70 | 6661.70 | 6661.70 | 6661.70 | 6661.70 | 6661.70 | 6661.70 | 6661.70 | 6661.58 | 6661.50 | 6661.49 | 6661.38 | 6661.24 | 6661.16 | 6661.23 | 6660.99 | 6660.78 |
| **D4** | 6662.82 | | 6662.82 | 6662.82 | 6662.82 | 6662.82 | 6662.82 | 6662.82 | 6662.82 | 6662.79 | 6662.71 | 6662.83 | 6662.93 | 6662.80 | 6662.67 | 6662.58 | 6662.62 | 6662.45 | 6662.33 |
| **D5** | 6666.53 | | 6666.53 | 6666.42 | 6666.36 | 6666.35 | 6666.53 | 6666.53 | 6666.39 | 6666.36 | 6666.34 | 6666.26 | 6666.33 | 6666.23 | 6666.11 | 6665.99 | 6666.05 | 6665.89 | 6665.77 |
| **D6** | 6669.14 | | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.14 | 6669.24 | 6669.06 | 6669.11 |
| **D7** | 6670.18 | | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 | 6670.18 |
| **D8** | 6670.97 | | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 | 6670.97 |
| **D9** | 6670.62 | | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 | 6670.62 |
| **D10** | 6670.78 | | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 | 6670.78 |
| **D11** | 6665.66 | | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 |
| **E2** | 6657.57 | | 6657.57 | 6657.57 | 6657.57 | 6657.57 | 6657.57 | 6657.57 | 6657.53 | 6657.62 | 6657.54 | 6657.51 | 6657.52 | 6657.55 | 6657.52 | 6657.50 | 6657.51 | 6657.47 | 6657.48 |
| **E3** | 6657.82 | | 6657.82 | 6657.82 | 6657.82 | 6657.82 | 6657.82 | 6657.82 | 6657.80 | 6657.87 | 6657.80 | 6657.82 | 6657.79 | 6657.82 | 6657.80 | 6657.80 | 6657.88 | 6657.78 | 6657.76 |
| **E4** | 6656.50 | | 6656.50 | 6656.46 | 6656.42 | 6656.40 | 6656.46 | 6656.50 | 6656.44 | 6656.48 | 6656.42 | 6656.38 | 6656.51 | 6656.44 | 6656.42 | 6656.42 | 6656.51 | 6656.40 | 6656.37 |
| **E5** | 6661.16 | | 6661.16 | 6661.08 | 6661.04 | 6661.05 | 6661.16 | 6661.16 | 6661.10 | 6661.12 | 6661.07 | 6661.03 | 6661.15 | 6661.07 | 6661.06 | 6661.05 | 6661.16 | 6661.07 | 6661.02 |
| **E6** | 6665.05 | | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.05 | 6665.14 | 6664.99 | 6665.01 |
| **E7** | 6666.84 | | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 | 6666.84 |
| **E8** | 6666.20 | | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 | 6666.20 |
| **E9** | 6665.53 | | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 | 6665.53 |
| **E10** | 6665.93 | | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 | 6665.93 |
| **X-1** | 6673.16 | 6673.16 | 6673.16 | 6673.16 | 6673.16 | 6673.16 | 6673.16 | 6673.16 | 6673.16 | 6673.16 | 6673.16 | 6672.70 | 6672.43 | 6672.32 | 6672.16 | 6671.98 | 6671.90 | 6671.99 | 6671.69 |

| Date | 2/12/1994 | 2/21/1994 | 2/28/1994 | 3/8/1994 | 3/20/1994 | 4/8/1994 | 4/19/1994 | 5/3/1994 | 5/15/1994 | 6/7/1994 | 6/28/1994 | 7/11/1994 | 8/2/1994 | 8/16/1994 | 9/12/1994 | 10/1/1994 | 10/22/1994 | 11/12/1994 | 12/6/1994 | 12/26/1994 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A2 | 6657.15 | 6657.09 | 6657.10 | 6657.09 | 6657.06 | 6657.05 | 6657.05 | 6657.03 | 6657.03 | 6656.93 | 6656.99 | 6657.03 | 6657.03 | 6657.03 | 6657.04 | 6657.03 | 6657.03 | 6657.02 | 6656.98 | 6657.00 |
| A3 | 6657.80 | 6657.53 | 6657.54 | 6657.55 | 6657.53 | 6657.49 | 6657.48 | 6657.46 | 6657.45 | 6657.46 | 6657.40 | 6657.45 | 6657.44 | 6657.45 | 6657.45 | 6657.43 | 6657.43 | 6657.42 | 6657.37 | 6657.41 |
| A4 | 6658.06 | 6657.89 | 6657.92 | 6657.89 | 6657.86 | 6657.87 | 6657.87 | 6657.85 | 6657.85 | 6657.85 | 6657.80 | 6657.83 | 6657.83 | 6657.84 | 6657.85 | 6657.84 | 6657.83 | 6657.83 | 6657.77 | 6657.80 |
| A5 | 6659.67 | 6659.50 | 6659.52 | 6659.50 | 6659.49 | 6659.52 | 6659.51 | 6659.61 | 6659.50 | 6659.50 | 6659.46 | 6659.29 | 6659.30 | 6659.34 | 6659.34 | 6659.33 | 6659.33 | 6659.32 | 6659.31 | 6659.29 |
| A6 | 6665.79 | 6665.70 | 6665.71 | 6665.71 | 6665.70 | 6665.73 | 6665.72 | 6665.83 | 6665.72 | 6665.72 | 6665.67 | 6665.71 | 6665.70 | 6665.70 | 6665.69 | 6665.70 | 6665.70 | 6665.70 | 6665.70 | 6665.67 |
| A7 | 6666.18 | 6666.25 | 6666.26 | 6666.25 | 6666.23 | 6666.25 | 6666.24 | 6666.35 | 6666.24 | 6666.23 | 6666.20 | 6666.22 | 6666.18 | 6666.18 | 6666.19 | 6666.18 | 6666.18 | 6666.18 | 6666.20 | 6666.12 |
| A8 | 6666.68 | 6666.68 | 6666.73 | 6666.71 | 6666.71 | 6666.78 | 6666.77 | 6666.87 | 6666.76 | 6666.75 | 6666.71 | 6666.74 | 6666.68 | 6666.69 | 6666.70 | 6666.69 | 6666.69 | 6666.68 | 6666.73 | 6666.62 |
| A9 | 6666.41 | 6666.45 | 6666.49 | 6666.41 | 6666.50 | 6666.52 | 6666.55 | 6666.65 | 6666.53 | 6666.53 | 6666.50 | 6666.50 | 6666.50 | 6666.45 | 6666.46 | 6666.45 | 6666.44 | 6666.44 | 6666.48 | 6666.45 |
| A10 | 6666.16 | 6666.39 | 6666.43 | 6666.40 | 6666.43 | 6666.49 | 6666.55 | 6666.64 | 6666.52 | 6666.52 | 6666.48 | 6666.50 | 6666.54 | 6666.47 | 6666.50 | 6666.49 | 6666.46 | 6666.46 | 6666.50 | 6666.48 |
| A11 | 6663.97 | 6663.90 | 6663.95 | 6663.96 | 6663.96 | 6664.00 | 6663.99 | 6664.08 | 6663.97 | 6663.97 | 6663.94 | 6664.08 | 6664.10 | 6664.08 | 6664.11 | 6664.10 | 6664.07 | 6664.07 | 6664.07 | 6664.08 |
| B1 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 |
| B2 | 6660.66 | 6659.95 | 6659.94 | 6659.91 | 6659.87 | 6659.78 | 6659.73 | 6659.67 | 6659.62 | 6659.59 | 6659.49 | 6659.49 | 6659.47 | 6659.47 | 6659.40 | 6659.38 | 6659.38 | 6659.32 | 6659.28 | 6659.28 |
| B3 | 6663.21 | 6661.80 | 6661.75 | 6661.62 | 6661.49 | 6661.26 | 6661.16 | 6661.12 | 6660.85 | 6660.73 | 6660.57 | 6660.55 | 6660.48 | 6660.43 | 6660.37 | 6660.33 | 6660.26 | 6660.22 | 6660.12 | 6660.13 |
| B4 | 6664.78 | 6663.66 | 6663.65 | 6663.57 | 6663.48 | 6663.40 | 6663.35 | 6663.29 | 6663.24 | 6663.19 | 6663.10 | 6663.10 | 6663.08 | 6663.05 | 6663.03 | 6663.02 | 6662.97 | 6662.96 | 6662.91 | 6662.93 |
| B5 | 6666.77 | 6665.82 | 6665.81 | 6665.80 | 6665.77 | 6665.75 | 6665.72 | 6665.81 | 6665.67 | 6665.65 | 6665.57 | 6665.63 | 6665.63 | 6665.64 | 6665.61 | 6665.61 | 6665.59 | 6665.58 | 6665.59 | 6665.54 |
| B6 | 6669.34 | 6669.25 | 6669.27 | 6669.23 | 6669.24 | 6669.57 | 6669.51 | 6669.65 | 6669.49 | 6669.47 | 6669.40 | 6669.47 | 6669.42 | 6669.39 | 6669.39 | 6669.36 | 6669.35 | 6669.34 | 6669.34 | 6669.32 |
| B7 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6673.15 | 6674.09 | 6673.88 | 6673.75 | 6673.62 | 6673.59 | 6673.51 | 6673.46 | 6673.39 | 6673.38 | 6673.28 | 6673.24 | 6673.23 | 6673.10 |
| B8 | 6671.24 | 6671.20 | 6671.13 | 6671.06 | 6670.99 | 6670.89 | 6670.82 | 6670.86 | 6670.57 | 6670.35 | 6670.43 | 6670.40 | 6670.27 | 6670.23 | 6670.17 | 6670.14 | 6670.05 | 6669.99 | 6669.99 | 6669.85 |
| B9 | 6671.79 | 6671.61 | 6671.55 | 6672.17 | 6671.33 | 6671.23 | 6671.23 | 6671.31 | 6671.11 | 6670.97 | 6670.84 | 6670.79 | 6670.72 | 6670.60 | 6670.51 | 6670.49 | 6670.37 | 6670.30 | 6670.29 | 6670.22 |
| B10 | 6671.75 | 6671.72 | 6671.70 | 6671.67 | 6671.64 | 6671.62 | 6670.74 | 6672.16 | 6671.55 | 6671.42 | 6671.33 | 6671.29 | 6671.28 | 6671.16 | 6671.11 | 6671.10 | 6671.00 | 6670.95 | 6670.98 | 6670.93 |
| B11 | 6666.00 | 6665.93 | 6665.98 | 6666.01 | 6666.00 | 6666.05 | 6666.04 | 6666.13 | 6666.03 | 6666.03 | 6665.99 | 6666.13 | 6666.15 | 6666.14 | 6666.16 | 6666.16 | 6666.12 | 6666.12 | 6666.12 | 6666.12 |
| C1 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 |
| C2 | 6663.53 | 6662.34 | 6662.29 | 6662.26 | 6662.20 | 6662.10 | 6662.05 | 6661.98 | 6661.56 | 6661.50 | 6661.38 | 6661.37 | 6661.33 | 6661.28 | 6661.24 | 6661.19 | 6661.15 | 6661.11 | 6661.06 | 6661.06 |
| C3 | 6671.82 | 6671.82 | 6670.43 | 6670.19 | 6670.17 | 6669.97 | 6669.86 | 6669.78 | 6669.56 | 6669.36 | 6669.13 | 6669.05 | 6668.92 | 6668.77 | 6668.59 | 6668.49 | 6668.31 | 6668.18 | 6668.03 | 6667.94 |
| C4 | 6671.49 | 6670.19 | 6670.13 | 6669.97 | 6669.82 | 6673.39 | 6669.47 | 6669.41 | 6669.20 | 6669.03 | 6668.82 | 6668.79 | 6668.70 | 6668.62 | 6668.51 | 6668.47 | 6668.37 | 6668.31 | 6668.22 | 6668.21 |
| C5 | 6674.67 | 6672.77 | 6672.74 | 6672.66 | 6672.58 | 6672.52 | 6672.45 | 6672.51 | 6672.34 | 6672.28 | 6672.18 | 6672.14 | 6672.14 | 6672.12 | 6672.08 | 6672.06 | 6672.03 | 6672.01 | 6672.01 | 6671.76 |
| C6 | 6672.27 | 6672.49 | 6672.51 | 6672.46 | 6672.45 | 6672.45 | 6672.42 | 6672.52 | 6672.37 | 6672.35 | 6672.27 | 6672.34 | 6672.29 | 6672.24 | 6672.22 | 6672.20 | 6672.16 | 6672.15 | 6672.14 | 6672.11 |
| C7 | 6676.13 | 6676.07 | 6676.02 | 6675.89 | 6675.76 | 6675.57 | 6675.46 | 6675.44 | 6675.21 | 6675.02 | 6674.84 | 6674.77 | 6674.57 | 6674.05 | 6674.36 | 6674.30 | 6674.16 | 6674.05 | 6673.93 | 6673.84 |
| C8 | 6675.39 | 6675.28 | 6675.22 | 6675.36 | 6675.34 | 6674.74 | 6674.63 | 6674.61 | 6674.39 | 6674.23 | 6674.07 | 6674.08 | 6673.92 | 6673.87 | 6673.77 | 6673.73 | 6673.62 | 6673.54 | 6673.52 | 6673.38 |
| C9 | 6674.67 | 6674.54 | 6674.50 | 6674.33 | 6674.20 | 6674.03 | 6673.90 | 6673.88 | 6673.66 | 6673.50 | 6673.36 | 6673.31 | 6673.27 | 6673.12 | 6673.04 | 6673.02 | 6672.90 | 6672.85 | 6672.76 | 6672.76 |
| C10 | 6675.00 | 6674.84 | 6674.90 | 6674.71 | 6674.57 | 6674.39 | 6674.94 | 6674.90 | 6674.68 | 6674.51 | 6674.36 | 6674.33 | 6674.27 | 6674.14 | 6674.06 | 6674.02 | 6673.91 | 6673.83 | 6673.76 | 6673.75 |
| C11 | 6666.81 | 6666.74 | 6666.80 | 6666.81 | 6666.80 | 6666.85 | 6666.81 | 6666.91 | 6666.81 | 6666.81 | 6666.78 | 6666.77 | 6666.80 | 6666.79 | 6666.81 | 6666.80 | 6666.77 | 6666.76 | 6666.64 | 6666.67 |
| D1 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 |
| D2 | 6659.19 | 6658.65 | 6658.64 | 6658.63 | 6658.51 | 6658.45 | 6658.42 | 6658.39 | 6658.32 | 6658.31 | 6658.23 | 6658.23 | 6658.20 | 6658.17 | 6658.16 | 6658.13 | 6658.11 | 6658.09 | 6658.05 | 6658.06 |
| D3 | 6661.70 | 6660.69 | 6660.67 | 6660.57 | 6660.50 | 6660.40 | 6660.36 | 6660.36 | 6660.23 | 6660.18 | 6660.07 | 6660.08 | 6660.05 | 6660.02 | 6659.98 | 6659.98 | 6659.91 | 6659.88 | 6659.82 | 6659.84 |
| D4 | 6662.82 | 6662.27 | 6662.27 | 6662.18 | 6662.14 | 6662.06 | 6662.02 | 6662.04 | 6661.93 | 6661.89 | 6661.79 | 6661.80 | 6661.80 | 6661.77 | 6661.74 | 6661.75 | 6661.69 | 6661.68 | 6661.63 | 6661.64 |
| D5 | 6666.53 | 6665.67 | 6665.73 | 6665.67 | 6665.64 | 6665.62 | 6665.57 | 6665.73 | 6665.53 | 6665.50 | 6665.42 | 6665.39 | 6665.39 | 6665.37 | 6665.35 | 6665.36 | 6665.32 | 6665.31 | 6665.31 | 6665.29 |
| D6 | 6669.14 | 6669.08 | 6669.11 | 6669.06 | 6669.07 | 6669.10 | 6669.09 | 6669.20 | 6669.08 | 6669.08 | 6669.02 | 6669.13 | 6669.08 | 6669.05 | 6669.05 | 6669.06 | 6669.04 | 6669.04 | 6669.06 | 6669.05 |
| D7 | 6670.18 | 6670.07 | 6670.04 | 6669.94 | 6669.86 | 6669.75 | 6669.66 | 6669.67 | 6669.48 | 6669.36 | 6669.27 | 6669.37 | 6669.27 | 6669.25 | 6669.21 | 6669.21 | 6669.12 | 6669.09 | 6669.06 | 6669.04 |
| D8 | 6670.97 | 6670.84 | 6670.83 | 6670.72 | 6670.65 | 6670.56 | 6670.50 | 6670.55 | 6670.38 | 6670.30 | 6670.22 | 6670.38 | 6670.28 | 6670.26 | 6670.24 | 6670.24 | 6670.17 | 6670.14 | 6670.14 | 6670.12 |
| D9 | 6670.62 | 6670.50 | 6670.53 | 6670.44 | 6670.41 | 6670.37 | 6670.31 | 6670.37 | 6670.21 | 6670.17 | 6670.11 | 6670.10 | 6670.04 | 6670.02 | 6669.99 | 6670.01 | 6669.93 | 6669.92 | 6669.89 | 6669.90 |
| D10 | 6670.78 | 6670.86 | 6670.88 | 6670.86 | 6670.83 | 6670.81 | 6670.72 | 6670.73 | 6670.57 | 6670.46 | 6670.35 | 6670.33 | 6670.33 | 6670.22 | 6670.16 | 6670.14 | 6670.05 | 6670.01 | 6669.97 | 6669.98 |
| D11 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.66 | 6665.89 | 6665.78 | 6665.78 | 6665.76 | 6665.76 | 6665.77 | 6665.77 | 6665.79 | 6665.79 | 6665.74 | 6665.73 | 6665.74 | 6665.75 |
| E2 | 6657.57 | 6657.47 | 6657.51 | 6657.46 | 6657.46 | 6657.48 | 6657.48 | 6657.52 | 6657.44 | 6657.44 | 6657.35 | 6657.38 | 6657.32 | 6657.33 | 6657.33 | 6657.37 | 6657.30 | 6657.29 | 6657.24 | 6657.28 |
| E3 | 6657.82 | 6657.75 | 6657.80 | 6657.89 | 6657.97 | 6657.99 | 6658.00 | 6658.06 | 6657.98 | 6657.99 | 6657.93 | 6657.95 | 6657.96 | 6657.99 | 6657.99 | 6658.05 | 6657.98 | 6657.99 | 6657.96 | 6657.99 |
| E4 | 6656.50 | 6656.37 | 6656.42 | 6656.37 | 6656.36 | 6656.38 | 6656.39 | 6656.45 | 6656.35 | 6656.36 | 6656.34 | 6656.39 | 6656.39 | 6656.33 | 6656.32 | 6656.36 | 6656.30 | 6656.30 | 6656.27 | 6656.29 |
| E5 | 6661.16 | 6661.02 | 6661.05 | 6661.02 | 6661.00 | 6661.02 | 6661.01 | 6661.09 | 6660.99 | 6660.99 | 6660.97 | 6660.98 | 6661.02 | 6661.00 | 6661.02 | 6661.03 | 6660.99 | 6660.99 | 6661.01 | 6661.00 |
| E6 | 6665.05 | 6665.01 | 6665.05 | 6665.01 | 6665.00 | 6665.03 | 6665.02 | 6665.12 | 6665.00 | 6665.01 | 6664.99 | 6665.05 | 6665.00 | 6664.99 | 6665.00 | 6665.01 | 6664.99 | 6664.99 | 6665.01 | 6664.99 |
| E7 | 6666.84 | 6666.82 | 6666.87 | 6666.83 | 6666.83 | 6666.85 | 6666.84 | 6666.96 | 6666.83 | 6666.84 | 6666.81 | 6666.86 | 6666.80 | 6666.82 | 6666.80 | 6666.86 | 6666.80 | 6666.81 | 6666.82 | 6666.83 |
| E8 | 6666.20 | 6666.18 | 6666.22 | 6666.19 | 6666.20 | 6666.21 | 6666.21 | 6666.33 | 6666.20 | 6666.20 | 6666.18 | 6666.28 | 6666.23 | 6666.25 | 6666.28 | 6666.29 | 6666.23 | 6666.24 | 6666.24 | 6666.25 |
| E9 | 6665.53 | 6665.50 | 6665.56 | 6665.52 | 6665.52 | 6665.49 | 6665.53 | 6665.66 | 6665.55 | 6665.55 | 6665.52 | 6665.51 | 6665.48 | 6665.49 | 6665.52 | 6665.52 | 6665.47 | 6665.48 | 6665.46 | 6665.49 |
| E10 | 6665.93 | 6665.88 | 6665.95 | 6665.90 | 6665.94 | 6666.00 | 6665.99 | 6666.14 | 6666.03 | 6666.03 | 6666.01 | 6666.02 | 6666.00 | 6666.01 | 6666.04 | 6666.04 | 6665.98 | 6665.98 | 6665.97 | 6666.00 |
| X-1 | 6673.16 | 6671.45 | 6671.27 | 6671.22 | 6671.05 | 6670.92 | 6670.72 | 6670.57 | 6670.47 | 6670.20 | 6669.92 | 6669.60 | 6669.47 | 6669.20 | 6669.00 | 6668.51 | 6668.25 | 6668.02 | 6667.75 | 6667.57 |

