DRAFT ANNUAL GROUNDWATER REPORT

2019 - 2020

US GYPSUM, IMPERIAL COUNTY

September 2020

TODD GROUNDWATER

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1. INTRODUCTION

In 1999, US Gypsum (USG) began an expansion and modernization project for the Plaster City Plant. This project replaced the slow, unreliable production line built in 1956 with a high-speed gypsum wallboard manufacturing facility. In 2008, an environmental impact report and study (EIR/EIS) for this Plaster City Plant expansion was approved. This EIR/EIS showed that groundwater levels in the Coyote Wells Valley Basin (**Figure 1**) had been declining prior to the Plaster City Plant expansion, and it predicted that the expansion may exacerbate groundwater level declines. A mitigation plan for the EIR/EIS led to the development of a Groundwater Monitoring Program for USG in 2015 (Todd, 2015). A Settlement Agreement with the Sierra Club in 2018 further clarified the Groundwater Monitoring Program and added additional information.

This Annual Report documents conditions and changes that occurred from Spring 2019 through Spring 2020. Water levels are monitored by the United States Geological Survey (USGS) each spring, and USG monitors water levels in three production wells and two monitoring wells yearlong through virtual loggers. The Annual Report is submitted to Imperial County by the first business day of October.

This annual report documents and discusses new groundwater level and quality data. Overall, the conditions in the Coyote Wells Valley Basin have remained similar to conditions reported in 2019, although some wells show a slight decline in groundwater elevation. Water level elevations were measured by the USGS at 25 wells and water quality was sampled at 16 wells across the basin. USG measured water levels in an additional well and water quality in three additional wells. One well has shown declines in water levels over the past four years.

2. PHYSICAL SETTING

2.1. Description of Groundwater Basin

The Coyote Wells Valley Groundwater Basin (No. 7-29), as defined by the California Department of Water Resources (DWR, 2003)[1] encompasses 64,000 acres (100 square miles) in the Yuha desert west of Imperial Valley, California (**Figure 1**). Groundwater from this basin is pumped for the Plaster City Plant, the community of Ocotillo, local domestic wells, and, recently, dewatering for a proposed construction project by US Customs and Border Protection. It is located mostly in Imperial County, with the western edge extending into San Diego County. DWR generally defines groundwater basins based on the extent of alluvial deposits, though the eastern and southern boundaries of the basin are more political, as opposed to geologic, boundaries. A more detailed description of the basin and the regional hydrogeology can be found in **Appendix A**.

[1] The EIR/EIS refers to the area as the Ocotillo/Coyote Wells Groundwater Basin as defined by USGS.

2.2. HYDROLOGY

The Coyote Wells Valley Basin has an arid climate and receives limited precipitation and natural recharge. The closest active precipitation station is in El Centro (Western Regional Climate Center, 2020). Annual rainfall has ranged from 0.07 inches in 2006 to 7.3 inches in 1982. **Figure 2** shows the annual spring to spring precipitation for the El Centro station. Over the period of record 1934-2020, the average annual spring to spring rainfall is 2.59 inches. From April 2019 through March 2020, annual precipitation was 4.94 inches, almost twice the average.

2.3. GROUNDWATER PUMPING

Industrial usage by the Plaster City plant is the main use of groundwater pumping within the basin. This groundwater is pumped from three US Gypsum production wells (USG- 4, 5, and 6) located in the center of the Basin (see **Figure 3)**. This figure also shows wells in the monitoring program. **Figure 4** provides a close-up view of well locations around Ocotillo.

As documented in **Table 1**, groundwater pumping by USG in calendar year 2019 amounted to 388 AFY, similar to last year's total (374 AFY). Annual pumping data from 1970 to the present are shown in **Figure 5**.

As this Annual Report covers the end of Spring 2019 (Q3 and Q4 2019) through Spring 2020 (Q1 and Q2 2020), the pumping over this time was 357 AFY. **Table 2** shows the pumping on a quarterly basis. Pumping volumes have been consistent in each quarter, reflecting steady pumping throughout the year. The average over the past four quarters is 89 AF per quarter.

2.3.1. Pumping From other Sources

Groundwater pumping from the basin has traditionally been for residential and industrial uses. Wells of two mutual water companies and individual domestic wells have been estimated to produce 127 AFY as of 2004 (Todd, 2007).

Pumping by the United States Customs and Border Protection (USCBP) from two wells in the southern portion of the Coyote Wells Subbasin has begun during this period. The pumping is intended to aid the construction of a proposed barrier, and the wells are situated on a 60 foot-wide strip of federal land along the US/Mexico border. During January through June 2020, these wells have pumped 88 AF; by way of comparison, this is approximately 50% of the water pumped from USG during this time. Four USCBP wells slightly east of the Coyote Wells subbasin pumped an additional 187.6 during this time. A comparison of USG pumping to total USCBP pumping is shown in **Figure 6**. From December 2019 to July 2020, USCBP reported pumping 305.9 AF along the southern Imperial County border. All six USCBP wells are shown in **Figure 3.**

The southeastern border of the Coyote Wells Subbasin is not hydrogeologically disconnected from the Imperial Valley Groundwater Basin, so this sizable amount of recent pumping from the USCBP may affect groundwater levels in the Coyote Wells Valley Groundwater Basin. Imperial County is aware of the groundwater sustainability complications related to this sudden increase in groundwater production and has issued a cease and desist letter to USCBP until obtaining permits. The county's position is that pumping must be in compliance with the Imperial County Groundwater Management Ordinance. USCBP has rejected this request, stating that all six groundwater wells are located on federal property and that they will provide an Environmental Stewardship Plan.

3. MONITORING PROGRAM

Table 3 identifies all recently monitored wells within and just east of the groundwater basin. Water levels are monitored by the US Geological Survey (USGS) and US Gypsum, and water quality is monitored by USGS. In Spring 2020, the USGS monitored water levels in 25 wells and water quality in 16 wells. The USGS provides water level and water quality data on a semi-annual basis that is made available on the National Water Information System (NWIS) https://waterdata.usgs.gov/.

USG has probes in five wells to monitor water levels. Four of the logs produced daily water level data for 2019-2020 (USG-4, USG-5, USG-6, and 36A2/MW-2A). USG-4, USG-5, and USG-6 are pumping wells. Water level measurements in these wells fluctuate based on pumping and may not reflect regional water levels. When a well is pumped, groundwater levels decline in the well, and the resultant drawdown varies based on type of pump, efficiency of well, and other variables. Water levels are expected to return to static water levels shortly after the pump is turned off. For example, in USG-4, pumping levels are 12 feet below static levels. Hydrographs for these wells can be found in **Appendix B**.

Table 3 also lists that wells that were recently monitored but not included in the 2020 dataset, along with the monitoring entity (USGS or USG) and reason for interruption of monitoring.

Locations of monitored wells across and beyond the basin are shown on **Figure 3** and the wells in the Ocotillo area are shown on **Figure 4;** blue indicates wells that have both level (WL) and quality (WQ) data from 2020, yellow indicates wells with water level data only and green indicates water quality data only. This year, USG well locations were systematically verified with well documentation provided by USG.

4. GROUNDWATER ELEVATIONS

4.1. WATER LEVELS

Hydrographs for all monitoring wells are shown in **Appendix B.** Hydrographs are presented in two sets: one set shows hydrographs for all active wells at the same scale for easy comparison and the other set shows the same water levels with a range of 25 feet to highlight small changes. Overall, the hydrographs show that groundwater levels have small changes over time.

Figure 7 shows the location of key wells with hydrographs of groundwater levels. Key wells were selected on the basis of relatively complete water level histories and representative locations that show trends across the groundwater basin. All hydrographs on **Figure 7** have a consistent vertical scale, which eases comparison among hydrographs.

Pumping in USG wells impacts local groundwater levels. Monitoring wells 31B1 and 36D2, located near the USG production wells, show decreasing trends from 1990s to 2008, a slight increase from 2008 to 2015 and a slight decrease from 2015 to 2020. Water level decreases are due to nearby USG well pumping. Water levels from these wells show recovery in response to decreased pumping in 2008 to 2015.

These direct, short-term reponses to the pumping are only identified in wells near the USG production wells. For example, well 24D1, north of the USG wells, shows a steady decrease in water levels while 16J1, south of the USG wells, shows a steady increase. Water levels in neither well show direct reponses to USG pumping trends, such as when USG pumping was reduced by half from 2009 to 2015. Wells along the eastern edge of the basin, 42L1 and to a much lesser extent 32R1, reflect seasonal variations and show sharp increases shortly after peak precipitation events (1993 and 1997).

Of the 21 wells monitored by the USGS in both 2019 and 2020, four showed increasing water levels, eleven showed stable water levels (less than 0.18 feet in either direction), and six showed decreasing water levels. The three USG wells show daily variation due to pumping; however, these wells do not reflect static conditions. Wells with decreasing trends were located across the basin.

The maximum water level decrease observed during spring 2019 through spring 2020 was 0.44 ft in well 42L1. During the previous period of study, spring 2018 to spring 2019, monitoring wells 36A1 and 36A2, near the USG wells, decreased by 1.26 and 1.41 feet, respectively. During this period of study, the groundwater levels in 36A1 decreased by 0.41 ft, and the levels in 36A2 remained steady. The maximum water level increase over the past year was 1.13 ft in well 11G1.

Figure 8 shows groundwater contours and flow direction in the vicinity of Ocotillo. Groundwater generally flows from west to east. A pumping depression is shown around one well on the west; this depression is likely due to recent pumping in one or more private, non-USG wells.

4.2. Assessment of Groundwater Level Declines

Groundwater level declines in the Coyote Wells Valley Basin previously have been characterized as short term or long term. Short-term drawdowns are due to nearby pumping, with declines corresponding to nearby pumping and recovery occurring shortly after pumping has ceased. This is a localized and short-term phenomenon. Long-term regional decline is exhibited in some Coyote Wells Valley Basin wells; such long-term regional decline also is affected by pumping whereby additional pumping would cause the declining trend to be more widespread or to occur at a greater than predicted rate.

Production wells have alternating periods in which well pumps are off and on. When well pumps are operating, groundwater levels decline in and around the pumped well. This short-term, localized drawdown can can have adverse effects on well yield in nearby wells. A performance standard for the monitoring program was created to assess such potential impacts:

> *Well interference is defined as the combined pumping from all USG pumping wells so as* ***not to exceed 5 feet of drawdown at the nearest water-supply well.***

No private wells have yet reported well interference issues due to USG pumping. As shown in the hydrographs for USG-4, USG-5, and USG-6, water levels vary greatly when the well is pumping, but water levels recover quickly within days when wells are not pumping.

To assess potential impacts of USG pumping on long-term regional decline in groundwater levels, the performance standard is designed to act as an early warning system; it is stated below:

> *Water level decline is defined as four consecutive **annual** groundwater measurements (**spring only**) declining at a rate that is greater **than 0.1875 feet per year**, occurring at more than **10 percent of wells** in the regional monitoring program.*

To reduce any seasonal effects on groundwater levels, only spring measurements are used to calculate the rate of decline. **Table 4** summarizes the calculated rate of decline by well for the period of record (2010-2020); declines greater than 0.1875 feet per year are highlighted. For the first time since monitoring began, one well has shown a decline of greater than 0.1875 feet per year for four consecutive years. Well 42L1, in the far eastern portion of the basin, has experienced average declines of 0.42 ft per year for the past four years. It can be noted the average change in water levels over the past ten years at well 42L1 was an increase of 0.02 feet.

Review of groundwater level data shown in **Table 4** and **Figure 7** indicate that the pattern and rates of groundwater level changes in Well 42L1 are unlike other monitored wells (including wells close to USG wells), suggesting the importance of local factors in addition to regional decline. Historical water levels in this well have been uniquely variable (see F**igure 7**). Comparison between the Well 42L1 hydrograph on **Figure 7** and the annual rainfall amounts on **Figure 2** show a correspondence between high rainfall years and short-term increases in groundwater levels at Well 42L1. This is likely caused by the location of Well 42L1 along Yuha Wash, which concentrates and percolates rainfall-induced runoff from surrounding uplands. Based on that correspondence, the above-average rainfall amounts during this past water year are expected to increase Well 42L1 groundwater levels in the near future.

Although Well 42L1 has shown declines at a rate greater than 0.1875 feet per year for four years, this well represents less than 10% of the total wells monitored (excluding USG production wells). Accordingly, the performance standard for assessing long-term regional decline has not been exceeded.

The potential impact of recently-initiated USCBP groundwater pumping is not yet apparent at time of writing of this report. Wells 16J1 and 22E2 (and 17A1 to the east) are closest to the new wells; groundwater levels in these wells (and other wells in the southern basin) should be evaluated with respect to this new pumping. Moreover, application of the performance standard, which is linked to USG pumping, may need to be reviewed to acknowledge USCBP pumping.

5. WATER QUALITY

5.1. GROUNDWATER QUALITY

The EIR/EIS indicated that potential groundwater quality degradation from increased groundwater production would include the following processes:

- lateral migration of saline water from Tertiary marine sediments that crop out in the Ocotillo and No Mirage area and areas to the east of Coyote Wells
- vertical migration of saline water from the Tertiary marine sediments present at depth below the alluvial aquifer.

The monitoring program is designed to detect changes in TDS concentrations due to increased pumping by USG wells. TDS is used as an indicator for general mineral groundwater quality. Tracking TDS changes is a simplified, but widely accepted, method to detect changes in general water quality.

5.2. POTENTIAL WATER QUALITY DEGRADATION

TDS concentrations for the active USGS monitoring wells are shown in **Table 5** and tables of other constituents are presented in **Appendix C.** In brief, water quality data generally show stable trends for the key constituents. While higher TDS concentrations exist in the eastern portion of the basin, the stable temporal trends indicate the unlikelihood that high TDS concentrations in the east are migrating west.

The following performance standard has been developed as an early warning of changing conditions from USG pumping and its potential effect on water quality:

> *A significant increasing trend in **total dissolved solids** (TDS) concentrations is defined as TDS concentrations in groundwater from any well in the groundwater basin whereby **four consecutive annual samples (collected each spring)** show a cumulative increase greater than **20 percent of the long-term average** for that well.*

No wells show increasing TDS concentrations, as defined by the updated 2018 USG performance standard. Only one well, 31B1, showed an increase in TDS of 5%. This is the first consecutive year with a TDS increase for this well, so it is not a significant increasing trend. Twelve of the sixteen active monitoring wells with both 2018 and 2019 measurements showed stable TDS concentrations, defined as a change of less than five percent of the mean concentrations. Three wells (11H3, 24D1, and 34B1) showed decreases of greater than 5%. The wells with decreasing TDS concentrations are located throughout the basin.

Figures 9a and **9b** show springtime TDS concentrations for each well. **Figure 9a** shows all of the wells with a scale of 0 to 1,600 mg/L and **Figure 9b** shows well 31B1, the only well with a TDS concentration greater than 5 percent of the well's mean TDS concentration. All active wells in the monitoring network have satisfied the performance standard for TDS, meaning that cumulative 4-year increases in TDS concentrations (if any) have been less than 20 percent of the well's average TDS concentration.

Figure 10 shows maximum TDS concentrations within the groundwater basin for Spring 2020; data are provided in Appendix C. As documented in **Table 5**, one well with previously high TDS concentrations (42A8) showed a decline from a high of 1,240 mg/L in April 2011 to 555 mg/L in March 2020. The highest TDS concentration observed in 2020 was from Well 24B1, which had a maximum TDS concentration of 1,310 mg/L. TDS concentrations in Well 24B1 have remained stable since 2015.

6. SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA)

Pursuant to the Sustainable Groundwater Management Act (SGMA), Imperial County elected to assume the role of Groundwater Sustainability Agency (GSA) for all groundwater basins and sub-basins within the county. Consequently, the County has been deemed the exclusive GSA for the Coyote Wells Valley Basin.

In this role, the County has continued to work cooperatively with local agencies, water providers and other interested stakeholders within the basin. Should the County choose to prepare a Groundwater Sustainability Plan (GSP) for the Basin, the County will consider the interests of all beneficial uses and users of groundwater, as directed by California Water Code section 10723.2. As a beneficial user of groundwater, USG should remain aware of and participate in any GSP process; groundwater management may change how groundwater is monitored, reported, or allocated in the basin.

As of August 2020, there is no initial notification for a GSP of Coyote Wells Valley Basin and there are no other indications that the county is moving ahead in the process.

7. CONCLUSIONS

The current monitoring program meets the objectives set forth in EIR/EIS, noting the importance of continued USGS data collection. The water level data collected are sufficient to identify increases in the rate of water-level decline. While one well did show declining groundwater levels for a four-year period, the performance standard for basin-wide groundwater decline entails four-year declines in 10% of monitored wells. Similarly, the performance standard for potential water quality degradation requires that four consecutive annual samples show a cumulative increase greater than 20 percent of the long-term average for that well. In summary, none of the performance standards have been exceeded, and no significant adverse trends have been identified.

US Gypsum will prepare the next Annual Report due to the County of Imperial by the first business day in October 2021.

8. REFERENCES

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TABLES

Table 1. Annual USG Pumping by Well (AFY)

Calendar Year Pumping	Well #4	Well #5	Well #6	Total
2005	226	199	149	575
2006	199	188	162	549
2007	192	174	135	501
2008	140	136	125	400
2009	75	84	78	237
2010	78	82	79	239
2011	81	83	82	247
2012	69	109	70	248
2013	106	66	78	250
2014	98	59	82	239
2015	87	93	91	271
2016	115	118	106	339
2017	93	148	121	362
2018	154	127	92	374
2019	145	101	141	388

Table 2. Quarterly USG Pumping by Well (AF per quarter)

Year	Quarter	#4	#5	#6	TOTAL	Annual Distribution
2019	Q1	30	28	32	90	--
2019	Q2	42	20	39	102	27%
2019	Q3	45	26	41	112	30%
2019	Q4	29	26	29	84	22%
2020	Q1	25	19	33	77	21%
2020	Q2	29	26	30	85	--

Table 3. List of Actively Monitored Wells and Available Data for 2020

Well Name	Short Name	Active WL Network	Active WQ Network	First WL Measurement	First WQ Measurement	Agency
17S11E22E2	22E2	Y		1975	1975	USGS
17S10E11B1	11B1	Y		1975	*	USGS
17S10E11G1	11G1	Y		1967	1967	USGS
17S10E11G4	11G4	Y		1978	*	USGS
17S10E11H3	11H3	Y	Y	1987	1987	USGS
17S11E16J1	16J1	Y		1970	1972	USGS
16S11E23B1	23B1	Y		1974	1964	USGS
16S9E24B1	24B1	Y	Y	1976	1977	USGS
16S9E24D1	24D1	Y	Y	1976	1977	USGS
16S9E25K2	25K2	Y	Y	1972	1972	USGS
16S9E26F1	26F1	Y	Y	1998	2013	USGS
16S11E27F1	27F1	Y		1975	*	USGS
16S10E27R1	27R1	Y		1975	1975	USGS
16S10E29H1	29H1	Y		1975	1975	USGS
16S10E20R1	30R1		Y	1959	1959	USGS
16S10E31B1	31B1	Y	Y	1993	2013	USGS
16S01E32N1	32N1		Y	2018	2018	USGS
16S10E32P2	32P2	Y		2017	*	USGS
16S01E32P3	32P3		Y	2016	2016	USGS
15S11E32R1	32R1	Y		1974	1964	USGS
16S9E34B1	34B1		Y	1998	1997	USGS
16S9E35M1	35M1	Y		1962	1962	USGS
16S9E36A1	36A1(MW-2B)	Y	Y	2012	2013	USGS
16S9E36A2	36A2 (MW-2A)	Y	Y	2012	2013	USGS
16S9E36B1	36B1 / USG-6	Y	Y	1969	1963	USGS
16S9E36D2	36D2	Y		1975	195	USGS
16S9E36G3	36G3 / USG-4	Y	Y	1969	1963	USGS
16S9E36H2	36H2	Y	Y	2015	2015	USGS
16S9E36H2	36H2 / USG-5	Y	Y	1954	1963	USGS
16S10E42A8	42A8		Y	1994	1994	USGS
16S11E42L1	42L1	Y		1975	1975	USGS

Wells Not Monitored in 2020 that were recently active

Well Name	Short Name	Agency	Reason
16S09E25M2	25M2	USGS	No reason given by USGS, WL not monitored since
16S10E28D1	28D1	USGS	No reason given by USGS, Last monitored 2018
16S10E32P1	32P1	USGS	No reason given by USGS, Last monitored 2017

Table 4. Water Level Trends

Well	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Maximum consecutive years of declines greater than 0.1875 ft/year
11B1	0.60	0.52	0.56	0.44	0.37	0.60	0.62	0.43	0.42	0.37	0.47	
11G1		0.83	-0.18	0.84	0.64	-0.39	1.46	-0.89			1.13	
11G4	0.62	0.29	0.30	0.60	0.55	0.42	0.62	-0.48	1.70	0.28	0.24	
11H3			-1.09	2.05	0.29	0.84	0.66	-0.05	0.79	0.24	0.39	
16J1	0.38	0.46	0.12	0.27	0.13	0.03	0.20	0.08	0.27	0.06	0.06	
22E2	0.38	0.41	0.16	0.24	0.46	-0.27	0.20	0.71	-0.34	0.03	0.09	
23B1	-0.30	0.26	-0.45	-0.06	-0.63	0.55	-0.10	3.74	-3.80	0.05	-0.06	
24B1	-0.07	-0.23	-0.16			-0.14	-0.09	-0.10	-0.13	-0.13	-0.11	
24D1	-0.08	-0.18	-0.11			-0.51	0.30	-0.04	-0.13	-0.11	-0.14	
26F1	-0.07	-0.05	-0.11	-0.07	-0.10	-0.06	-0.08	-1.21			-0.15	
27F1	-0.10	-0.25	-0.28	0.13	-0.10	-0.15	0.05	-0.08	0.13	-0.02	-0.21	1
27R1	-0.12	0.01	-0.09	0.01	0.41	0.05	0.13	-0.13	0.22	0.30	-0.16	
29H1	0.35	-0.31	-0.09	-0.01	0.01	0.00	-0.02	-0.08	0.08	0.03	0.04	
31B1	0.35	0.27	0.18	0.03	-0.02	-0.78	-2.37	2.73	-0.35	-0.20	-0.20	3
32P2										-0.16	0.00	
32R1	0.01	0.02	-0.09	0.22	0.12	-0.07	-0.01			-0.26	-0.02	
35M1		4.30	0.00	2.83	1.10	-0.07	-0.26	-0.10	-0.05	0.05	-0.39	1
36A1(MW-2B)					0.25	-0.88	-0.31	-1.22	-0.01	-1.26	-0.42	2
36A2 (MW-2A)					-0.32	3.58	-0.50	-1.03	-0.13	-1.41	0.05	
36D2	0.48	0.36	0.17	0.11	-0.03	0.03	-0.17	-0.25	-0.15	-0.23	-0.24	2
42L1	-0.97	-1.01	-0.29	3.03	0.19	-0.05	0.01	-0.43	-0.40	-0.40	-0.44	4
USG-4				0.38	1.02	2.56	-1.64					Pumping
USG-5	2.99	0.93						-3.17656	0.8122			Pumping
USG-6				39.93	-0.20	-2.46	2.51	-0.11				Pumping

Table 5: Total Dissolved Solids Concentrations (mg/L)

Date	Chem	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32P03S	34B1	36A1 (MW-2B)	36A2 (MW-2A)	36C2	36D3	36H1/36H2	42A8	USG-4	USG-5	USG-6
Mar-09	Total Dissolved Soilds	287	1210		335			517				302			359	365	305	910			
Mar-10	Total Dissolved Soilds	307	1200		306			498				300			349	346	304	1100			
Apr-11	Total Dissolved Soilds	280	1220		325			525				298			485	359	306	1220			
Mar-12	Total Dissolved Soilds	315	1210	486				511				303			359		320	886			
Feb-13	Total Dissolved Soilds	284	1220	497	302			530	299			306						739			
Apr-14	Total Dissolved Soilds	292	1290	499	309			543	284			314			360		327	728			
Mar-15	Total Dissolved Soilds	297	1350	492					298			315									
Mar-16	Total Dissolved Soilds	280	1350	484	291		356	559	271			303	298	399	362			654	362	334	309
May-17	Total Dissolved Soilds	298	1350	495	323		353	567	283			300	303	412	357			594		328	314
Mar-18	Total Dissolved Soilds	288	1310	439	304	352	342	565	274	469	612	305	291	396	350		323	564	343		
Mar-19	Total Dissolved Soilds	322	1310	503	309	373	365	583	273	477	621	322	307	423	368		331	575	361		317
Mar-20	Total Dissolved Soilds	289	1280	431	296	367	366	572	288			305	303	420	369		324	555	372		309
	Average	295	1,275	481	310	364	356	543	284	473	617	306	300	410	372	357	318	775	360	331	312
	Change from 2019-2020	(33)	(30)	(72)	(13)	(6)	1	(11)	15	(477)	(621)	(17)	(4)	(3)	1	-	(7)	(20)	11	-	(8)
	20 percent of average	59	255	96	62		71	109	57			61	60	82	74	71	64	155	72	66	62

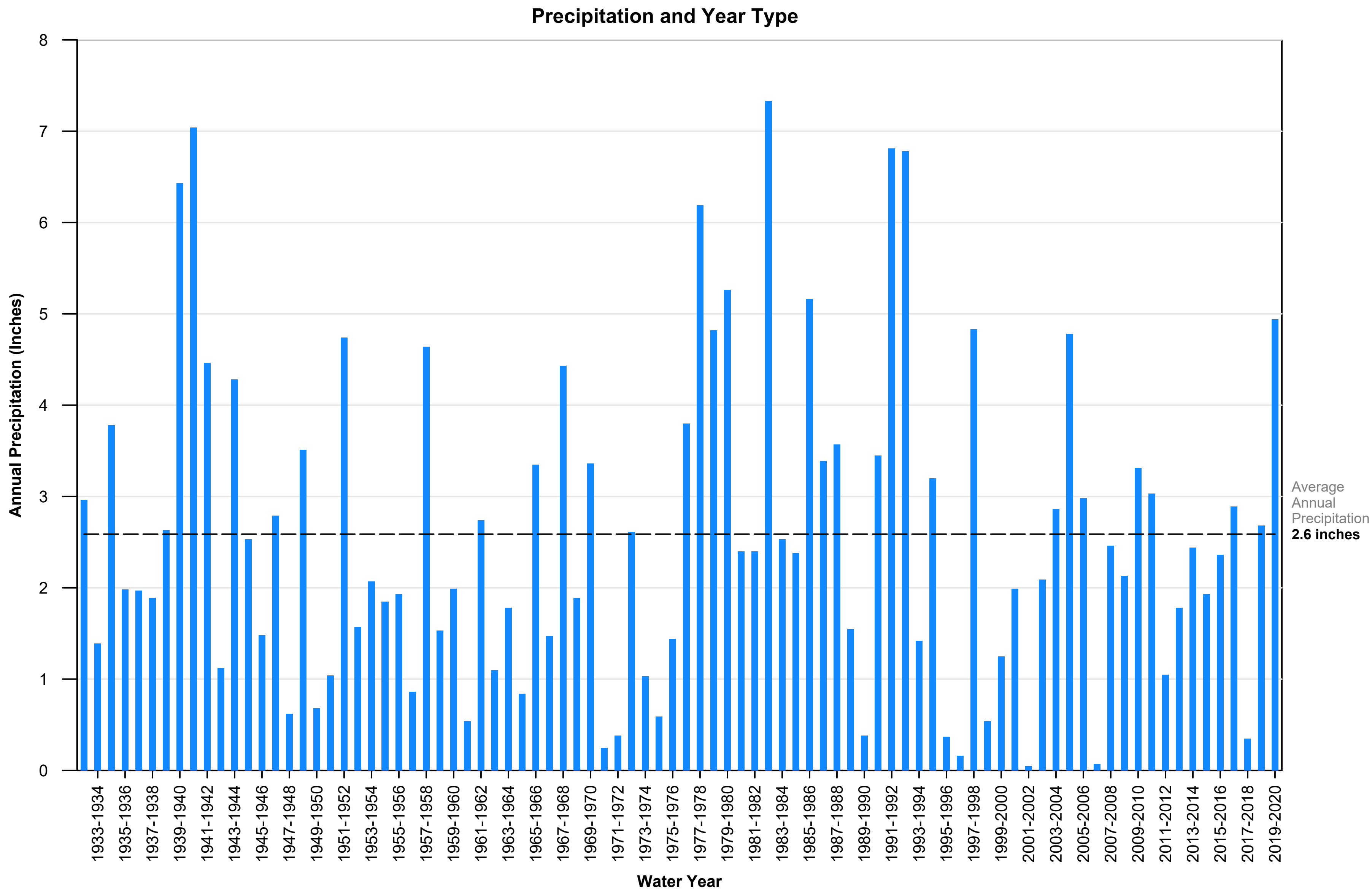
FIGURES

Coyote Wells Groundwater Basin

September 2020

TODD GROUNDWATER

Figure 1
Groundwater Basin Boundary

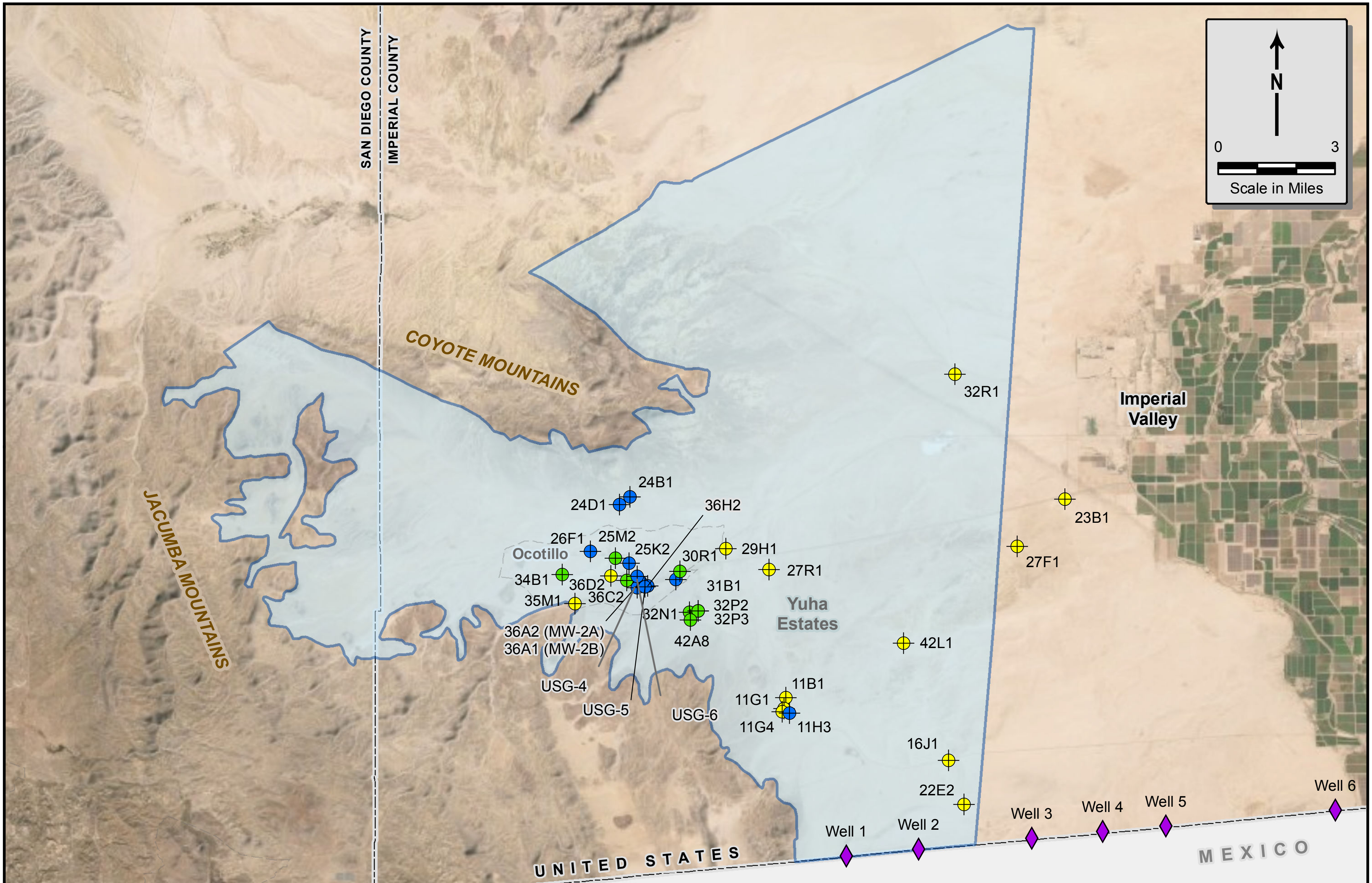


Average Annual Precipitation (2.6")
Precipitation

September 2020

TODD GROUNDWATER

Figure 2
Annual Precipitation

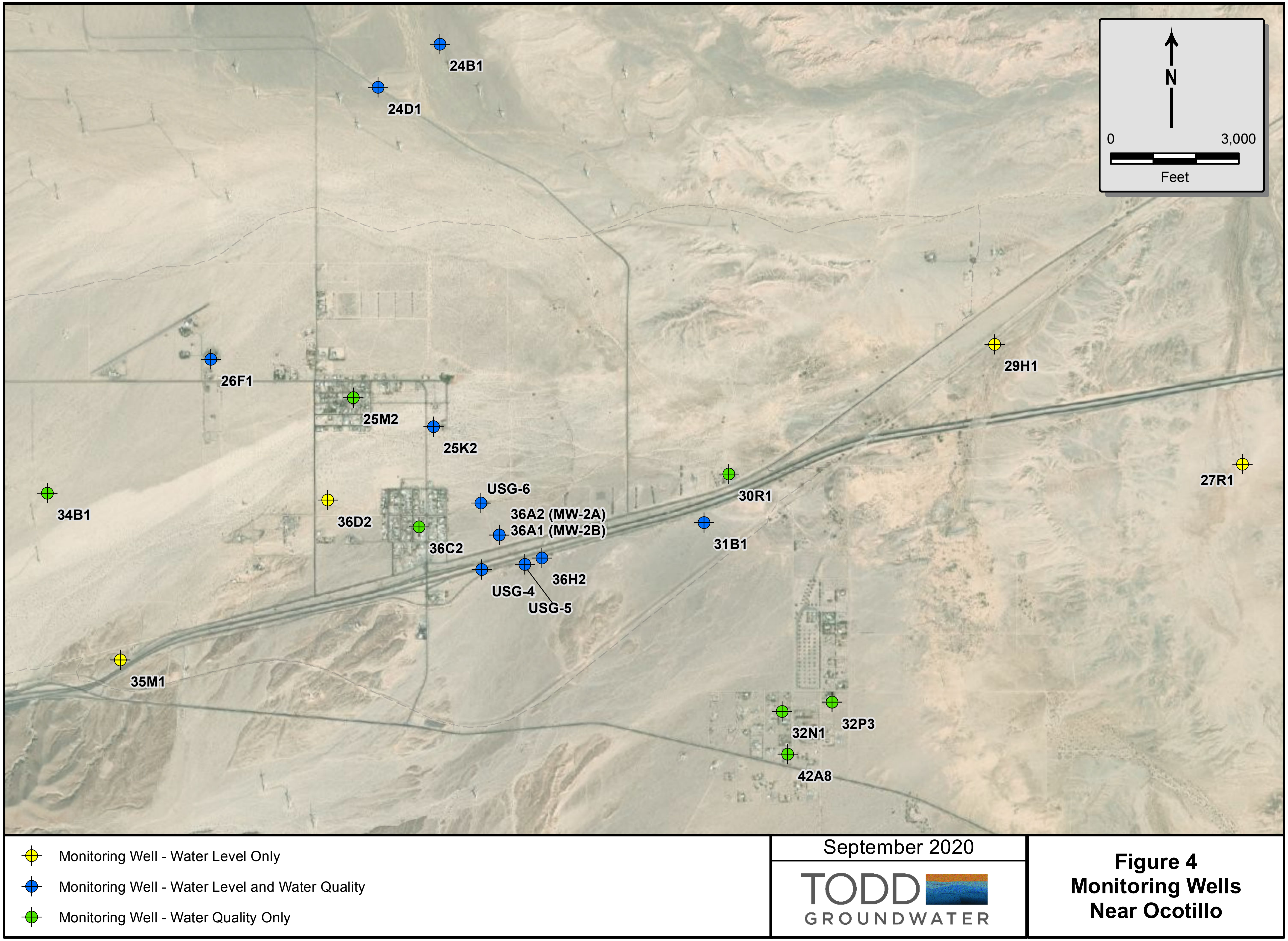


Monitoring Well - Water Level Only
Monitoring Well - Water Level and Water Quality
Monitoring Well - Water Quality Only
USCBP Wells
Coyote Wells Groundwater Basin

