



**CORTEZ MINE GROUNDWATER AND
SURFACE WATER
MONITORING PLAN**

2021 ANNUAL REPORT
February 25, 2022

**As will be presented on March 23, 2022
at the
Nevada Division of Water Resources
901 South Stewart Street, Suite 2002
Carson City, Nevada 89701-5249**

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

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ELECTRONIC APPENDICES

Included in report packet on a USB storage device and available via PowerBI and SharePoint:

<https://barrickgold.sharepoint.com/sites/NGMAnnualWater/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FNGMAnnualWater%2FShared%20Documents%2FCortez%20Operations%20Groundwater%20and%20Surface%20Water%20Monitoring%20Plan%2F2021&viewid=d9184371%2D408e%2D4bfb%2Da0c2%2D76ac3a6b3f22>

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APPENDICES

APPENDIX A: 2021 Cortez Seep, Spring, and Stream Monitoring Reports

- Included as digital report on USB storage device

APPENDIX B: 2021 Goldrush Seep and Spring Monitoring Annual Report

- Included as digital report on USB storage device

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

1 EXECUTIVE SUMMARY

The following report is the fourth annual submission of the Cortez Mine Groundwater and Surface Water Monitoring Plan (COGSWMP). This report presents and discusses data collected at the Cortez Hills, Crossroads/Pipeline, and Goldrush deposits during the 2021 calendar year to fulfill the requirements set forth in the “Cortez Mine Groundwater and Surface Water Monitoring Plan Update” dated September 5, 2018, and the filing requirements as stated in the State Engineer’s Order 1189 and Permit 77179. Groundwater elevations and surface water flows are examined to assess potential impacts resulting from dewatering and water management activities occurring at the abovementioned sites.

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2 INTRODUCTION

Nevada Gold Mines (NGM) owns and operates the Cortez Mine located in Eureka and Lander counties in the Crescent Valley hydrographic basin of northeastern Nevada and consists of the Gold Acres, Pipeline, Cortez, and Cortez Hills complexes. Portions of these complexes are located on private land owned by NGM as well as public land administered by the U.S. Bureau of Land Management, Battle Mountain District (BLM). Current operations can be divided into the Pipeline and Cortez Hills Areas. The first gold mining activity in the area was conducted at Cortez Gold Acres located in the Pipeline Area in 1935. It wasn't until the 1960s that the Cortez Hills Area was first mined for gold. Most of these original pits and processing facilities are in various stages of reclamation.

Currently at the Cortez Mine, three open pits and one underground mine are in operation. The oldest open pit at the Cortez Mine that is still in operation is in the Pipeline Complex. The Pipeline Pit consists of two now-connected open pits that were first approved in 1996 with additional ore reserves being authorized for mining in 2000 and 2005. Included in the 2005 expansion were modifications to Pipeline's dewatering and infiltration facilities. The hydrogeology at Pipeline is confounded by a highly heterogeneous alluvial aquifer that overlies the ore-bearing carbonate bedrock. East of the Pipeline pits is a third open pit known as Crossroads. The final open pit is the Cortez Hills Open Pit (CHOP) which has been approved for both surface and underground mining since 2008. Although no active mining is currently occurring at CHOP, future mining is expected to occur at Cortez Hills once Northwest Deeps is approved and the infrastructure has been managed accordingly. Open pit mining is expected to resume at Cortez Hills in 2028. The Cortez Hills Underground mine (CHUG) can be accessed via portals in CHOP as well as a portal in the pre-existing F-Canyon Pit. The new Range Front declines also provide access to the deeper sections of CHUG known as Deep South. Dewatering of the Cortez Hills Complex is challenging on account of the highly compartmentalized groundwater in that area. There are currently six hydrogeologic blocks understood to control dewatering activities in the Cortez Hills Area: Main Zone, Cortez Footwall, Falcon, Sage, Pediment, and Lower Zone.

Since the submission of the original Groundwater and Surface Water Monitoring Plan for the Pipeline Gold Project in 1993, Cortez has expanded and now includes additional monitoring locations not included in the original monitoring plan. The current monitoring plan includes only active surface and groundwater monitoring locations.

CORTEZ MINE WATER MANAGEMENT

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3 WATER MANAGEMENT

The Cortez Mine Water Management System (Figure 1) currently consists of a network of 60 pumping wells permitted for uses including mining, milling, dewatering, irrigation, and stock watering. The dewatering network is comprised of dewatering wells, vertical drains, and horizontal drains. Additional wells are used to supply the mines with potable and process water. In addition to these supply wells are pumpback wells for environmental mitigation. The final group of wells supply stock and irrigation water to ranches owned by NGM in Crescent Valley, Carico Lake Valley, and Pine Valley.

The Cortez Mine Water Management System includes three cross-valley pipelines (CVPs) and over 80 miles of distribution lines to move water from the mines to Rapid Infiltration Basins (RIBs), leach pads, standpipes, and irrigation facilities. The CVP-18 pipeline is used to deliver contact water from CHUG and the environmental pumpback wells to lined settling ponds before being consumed by the processing facilities at the Pipeline area. Non-contact water produced at CHOP is conveyed via two CVP-24 pipelines to the Pipeline Area, where it is co-mingled with Pipeline dewatering water and used for infiltration, irrigation, mill supply, dust suppression, and other mining uses. Although there are many different types of non-contact water consumption at the mine sites, the majority of the non-contact water is pumped to RIBs to be returned to the Crescent Valley Groundwater Basin - 054.

3.1 DEWATERING ACTIVITY

The hydrogeologic setting of the Cortez Mine consists of highly compartmentalized aquifers with varying degrees of hydraulic conductivity. The aquifers have been defined as distinct hydrogeologic blocks (Figure 2) and exhibit different water levels and potentiometric surfaces. As such, the dewatering of each block must be discussed independently of the others. However, in total, 42,000 ac-ft of water was produced during 2021 across the entire Cortez Mine property (Table 1a, Table 1b, and Table 1c; Map 1 and Map 2).

3.1.1 Cortez Footwall Hydrogeologic Block

Dewatering of the Cortez Footwall is conducted using dewatering wells DW-09 and DW-10. During 2021, a total of 159 ac-ft was pumped from the block at average rates of approximately 45 and 54 gpm, respectively.

3.1.2 Falcon Hydrogeologic Block

The Falcon Hydrogeologic Block is dewatered via wells DW-12, DW-13, DW-16, DW-18, DW-44, and DW-45. In 2021, DW-18 was held as a standby well whereas the remaining wells produced a total of 5,016 ac-ft. As DW-12, DW-13, and DW-16 pump at average rates of 256, 211, and 5 gpm, respectively, they are much lower producers than DW-44 and DW-45 that pumped at average rates of 1,875 and 762 gpm, respectively.

3.1.3 Lower Zone/Deep South

At Cortez Hills, DW-15 and DW-20 through DW-25 removed a total of 4,023 ac-ft from the Lower Zone in 2021 at an average combined pumping rate of 2,494 gpm.

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3.1.4 Sage Hydrogeologic Block

The Sage Hydrogeologic Block is dewatered using dewatering wells in conjunction with various drains. During the 2019 calendar year, 20 underground drains completed in the Sage Block were utilized to depressurize the CHOP highwall. There were no underground drains installed during 2020 or during 2021. Water from the underground drains were combined into a single pipeline exiting the CHOP portal. From there, the drain water entered the CVP-24 pipeline and was conveyed to RIBs and irrigation. In 2021, a total of 0.18 ac-ft had been pumped from the CHOP portal (WSP-F) whereas 12.85 ac-ft was produced from dewatering well DW-19. An additional 16.15 ac-ft was produced from Sage via well PPW-3, bringing the total 2021 production from the Sage block to 29.18 ac-ft at an average combined rate of 18 gpm.

3.1.5 Pediment Hydrogeologic Block

A network of 13 dewatering wells including DW-33 through 43, DW-46, and DW-47, are completed in the Pediment hydrogeologic block. DW-43 collapsed during 2020, whereas DW-34, DW-39, DW-40, and DW-41 collapsed due to highwall movement in 2021. All collapsed wells are planned to be formally plugged and abandoned. In total, 497 ac-ft was removed from the Pediment Block at an average rate of 308 gpm.

3.1.6 Crossroads Hydrogeologic Block

The Crossroads Pit in the Pipeline Area consists of an alluvial aquifer overlying the deep regional carbonate aquifer. In 2019, 55 vertical drains were utilized to drain alluvial water into the deep carbonate to alleviate pressures in the Crossroads highwall. In 2020, an additional 14 ex-pit drain wells (AW-109 through AW-121) and 3 in-pit drain wells (XD-401 through XD-403) were installed for passive drainage of the alluvial aquifer. In 2021, 2 in-pit drain wells (X80-21040 and X80-21041) and 4 ex-pit drain wells (X80-21030 through X80-21033) were installed. Active dewatering of the alluvial aquifer was conducted via wells AW-71 through AW-82, AW-85, and AW-98, and produced a total of 4,531 ac-ft at an average rate of 2,809 gpm. AW-13 and AW-19 were also utilized in the dewatering efforts and 61 ac-ft was produced from these two wells in 2021. The water produced from these wells is used as make-up water at the Area 30 Heap Leach Facility due to the elevated Profile I constituents. Dewatering of the deep carbonate aquifer was also conducted via wells DB-24, DB-25, DB-27, DB-28, DB-30, DB-31, DB-32, DB-33, DB-35, and DB-36. DB-37 was installed during 2021 and began production in October 2021. DB-22 was deepened, and a pump was installed during 2021; pumping is project to commence in 2022. These DB wells produced a total of 27,069 ac-ft in 2021. The total production from the Crossroads area in 2021 was 31,661 ac-ft.

3.1.7 Contact Water

Contact water is captured by 12 environmental pumpback wells located around the CHOP processing facilities. This water is combined in the CVP-18 pipeline with excess contact water that was used for dust suppression and drilling activities in CHUG. The CHUG water is collected in underground sumps and comingled with natural seepage water prior to entering the CVP-18 pipeline. As it is not currently feasible to distinguish between water provided to the underground, water produced by natural seepage, and the water coming from the pumpback wells; all the contact water is currently considered additional production and is metered via CVP-18. In 2021, a total of 593 ac-ft of contact water was produced from CHUG and the environmental pumpback wells. All of this water was used consumptively at Pipeline.

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3.1.8 Potable and Other Water Production

Potable water is produced by three wells. GVPW-01, located in Grass Valley, provided about 11 ac-ft of potable water to the CHOP Area. POT-2, in Crescent Valley, provided about 4.35 ac-ft of potable water to the Pipeline Area. Finally, M1PW-01 in Crescent Valley supplied 2.73 ac-ft of potable water to the Mill #1 Area. The SF well sends all its water to the Mill #1 Head Tank where the water is consumed for fire suppression or in the underground Metal Removal Plant. In 2021, the total water pumped from the SF well and consumed from the Mill #1 Head Tank was 0.42 ac-ft.

3.2 CONSUMPTION

In 2021, approximately 23% of the water produced at the Cortez Mine was consumed by a combination of mining and milling activities, evaporation, and irrigation. Of the 41,997 ac-ft produced, 9,823 ac-ft was consumed (Table 2).

3.2.1 Mine Consumption

At the Cortez Mine, water is consumed by the mill, dust suppression, or evaporation from various reservoirs and ponds. Mining and milling activities ultimately consumed a total of 1,735 ac-ft during 2021, whereas dust suppression consumed about 1,379 ac-ft. The combined total evaporation from the Cortez Hills Reservoir (CHR), RIBs, and holding ponds was 84 ac-ft. In total, 3,198 ac-ft were consumed by mining activities in the 2021 calendar year.

3.2.2 Ranch Consumption

Of the 41,997 ac-ft of water produced at the Cortez Mine, 6,594 ac-ft, approximately 16% of the total dewatering water produced during 2021, was sent to 15 irrigation pivots and four flood-irrigated pastures at NGM's Dean Ranch. Approximately 430 ac-ft of the irrigation water came from CHOP dewatering activities, whereas the remaining 6,165 ac-ft of irrigation water came from Pipeline and Crossroads dewatering activities.

3.3 INFILTRATION & STORAGE

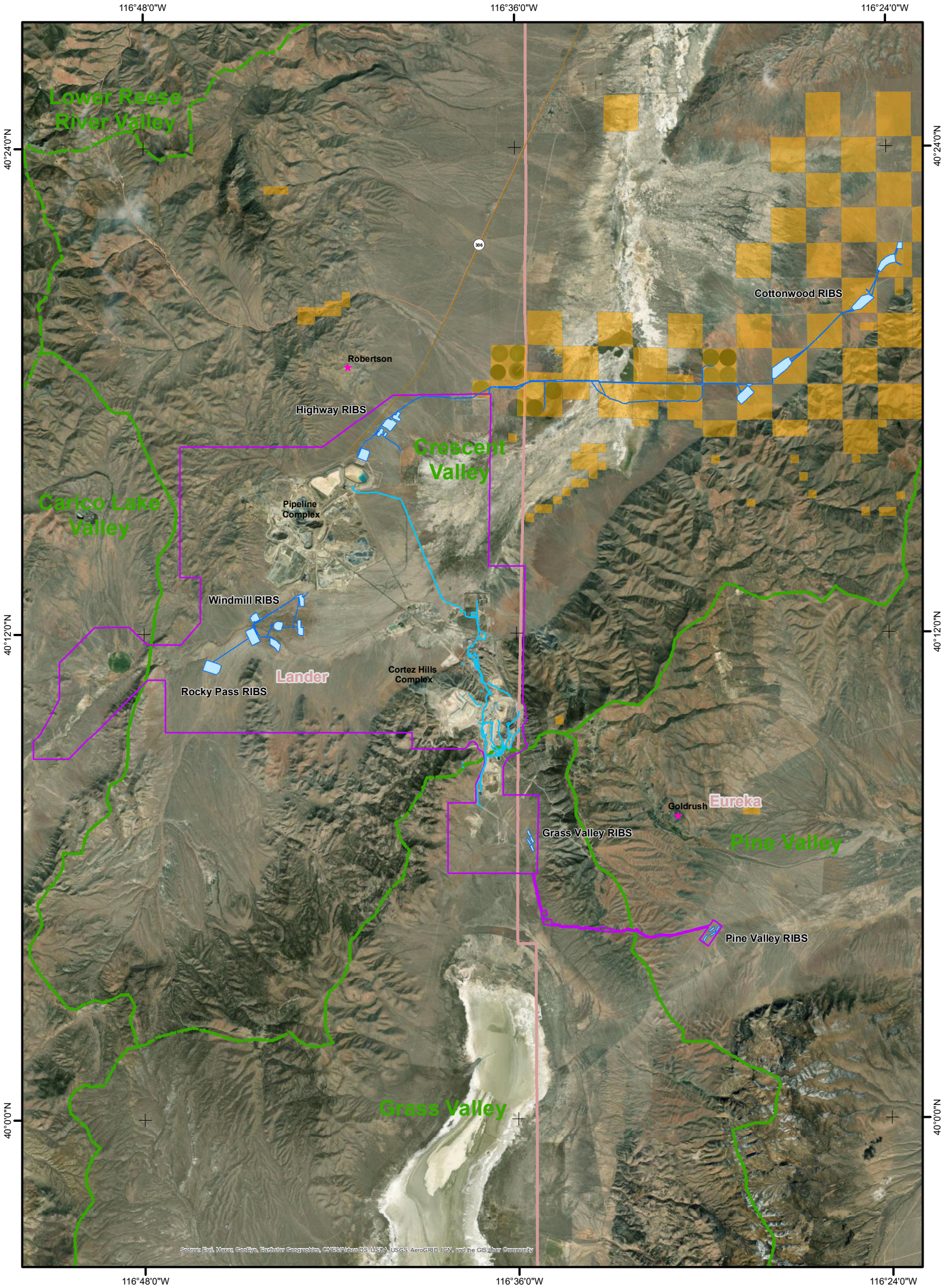
Excess water not consumed by the Cortez Mine or NGM ranches is discharged to either the CHR or one of the 16 infiltration galleries located throughout Crescent Valley, Pine Valley, and Grass Valley. In 2021, there was no unconsumed dewatering water that went to the CHR but approximately 22 ac-ft evaporated from the CHR surface. There was 32,174 ac-ft distributed throughout the 76 infiltration ponds at the Highway, Rocky Pass, Windmill, Cottonwood Pine Valley, and Grass Valley RIBs. In total, 77% of the water produced at the Cortez Mine was re-infiltrated into the Crescent Valley, Pine Valley, and Grass Valley hydrographic basins.