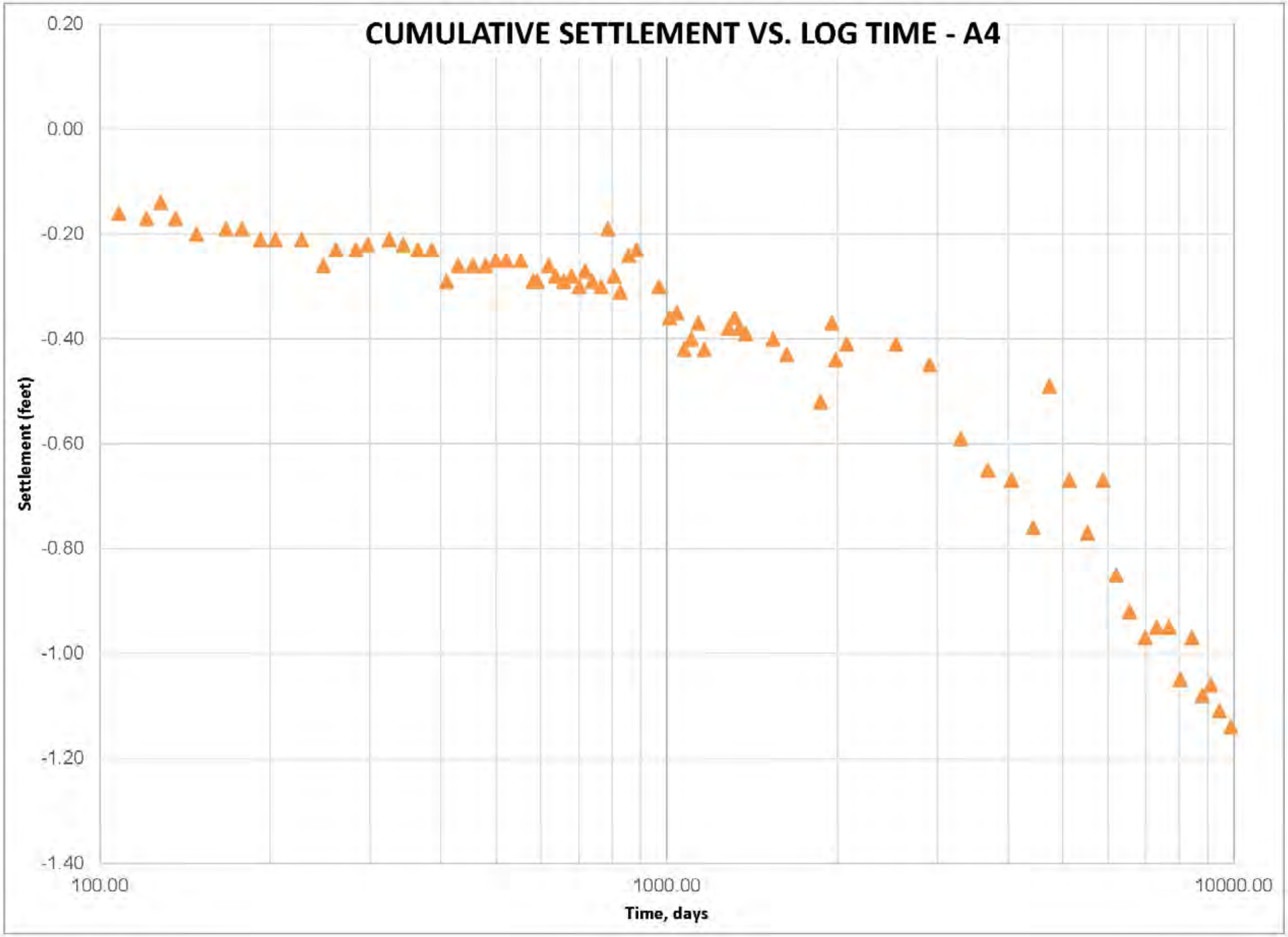
| Date | 1/21/1995 | 2/14/1995 | 3/6/1995 | 3/28/1995 | 4/29/1995 | 5/28/1995 | 6/6/1995 | 7/4/1995 | 7/22/1995 | 8/12/1995 | 9/2/1995 | 9/24/1995 | 10/11/1995 | 11/1/1995 | 11/28/1995 | 12/19/1995 | 1/8/1996 | 1/29/1996 | 2/27/1996 | 3/25/1996 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A2** | 6657.02 | 6657.01 | 6657.00 | 6656.99 | 6656.99 | 6656.98 | 6656.96 | 6656.98 | 6656.96 | 6656.98 | 6656.97 | 6656.95 | 6656.97 | 6656.97 | 6656.97 | 6657.05 | 6656.98 | 6656.95 | 6657.00 | 6657.02 |
| **A3** | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.37 | 6657.36 | 6657.38 | 6657.36 | 6657.37 | 6657.35 | 6657.33 | 6657.35 | 6657.35 | 6657.35 | 6657.41 | 6657.37 | 6657.31 | 6657.38 | 6657.38 |
| **A4** | 6657.80 | 6657.80 | 6657.81 | 6657.81 | 6657.81 | 6657.77 | 6657.77 | 6657.80 | 6657.78 | 6657.77 | 6657.78 | 6657.76 | 6657.79 | 6657.77 | 6657.76 | 6657.87 | 6657.78 | 6657.75 | 6657.82 | 6657.83 |
| **A5** | 6659.30 | 6659.31 | 6659.29 | 6659.30 | 6659.30 | 6659.26 | 6659.30 | 6659.29 | 6659.28 | 6659.29 | 6659.28 | 6659.23 | 6659.30 | 6659.28 | 6659.27 | 6659.34 | 6659.31 | 6659.26 | 6659.34 | 6659.33 |
| **A6** | 6665.68 | 6665.70 | 6665.67 | 6665.68 | 6665.73 | 6665.66 | 6665.71 | 6665.69 | 6665.69 | 6665.65 | 6665.68 | 6665.64 | 6665.71 | 6665.65 | 6665.68 | 6665.77 | 6665.70 | 6665.69 | 6665.75 | 6665.77 |
| **A7** | 6666.19 | 6666.18 | 6666.15 | 6666.15 | 6666.19 | 6666.15 | 6666.19 | 6666.16 | 6666.17 | 6666.11 | 6666.14 | 6666.11 | 6666.19 | 6666.15 | 6666.15 | 6666.21 | 6666.18 | 6666.15 | 6666.24 | 6666.21 |
| **A8** | 6666.70 | 6666.69 | 6666.65 | 6666.68 | 6666.71 | 6666.67 | 6666.70 | 6666.68 | 6666.67 | 6666.65 | 6666.64 | 6666.61 | 6666.71 | 6666.64 | 6666.70 | 6666.71 | 6666.67 | 6666.68 | 6666.73 | 6666.71 |
| **A9** | 6666.48 | 6666.45 | 6666.40 | 6666.43 | 6666.45 | 6666.42 | 6666.46 | 6666.44 | 6666.44 | 6666.41 | 6666.48 | 6666.36 | 6666.34 | 6666.43 | 6666.46 | 6666.49 | 6666.48 | 6666.45 | 6666.52 | 6666.51 |
| **A10** | 6666.50 | 6666.48 | 6666.44 | 6666.46 | 6666.46 | 6666.44 | 6666.48 | 6666.46 | 6666.46 | 6666.45 | 6666.51 | 6666.37 | 6666.51 | 6666.44 | 6666.48 | 6666.50 | 6666.47 | 6666.48 | 6666.51 | 6666.52 |
| **A11** | 6664.10 | 6664.08 | 6664.04 | 6664.07 | 6664.06 | 6664.06 | 6664.09 | 6664.07 | 6664.07 | 6664.07 | 6664.11 | 6663.97 | 6664.14 | 6664.08 | 6664.09 | 6664.11 | 6664.09 | 6664.09 | 6664.17 | 6664.15 |
| **B1** | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.99 | 6656.84 |
| **B2** | 6659.26 | 6659.23 | 6659.22 | 6659.19 | 6659.19 | 6659.16 | 6659.13 | 6659.13 | 6659.12 | 6659.14 | 6659.11 | 6658.98 | 6659.09 | 6659.05 | 6659.00 | 6659.15 | 6659.06 | 6659.04 | 6659.07 | 6659.11 |
| **B3** | 6660.10 | 6660.05 | 6660.02 | 6660.00 | 6659.98 | 6659.90 | 6659.90 | 6659.99 | 6659.87 | 6659.98 | 6659.86 | 6659.81 | 6659.83 | 6659.77 | 6659.66 | 6659.82 | 6659.78 | 6659.70 | 6659.79 | 6659.77 |
| **B4** | 6662.91 | 6662.90 | 6662.87 | 6662.86 | 6662.85 | 6662.80 | 6662.80 | 6662.91 | 6662.80 | 6662.79 | 6662.78 | 6662.74 | 6662.78 | 6662.73 | 6662.75 | 6662.84 | 6662.75 | 6662.72 | 6662.77 | 6662.79 |
| **B5** | 6665.55 | 6665.54 | 6665.52 | 6665.51 | 6665.53 | 6665.47 | 6665.51 | 6665.49 | 6665.48 | 6665.49 | 6665.46 | 6665.47 | 6665.52 | 6665.46 | 6665.43 | 6665.57 | 6665.46 | 6665.40 | 6665.49 | 6665.47 |
| **B6** | 6669.32 | 6669.30 | 6669.26 | 6669.27 | 6669.30 | 6669.21 | 6669.26 | 6669.24 | 6669.23 | 6669.18 | 6669.20 | 6669.13 | 6669.21 | 6669.15 | 6669.17 | 6669.25 | 6669.15 | 6669.15 | 6669.21 | 6669.18 |
| **B7** | 6673.13 | 6673.08 | 6673.02 | 6673.04 | 6673.04 | 6672.94 | 6672.98 | 6672.82 | 6672.89 | 6672.81 | 6672.85 | 6672.69 | 6672.82 | 6672.75 | 6672.70 | 6672.78 | 6672.61 | 6672.67 | 6672.70 | 6672.65 |
| **B8** | 6669.88 | 6669.83 | 6669.76 | 6669.78 | 6669.77 | 6669.67 | 6669.69 | 6669.52 | 6669.33 | 6669.54 | 6669.57 | 6669.36 | 6669.52 | 6669.39 | 6669.41 | 6669.39 | 6669.34 | 6669.33 | 6669.34 | 6669.31 |
| **B9** | 6670.17 | 6670.10 | 6670.03 | 6670.04 | 6670.02 | 6669.95 | 6669.97 | 6669.90 | 6669.89 | 6669.84 | 6669.87 | 6669.69 | 6669.85 | 6669.76 | 6669.72 | 6669.77 | 6669.72 | 6669.66 | 6669.73 | 6669.71 |
| **B10** | 6670.90 | 6670.86 | 6670.81 | 6670.83 | 6670.83 | 6670.77 | 6670.81 | 6670.76 | 6670.77 | 6670.73 | 6670.74 | 6670.56 | 6670.72 | 6670.62 | 6670.63 | 6670.62 | 6670.58 | 6670.58 | 6670.61 | 6670.59 |
| **B11** | 6666.10 | 6666.12 | 6666.08 | 6666.11 | 6666.10 | 6666.09 | 6666.13 | 6666.09 | 6666.11 | 6666.11 | 6666.16 | 6666.00 | 6666.18 | 6666.08 | 6666.09 | 6666.12 | 6666.11 | 6666.10 | 6666.17 | 6666.17 |
| **C1** | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.40 | 6657.20 |
| **C2** | 6660.92 | 6661.00 | 6660.97 | 6660.93 | 6660.93 | 6660.89 | 6660.89 | 6660.87 | 6660.96 | 6660.91 | 6660.90 | 6660.88 | 6660.85 | 6660.79 | 6660.77 | 6660.77 | 6660.76 | 6660.77 | 6660.81 | 6660.71 |
| **C3** | 6667.80 | 6667.68 | 6667.59 | 6667.48 | 6667.33 | 6667.18 | 6667.14 | 6667.15 | 6667.13 | 6667.14 | 6667.07 | 6666.85 | 6666.73 | 6666.60 | 6666.38 | 6666.22 | 6666.13 | 6666.18 | 6666.12 | 6665.95 |
| **C4** | 6668.15 | 6668.10 | 6668.06 | 6668.02 | 6668.02 | 6667.92 | 6668.00 | 6668.01 | 6668.03 | 6667.98 | 6667.93 | 6667.77 | 6667.71 | 6667.62 | 6667.45 | 6667.46 | 6667.38 | 6667.40 | 6667.38 | 6667.26 |
| **C5** | 6671.97 | 6671.95 | 6671.92 | 6671.90 | 6671.94 | 6671.85 | 6671.89 | 6671.88 | 6671.97 | 6671.85 | 6671.85 | 6671.76 | 6671.82 | 6671.83 | 6671.60 | 6671.64 | 6671.58 | 6671.62 | 6671.64 | 6671.55 |
| **C6** | 6672.10 | 6672.06 | 6672.03 | 6672.03 | 6672.06 | 6671.98 | 6672.03 | 6672.01 | 6672.10 | 6671.95 | 6671.80 | 6671.62 | 6671.64 | 6671.64 | 6671.44 | 6671.47 | 6671.38 | 6671.42 | 6671.42 | 6671.33 |
| **C7** | 6673.70 | 6673.60 | 6673.49 | 6673.42 | 6673.38 | 6673.33 | 6673.23 | 6673.14 | 6673.25 | 6673.10 | 6672.99 | 6672.76 | 6672.75 | 6672.48 | 6672.43 | 6672.36 | 6672.22 | 6672.21 | 6672.14 | 6671.99 |
| **C8** | 6673.40 | 6673.34 | 6673.26 | 6673.23 | 6673.25 | 6673.15 | 6673.17 | 6673.12 | 6673.24 | 6673.13 | 6673.09 | 6672.93 | 6672.98 | 6672.89 | 6672.82 | 6672.78 | 6672.67 | 6672.70 | 6672.69 | 6672.56 |
| **C9** | 6672.71 | 6672.66 | 6672.60 | 6672.57 | 6672.61 | 6672.51 | 6672.51 | 6672.49 | 6672.62 | 6672.50 | 6672.45 | 6672.29 | 6672.35 | 6672.24 | 6672.16 | 6672.15 | 6672.01 | 6672.05 | 6672.07 | 6671.93 |
| **C10** | 6673.70 | 6673.63 | 6673.56 | 6673.54 | 6673.57 | 6673.48 | 6673.49 | 6673.48 | 6673.62 | 6673.52 | 6673.53 | 6673.40 | 6673.48 | 6673.42 | 6673.34 | 6673.33 | 6673.20 | 6673.23 | 6673.25 | 6673.11 |
| **C11** | 6666.75 | 6666.77 | 6666.73 | 6666.74 | 6666.75 | 6666.74 | 6666.78 | 6666.79 | 6666.79 | 6666.74 | 6666.78 | 6666.70 | 6666.82 | 6666.73 | 6666.82 | 6666.65 | 6666.82 | 6666.76 | 6666.81 | 6666.80 |
| **D1** | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.78 | 6658.57 |
| **D2** | 6658.04 | 6658.03 | 6658.01 | 6657.98 | 6658.00 | 6657.97 | 6657.96 | 6657.93 | 6657.93 | 6657.92 | 6657.92 | 6657.90 | 6657.88 | 6657.84 | 6657.83 | 6657.83 | 6657.83 | 6657.82 | 6657.80 | 6657.80 |
| **D3** | 6659.82 | 6659.80 | 6659.77 | 6659.75 | 6659.72 | 6659.67 | 6659.75 | 6659.77 | 6659.66 | 6659.80 | 6659.66 | 6659.62 | 6659.64 | 6659.58 | 6659.57 | 6659.57 | 6659.58 | 6659.56 | 6659.55 | 6659.53 |
| **D4** | 6661.63 | 6661.61 | 6661.59 | 6661.57 | 6661.59 | 6661.51 | 6661.60 | 6661.62 | 6661.50 | 6661.66 | 6661.52 | 6661.48 | 6661.50 | 6661.39 | 6661.42 | 6661.40 | 6661.42 | 6661.41 | 6661.39 | 6661.38 |
| **D5** | 6665.29 | 6665.27 | 6665.25 | 6665.23 | 6665.27 | 6665.19 | 6665.23 | 6665.21 | 6665.19 | 6665.19 | 6665.19 | 6665.13 | 6665.22 | 6665.09 | 6665.16 | 6665.11 | 6665.17 | 6665.15 | 6665.14 | 6665.12 |
| **D6** | 6669.05 | 6669.02 | 6669.00 | 6669.00 | 6669.05 | 6668.99 | 6669.04 | 6669.02 | 6669.02 | 6669.14 | 6669.19 | 6669.09 | 6669.18 | 6669.10 | 6669.15 | 6669.05 | 6669.18 | 6669.14 | 6669.16 | 6669.08 |
| **D7** | 6669.00 | 6668.95 | 6668.91 | 6668.89 | 6668.92 | 6668.85 | 6668.86 | 6668.87 | 6668.82 | 6668.79 | 6668.76 | 6668.70 | 6668.89 | 6668.67 | 6668.79 | 6668.66 | 6668.71 | 6668.66 | 6668.65 | 6668.64 |
| **D8** | 6670.09 | 6670.05 | 6670.01 | 6669.99 | 6670.05 | 6669.97 | 6670.00 | 6669.99 | 6669.96 | 6669.95 | 6669.90 | 6669.85 | 6670.01 | 6669.84 | 6669.90 | 6669.78 | 6669.89 | 6669.85 | 6669.86 | 6669.78 |
| **D9** | 6669.88 | 6669.85 | 6669.80 | 6669.79 | 6669.84 | 6669.77 | 6669.79 | 6669.81 | 6669.77 | 6669.76 | 6669.71 | 6669.66 | 6669.82 | 6669.63 | 6669.74 | 6669.62 | 6669.69 | 6669.63 | 6669.66 | 6669.61 |
| **D10** | 6669.92 | 6669.92 | 6669.87 | 6669.86 | 6669.89 | 6669.84 | 6669.87 | 6669.87 | 6669.85 | 6669.85 | 6669.78 | 6669.71 | 6669.80 | 6669.67 | 6669.75 | 6669.58 | 6669.72 | 6669.65 | 6669.69 | 6669.57 |
| **D11** | 6665.72 | 6665.74 | 6665.71 | 6665.70 | 6665.73 | 6665.72 | 6665.76 | 6665.77 | 6665.75 | 6665.74 | 6665.76 | 6665.68 | 6665.81 | 6665.71 | 6665.81 | 6665.65 | 6665.80 | 6665.73 | 6665.79 | 6665.79 |
| **E2** | 6657.29 | 6657.27 | 6657.27 | 6657.26 | 6657.21 | 6657.20 | 6657.26 | 6657.32 | 6657.24 | 6657.38 | 6657.23 | 6657.20 | 6657.22 | 6657.15 | 6657.17 | 6657.18 | 6657.18 | 6657.18 | 6657.16 | 6657.15 |
| **E3** | 6658.00 | 6658.00 | 6657.99 | 6657.98 | 6657.95 | 6657.94 | 6658.00 | 6658.07 | 6657.92 | 6658.12 | 6657.99 | 6657.96 | 6658.00 | 6657.92 | 6657.96 | 6657.99 | 6657.99 | 6657.99 | 6657.99 | 6657.96 |
| **E4** | 6656.30 | 6656.28 | 6656.25 | 6656.27 | 6656.24 | 6656.23 | 6656.30 | 6656.35 | 6656.24 | 6656.40 | 6656.27 | 6656.24 | 6656.28 | 6656.15 | 6656.22 | 6656.20 | 6656.22 | 6656.22 | 6656.22 | 6656.19 |
| **E5** | 6661.00 | 6660.98 | 6660.95 | 6660.98 | 6661.02 | 6660.94 | 6660.99 | 6660.97 | 6660.95 | 6660.96 | 6660.96 | 6660.91 | 6661.01 | 6660.89 | 6660.96 | 6660.95 | 6660.98 | 6661.36 | 6660.96 | 6660.93 |
| **E6** | 6665.00 | 6664.99 | 6664.96 | 6664.99 | 6665.02 | 6664.97 | 6665.01 | 6664.99 | 6665.00 | 6664.96 | 6664.93 | 6664.93 | 6665.04 | 6664.92 | 6665.00 | 6664.91 | 6665.04 | 6664.99 | 6665.01 | 6664.96 |
| **E7** | 6666.79 | 6666.80 | 6666.78 | 6666.80 | 6666.85 | 6666.78 | 6666.82 | 6666.83 | 6666.81 | 6666.77 | 6666.78 | 6666.73 | 6666.92 | 6666.74 | 6666.85 | 6666.87 | 6666.82 | 6666.78 | 6666.80 | 6666.76 |
| **E8** | 6666.23 | 6666.24 | 6666.21 | 6666.24 | 6666.28 | 6666.22 | 6666.26 | 6666.27 | 6666.24 | 6666.24 | 6666.20 | 6666.18 | 6666.35 | 6666.19 | 6666.29 | 6666.16 | 6666.28 | 6666.23 | 6666.20 | 6666.14 |
| **E9** | 6665.47 | 6665.48 | 6665.44 | 6665.47 | 6665.51 | 6665.47 | 6665.52 | 6665.52 | 6665.49 | 6665.48 | 6665.45 | 6665.43 | 6665.49 | 6665.42 | 6665.56 | 6665.43 | 6665.52 | 6665.47 | 6665.50 | 6665.45 |
| **E10** | 6665.98 | 6666.01 | 6665.96 | 6665.97 | 6666.01 | 6665.98 | 6666.03 | 6666.02 | 6665.99 | 6665.97 | 6665.96 | 6665.94 | 6666.06 | 6665.97 | 6666.06 | 6665.93 | 6666.06 | 6666.01 | 6666.06 | 6665.96 |
| **X-1** | 6667.34 | 6667.12 | 6666.95 | 6666.74 | 6673.16 | 6673.16 | 6673.16 | 6666.19 | 6666.24 | 6665.99 | 6665.75 | 6665.42 | 6665.22 | 6665.02 | 6664.73 | 6664.61 | 6664.47 | 6664.37 | 6664.26 | 6664.04 |