September 2020

TODD GROUNDWATER

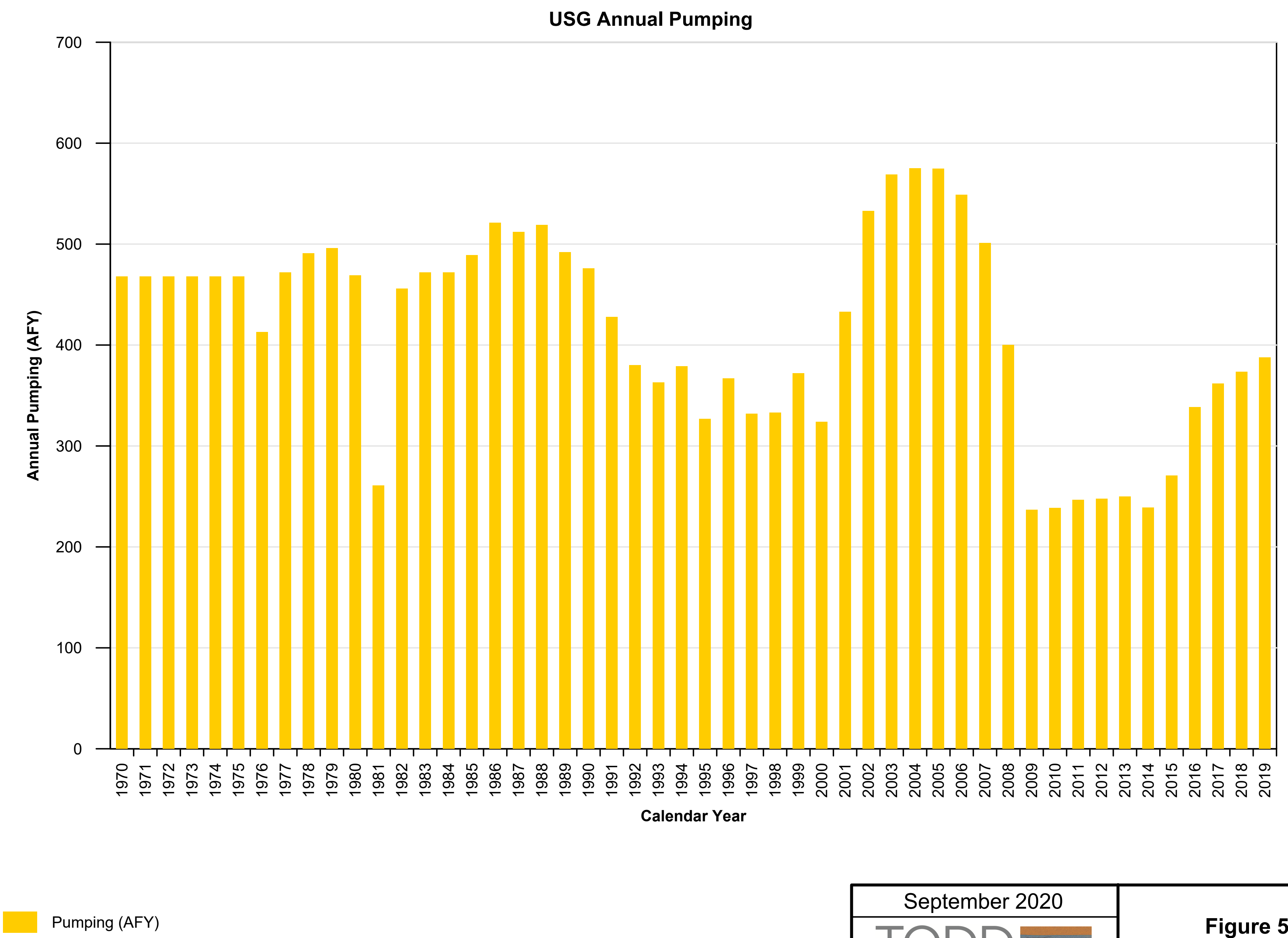
Figure 3
Active Monitoring Wells



September 2020

TODD GROUNDWATER

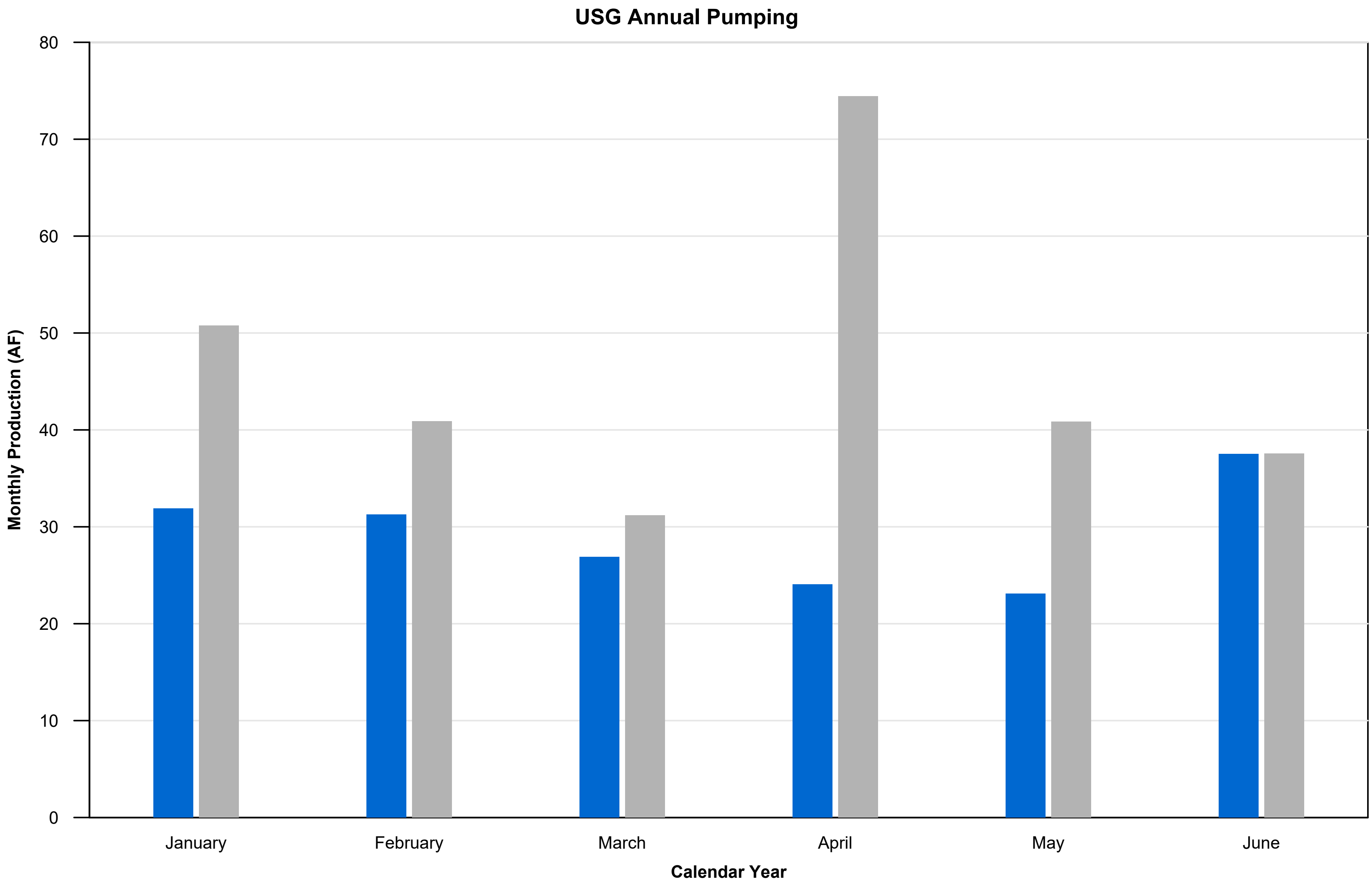
Figure 4
Monitoring Wells
Near Ocotillo



September 2020

TODD GROUNDWATER

Figure 5
Annual Pumping



US Gypsum
All US Customs and Border Patrol Wells

September 2020

TODD GROUNDWATER

Figure 6
Monthly Production
2020

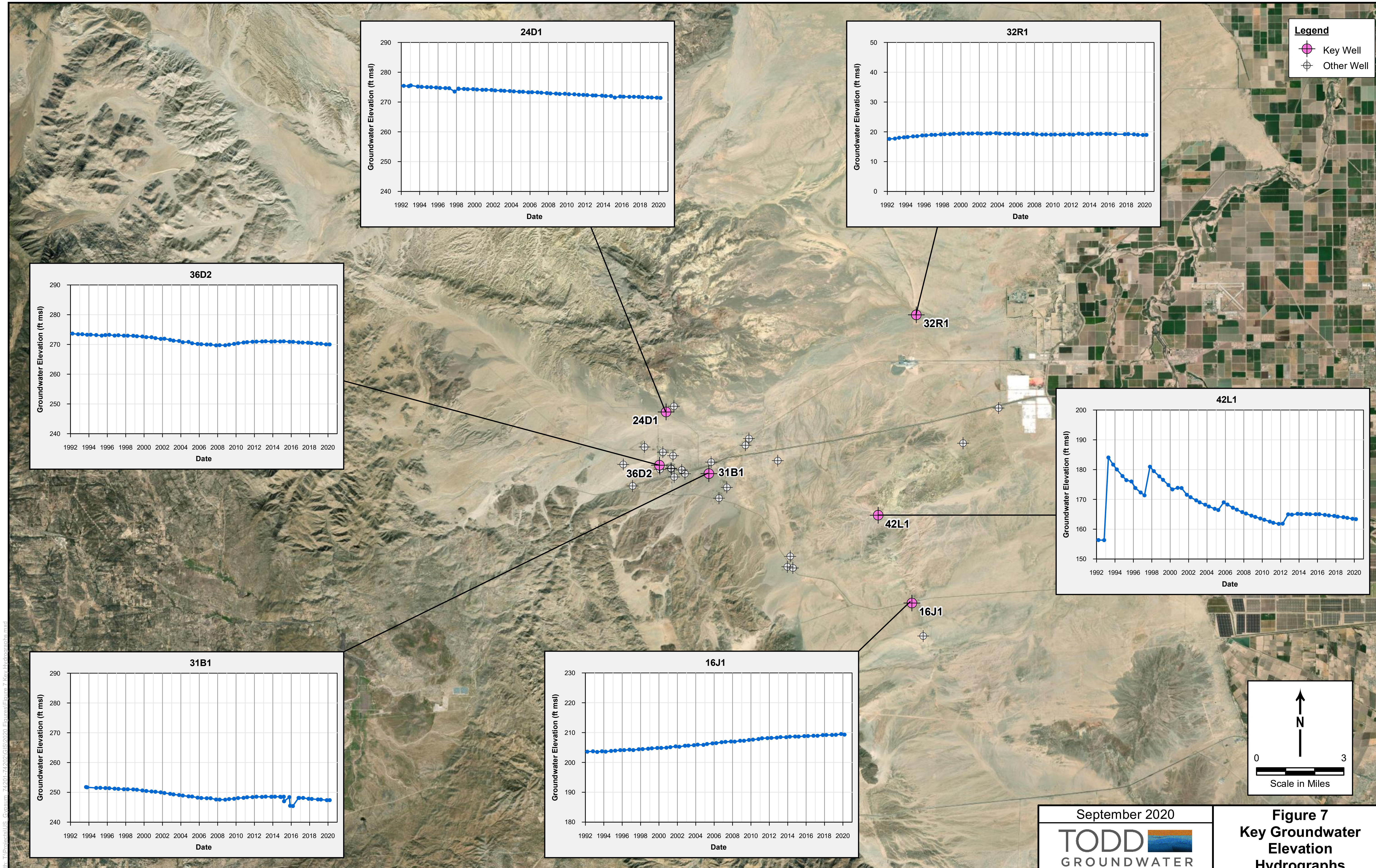
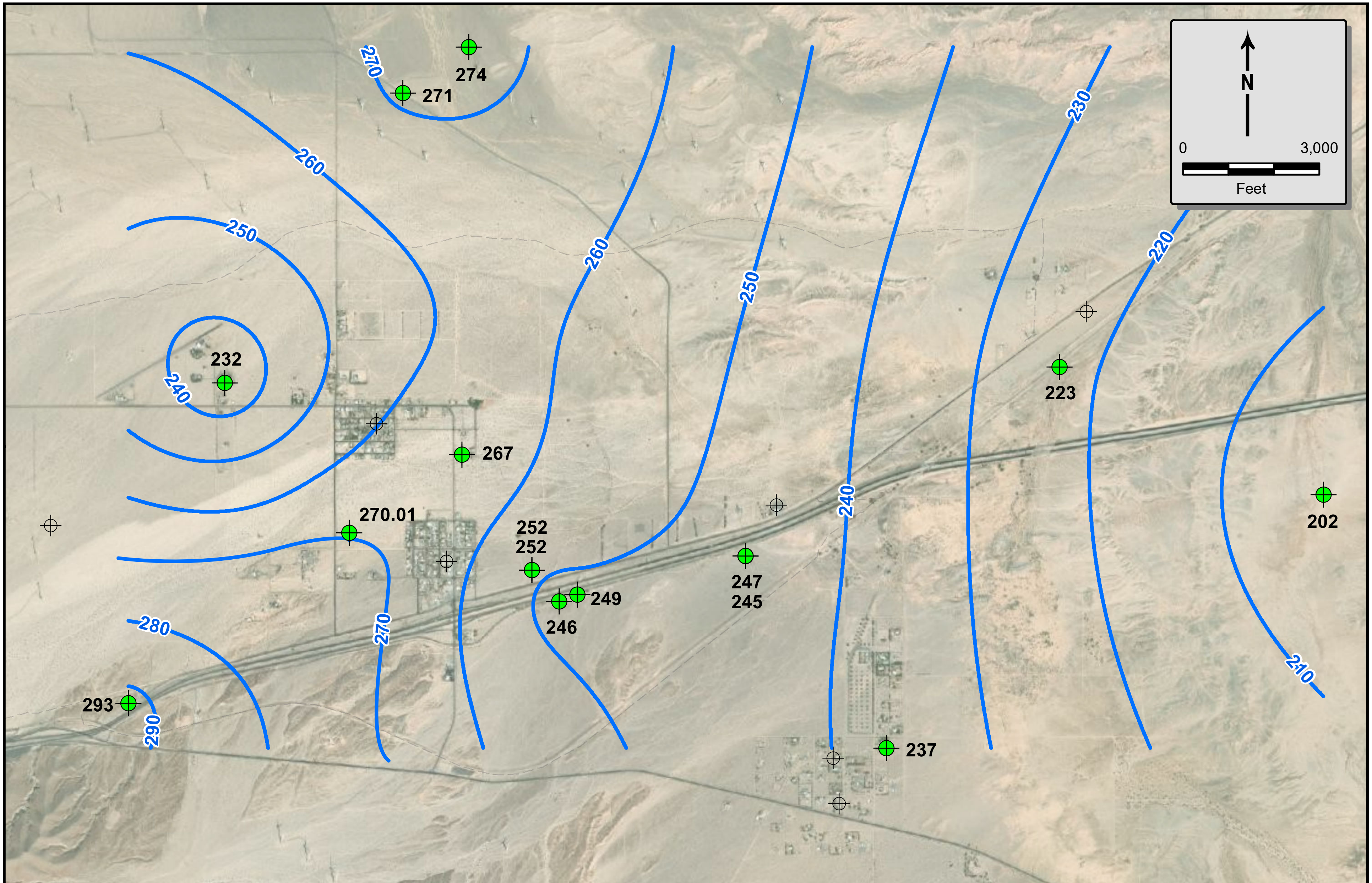


Figure 7
Key Groundwater Elevation Hydrographs



Spring 2020 Water Level Measurements

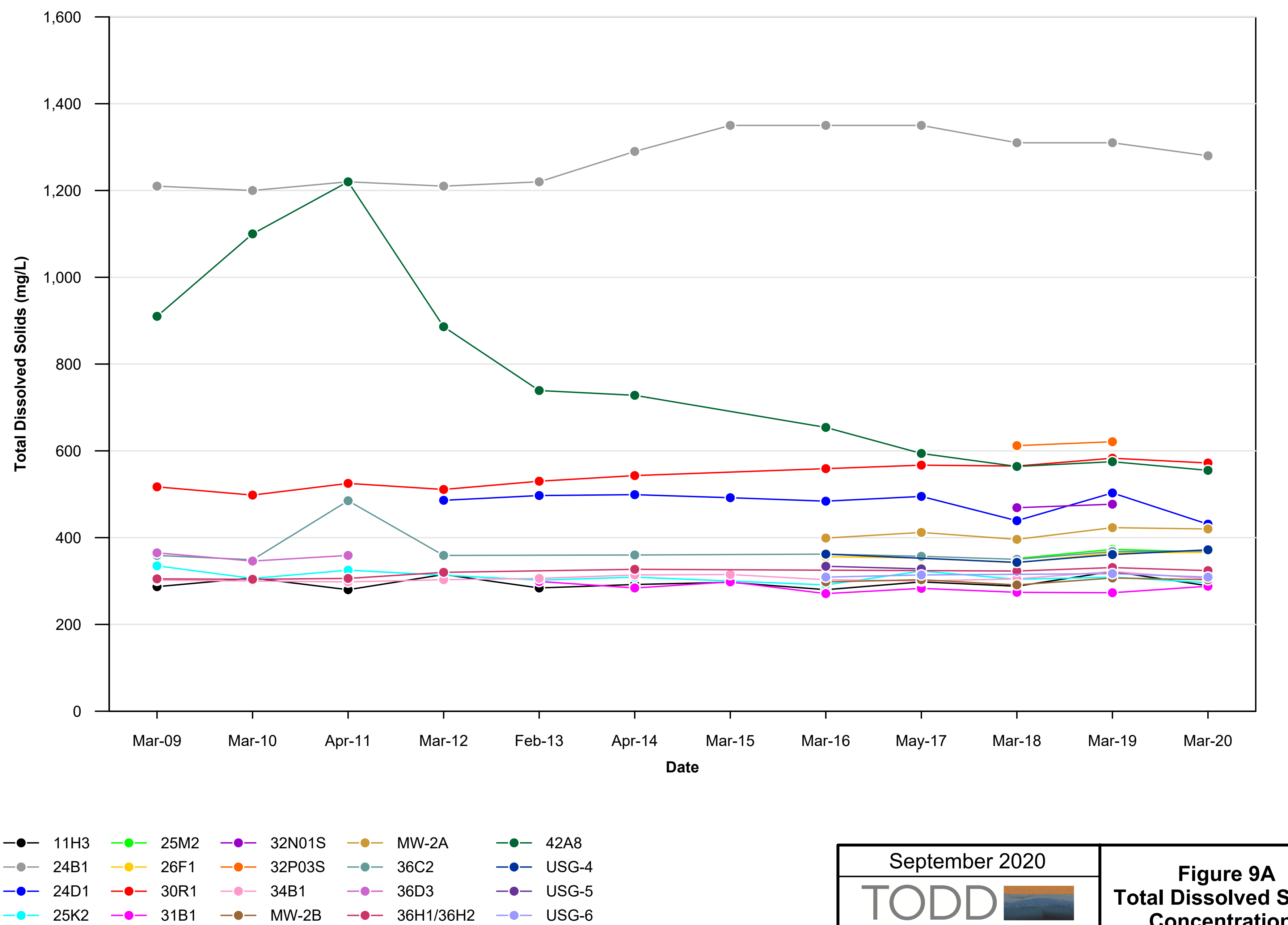
Not Monitored

Spring 2020 Groundwater Contour (feel msl)

September 2020

TODD GROUNDWATER

Figure 8
Groundwater Contours and Flow Direction
Spring 2020



September 2020

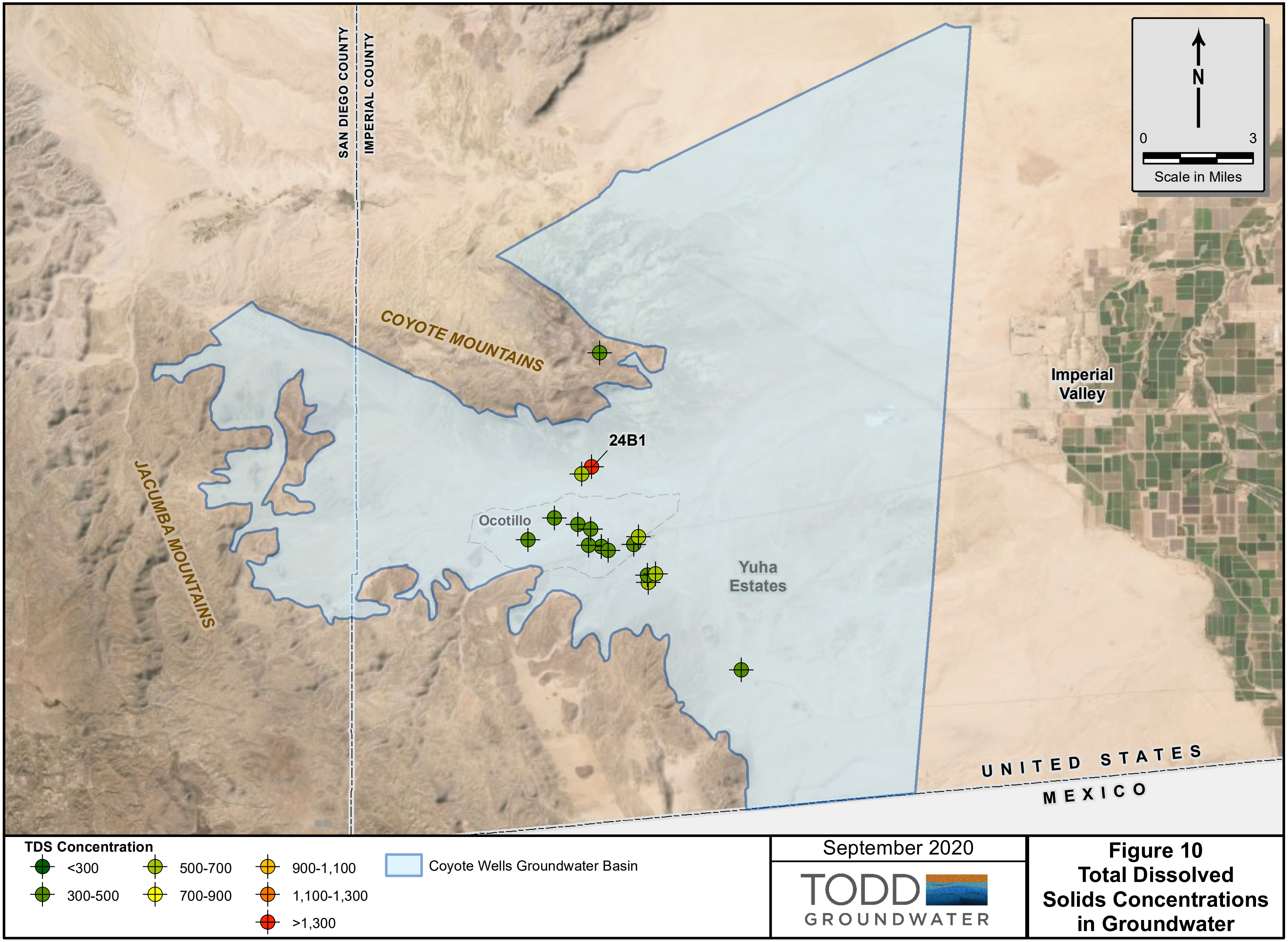
TODD GROUNDWATER

Figure 9A
Total Dissolved Solids Concentrations

September 2020

TODD GROUNDWATER

Figure 9B
Total Dissolved Solids Concentrations in Well 31B1



September 2020

TODD GROUNDWATER

Figure 10
Total Dissolved Solids Concentrations in Groundwater

APPENDIX A

BASIN DESCRIPTION AND HYDROGEOLOGY

Groundwater for the Plaster City Plant, community of Ocotillo, and local domestic wells is pumped from the Coyote Wells Valley Groundwater Basin (No. 7-29), as defined by the California Department of Water Resources (DWR, 2003)[2]. DWR generally defines groundwater basins based on the extent of alluvial deposits. As depicted in **Figure A-1,** the Basin encompasses 64,000 acres (100 square miles) in the Yuha desert west of Imperial Valley, California. It is located mostly in Imperial County, with the western edge extending into San Diego County. The Basin is bounded by the Coyote Mountains to the north and the Jacumba Mountains to the west and southwest. These boundaries correspond to the geologic contacts between alluvium and less permeable geologic formations as mapped by DWR. The southern basin boundary is the United States-Mexico border and the eastern boundary is a roughly north-south line from Superstition Mountain on the north to the international border. Part of the northeastern boundary is a surface drainage divide connecting the Coyote Mountains with Superstition Mountain.

8.1. HYDROGEOLOGY

Figure A-2 shows the surficial geology within the Coyote Wells Valley Groundwater Basin, as mapped by the USGS (Loeltz, 1975). The groundwater basin boundaries on the north, west, and southwest generally coincide with the low-permeability formations of the mountain ranges; some discrepancies reflect the scale and interpretation of geologic mapping. The main water-bearing units of the basin are the Quaternary alluvial deposits forming the basin floor. In many areas, alluvium and lake deposits overlie older Quaternary/Tertiary formations including the Palm Springs and Imperial formations. As shown in **Figure A-2**, these crop out to the west and east.

Figure A-3 is a general cross-section illustrating the major formations in the basin (see **Figure A-1** for location). This cross-section is reproduced from the Final EIR/EIS and shows two layers defined for groundwater flow modeling. The upper layer (Layer 1) consists of alluvial deposits (Qa/Qof) and the lower layer (Layer 2) is composed of the Palm Springs and Imperial formations (QTp/QTi), which have been uplifted in the area east of Ocotillo and are relatively near the ground surface. The water-bearing alluvial deposits (Layer 1) are primarily restricted to the center of the basin, with thickness of 550 feet or greater in the Ocotillo area. As shown, the alluvium was previously indicated to be 650 feet thick; however, monitoring wells recently drilled near the US Gypsum pumping encountered alluvium to a depth of 800 feet. The alluvial deposits thin toward the margins of the basin where they become unsaturated. Along the basin margins, the saturated zones occur in the Palm Springs and Imperial formations.

In brief, the alluvial Layer 1 aquifer near Ocotillo is generally characterized by relatively high permeability, good water quality, and rapid recovery from pumping. The less permeable Layer 2 (Palm Springs/Imperial formations) east of Ocotillo and in the Yuha Estates area is characterized by relatively poor water quality and greater, more persistent impacts from pumping. In the Ocotillo area, groundwater levels in Layer 1 have been indicated to be higher than those in Layer 2. However, continued groundwater level declines in Layer 1—at more rapid rates than those in Layer 2—present the potential for significant change in that

[2] The EIR/EIS refers to the area as the Ocotillo/Coyote Wells Groundwater Basin as defined by USGS.

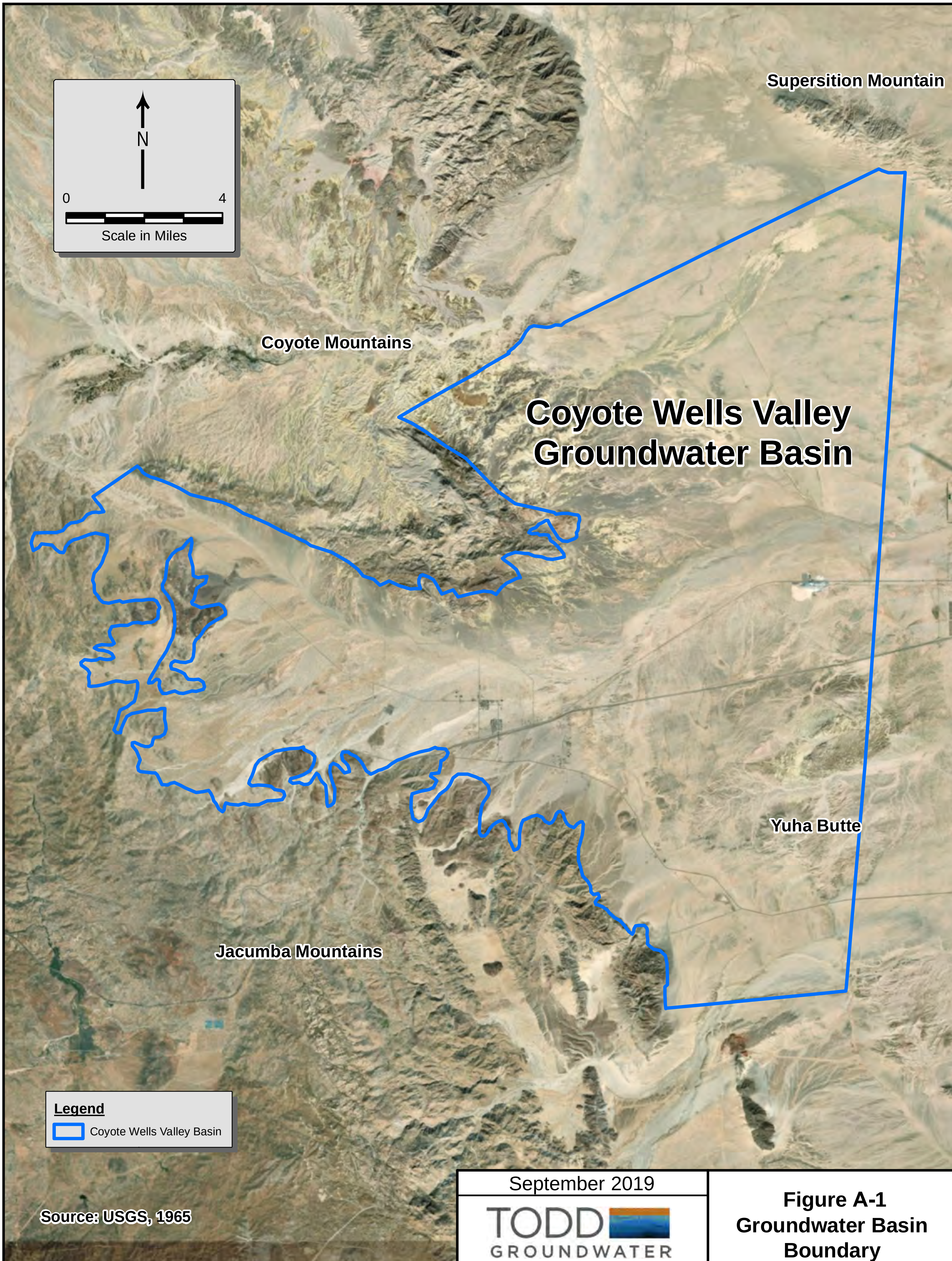
vertical gradient. In that case, relatively poor groundwater from Layer 2 could migrate into Layer 1, resulting in water quality deterioration in Layer 1.

Geologic units in the Ocotillo/Coyote Wells Groundwater Basin can be grouped as follows:

- Quaternary Alluvium (Layer 1), composed of poorly consolidated older alluvial fan deposits and sand, underlies much of the basin floor and extends locally into large canyons of the surrounding mountains. Lake deposits also are mapped by USGS. Most wells drilled in the Ocotillo area are completed within the alluvium. The alluvial wells are noted for high yields and relatively good water quality.
- The Palm Springs Formation (in Layer 2) is composed of fluvial and deltaic sand, silt, and clay deposits deposited by the ancestral Colorado River during the early Pleistocene. Thicknesses can range up to several thousand feet. No pumping test data were found for the Palm Springs Formation, but the aquifer properties (e.g., transmissivity and specific yield) are likely similar to those of the Imperial Formation.
- The Late Miocene to Pliocene Imperial Formation (in Layer 2) is generally described as interbedded claystone and sandstone of dominantly marine origin. The Imperial Formation has an exposed thickness of over 1,500 feet in the Yuha area. Wells drilled into the Imperial Formation typically have low yields and produce poor quality water.

Significant differences have been noted in the hydrogeologic properties, water levels, and water quality between the area around the community of Ocotillo and areas to the east. Near Ocotillo, transmissivities (aquifer properties describing the ease with which groundwater flows through the aquifer) have been noted as significantly higher than those to the east. Transmissivities have been measured in the range of 5,800 to 6,700 ft^2/day near Ocotillo, whereas transmissivities of 34 to 957 ft^2/day have been noted in the eastern areas. These variations are reflected in groundwater gradients: shallower (flatter) hydraulic gradients have been mapped in the Ocotillo area and steeper hydrologic gradients have been mapped in the area east of Ocotillo.

While there is an occurrence of unconfined groundwater in other parts of the basin, water quality these areas are generally poor, with existing wells drilled in confined groundwater showing improved water quality. Groundwater generally flows southeast through the basin, with the principal recharge derived from percolation from precipitation and ephemeral runoff from the surrounding mountains (Skrivan, 1977).



September 2019

TODD GROUNDWATER

Figure A-1
Groundwater Basin Boundary

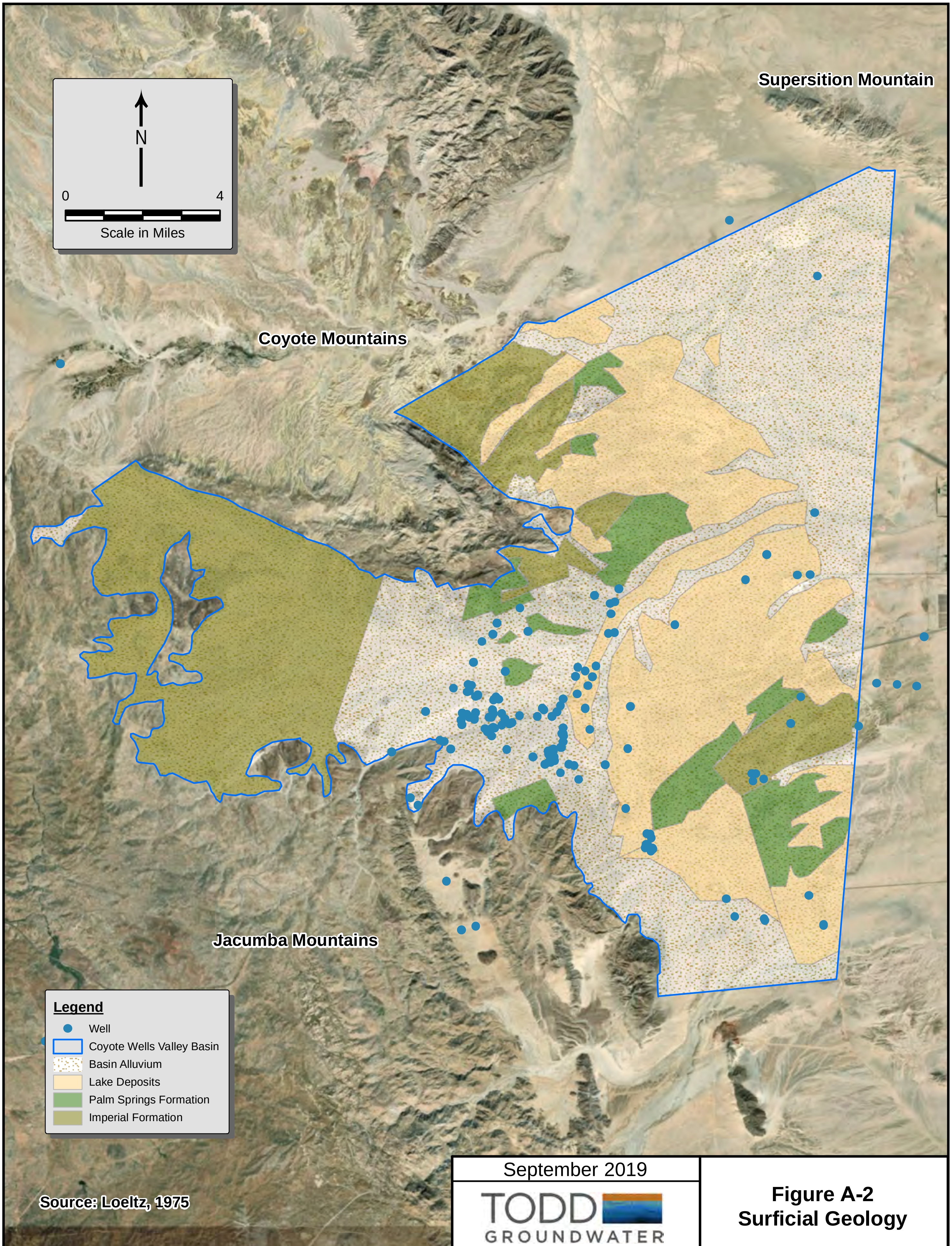
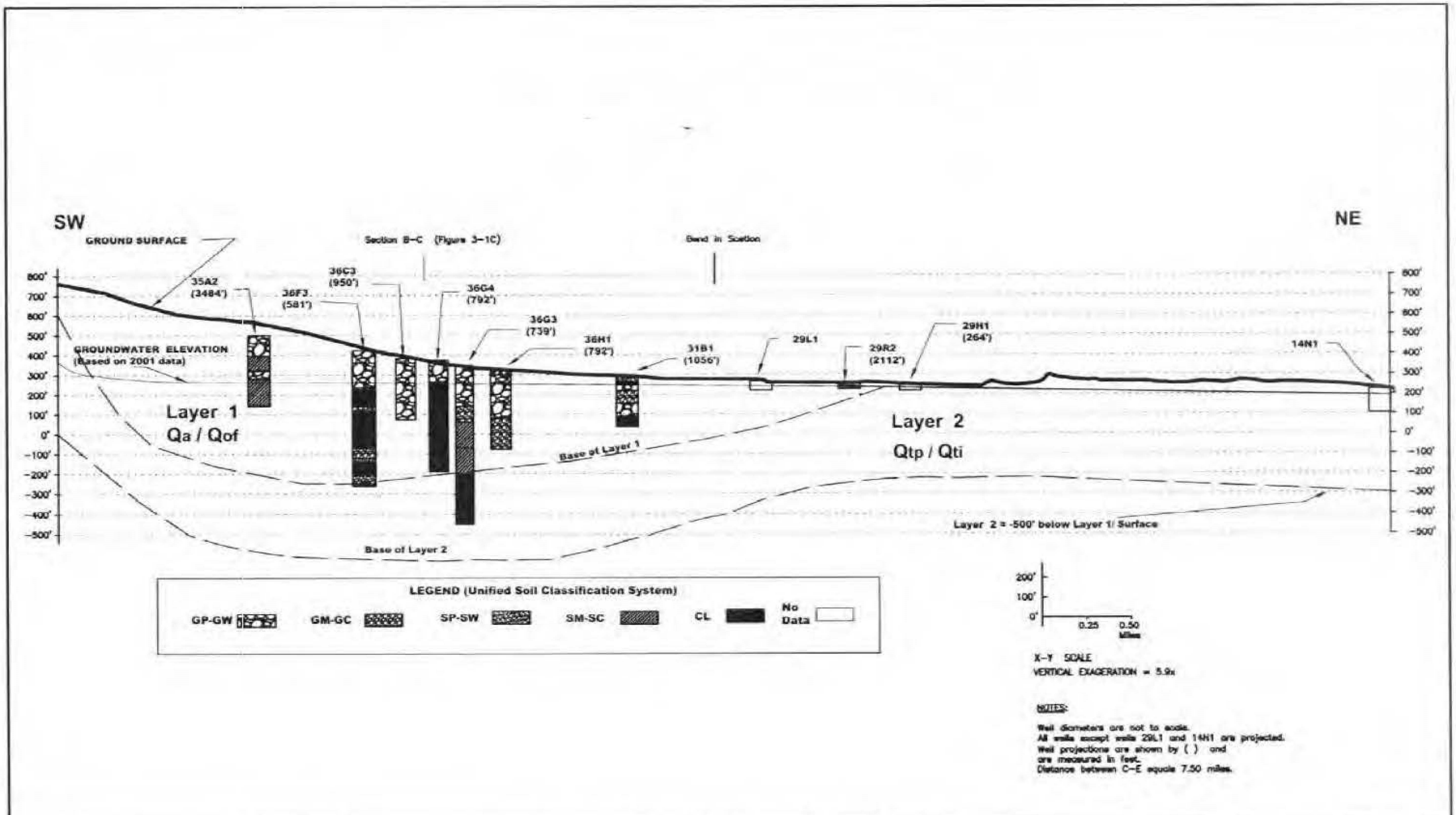


Figure A-2
Surficial Geology



Bookman-Edmonston
A Division of GEI Consultants, Inc.

Ocotillo/Coyote Wells Groundwater Study

Geologic Cross-Section (Ocotillo-Transverse)