3.4 MONITORING NETWORK STATUS AND MODIFICATIONS

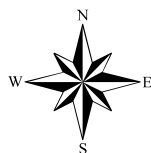
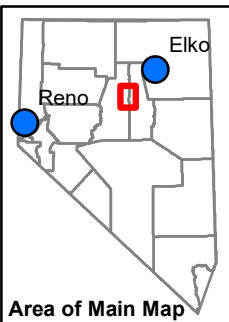
As the COGSWMP consists of a vast monitoring network, maintenance is ongoing, and accessibility is highly variable throughout the calendar year. Table 3 summarizes the status of the monitoring network throughout the monitoring period. While some wells have been deemed "Inactive", the majority of the locations will be returned to service with simple equipment maintenance or the installation of dataloggers so that poor road conditions do not prevent data collection. The locations in the Goldrush area that were inaccessible during Q4 2021 (GRMW-06, GRMW-07, GRMW-12, GRPZ-29, GVI-2D, PVI-2D, and RHPZ-08) are all on dataloggers; therefore, the next data collection is expected to have those water levels recorded. These levels

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will be included with the Q1Q2 2022 electronic submittal and the 2022 COGSWMP Annual Report. Wells that are “Pumping” have been identified in this table to indicate that their water levels are likely lower than the regional water table.



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



0 50 100 200 300 Miles

1:200,000

1 inch = 16,666.67 feet

CORTEZ MONITORING PLAN







Cortez Water Management

Figure 1

Drawn by: Jeanne

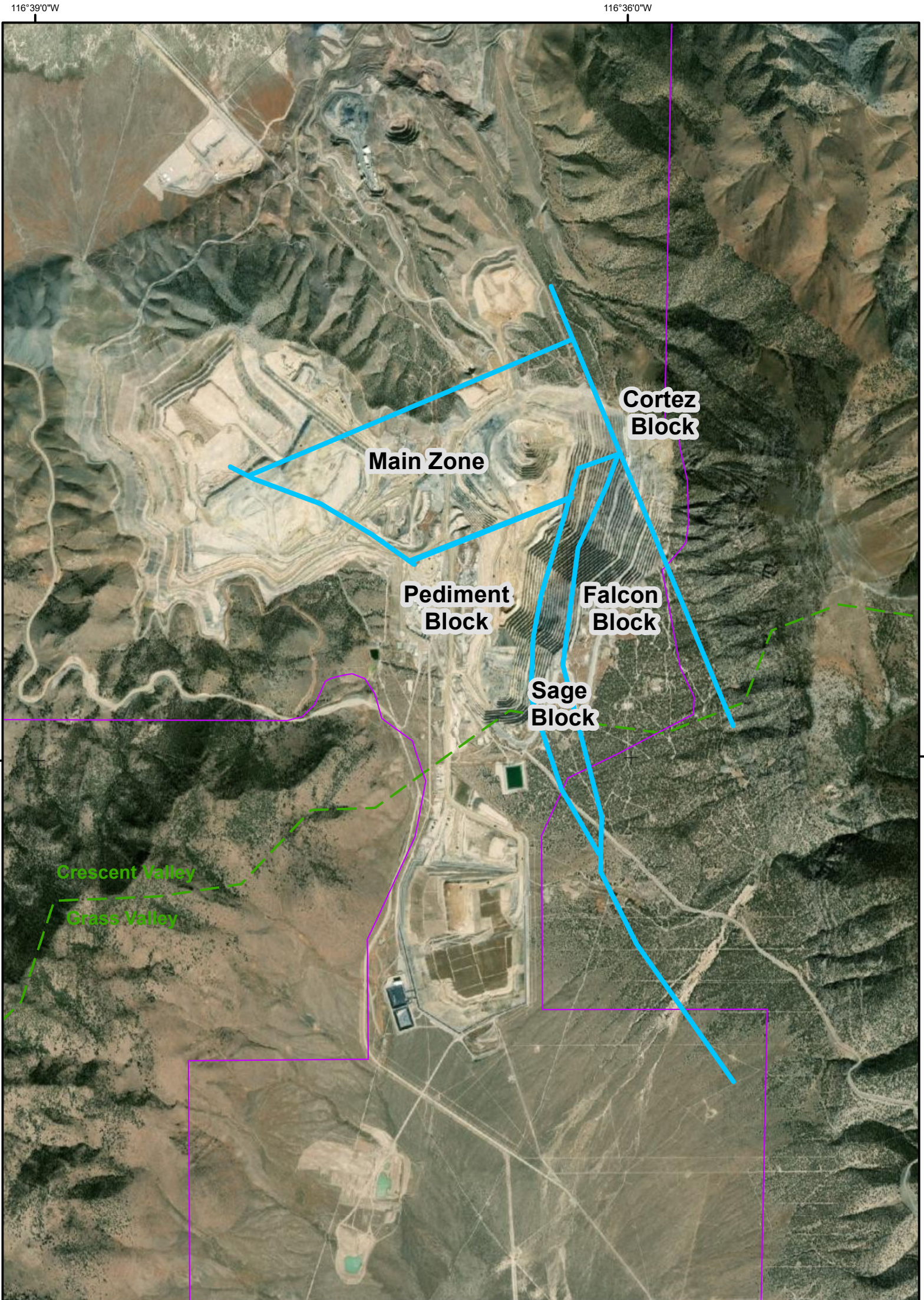
Revision: 2/21/2022

Nevada State Plane 1983 East

-  NGM Mineral Occurrence
-  Cortez PoO
-  Rapid Infiltration Basins
-  Pipelines
-  Hydrographic Basin Boundary
-  Dean Ranch

Provisional Map- This map was not prepared from a field survey and should not be relied upon as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy is not to be relied upon. This map is intended only as an internal representation of land status and is for NGM use only.

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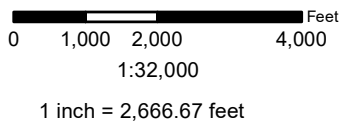
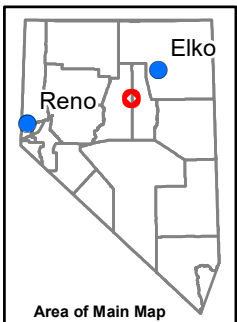


CORTEZ MONITORING PLAN

Cortez Hydrologic Blocks

Figure 2

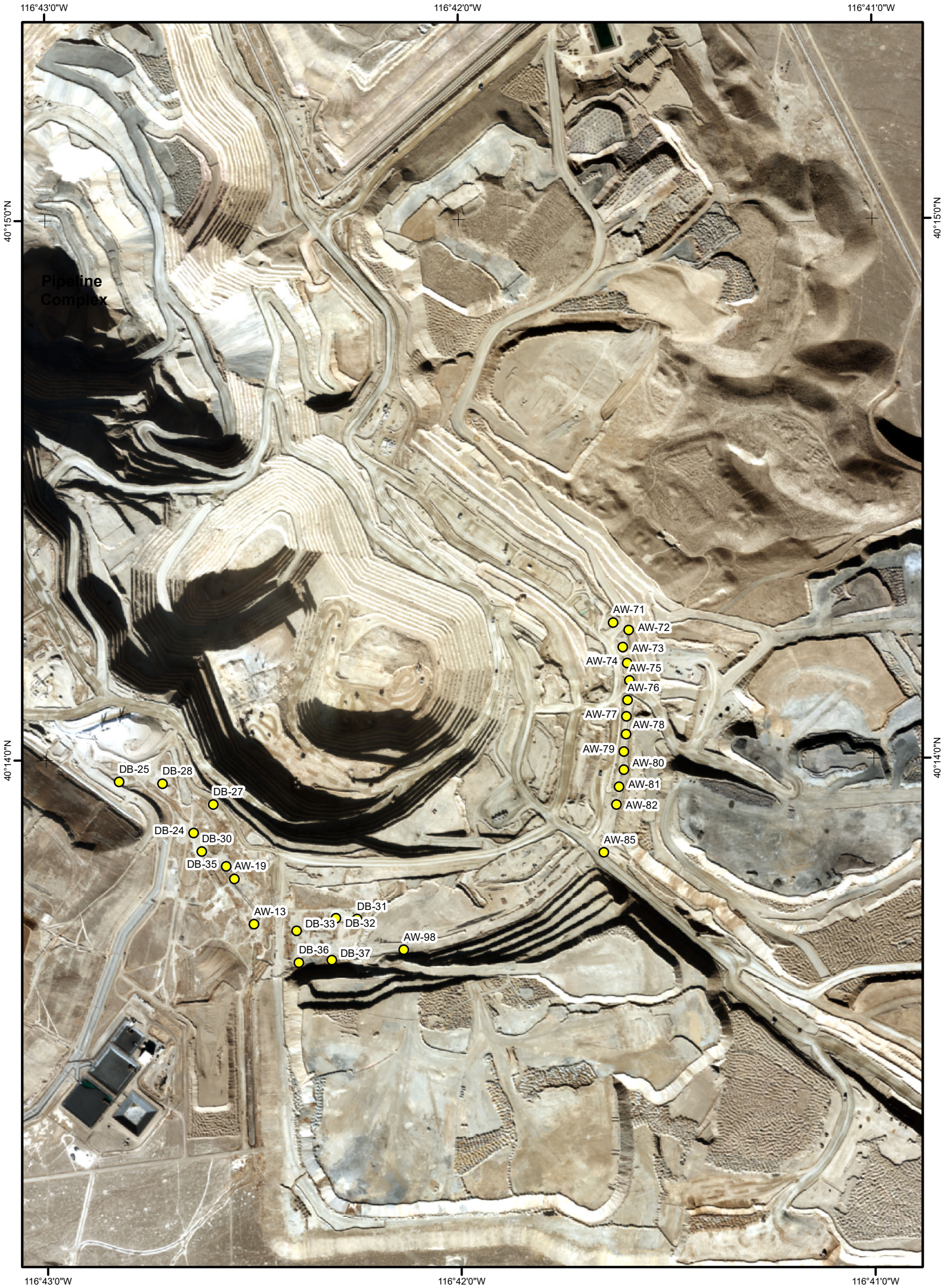
- Hydro_Blocks
- - - Hydrographic Basin Boundary
- Cortez_Authorized_Boundary



Drawn by: Jeanne
Revision: 2/4/2021

Nevada State Plane 1983 East

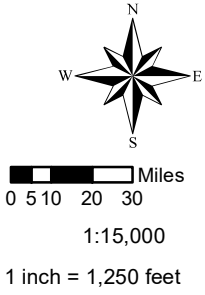
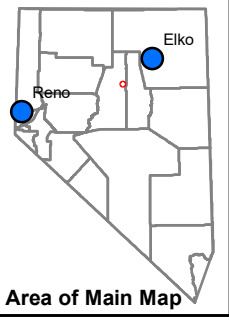
Provisional Map-
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CORTEZ MONITORING PLAN

2021 Crossroads Dewatering Wells

Map 1



- Dewatering Wells
- Cortez PoO
- Hydrographic Basin Boundary
- Counties - Nevada

Drawn by: Erica
Revision: 2/22/2022

Nevada State Plane 1983 East

Provisional Map- This map was not prepared from a field survey and should not be relied on as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy is not to be relied upon. This map is intended only as an internal representation of land status and is for NGM use only.

116°37'0"W

116°36'0"W

40°10'0"N

40°10'0"N

40°9'0"N

40°9'0"N

116°37'0"W

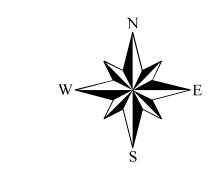
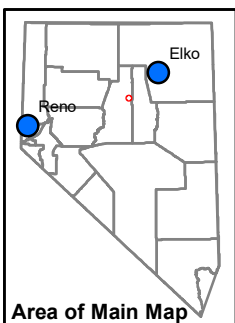
116°36'0"W



CORTEZ MONITORING PLAN

2021 Cortez Hills Dewatering Wells

Map 2



1:15,000
1 inch = 1,250 feet

- Dewatering Wells
- Cortez PoO
- Hydrographic Basin Boundary
- Counties - Nevada

Drawn by: Erica
Revision: 2/22/2022

Nevada State Plane 1983 East

Provisional Map- This map was not prepared from a field survey and should not be relied upon as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy is not to be relied upon. This map is intended only as an internal representation of land status and is for NGM use only.

CORTEZ MINE WATER MANAGEMENT TABLES

TABLE 1a: PIPELINE WATER MANAGEMENT

TABLE 1b: CORTEZ HILLS WATER MANAGEMENT

TABLE 1c: CORTEZ OPERATIONS WATER MANAGEMENT

TABLE 2a: PIPELINE WELL SUMMARY

TABLE 2b: CORTEZ HILLS WELL SUMMARY

TABLE 3: MONITORING NETWORK STATUS AND MODIFICATIONS

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Table 1a. Pipeline Water Management (ac-ft)

Water Production Summary	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Total
Production Total	2,993.06	2,366.24	2,187.81	2,150.66	2,395.59	2,406.72	2,479.02	2,784.29	2,706.56	2,866.93	3,152.45	3,175.77	31,665.09
AW-13	0.00	4.82	5.52	5.36	5.36	5.40	5.53	5.52	5.35	5.52	5.38	5.57	59.33
AW-19	0.07	0.61	0.61	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86
AW-71	55.38	51.13	63.21	65.83	61.41	59.73	61.06	52.62	38.41	41.29	40.56	42.23	632.87
AW-72	18.04	16.23	11.69	20.12	20.47	19.24	19.95	20.19	19.84	20.25	19.30	19.30	224.61
AW-73	46.05	41.68	46.22	44.67	46.03	45.22	47.42	47.69	46.71	48.04	45.98	44.36	550.07
AW-74	29.35	26.30	28.94	26.96	27.77	27.14	27.32	27.69	27.02	27.85	26.78	27.39	330.50
AW-75	59.01	53.53	59.13	57.54	58.95	58.64	62.94	62.84	60.86	62.67	60.38	57.82	714.31
AW-76	36.55	32.81	35.79	35.69	37.68	35.62	35.40	34.90	33.42	34.26	33.06	34.21	419.42
AW-77	49.95	45.19	49.89	48.12	49.55	47.97	49.95	49.81	48.04	49.63	47.95	46.32	582.36
AW-78	23.54	21.23	23.61	22.87	23.55	22.66	23.33	23.19	22.26	22.78	21.71	22.11	272.82
AW-79	26.13	22.94	24.76	23.90	24.36	23.35	24.72	24.11	22.75	23.33	22.37	23.57	286.31
AW-80	0.07	11.07	20.12	19.08	19.34	18.67	2.23	6.93	10.49	10.55	10.01	10.49	139.06
AW-81	24.84	21.67	22.85	21.77	22.15	21.74	23.89	23.31	21.69	22.19	21.07	21.98	269.15
AW-82	7.87	6.99	7.82	7.63	7.92	7.42	6.49	5.89	5.20	4.94	6.98	6.81	81.95
AW-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AW-98	2.32	2.11	2.33	2.31	2.39	2.31	2.39	2.40	2.32	2.41	2.04	2.09	27.42
DB-24	304.02	147.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	451.68
DB-25	359.80	253.88	362.37	352.09	347.72	174.86	0.00	0.00	0.00	131.95	354.85	363.63	2,701.16
DB-27	152.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	152.55
DB-28	256.78	229.94	286.19	279.72	289.96	232.88	294.37	287.94	272.30	0.01	0.00	0.00	2,430.09
DB-30	355.67	195.18	0.00	0.00	0.00	0.00	21.07	386.62	373.24	377.80	370.25	364.77	2,444.61
DB-31	0.00	0.00	0.00	22.90	228.16	224.46	227.92	224.64	214.63	219.03	211.95	215.32	1,789.00
DB-32	355.22	318.80	356.72	330.93	343.68	342.27	351.71	349.93	336.92	361.76	349.05	349.31	4,146.28
DB-33	51.78	299.13	397.79	383.47	372.81	374.73	389.34	384.67	374.70	398.05	361.83	360.22	4,148.52
DB-35	373.27	204.07	0.00	0.00	0.00	268.97	396.71	384.75	384.20	397.95	386.71	399.28	3,195.91
DB-37	404.43	358.92	381.87	378.75	405.96	393.08	404.89	378.25	385.86	396.46	385.66	384.57	4,658.69
DB-36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	207.86	368.24	374.12	950.21
POT-2 P1	0.35	0.34	0.39	0.38	0.37	0.37	0.40	0.39	0.35	0.36	0.34	0.33	4.35
Water Management Summary	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Total
Managed Water Total	3,041.50	2,420.23	2,254.26	2,216.64	2,437.48	2,452.50	2,528.53	2,827.02	2,754.42	2,905.69	3,188.82	3,231.05	32,258.15
Consumptive Total	290.25	149.81	138.08	338.66	1,162.41	1,257.32	1,319.47	1,325.67	1,332.33	996.67	184.78	216.04	8,711.49
Non-Consumptive Total	2,751.25	2,270.43	2,116.18	1,877.99	1,275.07	1,195.18	1,209.05	1,501.34	1,422.09	1,909.02	3,004.04	3,015.01	23,546.66
Mill Supply	227.15	77.89	31.54	36.16	56.61	42.82	54.90	124.21	97.45	131.87	114.51	145.89	1,141.00
Heap Leach*	48.44	54.00	66.45	65.99	41.89	45.78	49.51	42.73	47.87	38.76	36.37	55.28	593.06
Dust Suppression	13.09	14.20	34.99	80.40	89.59	126.24	101.61	94.91	97.12	43.10	31.16	13.79	740.21
Irrigation	0.00	0.00	0.00	149.59	965.30	1,032.34	1,099.88	1,053.90	1,084.16	779.11	0.00	0.00	6,164.27
Stockwater	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	6.42
Evaporation	0.68	2.85	4.18	5.59	8.12	9.24	12.65	9.01	4.84	2.93	1.86	0.22	62.18
Infiltration	2,751.25	2,270.43	2,116.18	1,877.99	1,275.07	1,195.18	1,209.05	1,501.34	1,422.09	1,909.02	3,004.04	3,015.01	23,546.66
Potable	0.35	0.34	0.39	0.38	0.37	0.37	0.40	0.39	0.35	0.36	0.34	0.33	4.35