| Date | 6/18/1996 | 7/31/1996 | 8/30/1996 | 9/30/1996 | 11/1/1996 | 12/2/1996 | 12/31/1996 | 4/30/1997 | 6/2/1997 | 6/30/1997 | 8/1/1997 | 1/9/1998 | 4/8/1998 | 12/4/1998 | 3/1/1999 | 4/1/1999 | 7/1/1999 | 10/3/2000 | 10/10/2001 | 11/4/2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A2** | 6656.94 | 6656.85 | 6656.89 | 6656.84 | 6656.92 | 6656.90 | 6656.90 | 6656.92 | 6656.87 | 6656.92 | 6656.88 | 6656.81 | 6656.79 | 6656.77 | 6656.89 | 6656.83 | 6656.86 | 6656.84 | 6656.79 | 6656.72 |
| **A3** | 6657.30 | 6657.26 | 6657.25 | 6657.22 | 6657.28 | 6657.20 | 6657.22 | 6657.23 | 6657.24 | 6657.27 | 6657.23 | 6657.22 | 6657.14 | 6657.12 | 6657.25 | 6657.18 | 6657.22 | 6657.20 | 6657.14 | 6657.01 |
| **A4** | 6657.76 | 6657.70 | 6657.71 | 6657.64 | 6657.66 | 6657.69 | 6657.64 | 6657.68 | 6657.70 | 6657.68 | 6657.67 | 6657.66 | 6657.63 | 6657.54 | 6657.69 | 6657.62 | 6657.65 | 6657.65 | 6657.61 | 6657.47 |
| **A5** | 6659.27 | 6659.23 | 6659.19 | 6659.17 | 6659.19 | 6659.18 | 6659.16 | 6659.22 | 6659.18 | 6659.28 | 6659.22 | 6659.15 | 6659.16 | 6659.08 | 6659.24 | 6659.19 | 6659.20 | 6659.22 | 6659.19 | 6659.03 |
| **A6** | 6665.57 | 6665.68 | 6665.64 | 6665.59 | 6665.62 | 6665.58 | 6665.57 | 6665.71 | 6665.65 | 6665.67 | 6665.61 | 6665.63 | 6665.57 | 6665.59 | 6665.69 | 6665.62 | 6665.68 | 6665.68 | 6665.67 | 6665.53 |
| **A7** | 6666.12 | 6666.09 | 6666.06 | 6666.06 | 6666.07 | 6666.05 | 6666.00 | 6666.06 | 6666.10 | 6666.05 | 6666.04 | 6666.03 | 6666.00 | 6665.98 | 6666.09 | 6666.05 | 6666.13 | 6666.10 | 6666.08 | 6666.01 |
| **A8** | 6666.61 | 6666.53 | 6666.61 | 6666.55 | 6666.54 | 6666.57 | 6666.56 | 6666.51 | 6666.56 | 6666.59 | 6666.60 | 6666.55 | 6666.53 | 6666.50 | 6666.50 | | 6666.63 | 6666.61 | 6666.56 | 6666.49 |
| **A9** | 6666.38 | 6666.40 | 6666.34 | 6666.32 | 6666.31 | 6666.34 | 6666.35 | 6666.36 | 6666.33 | 6666.39 | 6666.28 | 6666.39 | 6666.26 | 6666.27 | 6666.27 | | 6666.40 | 6666.36 | 6666.38 | 6666.25 |
| **A10** | 6666.39 | 6666.40 | 6666.38 | 6666.34 | 6666.33 | 6666.36 | 6666.32 | 6666.37 | 6666.32 | 6666.44 | 6666.32 | 6666.30 | 6666.30 | 6666.28 | 6666.27 | | 6666.42 | 6666.30 | 6666.41 | 6666.30 |
| **A11** | 6664.03 | 6663.99 | 6663.98 | 6663.96 | 6663.99 | 6664.02 | 6663.87 | 6663.97 | 6664.06 | 6664.08 | 6663.96 | 6663.99 | 6663.93 | 6663.96 | 6663.94 | 6664.00 | 6664.09 | 6663.97 | 6664.07 | 6663.95 |
| **B1** | 6656.75 | 6656.75 | 6656.69 | 6656.66 | 6656.72 | 6656.75 | 6656.63 | 6656.68 | 6656.66 | 6656.75 | 6656.66 | 6656.60 | 6656.59 | 6656.60 | 6656.66 | 6656.66 | 6656.67 | 6656.65 | 6656.59 | 6656.50 |
| **B2** | 6658.98 | 6658.99 | 6658.94 | 6658.86 | 6658.94 | 6658.99 | 6658.84 | 6658.87 | 6658.82 | 6658.86 | 6658.76 | 6658.65 | 6658.66 | 6658.58 | 6658.68 | 6658.64 | 6658.66 | 6658.63 | 6658.53 | 6658.44 |
| **B3** | 6659.66 | 6659.60 | 6659.59 | 6659.64 | 6659.54 | 6659.57 | 6659.42 | 6659.51 | 6659.54 | 6659.44 | 6659.42 | 6659.38 | 6659.28 | 6659.24 | 6659.36 | 6659.33 | 6659.35 | 6659.29 | 6659.21 | 6659.09 |
| **B4** | 6662.67 | 6662.64 | 6662.65 | 6662.56 | 6662.64 | 6662.64 | 6662.51 | 6662.54 | 6662.63 | 6662.61 | 6662.57 | 6662.49 | 6662.45 | 6662.44 | 6662.56 | 6662.50 | 6662.53 | 6662.53 | 6662.49 | 6662.35 |
| **B5** | 6665.42 | 6665.32 | 6665.36 | 6665.28 | 6665.39 | 6665.30 | 6665.27 | 6665.32 | 6665.28 | 6665.42 | 6665.34 | 6665.30 | 6665.27 | 6665.20 | 6665.35 | 6665.32 | 6665.35 | 6665.38 | 6665.33 | 6665.22 |
| **B6** | 6669.13 | 6669.06 | 6669.03 | 6669.01 | 6668.97 | 6668.96 | 6668.98 | 6669.05 | 6668.95 | 6669.00 | 6668.90 | 6668.85 | 6668.81 | 6668.73 | 6668.88 | 6668.80 | 6668.84 | 6668.80 | 6668.75 | 6668.60 |
| **B7** | 6672.48 | 6672.42 | 6672.37 | 6672.32 | 6672.30 | 6672.30 | 6672.23 | 6672.21 | 6672.21 | 6672.23 | 6672.17 | 6672.10 | 6671.96 | 6671.88 | 6671.88 | 6671.91 | 6671.93 | 6671.87 | 6671.86 | 6671.77 |
| **B8** | 6669.13 | 6669.06 | 6669.02 | 6669.02 | 6668.98 | 6668.97 | 6668.94 | 6668.89 | 6668.91 | 6668.83 | 6668.84 | 6668.76 | 6668.67 | 6668.56 | 6668.58 | | 6668.64 | 6668.60 | 6668.53 | 6668.49 |
| **B9** | 6669.55 | 6669.51 | 6669.46 | 6669.41 | 6669.39 | 6669.38 | 6669.33 | 6669.31 | 6669.32 | 6669.23 | | | | 6668.99 | 6668.94 | 6669.02 | 6669.05 | 6670.09 | 6668.94 | 6668.81 |
| **B10** | 6670.48 | 6670.44 | 6670.41 | 6670.33 | 6670.37 | 6670.36 | 6670.33 | 6670.29 | 6670.34 | 6670.06 | 6670.27 | 6670.26 | 6670.12 | 6670.10 | 6670.12 | 6670.17 | 6670.22 | 6670.08 | 6670.11 | 6670.02 |
| **B11** | 6666.05 | 6666.03 | 6666.01 | 6666.03 | 6665.97 | 6665.98 | 6665.96 | 6666.02 | 6666.03 | 6666.11 | 6665.96 | 6665.96 | 6665.97 | 6665.96 | 6665.96 | 6666.04 | 6666.11 | 6666.01 | 6666.11 | 6666.00 |
| **C1** | 6657.12 | 6657.07 | 6657.05 | 6657.04 | 6657.06 | 6657.00 | 6657.00 | 6656.99 | 6657.03 | 6657.06 | 6657.04 | 6656.97 | 6656.95 | 6656.93 | 6656.85 | | 6657.01 | 6657.00 | 6656.93 | 6656.83 |
| **C2** | 6660.69 | 6660.65 | 6660.66 | 6660.54 | 6660.61 | 6660.49 | 6660.50 | 6660.48 | 6660.48 | 6660.48 | 6660.48 | 6660.39 | 6660.35 | 6660.25 | 6660.21 | | 6660.35 | 6660.34 | 6660.24 | 6660.17 |
| **C3** | 6665.73 | 6665.73 | 6665.65 | 6665.56 | 6665.59 | 6665.43 | 6665.42 | 6665.30 | 6665.31 | 6665.23 | 6665.23 | 6665.12 | 6665.00 | 6664.95 | 6664.87 | | 6665.03 | 6665.00 | 6664.94 | 6664.84 |
| **C4** | 6667.22 | 6667.15 | 6667.15 | 6667.07 | 6667.05 | 6667.03 | 6667.00 | 6666.95 | 6666.93 | 6666.99 | 6666.90 | 6666.85 | 6666.83 | 6666.77 | 6666.73 | | 6666.86 | 6667.46 | 6666.85 | 6666.68 |
| **C5** | 6671.53 | 6671.52 | 6671.52 | 6671.49 | 6671.46 | 6671.46 | 6671.42 | 6671.47 | 6671.45 | 6671.46 | 6671.46 | 6671.36 | 6671.34 | 6671.27 | 6671.28 | 6671.38 | 6671.40 | 6671.44 | 6671.34 | 6671.25 |
| **C6** | 6671.29 | 6671.28 | 6671.25 | 6671.17 | 6671.18 | 6671.17 | 6671.16 | 6671.20 | 6671.13 | 6671.40 | 6671.06 | 6671.01 | 6670.97 | 6670.95 | 6670.97 | 6671.00 | 6671.05 | 6671.02 | 6670.96 | 6670.82 |
| **C7** | 6671.76 | 6671.68 | 6671.52 | 6671.53 | 6671.46 | 6671.39 | 6671.41 | 6671.35 | 6671.25 | 6671.24 | 6671.13 | 6670.91 | 6670.87 | 6670.78 | 6670.71 | 6670.78 | 6670.80 | 6670.72 | 6670.67 | 6670.58 |
| **C8** | 6672.47 | 6672.42 | 6672.38 | 6672.27 | 6672.26 | 6672.22 | 6672.21 | 6672.20 | 6672.16 | 6672.16 | 6672.17 | 6671.99 | 6671.96 | 6671.87 | 6671.89 | 6671.93 | 6671.97 | 6671.96 | 6671.92 | 6671.89 |
| **C9** | 6671.90 | 6671.86 | 6671.82 | 6671.72 | 6671.69 | 6671.64 | 6671.70 | 6671.62 | 6671.68 | 6671.58 | 6671.56 | 6671.51 | 6671.49 | 6671.40 | 6671.41 | 6671.49 | 6671.54 | 6671.47 | 6671.48 | 6671.43 |
| **C10** | 6673.01 | 6673.09 | 6673.05 | 6672.88 | 6672.92 | 6672.91 | 6672.89 | 6672.81 | 6672.86 | 6672.85 | 6672.83 | 6672.72 | 6672.69 | 6672.62 | 6672.61 | 6672.66 | 6672.71 | 6672.58 | 6672.58 | 6672.49 |
| **C11** | 6666.84 | 6666.67 | 6666.69 | 6666.58 | 6666.63 | 6666.59 | 6666.55 | 6666.65 | 6666.63 | 6666.50 | 6666.60 | 6666.56 | 6666.57 | 6666.56 | 6666.56 | | 6666.70 | 6666.61 | 6666.70 | 6666.60 |
| **D1** | 6658.56 | 6658.51 | 6658.54 | 6658.47 | 6658.47 | 6658.59 | 6658.46 | 6658.47 | 6658.46 | 6658.47 | 6658.51 | 6658.42 | 6658.44 | 6658.36 | 6658.31 | | 6658.44 | 6658.44 | 6658.34 | 6658.29 |
| **D2** | 6657.80 | 6657.77 | 6657.81 | 6657.69 | 6657.73 | 6657.72 | 6657.65 | 6657.64 | 6657.64 | 6657.68 | 6657.60 | 6657.59 | 6657.55 | 6657.52 | 6657.48 | | 6657.62 | 6657.59 | 6657.52 | 6657.44 |
| **D3** | 6659.53 | 6659.41 | 6659.49 | 6659.40 | 6659.45 | 6659.39 | 6659.32 | 6659.39 | 6659.36 | 6659.48 | 6659.38 | 6659.36 | 6659.29 | 6659.27 | 6659.22 | | 6659.33 | 6659.30 | 6659.24 | 6659.11 |
| **D4** | 6661.38 | 6661.33 | 6661.36 | 6661.25 | 6661.32 | 6661.29 | 6661.31 | 6661.26 | 6661.31 | 6661.33 | 6661.28 | 6661.22 | 6661.21 | 6661.17 | 6661.11 | | 6661.24 | 6661.26 | 6661.22 | 6661.07 |
| **D5** | 6665.08 | 6665.03 | 6665.12 | 6664.98 | 6664.99 | 6665.09 | 6665.00 | 6665.03 | 6665.04 | 6665.12 | 6665.01 | 6665.00 | 6665.00 | 6664.95 | 6664.95 | | 6665.07 | 6665.11 | 6665.02 | 6664.94 |
| **D6** | 6669.05 | 6669.02 | 6669.07 | 6668.97 | 6668.99 | 6669.03 | 6669.01 | 6669.04 | 6669.03 | 6669.07 | 6669.02 | 6668.97 | 6668.97 | 6668.96 | 6668.96 | | 6669.05 | 6669.05 | 6669.02 | 6668.88 |
| **D7** | 6668.55 | 6668.51 | 6668.54 | 6668.45 | 6668.50 | 6668.47 | 6668.40 | 6668.50 | 6668.36 | 6668.36 | 6668.38 | 6668.26 | 6668.24 | 6668.14 | 6668.14 | | 6668.25 | 6668.16 | 6668.12 | 6668.06 |
| **D8** | 6669.71 | 6669.68 | 6669.76 | 6669.60 | 6669.69 | 6669.65 | 6669.63 | 6669.60 | 6669.65 | 6669.66 | | | | | | | | | | |
| **D9** | 6669.56 | 6669.51 | 6669.57 | 6669.42 | 6669.53 | 6669.50 | 6669.37 | 6669.48 | 6669.47 | 6669.39 | 6669.42 | 6669.29 | 6669.24 | 6669.24 | 6669.17 | | 6669.29 | 6669.20 | 6669.20 | 6671.43 |
| **D10** | 6669.50 | 6669.51 | 6669.52 | 6669.38 | 6669.47 | 6669.45 | 6669.31 | 6669.37 | 6669.44 | 6669.38 | 6669.32 | 6669.21 | 6669.15 | 6669.09 | 6669.08 | | 6669.19 | 6669.03 | 6669.02 | 6668.95 |
| **D11** | 6665.62 | 6665.60 | 6665.66 | 6665.58 | 6665.62 | 6665.70 | 6665.56 | 6665.59 | 6665.61 | 6665.69 | 6665.64 | 6665.60 | 6665.58 | 6665.61 | 6665.59 | | 6665.72 | 6665.63 | 6665.72 | 6665.69 |
| **E2** | 6657.07 | 6657.10 | 6657.11 | 6657.04 | 6657.07 | 6657.05 | 6657.14 | 6657.04 | 6657.04 | 6657.06 | 6657.05 | 6657.03 | 6657.04 | 6657.00 | 6656.94 | | 6657.07 | 6657.06 | 6656.99 | 6656.92 |
| **E3** | 6657.92 | 6657.90 | 6657.97 | 6657.83 | 6657.92 | 6657.83 | 6657.83 | 6657.92 | 6657.87 | 6657.97 | 6657.89 | 6657.91 | 6657.90 | 6657.90 | 6657.86 | | 6658.00 | 6658.00 | 6657.99 | 6657.88 |
| **E4** | 6656.13 | 6656.14 | 6656.14 | 6656.09 | 6656.13 | 6656.11 | 6656.17 | 6656.15 | 6656.12 | 6656.03 | 6656.10 | 6656.12 | 6656.18 | 6656.09 | 6656.02 | | 6656.16 | 6656.18 | 6656.14 | 6655.96 |
| **E5** | 6660.87 | 6660.87 | 6660.83 | 6660.78 | 6660.85 | 6660.84 | 6660.84 | 6660.87 | 6660.85 | 6660.93 | 6660.81 | 6660.88 | 6660.86 | 6660.82 | 6660.80 | | 6660.92 | 6660.96 | 6660.89 | 6660.80 |
| **E6** | 6664.92 | 6664.86 | 6664.92 | 6664.83 | 6664.87 | 6664.84 | 6664.87 | 6664.93 | 6664.90 | 6664.94 | 6664.94 | 6664.84 | 6664.86 | 6664.86 | 6664.85 | | 6664.95 | 6664.98 | 6664.95 | 6664.85 |
| **E7** | 6666.88 | 6666.67 | 6666.72 | 6666.63 | 6666.73 | 6666.61 | 6666.64 | 6666.65 | 6666.67 | 6666.70 | 6666.71 | 6666.61 | 6666.64 | 6666.65 | 6666.60 | | 6666.75 | 6666.72 | 6666.70 | 6666.62 |
| **E8** | 6666.08 | 6666.03 | 6666.10 | 6666.01 | 6666.05 | 6665.98 | 6665.99 | 6666.06 | 6666.08 | 6666.11 | 6666.08 | 6666.02 | 6666.03 | 6666.02 | 6666.03 | | 6666.18 | 6666.14 | 6666.12 | 6666.05 |
| **E9** | 6665.37 | 6665.33 | 6665.39 | 6665.33 | 6665.36 | 6665.28 | 6665.30 | 6665.37 | 6665.34 | 6665.36 | 6665.37 | 6665.35 | 6665.39 | 6665.32 | 6665.34 | | 6665.47 | 6665.43 | 6665.45 | 6665.14 |
| **E10** | 6665.86 | 6665.81 | 6665.90 | 6665.83 | 6665.84 | 6665.86 | 6665.80 | 6665.92 | 6665.93 | 6665.87 | 6665.89 | 6665.81 | 6665.83 | 6665.81 | 6665.81 | | 6665.95 | 6665.79 | 6665.90 | 6665.80 |
| **X-1** | 6663.71 | 6663.59 | 6663.50 | 6663.39 | 6663.38 | 6663.19 | 6663.19 | 6662.94 | 6663.00 | 6662.94 | 6662.88 | 6662.66 | 6662.51 | 6662.43 | 6662.30 | | 6662.45 | 6662.37 | 6662.27 | 6662.16 |

| Date | 11/24/2003 | 11/29/2004 | 12/6/2005 | 10/5/2006 | 11/8/2007 | 12/4/2008 | 12/1/2009 | 10/12/2010 | 10/1/2011 | 12/1/2012 | 11/4/2013 | 11/6/2014 | 11/6/2015 | 11/29/2016 | 11/29/2017 | 9/27/2018 | 8/22/2019 | 11/16/2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A2** | 6656.74 | 6656.70 | 6656.69 | 6656.83 | 6656.78 | 6656.62 | 6656.79 | 6656.60 | 6656.50 | 6656.45 | 6656.45 | 6656.44 | 6656.32 | 6656.40 | 6656.29 | 6656.32 | 6656.27 | 6656.25 |
| **A3** | 6657.07 | 6657.08 | 6657.03 | 6655.16 | 6655.10 | | | | | | | | | | 6656.71 | 6656.68 | 6656.67 | 6656.65 |
| **A4** | 6657.41 | 6657.39 | 6657.30 | 6657.57 | 6657.39 | 6657.29 | 6657.39 | 6657.21 | 6657.14 | 6657.09 | 6657.11 | 6657.11 | 6657.01 | 6657.09 | 6656.98 | 6657.00 | 6656.95 | 6656.92 |
| **A5** | 6659.03 | 6659.16 | 6659.12 | 6659.20 | 6659.16 | 6659.04 | 6659.18 | 6659.02 | 6658.96 | 6658.93 | 6658.95 | 6658.96 | 6658.87 | 6658.96 | 6658.87 | 6658.87 | 6658.85 | 6658.84 |
| **A6** | 6665.56 | 6665.66 | 6665.62 | 6665.68 | 6665.62 | 6665.53 | 6665.62 | 6665.48 | 6665.42 | 6665.40 | 6665.44 | 6665.43 | 6665.30 | 6665.42 | 6665.33 | 6665.33 | 6665.31 | 6665.27 |
| **A7** | 6665.99 | 6666.00 | 6666.05 | 6666.03 | 6666.04 | 6665.91 | 6666.05 | 6665.81 | 6665.84 | 6665.80 | 6665.83 | 6665.81 | 6665.67 | 6665.77 | 6665.67 | 6665.70 | 6665.63 | 6665.57 |
| **A8** | 6666.45 | 6666.44 | 6666.55 | 6666.54 | 6666.49 | 6666.33 | 6666.47 | 6666.31 | 6666.25 | 6666.21 | 6666.25 | 6666.21 | 6666.10 | 6666.21 | 6666.09 | 6666.10 | 6666.08 | 6666.04 |
| **A9** | 6666.25 | 6666.25 | 6666.38 | 6666.38 | 6666.31 | 6666.15 | 6666.28 | 6666.13 | 6666.07 | 6666.02 | 6666.07 | 6666.03 | 6665.94 | 6666.04 | 6665.92 | 6665.97 | 6665.90 | 6665.88 |
| **A10** | 6666.30 | 6666.29 | 6666.34 | 6666.33 | 6666.34 | 6666.15 | 6666.34 | 6666.18 | 6666.11 | 6666.06 | 6666.10 | 6666.06 | 6665.99 | 6666.07 | 6665.94 | 6665.99 | 6665.94 | 6665.89 |
| **A11** | 6663.94 | 6663.93 | 6663.95 | 6663.99 | 6664.00 | 6663.81 | 6664.00 | 6663.86 | 6663.78 | 6663.72 | 6663.78 | 6663.74 | 6663.68 | 6663.78 | 6663.65 | 6663.61 | 6663.67 | 6663.66 |
| **B1** | 6656.54 | 6656.52 | 6656.51 | 6656.45 | 6658.57 | 6656.44 | 6656.60 | 6656.43 | 6656.33 | 6656.31 | 6656.31 | 6656.26 | 6656.19 | 6656.26 | 6656.18 | 6656.14 | 6656.08 | 6656.08 |
| **B2** | 6658.48 | 6658.46 | 6658.45 | 6658.39 | 6658.41 | 6658.30 | 6658.44 | 6658.28 | 6658.16 | 6658.16 | 6658.16 | 6658.13 | 6657.99 | 6658.05 | 6657.92 | 6657.89 | 6657.81 | 6657.76 |
| **B3** | 6659.12 | 6659.12 | 6659.07 | 6658.98 | | | | | | | | | | | | | #N/A | #N/A |
| **B4** | 6662.36 | 6662.40 | 6662.33 | 6662.37 | 6662.38 | 6662.31 | 6662.42 | 6662.30 | 6662.16 | 6662.16 | 6662.16 | 6662.12 | 6662.01 | 6662.09 | 6661.97 | 6661.91 | 6661.91 | 6661.83 |
| **B5** | 6665.16 | 6665.32 | 6665.20 | 6665.08 | 6665.12 | 6665.02 | 6665.15 | 6664.99 | 6664.87 | 6664.87 | 6664.88 | 6664.84 | 6664.74 | 6664.85 | 6664.76 | 6664.74 | 6664.69 | 6664.68 |
| **B6** | 6668.64 | 6668.73 | 6668.69 | 6668.61 | 6668.64 | 6668.53 | 6668.63 | 6668.47 | 6668.40 | 6668.38 | 6668.36 | 6668.31 | 6668.16 | 6668.22 | 6668.10 | 6668.08 | 6668.04 | 6667.92 |
| **B7** | 6671.74 | 6671.71 | 6671.79 | 6671.69 | 6671.74 | 6671.60 | 6671.73 | 6671.50 | 6671.51 | 6671.51 | 6671.48 | 6671.44 | 6671.29 | 6671.37 | 6671.24 | 6671.24 | 6671.19 | 6667.07 |
| **B8** | 6668.45 | 6668.47 | 6668.56 | 6668.44 | 6668.44 | | | | | | | | | | 6668.00 | 6667.99 | 6667.95 | 6667.90 |
| **B9** | 6668.83 | 6668.84 | 6668.98 | 6668.85 | 6668.87 | 6668.68 | 6668.83 | 6668.64 | 6668.59 | 6668.57 | 6668.58 | 6668.52 | 6668.41 | 6668.48 | 6668.37 | 6668.33 | 6668.28 | 6668.24 |
| **B10** | 6670.02 | 6670.03 | 6670.04 | | | | | | | | | | | | | | #N/A | #N/A |
| **B11** | 6666.00 | 6666.00 | 6666.02 | 6665.94 | 6665.97 | 6665.81 | 6665.99 | 6665.83 | 6665.76 | 6665.73 | 6665.76 | 6665.68 | 6665.68 | 6665.68 | 6661.41 | 6661.40 | 6661.39 | 6661.33 |
| **C1** | 6656.88 | 6656.86 | 6656.83 | 6656.77 | 6656.86 | 6656.73 | 6656.89 | 6656.90 | 6656.63 | 6656.64 | 6656.61 | 6656.62 | 6656.39 | 6656.52 | 6656.39 | 6656.42 | 6656.38 | 6656.35 |
| **C2** | 6660.23 | 6660.17 | 6660.21 | 6660.16 | 6660.16 | 6660.00 | 6660.20 | 6660.23 | 6659.93 | 6659.97 | 6659.95 | 6659.91 | 6659.71 | 6659.83 | 6659.72 | 6659.68 | 6659.65 | 6659.60 |
| **C3** | 6664.87 | 6664.91 | 6664.71 | 6664.78 | 6664.78 | 6664.68 | 6664.82 | 6664.87 | 6664.54 | 6664.56 | 6664.55 | 6664.48 | 6664.48 | 6664.38 | 6664.27 | 6664.25 | 6664.17 | 6664.16 |
| **C4** | 6666.72 | 6666.85 | 6666.69 | 6666.76 | 6666.72 | | | | | | | | | | 6664.33 | 6664.30 | 6664.28 | 6664.22 |
| **C5** | 6671.22 | 6671.24 | 6671.31 | 6671.14 | 6671.18 | 6671.11 | 6671.24 | 6671.08 | 6671.02 | 6671.01 | 6671.02 | 6670.94 | 6670.75 | 6670.89 | 6670.74 | 6670.75 | 6670.74 | 6670.69 |
| **C6** | 6670.90 | 6670.84 | 6670.96 | 6670.91 | 6670.86 | 6670.75 | 6670.86 | 6670.69 | 6670.62 | 6670.62 | 6670.62 | 6670.54 | 6670.38 | 6670.50 | 6670.38 | 6670.40 | 6670.34 | 6670.26 |
| **C7** | 6670.54 | 6670.59 | 6670.61 | 6670.51 | 6670.55 | 6670.39 | 6670.57 | 6670.36 | 6670.32 | 6670.30 | 6670.32 | 6670.26 | 6670.04 | 6670.17 | 6670.06 | 6670.06 | 6670.00 | 6667.80 |
| **C8** | 6671.86 | 6671.88 | 6671.95 | 6671.80 | 6671.87 | | | | | | | | | | | | #N/A | #N/A |
| **C9** | 6671.37 | 6671.40 | 6671.57 | 6671.42 | 6671.39 | 6671.22 | 6671.39 | 6671.39 | 6671.39 | 6671.39 | 6671.39 | 6671.39 | 6671.39 | 6671.39 | 6670.90 | 6670.91 | 6670.90 | 6670.80 |
| **C10** | 6672.49 | 6672.50 | 6672.52 | 6672.39 | 6672.42 | 6672.24 | 6672.42 | 6672.24 | 6672.16 | 6672.17 | 6672.20 | 6672.12 | 6671.97 | 6672.11 | 6671.96 | 6671.97 | 6671.93 | 6671.88 |
| **C11** | 6666.61 | 6666.63 | 6666.65 | 6666.60 | 6666.63 | | | | | | | | | | | | #N/A | #N/A |
| **D1** | 6658.34 | 6658.32 | 6658.29 | 6658.23 | 6658.39 | 6658.25 | 6658.41 | 6658.39 | 6658.13 | 6658.17 | 6658.17 | 6658.18 | 6657.95 | 6658.09 | 6658.01 | 6657.99 | 6657.98 | 6657.96 |
| **D2** | 6657.48 | 6657.43 | 6657.50 | 6657.43 | 6657.47 | | | | | | | | | | 6655.12 | 6655.12 | 6655.12 | 6655.05 |
| **D3** | 6659.16 | 6659.19 | 6659.13 | 6659.01 | 6659.06 | 6658.97 | 6659.04 | 6659.07 | 6658.85 | 6658.91 | 6658.87 | 6658.84 | 6658.66 | 6658.78 | 6658.65 | 6658.60 | 6658.59 | 6658.51 |
| **D4** | 6661.12 | 6661.25 | 6661.10 | 6661.12 | 6661.14 | 6661.03 | 6661.12 | 6661.11 | 6660.88 | 6660.93 | 6660.90 | 6660.89 | 6660.66 | 6660.76 | 6660.63 | 6660.61 | 6660.58 | 6660.51 |
| **D5** | 6664.93 | 6665.11 | 6664.99 | 6664.90 | 6664.95 | 6664.85 | 6664.93 | 6664.91 | 6664.68 | 6664.71 | 6664.66 | 6664.62 | 6664.44 | 6664.56 | 6664.46 | 6664.44 | 6664.40 | 6664.39 |
| **D6** | 6668.91 | 6668.87 | 6668.97 | 6668.88 | 6668.91 | 6668.79 | 6668.88 | 6668.85 | 6668.62 | 6668.68 | 6668.63 | 6668.59 | 6668.43 | 6668.55 | 6668.46 | 6668.45 | 6668.42 | 6668.37 |
| **D7** | 6668.00 | 6668.04 | 6668.07 | 6667.96 | 6668.04 | 6667.89 | 6668.02 | 6668.13 | 6667.89 | 6667.91 | 6667.86 | 6667.81 | 6667.64 | 6667.75 | 6667.66 | 6667.65 | 6667.61 | 6667.57 |
| **D8** | | | | | | | | | | | | | | | | | #N/A | #N/A |
| **D9** | 6669.05 | 6669.03 | 6669.20 | 6669.07 | 6669.08 | 6668.90 | 6669.05 | 6668.99 | 6668.80 | 6668.83 | 6668.76 | 6668.72 | 6668.57 | 6668.68 | 6668.59 | 6668.59 | 6668.55 | 6668.46 |
| **D10** | 6668.94 | 6668.93 | 6668.94 | 6668.83 | 6668.88 | 6668.67 | 6668.82 | 6668.75 | 6668.58 | 6668.64 | 6668.56 | 6668.53 | 6668.39 | 6668.51 | 6668.40 | 6668.43 | 6668.40 | 6668.20 |
| **D11** | 6665.64 | 6665.65 | 6665.68 | 6665.63 | 6665.70 | 6665.53 | 6665.71 | 6665.63 | 6665.53 | 6665.54 | 6665.49 | 6665.49 | 6665.23 | 6665.35 | 6665.24 | 6665.28 | 6665.27 | 6665.19 |
| **E2** | 6656.95 | 6656.93 | 6656.90 | 6656.94 | 6656.99 | 6656.83 | 6657.00 | 6656.89 | 6656.73 | 6656.75 | 6656.76 | 6656.76 | 6656.53 | 6656.66 | 6656.58 | 6656.54 | 6656.56 | 6656.52 |
| **E3** | 6657.91 | 6657.93 | 6657.88 | 6657.94 | 6657.99 | 6657.88 | 6658.00 | 6657.93 | 6657.79 | 6657.81 | 6657.83 | 6657.83 | 6657.63 | 6657.79 | 6657.73 | 6657.70 | 6657.70 | 6657.69 |
| **E4** | 6655.98 | 6656.10 | 6655.91 | 6656.04 | 6655.97 | 6655.84 | 6655.96 | 6655.86 | 6655.72 | 6655.73 | 6655.73 | 6655.75 | 6655.53 | 6655.67 | 6655.58 | 6655.57 | 6655.59 | 6655.53 |
| **E5** | 6660.79 | 6660.82 | 6660.80 | 6660.93 | 6660.89 | 6660.76 | 6660.85 | 6660.75 | 6660.71 | 6660.63 | 6660.63 | 6660.63 | 6660.43 | 6660.60 | 6660.50 | 6660.49 | 6660.47 | 6660.48 |
| **E6** | 6664.86 | 6664.84 | 6664.91 | 6665.10 | 6664.93 | 6664.84 | 6664.93 | 6664.84 | 6664.72 | 6664.75 | 6664.77 | 6664.77 | 6664.55 | 6664.72 | 6664.68 | 6664.65 | 6664.66 | 6664.60 |
| **E7** | 6666.58 | 6666.61 | 6666.66 | 6666.73 | 6666.62 | 6666.56 | 6666.68 | 6666.59 | 6666.46 | 6666.37 | 6666.43 | 6666.40 | 6666.15 | 6666.68 | 6664.28 | 6664.27 | 6664.23 | 6664.21 |
| **E8** | 6666.02 | 6666.02 | 6666.12 | 6666.10 | 6666.07 | 6665.94 | 6666.07 | 6665.98 | 6665.85 | 6665.87 | 6665.87 | 6665.90 | 6665.66 | 6665.83 | 6665.78 | 6665.77 | 6665.76 | 6665.70 |
| **E9** | 6665.33 | 6665.32 | 6665.47 | 6665.51 | 6665.45 | 6665.27 | 6665.43 | 6665.34 | 6665.22 | 6665.24 | 6665.23 | 6665.25 | 6665.01 | 6665.19 | 6665.09 | 6665.13 | 6665.13 | 6665.05 |
| **E10** | 6665.79 | 6665.75 | 6665.80 | 6665.91 | 6665.85 | 6665.64 | 6665.83 | 6665.74 | 6665.61 | 6665.63 | 6665.62 | 6665.65 | 6665.42 | 6665.57 | 6665.48 | 6665.53 | 6665.49 | 6665.44 |
| **X-1** | 6662.21 | 6662.25 | 6662.04 | 6662.11 | 6662.14 | 6662.05 | 6662.21 | 6662.26 | 6661.93 | 6661.97 | 6661.96 | 6661.90 | 6661.90 | 6661.90 | 6661.74 | 6661.69 | 6661.61 | 6661.56 |

Notes:

1. B7 survey notes for 2020: B7 found to have been disturbed. A 4.14 ft section of drill stem was found broken off from the monument. It appears to have been run over having it's PVC casing demolished leaving it 0.5' below grade. A new PVC casing will be installed.
2. B11 survey notes for 2018, 2019, and 2020: B11 found buried 1.3 ft deep.
3. C4 survey notes for 2018, 2019, and 2020: C4 found bent 15 degeres from 1.5ft. Monument would be 0.05 ft higher if straightened.
4. C7 survey notes for 2020: C7 found to have been disturbed. A 2.22 ft section of drill stem was found broken off from the monument. It appears to have been run over having it's PVC casing demolished leaving it 0.5' below grade. A new PVC casing will be installed.