U.S. Gypsum Company

9/24/03

FIGURE 3-1E

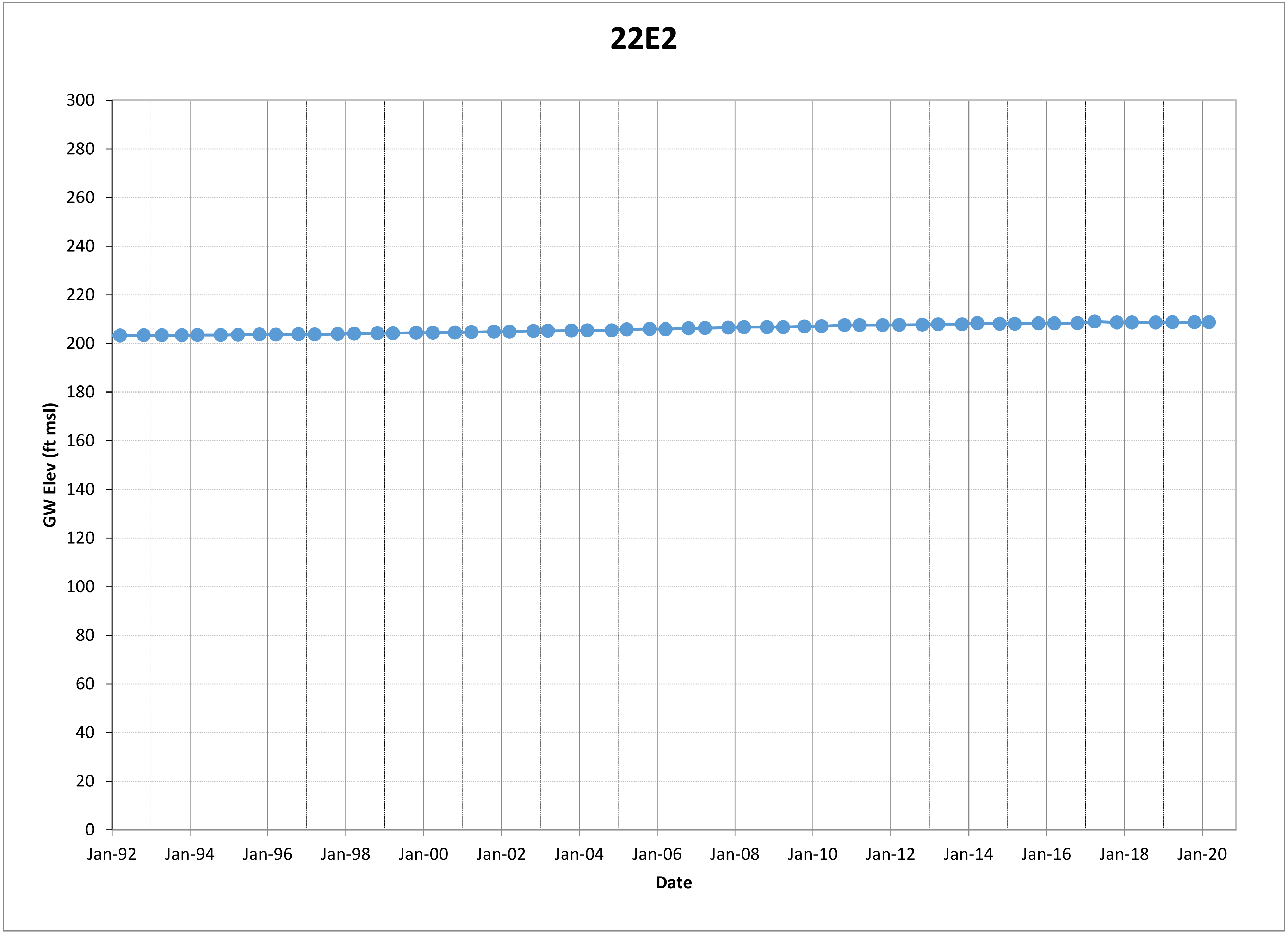
September 2019

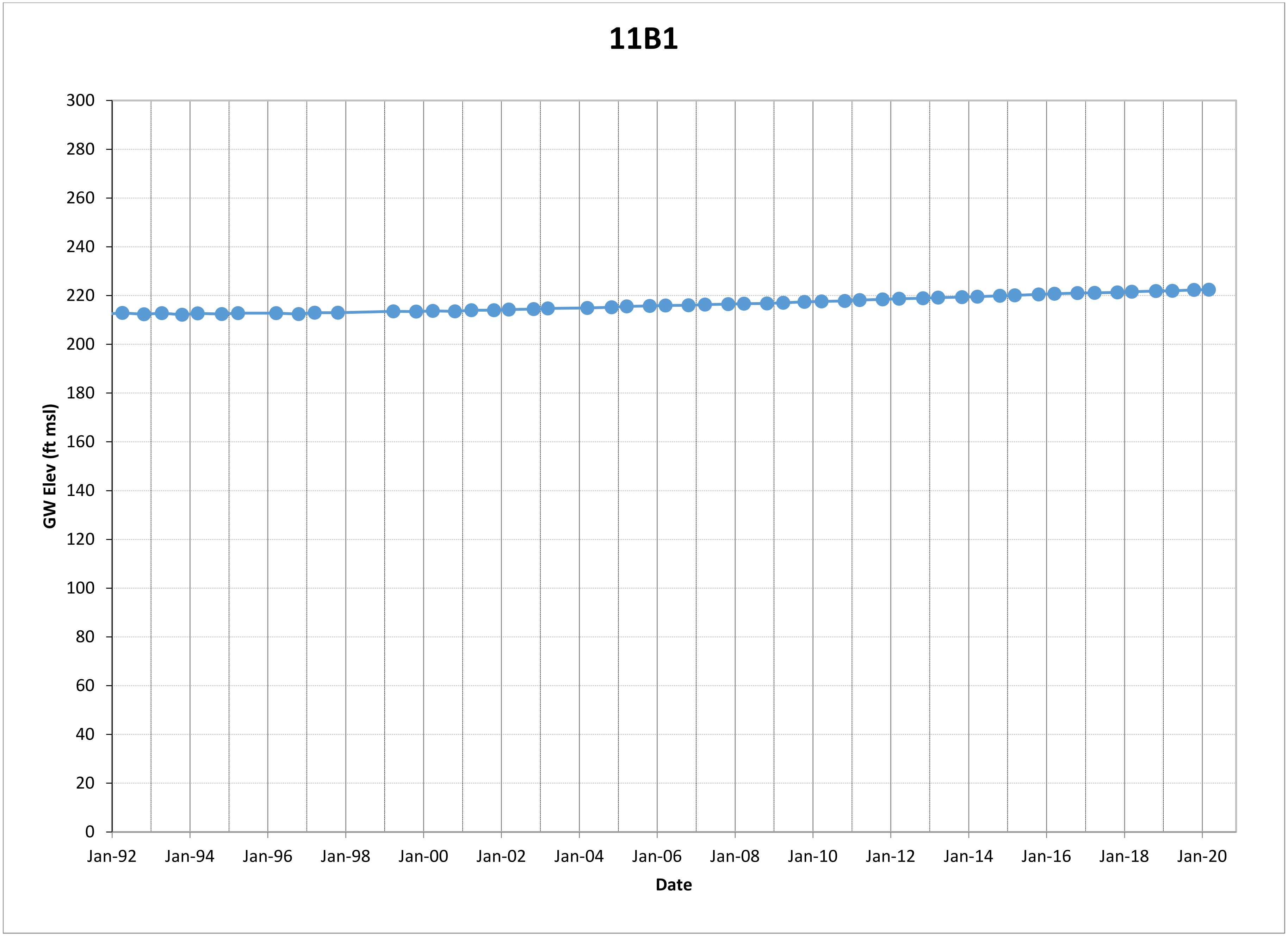
TODD GROUNDWATER

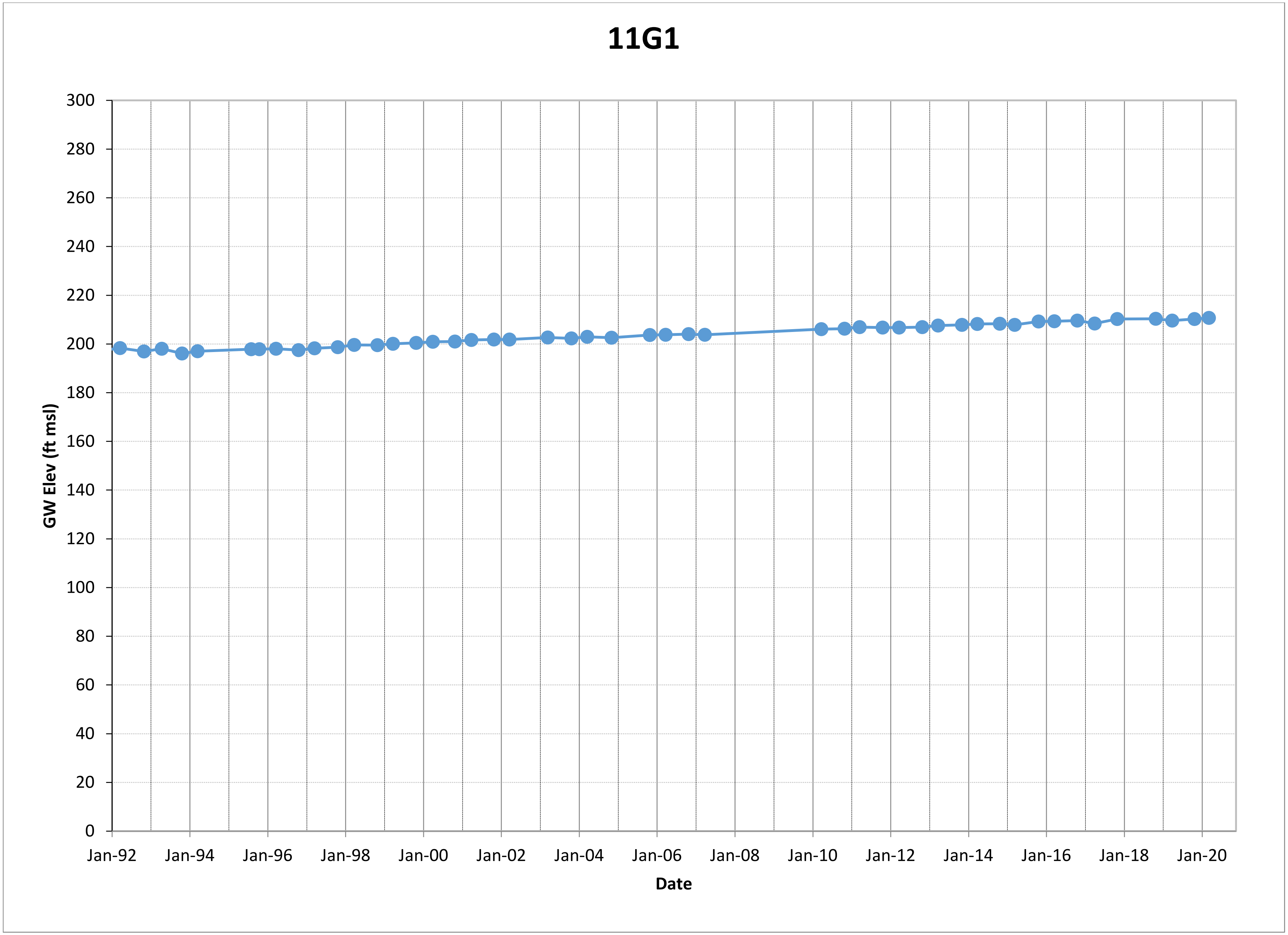
Figure A-3
Geologic Cross Section

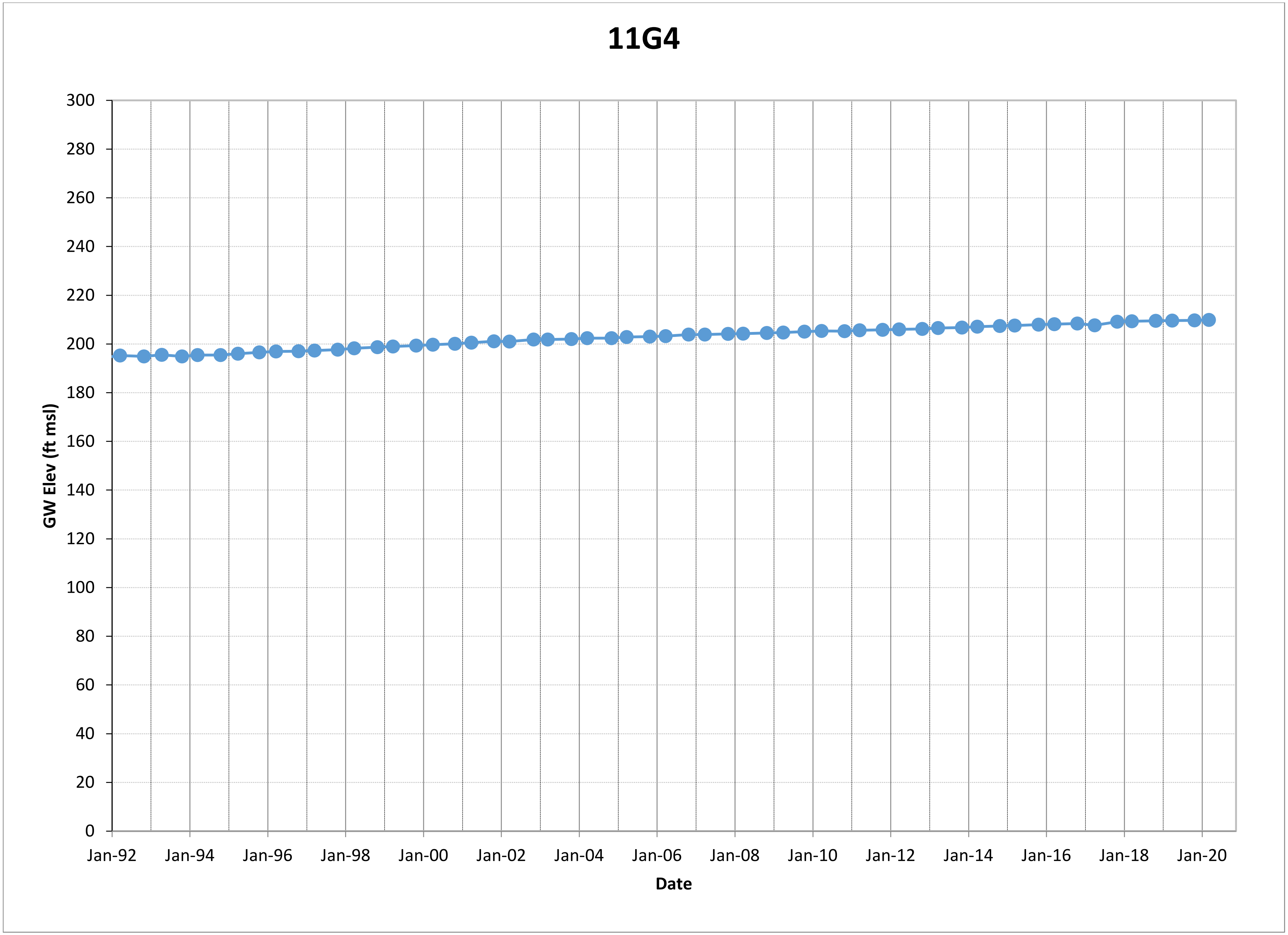
APPENDIX B

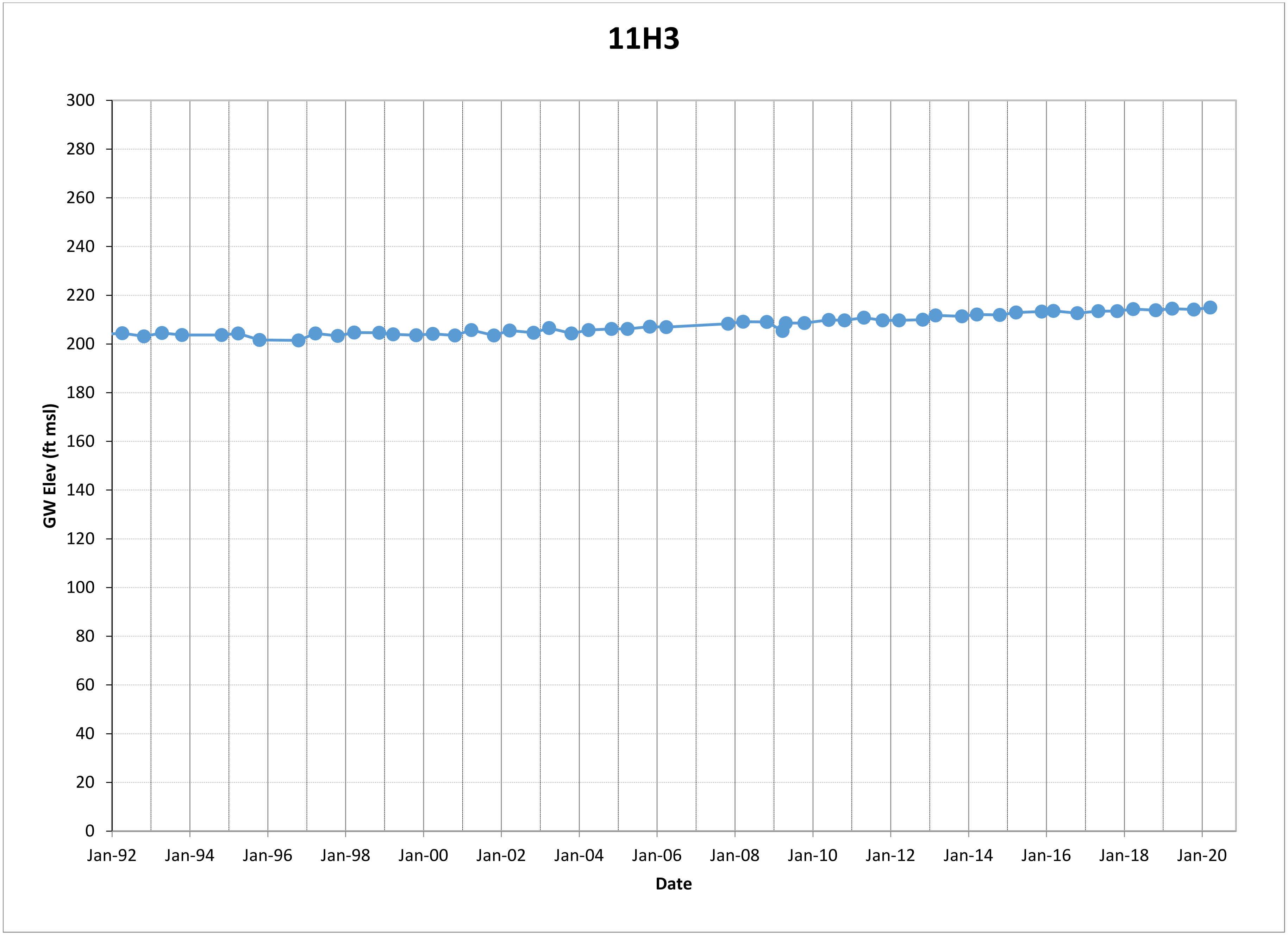
GROUNDWATER ELEVATION HYDROGRAPHS

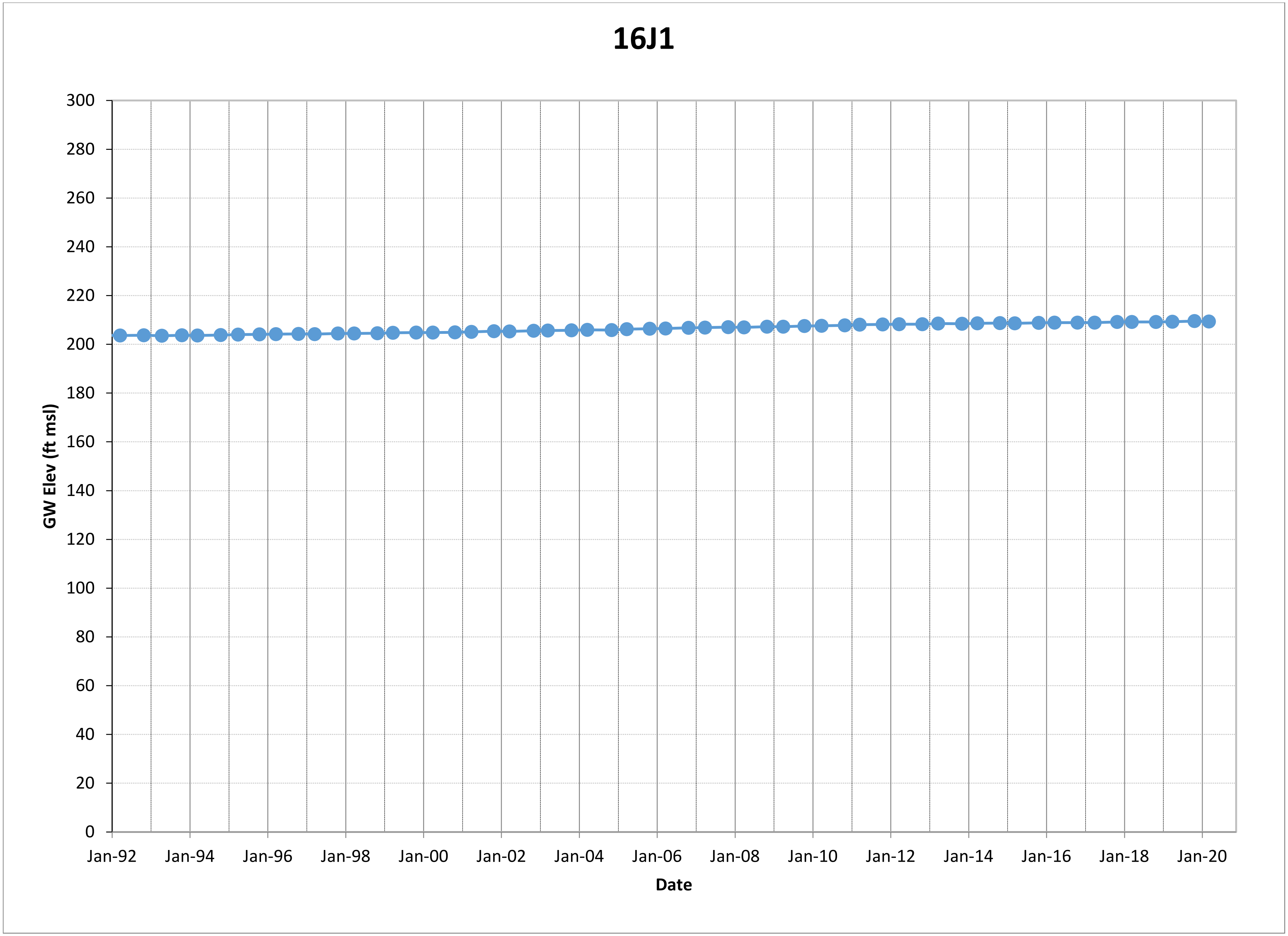

22E2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

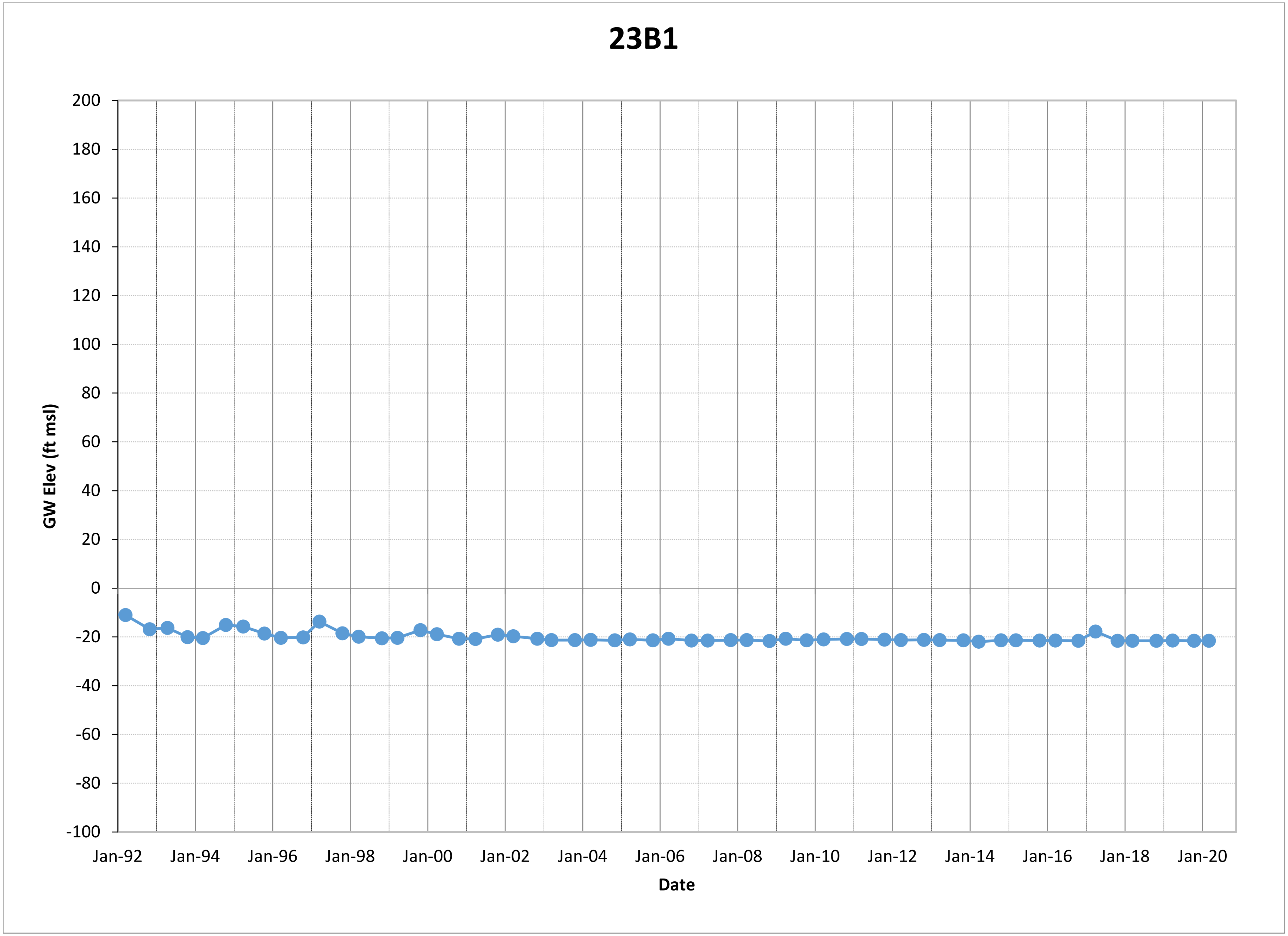

11B1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


11G1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

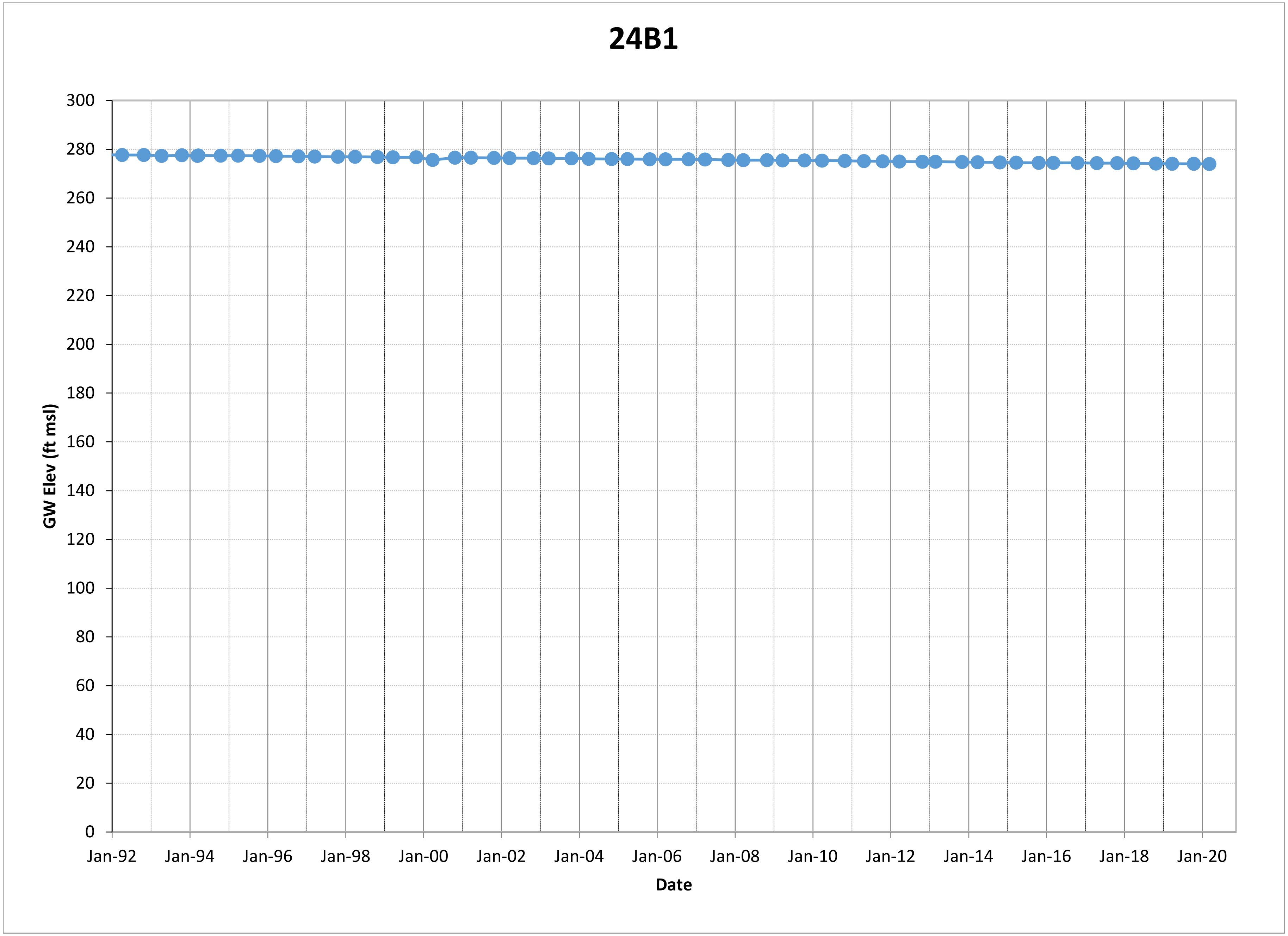

11G4
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


11H3
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

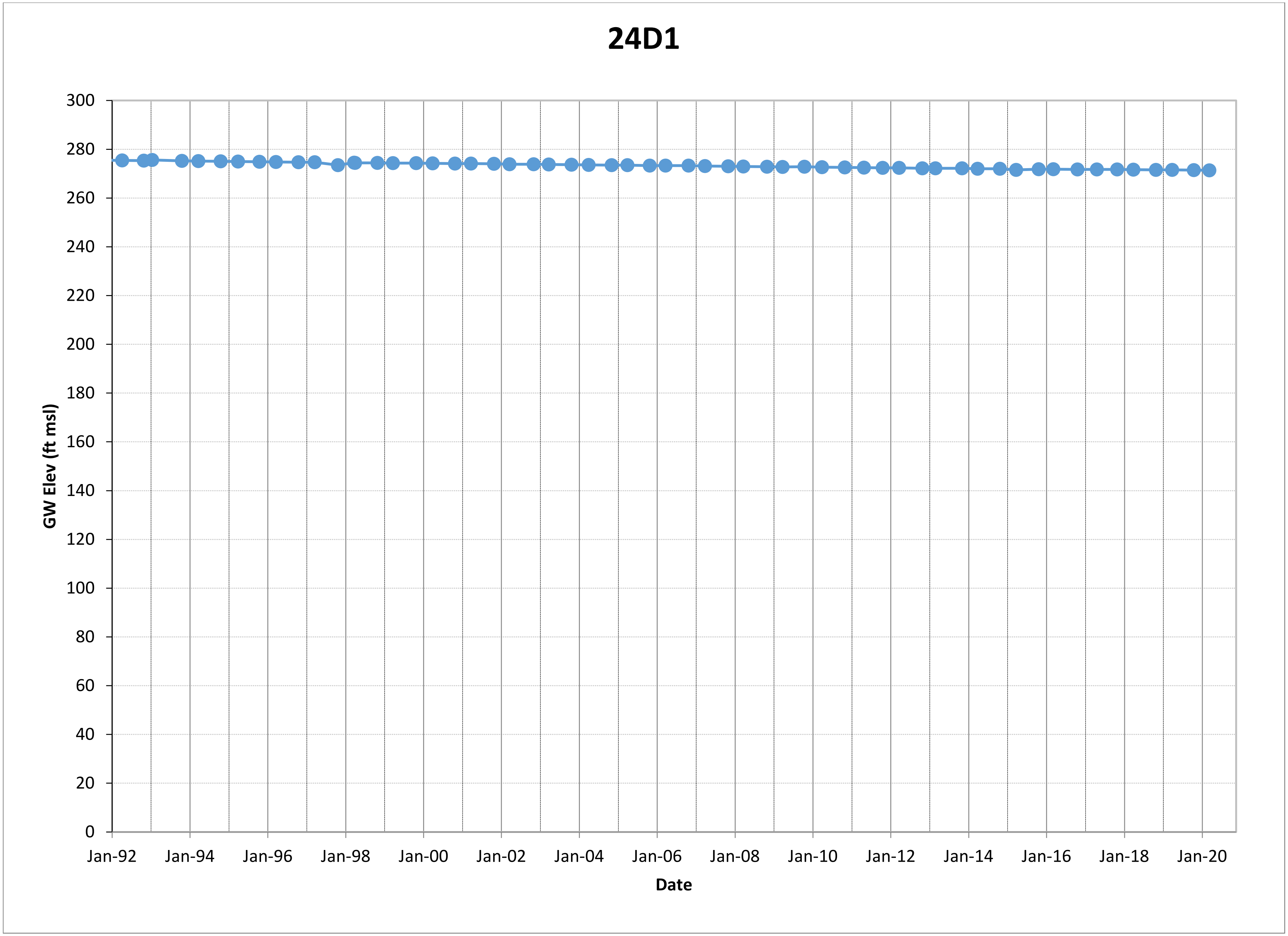

16J1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

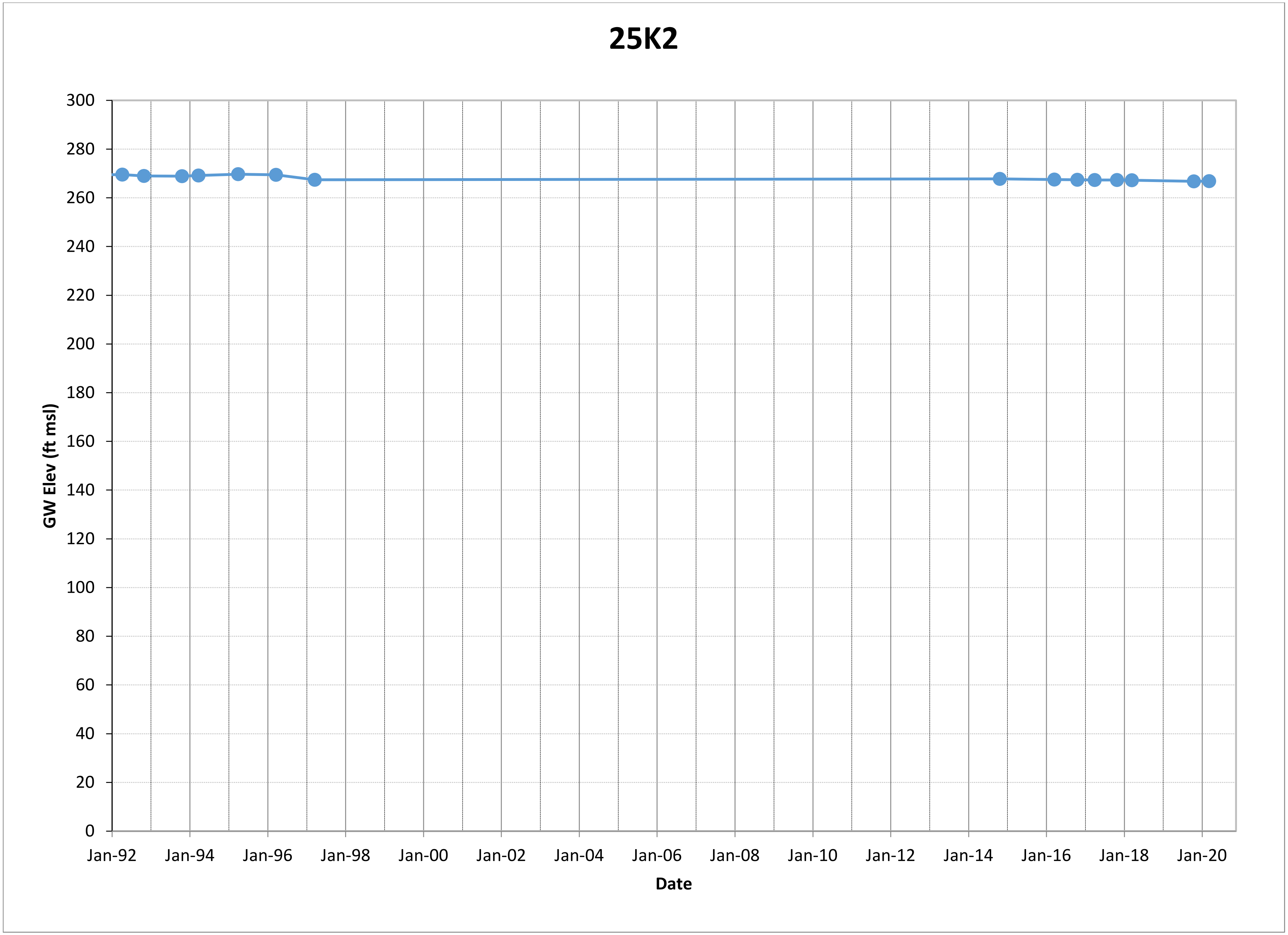


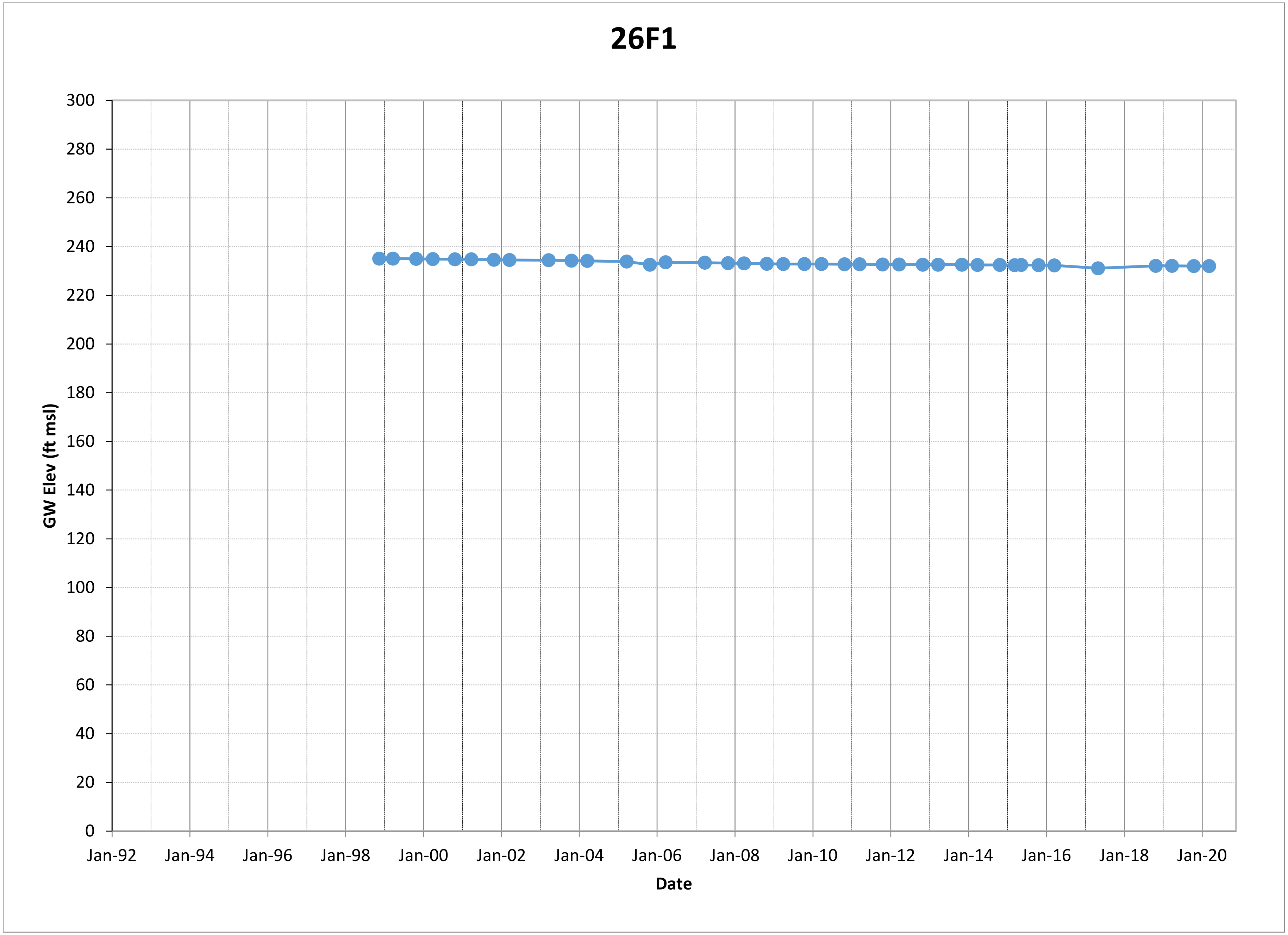
23B1
GW Elev (ft msl)
200
180
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



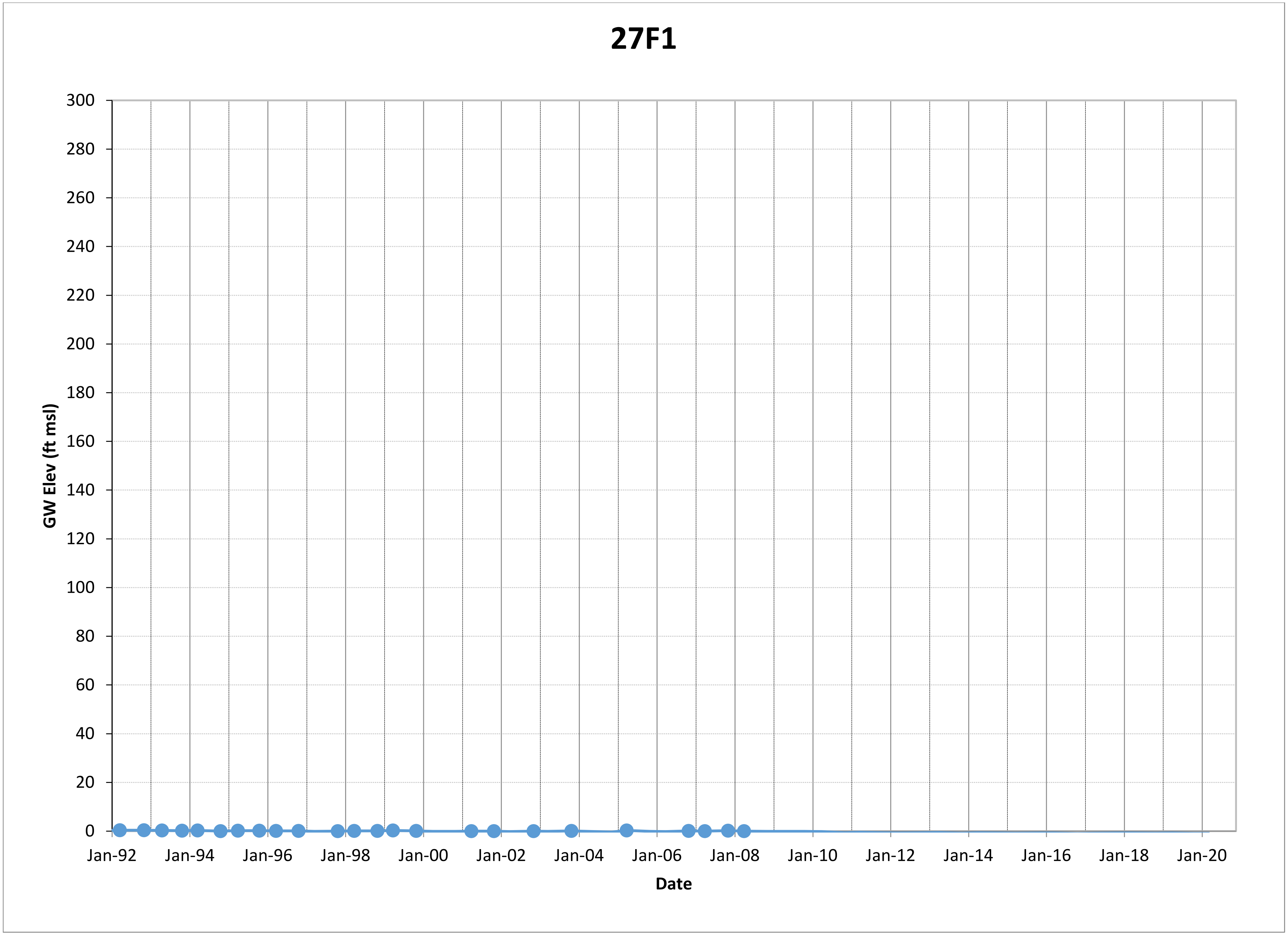
24B1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