*Pipeline Heap Leach water is produced at Cortez Hills and conveyed to Pipeline via the Cross Valley Pipeline. Therefore, more water is managed at Pipeline than what is produced at Pipeline.

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Table 1b. Cortez Hills Water Management (ac-ft)

Water Production Summary	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Total
Production Total	946.02	803.77	891.74	846.51	841.76	826.31	843.86	902.07	878.17	852.92	830.32	868.08	10,331.54
DW-09	5.39	4.19	4.92	6.05	6.69	6.44	6.74	6.74	6.52	6.49	6.04	5.69	71.91
DW-10	6.65	6.33	7.30	7.26	7.59	7.34	7.62	7.66	7.47	7.76	7.46	6.89	87.32
DW-12	35.30	31.93	35.70	33.77	35.43	33.98	34.83	34.80	34.79	34.63	33.60	34.39	413.12
DW-13	16.44	14.85	16.44	34.16	34.80	32.33	32.35	31.68	31.11	35.30	32.81	27.91	340.17
DW-15	28.81	27.78	29.87	28.74	27.50	24.45	23.83	22.04	19.00	18.57	17.41	16.90	284.92
DW-16	1.15	1.00	1.00	0.82	0.75	0.64	0.52	0.35	0.30	0.45	0.63	0.65	8.26
DW-19	1.23	1.09	1.17	1.11	1.12	1.06	1.07	1.05	0.99	1.02	0.96	0.97	12.85
DW-20	62.68	60.09	69.11	63.03	63.46	57.57	62.80	58.52	59.44	60.80	58.46	56.57	732.55
DW-21	124.13	112.10	117.71	87.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	441.07
DW-22	49.87	46.51	51.63	47.45	47.54	45.31	46.13	45.93	34.61	39.97	38.92	20.62	514.50
DW-23	19.18	16.49	16.96	15.84	15.83	14.37	14.07	13.19	11.95	11.85	11.11	10.99	171.82
DW-24	66.48	0.00	0.00	0.00	91.07	102.79	99.22	105.69	101.42	103.69	98.91	99.42	868.69
DW-25	86.30	78.22	83.53	81.96	84.58	81.23	83.58	87.37	83.36	87.93	85.02	86.35	1,009.43
DW-33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.53	90.57	43.86	44.03	83.13	328.12
DW-34	0.98	0.91	0.95	0.83	0.87	1.00	1.07	0.33	0.00	0.00	0.00	0.00	6.94
DW-35	1.19	0.95	0.86	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.48
DW-36	1.78	1.61	1.78	1.74	1.88	1.86	1.95	1.93	1.89	1.99	1.95	2.13	22.49
DW-37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DW-38	2.54	2.25	2.42	2.33	2.44	2.39	2.38	2.23	2.20	2.25	2.19	2.00	27.62
DW-39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DW-40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DW-41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DW-42	9.86	8.92	10.02	9.90	9.60	9.72	9.77	9.69	0.27	1.24	10.74	10.71	100.43
DW-43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DW-44	261.92	235.60	259.67	249.37	260.34	250.76	258.28	256.96	243.36	255.88	246.25	246.28	3,024.67
DW-45	112.62	96.02	111.13	105.58	105.33	104.44	105.23	103.52	97.83	97.36	92.18	98.42	1,229.67
DW-46	0.56	0.50	0.54	0.51	0.52	0.49	0.50	0.50	0.49	0.50	0.48	0.24	5.82
DW-47	0.21	0.18	0.20	0.19	0.19	0.18	0.19	0.18	0.17	0.17	0.17	0.08	2.12
CVP-18**	48.44	54.00	66.45	65.99	41.89	45.78	49.51	42.73	47.87	38.76	36.37	55.28	593.06
GVPW-01	0.74	0.75	0.80	0.82	0.75	0.67	0.68	0.75	0.65	0.73	2.95	0.75	11.04
Mill #1 HT	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.20	0.14	0.00	0.00	0.00	0.42
PPW-03	1.49	1.33	1.45	1.39	1.49	1.37	1.40	1.29	1.22	1.24	1.23	1.23	16.15
M1PW-01	0.06	0.12	0.09	0.05	0.09	0.13	0.06	0.19	0.51	0.47	0.48	0.48	2.73
WSP-F	0.00	0.06	0.05	0.00	0.00	0.00	0.03	0.01	0.01	0.01	0.00	0.00	0.18

**Water produced at CVP-18 is conveyed to Pipeline Heap Leach. Therefore, more water is produced at Cortez Hills than what is managed at Cortez Hills. Consumption is counted against Cortez Hills permits.

Water Management Summary	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Total
Managed Water Total	897.58	749.77	825.29	780.52	799.87	780.52	794.35	859.34	830.31	814.17	793.95	812.80	9,738.47
Consumptive Total	27.76	26.74	36.29	117.81	129.45	150.70	153.92	131.08	138.33	114.94	41.86	42.48	1,111.35
Non-Consumptive Total	869.82	723.03	789.01	662.72	670.42	629.83	640.42	728.26	691.98	699.22	752.09	770.32	8,627.13
Mill Supply	0.24	0.23	0.23	0.03	0.04	0.21	0.01	0.08	0.02	0.03	0.02	0.12	1.26
Dust Suppression	31.48	26.12	38.97	55.60	59.38	84.19	79.58	73.45	66.54	47.37	39.03	37.02	638.72
Irrigation ¹	0.00	0.00	0.00	63.86	64.20	58.21	63.32	58.88	59.74	61.25	0.00	0.00	429.46
Stockwater ²	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	5.60
Evaporation	0.24	1.01	1.48	1.98	2.87	3.27	4.47	3.19	1.71	1.04	0.66	0.08	22.00
Infiltration	869.82	723.03	789.01	662.72	670.42	629.83	640.42	728.26	691.98	699.22	752.09	770.32	8,627.13
Reservoir	-5.91	-2.39	-6.23	-5.42	1.24	3.15	4.97	-6.24	8.33	3.22	0.18	3.27	-1.84
Potable	1.24	1.31	1.38	1.29	1.25	1.21	1.11	1.26	1.52	1.56	1.51	1.52	16.14

¹Water supplied to irrigation from Cortez Hills from DW-16 (Permit 79897) and DW-20 (Permit 90348)

²Water supplied to stock from Cortez Hills from DW-22 (Permit 88431)

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Table 1c. Cortez Operations Water Management Summary (ac-ft)

	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Total
Production Total	3,939.08	3,170.01	3,079.55	2,997.17	3,237.35	3,233.03	3,322.87	3,686.36	3,584.73	3,719.86	3,982.77	4,043.85	41,996.62
Managed Water Total	3,939.08	3,170.01	3,079.55	2,997.17	3,237.35	3,233.03	3,322.87	3,686.36	3,584.73	3,719.86	3,982.77	4,043.85	41,996.62
Consumptive Total	318.00	176.55	174.36	456.46	1,291.86	1,408.02	1,473.40	1,456.75	1,470.67	1,111.61	226.64	258.52	9,822.84
Non-Consumptive Total	3,621.07	2,993.46	2,905.19	2,540.70	1,945.50	1,825.00	1,849.47	2,229.61	2,114.07	2,608.25	3,756.14	3,785.33	32,173.78
Mill Supply	275.83	132.12	98.21	102.18	98.54	88.81	104.42	167.02	145.34	170.66	150.90	201.28	1,735.32
Dust Suppression	44.57	40.32	73.96	136.01	148.97	210.43	181.18	168.35	163.66	90.47	70.19	50.82	1,378.93
Irrigation	0.00	0.00	0.00	213.44	1,029.50	1,090.55	1,163.19	1,112.77	1,143.90	840.37	0.00	0.00	6,593.73
Stockwater	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.02
Evaporation	0.92	3.86	5.66	7.57	10.99	12.51	17.12	12.20	6.56	3.97	2.52	0.30	84.19
Infiltration	3,621.07	2,993.46	2,905.19	2,540.70	1,945.50	1,825.00	1,849.47	2,229.61	2,114.07	2,608.25	3,756.14	3,785.33	32,173.78
Reservoir	-5.91	-2.39	-6.23	-5.42	1.24	3.15	4.97	-6.24	8.33	3.22	0.18	3.27	-1.84
Potable	1.59	1.65	1.76	1.68	1.61	1.57	1.51	1.64	1.87	1.92	1.84	1.85	20.49

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Table 2a. Pipeline Well Summary

Well Name	Aquifer	Instantaneous Max Flowrate (CFS)	End of Year Water Level (ft AMSL)	Comments
AW-13	Alluvium		4223	
AW-14	Alluvium			No Pumping in 2021
AW-16	Alluvium			No Pumping in 2021
AW-17	Alluvium			No Pumping in 2021
AW-18	Alluvium			Mined Out by Crossroads
AW-19	Alluvium		4395	
AW-20	Alluvium			No Pumping in 2021
AW-71	Alluvium	1.11	3954	
AW-72	Alluvium	0.34	3727	
AW-73	Alluvium	0.81	3841	
AW-74	Alluvium	0.49	3712	
AW-75	Alluvium	1.06	3718	
AW-76	Alluvium	0.61	3753	
AW-77	Alluvium	0.84	3721	
AW-78	Alluvium	0.40	3674	
AW-79	Alluvium	0.44	3734	
AW-80	Alluvium	0.34	3768	
AW-81	Alluvium	0.42		No Equipment
AW-82	Alluvium	0.13	3585	
AW-85	Alluvium			Out of service due to low water yield.
AW-98	Alluvium	0.04	4233	
DB-21	Deep Bedrock			Mined Out
DB-24	Deep Bedrock	5.11	3382	
DB-25	Deep Bedrock	6.09	4530	
DB-27	Deep Bedrock	2.56		Plugged 2/2/21
DB-28	Deep Bedrock	4.95	3564	
DB-29	Deep Bedrock			To Be Plugged & Abandoned
DB-30	Deep Bedrock	6.50	3459	
DB-31	Deep Bedrock	3.83	3569	
DB-32	Deep Bedrock	6.08		No sounding tube
DB-33	Deep Bedrock	6.69	3518	
DB-35	Deep Bedrock	6.71	3473	
DB-36	Deep Bedrock	6.82	3560	
DB-37	Deep Bedrock	6.29	3549	Began pumping in October 2021
POT-2 P1	POT-2 P1	0.01		

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Table 2b. Cortez Hills Well Summary

Well Name	Aquifer	Instantaneous Max Flowrate (CFS)	End of Year Water Level (ft AMSL)	Comments
DW-09	Cortez Footwall	0.11	5056	
DW-10	Cortez Footwall	0.13	5033	
DW-12	Falcon	0.60	4882	
DW-13	Falcon	0.59	4882	
DW-18	Falcon			Standby Well, Open Hole
DW-16	Falcon	0.02	4881	
DW-44	Falcon	4.40	4730	
DW-45	Falcon	1.89	4681	
DW-15	Lower Zone	0.48	3136	VFD in use to control pumping water level
DW-20	Lower Zone	1.16	3301	VFD in use to control pumping water level
DW-21	Lower Zone	2.09	3502	VFD in use to control pumping water level
DW-22	Deep South	0.87	3343	VFD in use to control pumping water level
DW-23	Deep South	0.32	2633	VFD in use to control pumping water level
DW-24	Deep South	1.78	2179	VFD in use to control pumping water level
DW-25	Deep South	1.48	3118	VFD in use to control pumping water level
WSPF	UG Portal	0.00		Drains UG for SAGE are P&A'd
DW-19	Sage	0.02	4343	
PPW-03	Sage	0.03		Equipment failed
PPW-05	Sage			Plugged and Abandoned
DW-14	Pediment			Out of service due to low water yield.
DW-17	Pediment			Lost March 2016 due wall shifting
DW-33	Pediment	0.02	5384	
DW-34	Pediment	0.02	5404	
DW-35	Pediment	0.03	4978	
DW-36	Pediment			Collapsed casing. P&A Planned.
DW-37	Pediment	0.04	5100	
DW-38	Pediment			Plugged and Abandoned
DW-39	Pediment	0.00	5322	Off for winter to prevent freezing. Low Flow
DW-40	Pediment	0.00	5923	
DW-41	Pediment	0.00	5254	
DW-42	Pediment	0.17	5106	
DW-43	Pediment			Collapsed casing. P&A Planned.
DW-46	Pediment	0.01	5106	
DW-47	Pediment	0.00	4836	
DW-49	Pediment			Plugged and Abandoned 11/2020
DW-50	Pediment			Plugged and Abandoned 11/2020
GVPW-01	GVPW-01	0.05		
GVPW-02	GVPW-02			Not in service
M1PW-01	Mill #1	0.01		

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Table 3. Monitoring Network Status and Modifications