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GRP EOR Annual Inspection
Cumulative Settlement Plot for A4

Stantec

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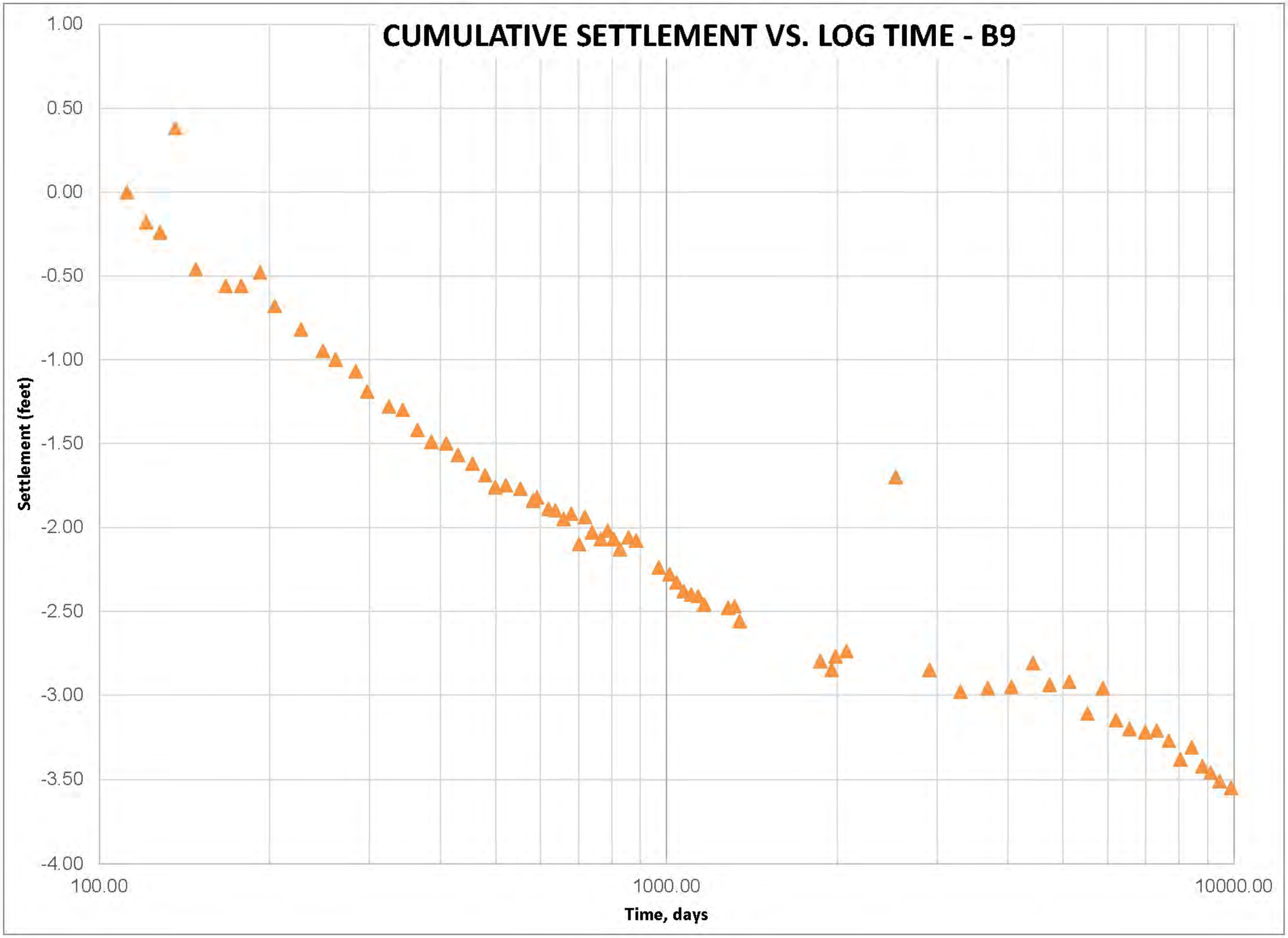
| JANUARY 2021 | C-7 |




GRP EOR Annual Inspection
Cumulative Settlement Plot for B9

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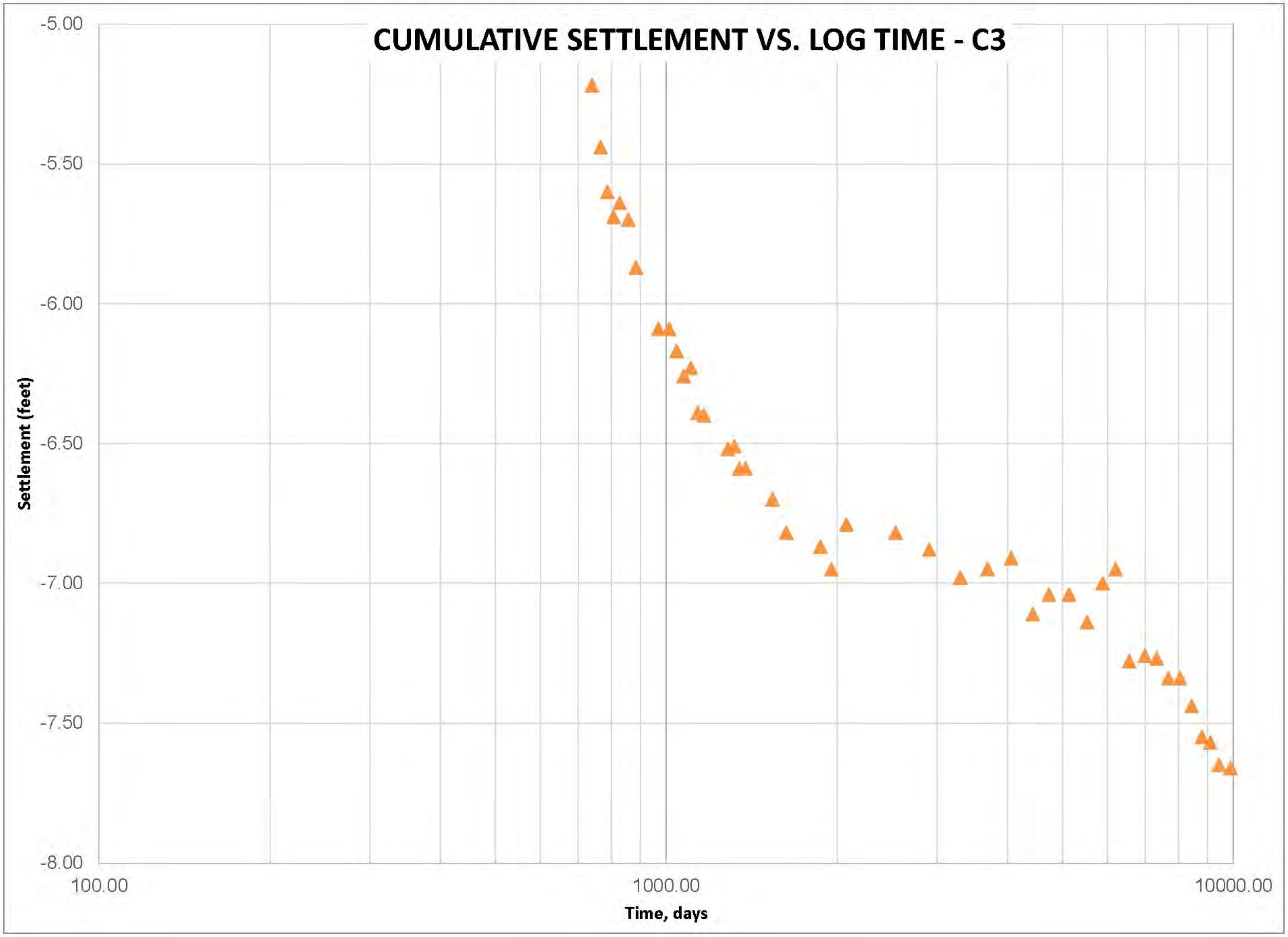
| JANUARY 2021 | C-8 |

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**GRP EOR Annual Inspection**
**Cumulative Settlement Plot for C3**

Stantec

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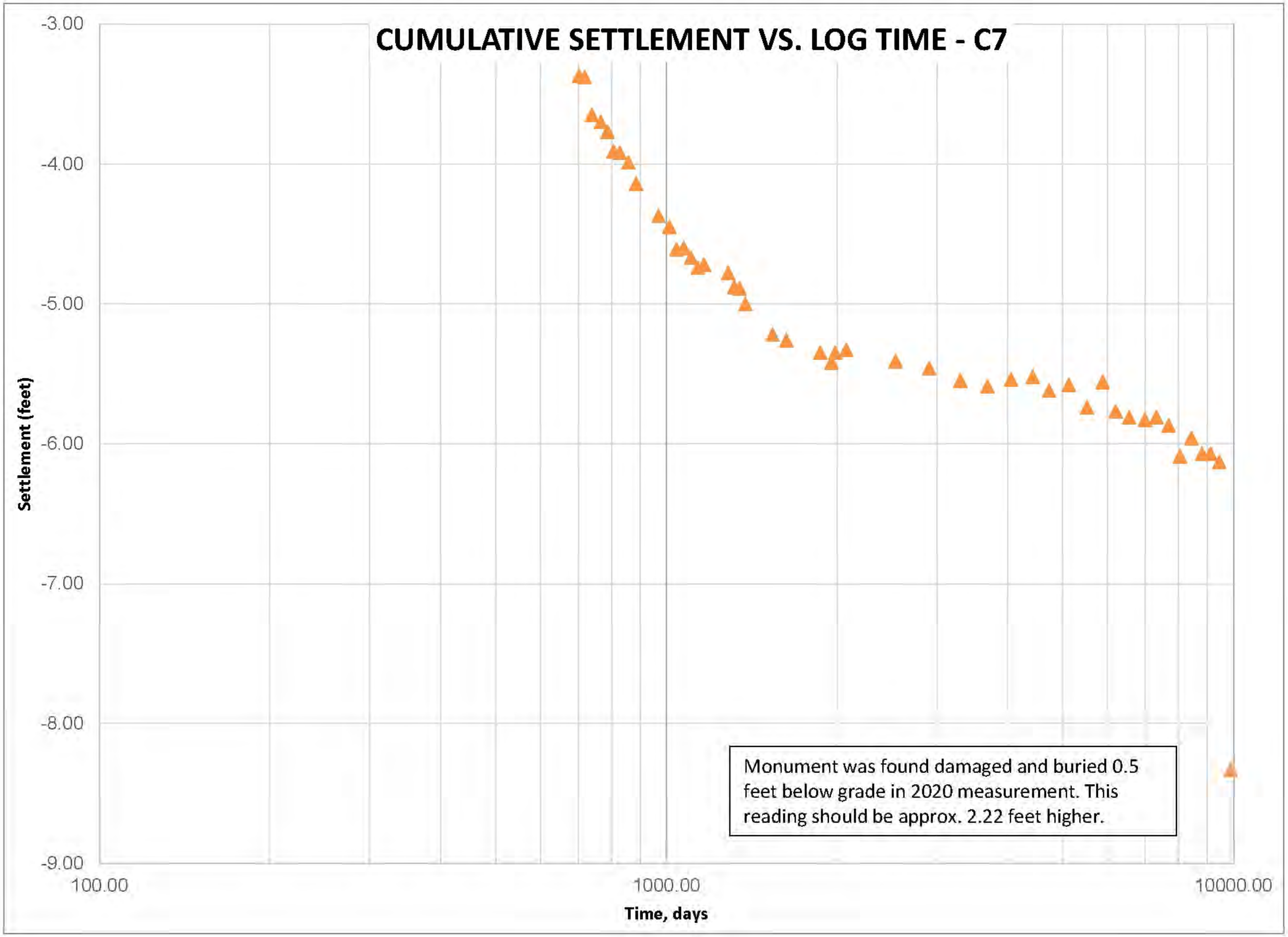
| JANUARY 2021 | C-9 |




GRP EOR Annual Inspection
Cumulative Settlement Plot for C7

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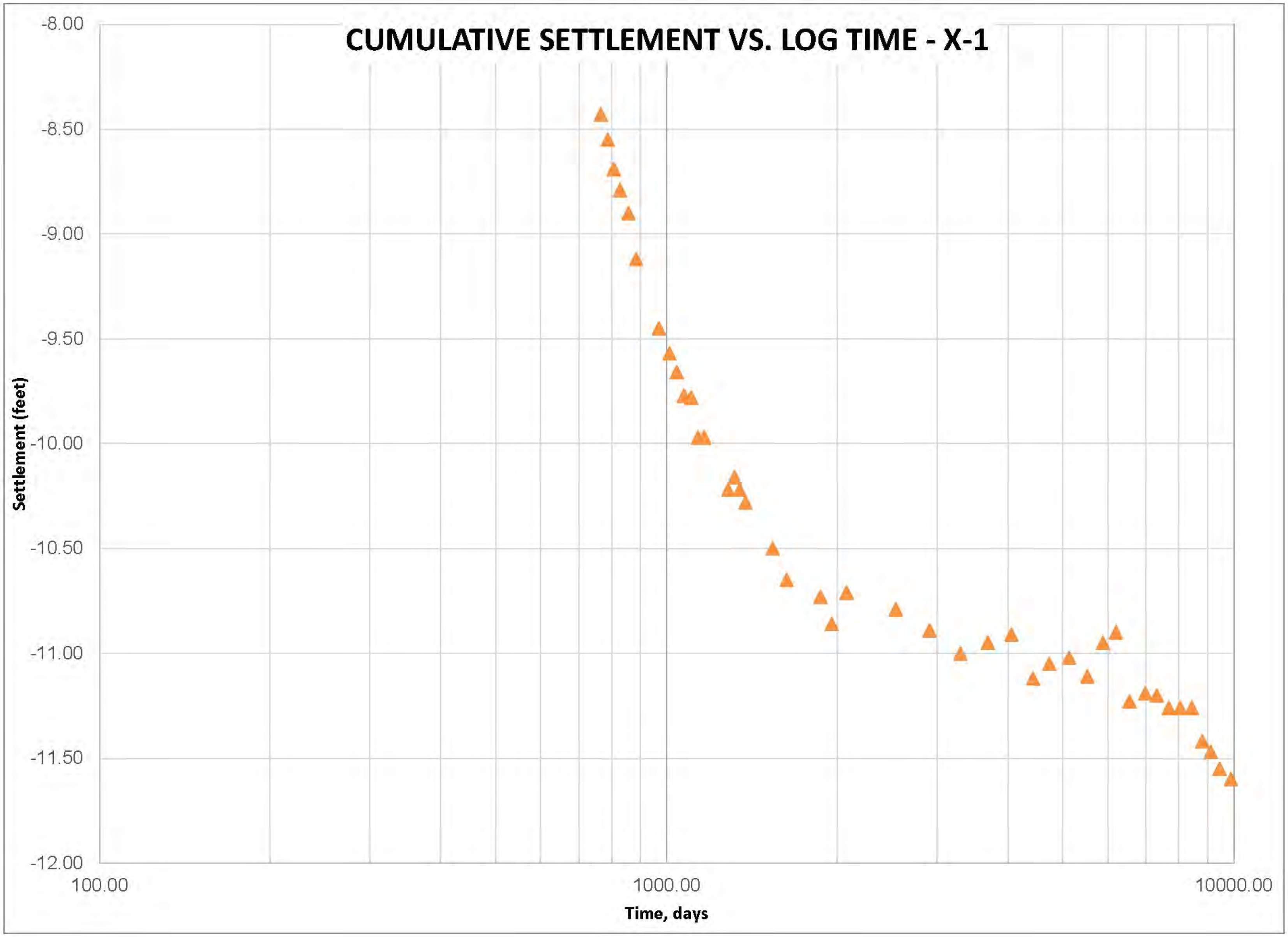
| JANUARY 2021 | C-10 |

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**GRP EOR Annual Inspection**
**Cumulative Settlement Plot for X1**

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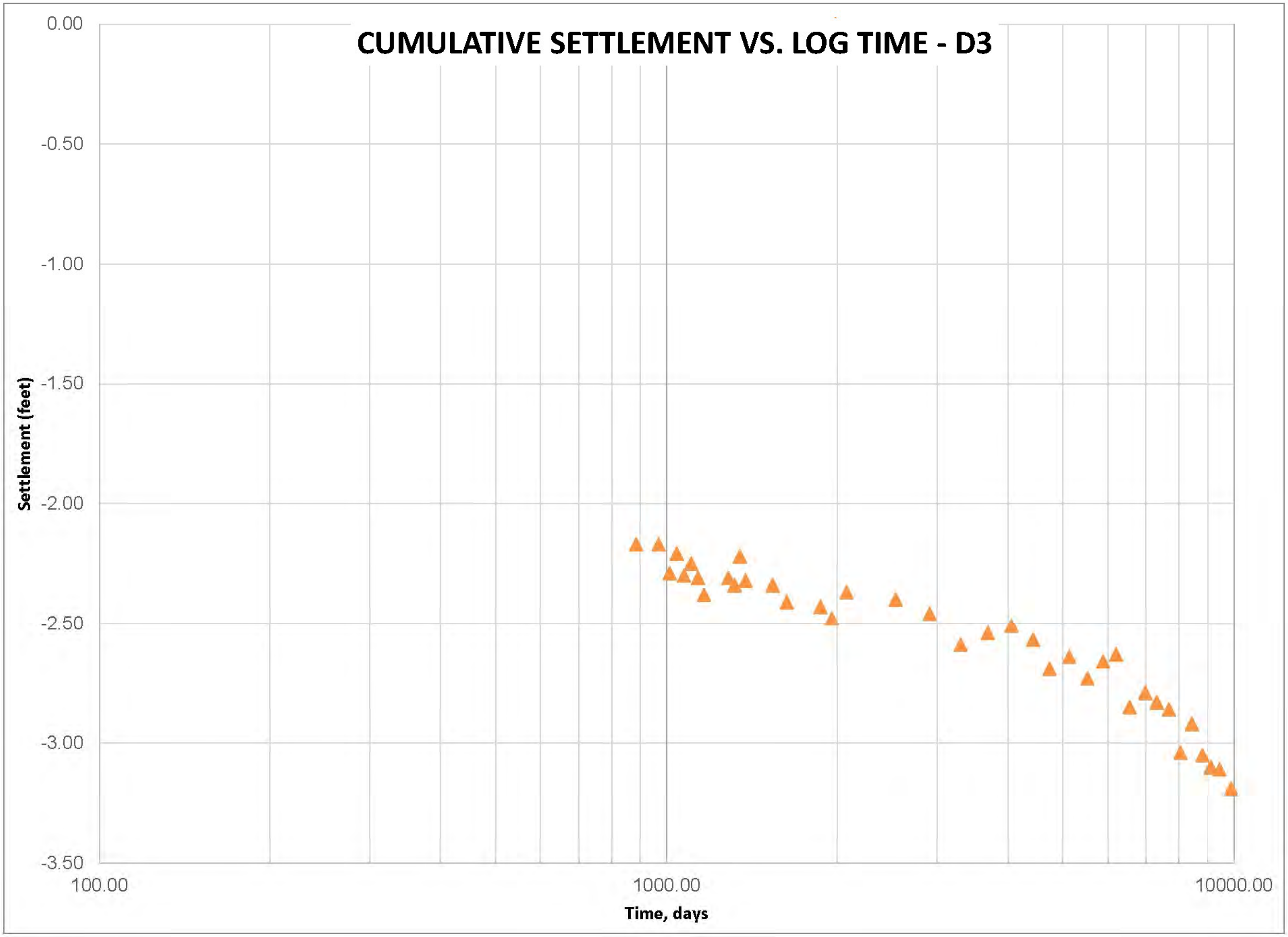
| JANUARY 2021 | C-11 |

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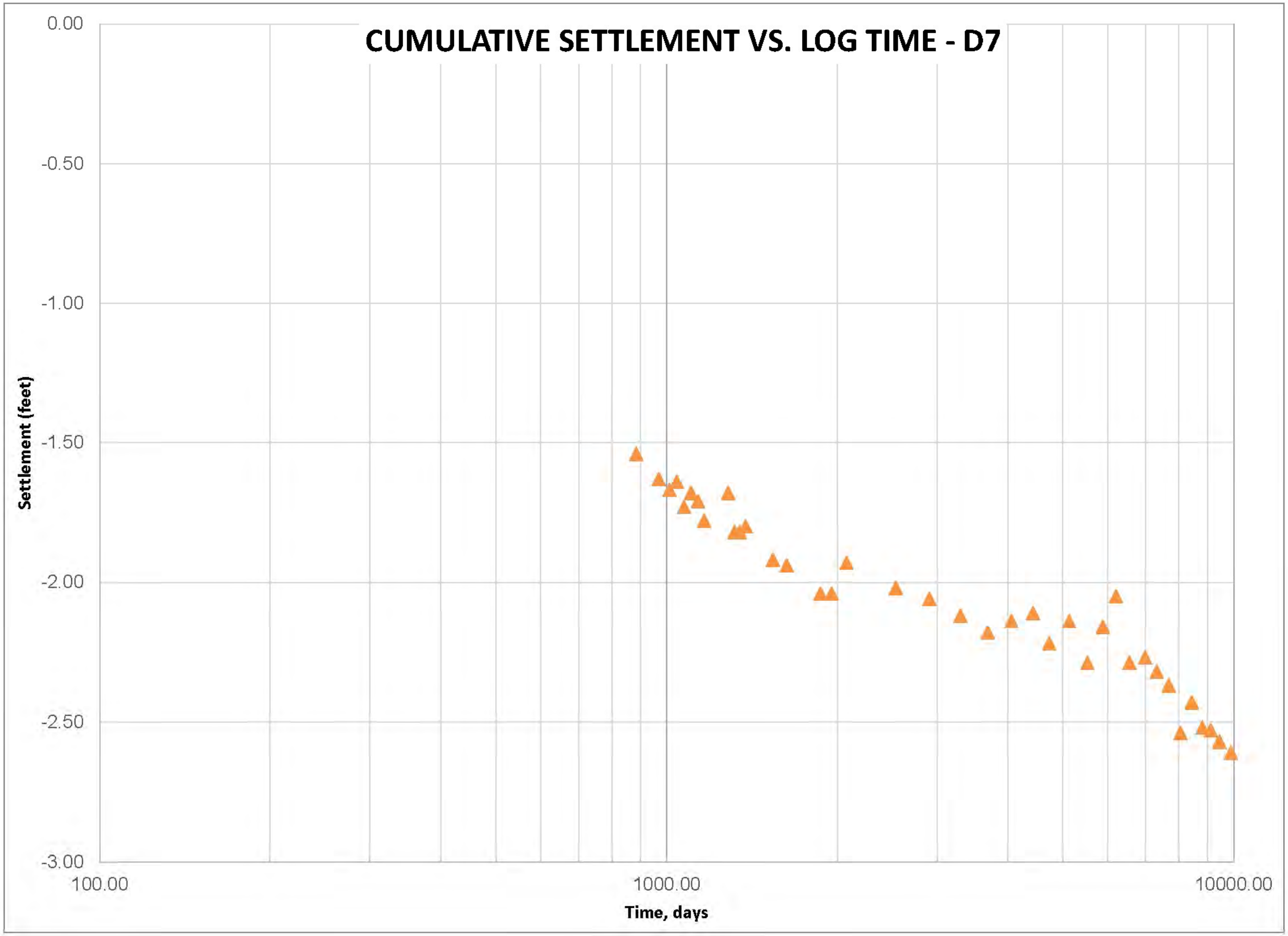
GRP EOR Annual Inspection
Cumulative Settlement Plot for D3

Stantec

JANUARY 2021

C-12

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GRP EOR Annual Inspection
Cumulative Settlement Plot for D7