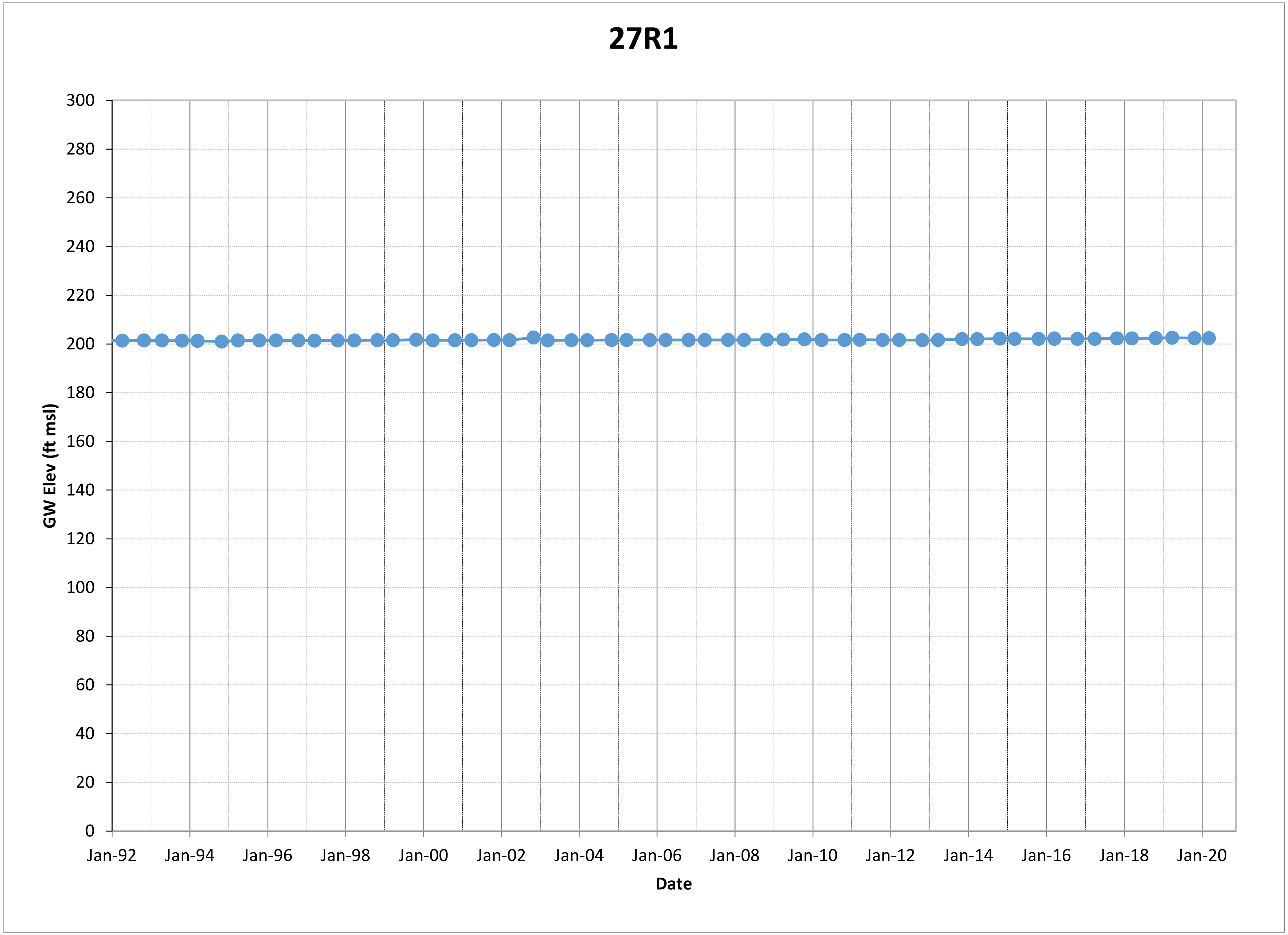

24D1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

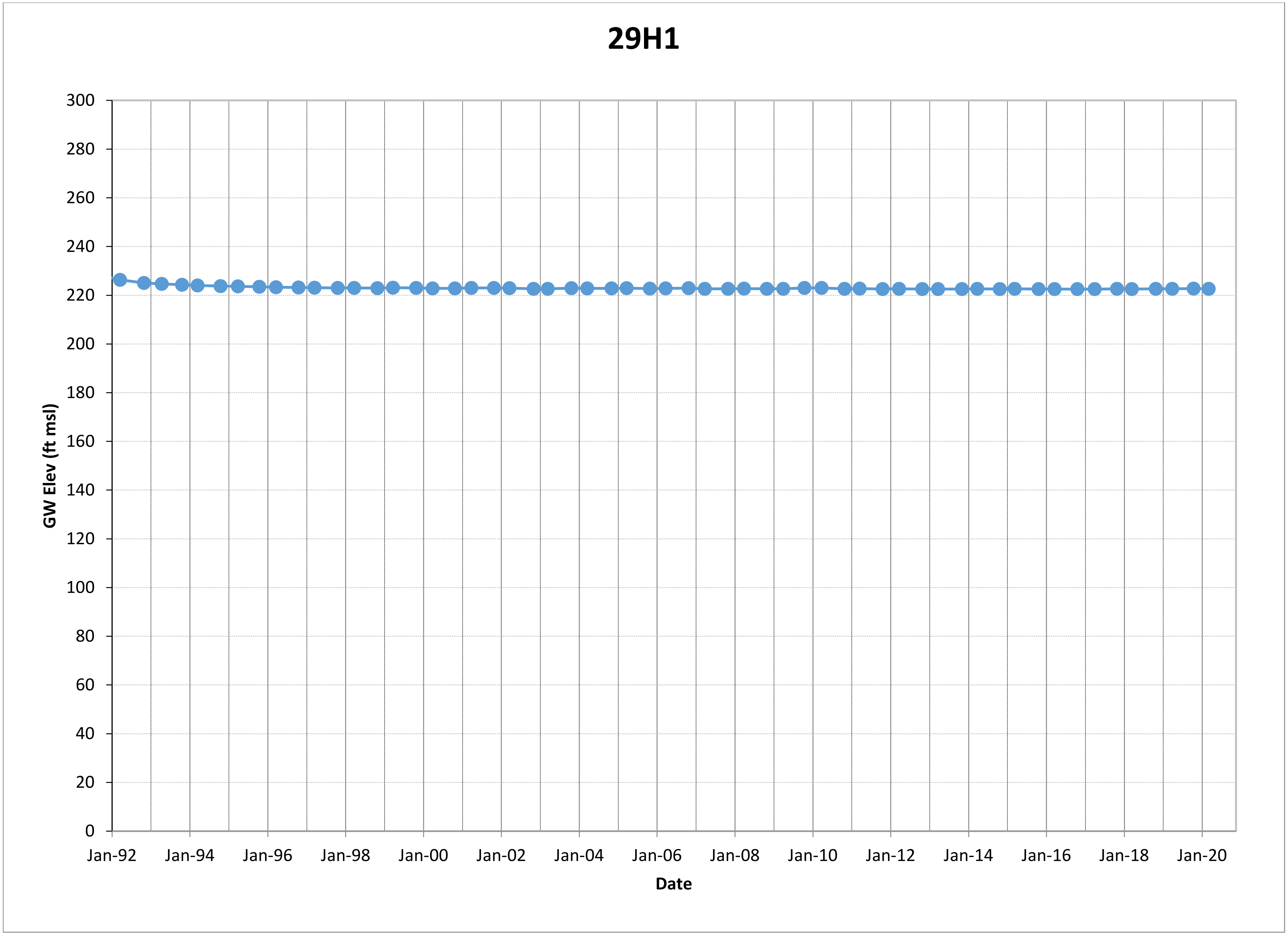

25K2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

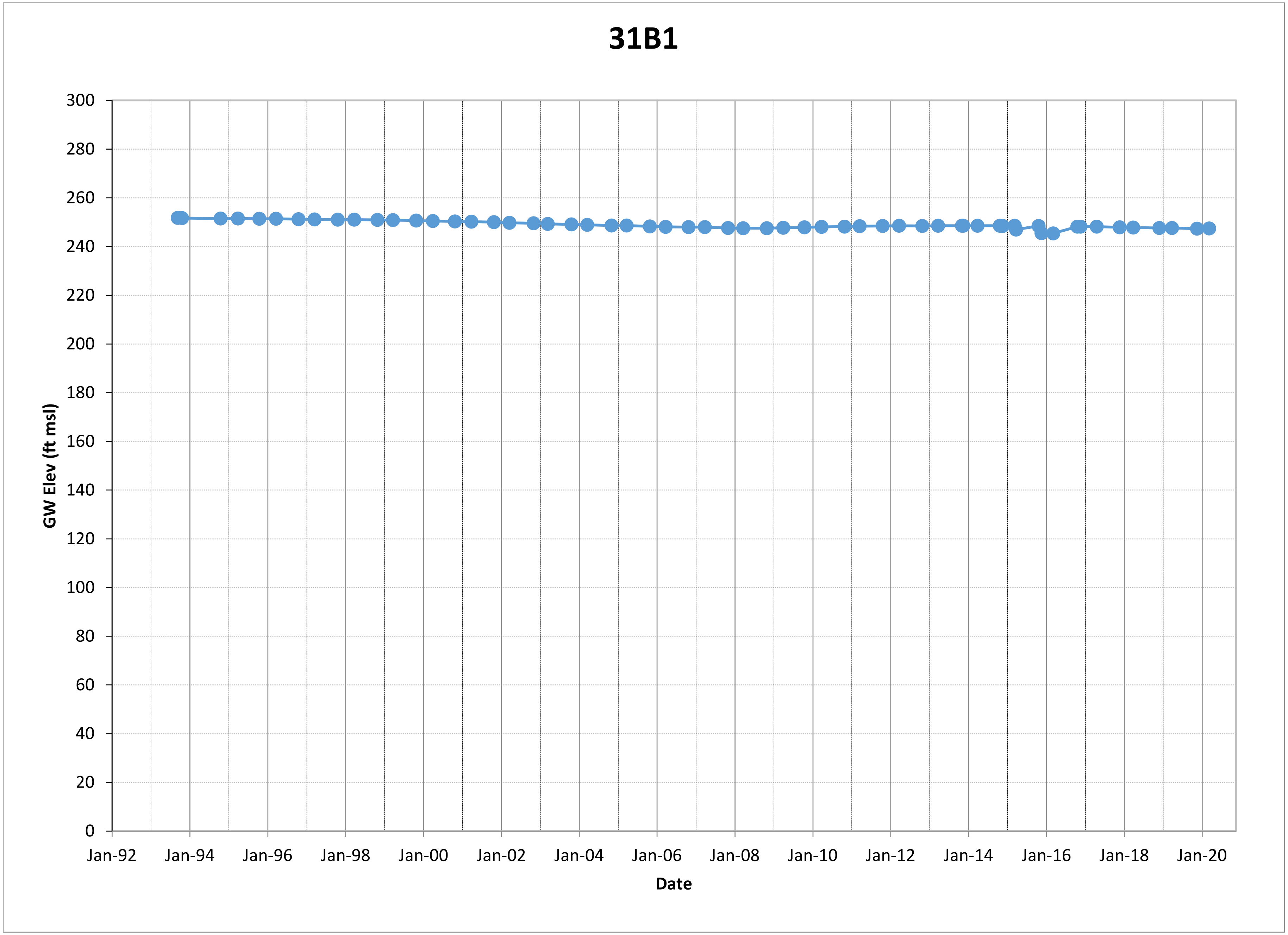


26F1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

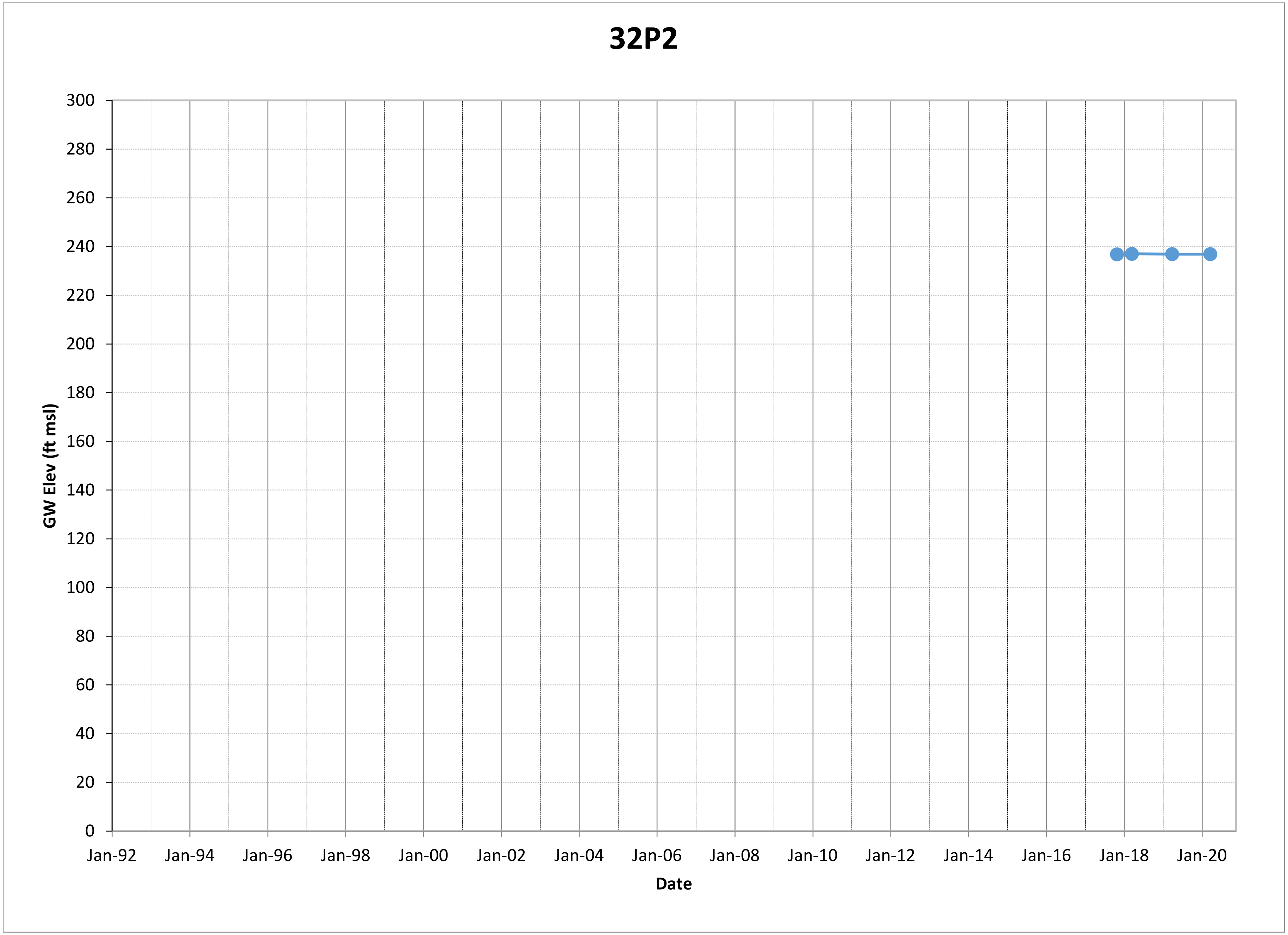

27F1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

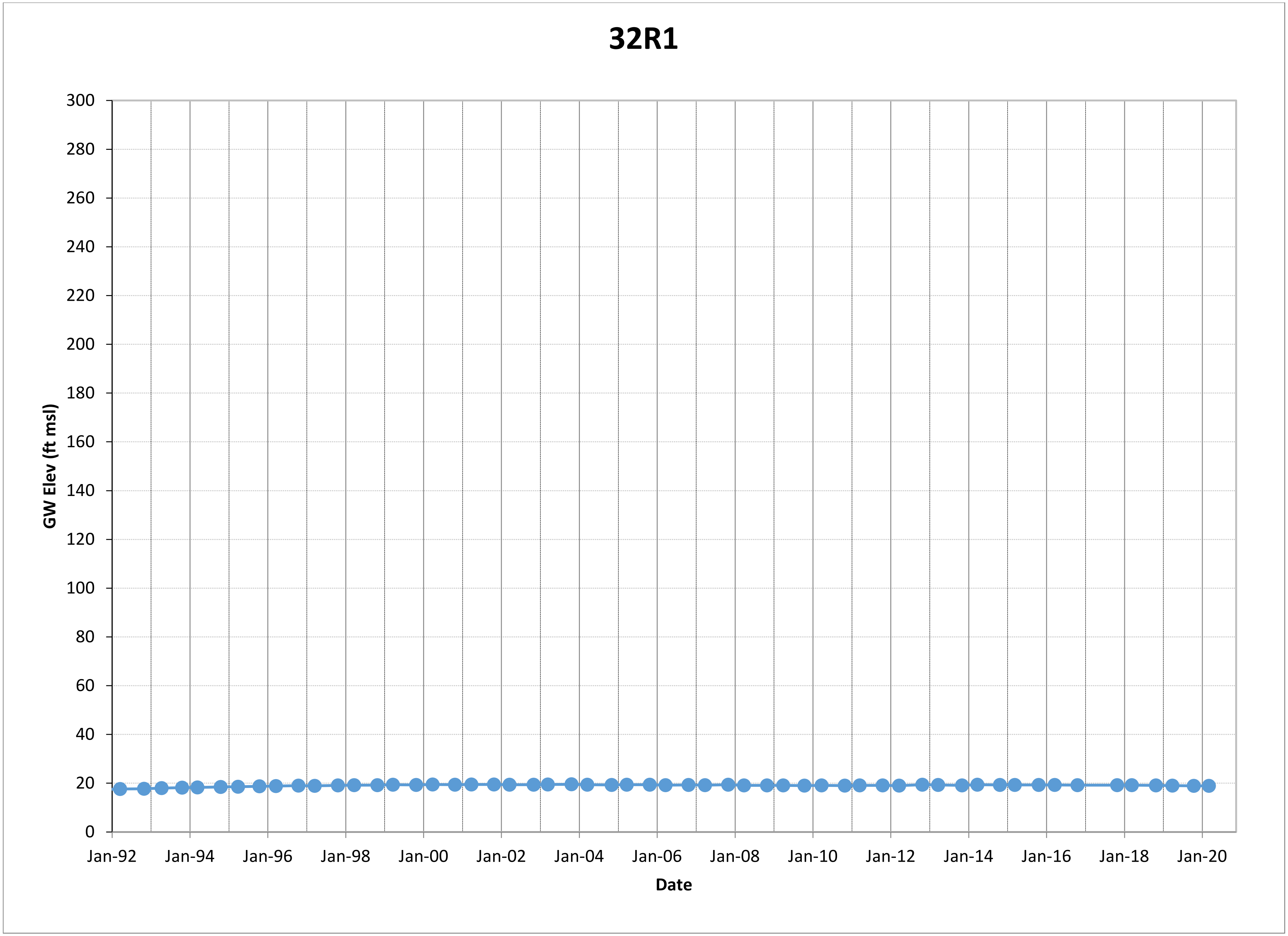

27R1
GW Elev (ft msl)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


29H1
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

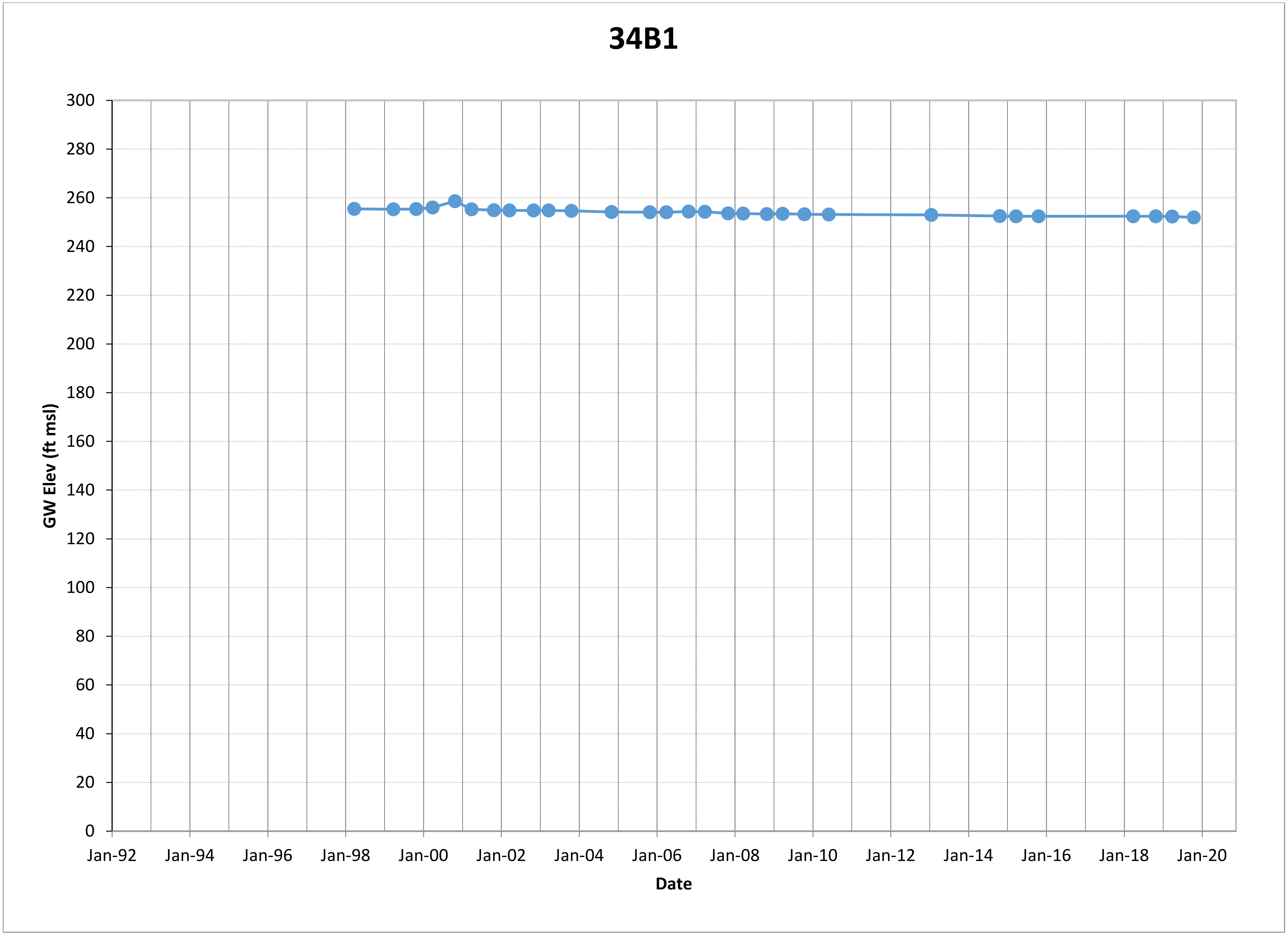


31B1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

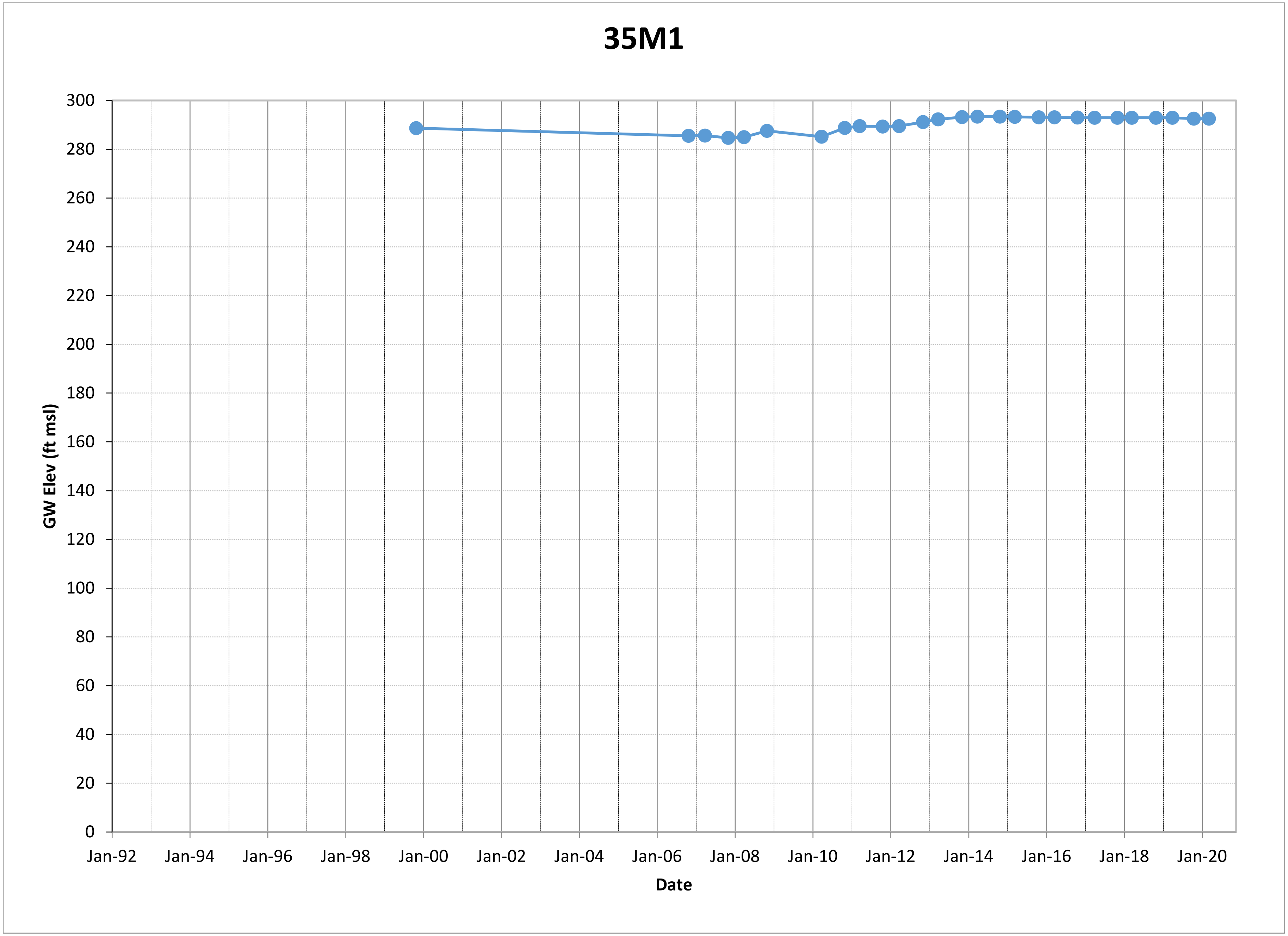

32P2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

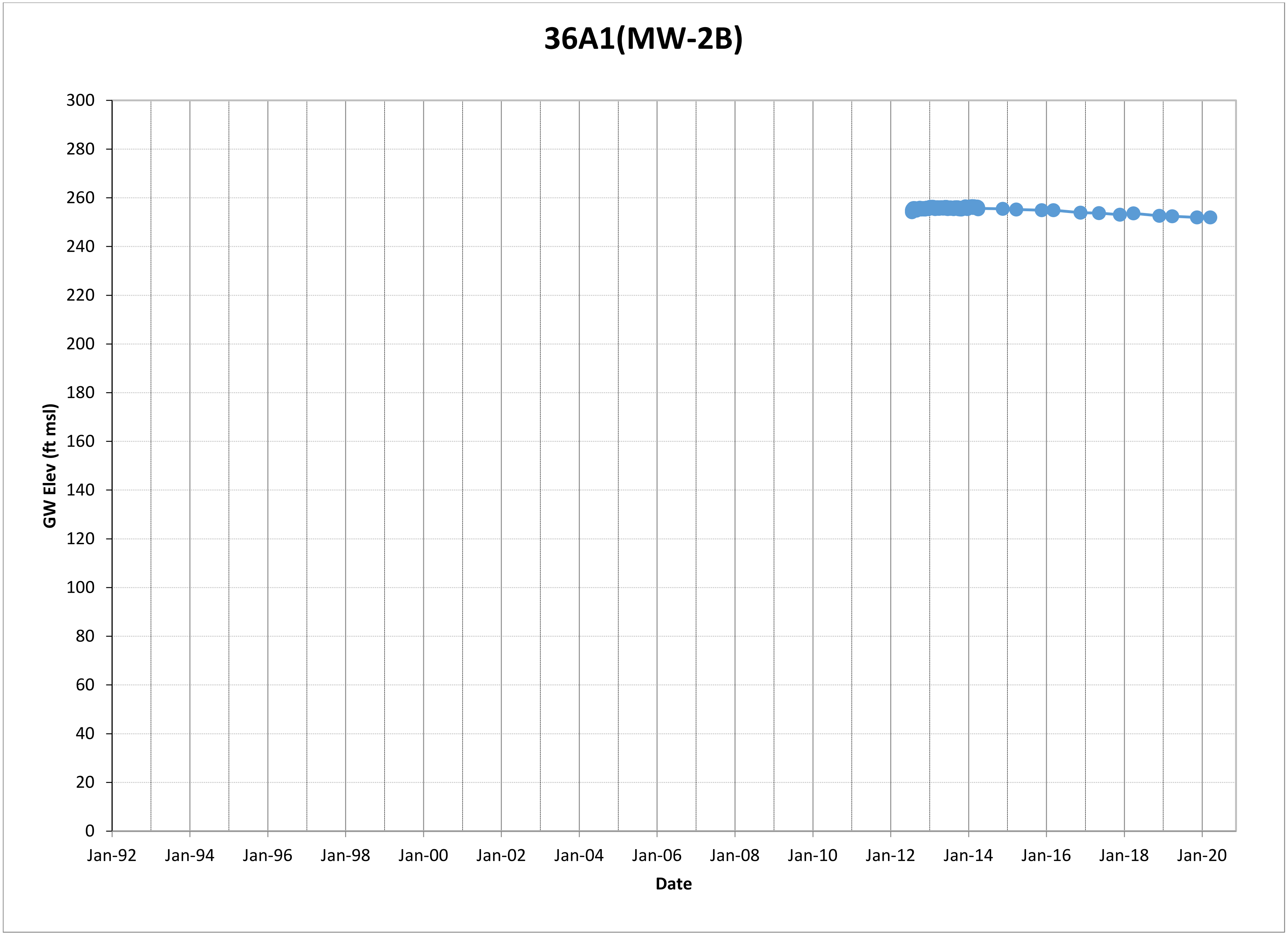


32R1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

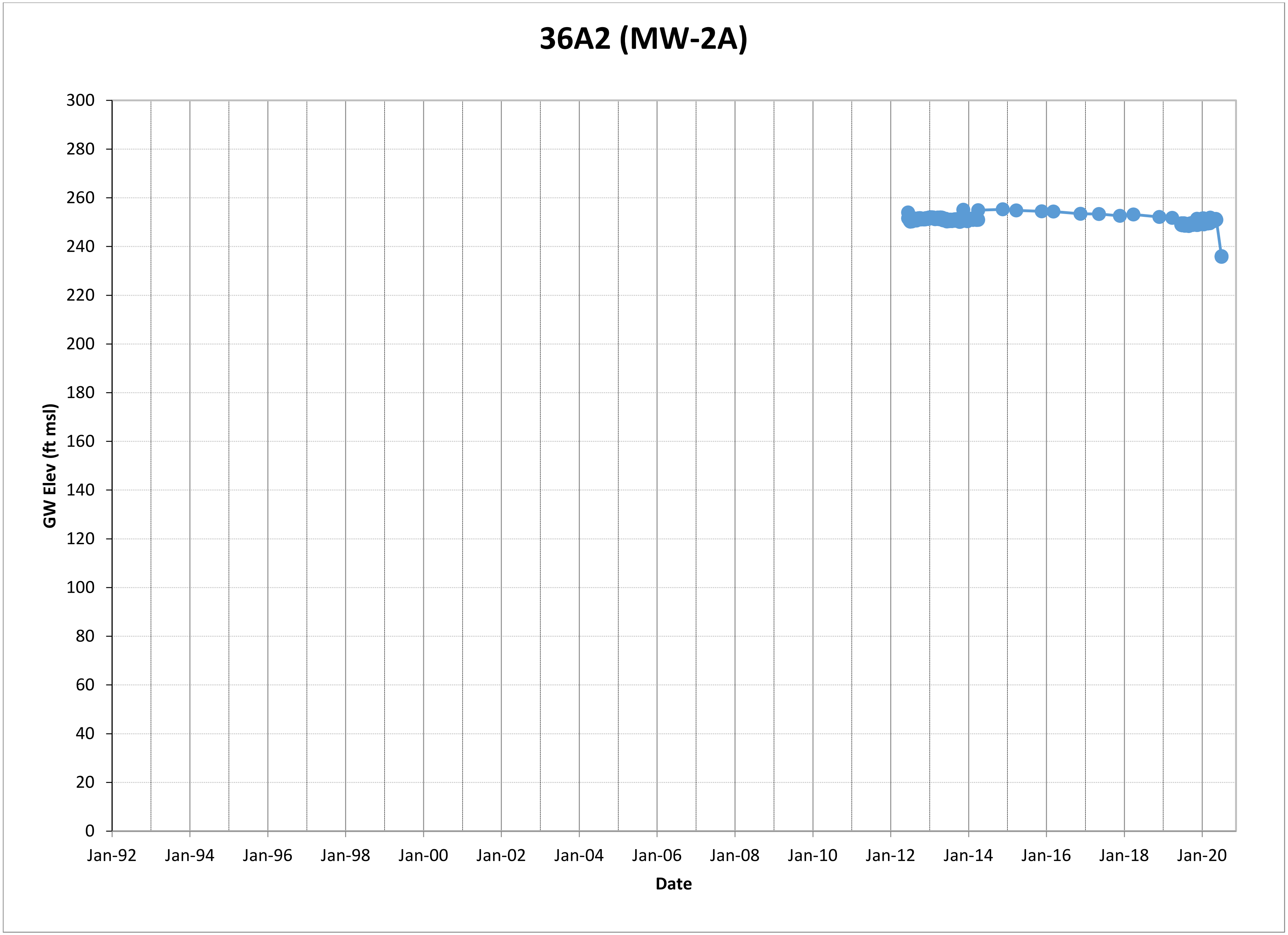


34B1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


35M1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



36A1(MW-2B)
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


36A2 (MW-2A)
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
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Jan-14
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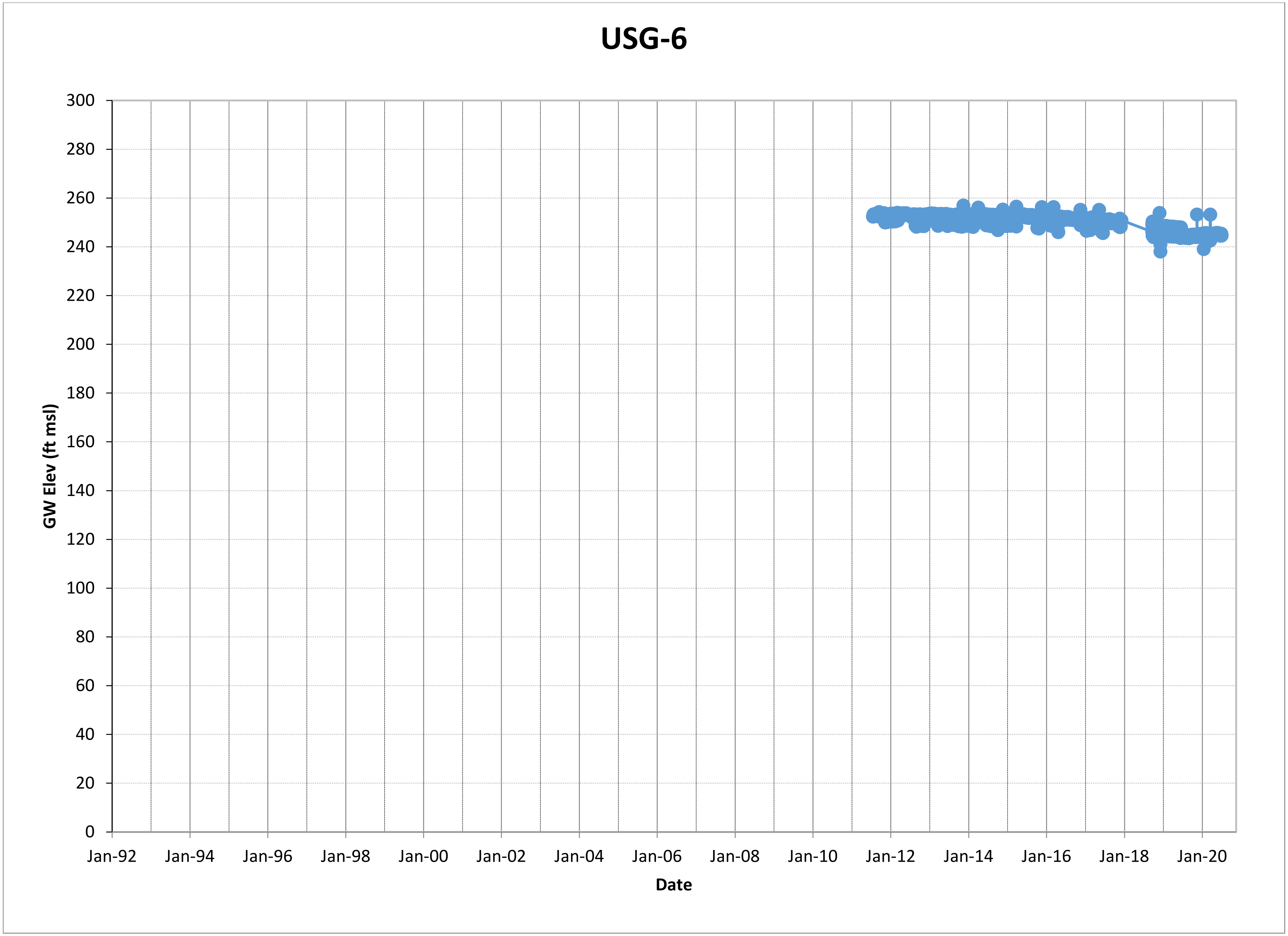
Jan-18
Jan-20
Date



USG-6
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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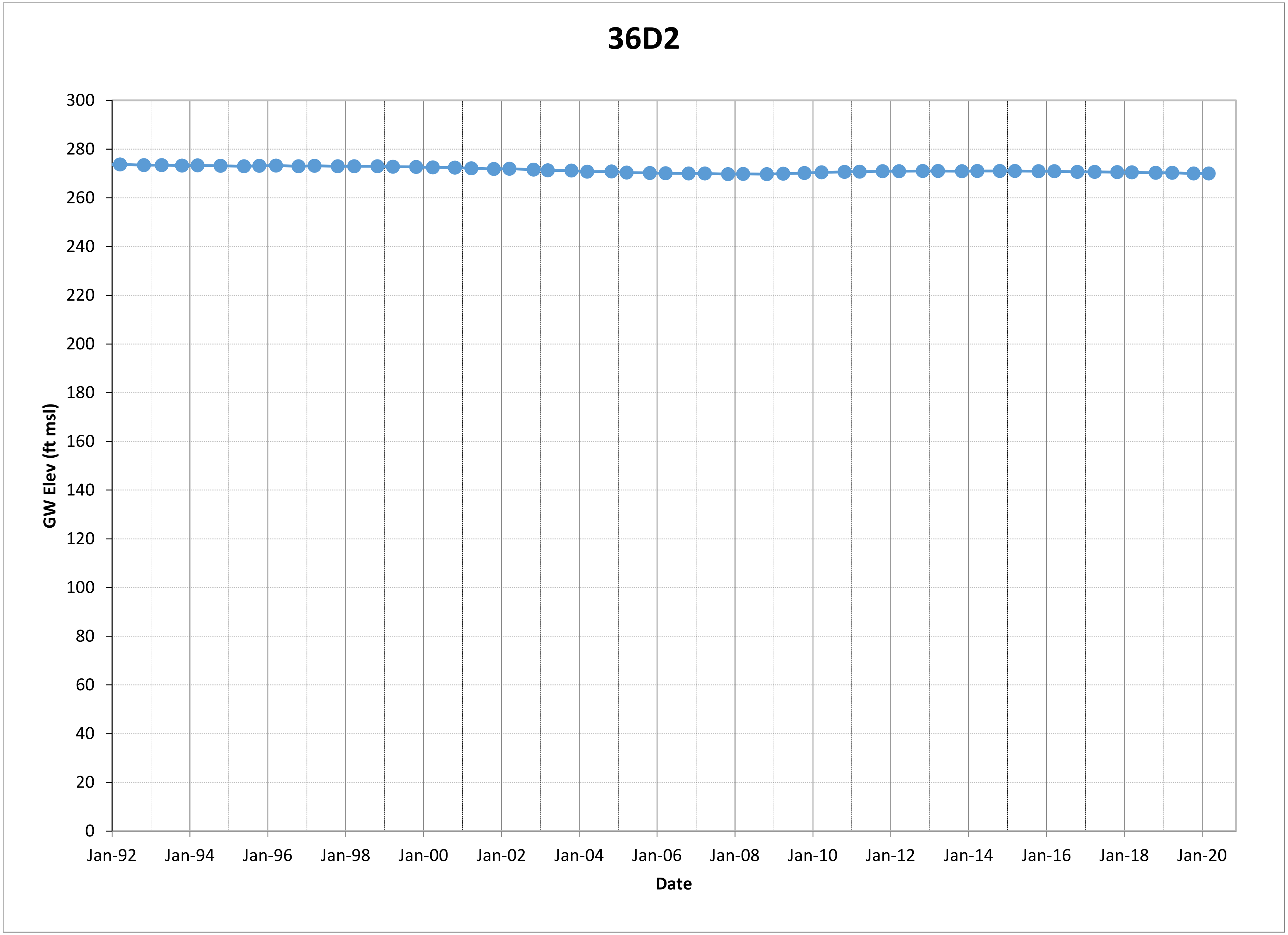
Jan-14
Jan-16
Jan-18
Jan-20
Date


36D2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
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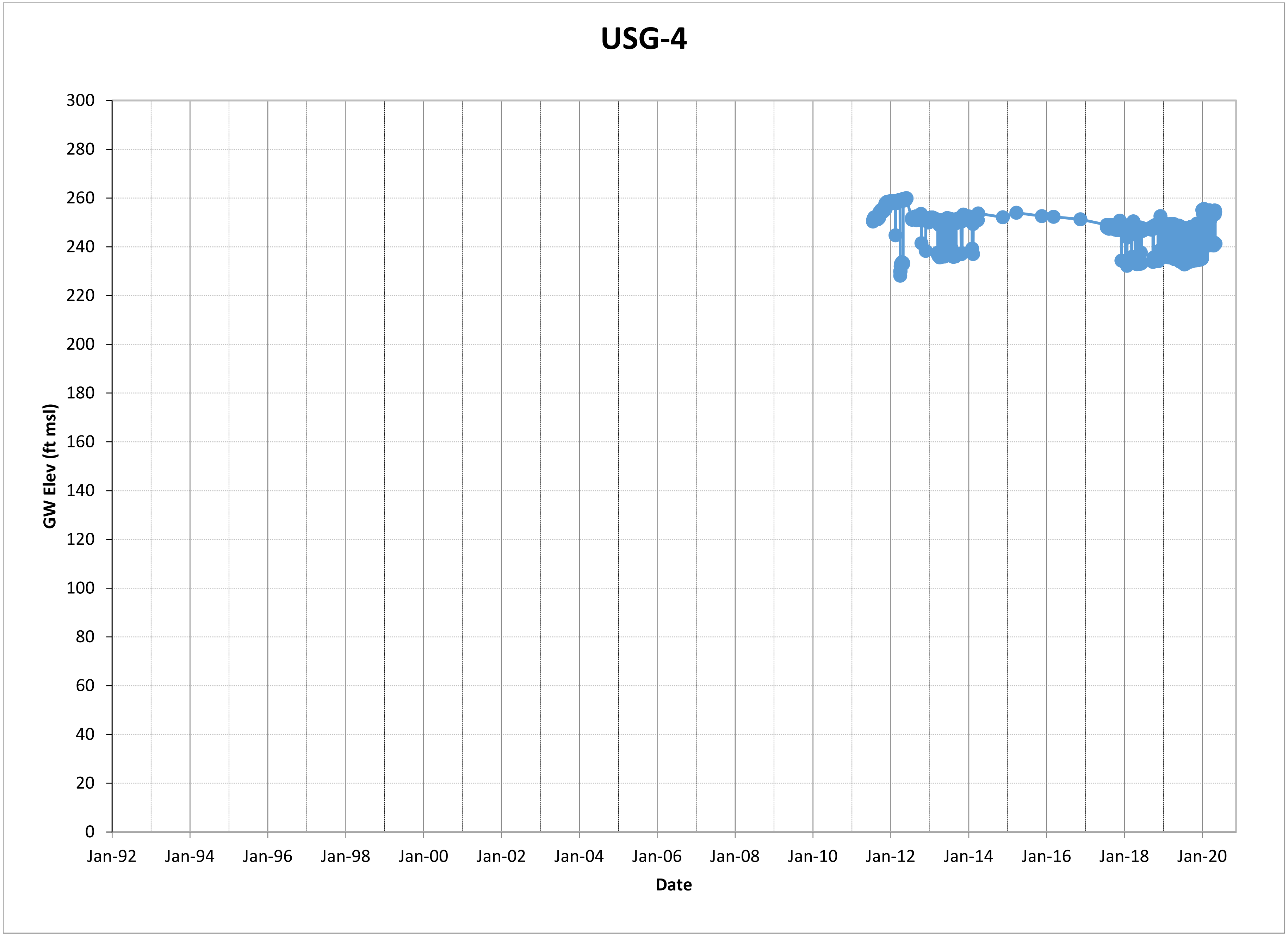
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



USG-4
GW Elev (ft msl)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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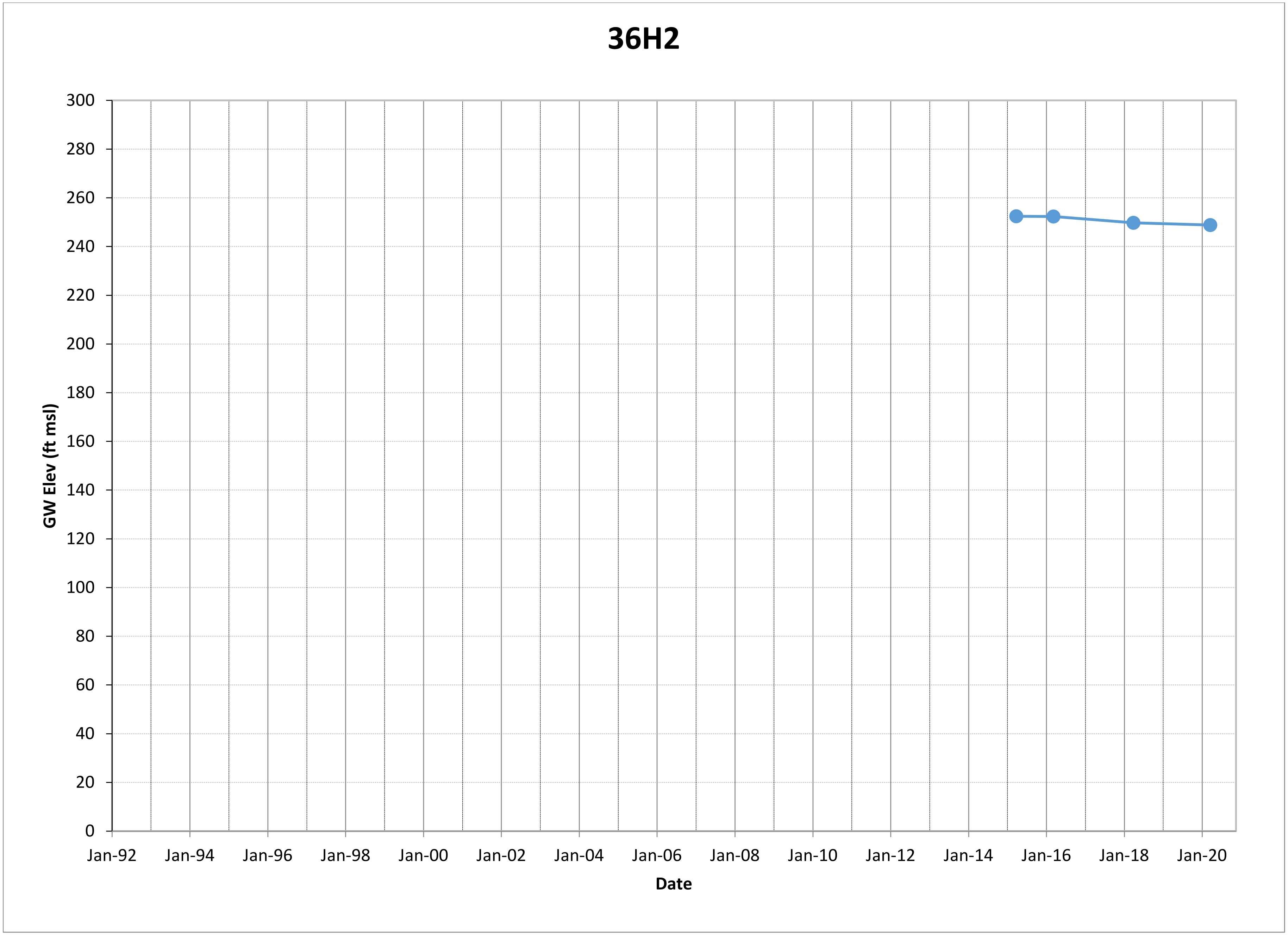
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


36H2
GW Elev (ft msl)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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Jan-14
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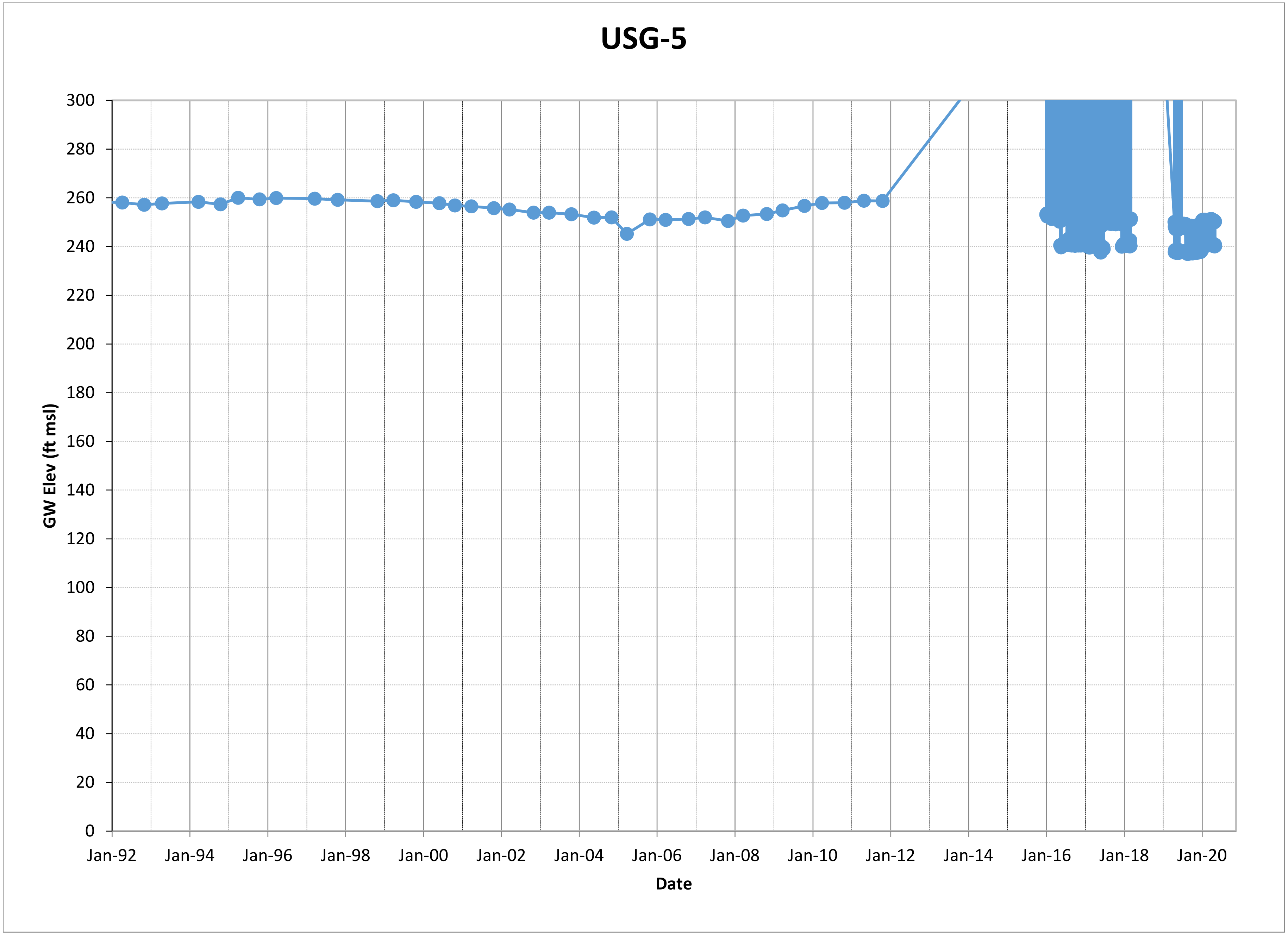
Jan-18
Jan-20
Date