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
AW-17	8/26/2019	NA	No Data	Converted to drains - per Shaun Debray
CHMW-04	3/1/2019	NA	No Access	No safe access.
CHPZ-135 Steel	7/1/2021	11/1/2021	Work Required	Transducer failure.
CHPZ-360 P1	7/18/2020	12/31/2021	Work Required	Equipment failure - dead
DB-22	7/1/2021	NA	No Data	Equipment Failure
DB-25	7/1/2021	NA	No Data	Transducer Failure
DB-28	10/1/2021	NA	No Data	Equipment Failure
DRW-01	1/2/2021	Ongoing	No Data	Water running out valve
DRW-02	3/16/2019	Ongoing	No Data	Water running out valve
FMW-06S	1/1/2021	2/1/2021	No Access	No access
FMW-11	1/2/2021	1/31/2021	No Access	No access
GRMW-01 Steel	2/4/2020	12/31/2021	No Data	Out of service. Pump is being repaired. No monitoring equipment
GRMW-06 Steel	11/16/2018	12/31/2021	No Data	No access. Well obstructed by pump.
GRMW-07 Steel	10/1/2021	12/31/2021	No Data	No access
GRMW-08 Steel	10/1/2021	12/1/2021	No Data	Datalogger malfunction
GRMW-12 Steel	10/1/2021	12/31/2021	No Data	No access
GRMW-14 Steel	1/1/2021	12/31/2021	No Data	Datalogger malfunction
GRMW-15 Steel	12/31/2018	12/31/2021	No Data	Status changed to inactive 7/7/20 Well obstructed by pump preventing water level measurement
GRMW-20 Steel	4/1/2021	6/1/2021	No Data	Datalogger malfunction
GRPZ-29 PVC	10/1/2021	12/31/2021	No Data	No access
GVI-2D	10/1/2021	12/31/2021	No Data	No access
GVI-3D	10/1/2021	12/31/2021	No Data	Datalogger malfunction
IM-37D	5/1/2021	12/31/2021	No Data	Dry
IM-66S	1/2/2021	2/28/2021	No Data	Datalogger malfunction
IM-67S	1/2/2021	2/28/2021	No Data	Datalogger malfunction
IM-68D	12/1/2021	12/31/2021	No Data	Transducer/datalogger failure
IM-68S	12/1/2021	12/31/2021	No Data	Transducer/datalogger failure
IM-69D	1/2/2021	3/31/2021	No Data	Datalogger malfunction
IM-70S	1/2/2021	3/31/2021	No Data	Datalogger malfunction
IZ-17	1/1/2021	NA	No Data	Dry
IZ-18	1/1/2021	2/1/2021	No Access	No access
IZ-19	1/1/2021	2/1/2021	No Access	No access
IZ-20	1/1/2021	2/1/2021	No Access	No access
MCPZ-01 Steel	4/1/2021	NA	No Data	Datalogger failure
North McCoy	1/1/2021	2/1/2021	No Data	No access
PPW-03	3/1/2019	NA	No Data	Transducer/datalogger failure
PVI-1D	1/2/2021	NA		Transducer correction was not applied to 2020 data
PVI-2D	10/1/2021	12/31/2021	No Data	No access
RHMW-02 PVC	10/1/2021	11/30/2021	No Data	Transducer/datalogger failure
RHPZ-08 PVC	10/1/2021	12/31/2021	No data	No access
SFPMC Steel	7/1/2021	12/31/2021	No Data	Transducer/datalogger failure
SH-01B	9/14/2019	NA	No Data	500 feet DTW reel gets caught on something. Investigation ongoing
W4-01	7/1/2021		No Data	Dry
W4-02	10/1/2021		No Data	Dry
Willow Springs	1/1/2021	6/30/2021	No Data	Datalogger failure

HYDROGEOLOGY

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4 HYDROGEOLOGY

In general, the hydrogeology of the Cortez Mine can be simplified into areas of drawdown around the Pipeline, Crossroads, and Cortez Hills pits and areas of mounding around the infiltration ponds at the Rocky Pass, Windmill, Highway, and Cottonwood RIBs. As the Cortez Mine has been in operation for several decades, the groundwater monitoring wells and piezometers available to analyze drawdown and mounding trends have changed substantially. While some pre-mining data exists for several monitoring wells and piezometers included in this report, many monitoring locations were installed after dewatering activities had already started. For these locations with limited pre-mining data, simulated water levels from the Barrick Cortez 4-Basin Model Groundwater Flow Model Report (Itasca, 2016) were used along with actual pre-mining water levels to interpolate pre-mining water levels in the areas around the open pits. These interpolated water levels were then used to approximate the total drawdown to date. As the model is continually being calibrated with new data, these interpolated pre-mining water levels are subject to change in future reports.

In contrast to the dewatered areas around the open pits, areas around the RIBs that are exhibiting groundwater mounding are in alluvial aquifers and are significantly shallower than the groundwater modeled by the 4-Basin Model. Prior to the RIBs being installed, the alluvial aquifers were likely not impacted by mining activities. Therefore, the water levels that were initially measured in the monitoring wells around the RIBs before the RIBs were put into service are used to determine the total mounding to date.

In the following section, the hydrogeology of the Cortez Mine is discussed in terms of drawdown and mounding. Following the discussion, groundwater data are presented in the following format:

1. A plan map depicting the water level change that occurred during the reporting period as Map 3,
2. A plan map depicting the potentiometric surface elevation as of December 31, 2021, is included as Map 4,
3. A plan map depicting the water table fluctuations, which have occurred between initiation of the monitoring program (1996) and December 31, 2021, is included as Map 5, and,
4. Hydrographs and water level elevation data for COGSWMP groundwater piezometers.

4.1 DRAWDOWN NEAR DEWATERING OPERATIONS

Overall drawdown at the Cortez Mine is depicted in Maps 1 through 3. In the Pipeline Area, the alluvial aquifer is being dewatered by various wells and vertical drains. The water drained into the deep carbonate aquifer is ultimately pumped out by larger dewatering wells. By the end of 2021, water elevations in the Crossroads alluvial wells indicated an average water elevation of 3,860 ft amsl (Table 2a). Water levels in the deep bedrock aquifer dropped by over 20 feet resulting in a year-end water elevation of 3,602 ft. amsl.

In the CHOP area, the lowest water elevation is observed in the Lower Zone/Deep South area of CHUG. From there, the water levels follow the northwest-southeast trending carbonate geology

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with some drawdown also being observed within the Goldrush Project. Drawdown at CHOP is further broken down by the hydrologic blocks in the following sections.

4.1.1 Cortez Footwall

The key water level indicators included in this report for the Cortez Footwall are piezometers CHMW-04 and CHPZ-370. However, CHMW-04 continued to be inaccessible for the 2021 calendar year. Therefore, CHPZ-370 will be used to define the water level for 2021. As dewatering of the Cortez footwall has recently slowed down, CHPZ-370 measured an increase in water level of 12 feet during 2021. At the end of 2021 the water elevation in the Cortez Footwall was 5,236 ft amsl.

4.1.2 Crossroads

Significant dewatering of the alluvial aquifer began in early 2017 as is observed in CRA-2 and CRA-4. Due to failed casing, both CRA-2 and CRA-4 were formally plugged and abandoned in November of 2019. In order to track the water elevations in the Crossroads alluvium, site hydrologists installed several grouted in vibrating wire piezometers. Piezometers XRPZ-02 P1 and XRPZ-02 P2 most closely resembled the trends in CRA-2 and CRA-4, respectively, prior to those wells failing. At the end of 2021, the water elevations in XRPZ-02 P1 and XRPZ-02 P2 were 4,138 and 4,242 ft amsl, respectively, which equates to an approximate lowering of the water table in the proximity of CRA-2 and CRA-4 by 2 feet and 1 foot, respectively during the 2021 calendar year.

In contrast to the Crossroads alluvium, dewatering of the Pipeline carbonates continued in 2021 with an observed drawdown of 19 ft in DB-19 to an elevation of 3,605 ft amsl at the end of 2021.

4.1.3 Falcon Hydrogeologic Block

The dewatering trend in the Falcon Block can be observed in piezometer CHPZ-69. Although CHPZ-69 was not installed until 2010, comparing the current water elevation to simulated pre-mining water levels suggests that approximately 882 feet of drawdown has been observed in CHPZ-69 since the commencement of dewatering activities in the CHOP area. An observed 33 feet of drawdown occurred in CHPZ-69 during the 2021 calendar year.

4.1.4 Lower Zone/Deep South

As stated above, the Lower Zone hydrogeologic block exhibits the lowest water level in the CHOP area; as of the second quarter 2021, the water elevation in piezometer CHPZ-135 was 3,700 ft amsl. After the second quarter of 2021, the transducer experienced a zero shift and work is currently being done to get the transducer back into commission. Production from the Lower Zone continues in order to dewater to the ultimate elevation of 3,000 ft amsl. In 2021, there was an observed drawdown of 7 feet.

4.1.5 Pediment Hydrogeologic Block

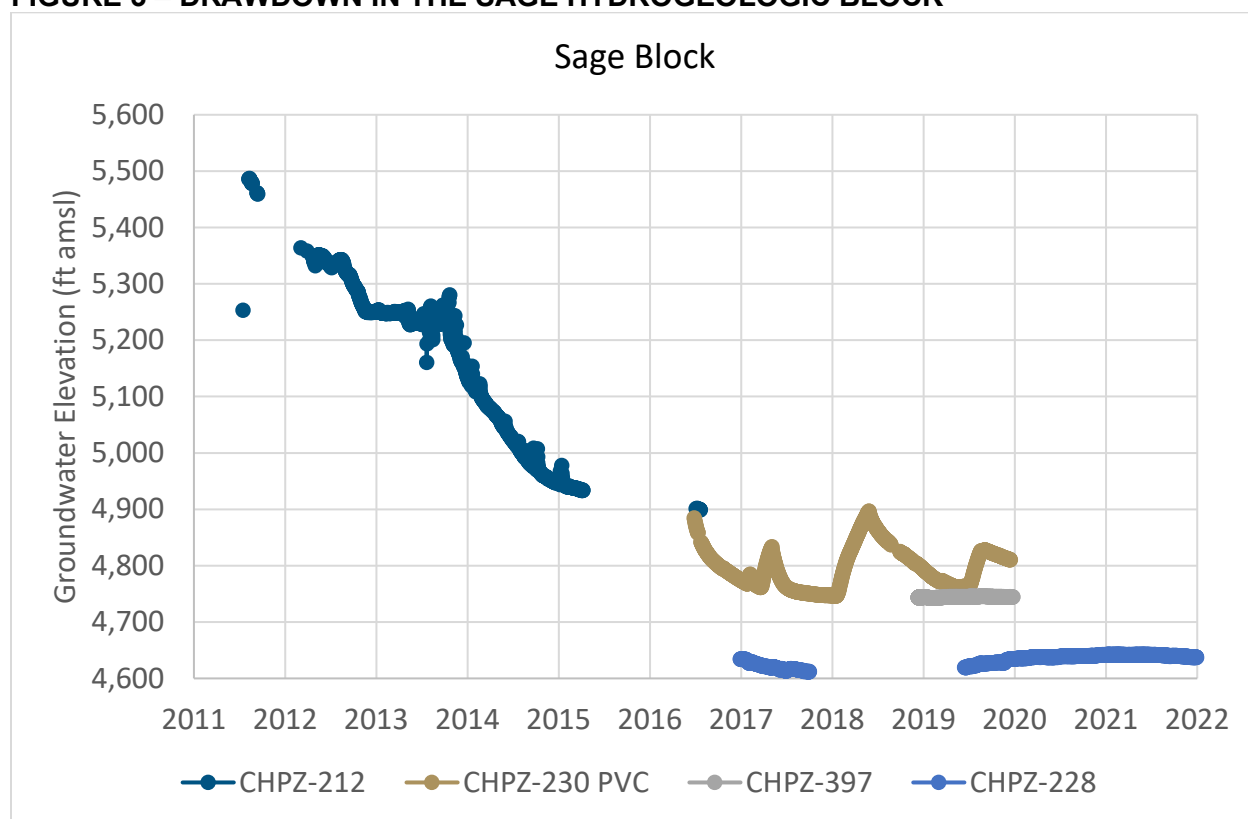
The dewatering trend in the Pediment Block can be observed in piezometer CHPZ-329. By the end of 2021, the water level in the Pediment Block was 5,362 ft amsl. This equates to an increase in water level of approximately 11 feet in 2021.

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4.1.6 Sage Hydrogeologic Block

The Sage Block is dewatered using a series of bedrock wells in conjunction with horizontal drains. The only monitoring location for the Sage Block in the report is PPW-03. However, this transducer has failed and does not accurately represent the true water elevation in the block. Due to the nature of the Sage Block, maintaining piezometers in that hydrogeologic unit has proven difficult. Between 2011 and 2016, CHPZ-212 exhibited 580 ft of drawdown before failing (Figure 3). Similarly, CHPZ-230 PVC measured about 90 ft of drawdown before failing at the end of 2019. CHPZ-397 remained stagnant through 2019 and 2020 until failing due to the highwall movement. CHPZ-228 was out of service from the beginning of 2018 through the first half of 2019 but indicated a final water elevation of 4,636 ft amsl at the end of 2021. Drawdown from the end of 2020 through the end of 2021 was 6 feet. In addition, the individual piezometer trends would suggest that dewatering of the Sage Block has been relatively stagnant since late 2017.

FIGURE 3 – DRAWDOWN IN THE SAGE HYDROGEOLOGIC BLOCK



4.2 MOUNDING IN INFILTRATION AREAS

In the vicinity of active infiltration activities, mounding water tables are common and expected. Mounding south of Pipeline is rather complex as monitoring wells can indicate both dewatering and mounding trends depending how far they are from dewatering and infiltration activities. The greatest mound has historically been observed in IM-42 which monitors the Windmill RIBs to the south of Pipeline. As of December 31, 2021, water was still mounded a total of 126 feet above its original water level but due to a 60% reduction in the amount of water being sent to the Windmill RIBs in 2021 the mound decreased 9 feet from what was measured in 2020. The next greatest mound was also observed at the Windmill RIBs at IM-29, where the mound has reached 82 ft

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above pre-mining water level. IM-02 exhibited the greatest mound at the Highway RIBs, reaching 34 feet above pre-mining water level, a decrease in 24 feet from 2020. Finally, the Cottonwood RIBs are newer than the other infiltration galleries and so the maximum cumulative mounding in that area is 45 feet at IM-63S.

4.2.1 Rocky Pass RIBs

The water levels in the vicinity of the Rocky Pass RIBs are reflective of both active dewatering and active infiltration. Wells Rocky Pass, RP-01, and RP-02 are the farthest wells from active infiltration and indicate overall drawdown between ten and one foot since the beginning of infiltration. However, at the end of 2021, wells located closer to the infiltration ponds including IM-57, IM-58, and IM-62 exhibited up to 18 feet of mounding since the initiation of infiltration. In 2021, this mounding was increased relative to the mounding observed in 2020. In December 2021, IM-58S exhibited its highest water elevation since 2015 at 4870.66 ft amsl which was approximately 2 ft higher than the water elevation measured at that well in November 2020.

4.2.2 Windmill RIBs

To the north of the Windmill RIBs, the dewatering impacts can still be observed. However, moving away from Pipeline, water levels begin to show the mounding that is expected in the vicinity of RIBs. Due to the high elevation of the Rocky Pass RIBs, the natural hydraulic gradient of the area is from the west to east. This gradient has resulted in significant mounding in the eastern RIB monitoring wells. For example, the water level in IM-42 has raised by approximately 130 ft since the beginning of infiltration. However, since the initial mounding that occurred in the late 1990s, water levels at the Windmill RIBs have stabilized and show little cumulative change year to year other than seasonal cycles when the RIBs are in use during the winter months and then being rested during irrigation season. In 2021, the Windmill RIBs were used to infiltrate a total of 5,866 ac-ft of dewatering water. This is the least amount of infiltration to occur at these RIB galleries since 2015 and is due to an effort to reduce the recirculation of water from the Windmill RIBs to the Pipeline bedrock dewatering wells. During 2021, the water levels at all of the Windmill monitoring wells showed a general downward trend.

4.2.3 Highway RIBs

Although USGS-R, is in close proximity to the Highway RIBs, it is partially screened in bedrock and has exhibited approximately 84 ft of drawdown since the inception of mining. The north Highway RIBs have not been in full service since 2018 and have continued on a downward trend through the end of 2021. In 2021 a total of 2,789 ac-ft was infiltrated at the Highway RIBs.

4.2.4 Cottonwood RIBs

The Cottonwood RIBs are the farthest RIBs from the mine operations and are in close proximity to irrigation pivots. During 2021, most of the monitoring wells continued to exhibit increased mounding since the original installation of the wells. However, compared to 2020, the water levels in IM-72S and IM-70S decreased. In 2021, approximately 13,279 ac-ft of water was sent to the Cottonwood RIB galleries in an effort to move the water as far from the Crossroads pit as possible so as to limit recirculation to the Pipeline bedrock wells.

4.2.5 Grass Valley RIBs

In accordance with Order 1283, NGM began discharging water produced in Crescent Valley to the Grass Valley RIBs in October 2020. A total of 4,839 ac-ft was reinfiltrated by the end of the

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

year, leaving 35,409 ac-ft to be reinfiltated in Grass Valley by the end of mining. RIB monitoring wells GVI-1D, GVI-2D, and GVI-3D exhibited significant mounding with a total of 83, 68, and 10 feet of mounding, respectively, by the end of 2021.