Stantec

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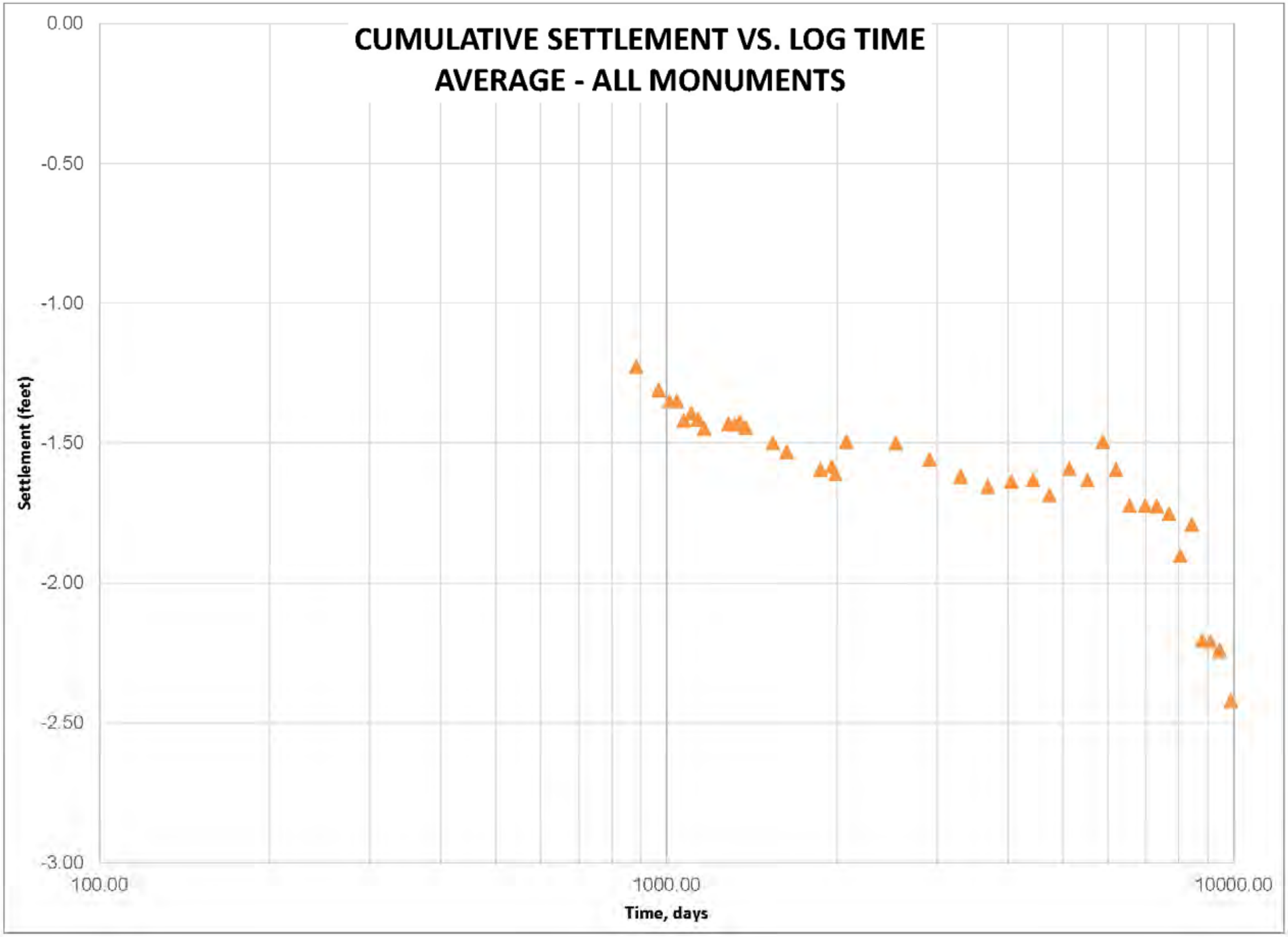
| JANUARY 2021 | C-13 |

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**GRP EOR Annual Inspection**
**Cumulative Settlement Plot for Average of all Monuments**

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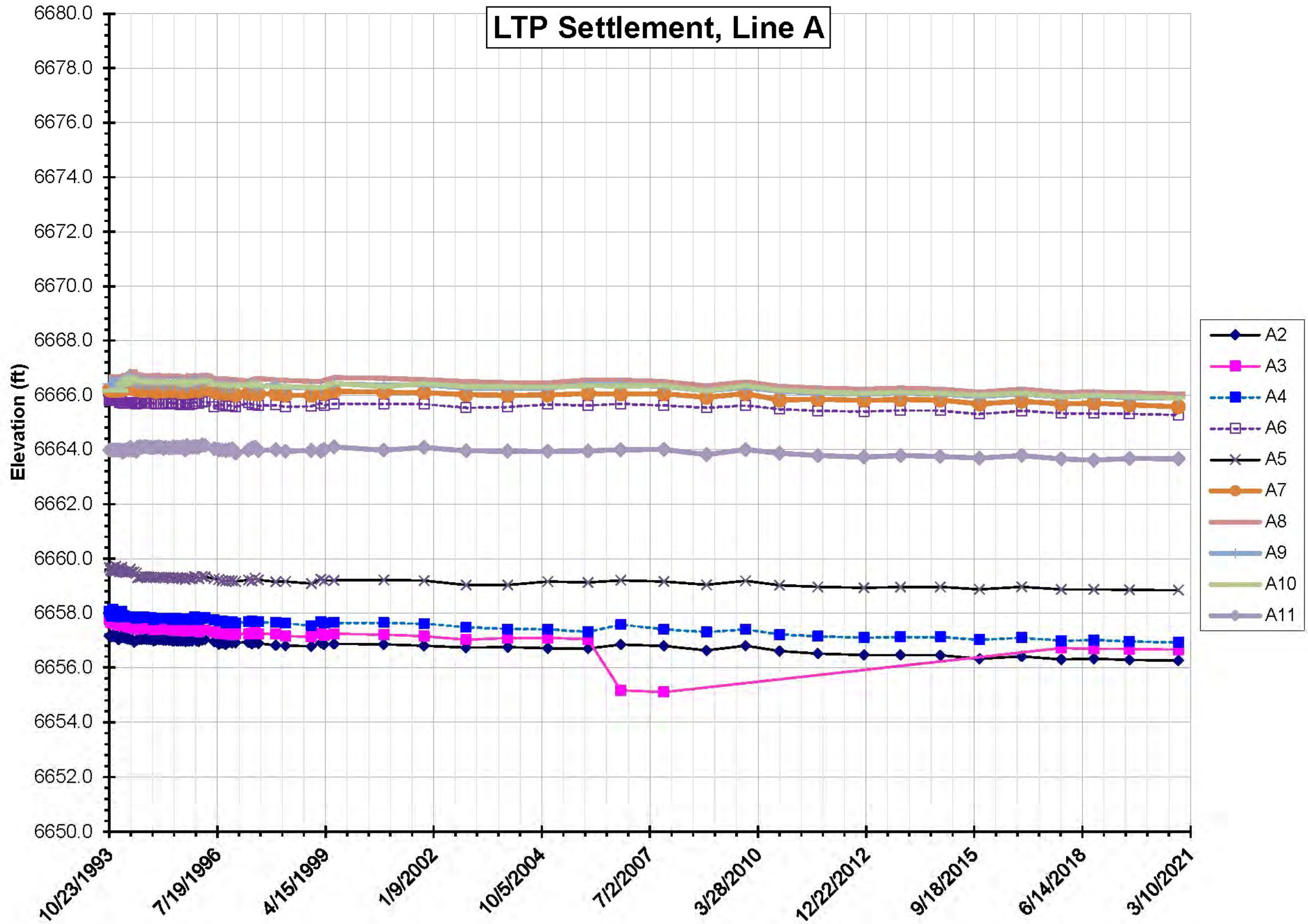
JANUARY 2021

C-14

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**GRP EOR Annual Inspection**
**Settlement over Time, Line A Monuments**

Stantec

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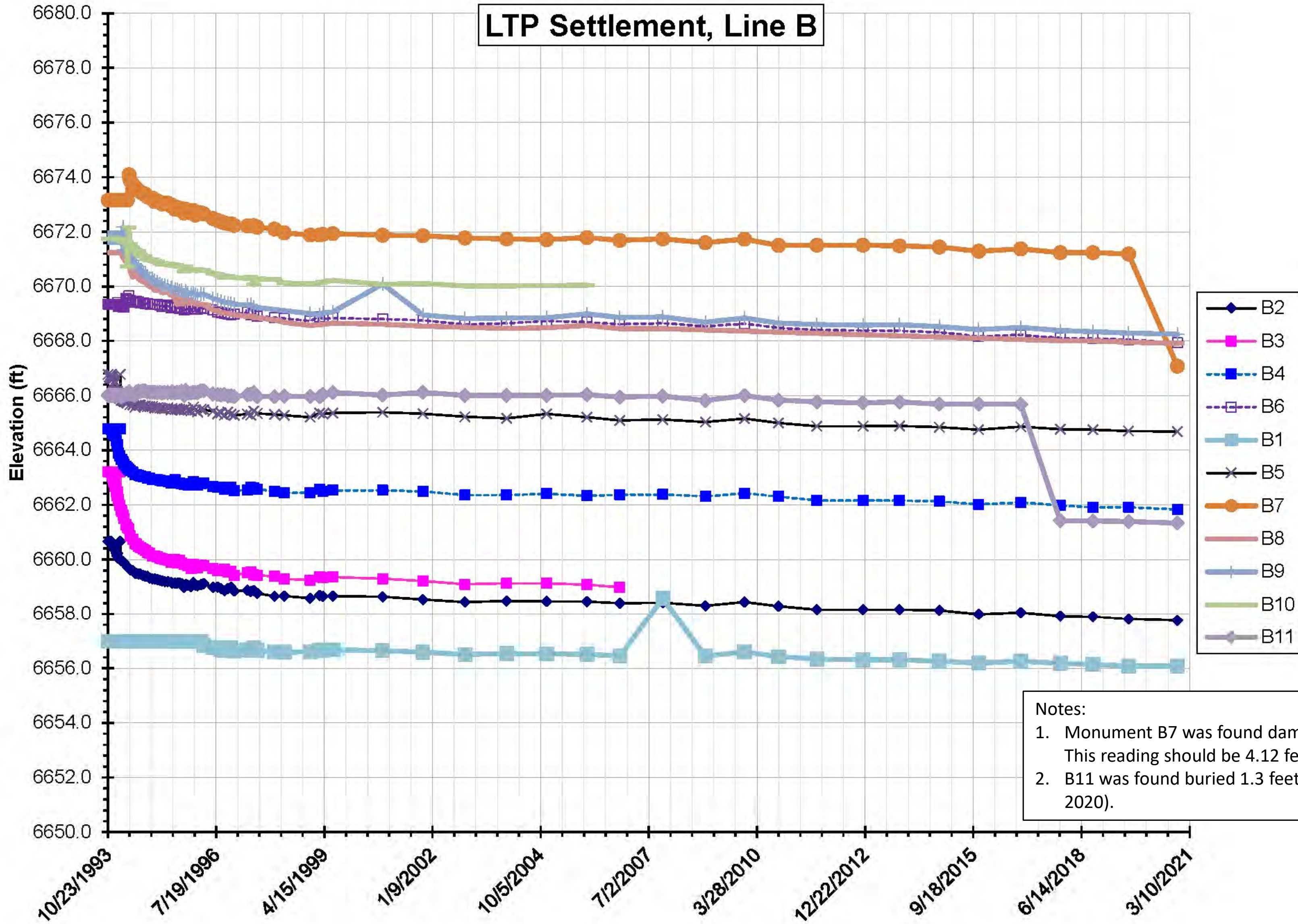
| JANUARY 2021 | C-15 |




Notes:

1. Monument B7 was found damaged in 2020. This reading should be 4.12 feet higher.
2. B11 was found buried 1.3 feet deep (2018 – 2020).

**GRP EOR Annual Inspection**
**Settlement over Time, Line B Monuments**

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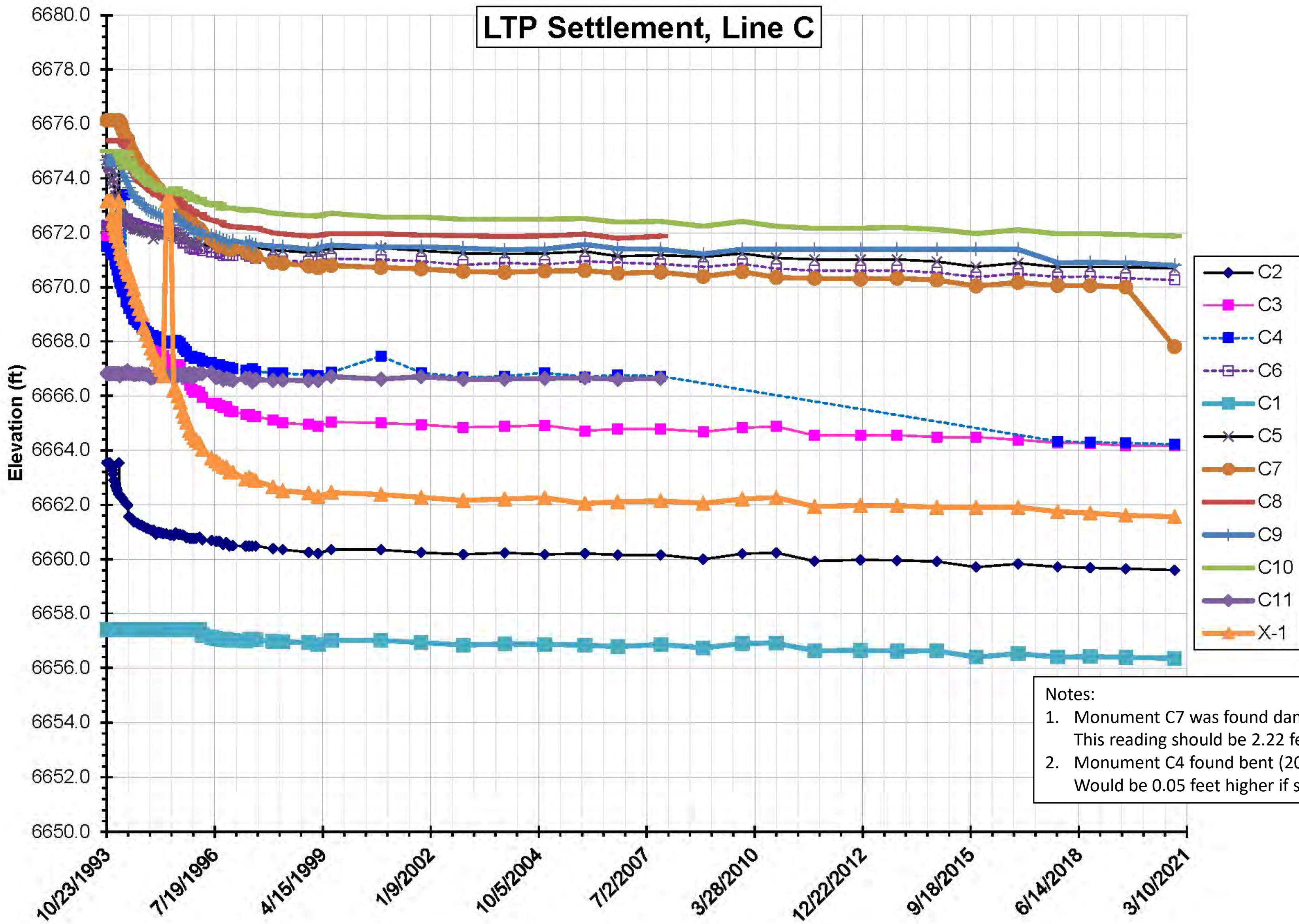
JANUARY 2021 | C-16




Notes:

1. Monument C7 was found damaged in 2020. This reading should be 2.22 feet higher.
2. Monument C4 found bent (2018-2020). Would be 0.05 feet higher if straightened.

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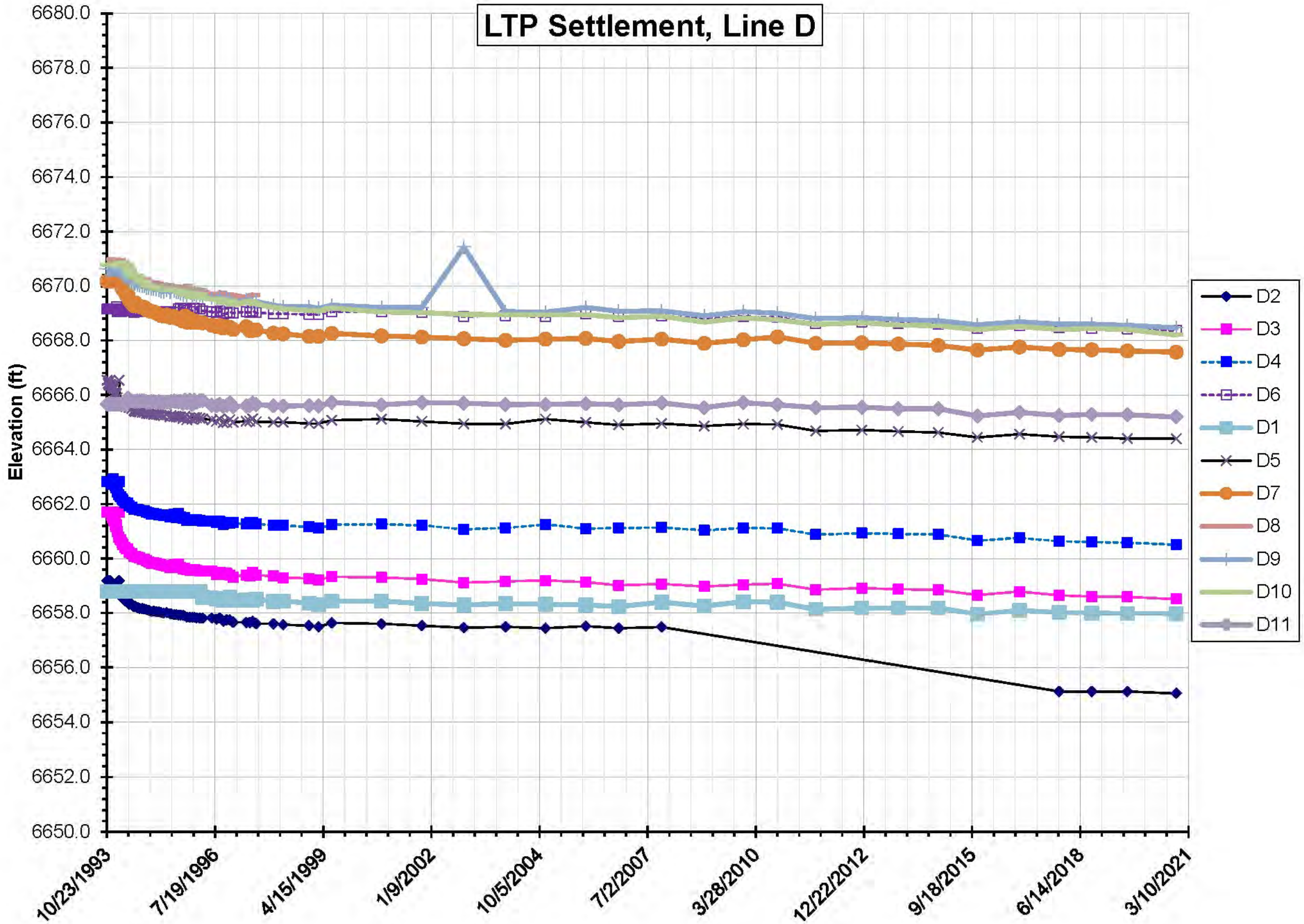
GRP EOR Annual Inspection
Settlement over Time, Line C Monuments

Stantec

| JANUARY 2021 | C-17 |
|---|---|

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**GRP EOR Annual Inspection**
**Settlement over Time, Line D Monuments**

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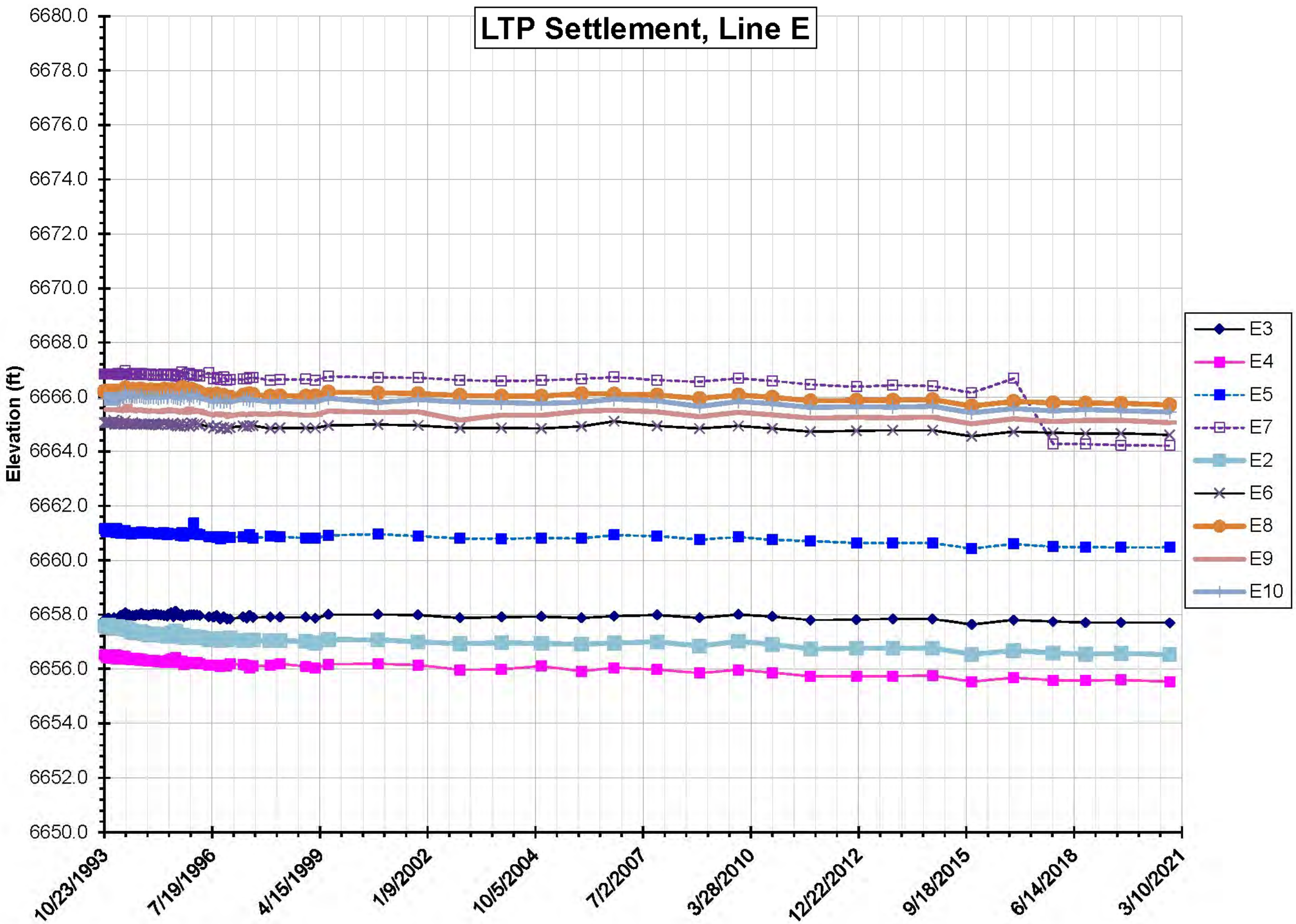
| JANUARY 2021 | C-18 |

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**GRP EOR Annual Inspection**
**Settlement over Time, Line E Monuments**

Stantec

| JANUARY 2021 | C-19 |
|---|---|

# Appendix D PIEZOMETER DATA AND PLOTS

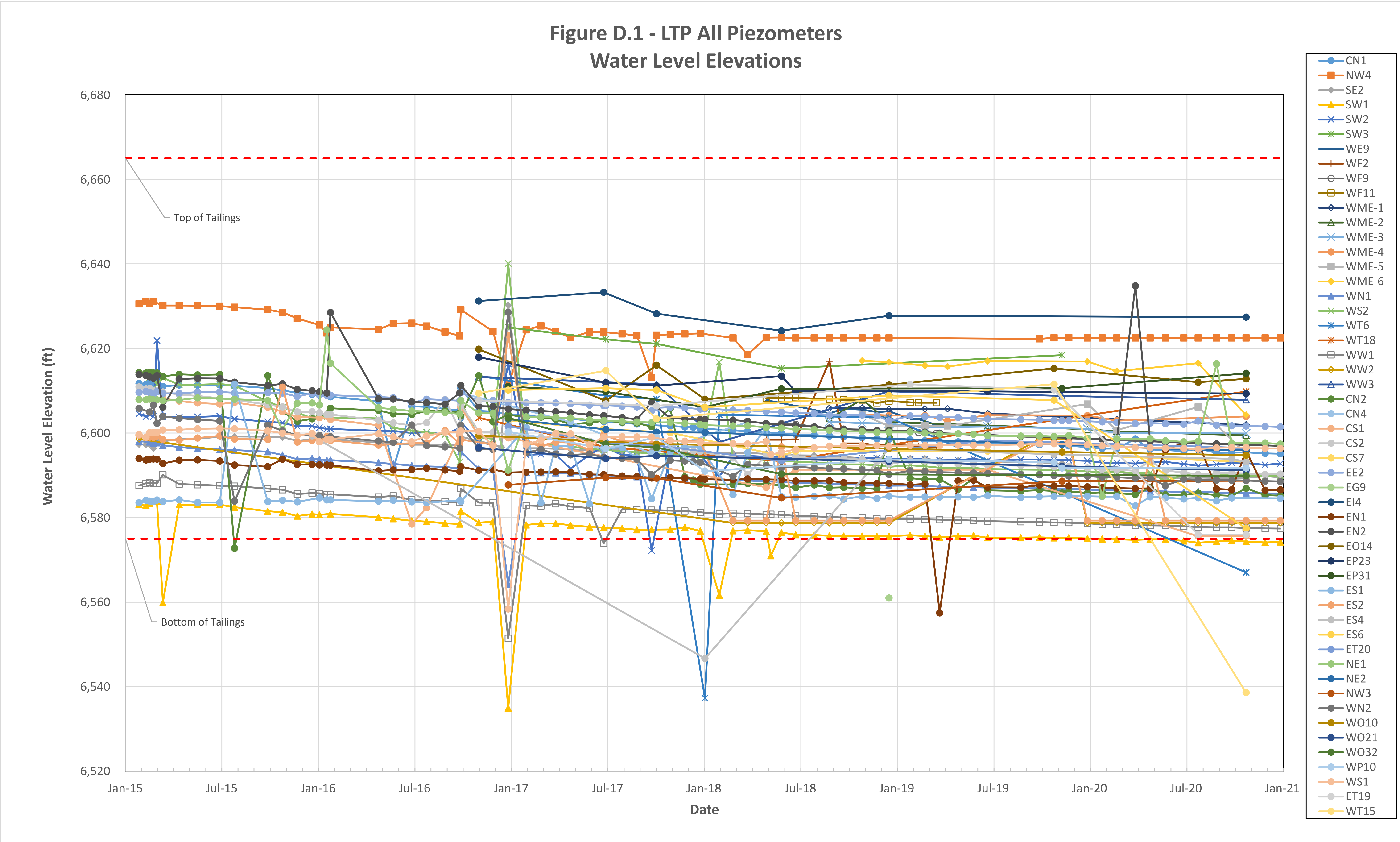

Figure D.1 - LTP All Piezometers
Water Level Elevations
Water Level Elevation (ft)
6,680
6,660
6,640
6,620
6,600
6,580
6,560
6,540
6,520
Top of Tailings
Bottom of Tailings
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Date
CN1
NW4
SE2
SW1
SW2
SW3
WE9
WF2
WF9
WF11
WME-1
WME-2
WME-3
WME-4
WME-5
WME-6
WN1
WS2
WT6
WT18
WW1
WW2
WW3
CN2
CN4
CS1
CS2
CS7
EE2
EG9
EI4
EN1
EN2
EO14
EP23
EP31
ES1
ES2
ES4
ES6
ET20
NE1
NE2
NW3
WN2
WO10
WO21
WO32
WP10
WS1
ET19
WT15