USG-5
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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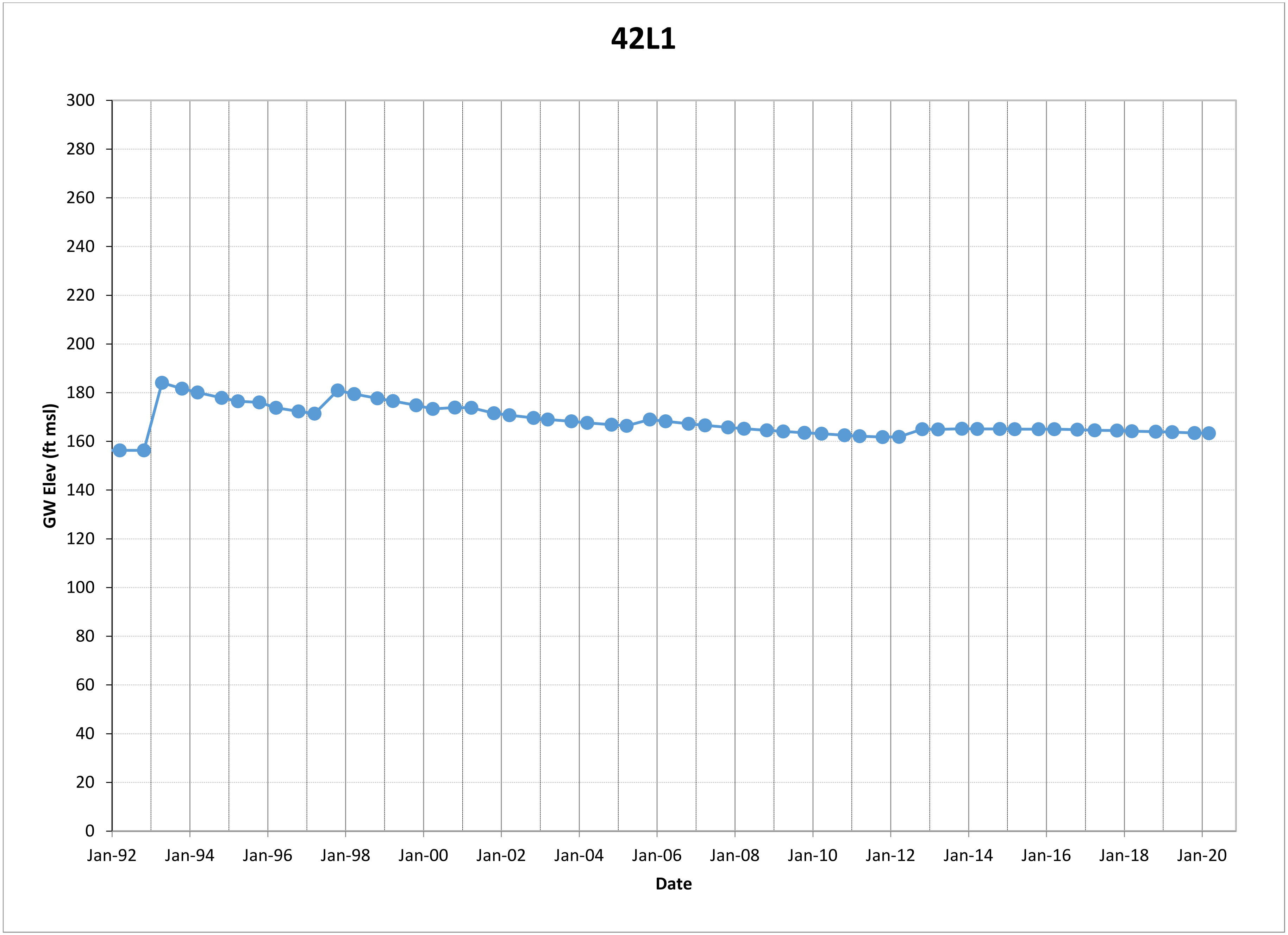
Jan-18
Jan-20
Date



42L1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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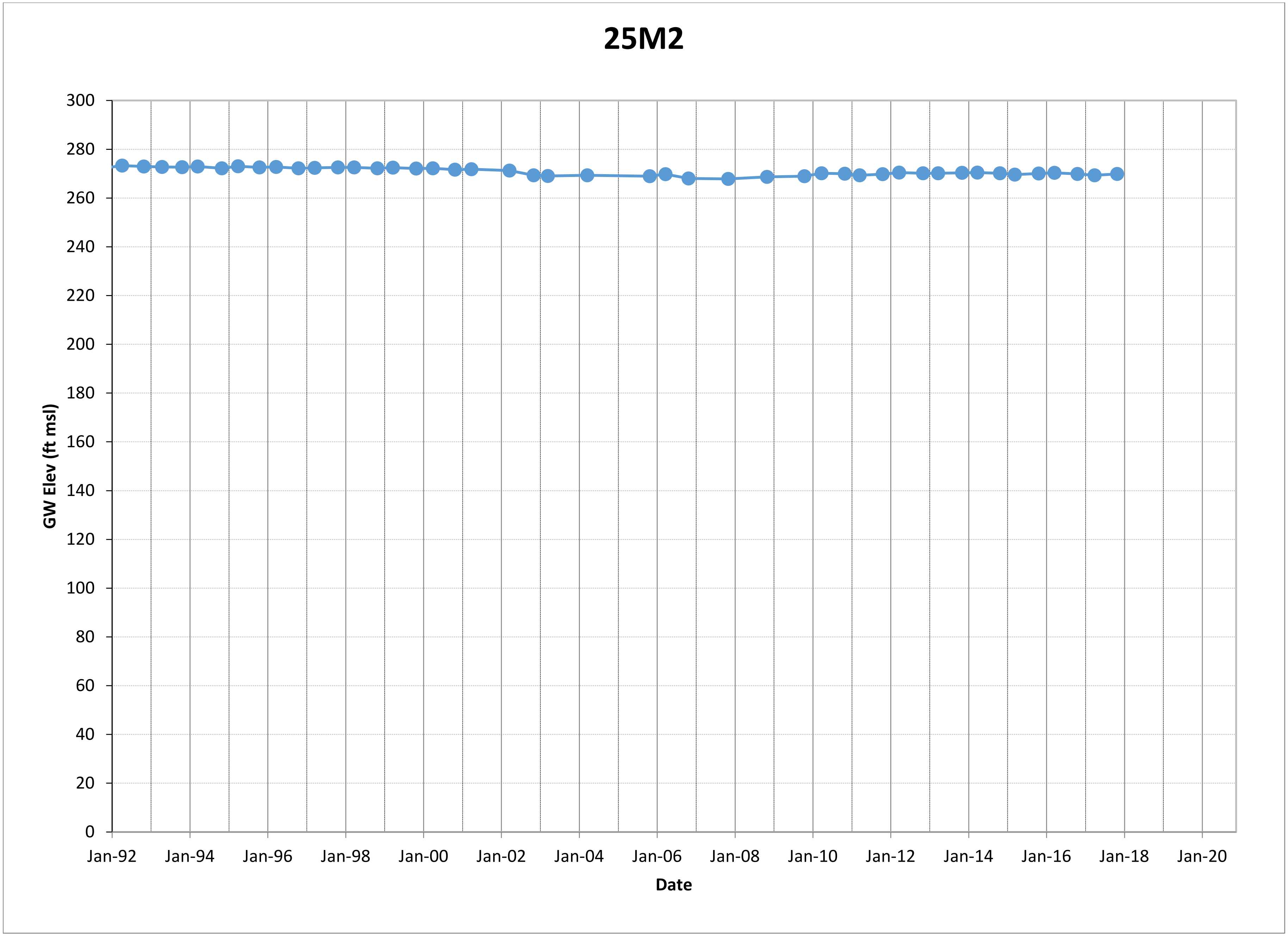
Date


25M2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
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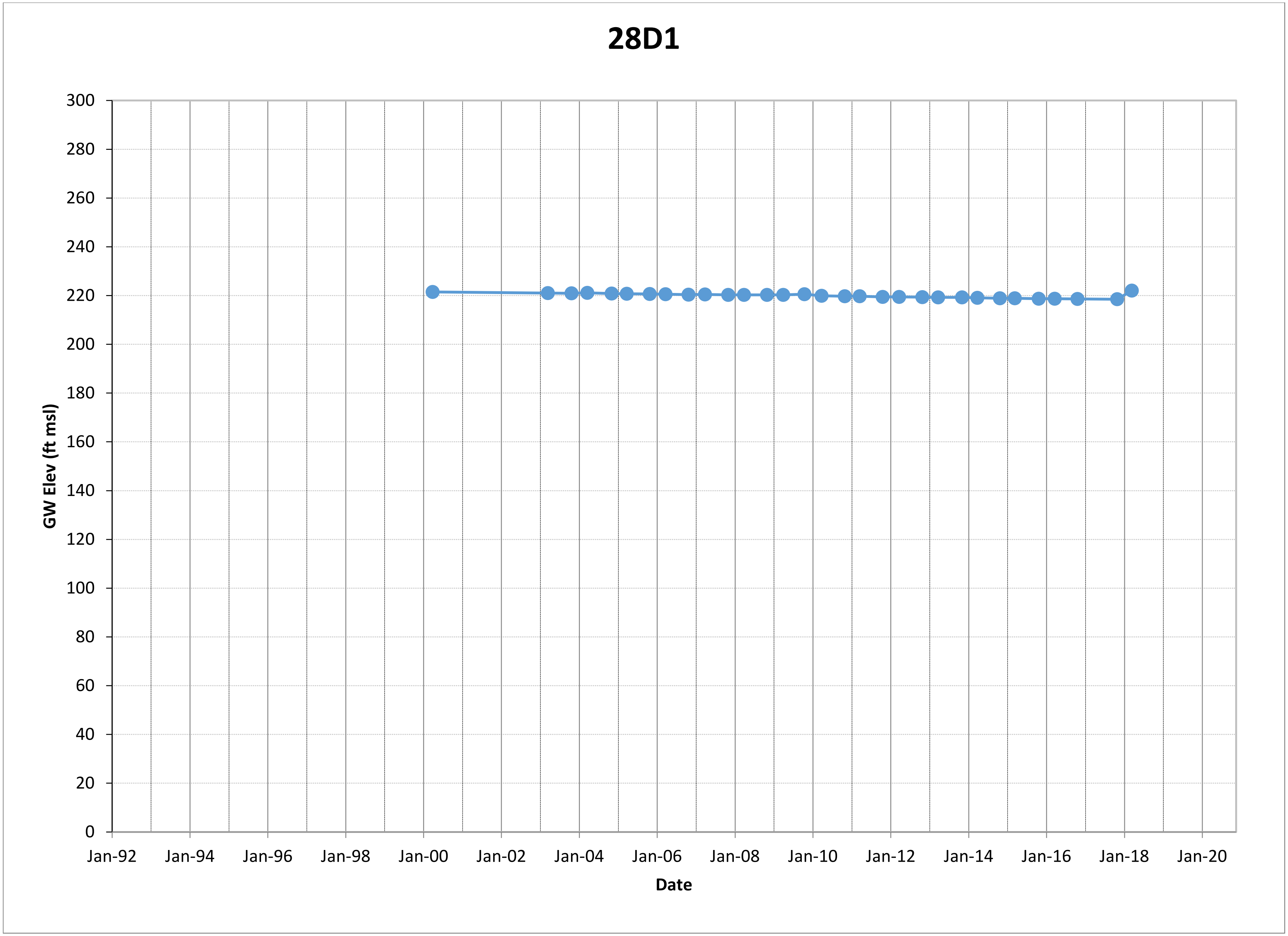
28D1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
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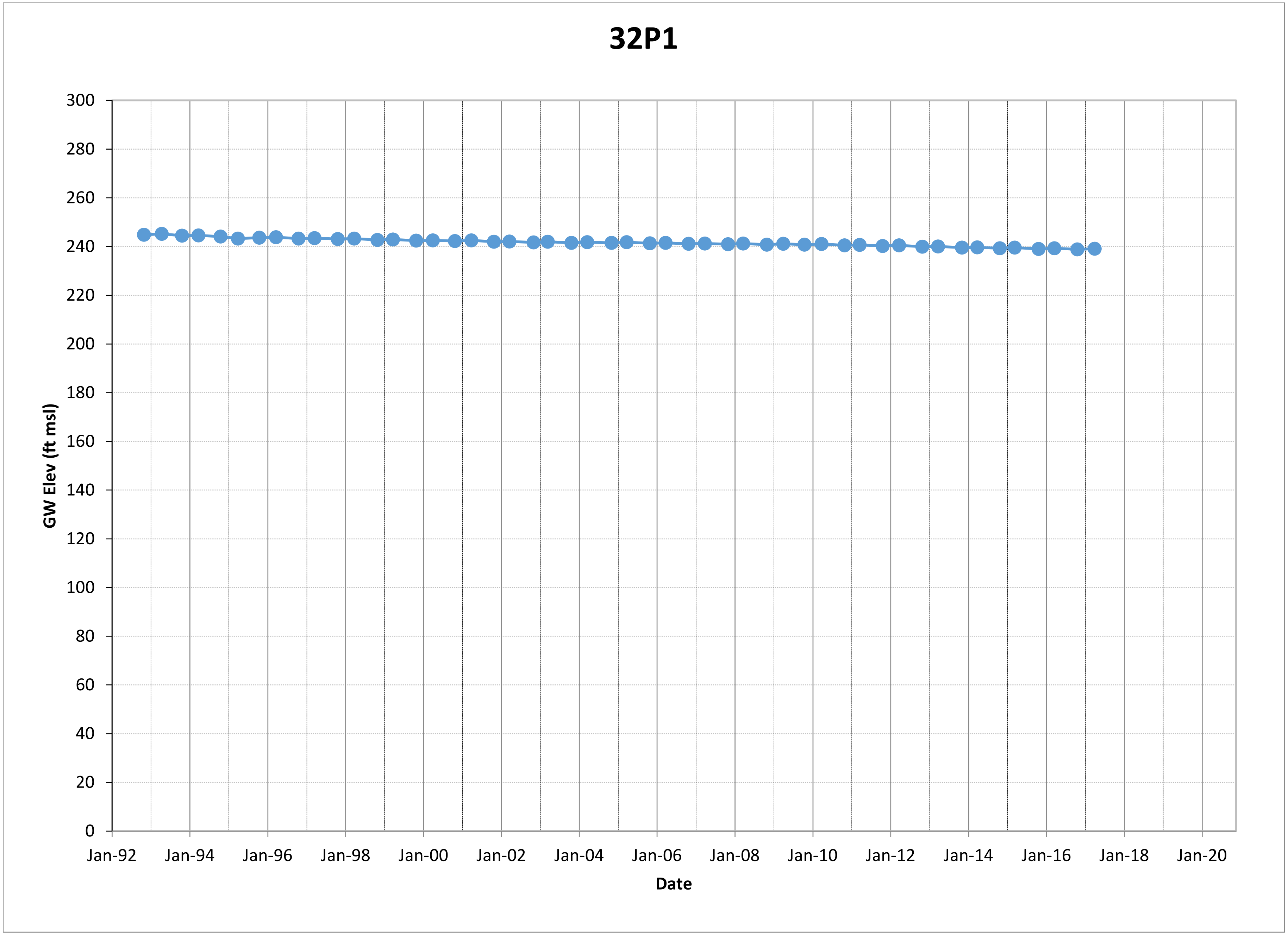
32P1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
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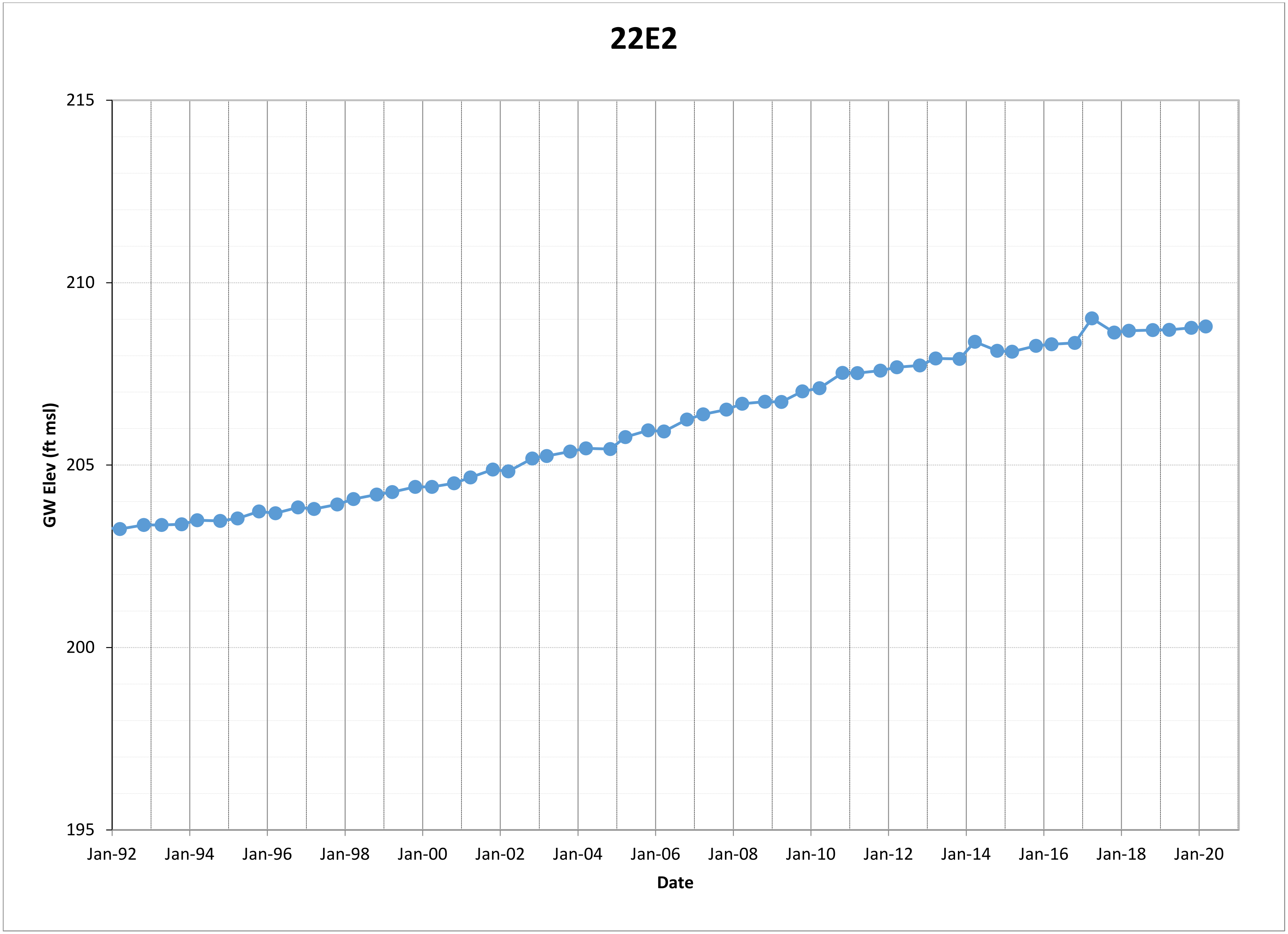
Jan-18
Jan-20
Date


22E2
GW Elev (ft msl)
215
210
205
200
195
Jan-92
Jan-94
Jan-96
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Jan-00
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Jan-06
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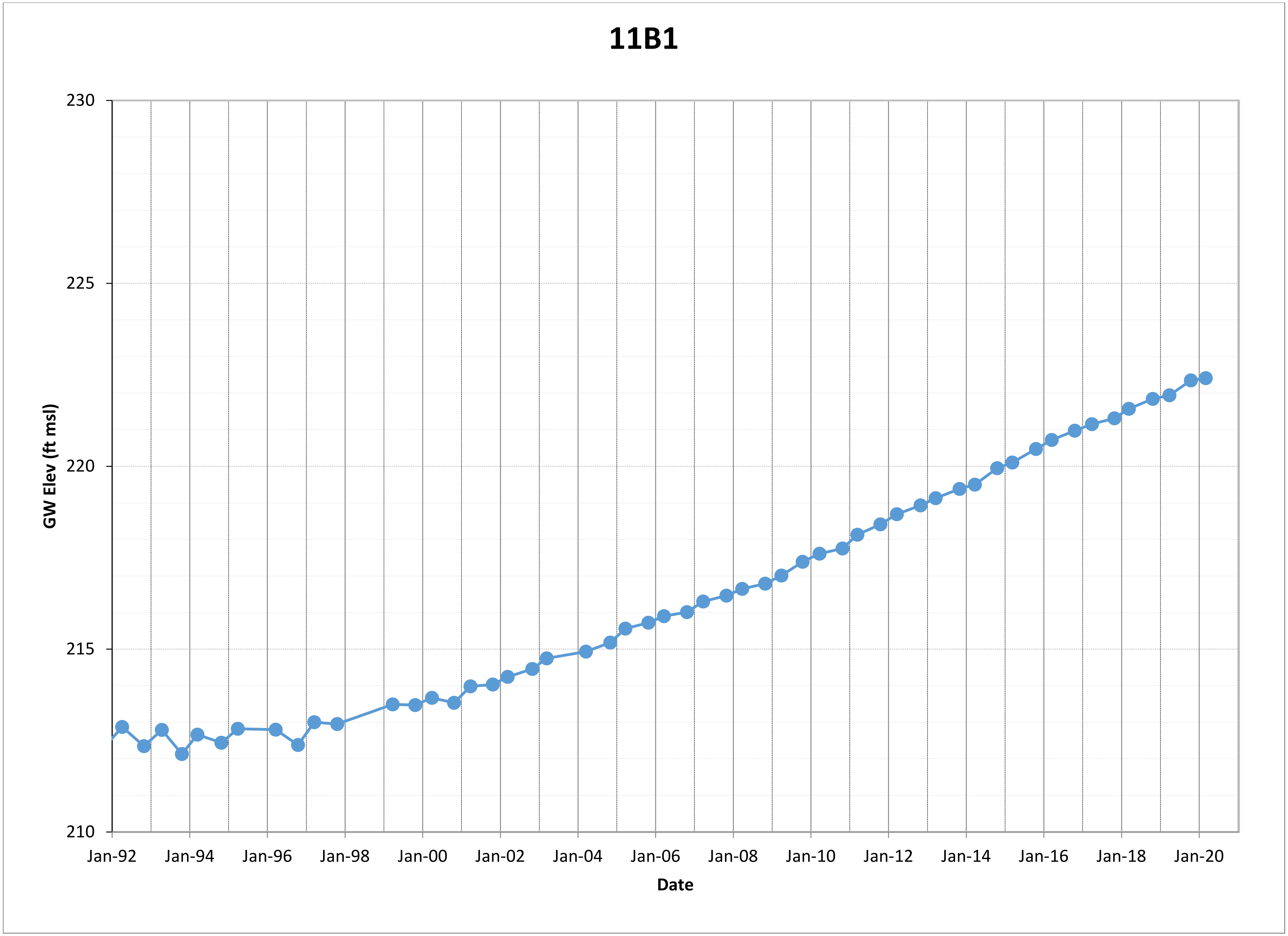
Jan-18
Jan-20
Date


11B1
GW Elev (ft msl)
230
225
220
215
210
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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Jan-06
Jan-08
Jan-10
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Jan-14
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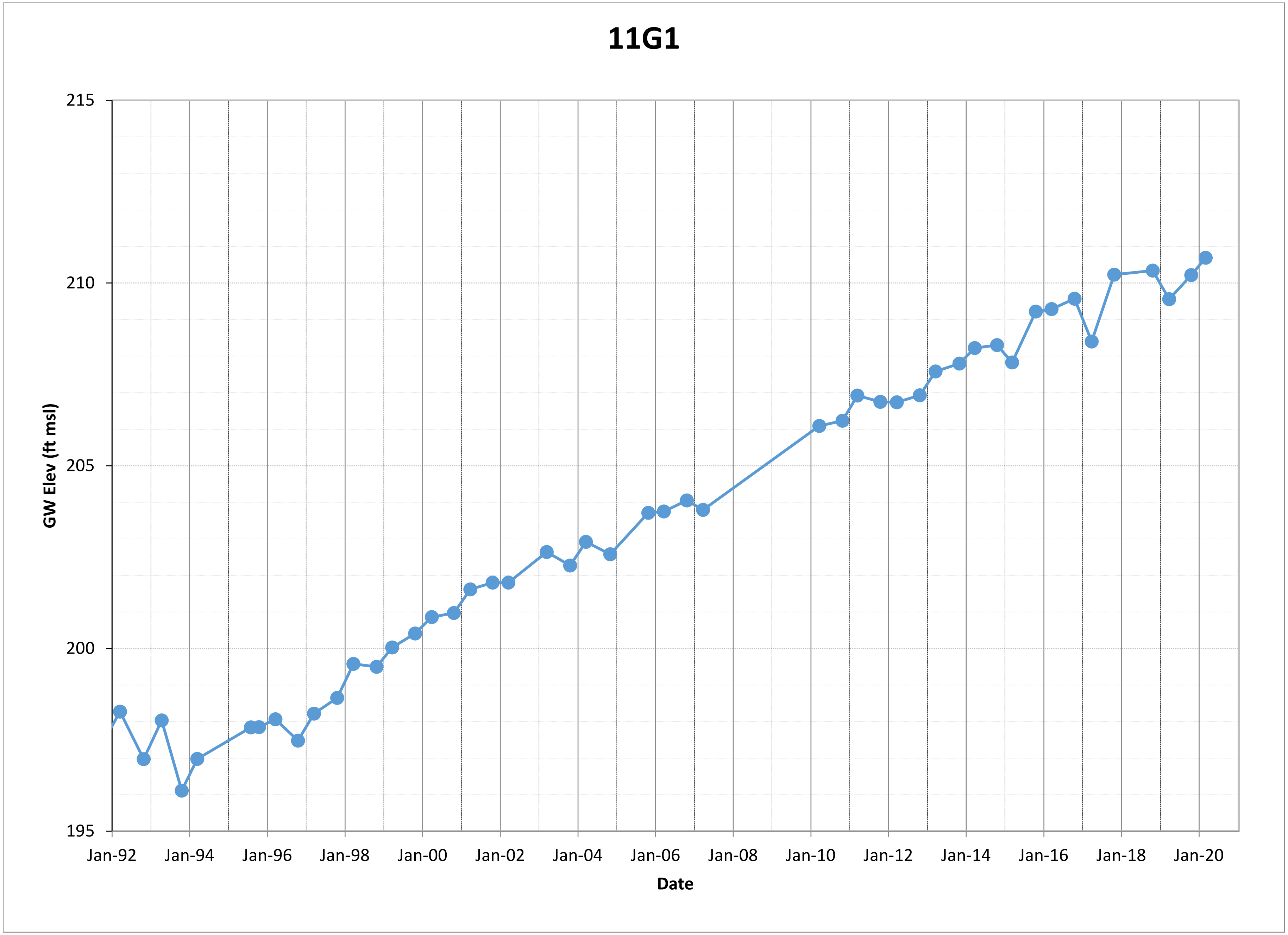
Jan-18
Jan-20
Date


11G1
215
210
205
200
195
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
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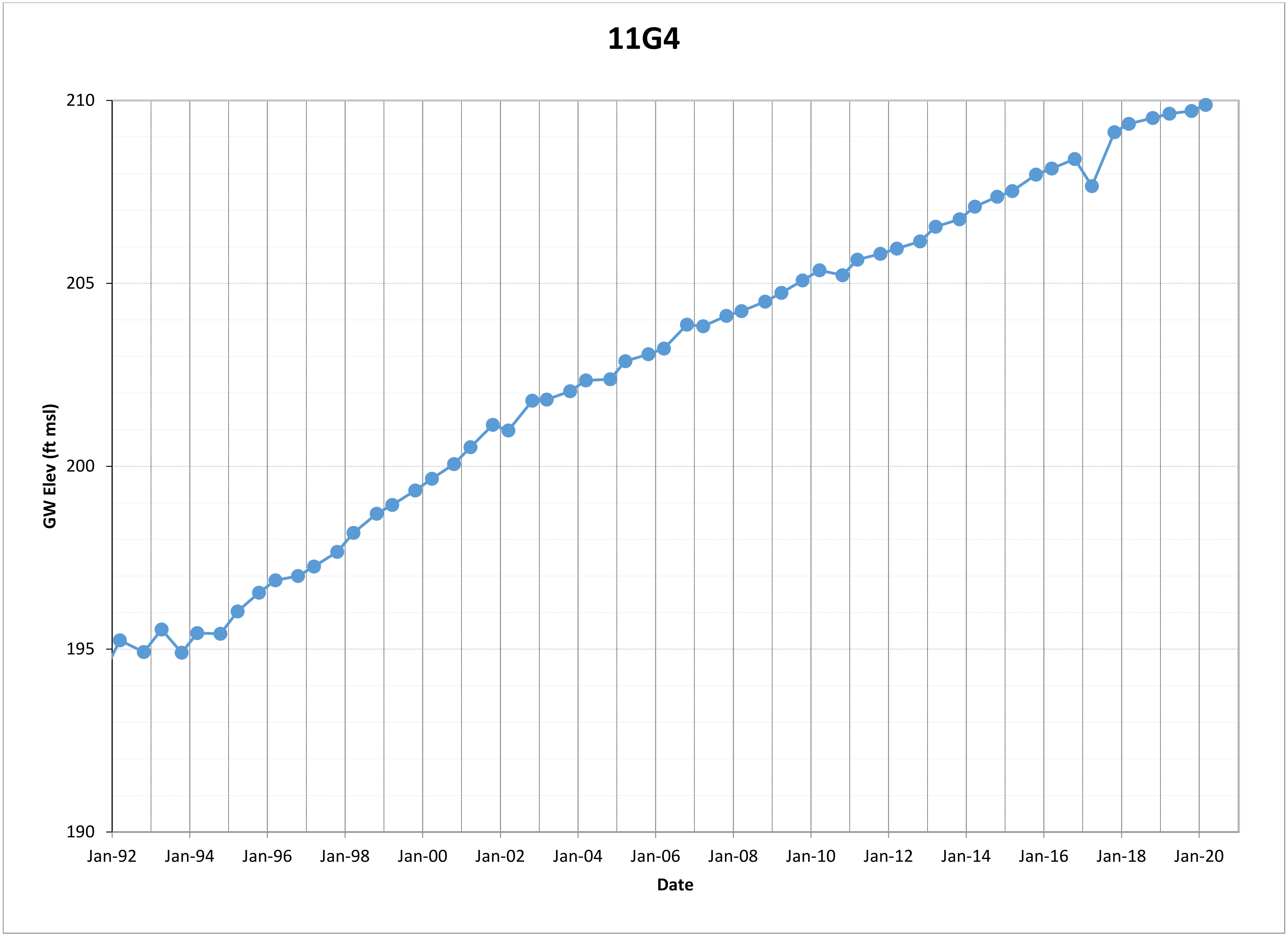
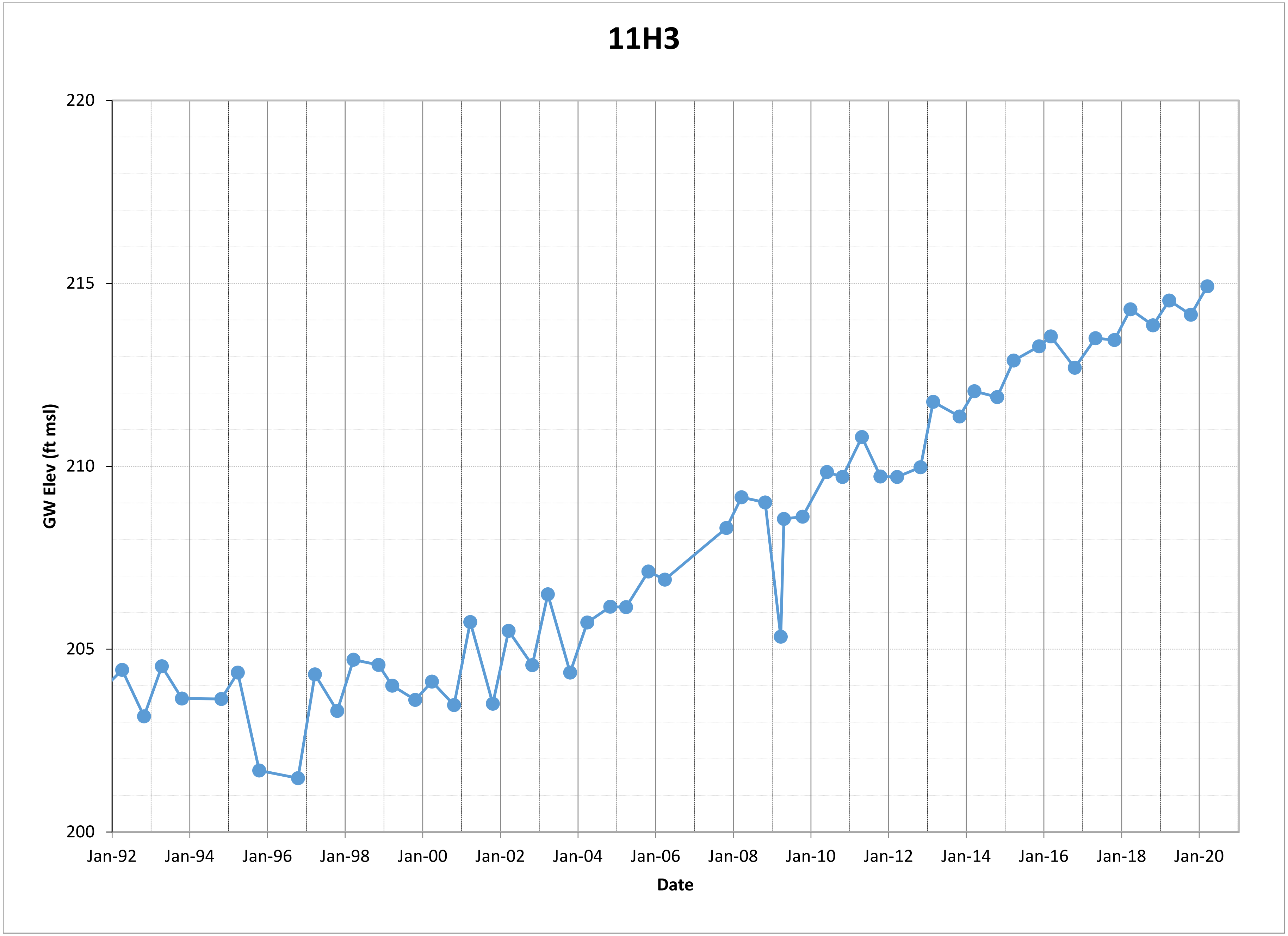
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



11G4
210
205
200
195
190
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


11H3
GW Elev (ft msl)
220
215
210
205
200
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
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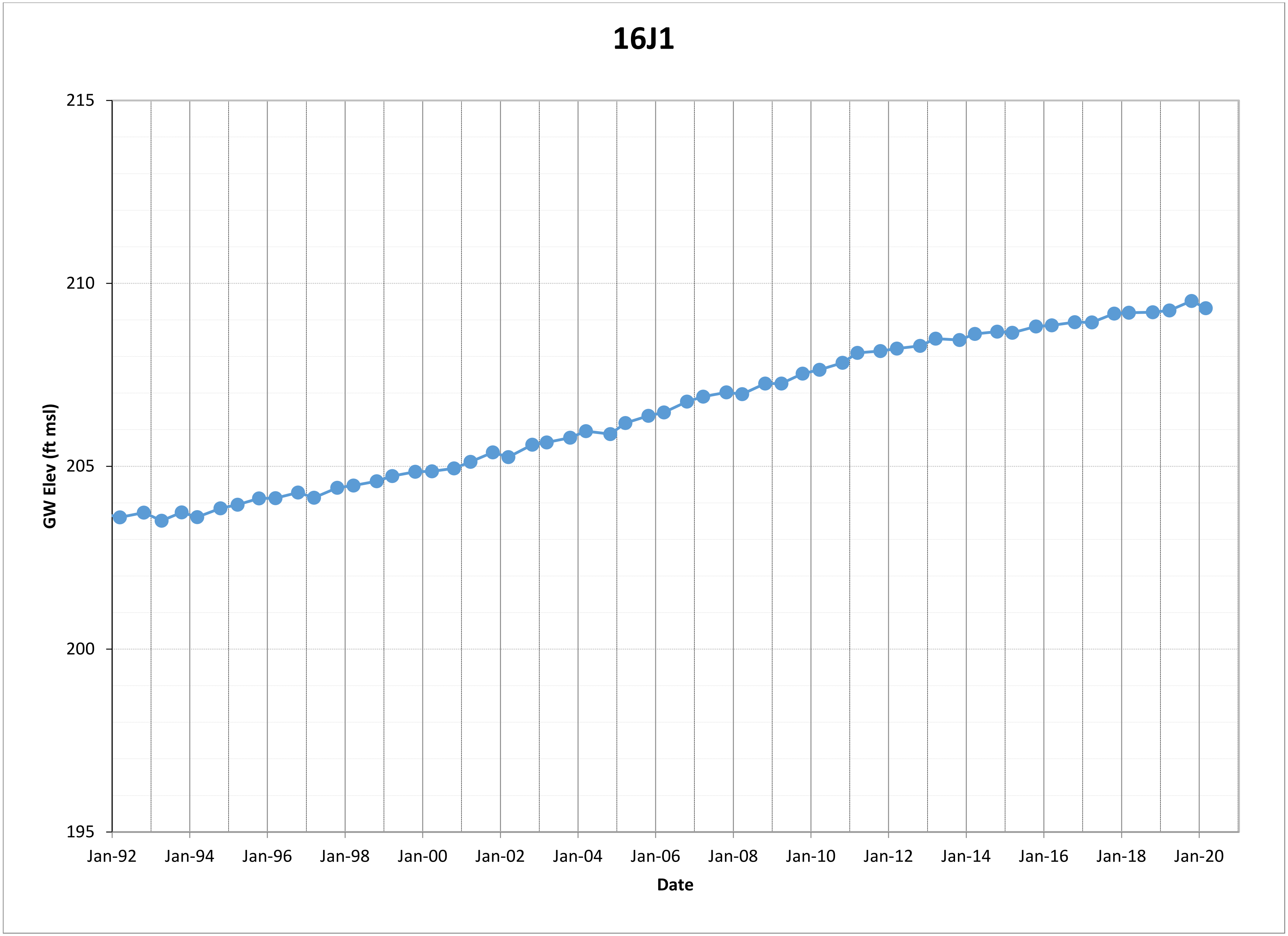
Jan-18
Jan-20
Date


16J1
GW Elev (ft msl)
215
210
205
200
195
Jan-92
Jan-94
Jan-96
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Jan-06
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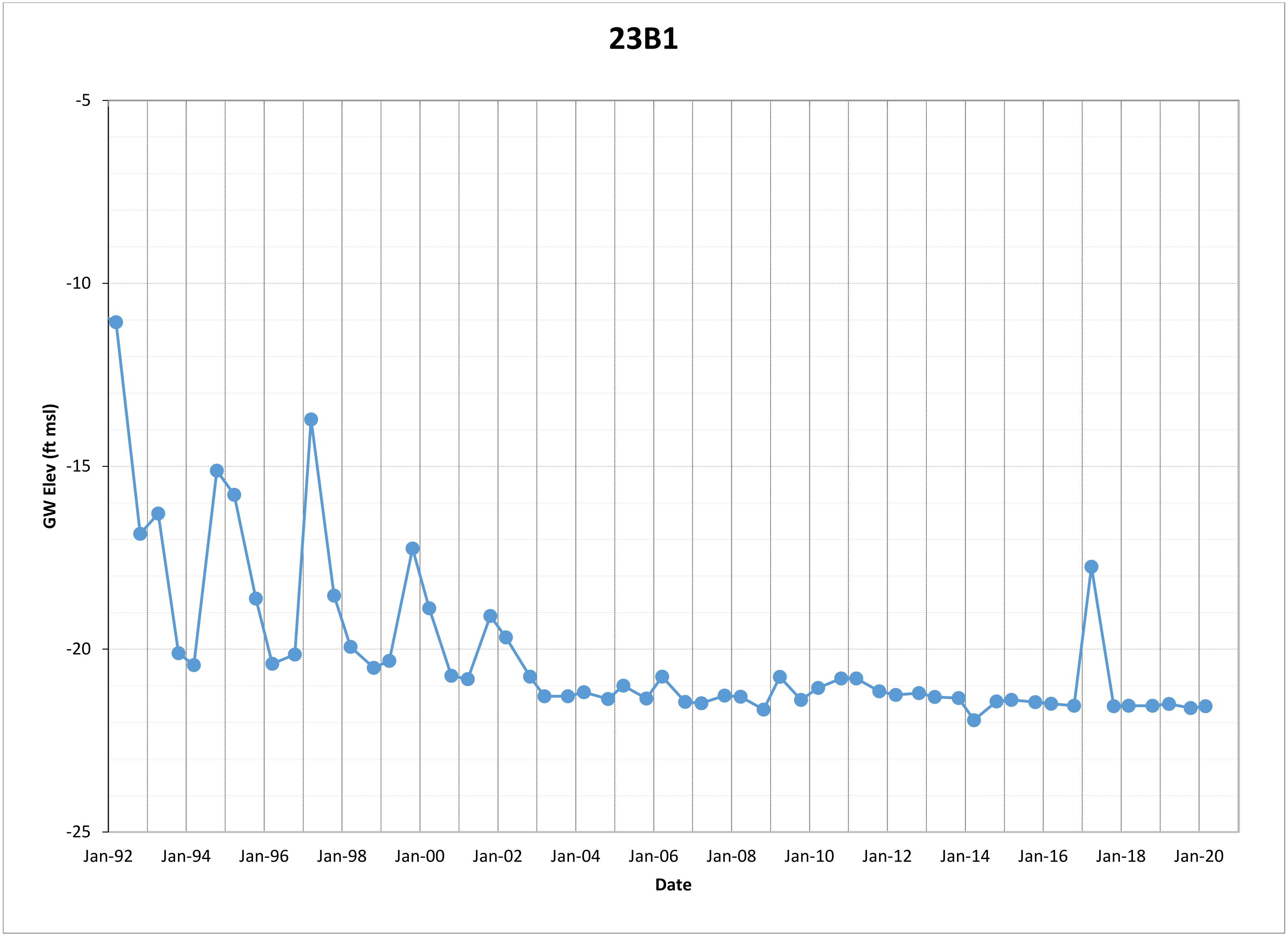
Jan-18
Jan-20
Date