4.2.6 Pine Valley RIBs

In accordance with Order 1284, NGM began discharging water produced in Crescent Valley to the Pine Valley RIBs in October 2020. In 2021, a total of 1,519 ac-ft was reinfiltated. A total of 24,056 ac-ft remains to be reinfiltated in Pine Valley by the end of mining. At the end of 2021, only RIB monitoring well PVI-2D exhibited an elevated water level of about 0.5 ft.

HYDROGEOLOGY

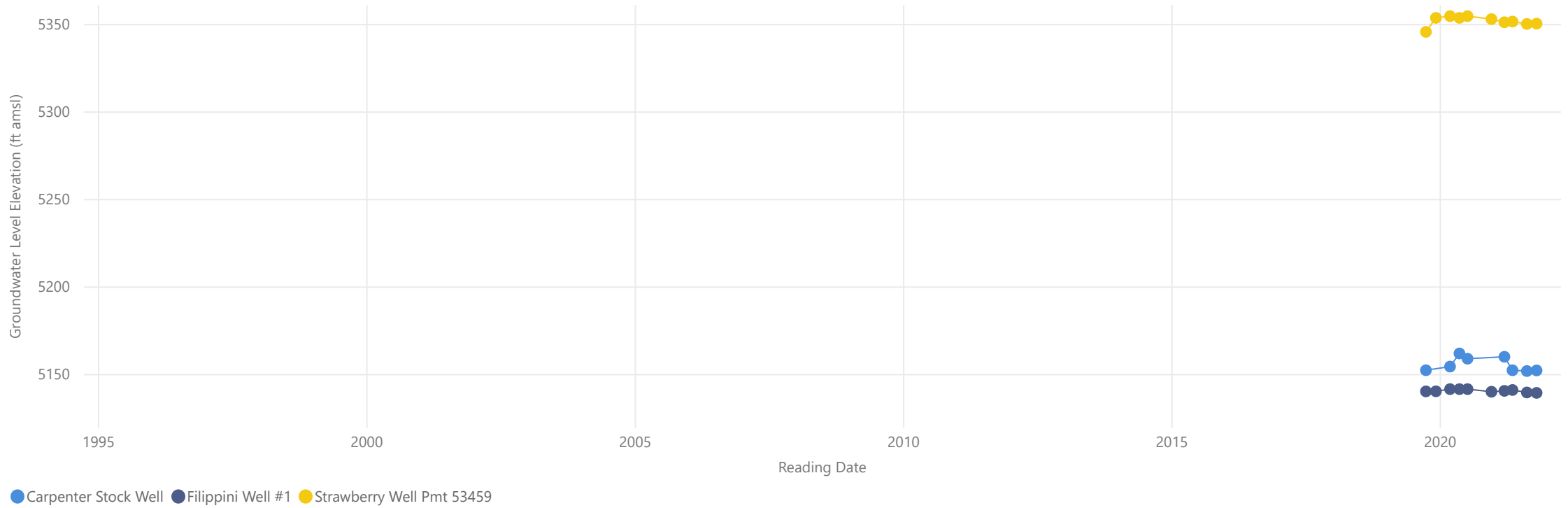
GROUNDWATER ELEVATION HYDROGRAPHS GROUPED BY GEOGRAPHIC AREA

CORTEZ HILLS NORTH
CORTEZ HILLS SOUTH
COTTONWOOD RIBS
FARM AREA
GOLDRUSH CENTRAL HORSE CANYON
GOLDRUSH HORSE CREEK AREA
GOLDRUSH LOWER HORSE CANYON
GOLDRUSH UPPER HORSE CANYON (1 AND 2)
GOLDRUSH UPPER PINE CREEK AREA
GOLDRUSH WILLOW CREEK AREA
GRASS VALLEY RIBs
HIGHWAY RIBS
MILL CANYON (1 AND 2)
MILL SITE
NORTH OF MILL SITE
NORTH PIPELINE
PIPELINE
PINE VALLEY RIBs
ROCKY PASS
TOIYABE
WINDMILL RIBS

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Carico Valley ▼



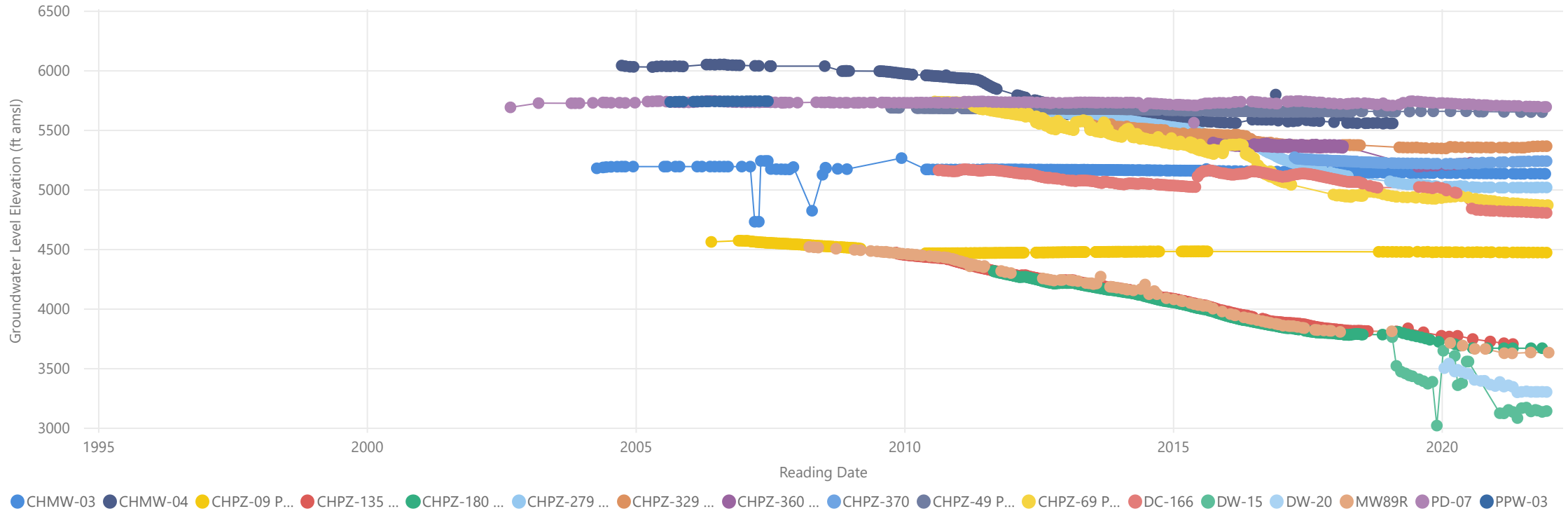
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
Carpenter Stock Well	10/1/2020	12/31/2020	No Access	No safe access
Carpenter Stock Well	11/15/2019	12/31/2019	No Access	No safe access Q4
Strawberry Well Pmt 53459	8/18/2019	12/6/2019	No Data	Depth to water > water level tape length. Ordered new tape.
Strawberry Well Pmt 53459	6/1/2019	7/1/2019	No Data	Monitoring to commence Q3 2019
Carpenter Stock Well	1/15/2019	7/1/2019	No Data	Monitoring commenced Q3 2019.
Filippini Well #1	1/15/2019	7/1/2019	No Data	Monitoring commenced Q3 2019.

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Cortez Hills North ▼



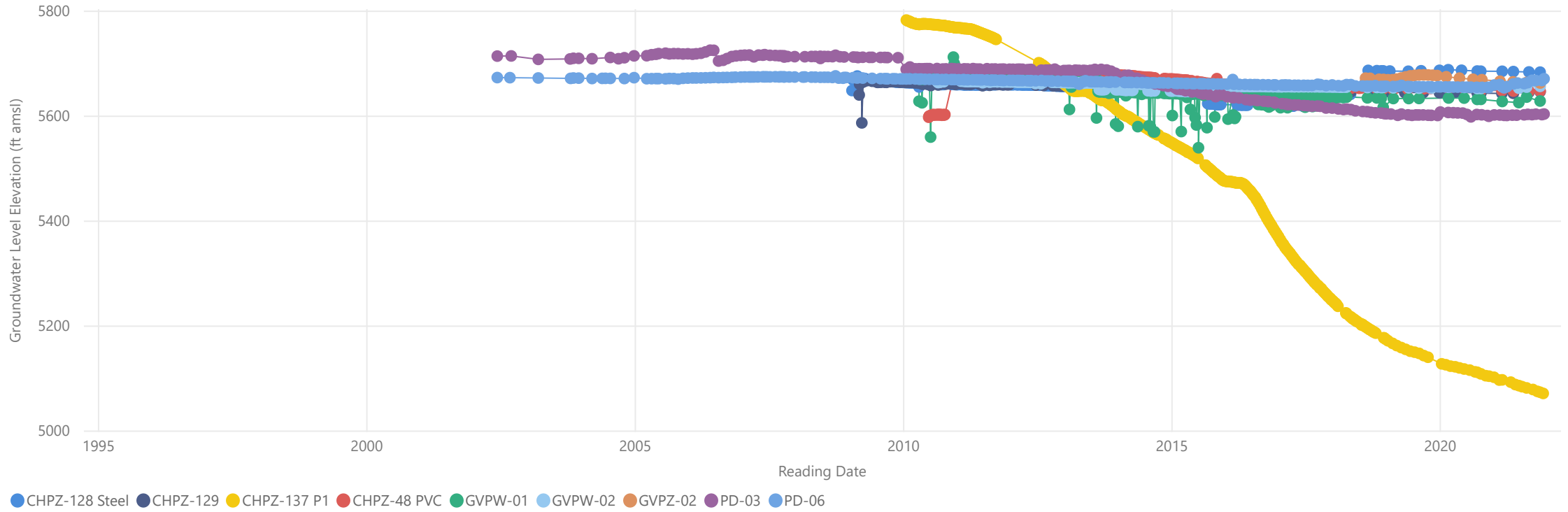
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
CHPZ-135 Steel	7/1/2021	11/1/2021	Work Required	Transducer failure.
CHPZ-360 P1	1/2/2021		No Data	Transducer failure
CHPZ-360 P1	7/18/2020	12/31/2020	Work Required	Equipment failure - dead
DC-166	5/6/2020	6/30/2020	No Data	Transducer failure
DW-15	1/14/2020	3/30/2020	No Data	Equipment failure - dead
DW-20	10/1/2019	12/31/2019	No Data	Pump and transducer pulled due to failure. Replacement pending.
CHPZ-09 PVC	5/26/2019	7/20/2019	No Data	No data
CHPZ-360 P1	3/10/2019	7/23/2019	Work Required	Transducer failure. Replacement pending

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Cortez Hills South ▼



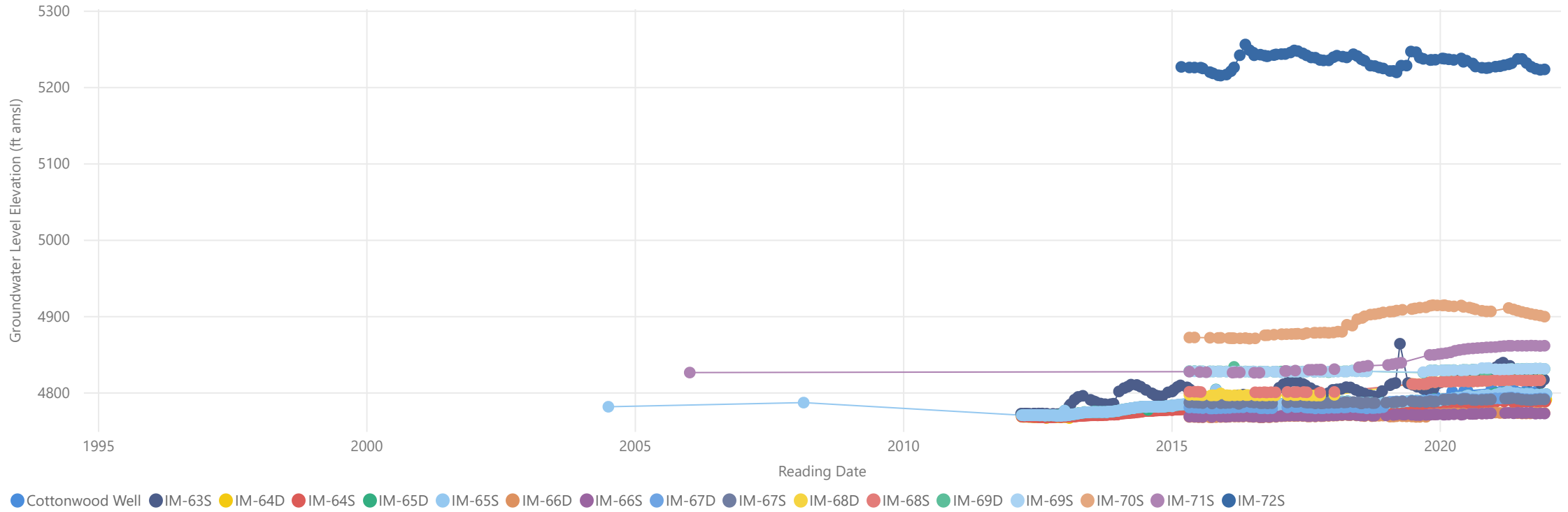
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
CHPZ-48 PVC	7/1/2020	9/30/2020	No Data	
CHPZ-137 P1	10/15/2019		No Data	No data
GVPW-01	9/1/2019	3/2/2020	No Access	No Access

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Cottonwood RIBs ▼



Events

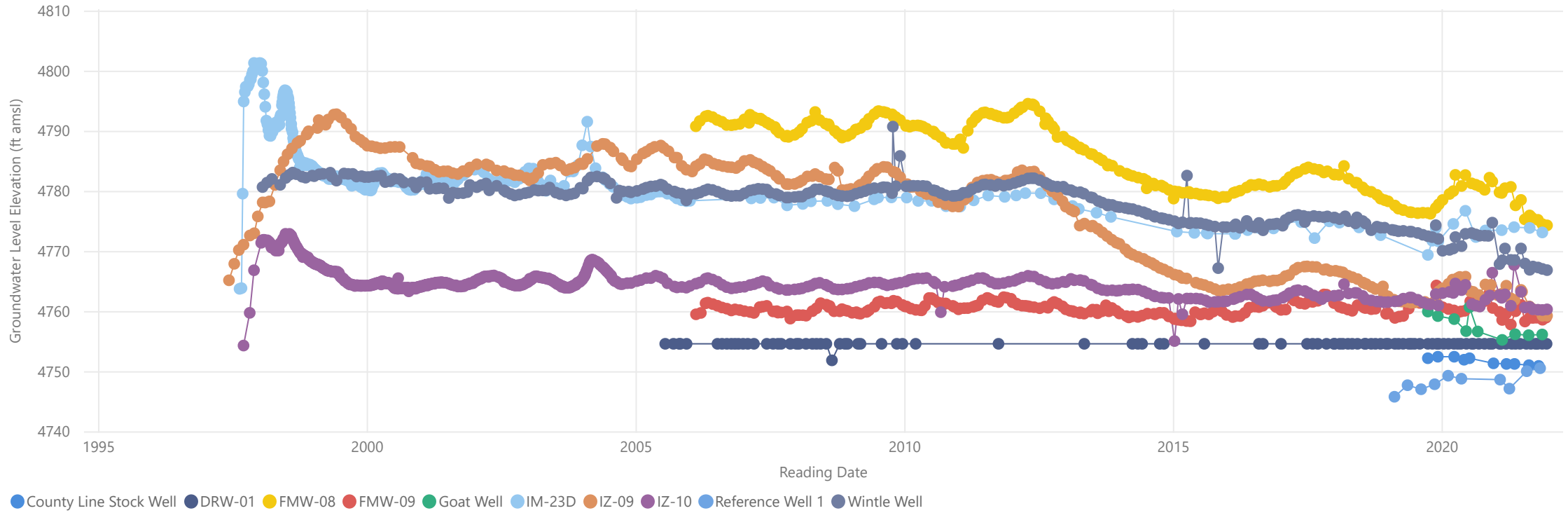
Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
IM-68D	12/1/2021	12/31/2021	No Data	Transducer/datalogger failure
IM-68S	12/1/2021	12/31/2021	No Data	Transducer/datalogger failure
IM-66S	1/2/2021	2/28/2021	No Data	Datalogger malfunction
IM-67S	1/2/2021	2/28/2021	No Data	Datalogger malfunction
IM-69D	1/2/2021	3/31/2021	No Data	Datalogger malfunction
IM-70S	1/2/2021	3/31/2021	No Data	Datalogger malfunction
Cottonwood Well	11/15/2019	12/31/2019	No Access	No safe access
IM-67D	5/15/2019	6/25/2019	No Access	No safe access.