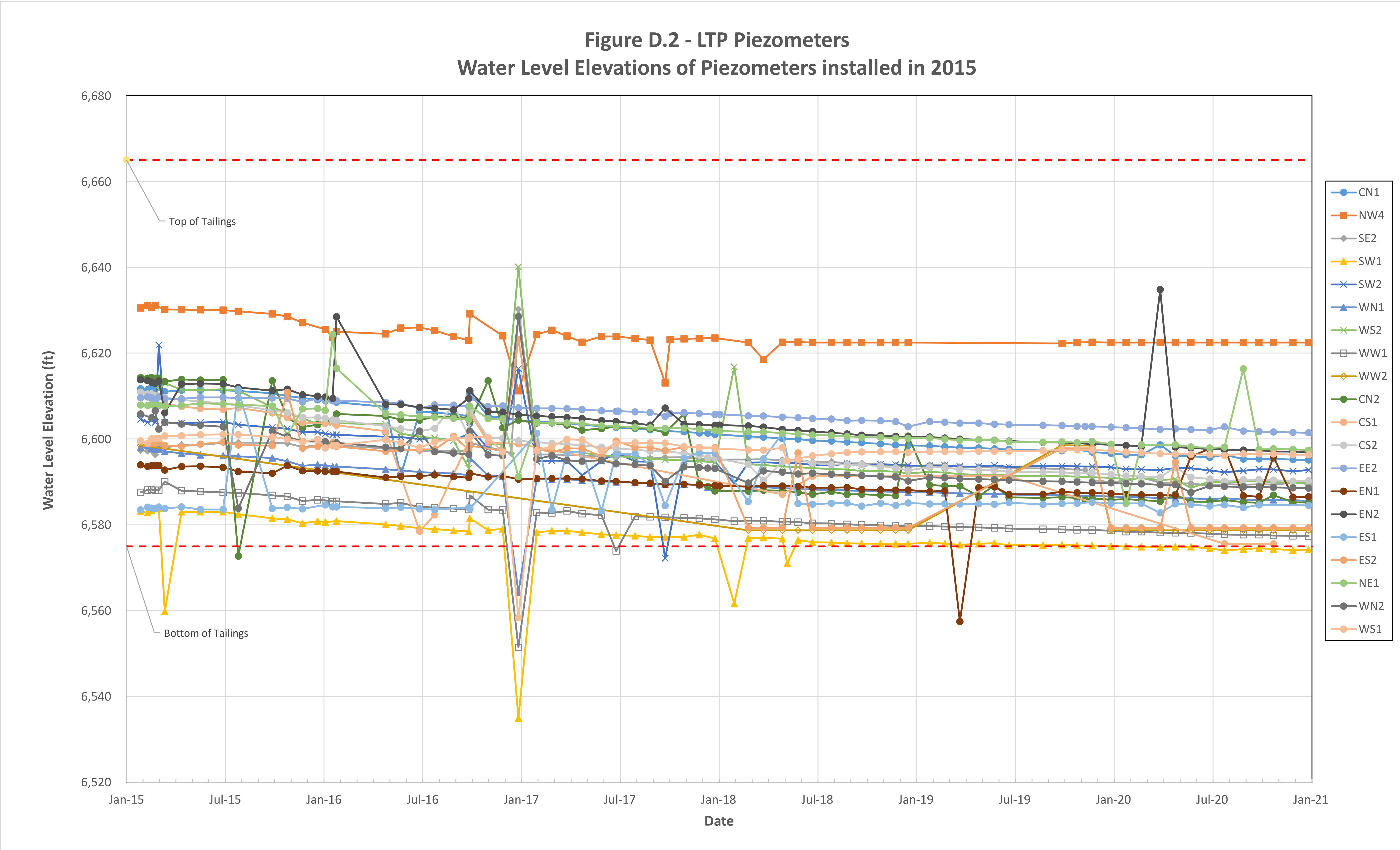
Figure D.2 - LTP Piezometers
Water Level Elevations of Piezometers installed in 2015
Water Level Elevation (ft)
Date
Top of Tailings
Bottom of Tailings
6,680
6,660
6,640
6,620
6,600
6,580
6,560
6,540
6,520
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
CN1
NW4
SE2
SW1
SW2
WN1
WS2
WW1
WW2
CN2
CS1
CS2
EE2
EN1
EN2
ES1
ES2
NE1
WN2
WS1

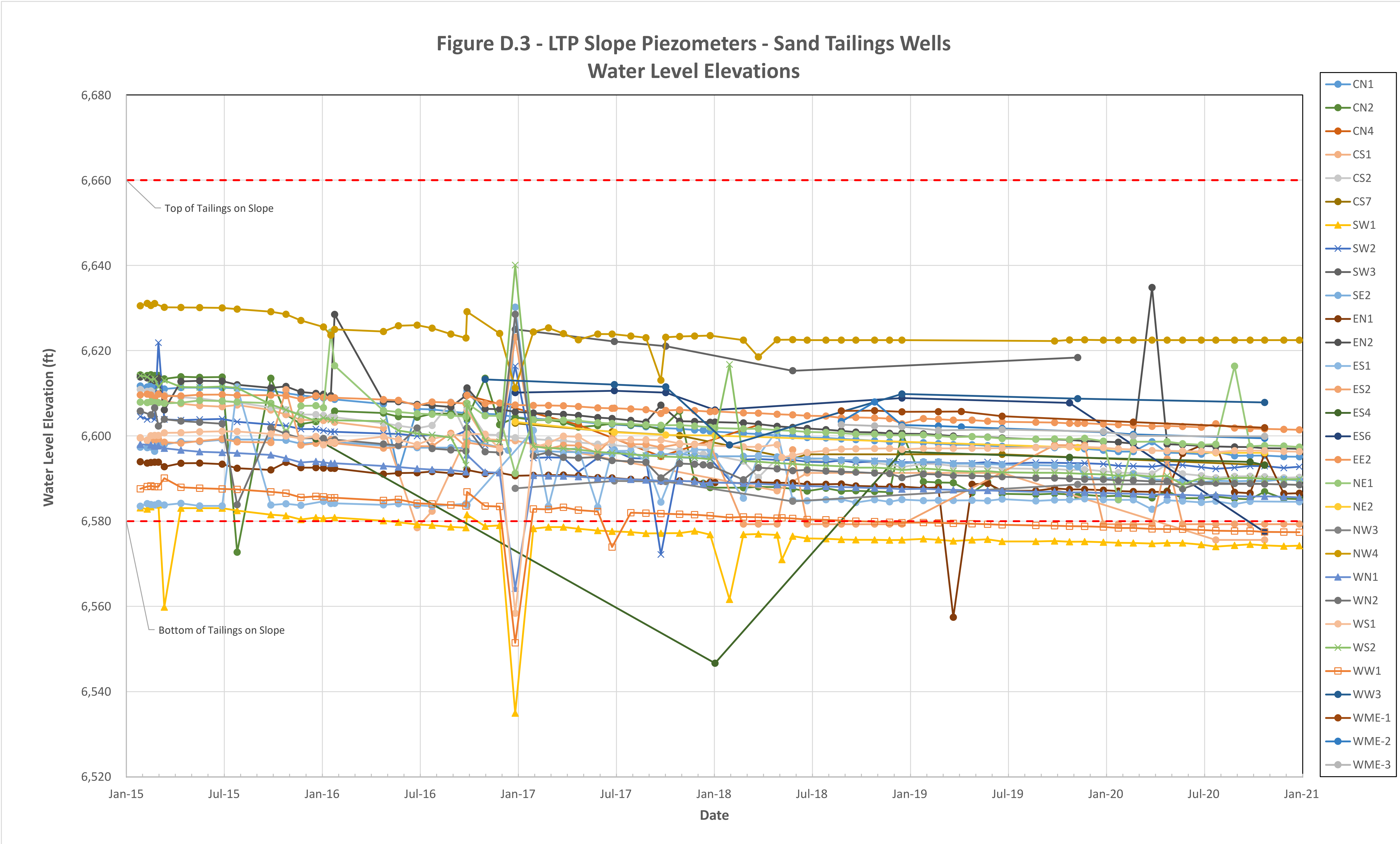
Figure D.3 - LTP Slope Piezometers - Sand Tailings Wells
Water Level Elevations
Water Level Elevation (ft)
6,680
6,660
6,640
6,620
6,600
6,580
6,560
6,540
6,520
Top of Tailings on Slope
Bottom of Tailings on Slope
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Date
CN1
CN2
CN4
CS1
CS2
CS7
SW1
SW2
SW3
SE2
EN1
EN2
ES1
ES2
ES4
ES6
EE2
NE1
NE2
NW3
NW4
WN1
WN2
WS1
WS2
WW1
WW3
WME-1
WME-2
WME-3

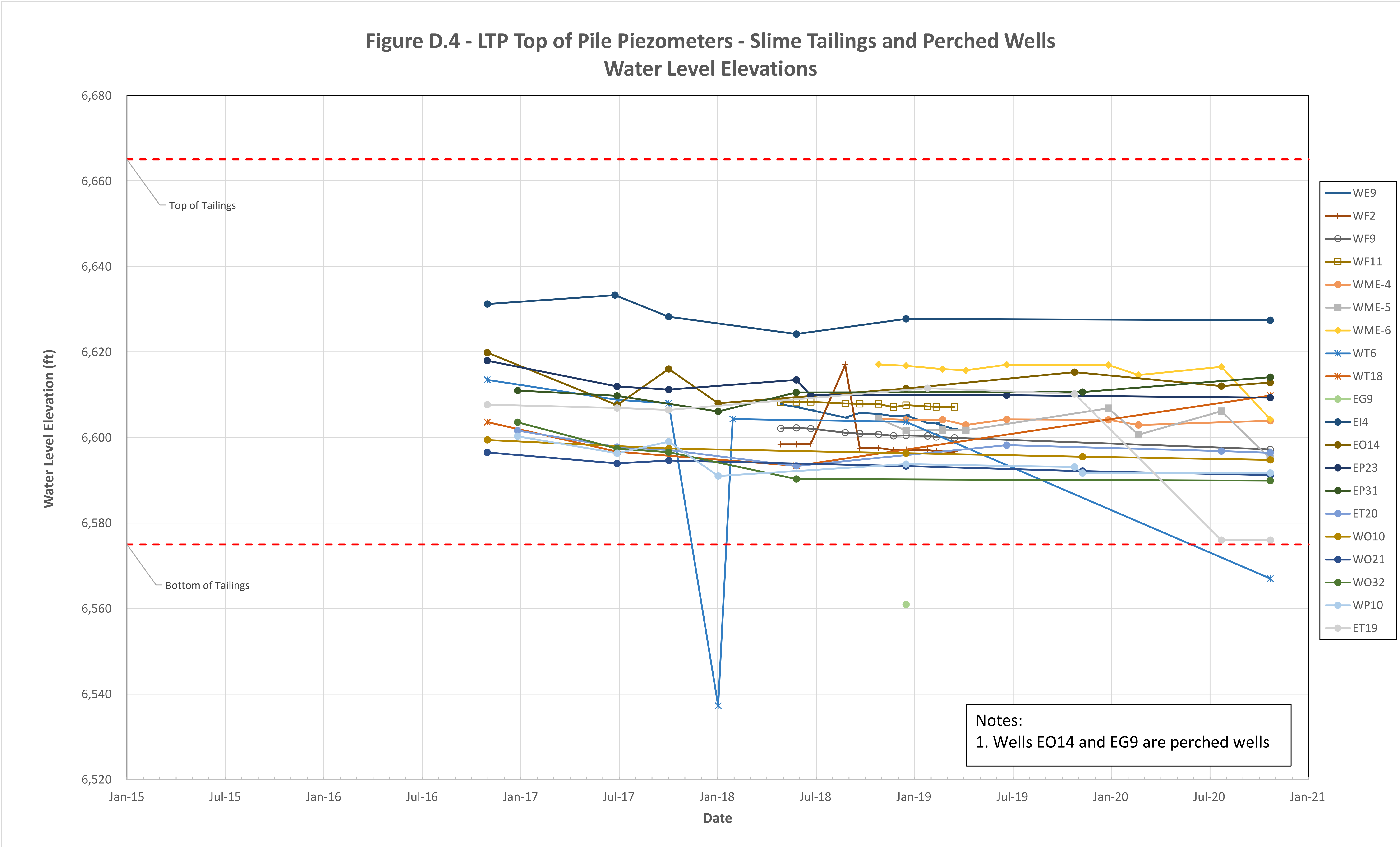

Figure D.4 - LTP Top of Pile Piezometers - Slime Tailings and Perched Wells
Water Level Elevations
Water Level Elevation (ft)
6,680
6,660
6,640
6,620
6,600
6,580
6,560
6,540
6,520
Top of Tailings
Bottom of Tailings
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Date
WE9
WF2
WF9
WF11
WME-4
WME-5
WME-6
WT6
WT18
EG9
EI4
EO14
EP23
EP31
ET20
WO10
WO21
WO32
WP10
ET19
Notes:
1. Wells EO14 and EG9 are perched wells

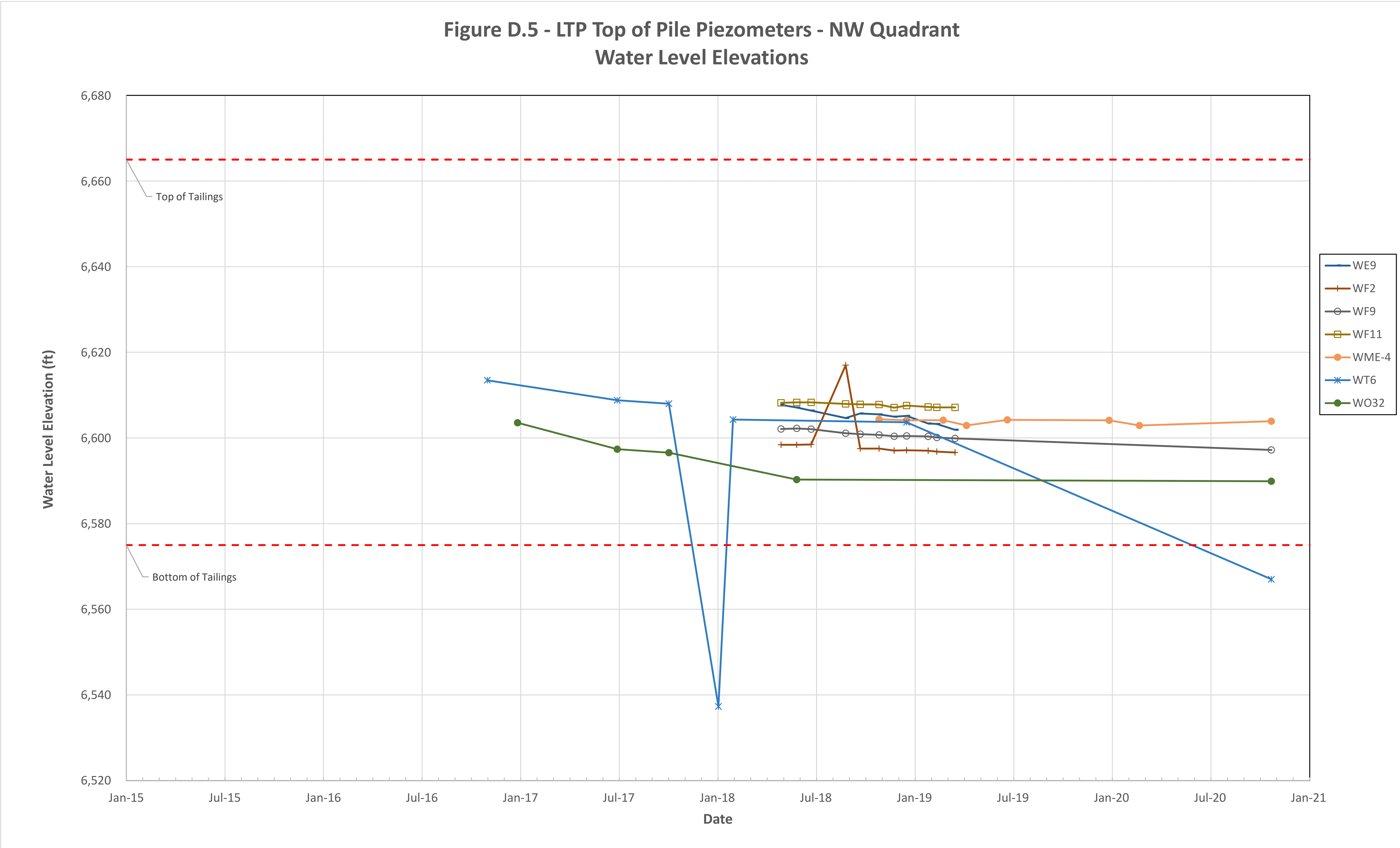

Figure D.5 - LTP Top of Pile Piezometers - NW Quadrant
Water Level Elevations
Water Level Elevation (ft)
6,680
6,660
6,640
6,620
6,600
6,580
6,560
6,540
6,520
Top of Tailings
Bottom of Tailings
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Date
WE9
WF2
WF9
WF11
WME-4
WT6
WO32

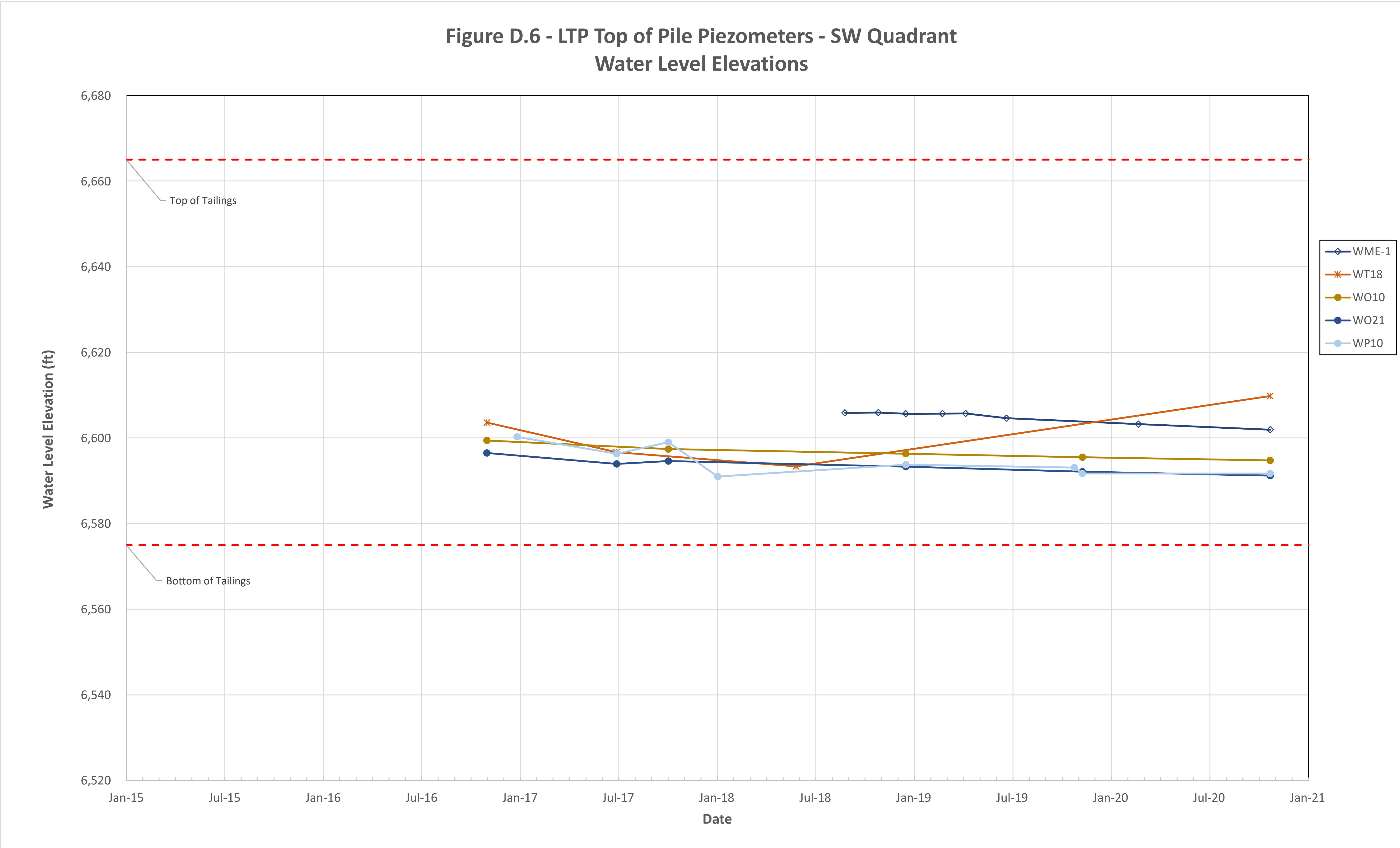
Figure D.6 - LTP Top of Pile Piezometers - SW Quadrant
Water Level Elevations
Water Level Elevation (ft)
6,680
6,660
6,640
6,620
6,600
6,580
6,560
6,540
6,520
Top of Tailings
Bottom of Tailings
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Date
WME-1
WT18
WO10
WO21
WP10

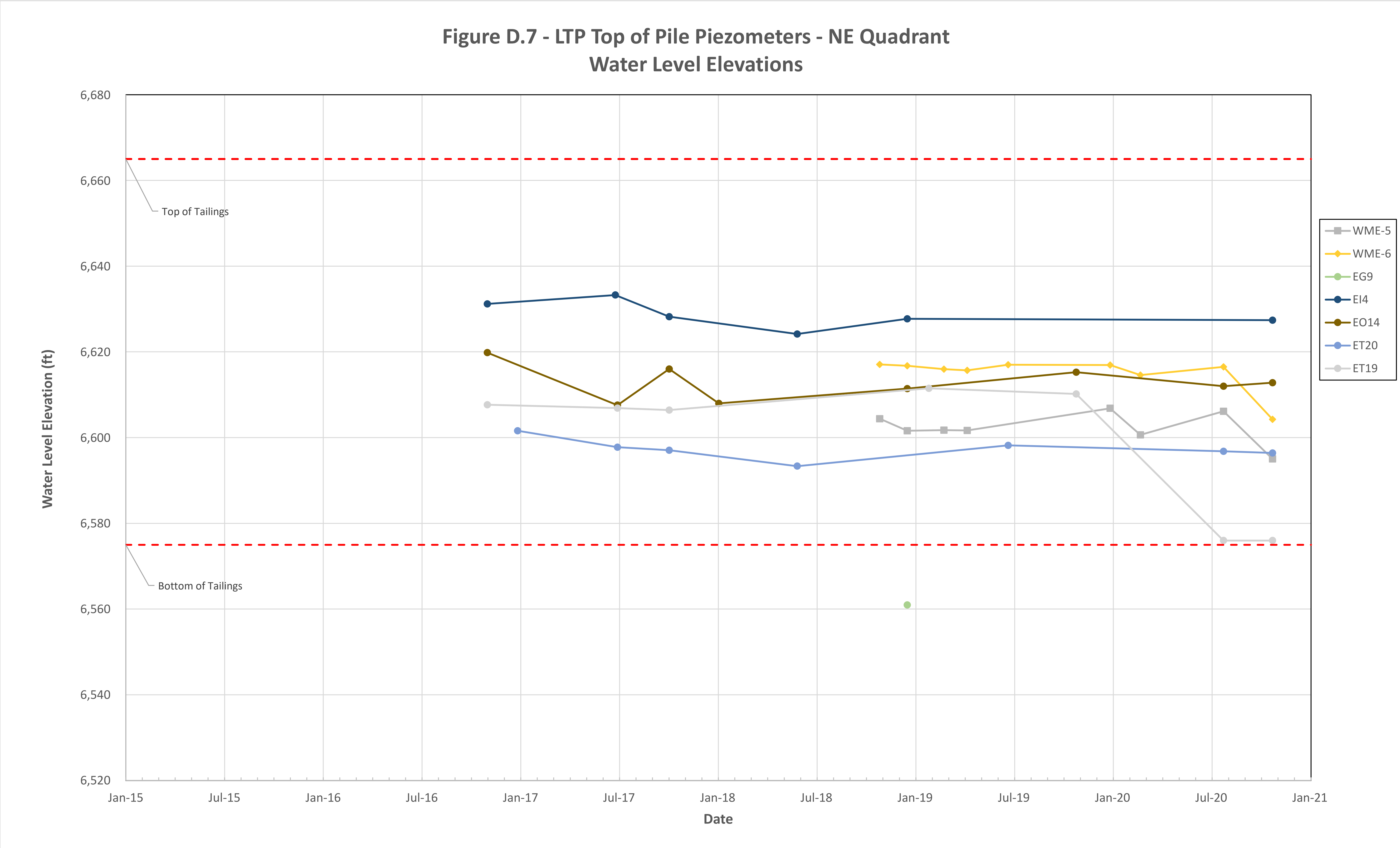

Figure D.7 - LTP Top of Pile Piezometers - NE Quadrant
Water Level Elevations
Water Level Elevation (ft)
6,680
6,660
6,640
6,620
6,600
6,580
6,560
6,540
6,520
Top of Tailings
Bottom of Tailings
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Date
WME-5
WME-6
EG9
EI4
EO14
ET20
ET19