23B1
GW Elev (ft msl)
-5
-10
-15
-20
-25
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
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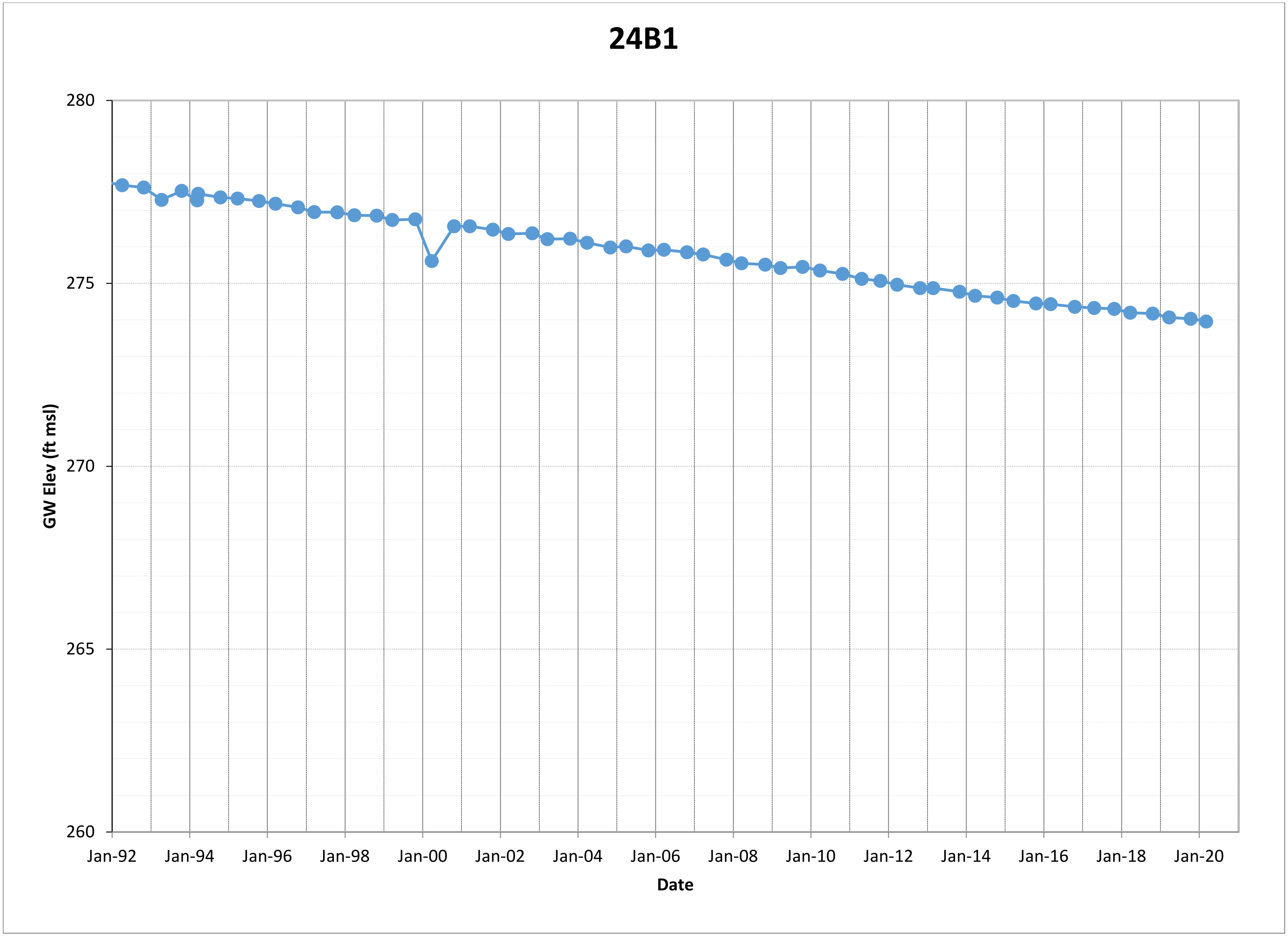
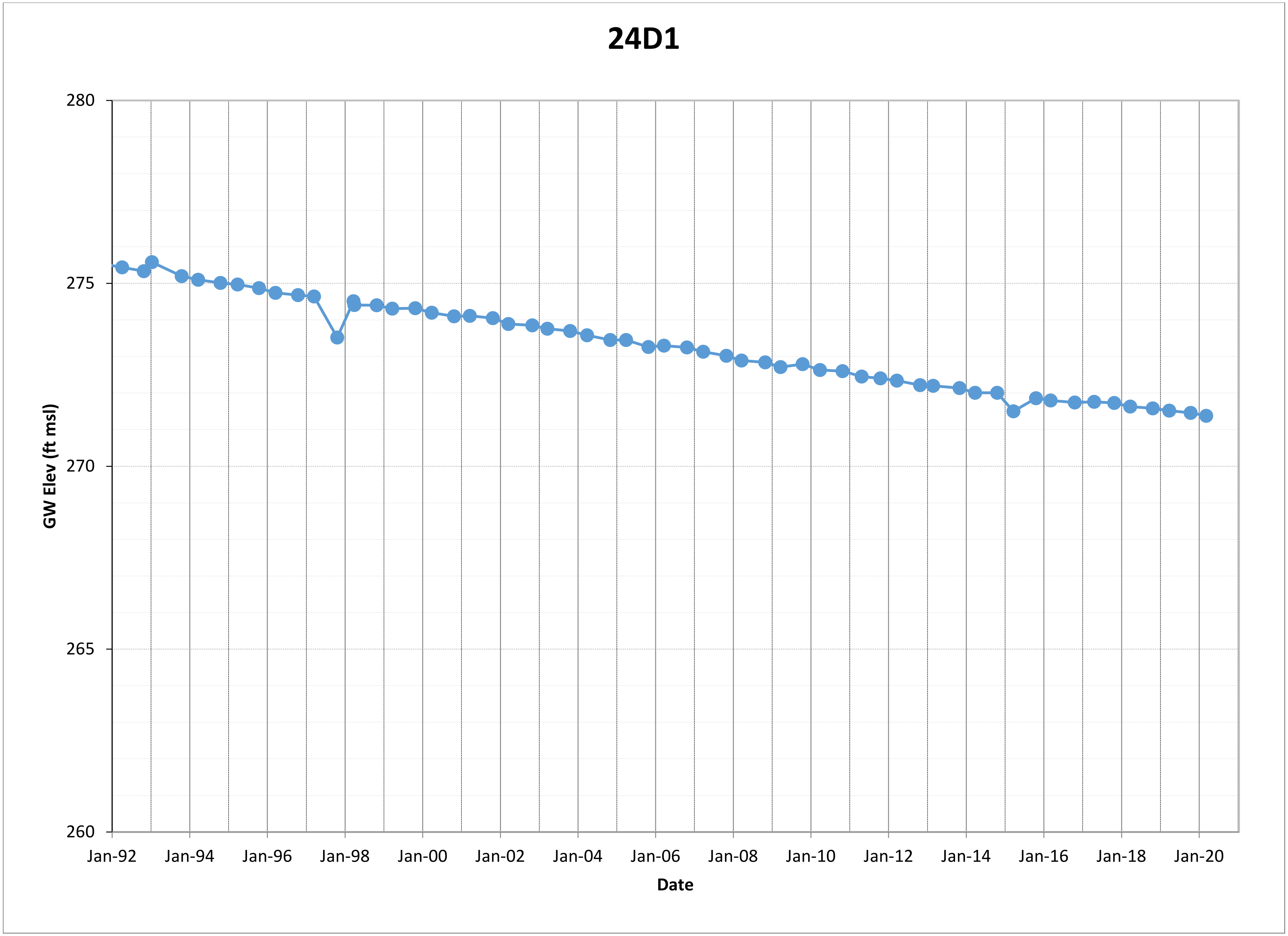
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



24B1
280
275
270
265
260
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


24D1
GW Elev (ft msl)
280
275
270
265
260
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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Jan-08
Jan-10
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Jan-14
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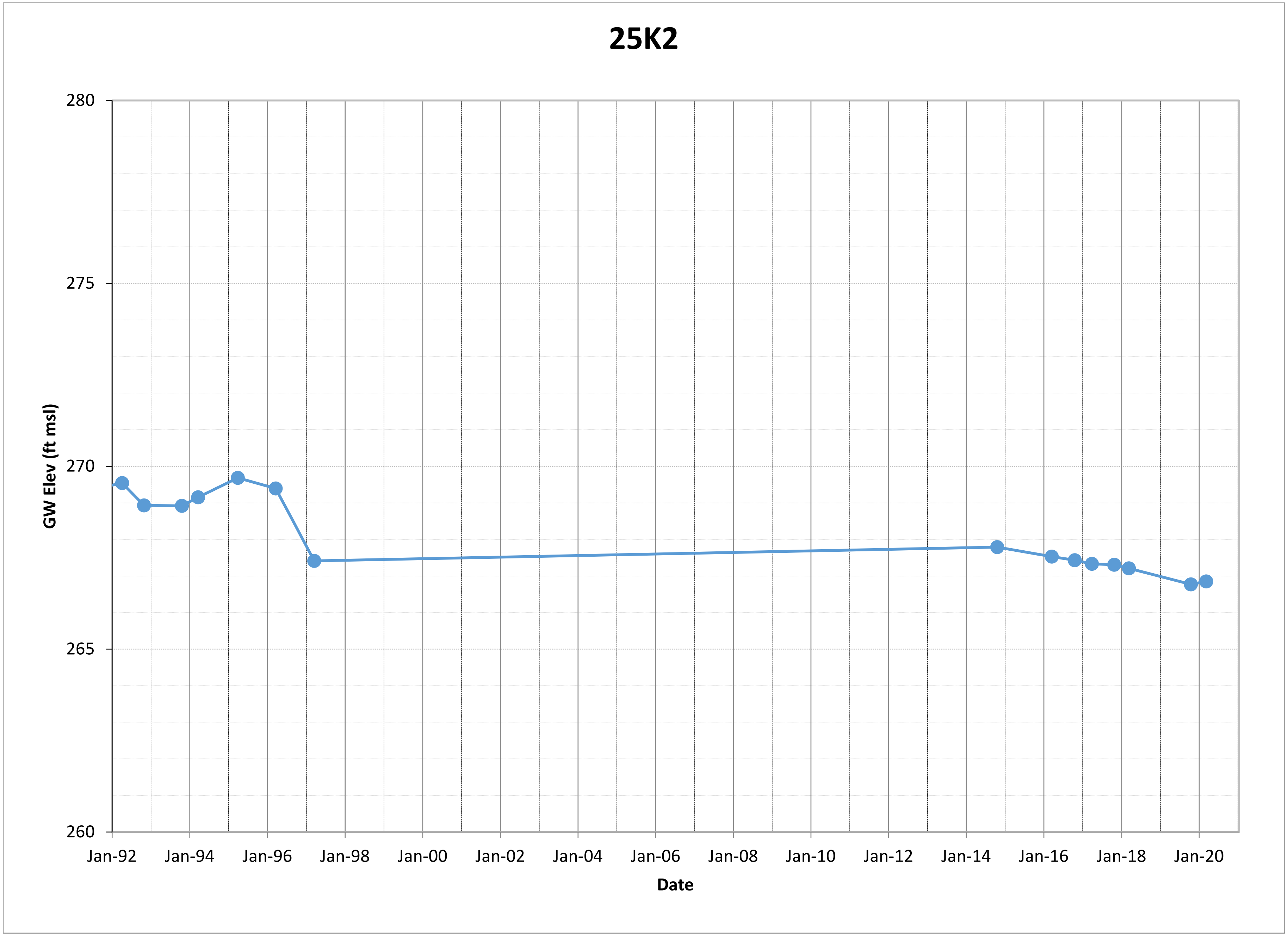
Jan-18
Jan-20
Date


25K2
280
275
270
265
260
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
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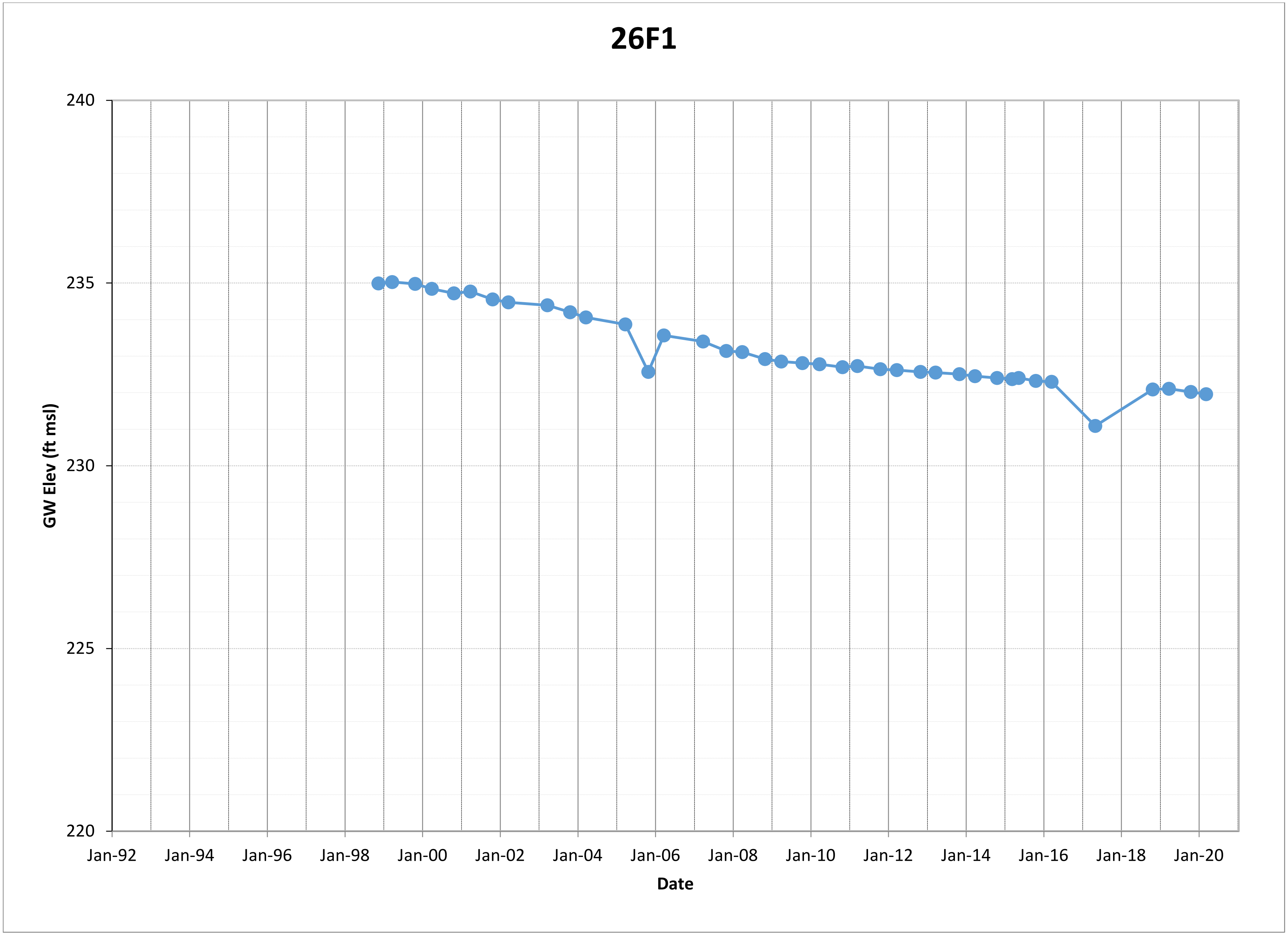
Jan-18
Jan-20
Date


26F1
240
235
230
225
220
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
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Jan-12
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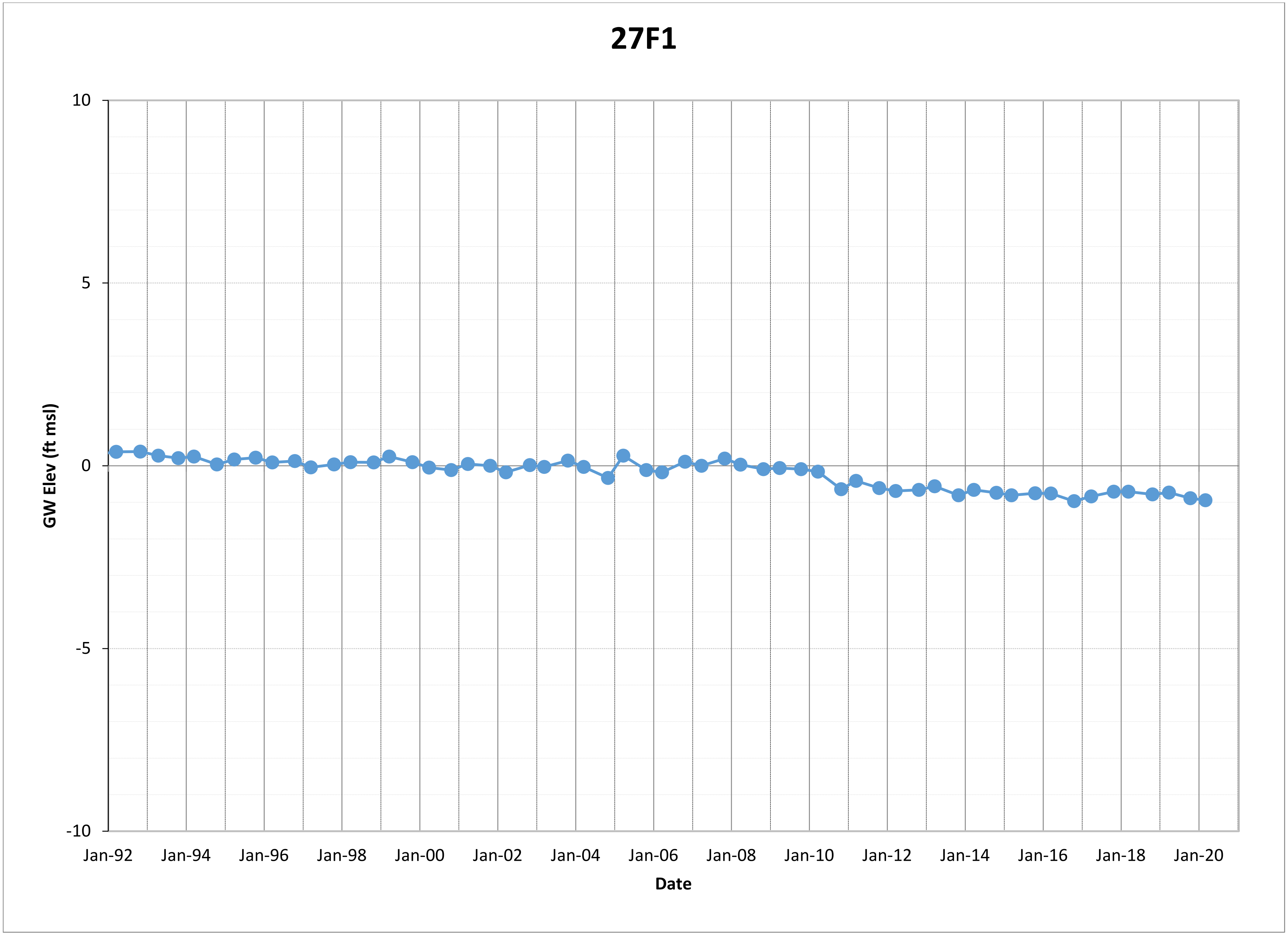
Jan-18
Jan-20
Date


27F1
GW Elev (ft msl)
10
5
0
-5
-10
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
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Jan-18
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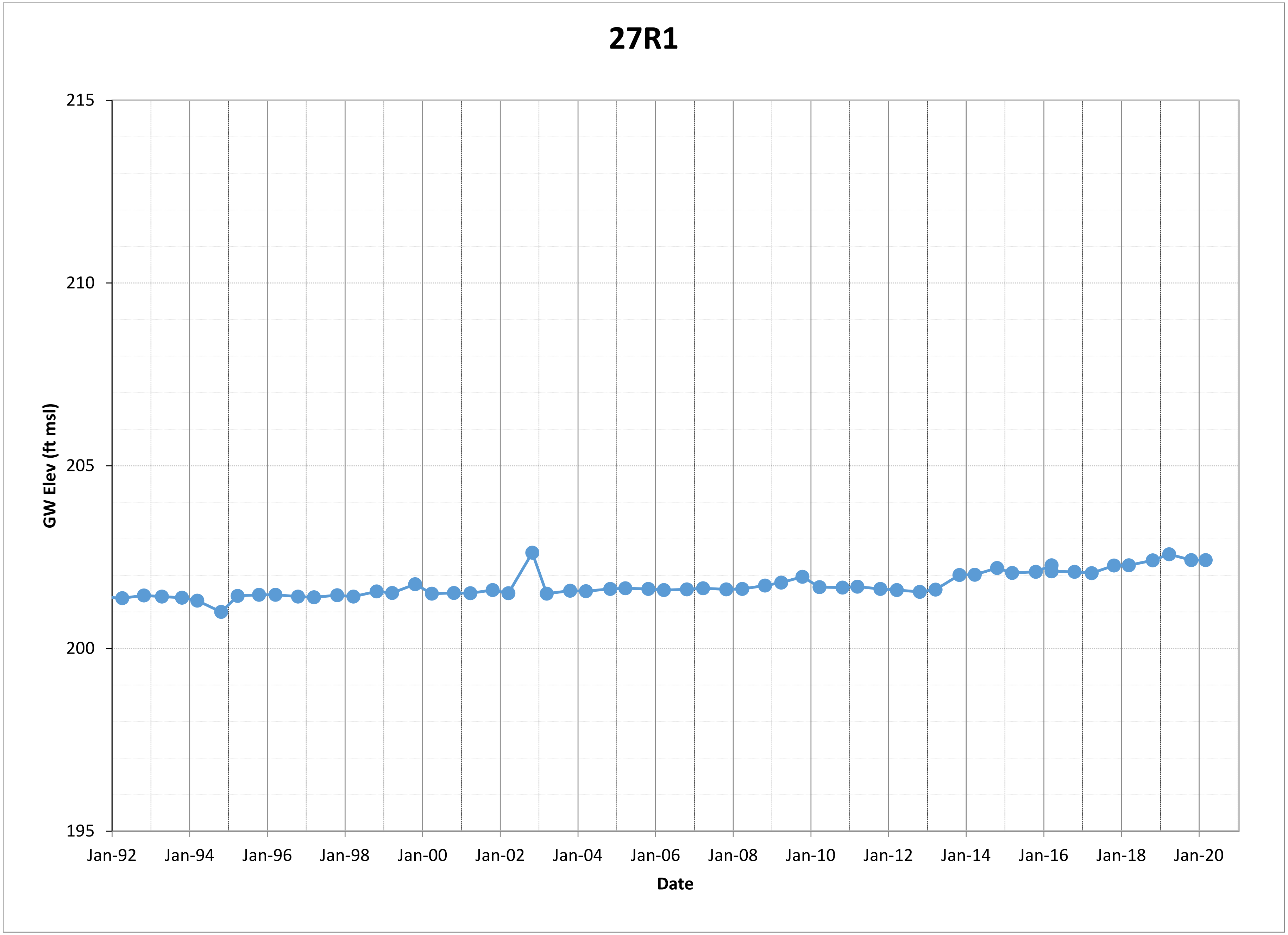
Date


27R1
GW Elev (ft msl)
215
210
205
200
195
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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Jan-06
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Jan-18
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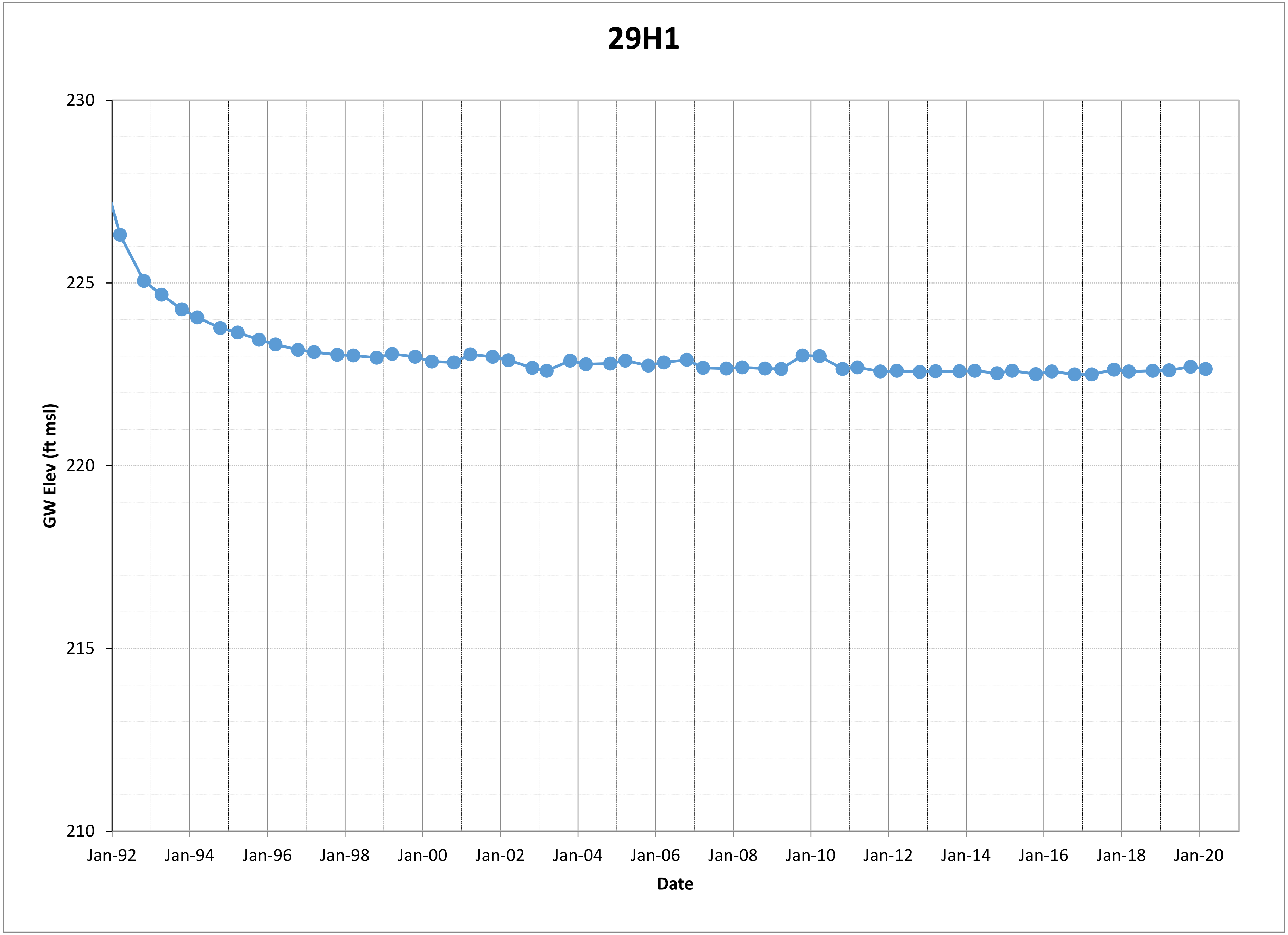
Date


29H1
GW Elev (ft msl)
230
225
220
215
210
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
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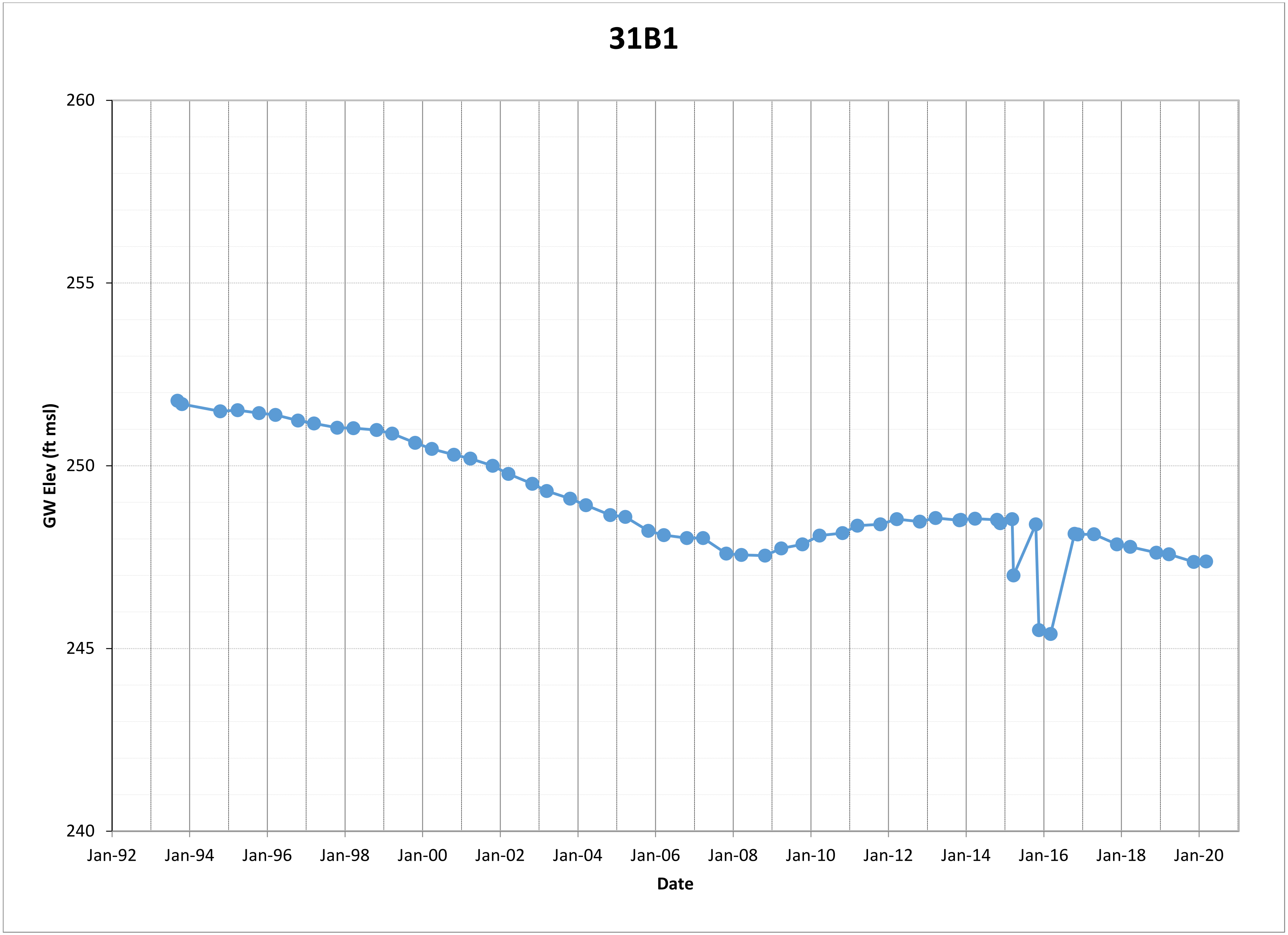
Jan-18
Jan-20
Date



31B1
260
255
250
245
240
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
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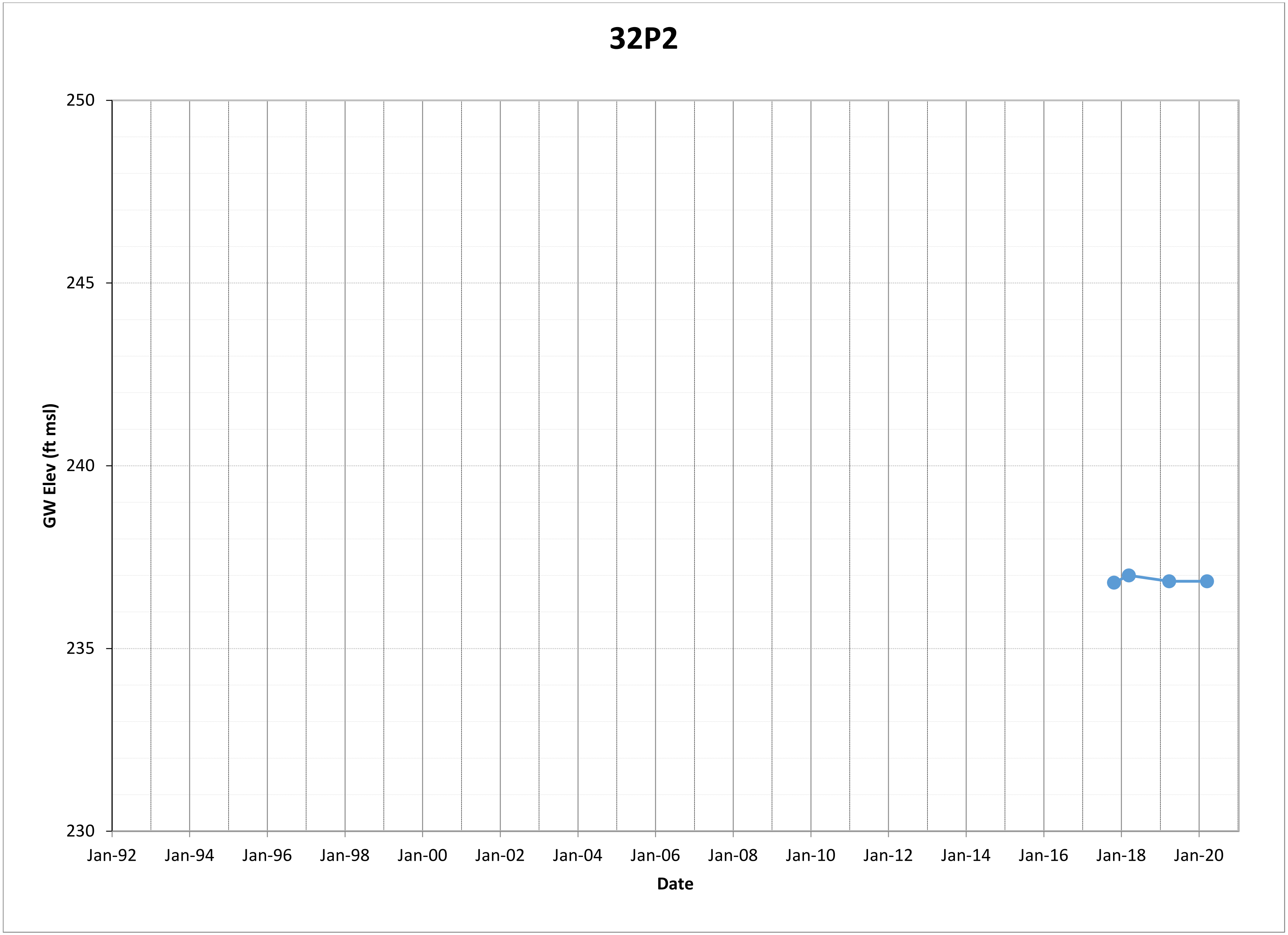
Jan-18
Jan-20
Date


32P2
GW Elev (ft msl)
250
245
240
235
230
Jan-92
Jan-94
Jan-96
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Jan-18
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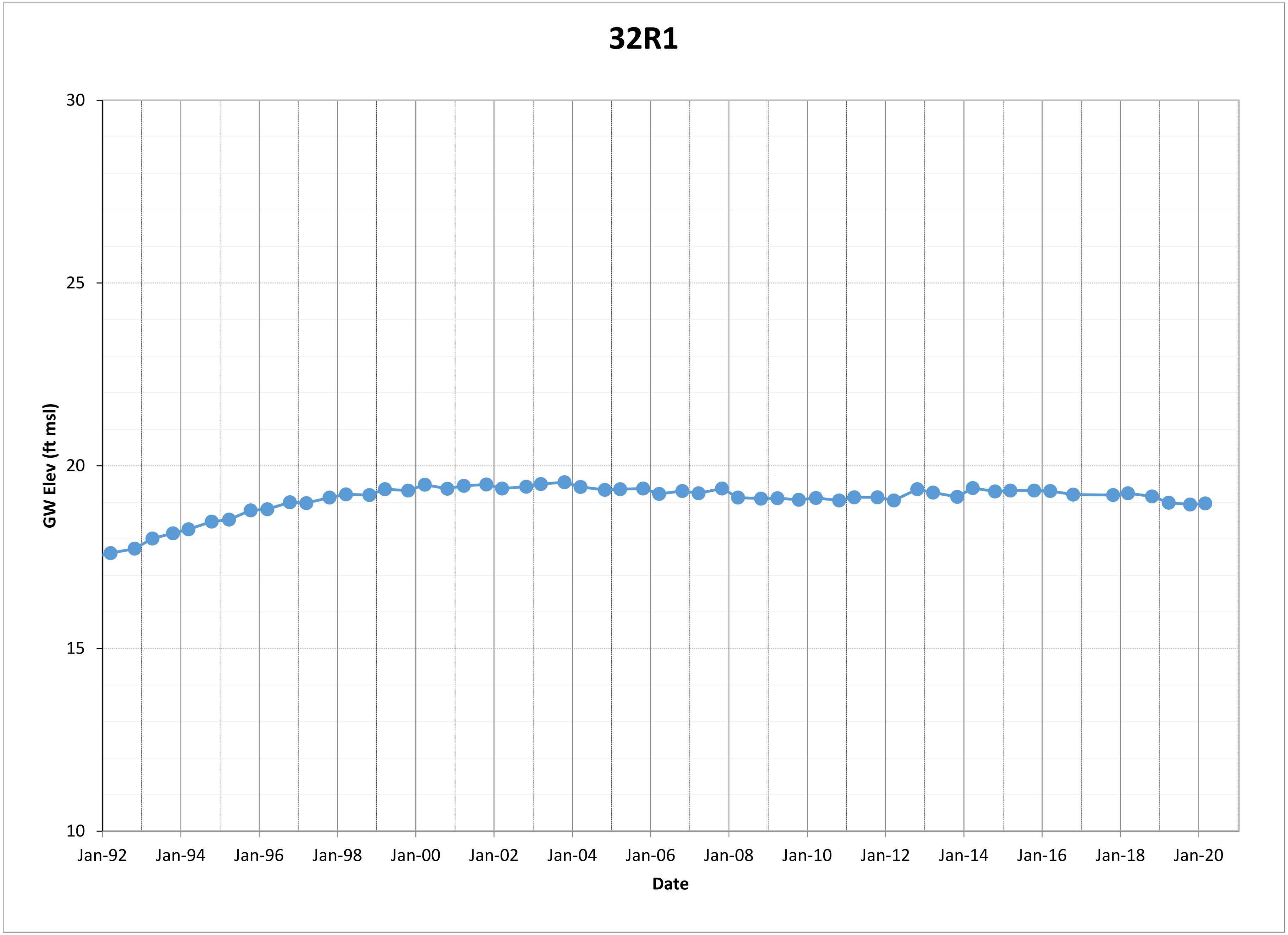
Date



32R1
GW Elev (ft msl)
30
25
20
15
10
Jan-92
Jan-94
Jan-96
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Jan-00
Jan-02
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Jan-06
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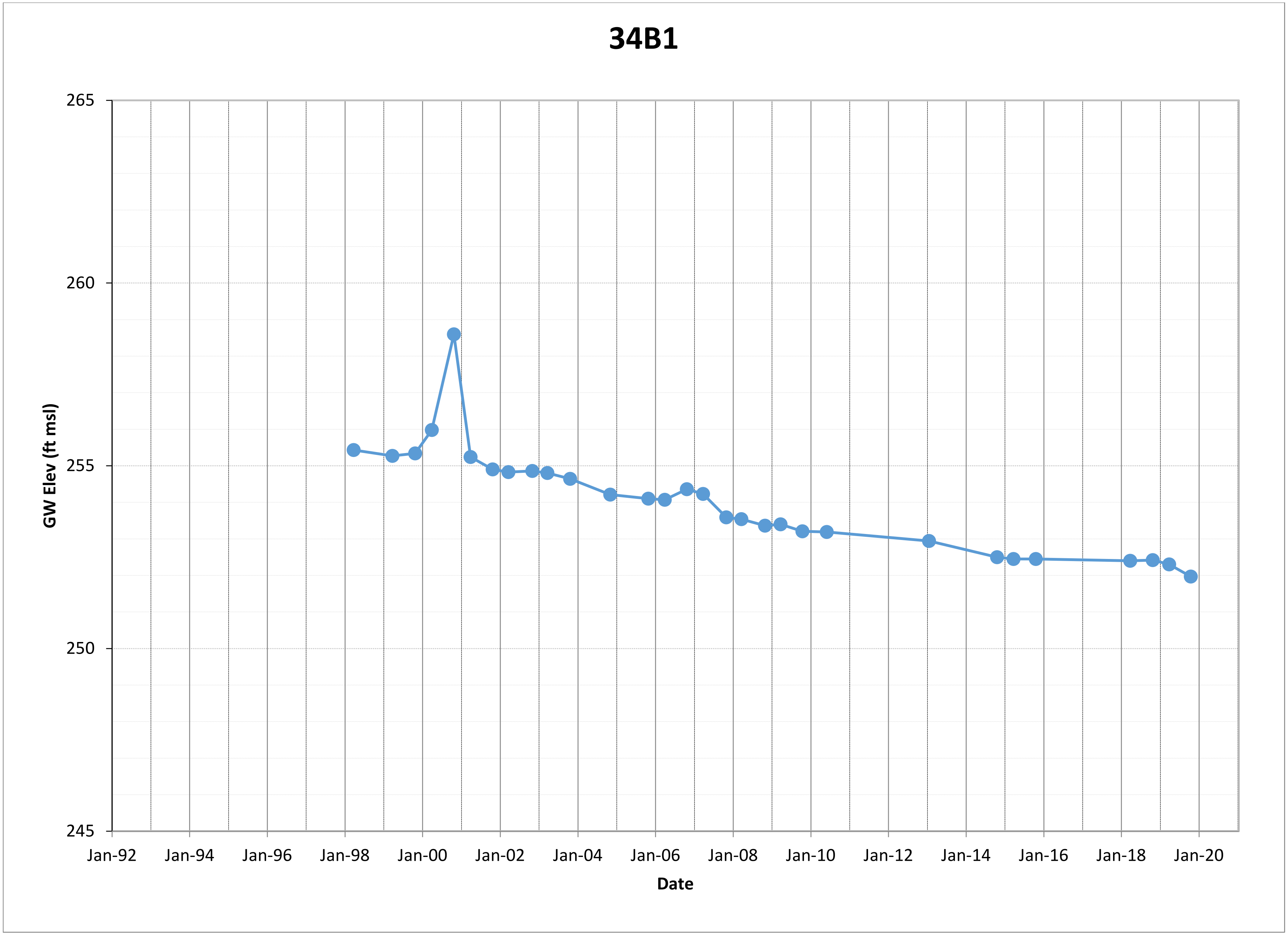
Date


34B1
GW Elev (ft msl)
265
260
255
250
245
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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Jan-04
Jan-06
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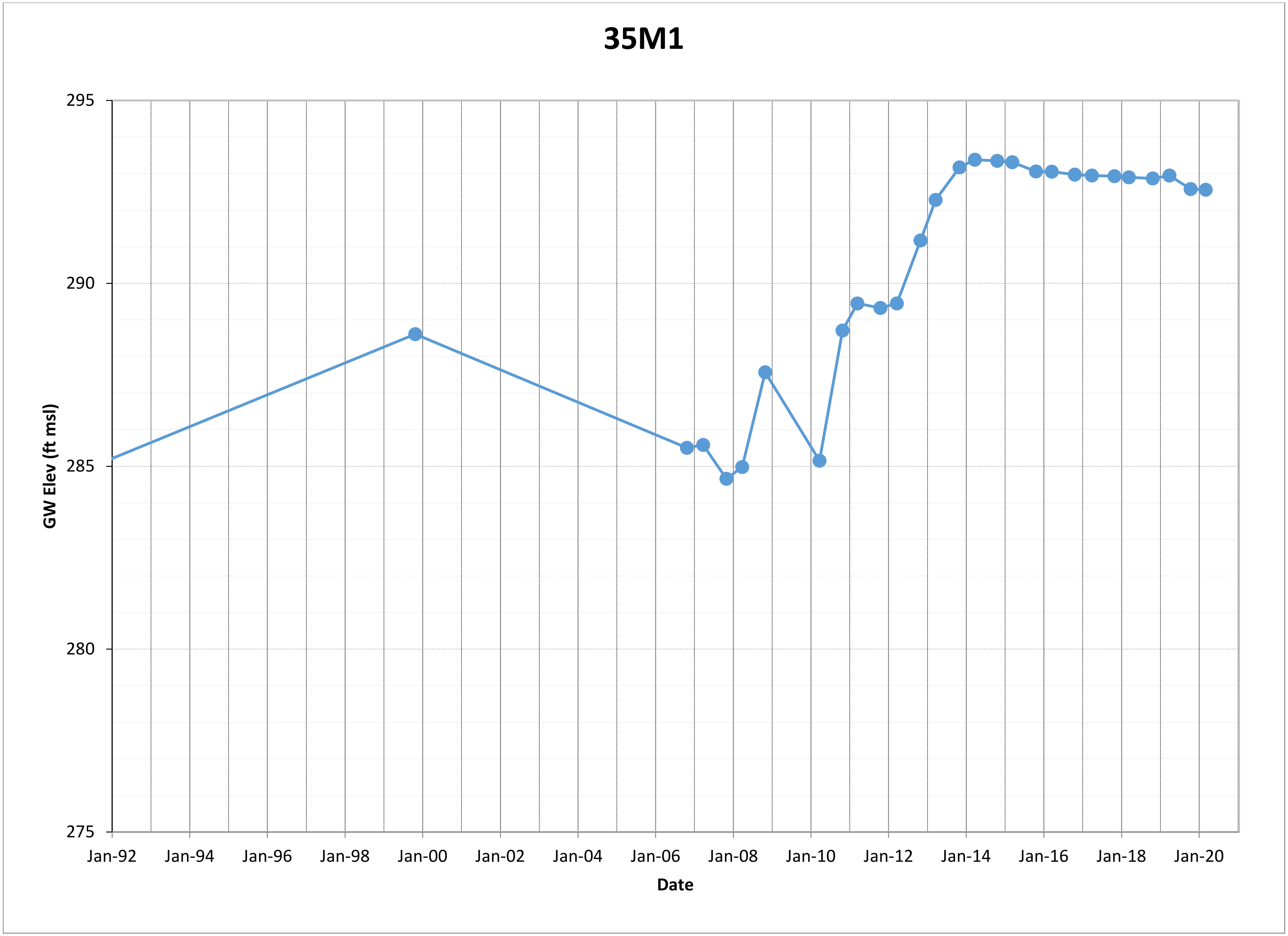
Jan-20
Date