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Groundwater Hydrographs

Farm Area ▼



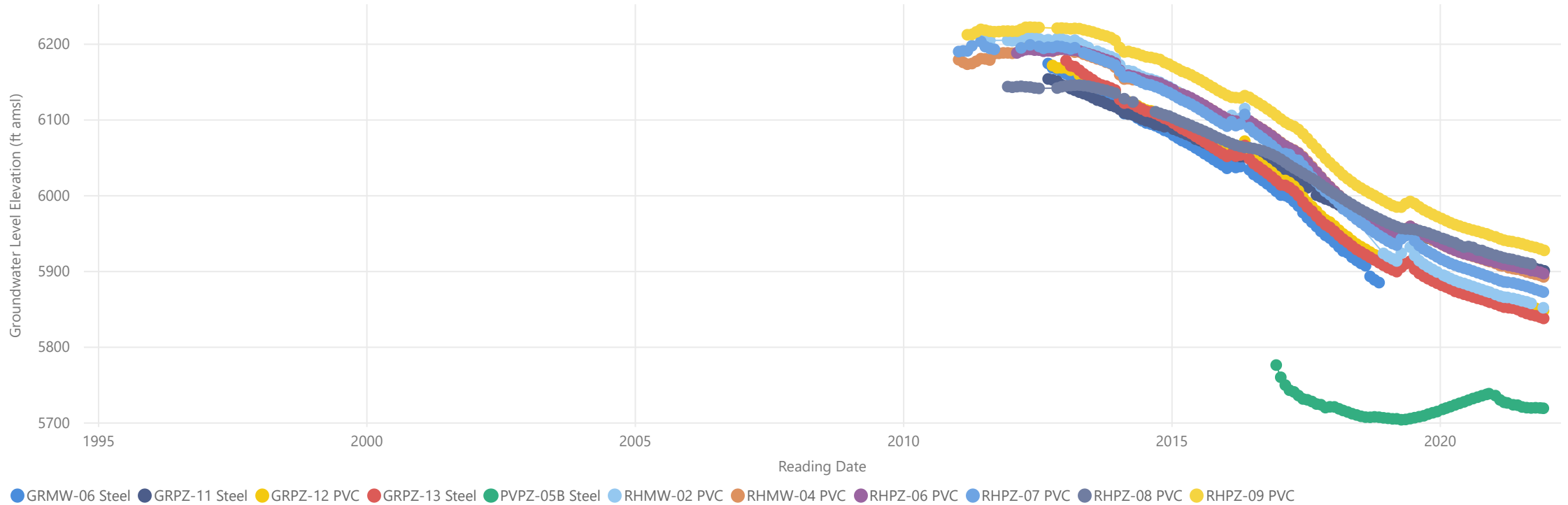
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
Reference Well 1	4/2/2021	7/1/2021	No Data	Unable to obtain data
DRW-01	1/2/2021		No Data	Flowing out of well
Reference Well 1	7/1/2020	12/31/2020	No Data	
FMW-09	10/1/2019	11/25/2019	No Access	No Access
County Line Stock Well	4/15/2019	7/1/2019	No Data	Monitoring commenced Q3 2019.
Goat Well	1/15/2019	7/1/2019	No Data	Monitoring commenced Q3 2019, casing is three feet above ground.
IM-23D	11/15/2018	9/30/2019	No Access	No access until 9/30/19
Reference Well 1	11/1/2018	1/1/2019	No Access	No access November & December 2018

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Groundwater Hydrographs

Goldrush - Central Horse Canyon ▼



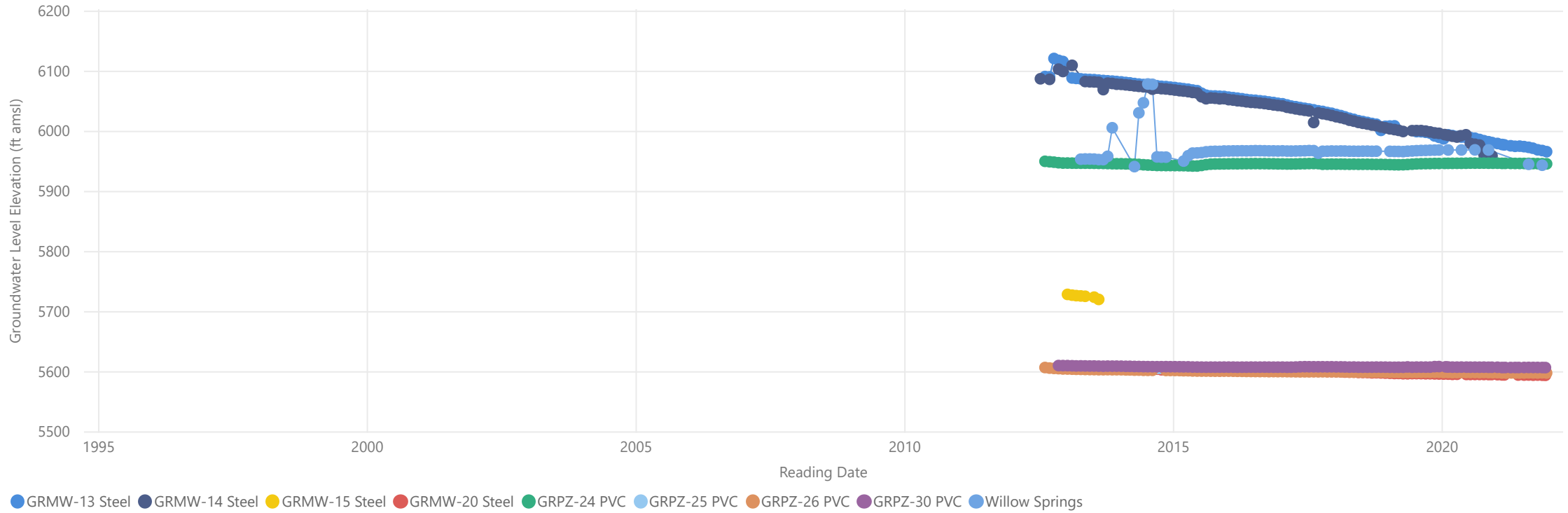
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
RHMW-02 PVC	10/1/2021	11/30/2021	No Data	Transducer/datalogger failure
RHPZ-08 PVC	10/1/2021	12/31/2021	No Data	No Access
GRMW-06 Steel	1/1/2021	12/31/2021	No Data	Datalogger malfunction
RHMW-02 PVC	4/16/2019	6/14/2019	No Data	No data
GRMW-06 Steel	11/16/2018		No Data	No access. Well obstructed by pump.
PVPZ-05B Steel	11/1/2018	1/1/2019	No Access	No Access
RHPZ-09 PVC	11/1/2018	1/1/2019	No Access	No access November & December 2018
GRPZ-12 PVC	10/16/2018	7/14/2019	No Data	No data

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Goldrush - Horse Creek Area ▼



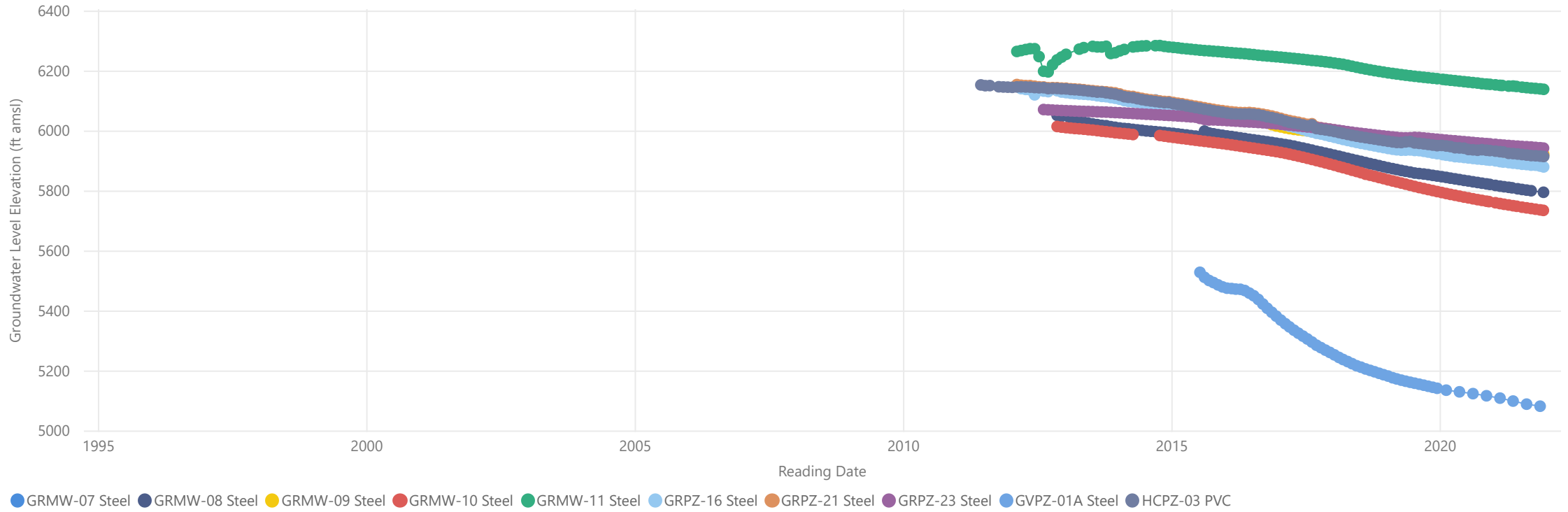
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
GRMW-20 Steel	4/1/2021	6/1/2021	No Data	Datalogger malfunction
Willow Springs	1/1/2021	6/30/2021	No Data	Datalogger failure
GRMW-14 Steel	1/1/2021	12/31/2021	No Data	Datalogger malfunction
GRMW-20 Steel	4/16/2020	6/17/2020	No Data	Mechanical failure
GRMW-13 Steel	1/1/2020		Flowing	Artesian
GRMW-14 Steel	4/16/2019	6/14/2019	No Data	No data
GRMW-13 Steel	2/16/2019	7/14/2019	No Data	No data
Willow Springs	1/1/2019		Flowing	Artesian

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Groundwater Hydrographs

Goldrush - Lower Horse Canyon ▼



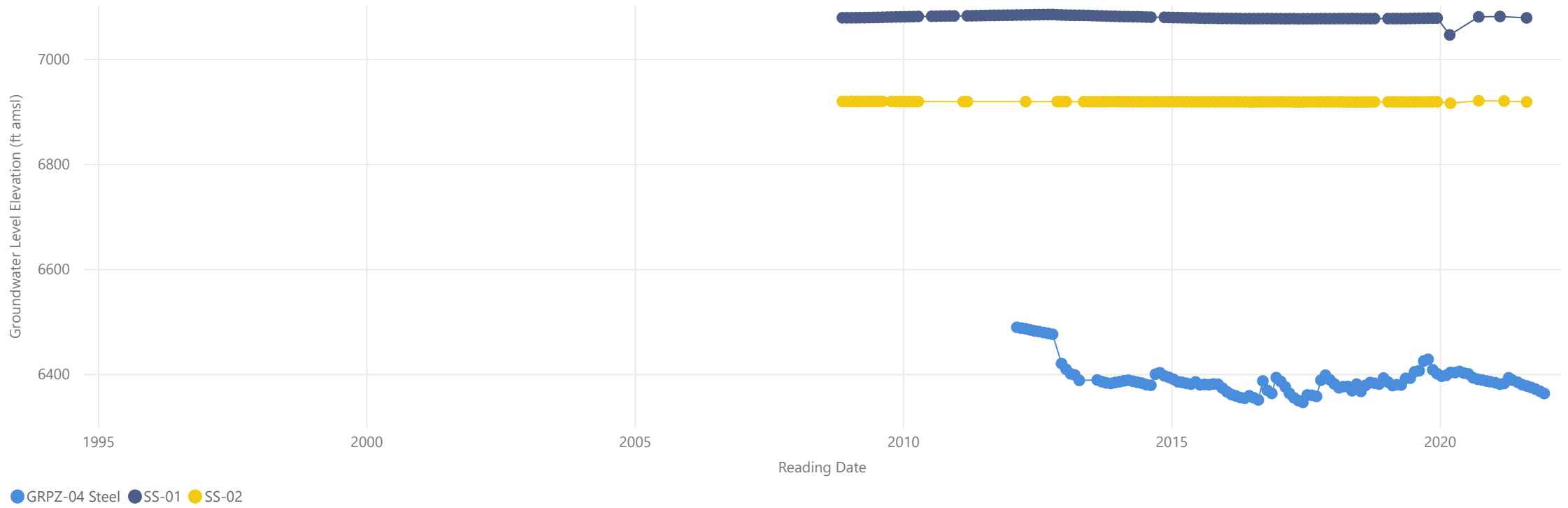
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
GRMW-08 Steel	10/1/2021	12/1/2021	No Data	Datalogger malfunction
GRMW-07 Steel	10/1/2021	12/31/2021	No Data	No Access

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Groundwater Hydrographs

Goldrush - Upper Horse Canyon 1



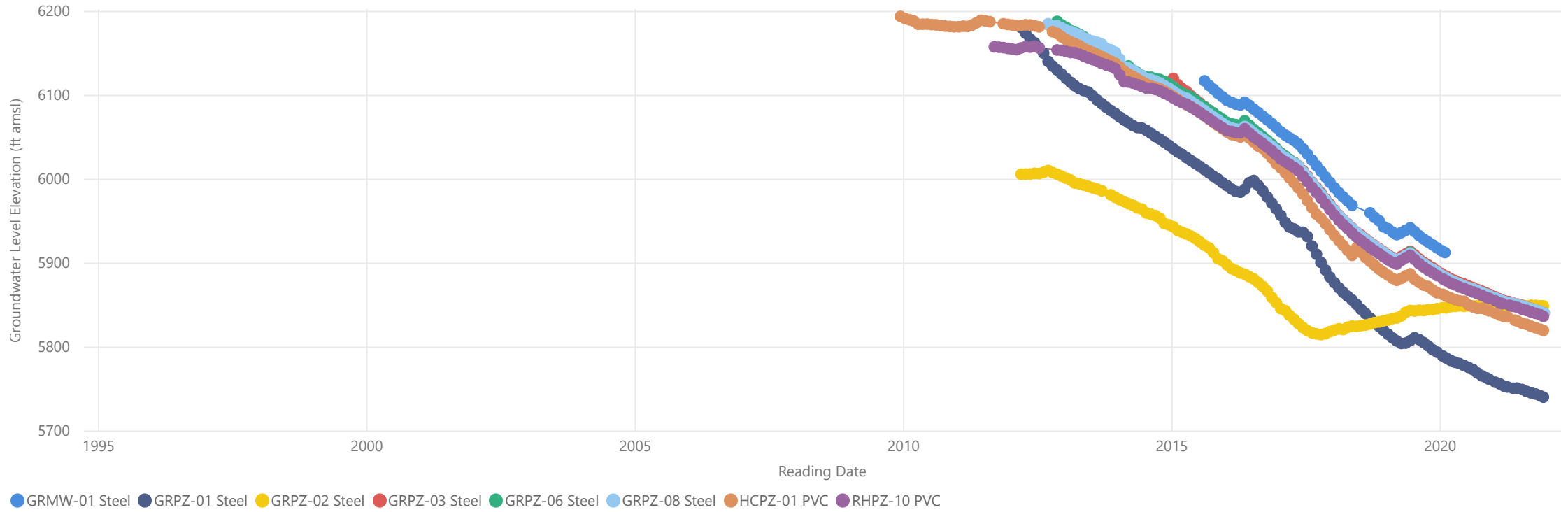
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
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Groundwater Hydrographs