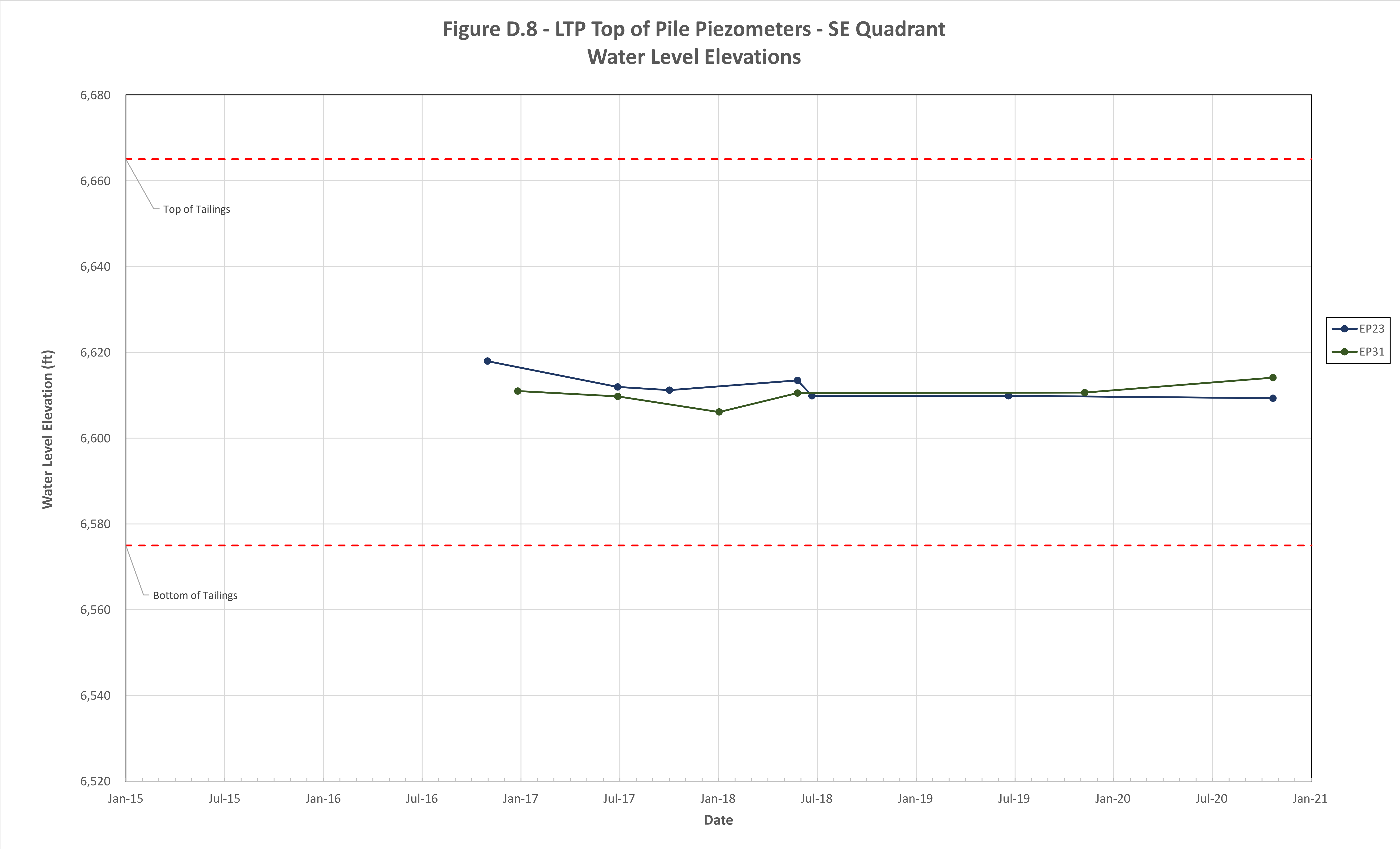

Figure D.8 - LTP Top of Pile Piezometers - SE Quadrant
Water Level Elevations
Water Level Elevation (ft)
6,680
6,660
6,640
6,620
6,600
6,580
6,560
6,540
6,520
Top of Tailings
Bottom of Tailings
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Date
EP23
EP31

## APPENDIX E

## GRANTS RECLAMATION PROJECT
## LAND USE REVIEW / SURVEY

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## GRANTS RECLAMATION PROJECT
## LAND USE REVIEW / SURVEY

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# Grants Reclamation Project

## Land Use Review / Survey

***Annual Report No. 19 - CY2020***

### 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 nineteenth 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, land use activities for those areas proximal to the tailings pile areas undergoing reclamation and closure and immediate surrounding areas where ongoing ground-water restoration continues to be reviewed.

### 2.0 2020 – 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. Much of the current land area within the immediate Site Boundary area containing the evaporation ponds, RO plant and both tailings pile areas and office / shop compound have been excluded from livestock grazing and other land use except those directly related to the ongoing ground-water restoration activities. These areas have been livestock fenced to exclude grazing.

Several small lot / small acreage parcels [e.g. residential lot(s)] held by HMC in the general area of the reclamation site are idle and are essentially not in use except in certain instances where treated and/or fresh water injection and water collection is underway as part of the ongoing groundwater restoration program

or are under agricultural use on selected lot(s). For example, Block 1 Lot 5 and Block 2 Lot 2 in Murray Acres were planted and irrigated in 2008 through 2020 with the Murray Acres San Andres irrigation well.

## 3.0 2020 – Land Use – Pleasant Valley Estates, Murray Acres, Broadview Acres, Felice Acres and Valle Verde 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 groundwater used for domestic purposes in these adjacent subdivision areas. HMC paid for the water usage from the Village of Milan for the first ten years and re-started paying for the water usage in late 2018.

An assessment of current land use in these four subdivision areas was undertaken in December 2020 to provide an annual review of the present uses, occupancy and status for the various lots within these 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.

This year, the annual review also included an assessment of the residential areas adjacent to Felice Acres, Pleasant Valley Estates and the Valle Verde residential areas and adjacent lots as was done for 2006 through 2019 surveys.

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 December 2020 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 subdivisions that would reflect the lot number, customer, water meter customer

ID number and whether the customer utilized Milan water during 2020. See Tables E-1 through E-5 for 2020 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-5.

Field review of the subdivisions areas, along with follow-up inquiries as required to confirm the status of water use at each property, indicates that occupied residential sites in, or immediately adjacent to the Felice Acres, Broadview Acres, Murray Acres, Pleasant Valley and Valle Verde subdivisions are on metered water service with the Village of Milan.

In the Valle Verde residential area and immediately adjacent to the subdivision, the one residence that was not on the Village of Milan water supply system in prior surveys was connected to the Milan water system in July, 2020.

## 4.0 New Milan Water Hook-Ups

Homestake (HMC) and the New Mexico Environment Department - Superfund Oversight Section entered into and executed a Memorandum of Agreement (MOA) in January 2009 regarding private well supplies utilized for domestic household use in the area. The MOA established an Area of Concern (AOC) wherein those residences within the area that are not on the Village of Milan water supply for domestic potable water use should be contacted and given the opportunity to be hooked up to that supply with HMC covering the cost of the hook-up. As of December 2020, no residences within the MOA Area of Concern (AOC) are pending with respect to a domestic water supply hook-up to the Village of Milan municipal water supply.

The last significant facet of the MOA addresses the concern with regard to an offer by HMC to residential property owners in the AOC to arrange for and pay for plugging and abandonment of private wells in the area. No private wells were abandoned as part of this MOA. Through public outreach to residents in the nearby neighborhoods, HMC is again offering to abandon private wells.

## 5.0 Conclusion

The review of land use for HMC properties and the five residential subdivision areas to the south and west of the Grants Reclamation Project site indicates that present land uses in the area have not changed significantly. As a result of the annual survey of the residential areas within the Memorandum of Agreement (MOA) Area of Concern (AOC) during 2020, no residential properties remain to be addressed in terms of providing a domestic water supply hook-up. Survey results indicate that all other water users in the AOC area are supplied by the Village of Milan water supply.

This land use survey / review is completed on an annual basis to meet annual license condition 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.