35M1
GW Elev (ft msl)
295
290
285
280
275
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
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Jan-10
Jan-12
Jan-14
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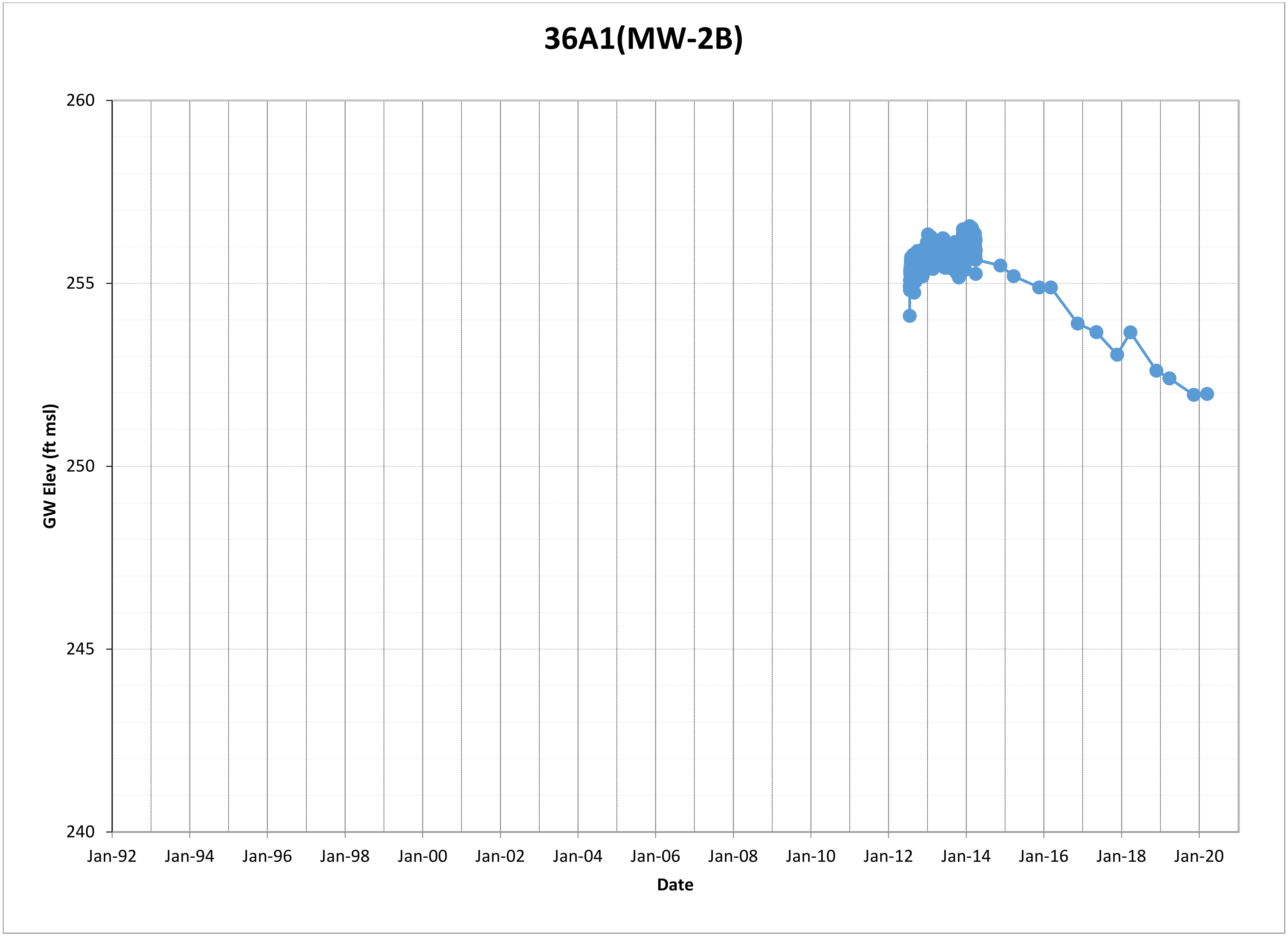
Jan-18
Jan-20
Date


36A1(MW-2B)
GW Elev (ft msl)
260
255
250
245
240
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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Jan-10
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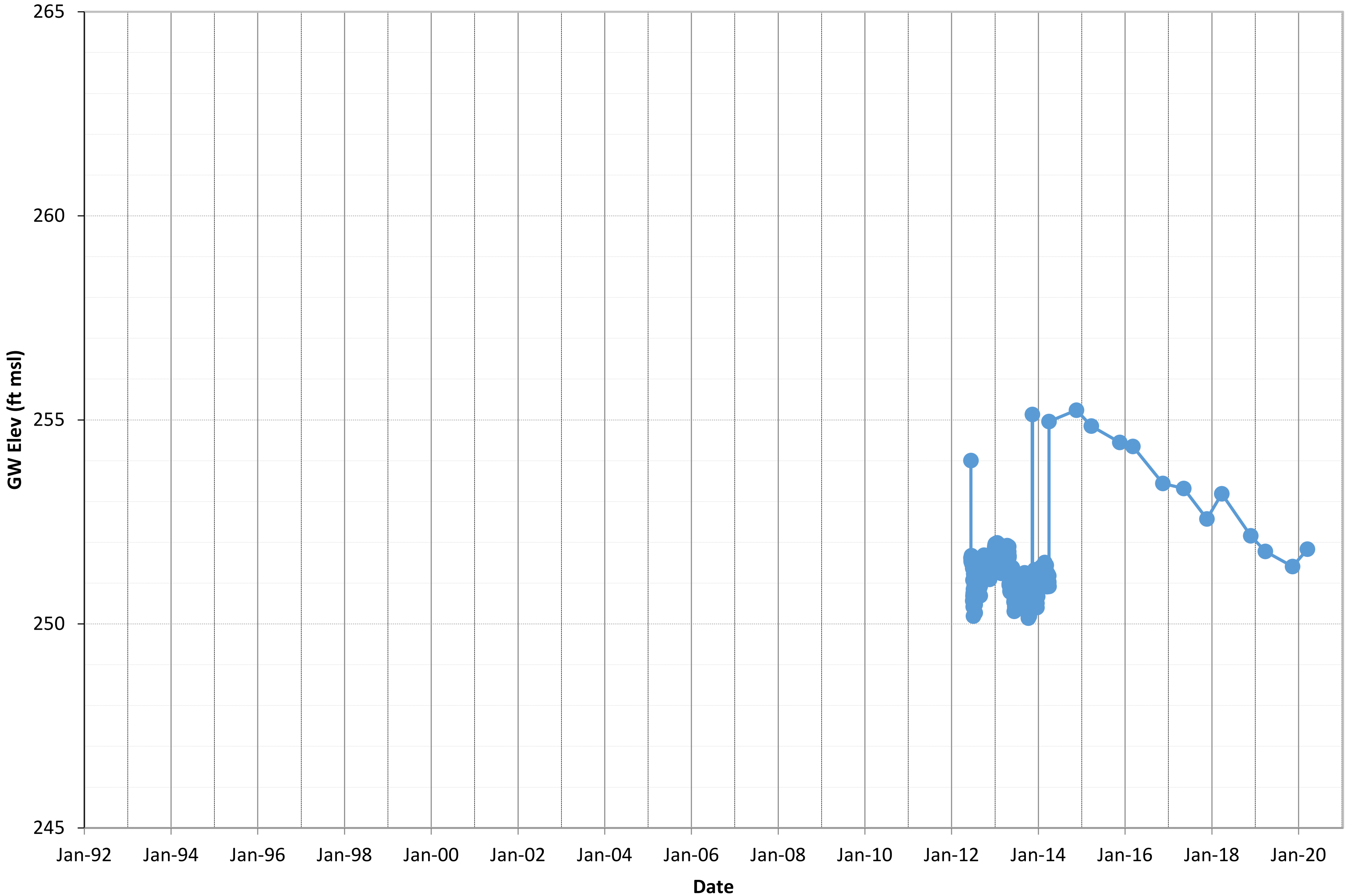
Jan-18
Jan-20
Date

36A2 (MW-2A)



265
260
255
250
245
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
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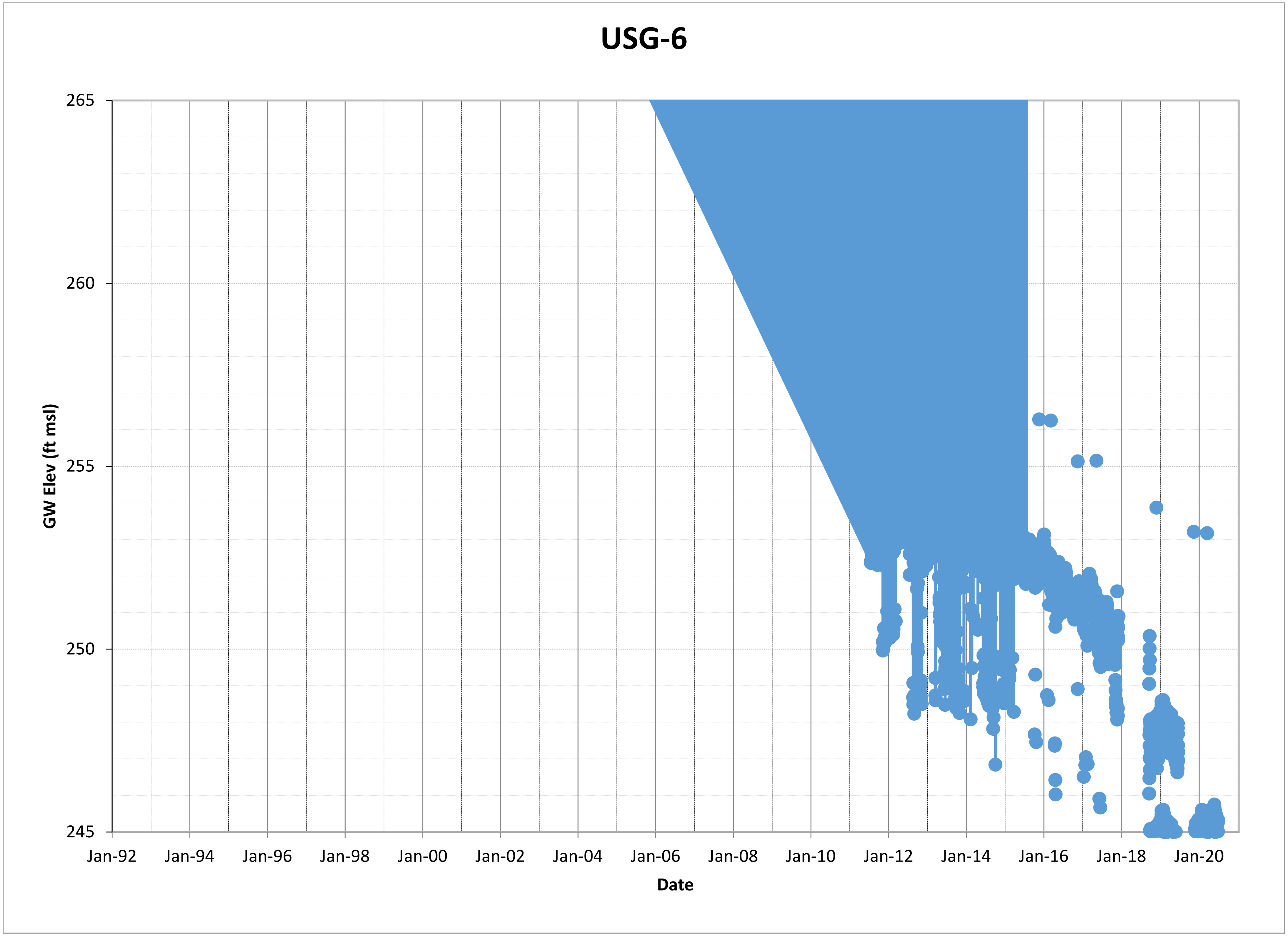
Jan-18
Jan-20
Date


USG-6
GW Elev (ft msl)
265
260
255
250
245
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
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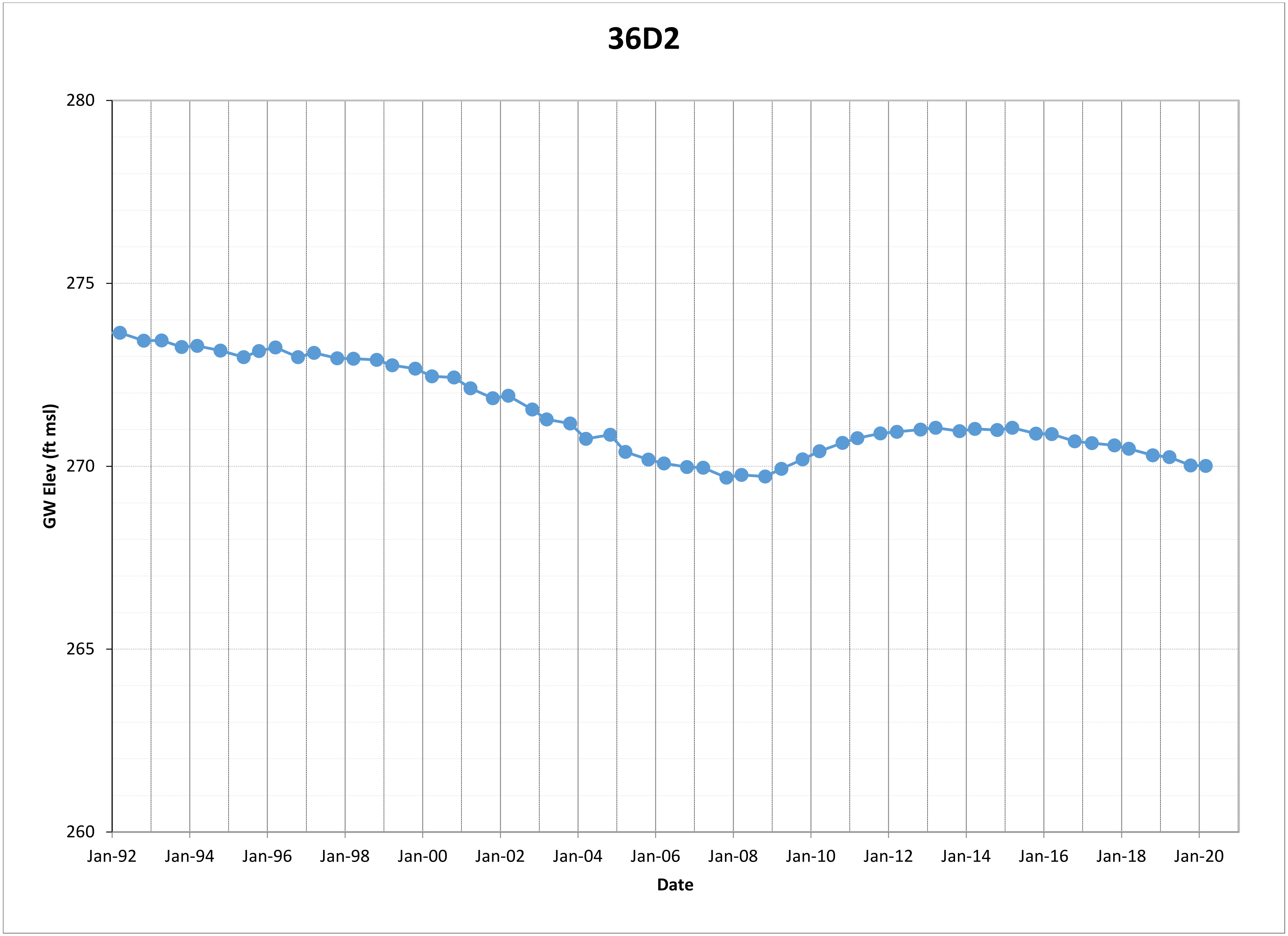
Jan-18
Jan-20
Date


36D2
280
275
270
265
260
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
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Jan-00
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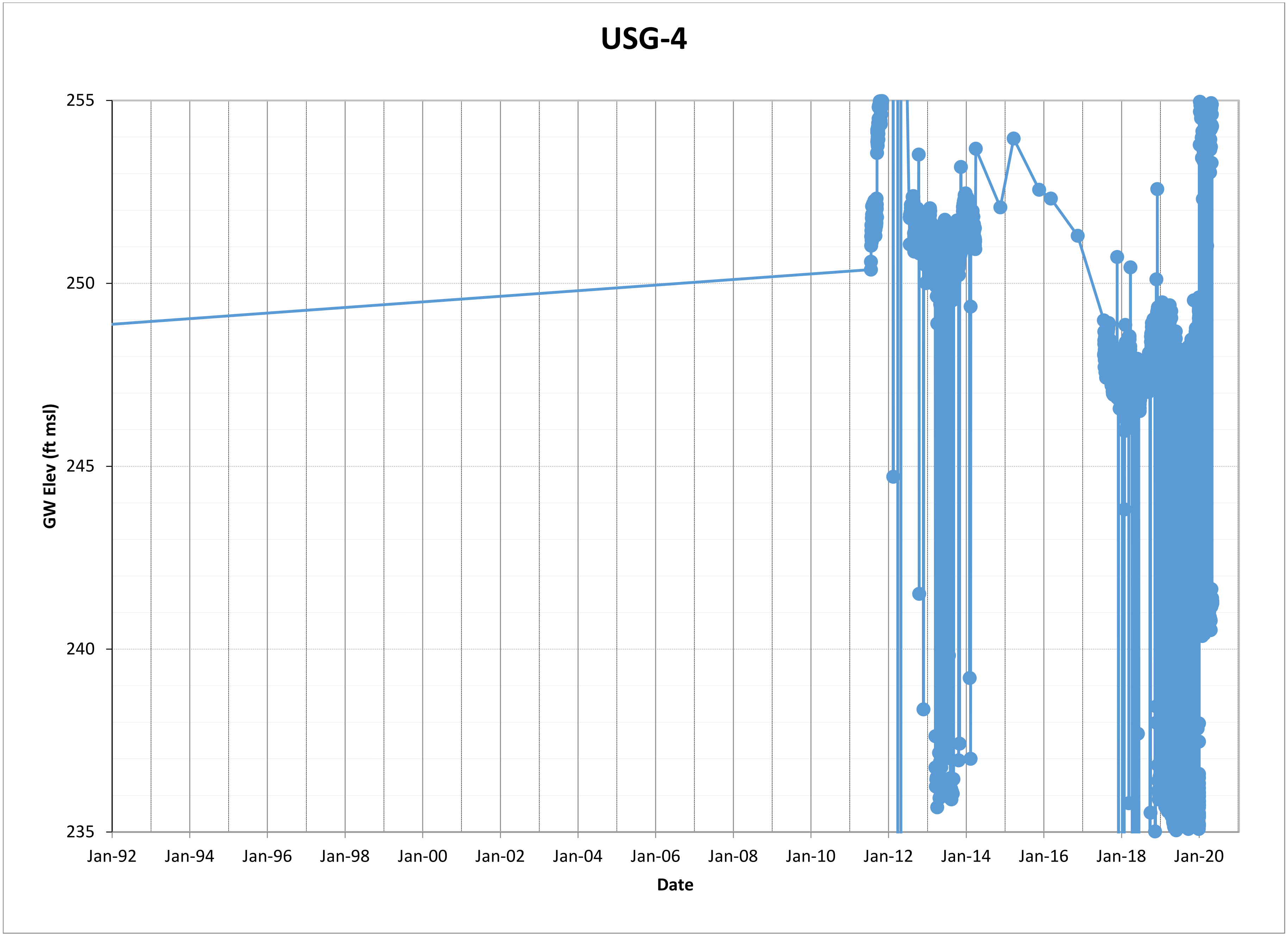
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


USG-4
GW Elev (ft msl)
255
250
245
240
235
Jan-92
Jan-94
Jan-96
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Jan-10
Jan-12
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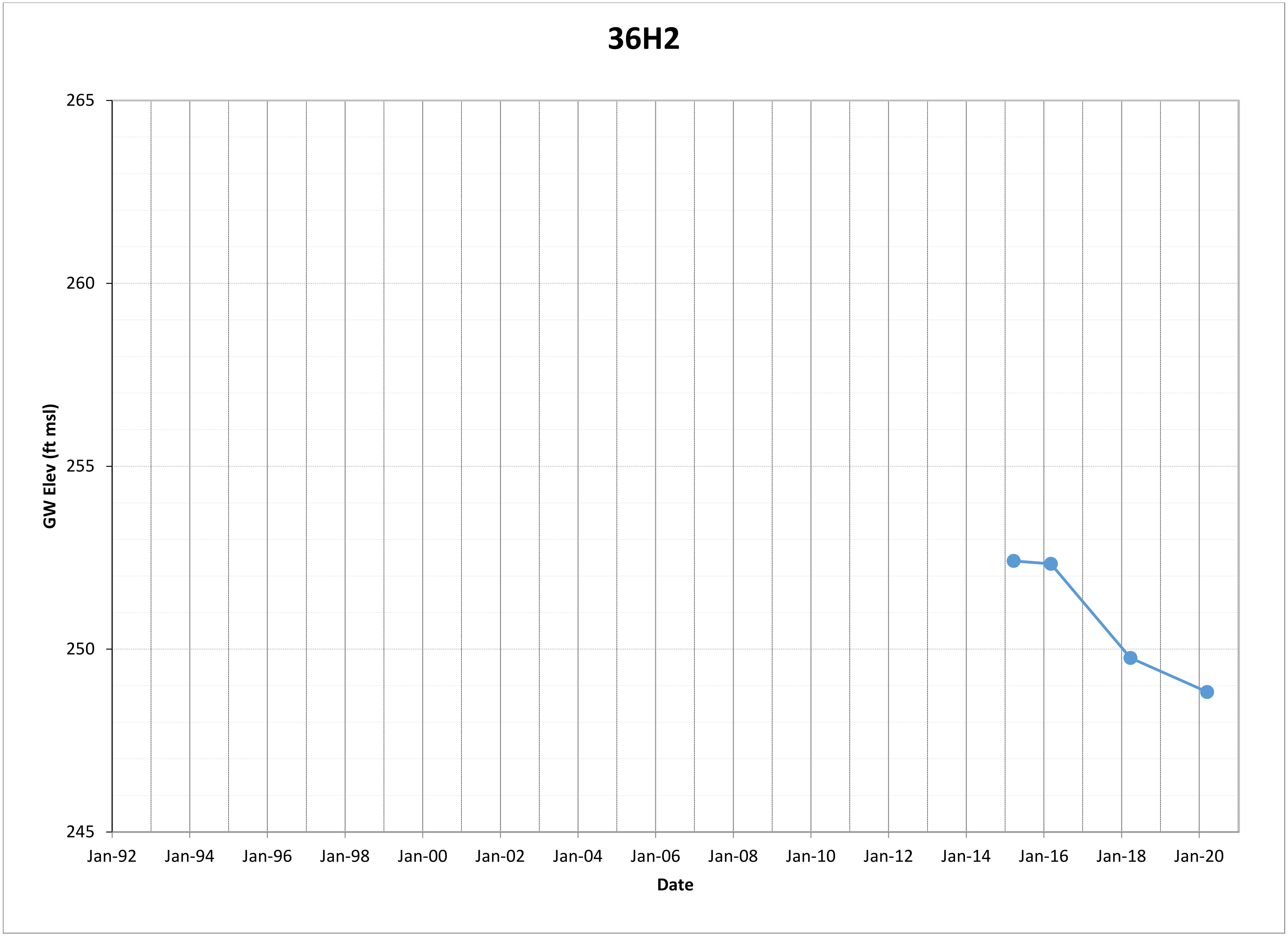
Jan-18
Jan-20
Date



36H2
GW Elev (ft msl)
265
260
255
250
245
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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Jan-06
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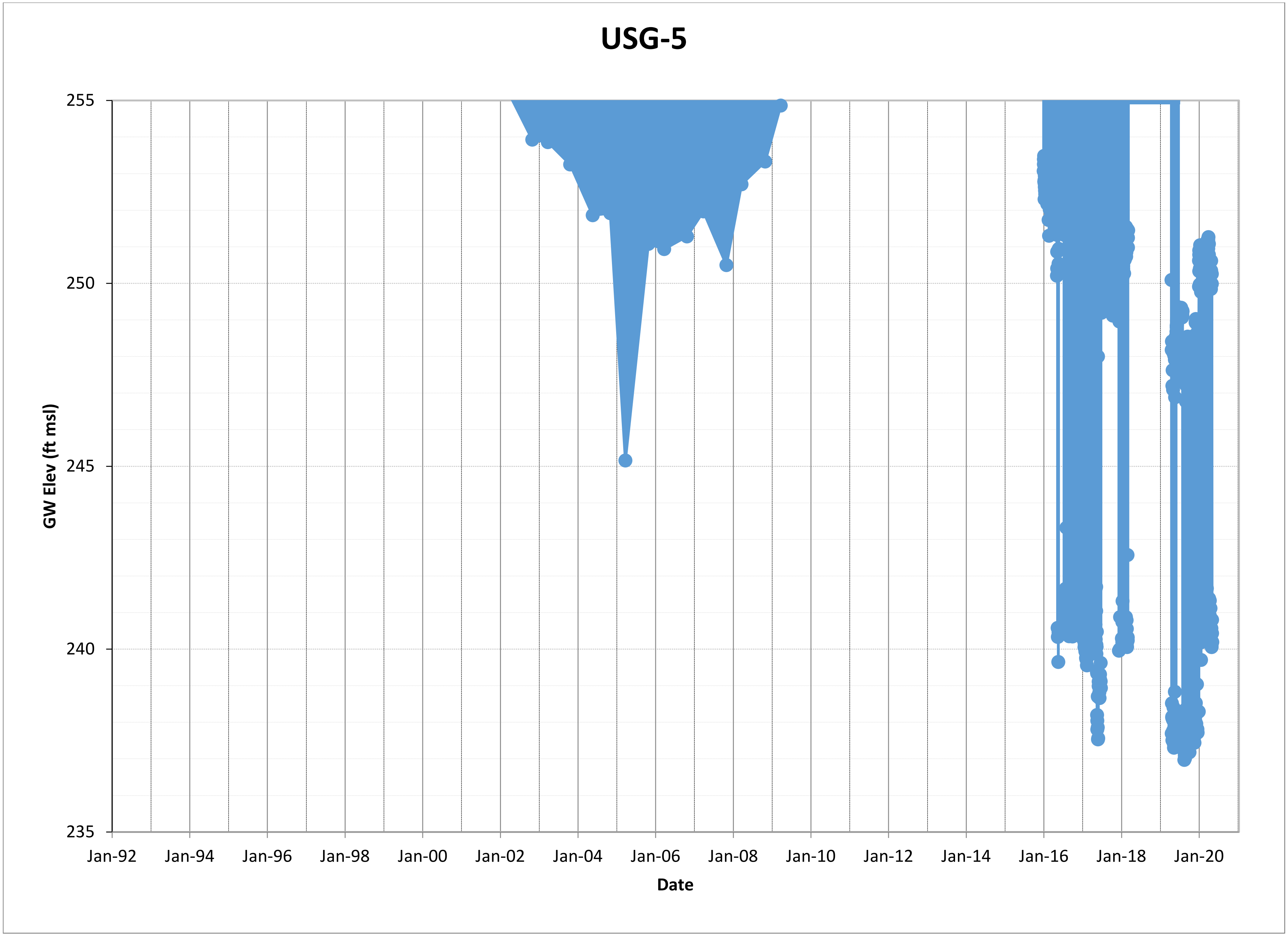
Jan-20
Date



USG-5
255
250
245
240
235
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
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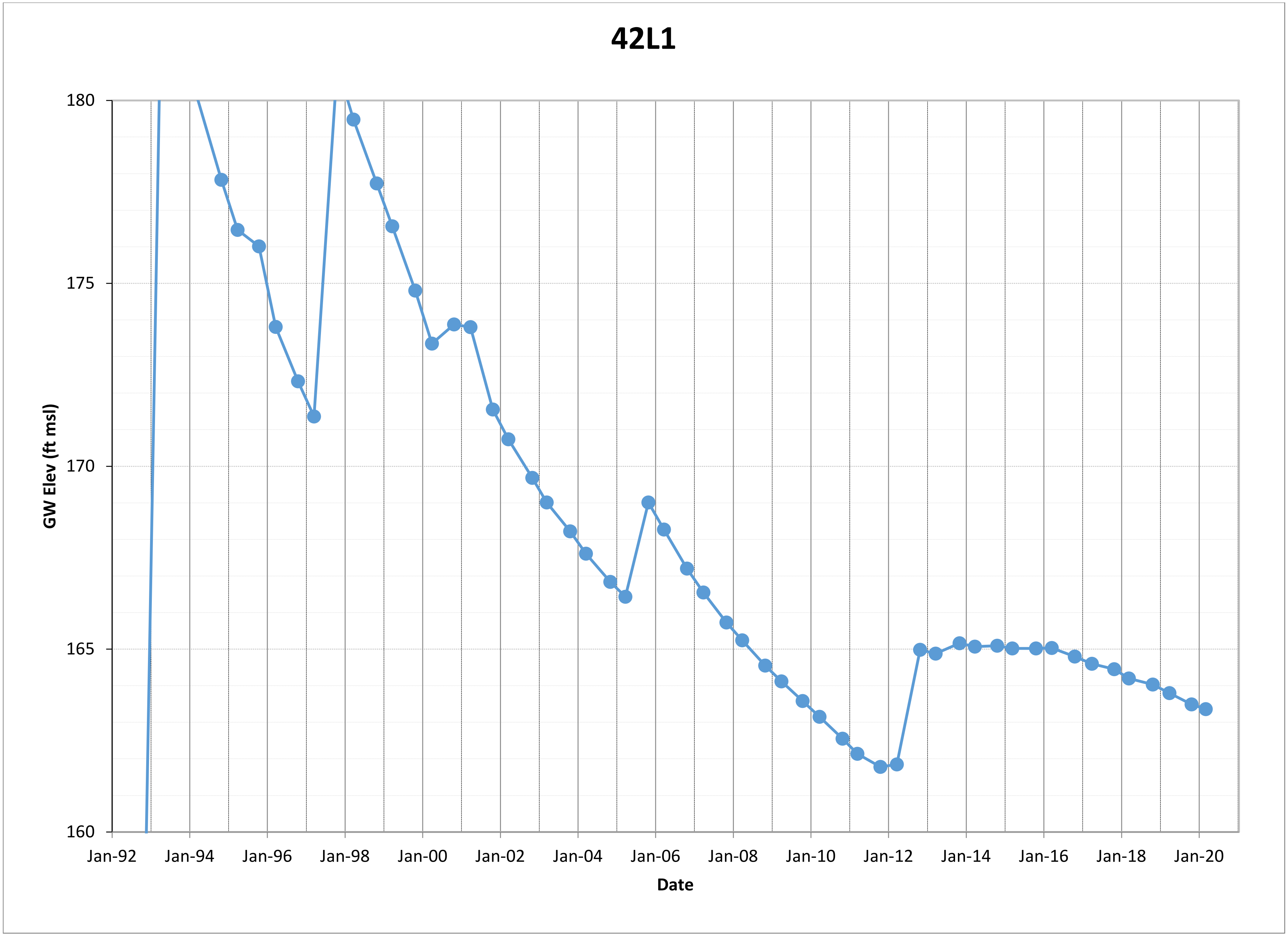
Jan-18
Jan-20
Date


42L1
GW Elev (ft msl)
180
175
170
165
160
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
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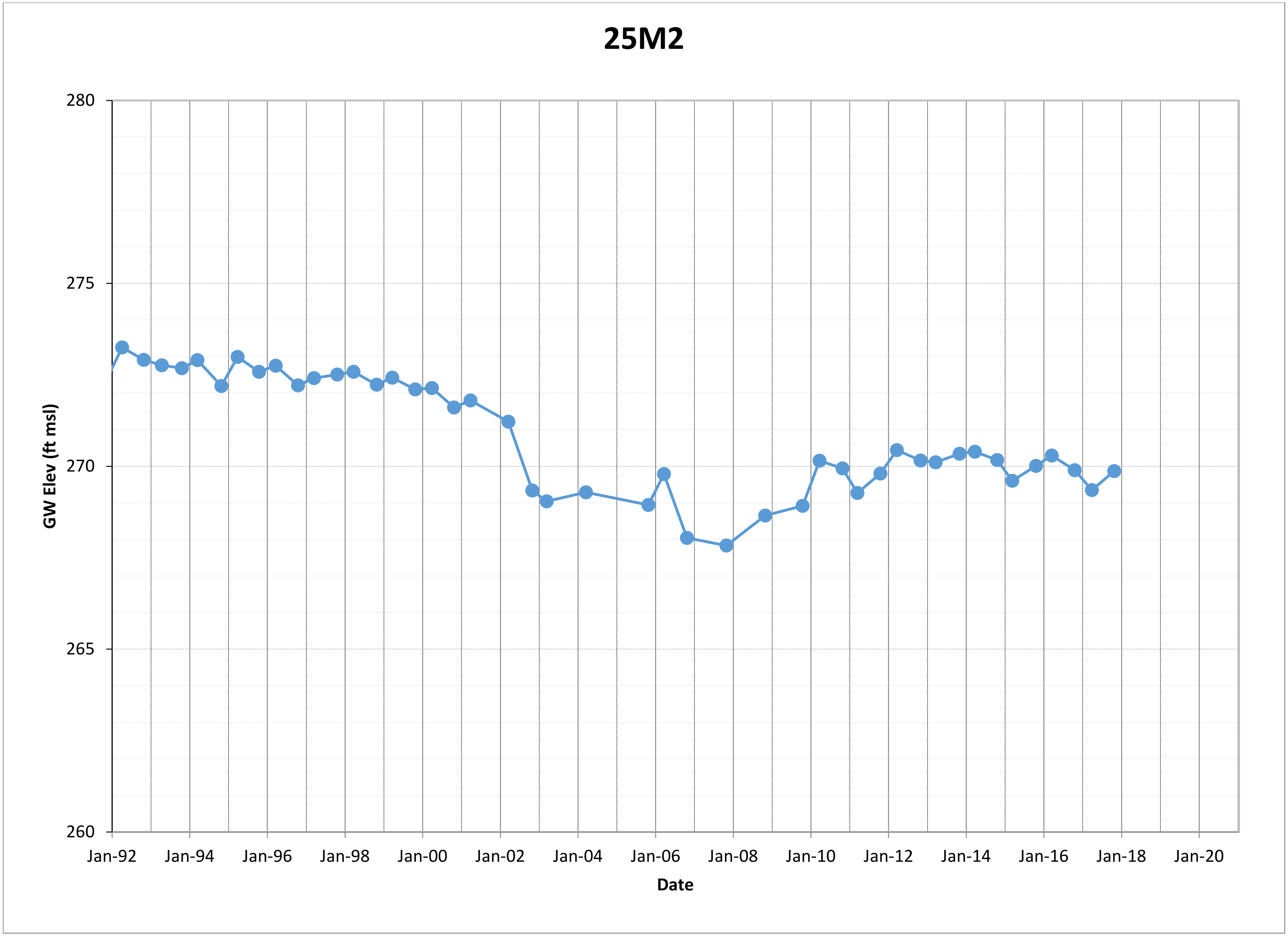
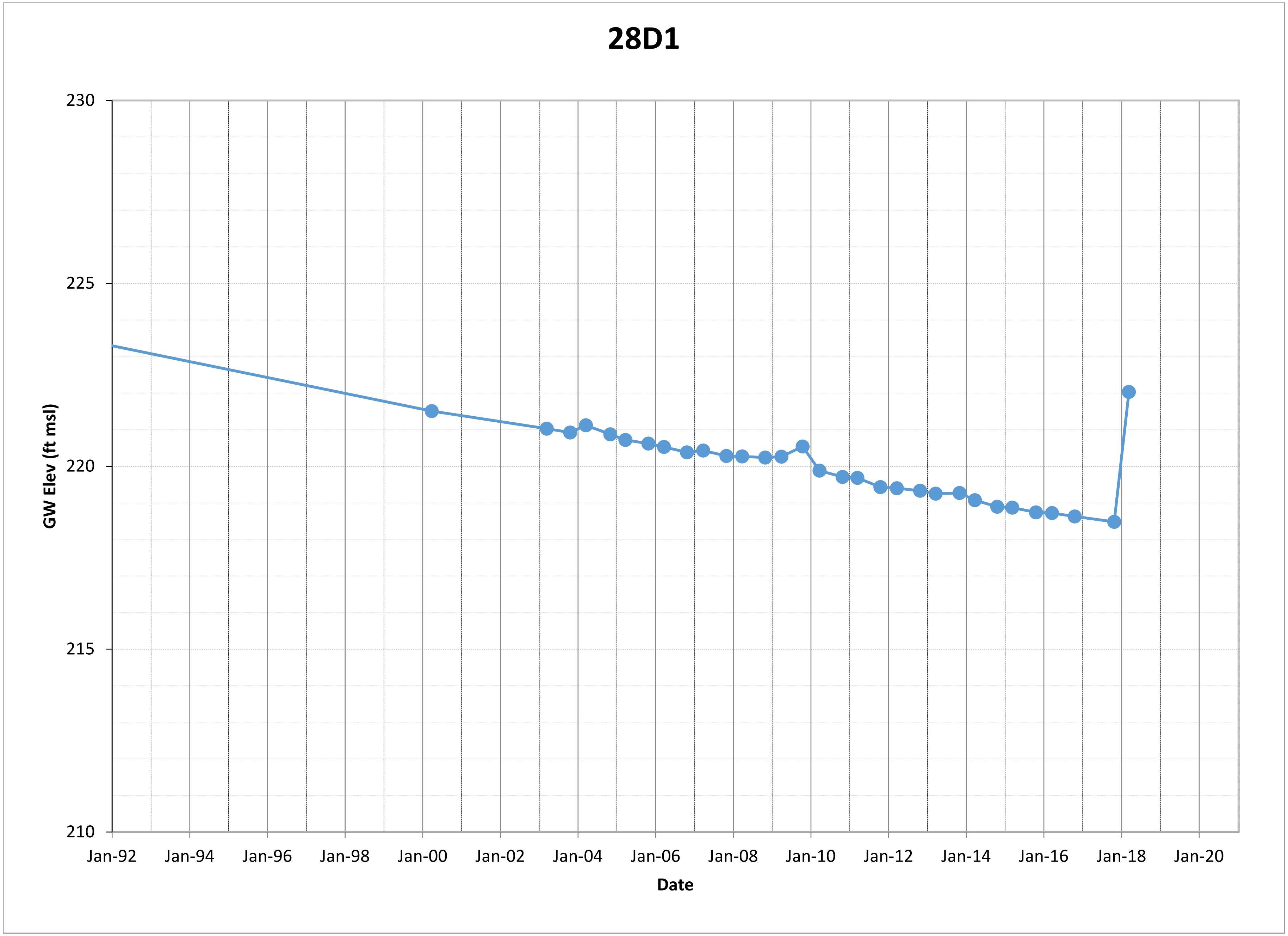
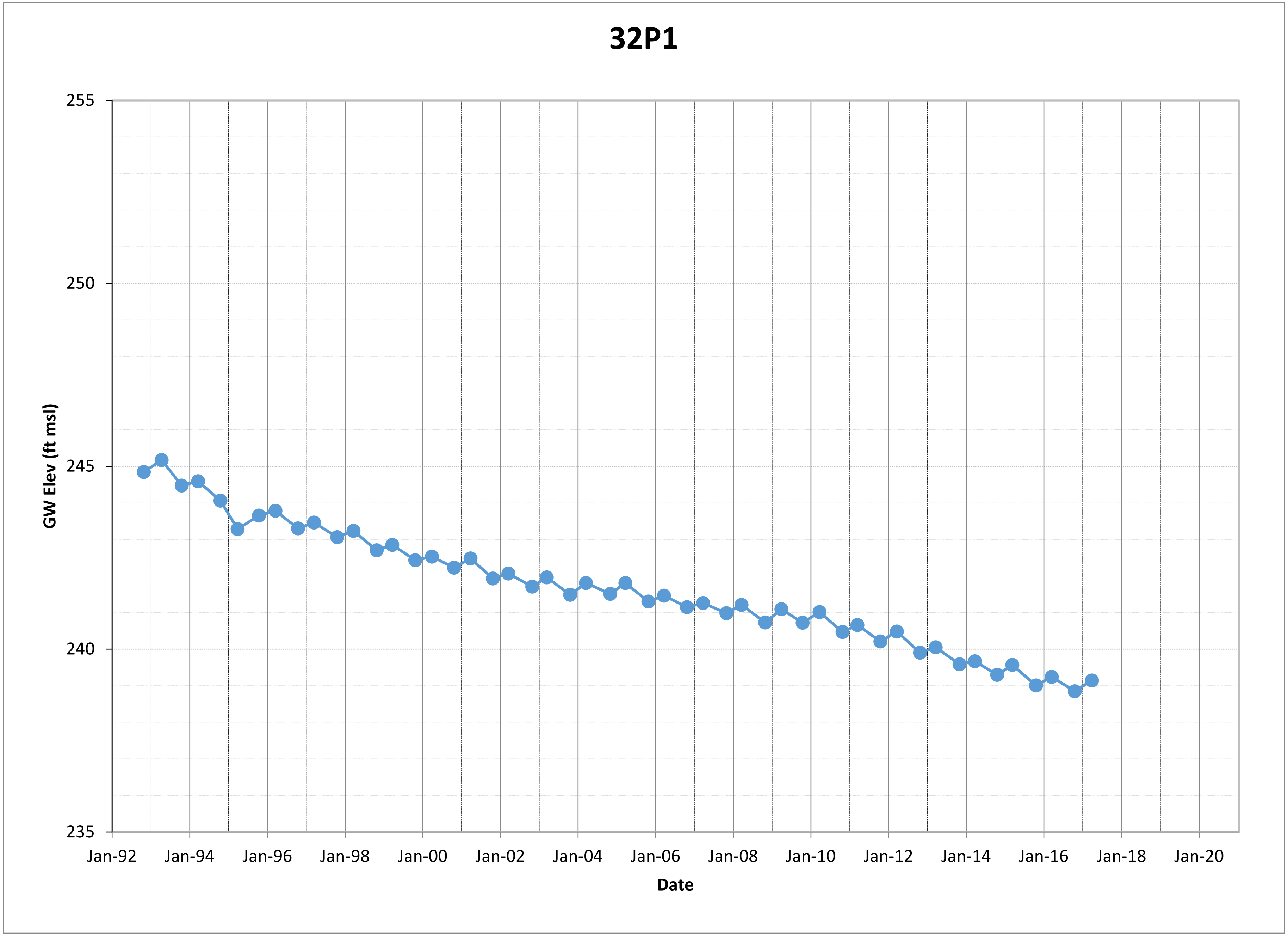
Jan-20
Date



25M2
GW Elev (ft msl)
280
275
270
265
260
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



28D1
GW Elev (ft msl)
230
225
220
215
210
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


32P1
GW Elev (ft msl)
255
250
245
240
235
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