Goldrush - Upper Horse Canyon 2 ▼



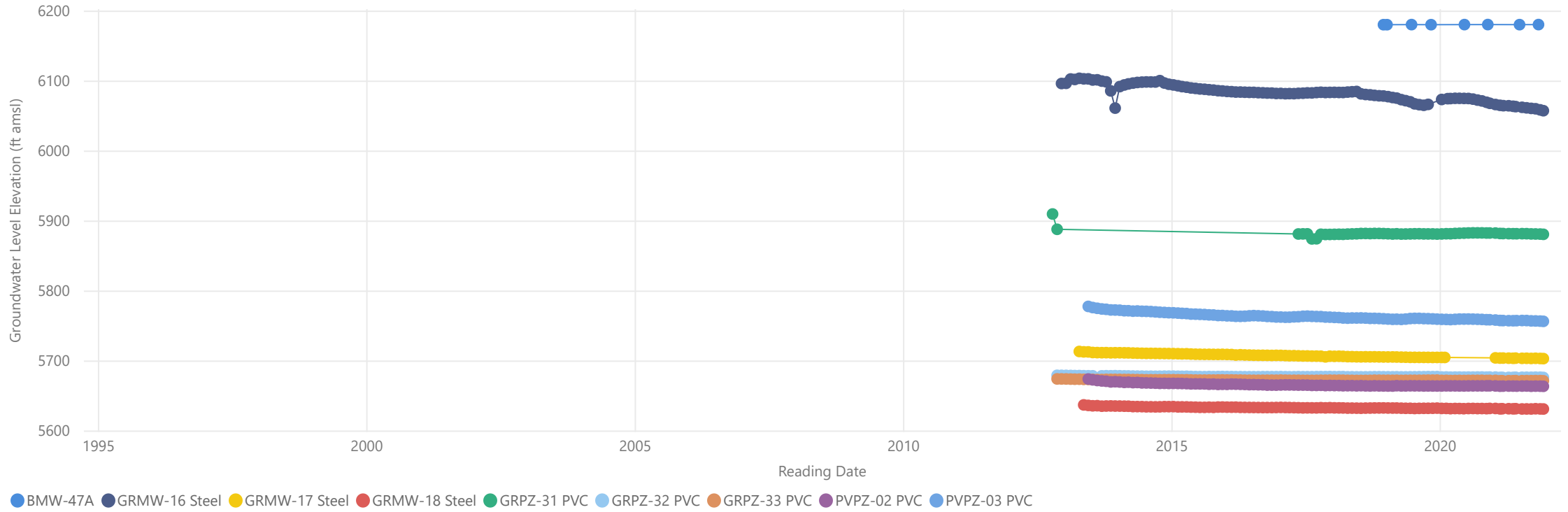
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
GRMW-01 Steel	2/4/2020		No Data	Out of service. Pump is being repaired. No monitoring equipment

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Goldrush - Willow Creek Area ▼



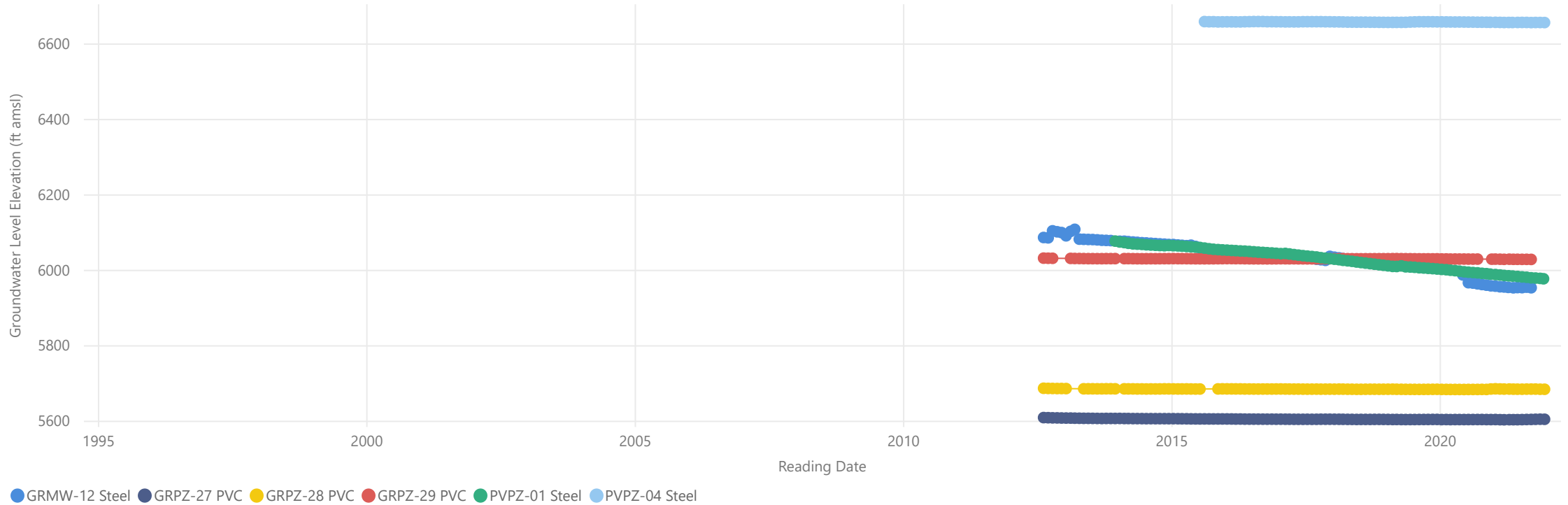
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
GRMW-17 Steel	3/1/2020	1/1/2021	No Data	Transducer will not connect
GRMZ-31 PVC	11/16/2012	5/14/2017	No Access	No Access

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Goldrush - Upper Pine Creek Area ▼



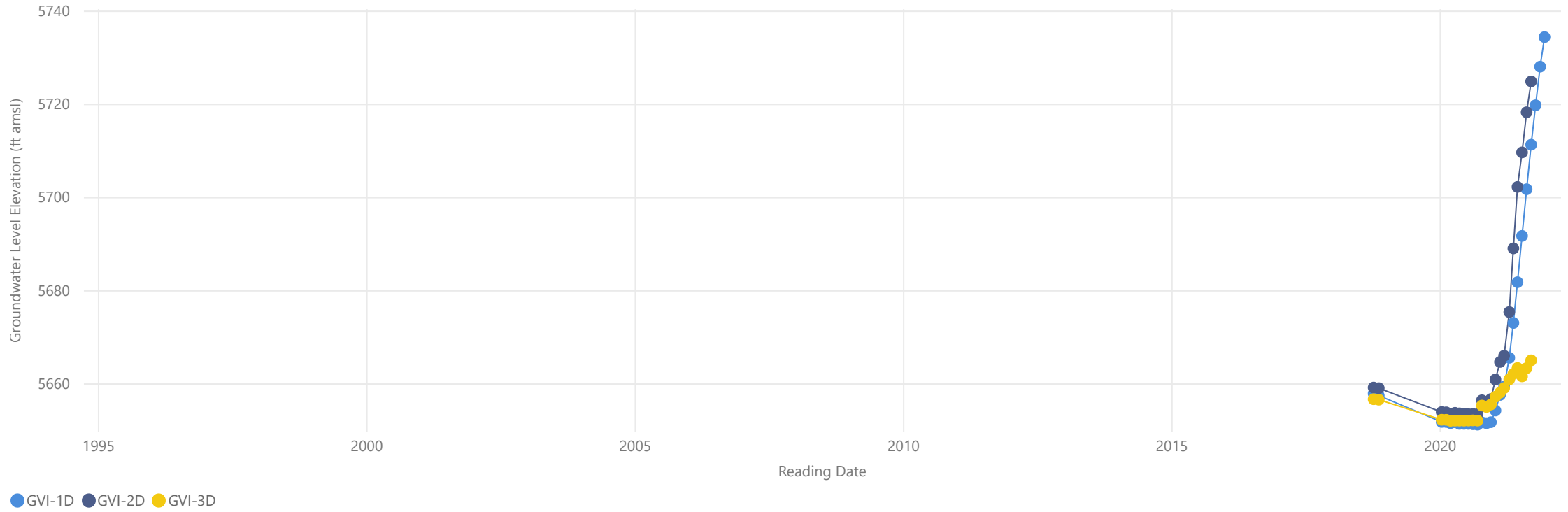
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
GRMW-12 Steel	10/1/2021	12/31/2021	No Data	No Access
GRPZ-29 PVC	10/1/2021	12/31/2021	No Data	No Access
GRPZ-29 PVC	10/1/2020	11/30/2020	No Data	Equipment Failure
GRMW-12 Steel	1/2/2020	6/6/2020	No Data	mechanical failure, wellhead and transducer froze, repaired in May
GRMW-12 Steel	1/1/2020			Artesian
PVPZ-04 Steel	11/1/2018	1/1/2019	No Access	No Access

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Groundwater Hydrographs

Grass Valley RIBs ▼



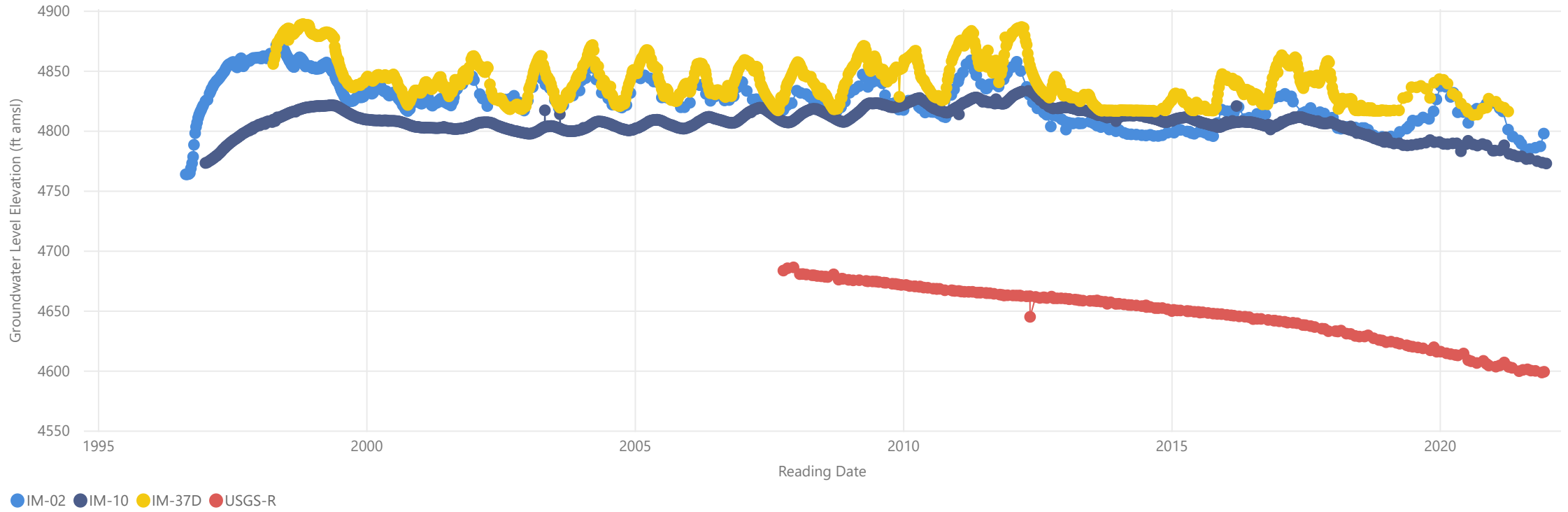
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
GVI-2D	10/1/2021	12/31/2021	No Data	No Access
GVI-3D	10/1/2021	12/31/2021	No Data	Datalogger malfunction
GVI-1D	1/1/2020	1/2/2020	New	
GVI-2D	1/1/2020	1/2/2020	New	
GVI-3D	1/1/2020	1/2/2020	New	

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Groundwater Hydrographs

Highway RIBs ▼



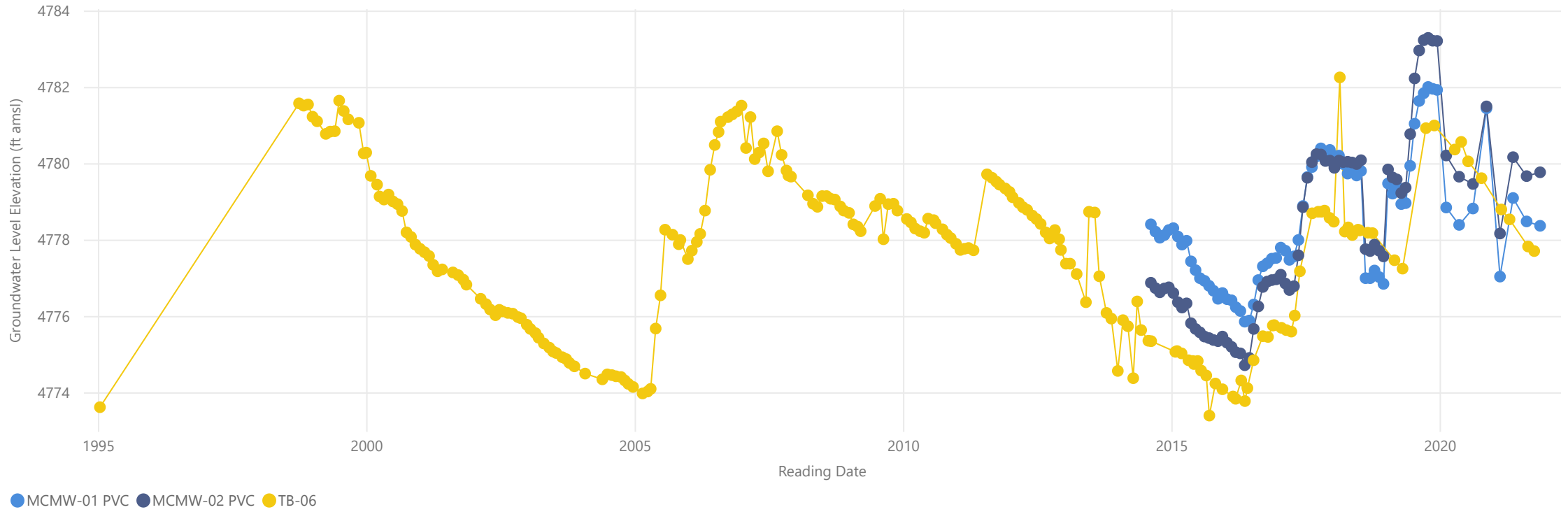
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
IM-37D	5/1/2021	12/31/2021	No Data	Dry

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Mill Canyon 2



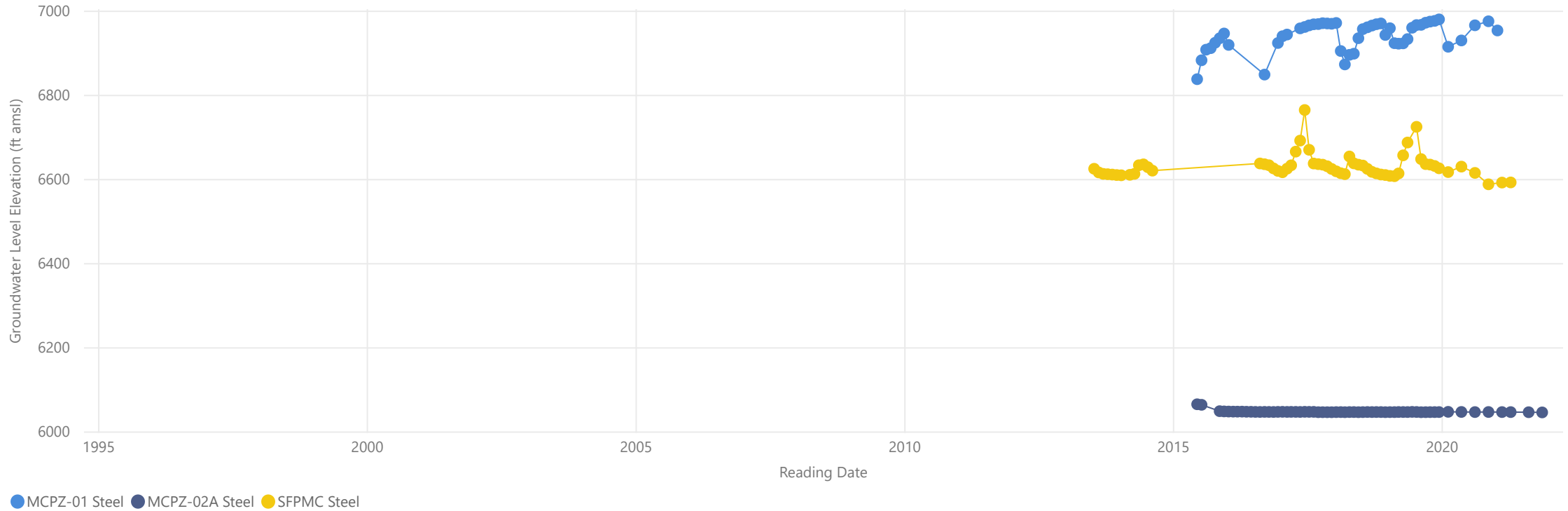
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
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2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Mill Canyon ▼