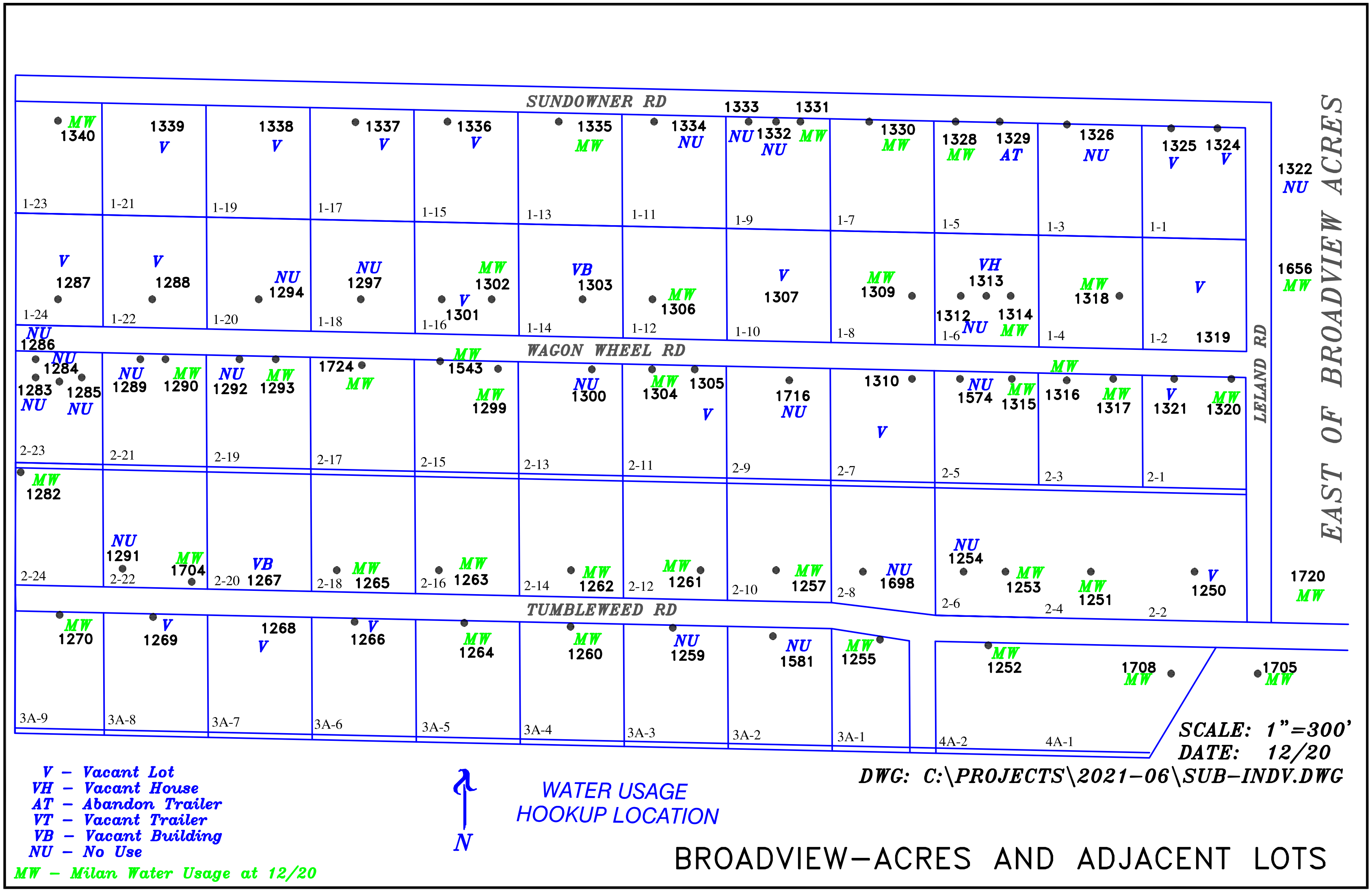


FIGURE E–1. BROADVIEW ACRES–LAND USE STATUS AND WATER USE

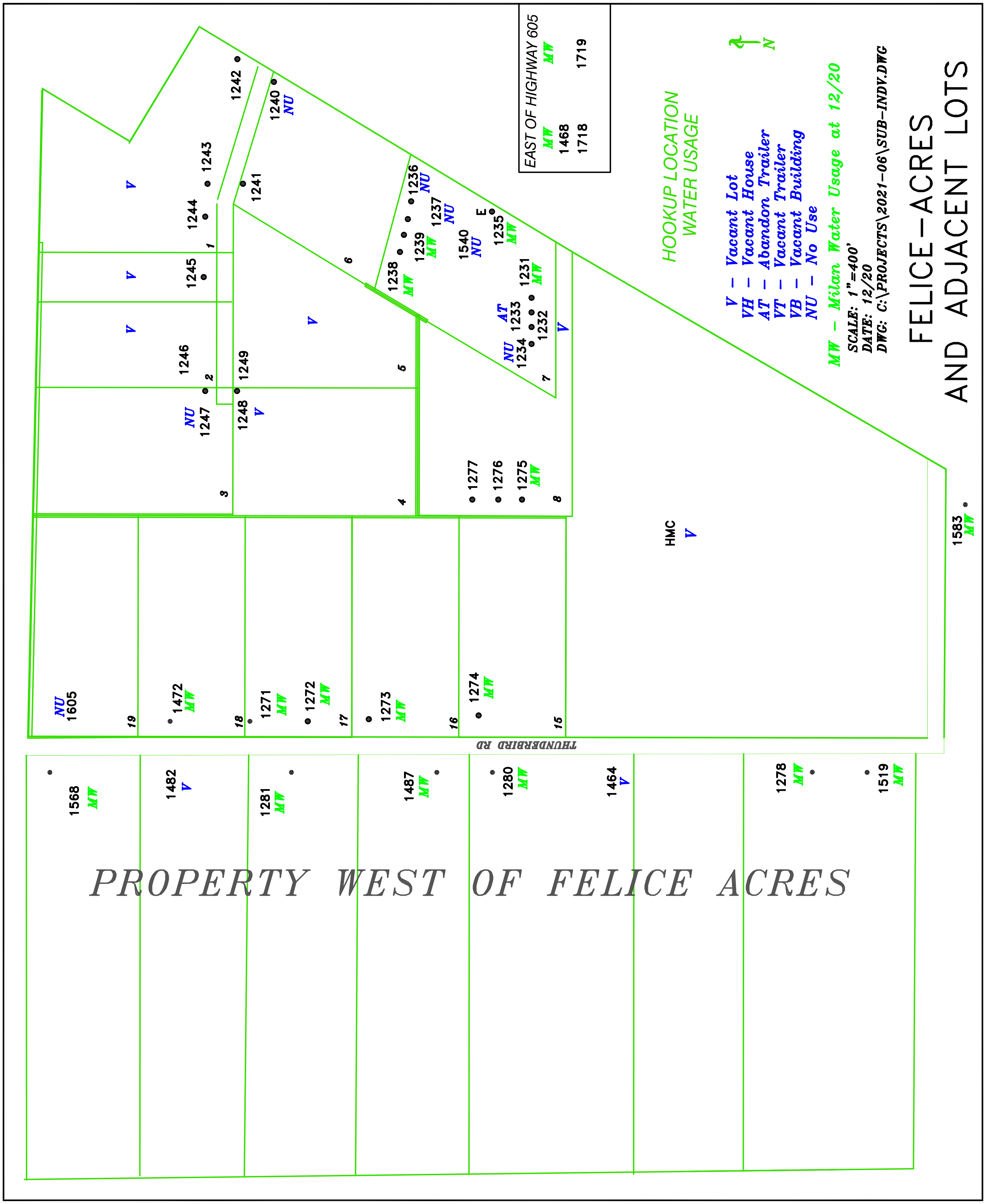


FIGURE E-2. FELICE ACRES - LAND USE STATUS AND WATER USE

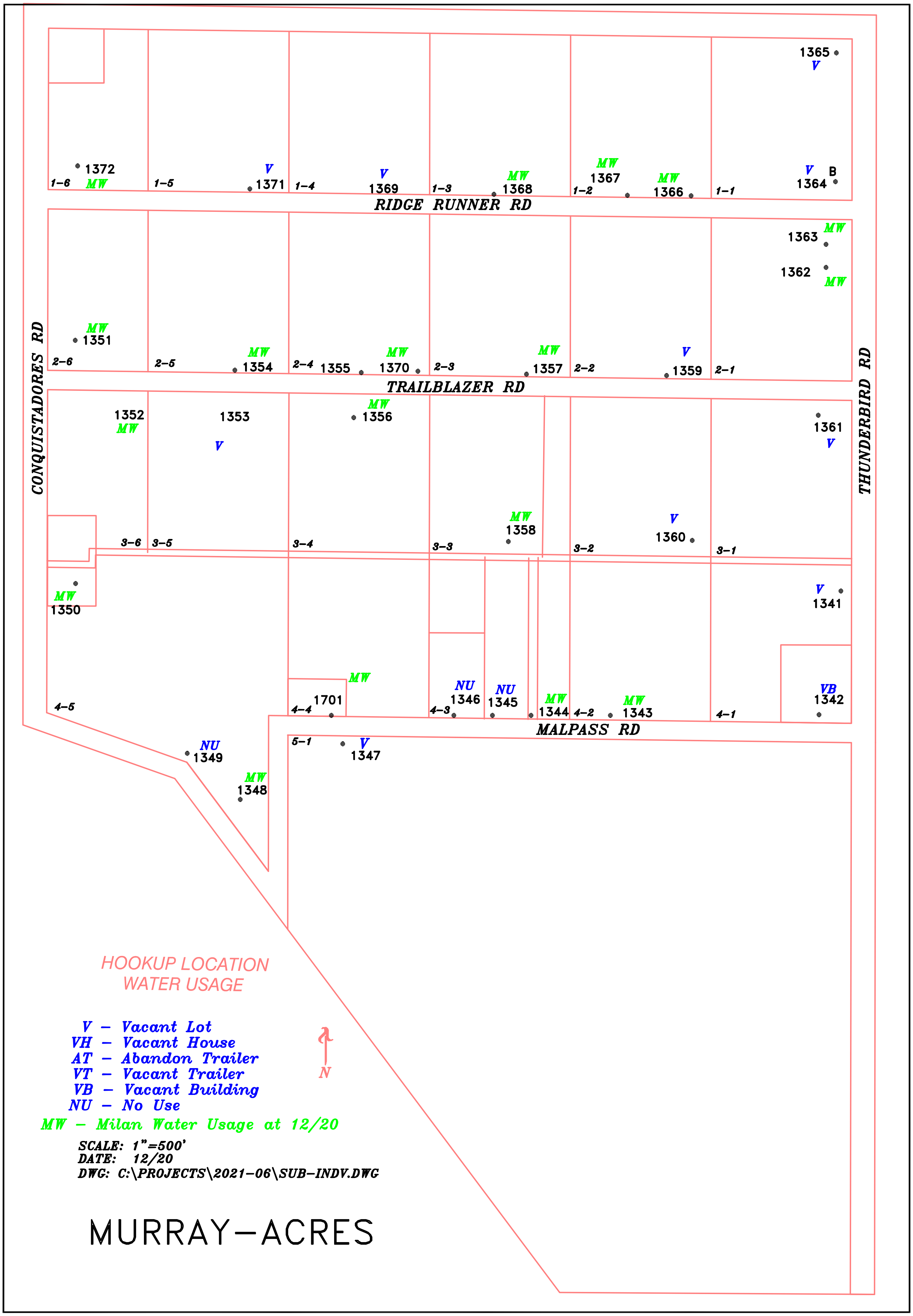


FIGURE E-3. MURRAY ACRES–LAND USE STATUS AND WATER USE

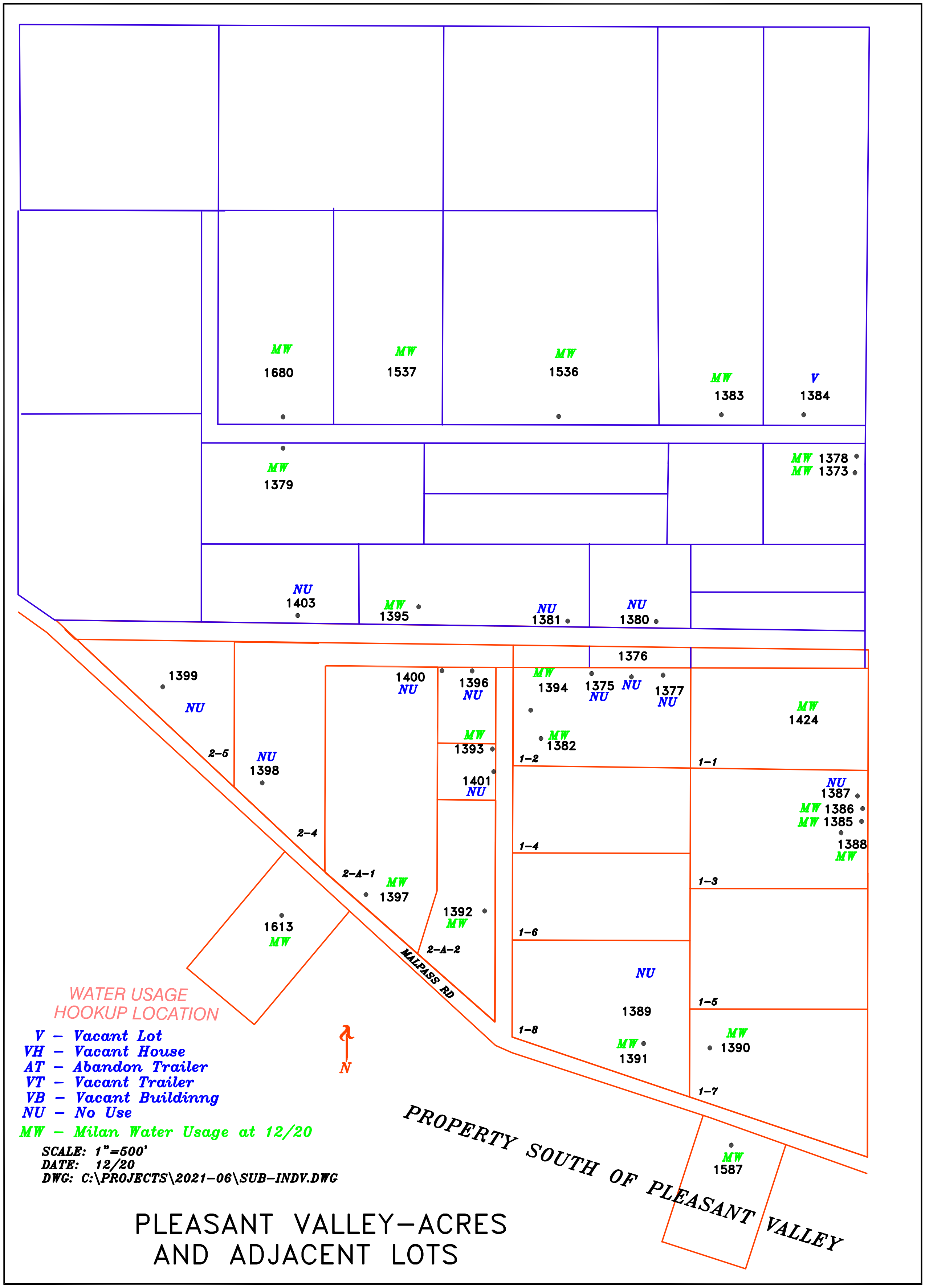


FIGURE E-4. PLEASANT VALLEY ESTATES-
LAND USE STATUS AND WATER USE

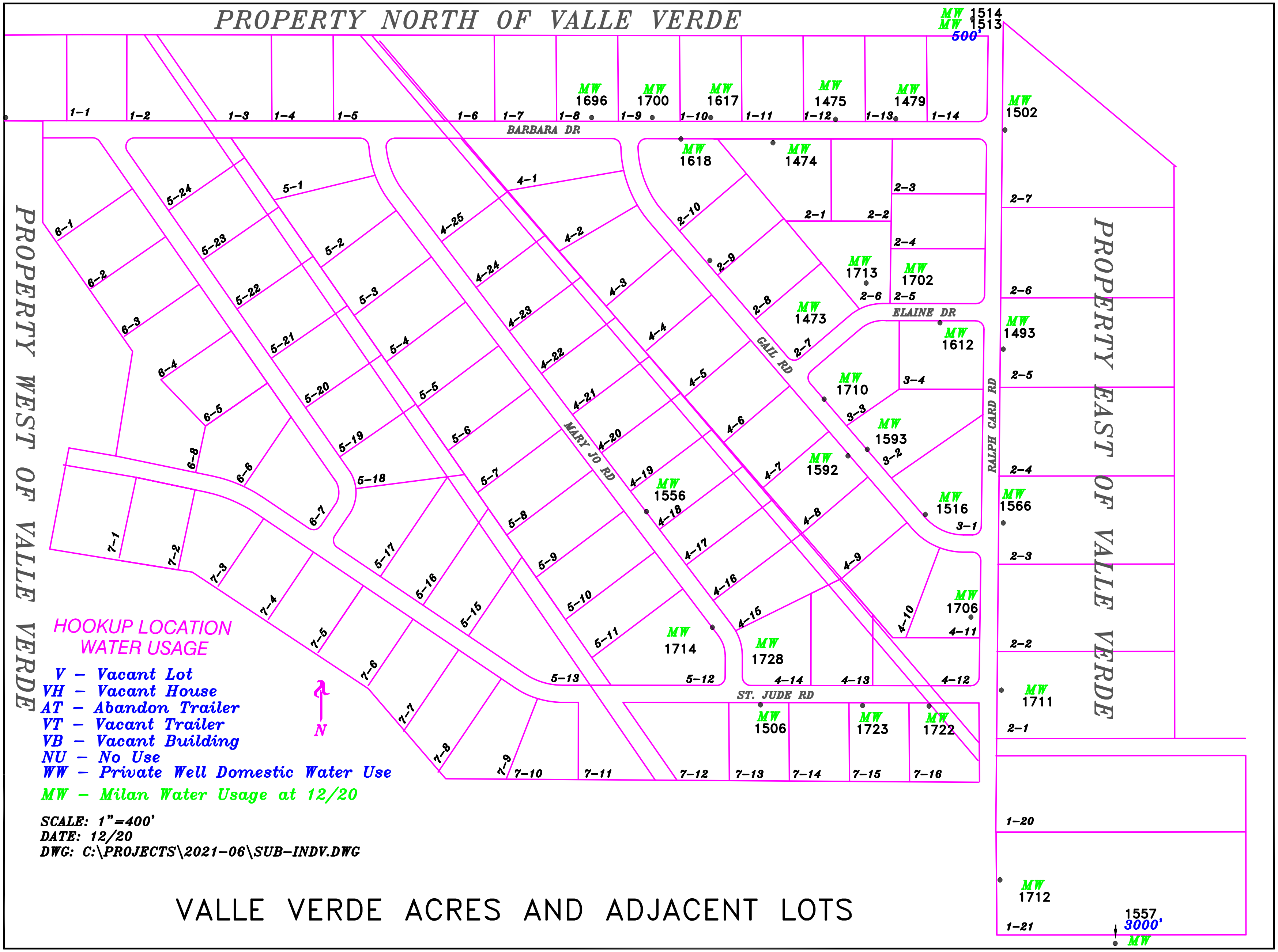


FIGURE E-5. VALLE VERDE ACRES–LAND USE STATUS AND WATER USE

**TABLE E-1 WATER USE OF MILAN WATER IN BROADVIEW ACRES AND ADJACENT LOTS**

| SUBDIVISION BLOCK / LOT | CUSTOMER NUMBER SITE ID | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2019 WATER USAGE | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2020 WATER USAGE |
|---|---|---|---|
| 1 / 1 | 1324 | | |
| 1 / 1 | 1325 | | |
| 1 / 2 | 1319 | | |
| 1 / 3 | 1326 | | |
| 1 / 4 | 1318 | X | X |
| 1 / 5 | 1328 | X | X |
| 1 / 5 | 1329 | | |
| 1 / 6 | 1312 | | |
| 1 / 6 | 1313 | | |
| 1 / 6 | 1314 | X | X |
| 1 / 7 | 1330 | X | X |
| 1 / 8 | 1309 | X | X |
| 1 / 9 | 1331 | X | X |
| 1 / 9 | 1332 | | |
| 1 / 9 | 1333 | | |
| 1 / 10 | 1307 | | |
| 1 / 11 | 1334 | | |
| 1 / 12 | 1306 | X | X |
| 1 / 13 | 1335 | X | X |
| 1 / 14 | 1303 | | |
| 1 / 15 | 1336 | | |
| 1 / 16 | 1301 | | |
| 1 / 16 | 1302 | X | X |
| 1 / 17 | 1337 | | |
| 1 / 18 | 1297 | | |
| 1 / 19 | 1338 | | |
| 1 / 20 | 1294 | | |
| 1 / 21 | 1339 | | |
| 1 / 22 | 1288 | | |
| 1 / 23 | 1340 | X | X |
| 1 / 24 | 1287 | | |
| 2 / 1 | 1320 | X | X |
| 2 / 1 | 1321 | | |
| 2 / 2 | 1250 | | |
| 2 / 3 | 1316 | X | X |
| 2 / 3 | 1317 | | X |
| 2 / 4 | 1251 | X | X |

## TABLE E-1 WATER USE OF MILAN WATER IN BROADVIEW ACRES AND ADJACENT LOTS

| SUBDIVISION BLOCK / LOT | CUSTOMER NUMBER SITE ID | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2019 WATER USAGE | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2020 WATER USAGE |
|---|---|---|---|
| 2 / 5 | 1315 | X | X |
| 2 / 5 | 1574 | | |
| 2 / 6 | 1253 | X | X |
| 2 / 6 | 1254 | | |
| 2 / 7 | 1310 | | |
| 2 / 8 | 1698 | | |
| 2 / 9 | 1308 | | |
| 2 / 10 | 1257 | X | X |
| 2 / 11 | 1304 | X | X |
| 2 / 11 | 1305 | | |
| 2 / 12 | 1261 | | X |
| 2 / 13 | 1300 | | |
| 2 / 14 | 1262 | X | X |
| 2 / 15 | 1299 | X | X |
| 2 / 15 | 1543 | X | X |
| 2 / 16 | 1263 | X | X |
| 2 / 17 | 1724 | X | X |
| 2 / 18 | 1265 | X | X |
| 2 / 19 | 1292 | | |
| 2 / 19 | 1293 | X | X |
| 2 / 20 | 1267 | | |
| 2 / 21 | 1289 | | |
| 2 / 21 | 1290 | X | X |
| 2 / 22 | 1291 | | |
| 2 / 22 | 1704 | X | X |
| 2 / 23 | 1283 | | |
| 2 / 23 | 1284 | | |
| 2 / 23 | 1285 | | |
| 2 / 23 | 1286 | | |
| 2 / 24 | 1282 | X | X |
| 3A / 1 | 1255 | X | X |
| 3A / 2 | 1581 | | |
| 3A / 3 | 1259 | | |
| 3A / 4 | 1260 | X | X |
| 3A / 5 | 1264 | X | X |

## TABLE E-1 WATER USE OF MILAN WATER IN BROADVIEW ACRES AND ADJACENT LOTS

| SUBDIVISION BLOCK / LOT | CUSTOMER NUMBER SITE ID | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2019 WATER USAGE | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2020 WATER USAGE |
|---|---|---|---|
| 3A / 6 | 1266 | | |
| 3A / 7 | 1268 | | |
| 3A / 8 | 1269 | | |
| 3A / 9 | 1270 | X | X |
| 4A / 1 | 1708 | X | X |
| 4A / 2 | 1252 | X | X |
| | 1705 | X | X |
| | | | |
| | | | |
| EAST OF BROADVIEW ACRES | | | |
| | 1322 | | |
| | 1656 | X | X |
| | 1720 | X | X |

## TABLE E-2 WATER USE OF MILAN WATER IN FELICE ACRES AND ADJACENT LOTS

| SUBDIVISION BLOCK / LOT | CUSTOMER NUMBER SITE ID | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2019 WATER USAGE | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2020 WATER USAGE |
|---|---|---|---|
| 1 | 1242 | | |
| 1 | 1243 | | |
| 1 | 1244 | | |
| 2 | 1245 | | |
| 2 | 1246 | | |
| 3 | 1247 | | |
| 4 | 1248 | | |
| 5 | 1249 | | |
| 6 | 1240 | | |
| 6 | 1241 | | |
| 7 | 1231 | X | X |
| 7 | 1232 | | |
| 7 | 1233 | | |
| 7 | 1234 | | |
| 7 | 1235 | X | X |
| 7 | 1236 | X | |
| 7 | 1237 | | |
| 7 | 1238 | X | X |
| 7 | 1239 | X | X |
| 7 | 1540 | | |
| 8 | 1275 | X | X |
| 8 | 1276 | | |
| 8 | 1277 | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | 1274 | X | X |
| 16 | 1273 | X | X |
| 17 | 1271 | X | X |
| 17 | 1272 | X | X |
| 18 | 1472 | X | X |
| 19 | 1605 | | |

## TABLE E-2 WATER USE OF MILAN WATER IN FELICE ACRES AND ADJACENT LOTS

| SUBDIVISION BLOCK / LOT | CUSTOMER NUMBER SITE ID | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2019 WATER USAGE | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2020 WATER USAGE |
|---|---|---|---|
| PROPERTY WEST OF FELICE ACRES | | | |
| | 1519 | X | X |
| | 1278 | X | X |
| | 1279 | | |
| | 1280 | X | X |
| | 1464 | | |
| | 1487 | X | X |
| | 1281 | X | X |
| | 1482 | | |
| | 1568 | X | X |
| PROPERTY SOUTH OF FELICE ACRES | | | |
| | 1583 | X | X |
| PROPERTY EAST OF FELICE ACRES | | | |
| | 1468 | X | X |
| | 1709 | | |
| | 1718 | X | X |
| | 1719 | X | X |

## TABLE E-3 WATER USE OF MILAN WATER IN MURRAY ACRES

| SUBDIVISION BLOCK / LOT | CUSTOMER NUMBER SITE ID | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2019 WATER USAGE | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2020 WATER USAGE |
|---|---|---|---|
| 1 / 1 | 1364 | | |
| 1 / 1 | 1365 | | |
| 1 / 2 | 1366 | X | X |
| 1 / 2 | 1367 | X | X |
| 1 / 3 | 1368 | X | X |
| 1 / 4 | 1369 | | |
| 1 / 5 | 1371 | | |
| 1 / 6 | 1372 | X | X |
| 2 / 1 | 1362 | X | X |
| 2 / 1 | 1363 | X | X |
| 2 / 2 | 1359 | | |
| 2 / 3 | 1357 | X | X |
| 2 / 4 | 1355 | | |
| 2 / 4 | 1370 | X | X |
| 2 / 5 | 1354 | X | X |
| 2 / 6 | 1351 | X | X |
| 3 / 1 | 1361 | | |
| 3 / 2 | 1360 | | |
| 3 / 3 | 1358 | X | X |
| 3 / 4 | 1356 | X | X |
| 3 / 5 | 1353 | | |
| 3 / 6 | 1352 | X | X |
| 4 / 1 | 1341 | | |
| 4 / 1 | 1342 | | |
| 4 / 2 | 1343 | X | X |
| 4 / 3 | 1344 | X | X |
| 4 / 3 | 1345 | | |
| 4 / 3 | 1346 | X | |
| 4 / 4 | 1701 | X | X |
| 4 / 5 | 1349 | | |
| 4 / 5 | 1350 | X | X |
| 5 / 1 | 1347 | | |
| | 1348 | X | X |

## TABLE E-4 WATER USE OF MILAN WATER IN PLEASANT VALLEY ESTATES AND ADJACAENT LOTS

| SUBDIVISION BLOCK / LOT | CUSTOMER NUMBER SITE ID | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2019 WATER USAGE | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2020 WATER USAGE |
|---|---|---|---|
| 1 / 1 | 1424 | X | X |
| 1 / 2 | 1375 | | |
| 1 / 2 | 1376 | | |
| 1 / 2 | 1377 | | |
| 1 / 2 | 1382 | X | X |
| 1 / 2 | 1394 | X | X |
| 1/3 | 1385 | X | X |
| 1 / 3 | 1386 | X | X |
| 1 / 3 | 1387 | | |
| 1 / 3 | 1388 | X | X |
| 1 / 7 | 1390 | X | X |
| 1 / 8 | 1389 | | |
| 1 / 8 | 1391 | X | X |
| 2 / 4 | 1398 | | |
| 2 / 5 | 1399 | | |
| 2 / A1 | 1397 | X | X |
| 2 / A2 | 1392 | X | X |
| 2 / A2 | 1393 | X | X |
| 2 / A2 | 1396 | | |
| 2 / A2 | 1400 | | |
| 2 / A2 | 1401 | | |
| | 1373 | X | X |
| | 1378 | X | X |
| | 1379 | X | X |
| | 1380 | | |
| | 1381 | | |
| | 1383 | X | X |
| | 1384 | | |
| | 1395 | X | X |
| | 1403 | | |
| | 1536 | X | X |
| | 1537 | X | X |
| | 1680 | X | X |

| PROPERTY SOUTH OF PLEASANT VALLEY ESTATES | | | |
|---|---|---|---|
| 17 - 2 | 1587 | X | X |
| 11 - 2 | 1613 | X | X |

**TABLE E-5 WATER USE IN VALLE VERDE AND ADJACENT LOTS**

| SUBDIVISION BLOCK / LOT | CUSTOMER NUMBER SITE ID | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2019 WATER USAGE | PRIVATE RESIDENTIAL WELL WATER 2019 | VILLAGE OF MILAN WATER SUPPLY SYSTEM 2020 WATER USAGE | PRIVATE RESIDENTIAL WELL WATER 2020 |
|---|---|---|---|---|---|
| 1 / 8 | 1696 | X | | X | |
| 1 / 9 | 1700 | X | | X | |
| 1 / 10 | 1617 | X | | X | |
| 1 / 12 | 1475 | X | | X | |
| 1 / 13 | 1479 | X | | X | |
| 2 / 1 | 1474 | X | | X | |
| 2/5 | 1702 | X | | X | |
| 2 / 6 | 1713 | X | | X | |
| 2 / 7 | 1473 | X | | X | |
| 2 / 9 | | | | | |
| 2/10 | 1618 | X | | X | |
| 3 / 1 | 1516 | X | | X | |
| 3 / 2 | 1593 | X | | X | |
| 3 / 3 | 1710 | X | | X | |
| 3 / 4 | 1612 | X | | X | |
| 4/11 | 1706 | X | | X | |
| 4 / 8 | 1592 | X | | X | |
| 4 / 14 | 1728 | | X | X | |
| 4 / 18 | 1556 | X | | X | |
| 5 / 12 | 1714 | X | | X | |
| 7 / 13 | 1506 | X | | X | |
| 7/ 16 | 1722 | X | | X | |
| 7/ 15 | 1723 | X | | X | |
| PROPERTY NORTH OF VALLE VERDE | | | | | |
| | 1513 | X | | X | |
| | 1514 | X | | X | |
| PROPERTY EAST OF VALLE VERDE | | | | | |
| 1/21 | 1712 | X | | X | |
| 2 / 1 | 1711 | X | | X | |
| 2 / 5 | 1493 | X | | X | |
| 2 / 7 | 1502 | X | | X | |
| 2 / 3 | 1566 | X | | X | |
| PROPERTY SOUTH OF VALLE VERDE | | | | | |
| | 1557 | X | | X | |

# APPENDIX F

# GRANTS RECLAMATION PROJECT METEOROLOGICAL DATA SUMMARY

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## GRANTS RECLAMATION PROJECT
## METEOROLOGICAL DATA

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# Grants Reclamation Project

## Meteorological Data
***CY2020***

### 1.0 Introduction

Homestake Mining Company of California (HMC) was issued discharge permit DP-200 in 2014. Specific permit condition 52 requires inclusion of available meteorological data in tabular format within the annual report. The following discussions, figures and tabulation present meteorological data for 2020.

### 2.0 Wind

The annual wind rose developed from data taken at HMC's meteorological station is presented in Figure F-1. The maximum, minimum and mean monthly wind speeds are presented in Table F-1.

### 3.0 Precipitation

The monthly precipitation depths are presented in Table F-1. The total measured precipitation depth at the Grant's was 7.55 inches in 2020.

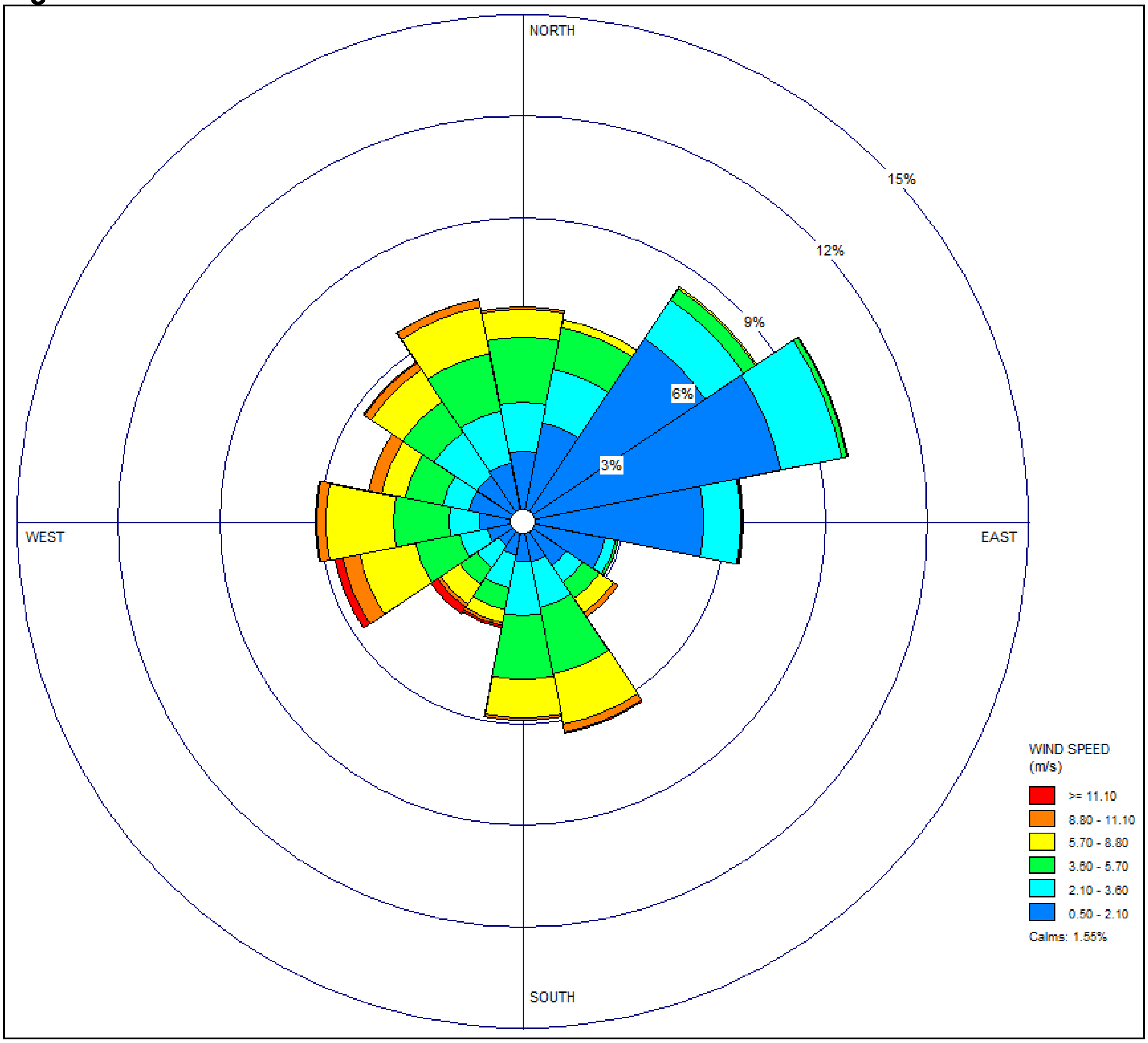
### 4.0 Temperature and Humidity

The maximum, minimum and mean monthly temperatures are presented in Table F-1. The maximum, minimum and mean monthly relative humidity for 2020 is presented in Table F-1.

### 5.0 Solar Radiation and Evaporation

The solar radiation measurements are presented in Table F-1. Table F-1 also presents an estimate of monthly potential evaporation based on available meteorological data.

## Figure F-1. Grants Site 2020 Annual Wind Rose



# Table F-1. Grants Site 2020 Monthly Meteorological Data Summary

| Month | Simple Stats | Wind Speed (m/s) | Air Temperature (c) | Relative Humidity (%) | Monthly Precipitation (in) | Solar Radiation (W/m²) | Net Solar Radiation (W/m²) | Average Daily Temp (c) | Calculated Heat Index | Evaporation Potential (cc/month) |
|---|---|---|---|---|---|---|---|---|---|---|
| Jan-20 | *max* | 11.1 | 12.8 | 93.9 | 0.5 | 140.5 | 94.2 | 0.00 | 0.00 | 0.00 |
| | *min* | 0.2 | -15.1 | 9.5 | | | | | | |
| | *mean* | 3.0 | -0.3 | 58.2 | | | | | | |
| Feb-20 | *max* | 15.9 | 17.0 | 94.6 | 0.81 | 174.0 | 116.6 | 1.45 | 0.15 | 0.29 |
| | *min* | 0.3 | -15.9 | 10.2 | | | | | | |
| | *mean* | 3.4 | 1.5 | 52.1 | | | | | | |
| Mar-20 | *max* | 15.8 | 18.2 | 93.0 | 0.86 | 213.7 | 143.2 | 6.49 | 1.49 | 2.40 |
| | *min* | 0.2 | -7.8 | 7.8 | | | | | | |
| | *mean* | 3.5 | 6.5 | 45.2 | | | | | | |
| Apr-20 | *max* | 12.5 | 26.5 | 88.2 | 0.29 | 297.4 | 199.3 | 10.69 | 3.16 | 4.82 |
| | *min* | 0.4 | -7.8 | 6.8 | | | | | | |
| | *mean* | 3.8 | 10.7 | 30.4 | | | | | | |
| May-20 | *max* | 12.3 | 29.0 | 70.2 | 0.02 | 324.3 | 217.3 | 16.76 | 6.24 | 9.52 |
| | *min* | 0.3 | -0.4 | 4.1 | | | | | | |
| | *mean* | 3.7 | 16.8 | 21.5 | | | | | | |
| Jun-20 | *max* | 14.8 | 31.7 | 80.6 | 0.16 | 327.0 | 219.1 | 21.16 | 8.88 | 12.83 |
| | *min* | 0.5 | 3.0 | 4.9 | | | | | | |
| | *mean* | 3.9 | 21.2 | 20.7 | | | | | | |
| Jul-20 | *max* | 8.1 | 34.6 | 94.7 | 1.36 | 284.7 | 190.8 | 22.30 | 9.62 | 13.95 |
| | *min* | 0.2 | 10.1 | 7.7 | | | | | | |
| | *mean* | 2.8 | 22.3 | 38.9 | | | | | | |
| Aug-20 | *max* | 10.7 | 33.3 | 90.4 | 1.19 | 264.6 | 177.3 | 23.12 | 10.16 | 13.77 |
| | *min* | 0.0 | 10.2 | 8.1 | | | | | | |
| | *mean* | 2.7 | 23.1 | 30.8 | | | | | | |
| Sep-20 | *max* | 13.2 | 31.8 | 92.0 | 0.66 | 262.6 | 175.9 | 16.98 | 6.37 | 8.26 |
| | *min* | 0.1 | 0.0 | 5.2 | | | | | | |
| | *mean* | 2.9 | 17.0 | 32.3 | | | | | | |
| Oct-20 | *max* | 13.0 | 27.0 | 95.2 | 0.92 | 220.4 | 147.7 | 11.08 | 3.33 | 4.49 |
| | *min* | 0.1 | -7.9 | 5.2 | | | | | | |
| | *mean* | 2.3 | 11.1 | 30.1 | | | | | | |
| Nov-20 | *max* | 11.8 | 22.0 | 93.8 | 0.34 | 158.1 | 105.9 | 5.19 | 1.06 | 1.50 |
| | *min* | 0.1 | -9.6 | 10.4 | | | | | | |
| | *mean* | 2.9 | 5.2 | 50.0 | | | | | | |
| Dec-20 | *max* | 12.5 | 15.8 | 90.2 | 0.44 | 139.8 | 93.7 | 0.00 | 0.00 | 0.00 |
| | *min* | 0.1 | -13.9 | 9.3 | | | | | | |
| | *mean* | 2.8 | -2.1 | 51.5 | | | | | | |

**Net solar radiation** = $(1-\alpha) \times SR$

$\alpha$ = albedo (Earth average around 0.35. Typical desert sands average 0.4 and grassses average 0.25. Going with a 0.33.

SR = solar radiation {From HMC met station data]

**Evaporation Potential (PET)** = $1.6 \times (L/12) \times (N/30) \times (10\ T_a/I)^{\alpha}$

$T_a$ = Average daily temperature (degrees Celsius; if negative then value of 0) for month being calculated.

L = Average day length (in hours) of month being calculated.

N = number of days in month being calculated.

$\alpha = (6.75E\text{-}7) \times I^3 - (7.71E\text{-}5) \times I^2 + (1.792E\text{-}2) \times I + 0.49239$

| α = | (a) | (b) | = a × b |
|---|---|---|---|
| | 6.75E-07 | 128456.5 | 8.67E-02 |
| | 7.71E-05 | 2545.9 | 1.96E-01 |
| | 1.79E-02 | 50.5 | 9.04E-01 |
| | | | 0.49239 |
| | α = | | 1.29E+00 |

$I = \Sigma$ *(for i = 1 to 12)* $(T_{ai}/5)^{1.514}$ = Heat index which depends on the 12 monthly mean temperatures ($T_{ai}$).

| | I = | | 50.46 |
|---|---|---|---|