APPENDIX C

WATER QUALITY RESULTS AND STATISTICAL ANALYSES

Table C-1. Alkalinity results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Alkalinity	122	173	101	126			131						109				131	157	107		218			
spring-10	Alkalinity	112	177	98.1	118			114						108				128	148	102		217			
spring-11	Alkalinity	124	177	98.9	121			114						107				128	150	102		234			
spring-12	Alkalinity	113	184	97.7				113						106				128		103		219			
spring-13	Alkalinity	126					127															208			
spring-14	Alkalinity	124	180	98.6	121		126	113	108					105	98.3		116	128		99.6		210	123		109
spring-15	Alkalinity	122	203	98	117		126	111	108					103	98.2		118	127			99	206	132		109
spring-16	Alkalinity	124	201	99	120		126	112	109					105	98.6		120	128			102	205	123		112
spring-17	Alkalinity	121	193	97	117		130	115	115					103	98.4		121	127			103	194			110
spring-18	Alkalinity	123	192	89	119	127	124	111	108	132		172		103	97.9		121	128			104	192	119		
spring-19	Alkalinity	115	191	97.8	118	126	126	110	107	131		176		103	97.1		121	127			104	193	119		109
spring-20	Alkalinity	126	189	85.2	114	128	126	112	108		132		202	101	98.8	120		127			105	193	127		110
	Mean	121.0	187.3	96.4	119.1	127.0	126.4	114.2	109.0	131.5	132.0	174.0	202.0	104.8	98.2	120.0	119.5	127.9	151.7	102.7	102.8	207.4	123.8	#DIV/0!	109.8

Table C-2. Bicarbonate results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Bicarbonate	146	178	108	147			142						127				152	174	120		254			
spring-10	Bicarbonate	128	188	113	139			136						127				152	170	120		262			
spring-11	Bicarbonate	141	181	112	144			128						122				144	172	115		270			
spring-12	Bicarbonate	132	192	113				132						123				150		121		262			
spring-13	Bicarbonate	148					145															241			
spring-14	Bicarbonate	145	180	110	142		147	127	126					120	105		136	147		116		243	144		126
spring-15	Bicarbonate	136	226	108	136		151	128	124					120	111		139	153			116	234	155		128
spring-16	Bicarbonate	145	214	113	136		144	129	123					121	107		140	151			118	232	140		131
spring-17	Bicarbonate	144	206	107	127		148	129	115					122	104		139	149			121	230			128
spring-18	Bicarbonate	140	200	102	139	147	150	131	124	157		201		120	104		142	150			125	220	137		
spring-19	Bicarbonate	134	226	112	138	150	147	132	120	155		207		120	102		146	149			125	227	140.5	120	131.5
	Mean	139.909	199.1	109.8	138.667	148.5	147.429	131.4	122	156	#DIV/0!	204	#DIV/0!	122.2	105.5	#DIV/0!	140.333	149.7	172	118.4	121	243.182	143.3	120	128.9

Table C-3. Boron results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Boron	158	727	471	202			372						238				485	764	204		1360			
spring-10	Boron	176	766	430	208			374						256				358	475	191		1500			
spring-11	Boron	167	718	422	203			362						247				504	729	197		1610			
spring-12	Boron	166	761	421				347						262				499		192		1270			
spring-13	Boron	146					254															1010			
spring-14	Boron	166	763	423	204		276	378	231					266	188		234	501		200		1030	491		220
spring-15	Boron	176	818	402	240		286	342	229					258	210		282	454			229	864	500		249
spring-16	Boron	172	840	420	200		279	373	236					257	195		243	508			209	938	470		220
spring-17	Boron	176	865	428	211		284	396	231					279	200		261	519			219	864			236
spring-18	Boron	179	834	381	219	253	287	405	233	545		780		284	198		254	517			221	843	459		
spring-19	Boron	178	855	446	214	241	280	396	231	535		768		265	193		257	535			212	864	459		232
spring-20	Boron	172	829	388	215	230	292	389	253		541		762	268	189	252		521			214	817	525		233
	Mean	169.3	797.8	421.1	211.6	241.3	279.8	375.8	234.9	540.0	541.0	774.0	762.0	261.8	196.1	252.0	255.2	491.0	656.0	196.8	217.3	1080.8	484.0	#DIV/0!	231.7

Table C-4. Calcium results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Calcium	18.7	3.62	12	23.3			36.1						8				18	7.36	18.4		36.3			
spring-10	Calcium	18.9	2.96	11.5	21.3			34.7						7.91				16.9	6.66	18.2		55.8			
spring-11	Calcium	19.4	2.87	11.6	22.1			37						7.2				17.7	7.12	19.4		60.7			
spring-12	Calcium	19.7	3.73	11.6				36.3						8.15				17.9		20.6		34.1			
spring-13	Calcium	18.7					19.9															22.7			
spring-14	Calcium	19.5	3.01	11.2	20.7		20.1	39.9	18.1					8.39	6.99		30.5	17.4		21.1		21.2	19.1		20.5
spring-15	Calcium	20.7	5.27	12.2	22.4		20.7	41.3	21.6					8.56	8.08		34.4	19.1			23.2	19.8	22.4		22.1
spring-16	Calcium	21.4	4.11	12.1	21		21.7	42.5	19.2					8.03	6.76		34.5	18.4			24.5	18.6	19.4		22.4
spring-17	Calcium	20.4	3.66	11.9	20.9		20.5	43.2	12.4					8.39	6.25		33.5	18			23.1	14.7			22.1
spring-18	Calcium	18.6	3.36	10.1	19.6	26.1	19.9	42.7	16.9	19.9		23.2		8.62	5.99		30.9	17.5			21.6	13.1	17.2		
spring-19	Calcium	19.9	3.97	11.3	19.9	27.7	21.2	44.6	14.8	20.5		23.9		8.61	5.48		33.1	17.9			22.2	13.5	17.95	22	21.7
spring-20	Calcium	19.8	4.12	10.1	20.3	27.2	20.9	44.5	22.3		20		29.4	8.12	5.02	33.2		18.2			21.3	12.8	19.2		21.1
	Mean	19.6	3.7	11.4	21.2	27.0	20.6	40.3	17.9	20.2	20.0	23.6	29.4	8.2	6.4	33.2	32.8	17.9	7.0	19.5	22.7	26.9	19.2	22.0	21.7

Table C-5. Carbonate results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Carbonate		11	3																					
spring-10	Carbonate	1.2	8.9	1.7	0.9			0.6						0.8				1.3	2.1	1.2		0.8			
spring-11	Carbonate	0.7	7.6	1.1	0.7			0.6						1.1				0.9	0.7	0.7		0.9			
spring-12	Carbonate	0.9	10.7	1.8										0.8				1		0.8		0.8			
spring-13	Carbonate	1					0.6															1.4			
spring-14	Carbonate	1	13.9	2.5	1		0.9	0.6	1.3					1.3	5.7		0.9	1.1		0.9		1.2	1.1		1
spring-15	Carbonate	0.9	7.2	1.7	0.8		0.8	0.6	0.6					0.9	3.1		0.5	1			0.6	1.2	0.8		0.7
spring-16	Carbonate	0.9	10.9	1.4	0.7		0.8	0.6	0.8					1	4		0.5	1.2			0.6	1.6	0.9		0.7
spring-17	Carbonate	0.8	7	1.6	0.5		0.6	0.5	4					0.7	5.1		0.6	0.9			0.7	1.4			0.8
spring-18	Carbonate	0.7	11	1.7	0.9	0.9	0.6	0.6	1.6	1.4		1.1		0.6	4.8		0.7	1.1			0.9	1.9	1.2		
spring-19	Carbonate	1.1	7.9	1.9	1.1	0.8	0.7	0.5	2.1	0.9		1.3		0.6	6.5		0.8	0.9			1	1.9	1.1		1.1
	Mean	0.9	9.6	1.8	0.8	0.9	0.7	0.6	1.7	1.2	#DIV/0!	1.2	#DIV/0!	0.9	4.9	#DIV/0!	0.7	1.0	1.4	0.9	0.8	1.3	1.0	#DIV/0!	0.9

Table C-6. Chloride results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Chloride	42.8	382	92.8	69.2			170						66.3				83.8	79.2	64.2		268			
spring-10	Chloride	60.9	393	96.6	62.5			179						68.5				84.6	82.9	66.9		393			
spring-11	Chloride	41.7	388	96.1	67			188						69.3				96.3	81.1	67.7		417			
spring-12	Chloride	60.6	392	95.9				181						69.1				85.4		71.8		262			
spring-13	Chloride	41.7					70.6															196			
spring-14	Chloride	43.7	403	93.6	58.2		70.3	191	56.2					70.8	57.8		115	82		76.6		183	85		66
spring-15	Chloride	46.9	398	92	58.1		71.7	189	63.6					72.2	59.9		109	83.4			86.7	149	97.8		68.2
spring-16	Chloride	44.1	394	92.7	58.3		71.7	198	58.2					71.5	59.5		108	82.5			82.3	152	83		68.2
spring-17	Chloride	47.8	408	94.8	56.9		70.7	206	57.4					70.7	58.5		118	81.7			76.9	130			67.3
spring-18	Chloride	44.7	410	84	57.2	81.3	71.1	202	56.4	116		168		71.9	58.4		115	82.1			74.7	116	78.8		
spring-19	Chloride	57.4	404	93.4	57.3	85.3	73.7	178	57.2	115		169		72.3	58.3		117	82.7			74.4	107	80.4	78	67.15
spring-20	Chloride	41.3	403	81.9	56.8	82.9	72.2	202	63.3		113		188	70.7	57.2	116		83.6			70.5	104	83.5		64.8
	Mean	47.8	397.7	92.2	60.2	83.2	71.5	189.5	58.9	115.5	113.0	168.5	188.0	70.3	58.5	116.0	113.7	84.4	81.1	69.4	77.6	206.4	84.8	78.0	66.9

Table C-7. Fluroide results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Fluoride	0.49	1.56	0.93	0.75			0.87						1.72				1.61	2.77	0.63		1.52			

spring-10	Fluoride	0.56	1.69	0.98	0.82			0.85						1.78				1.69	2.93	0.67		1.53			
spring-11	Fluoride	0.52	1.59	0.98	0.79			0.83						1.69				1.61	2.81	0.67		1.43			
spring-12	Fluoride	0.52	1.59	0.98				0.81						1.71				1.61		0.65		1.67			
spring-13	Fluoride	0.45					0.85															1.8			
spring-14	Fluoride	0.53	1.61	1.02	0.78		0.91	0.87	0.77					1.89	0.75		0.68	1.7		0.64		2.28	1.3		0.74
spring-15	Fluoride	0.48	1.48	0.94	0.72		0.9	0.76	0.73					2	0.69		0.6	1.77			0.63	1.91	1.27		0.7
spring-16	Fluoride	0.52	1.48	0.97	0.74		0.89	0.78	0.76					1.88	0.73		0.6	1.79			0.66	2.25	1.29		0.74
spring-17	Fluoride	0.47	1.51	0.97	0.72		0.85	0.77	0.67					1.8	0.69		0.61	1.71			0.62	2.36			0.71
spring-18	Fluoride	0.46	1.54	0.87	0.71	0.69	0.83	0.72	0.7	0.7		1.64		1.78	0.72		0.6	1.7			0.6	2.34	1.23		
spring-19	Fluoride	0.48	1.57	0.98	0.74	0.69	0.86	0.61	0.7	0.82		1.71		1.7	0.72		0.63	1.66			0.64	2.17	2.33	0.6	0.72
spring-20	Fluoride	0.48	1.58	0.85	0.75	0.66	0.89	0.73	0.76		0.83		1.49	1.84	0.66	0.63		1.79			0.61	2.28	1.25		0.7
	Mean	0.5	1.6	1.0	0.8	0.7	0.9	0.8	0.7	0.8	0.8	1.7	1.5	1.8	0.7	0.6	0.6	1.7	2.8	0.7	0.6	2.0	1.4	0.6	0.7

Table C-8. Iron results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Iron	2.8	130	4.4	13.1			26.6						14.2				34.4	3.4	7.7		27.3			
spring-10	Iron	-6	-6	-6	17.3			79.1						27.6				4.5	-6	4		73.9			
spring-11	Iron	-3.2	14.7	-3.2	-3.2			49						101				8.3	-3.2	-3.2		119			
spring-12	Iron	-3.2	-6.4	-3.2				61.1						16.4				5.7		13.5		57.7			
spring-13	Iron	6.9					14.5															96.6			
spring-14	Iron	-4	-8	-4	9.8		13.3	57.8	31.1					24.4	-4		6.9	8.5		6.6		83.1	5.3		4.9
spring-15	Iron	42.3	9	-4	14.8		7.5	31.5	10.3					12.9	5.7		13.2	10.2			32.7	43.2	4.4		10
spring-16	Iron	6.2	-8	-4	15.9		-8	66.5	12.3					53.7	-4		190	-8			5	22	-4		-4
spring-17	Iron	6.6	12.2	-5	17		-5	42.2	71.7					11.6	-5		5	-5			17.4	65			5.3
spring-18	Iron	-5	-10	-5	21.5	-5	-5	73	75	118		14.3		23.4	-5		-5	-5			12.4	87.1	-5		
spring-19	Iron	-10	-20	-10	12.1	-10	-10	48.4	176	18.2		-10		19.5	-10		10.8	-10			-10	61.5	-30	75	745
spring-20	Iron	-10	-20	-10	29.8	-10	13.4	66.1	-10		104		58	34.3	-10	16.2		-10			22.8	56.4	-10		-10
	Mean	2.0	8.0	-4.5	14.8	-8.3	2.6	54.7	52.3	68.1	104.0	2.2	58.0	30.8	-4.6	16.2	36.8	3.1	-1.9	5.7	13.4	66.1	-6.6	75.0	125.2

Table C-9. Magnesium results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Magnesium	4.16	1.59	3.84	5.58			11						1.51				3.17	4.41	3.98		13.4			
spring-10	Magnesium	3.67	1.31	3.36	4.56			11.2						1.51				2.76	1.24	3.5		21			
spring-11	Magnesium	4.2	1.28	3.7	5			12						1.46				3.07	1.39	3.98		22.8			
spring-12	Magnesium	4.27	1.57	3.72				11.7						1.65				3.16		4.27		12.3			
spring-13	Magnesium	4.27					3.85															8.63			
spring-14	Magnesium	4.31	1.38	3.69	4.7		4.19	12.8	4.84					1.66	0.621		7.65	3.12		4.39		7.6	3.46		3.95
spring-15	Magnesium	4.55	2.04	3.8	5.16		4.17	13	5.25					1.68	0.797		8.2	3.7			4.61	7.03	4.06		4.15
spring-16	Magnesium	4.38	1.78	3.65	4.92		4.2	13	4.99					1.61	0.575		8.01	3.15			4.57	6.26	3.28		4.17
spring-17	Magnesium	4.2	1.7	3.53	4.66		4.05	13.2	3.55					1.64	0.506		7.79	2.97			4.28	5.01			3.91
spring-18	Magnesium	4.05	1.77	3.13	4.54	5.17	3.81	14.6	4.55	5.1		7.21		1.66	0.46		7.9	2.98			4.3	4.82	3.07		
spring-19	Magnesium	3.92	1.9	3.52	4.37	5.29	4.13	14.3	4.21	4.86		6.96		1.66	0.408		7.77	2.9			4.24	4.54	3.085	4.3	4.05
spring-20	Magnesium	4.12	2.03	3.21	4.71	5.38	4.22	14.4	5.65		4.91		8.6	1.58	0.356	7.76		3.06			4.17	4.44	3.35		3.88
	Mean	4.2	1.7	3.6	4.8	5.3	4.1	12.8	4.7	5.0	4.9	7.1	8.6	1.6	0.5	7.8	7.9	3.1	2.3	4.0	4.4	9.8	3.4	4.3	4.0

Table C-10. pH results and upper confidence interval test

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	pH	8	8.8	8.3	7.8			7.7						8.1				8	8.1	8		7.7			
spring-10	pH	8.1	8.8	8.3	8			7.8						8				8.1	8.2	8.2		7.6			
spring-11	pH	7.9	8.8	8.3	7.9			7.8						8.2				8	8.1	8		7.6			
spring-12	pH	8	8.8	8.4				7.9						8				8		8		7.6			
spring-13	pH	8					7.9															7.9			
spring-14	pH	8.1	9	8.6	8.1		8	7.9	8.3					8.2	9		8	8.1		8.1		7.9	8.1		8.1
spring-15	pH	8	8.6	8.4	8		7.9	7.8	7.9					7.9	8.6		7.7	8			7.9	7.8	7.9		7.9
spring-16	pH	8.1	8.8	8.5	8.2		7.8	7.8	8.2					8.3	8.7		7.8	8			8	7.9	8		8
spring-17	pH	8	8.6	8.4	7.8		7.8	7.8	8.7					8	9		7.9	8			8.1	8			8.1
spring-18	pH	7.9	8.8	8.4	8	8	7.8	7.8	8.3	8.2		7.9		7.9	8.8		8	8.1			8	8.1	8.1		
spring-19	pH	8.1	8.7	8.4	8.2	7.9	7.9	7.8	8.4	8		7.8		8	8.9		7.8	8.2			8.1	8.1	8.16	8.08	8.205
spring-20	pH	8.1	8.7	8.4	8.35	8.05	8	7.9	8.05		8.1		8	8.35	8.95	7.9		8.25			8.05	8.25	8.05		8.05
	Mean	8.0	8.8	8.4	8.0	8.0	7.9	7.8	8.3	8.1	8.1	7.9	8.0	8.1	8.9	7.9	7.9	8.1	8.1	8.1	8.0	7.9	8.1	8.1	8.1

Table C-11. Potassium results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Potassium	3.97	2.7	4.02	4.87			4.87						3.28				4.18	2.53	4.44		4.58			
spring-10	Potassium	3.98	2.63	3.85	4.67			4.77						3.38				3.98	2.36	4.21		5.28			
spring-11	Potassium	3.74	2.74	3.68	4.48			5.07						3.22				3.92	2.42	4.17		5.49			
spring-12	Potassium	3.96	2.44	3.59				4.89						3.16				3.97		4.35		4.2			
spring-13	Potassium	3.9					4.59															3.47			
spring-14	Potassium	3.96	2.68	3.76	4.51		4.58	5.06	4.06					3.29	2.05		5.82	3.91		4.46		3.46	3.92		4.44
spring-15	Potassium	4.08	3.11	3.81	4.73		4.82	5.26	4.27					3.62	2.19		6.16	4.14			4.7	3.56	4.37		4.78
spring-16	Potassium	4.22	3.19	3.89	4.82		5.07	5.52	4.25					3.58	1.89		6.06	4.19			4.72	3.51	4.01		4.81
spring-17	Potassium	3.92	2.87	3.72	4.48		4.82	5.27	3.85					3.41	1.67		5.82	3.97			4.32	3.12			4.57
spring-18	Potassium	4.03	3.5	3.39	4.57	5.26	4.62	5.53	4.19	4.07		3.87		3.61	1.69		5.94	4.08			4.46	3.24	4.09		
spring-19	Potassium	3.78	2.76	3.68	4.51	5.28	4.83	5.29	3.91	3.9		3.62		3.45	1.55		5.83	3.95			4.31	2.92	3.83		4.79
spring-20	Potassium	3.88	2.79	3.34	4.39	5.02	4.86	5.26	4.1		3.8		3.97	3.29	1.4	5.81		3.96			4.33	2.96	3.89		4.62
	Mean	4.0	2.9	3.7	4.6	5.2	4.8	5.2	4.1	4.0	3.8	3.7	4.0	3.4	1.8	5.8	5.9	4.0	2.4	4.3	4.5	3.8	4.0	#DIV/0!	4.7

Table C-12. Sodium results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Sodium	75	434	153	80.5			122						88.5				99.5	119	75.7		265			
spring-10	Sodium	77	408	136	68.4			106						83.9				90.4	104	73.2		276			
spring-11	Sodium	72.3	438	151	80.4			124						90				99.9	118	73.9		335			
spring-12	Sodium	84.9	426	142				118						89.5				99.5		79.7		247			
spring-13	Sodium	71.3					94.2															218			
spring-14	Sodium	75.5	448	152	77.2		93.9	130	67.5					97	95.1		90.9	102		78.1		221	100		73.7
spring-15	Sodium	79.9	498	155	83.5		94.8	131	69.8					96.3	99.4		103	110			88.3	227	114		81.1
spring-16	Sodium	83.4	474	156	77.9		102	130	70.8					95	96.2		98.1	104			88	210	102		78.9
spring-17	Sodium	73.8	444	144	71.1		94.4	130	74.9					93.6	91.7		94.4	98.6			79.1	183			74.2
spring-18	Sodium	76.2	470	135	74.9	87.3	94.2	133	72.6	133		187		96.6	95.3		94	104			81.8	182	97.7		
spring-19	Sodium	80.9	453	148	74.4	87.8	93.9	131	70.9	126		180		94.1	92.3		94.4	101			79.2	178	94.3	77	76.4
spring-20	Sodium	72	455	133	76.1	86.7	96.6	130	72.3		128		197	94.9	92.3	93.3		102			77.4	172	101		74.3
	Mean	76.9	449.8	145.9	76.4	87.3	95.5	125.9	71.3	129.5	128.0	183.5	197.0	92.7	94.6	93.3	95.8	101.0	113.7	76.1	82.3	226.2	101.5	77.0	76.4

Table C-13. Specific Conductance results and upper confidence interval test (µS/cm)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Specific Conductance	491.5	2120	840	624			920.5						518.5				613.5	608.5	505.5		1575			
spring-10	Specific Conductance	537	2110	828	520.5			894.5						510.5				598.5	597.5	501.5		1960			

spring-11	Specific Conductance	475.5	2090	833.5	553			890.5						491.5				603	596	493.5		2110			
spring-12	Specific Conductance	537	2135	825				887.5						504				604		526.5		1480			
spring-13	Specific Conductance	504.5					590															1290			
spring-14	Specific Conductance	474	2210	819.5	501.5		589.5	937	462					502.5	477.5		689	597.5		530		1190	621.5		519.5
spring-15	Specific Conductance	494.5	2350	841.5	510		595	969.5	493					519	485		697	600			571.5	1150	682.5		515.5
spring-16	Specific Conductance	483.5	2330	836.5	508		593.5	979.5	472.5					510	488		710.5	604.5			569	1105	603		521
spring-17	Specific Conductance	542.5	2275	828.5	508		594.5	999.5	470					519.5	488.5		717.5	602.5			560.5	979			524.5
spring-18	Specific Conductance	499.5	2200	718.5	494	599.5	596	1015	465.5	771		1045		519.5	482.5		699.5	604.5			542	944	585		
spring-19	Specific Conductance	514	2265	842	505.5	634	609	1025	462.5	782		1055		526.5	488.5		718.5	611			550.5	949.5	591	546	517.667
spring-20	Specific Conductance	478	2245	718.5	492.5	603.5	602	1010	497.5		756.5		1140	513.5	476	711		605.5			521.5	876.5	636		508.5
	Mean	502.6	2211.8	812.0	521.7	612.3	596.2	957.1	474.7	776.5	756.5	1050.0	1140.0	512.3	483.7	711.0	705.3	604.0	600.7	511.4	552.5	1300.8	619.8	546.0	517.8

Table C-14.Sulfate results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	Sulfate	49.8	261	149	40.5			47.4						21.9				32.9	20.8	34.3		144			
spring-10	Sulfate	58.5	273	154	38.7			44.8						21.4				33.3	20.4	34.3		171			
spring-11	Sulfate	48.6	266	151	37.6			44.2						20.5				151	19.8	34		189			
spring-12	Sulfate	55.4	260	147				42.8						20.3				31.6		33.5		146			
spring-13	Sulfate	49.5					49.1															120			
spring-14	Sulfate	51.5	306	154	35.1		50.1	46.9	30.4					21.7	35.8		43.9	34.5		36.3		119	40.2		30
spring-15	Sulfate	52.5	306	146	41.2		50	45.2	31.8					21.4	36.2		42.4	34.5			36.1	100	42.2		29.9
spring-16	Sulfate	52	300	147	39.4		50.1	47.2	30.2					21	36.5		40.3	34.6			37.1	108	38		29.8
spring-17	Sulfate	52.6	301	150	39.6		48.7	48.1	24.6					20.9	35.5		44.6	33.8			37.1	96.7			29.5
spring-18	Sulfate	51.8	297	133	37.5	33.8	49.1	46.2	28.4	64.3		80.6		21.1	35.8		44.1	34.2			37	89.5	36.3		
spring-19	Sulfate	58.1	293	148	38.7	34.5	50.2	39.9	27.3	64.8		83.1		21.4	35.6		43.9	34.5			37	86	34.6	34	28.3
spring-20	Sulfate	49.4	290	129	39.1	33.8	49.9	47.2	31.2		63.4		79.9	20.3	35.1	41.5		34.1			36.3	83.7	36.6		29.2
	Mean	52.5	286.6	146.2	38.7	34.0	49.7	45.4	29.1	64.6	63.4	81.9	79.9	21.1	35.8	41.5	43.2	44.5	20.3	34.5	36.8	121.1	38.0	34.0	29.5

Table C-15-Total Dissolved Solids results and upper confidence interval test (mg/L)

Season-Yr	Simple_Name	11H3	24B1	24D1	25K2	25M2	26F1	30R1	31B1	32N01S	32N1	32P03S	32P3	34B1	36A1(MW-2B)	36A2 (MW-2A)	36A2(MW-2A)	36C2	36D3	36H1	36H2	42A8	USG-4	USG-5	USG-6
spring-09	TDS	287	1230	508	338			523						310				359	364	307		943			
spring-10	TDS	322	1260	492	322			516						310				363	349	299		1170			
spring-11	TDS	278	1240	490	325			506						284				350	357	289		1240			
spring-12	TDS	320	1260	484				502						295				355		309		891			
spring-13	TDS	276					375															747			
spring-14	TDS	285	1320	502	310		361	552	284					321	312		409	363		338		731	388		318
spring-15	TDS	283	1390	489	303		342	553	291					308	296		409	359			334	674	406		302
spring-16	TDS	280	1350	484	291		356	559	271					303	298		399	362			334	654	362		309
spring-17	TDS	298	1350	495	323		347.5	567	283					300	303		412	357			328	594			314
spring-18	TDS	288	1310	439	304	352	342	565	274	469		612		305	291		396	350			323	564	343		
spring-19	TDS	322	1310	503	309	373	365	583	273	477		621		322	307		423	368			331	575	361		317
spring-20	TDS	289	1280	431	296	367	366	572	288		474		697	305	303	420		369			324	555	372		309
	Mean	294.6	1307.0	480.9	309.2	364.0	356.8	547.5	280.6	473.0	474.0	616.5	697.0	305.3	301.4	420.0	408.0	359.6	353.0	308.8	329.0	763.2	372.0	#DIV/0!	311.5
	20% of mean	58.9	261.4	96.2	61.8	72.8	71.4	109.5	56.1	94.6	94.8	123.3	139.4	61.1	60.3	84.0	81.6	71.9	70.6	61.8	65.8	152.6	74.4	#DIV/0!	62.3
	years exceeding mean +20%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
		5.6	27.0	49.9	13.2	-3.0	-9.2	-24.5	-7.4	473.0	0.0	616.5	0.0	0.3	-1.6	0.0	408.0	-9.4	353.0	308.8	5.0	208.2	0.0	#DIV/0!	2.5
		2%	2%	10%	4%	-1%	-3%	-4%	-3%	100%	0%	100%	0%	0%	-1%	0%	100%	-3%	100%	100%	2%	27%	0%	#DIV/0!	1%

APPENDIX D

Pumping Data 2019-2020

Plaster City Water Usage

	Total Wells	#4 Well	#5 Well	#6 Well
1/7/2019		4138003.0	124555055.0	170029058.0
Acreft/wk	5.1	1.8	1.6	1.7
1/14/2019		4781516.0	125178234.0	170663359.0
Acreft/wk	5.8	2.0	1.9	1.9
1/21/2019		5557797.0	125922575.0	171382726.0
Acreft/wk	6.9	2.4	2.3	2.2
1/28/2019		6371329.0	126775164.0	172202185.0
Acreft/wk	7.6	2.5	2.6	2.5
2/4/2019		7219652.0	127555486.0	173055589.0
Acreft/wk	7.6	2.6	2.4	2.6
2/11/2019		8107174.0	128349058.0	173977844.0
Acreft/wk	8.0	2.7	2.4	2.8
2/18/2019		8884697.0	129115199.0	174812621.0
Acreft/wk	7.3	2.4	2.4	2.6
2/25/2019		9814655.0	129983214.0	175746352.0
Acreft/wk	8.4	2.9	2.7	2.9
3/4/2019		10463979.0	130620996.0	176425045.0
Acreft/wk	6.0	2.0	2.0	2.1
3/11/2019		11396195.0	131437325.0	177312637.0
Acreft/wk	8.1	2.9	2.5	2.7
3/18/2019		12058945.0	132103111.0	177979812.0
Acreft/wk	6.1	2.0	2.0	2.0
3/25/2019		12788105.0	132806657.0	178717208.0
Acreft/wk	6.7	2.2	2.2	2.3
4/1/2019		13662110.0	133561858.0	179556475.0
Acreft/wk	7.6	2.7	2.3	2.6
4/8/2019		14532040.0	134375466.0	180472435.0
Acreft/wk	8.0	2.7	2.5	2.8
4/15/2019		15408569.0	135162962.0	181323454.0
Acreft/wk	7.7	2.7	2.4	2.6
4/22/2019		16313095.0	136039745.0	182194561.0
Acreft/wk	8.1	2.8	2.7	2.7
4/29/2019		17053808.0	136831435.0	182946683.0
Acreft/wk	7.0	2.3	2.4	2.3
5/6/2019		17925102.0	137771183.0	183859563.0
Acreft/wk	8.4	2.7	2.9	2.8
5/13/2019		18844268.0	138645648.0	184780718.0
Acreft/wk	8.3	2.8	2.7	2.8
5/20/2019		19801651.0	139473250.0	185669627.0
Acreft/wk	8.2	2.9	2.5	2.7
5/27/2019		20862125.0	139473250.0	186618745.0
Acreft/wk	6.2	3.3	0.0	2.9
6/3/2019		22327385.0	139473250.0	187905729.0
Acreft/wk	8.4	4.5	0.0	3.9
6/10/2019		23342458.0	139473250.0	188765108.0

Acreft/wk	5.8	3.1	0.0	2.6
6/17/2019		24872385.0	139473250.0	190165433.0
Acreft/wk	9.0	4.7	0.0	4.3
6/24/2019		26460923.0	139473250.0	191564883.0
Acreft/wk	9.2	4.9	0.0	4.3
7/1/2019		27756425.0	139473250.0	192804445.0
Acreft/wk	7.8	4.0	0.0	3.8
7/8/2019		28991061.0	139473250.0	193860177.0
Acreft/wk	7.0	3.8	0.0	3.2
7/15/2019		30986925.0	139473250.0	195255255.0
Acreft/wk	10.4	6.1	0.0	4.3
7/22/2019		32402055.0	139473250.0	196415415.0
Acreft/wk	7.9	4.3	0.0	3.6
7/29/2019		33640835.0	140001028.0	197632946.0
Acreft/wk	9.2	3.8	1.6	3.7
8/5/2019		34674719.0	141689895.0	198604139.0
Acreft/wk	11.3	3.2	5.2	3.0
8/12/2019		35635690.0	142706752.0	199607692.0
Acreft/wk	9.2	2.9	3.1	3.1
8/19/2019		36593505.0	143680055.0	200599794.0
Acreft/wk	9.0	2.9	3.0	3.0
8/26/2019		37498849.0	144558682.0	201651275.0
Acreft/wk	8.7	2.8	2.7	3.2
9/2/2019		38086024.0	145114357.0	202028370.0
Acreft/wk	4.7	1.8	1.7	1.2
9/9/2019		38832676.0	145844871.0	202769019.0
Acreft/wk	6.8	2.3	2.2	2.3
9/16/2019		39429268.0	146397269.0	203360565.0
Acreft/wk	5.3	1.8	1.7	1.8
9/23/2019		40272972.0	147278804.0	204206995.0
Acreft/wk	7.9	2.6	2.7	2.6
9/30/2019		41055482.0	147955049.0	204972026.0
Acreft/wk	6.8	2.4	2.1	2.3
10/7/2019		41849455.0	148716480.0	205833091.0
Acreft/wk	7.4	2.4	2.3	2.6
10/14/2019		42515721.0	149326287.0	206491946.0
Acreft/wk	5.9	2.0	1.9	2.0
10/21/2019		43370065.0	150122913.0	207286062.0
Acreft/wk	7.5	2.6	2.4	2.4
10/28/2019		44181951.0	150895642.0	208095526.0
Acreft/wk	7.3	2.5	2.4	2.5
11/4/2019		45059834.0	151623824.0	209018049.0
Acreft/wk	7.8	2.7	2.2	2.8
11/11/2019		45888941.0	152394626.0	209798187.0
Acreft/wk	7.3	2.5	2.4	2.4
11/18/2019		46648414.0	153082670.0	210525897.0
Acreft/wk	6.7	2.3	2.1	2.2

11/25/2019		47086211.0	153489772.0	211019303.0
Acreft/wk	4.1	1.3	1.2	1.5
12/2/2019		47882811.0	154254002.0	211826204.0
Acreft/wk	7.3	2.4	2.3	2.5
12/9/2019		48735937.0	155035139.0	212690062.0
Acreft/wk	7.7	2.6	2.4	2.7
12/16/2019		49724713.0	155984056.0	213622430.0
Acreft/wk	8.8	3.0	2.9	2.9
12/23/2019		50397129.0	156539312.0	214304855.0
Acreft/wk	5.9	2.1	1.7	2.1
12/30/2019		51019652.0	157163323.0	214939971.0
Acreft/wk	5.8	1.9	1.9	1.9
1/6/2020		51287684.0	157799760.0	215656731.0
Acreft/wk	5.0	0.8	2.0	2.2
1/13/2020		51288122.0	158589307.0	216502600.0
Acreft/wk	5.0	0.0	2.4	2.6
1/20/2020		51871541.0	159130270.0	217004854.0
Acreft/wk	5.0	1.8	1.7	1.5
1/27/2020		52592028.0	159832962.0	217725593.0
Acreft/wk	6.6	2.2	2.2	2.2
2/3/2020		53267244.0	160450927.0	218471854.0
Acreft/wk	6.3	2.1	1.9	2.3
2/10/2020		53991887.0	161139523.0	219193903.0
Acreft/wk	6.6	2.2	2.1	2.2
2/17/2020		54739677.0	161859497.0	220007663.0
Acreft/wk	7.0	2.3	2.2	2.5
2/24/2020		55506984.0	161945278.0	220250844.0
Acreft/wk	3.4	2.4	0.3	0.7
3/2/2020		56345517.0	161983817.0	221508316.0
Acreft/wk	6.6	2.6	0.1	3.9
3/9/2020		56585981.0	162006258.0	222310802.0
Acreft/wk	3.3	0.7	0.1	2.5
3/16/2020		56588534.0	162157234.0	223321678.0
Acreft/wk	3.6	0.0	0.5	3.1
3/23/2020		57604686.0	162344991.0	224287567.0
Acreft/wk	6.7	3.1	0.6	3.0
3/30/2020		58446702.0	162628234.0	225198994.0
Acreft/wk	6.3	2.6	0.9	2.8
4/6/2020		59209165.0	162878036.0	226031847.0
Acreft/wk	5.7	2.3	0.8	2.6
4/13/2020		59848279.0	163589364.0	226744883.0
Acreft/wk	6.3	2.0	2.2	2.2
4/20/2020		60548425.0	164244698.0	227449178.0
Acreft/wk	6.3	2.1	2.0	2.2
4/27/2020		61172174.0	164850625.0	228085920.0
Acreft/wk	5.7	1.9	1.9	2.0
5/4/2020		61804602.0	165361698.0	228692964.0

Acreft/wk	5.4	1.9	1.6	1.9
5/11/2020		62359122.0	165925906.0	229290521.0
Acreft/wk	5.3	1.7	1.7	1.8
5/18/2020		63020818.0	166548825.0	229972582.0
Acreft/wk	6.0	2.0	1.9	2.1
5/25/2020		63734695.0	167197528.0	230710359.0
Acreft/wk	6.4	2.2	2.0	2.3
6/1/2020		64557247.0	168055095.0	231541398.0
Acreft/wk	7.7	2.5	2.6	2.6
6/8/2020		65400505.0	168919628.0	232471937.0
Acreft/wk	8.1	2.6	2.7	2.9
6/15/2020		66261517.0	169755358.0	233382843.0
Acreft/wk	8.0	2.6	2.6	2.8
6/22/2020		67075589.0	170554371.0	234146965.0
Acreft/wk	7.3	2.5	2.5	2.3
6/29/2020		67805037.0	171208570.0	234855950.0
Acreft/wk	6.4	2.2	2.0	2.2

APPENDIX E

U.S Customs and Border Protection Response to Imperial County

U.S. Customs and Border Protection
1300 Pennsylvania Avenue NW
Washington, D.C. 20229

August 5, 2020

Mr. Adam G. Crook
County Counsel
Imperial County
940 West Main Street, Suite 205
El Centro, CA 92243

Re: Imperial County Border Barrier Construction – Groundwater Pumping

Dear Mr. Crook:

Thank you for your letter dated July 13, 2020, which you sent on behalf of Imperial County (the "County") concerning the groundwater wells that U.S. Customs and Border Protection ("CBP"), in conjunction with the U.S. Army Corps of Engineers ("USACE), Bureau of Land Management ("BLM") and federal contractors, have drilled within the Ocotillo-Coyote Groundwater Basin (the "Basin") in support of border barrier projects in United States Border Patrol's El Centro Sector.

CBP, with the support and assistance of the Department of Defense and USACE, is executing two border barrier projects in the El Centro Sector (the "Projects"). The first, known as El Centro Project 1, involves the construction of approximately 15 miles of barrier and is situated between the Calexico West Port of Entry and the eastern boundary of the Jacumba Wilderness. The second, known as El Centro Project A, involves the construction of approximately three miles of border barrier within the Jacumba Wilderness. The Secretary of Homeland Security, pursuant to his authority under section 102 of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996, as amended ("IIRIRA"), 8 U.S.C. § 1103 note, has issued waivers for the Projects. *See* 84 Fed. Reg. 21080 (May 15, 2019); 85 Fed. Reg. 14960 (March 16, 2020) (the "Waivers").

Based on your letter, we understand that the County is requesting that CBP and USACE cease and desist all pumping of groundwater from the Basin unless and until CBP obtains certain permits from the County. In support of the County's request, you state that it is the County's position that CBP's groundwater utilization and well operation within the County is subject to, and must be done in compliance with, the Imperial County Groundwater Management Ordinance (Imperial Cnty. Cal. Ordinances tit. 9, div. 22, ch. 1-9) and the corresponding Water Well Regulations (*Id*. tit. 9, div. 21, ch. 1-4) (collectively, the "County Groundwater Laws."). You also assert that the Waivers do not apply to the installation and operation of the wells because they do not apply to "the allocation of groundwater resources" and "the wells are not located within the vicinity of the border." In addition, you request that CBP provide the County with certain information regarding the Projects, including a copy of the Environmental Stewardship Plans, the location of the six groundwater wells, any planned future wells, and data regarding the amount of groundwater that has been pumped from the wells.

For the reasons explained below, CBP respectfully disagrees with the County's legal conclusions regarding application of the County Groundwater Laws and the Waivers to the Projects. CBP therefore does not intend to cease and desist operating groundwater wells in support of the Projects as requested by the County. However, as explained in further detail below, CBP is willing to share certain information with the County regarding CBP's wells and groundwater usage.

Regarding the application of the County Groundwater Laws, all of the groundwater wells at issue are located on federal property within the federal Roosevelt Reservation, which consists of a 60' wide strip of land along the United States' border with Mexico that has been set aside for the express purpose of federal enforcement of customs and immigration laws. CBP is unaware of any applicable law or regulation that would require CBP to obtain permits pursuant to the County Groundwater Laws in order to drill and use groundwater wells located on federal property. A state or municipality may not impose its regulations on a federal agency unless specifically and unambiguously authorized by Congress. *See Hancock v. Train*, 426 U.S. 167, 178 (1976); *see also Lane v. Pena*, 518 U.S. 187, 192 (1996) ("A waiver of the Federal Government's sovereign immunity must be unequivocally expressed in statutory text . . . and will not be implied."). Consistent with the principle of federal sovereign immunity, the County Groundwater Laws recognize that federal agencies are subject to the County ordinance only to the extent authorized by federal law. *See id.* § 92201.04(U) ("'Person' includes any state or local government agency, private corporation, firm, partnership, individual, group of individuals, or, *to the extent authorized by law, any federal agency*.") (emphasis added). In this case, we are unaware of any waiver of federal sovereign immunity that would make CBP's installation or use of groundwater wells on federal property subject to the County Groundwater Laws.

Because the County Groundwater Laws do not apply the wells at issue, the application of the Waivers is not necessarily relevant to the County's assertion that CBP was required to obtain permits. Nevertheless, we note that CBP also respectfully disagrees with the County's assertions regarding the applicability of the Waivers. Because all of the groundwater wells are located in the federal Roosevelt Reservation—a 60' strip of land along the United States – Mexico border—they are clearly "in the vicinity of the United States border." IIRIRA § 102(a). Further, because the groundwater wells support the Projects, the installation and operation of the groundwater wells is not subject to the legal requirements that were set aside by the Waivers.

Although CBP disagrees with the County's legal conclusions regarding the applicability of the County Groundwater Laws and the Waivers, CBP is willing to work with the County and to accommodate some of the County's requests for information. We have also attached the locations of the six groundwater wells and monthly water use for your review. The Environmental Stewardship Plans have not been completed for the El Centro projects, but we will alert the County once the reports are available at www.cbp.gov.

We appreciate the County's concerns, and we hope this information is helpful to you.

Sincerely,

Paul Enriquez
Acquisition, Real Estate, and Environmental Director
Infrastructure Portfolio
Program Management Office Directorate
United States Border Patrol

Enclosures: El Centro Project 1 Well Coordinates; Monthly Water Use, El Centro Project 1, December 2019-June 2020

Enclosure A. El Centro Project 1 Well Coordinates

1. 32°38'5.30"N 115°53'53.88"W
2. 32°38'14.02"N 115°51'59.64"W
3. 32°38'27.77"N 115°48'59.71"W
4. 32°38'36.73"N 115°47'7.74"W
5. 32°38'43.50"N 115°45'27.22"W
6. 32°39'3.90"N 115°40'58.51"W

These coordinates are within ten feet of the actual well locations, due to imprecise GPS technology at the time they were taken.

Two additional wells are slated to be drilled for the El Centro Project A. This construction is ongoing, so coordinates are not confirmed at this time.

Enclosure B. Monthly Water Use, El Centro Project 1, December 2019-June 2020

Water Use (Dec 2019 - June 2020)
El Centro Projects

			Monthly Withdrawal (hundred gallons)											Total Withdrawal, All Wells (hundred gallons)
Well Info	Well	Well 1		Well 2		Well 3		Well 4 (decommissioned)		Well 5 (decommissioned)		Well 6		
	Welll Yield (GPM)	200-250 GPM		200-250 GPM		75-100 GPM		minimal		15-20 GPM		100-150 GPM		
	Depth	400 ft		400 ft		410 ft		410 ft		410 ft		400 ft		
	Start Meter Reading	184,669		129,012		237,134		544,293		244,862		196,923		
		Meter reading	Withdrawal	Meter reading	Withdrawal	Meter reading	Withdrawal	Meter reading	Withdrawal	Meter reading	Withdrawal	Meter reading	Withdrawal	
	12/02/19	N/A		N/A	N/A	243,862	6,728	544,293	0	251,914	7,052		6,323	20,103
	01/08/20	189,384	4,715	133,049	4,037	264,386	20,524	544,814	521	251,915	1	201,737	4,814	34,612
	02/04/20	209,158	19,774	162,257	29,208	288,595	24,209	544,861	47	251,915	0	220,746	19,009	92,247
Date	03/04/20	227,721	18,563	178,045	15,788	310,546	21,951	544,868	7	251,915	0	241,339	20,593	76,902
	04/01/20	237,182	9,461	200,543	22,498	323,245	12,699	544,878	10	251,915	0	253,581	12,242	56,910
	05/13/20	251,870	14,688	271,294	70,751	341,982	18,737	0	0	0	0	287,787	34,206	138,382
	06/08/20	275,183	23,313	292,832	21,538	355,546	13,564	0	0	0	0	304,097	16,310	74,725
	07/01/20	296,161	20,978	313,167	20,335	364,654	9,108	0	0	0	0	325,604	21,507	71,928
	Total withdrawn		111,492		184,155		127,520		585		7,053		135,004	565,809