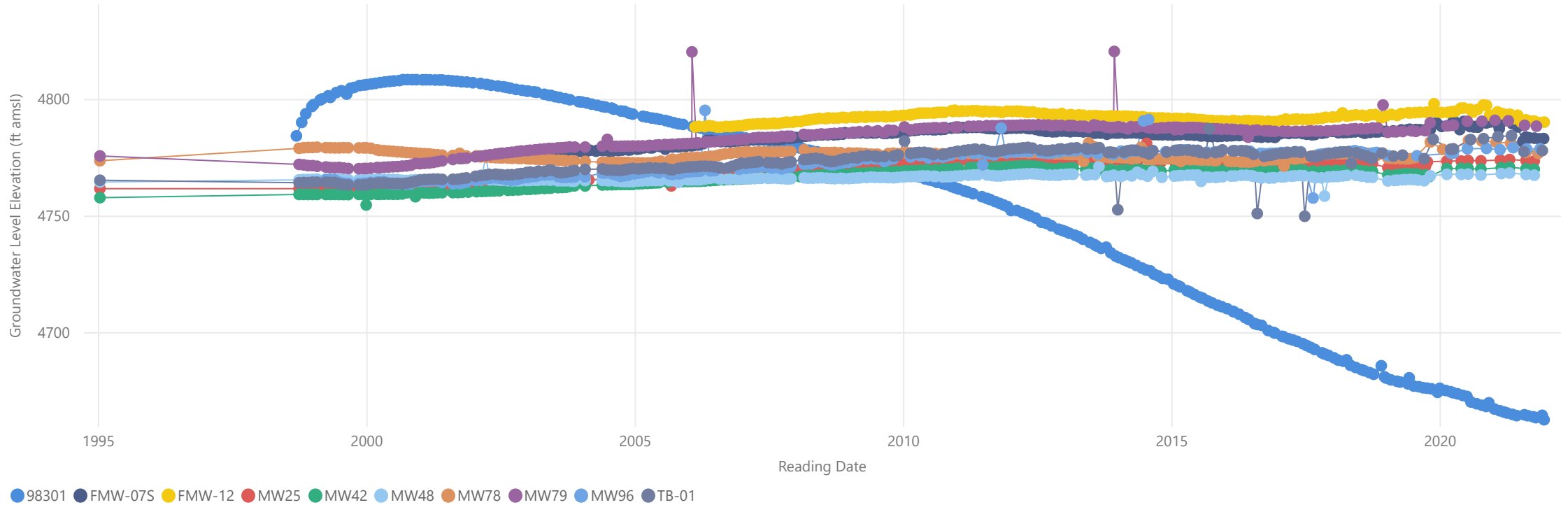
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
SFPMC Steel	7/1/2021	12/31/2021	No Data	Transducer/datalogger failure
MCPZ-01 Steel	4/1/2021		No Data	Datalogger failure
SFPMC Steel	5/16/2019	7/14/2019	No Data	No data
MCPZ-01 Steel	1/2/2019		Flowing	Artesian
MCPZ-01 Steel	11/1/2018	1/1/2019	No Access	No access November & December 2018
SFPMC Steel	11/1/2018	1/1/2019	No Access	No access November & December 2018

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Mill Site ▼



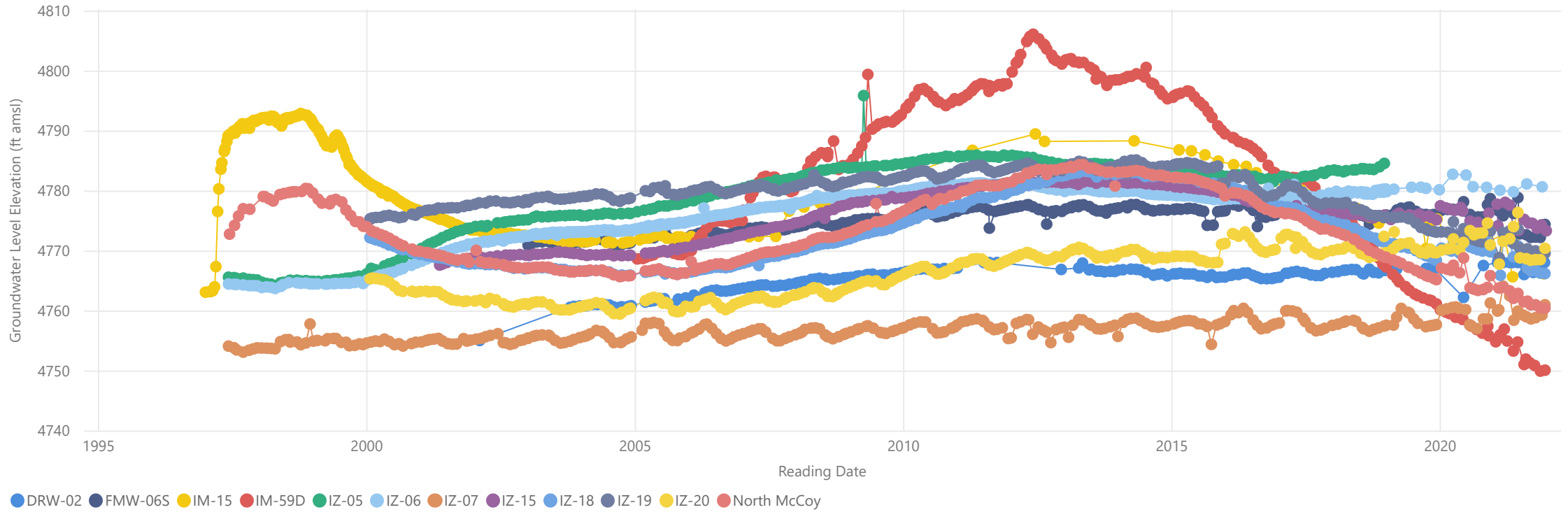
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
MW96	11/15/2019	6/17/2020	No Data	No data
MW96	5/15/2019	7/30/2019	No Data	No data

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

North of Mill Site ▼



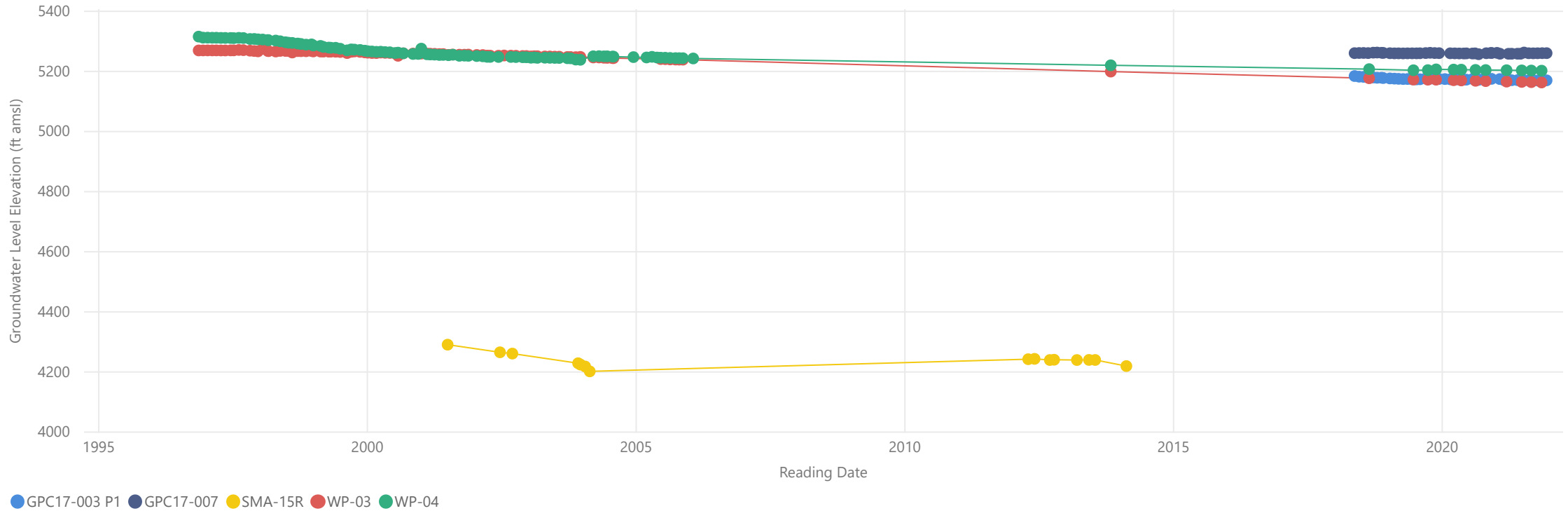
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
FMW-06S	1/1/2021	2/1/2021	No Access	No Access
IZ-18	1/1/2021	2/1/2021	No Access	No Access
IZ-19	1/1/2021	2/1/2021	No Access	No Access
IZ-20	1/1/2021	2/1/2021	No Access	No Access
North McCoy	1/1/2021	2/1/2021	No Data	No Access
DRW-02	3/16/2019		No Data	Water running out valve
IZ-05	1/17/2019		Inactive	Inactive.
IM-15	1/2/2019	9/29/2019	No Access	No access until 9/30/19

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

North Pipeline



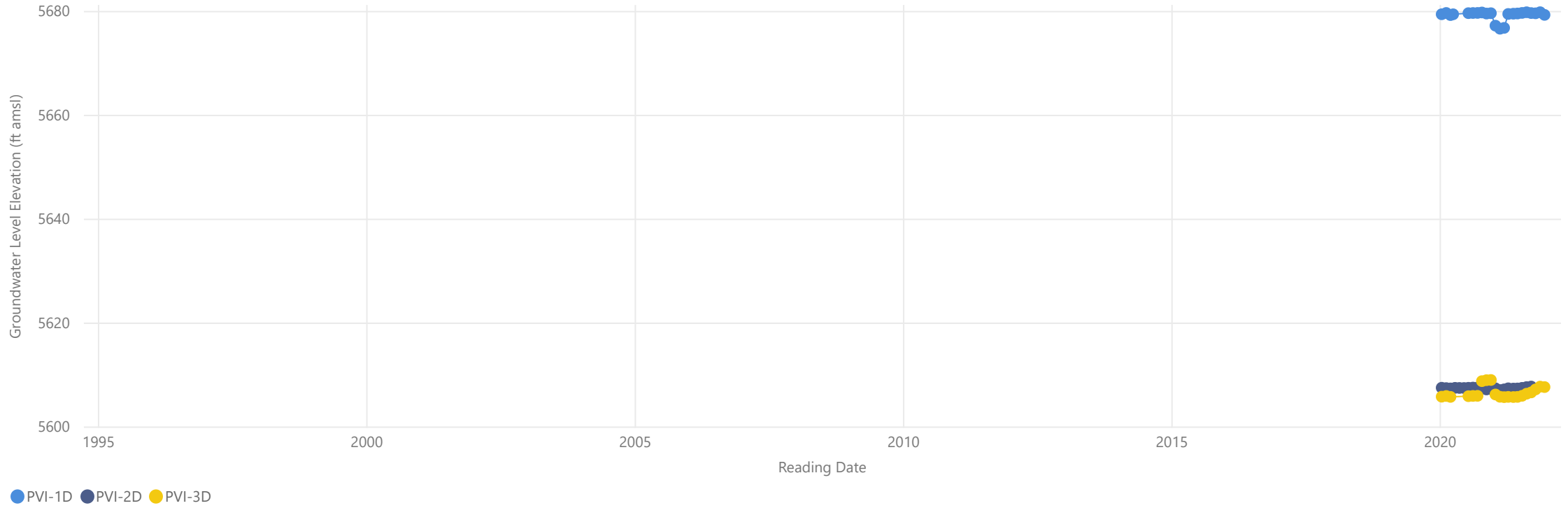
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
GPC17-007	1/2/2020	2/1/2020	No Data	No Data equipment failure
WP-03	1/15/2019	4/1/2019	No Data	Biannual measurement until 2Q2019
WP-04	1/15/2019	4/1/2019	No Data	Biannual measurement until 2Q2019
GPC17-003 P1	4/20/2018	5/1/2018	New	Installation complete in May 2018
GPC17-007	4/20/2018	5/1/2018	New	Installation complete in May 2018
SMA-15R	7/4/2001	2/19/2014	No Data	Inactive. Dry.

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Pine Valley RIBs ▼



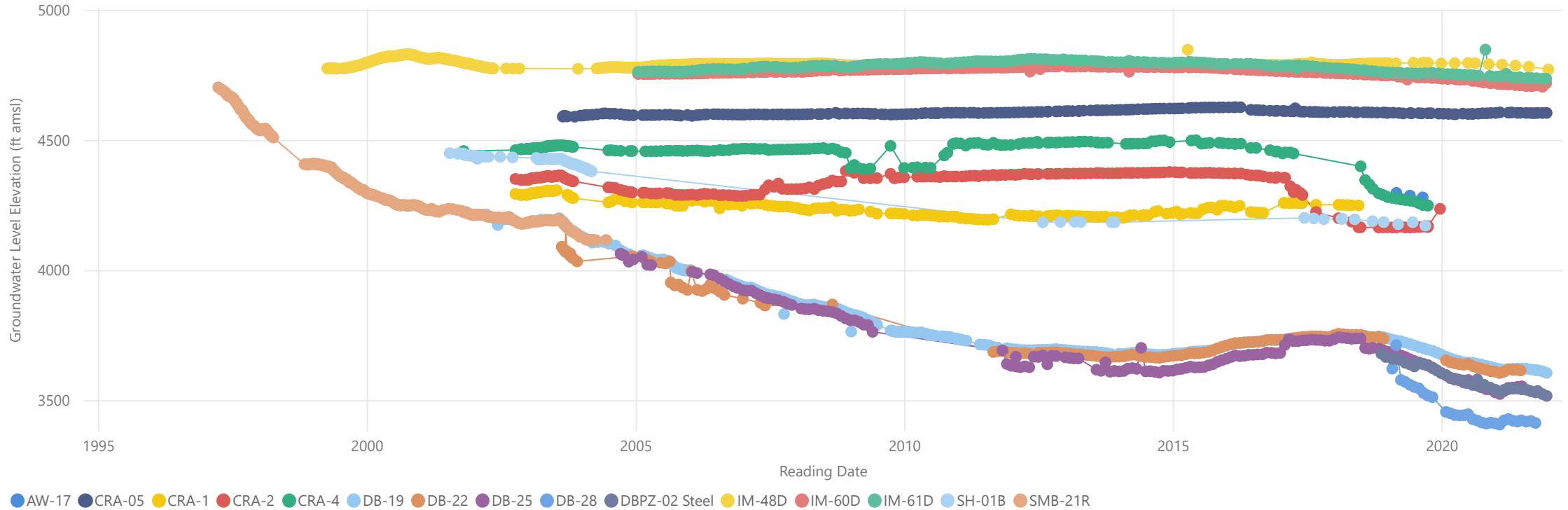
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
PVI-2D	10/1/2021	12/31/2021	No Data	No Access
PVI-1D	1/2/2021			Transducer correction was not applied to 2020 data
PVI-1D	5/1/2020	6/30/2020	No Data	Equipment Failure
PVI-3D	4/1/2020	6/30/2020	No Data	Equipment Failure
PVI-1D	1/1/2020	1/2/2020	New	
PVI-2D	1/1/2020	1/2/2020	New	
PVI-3D	1/1/2020	1/2/2020	New	

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Pipeline ▼



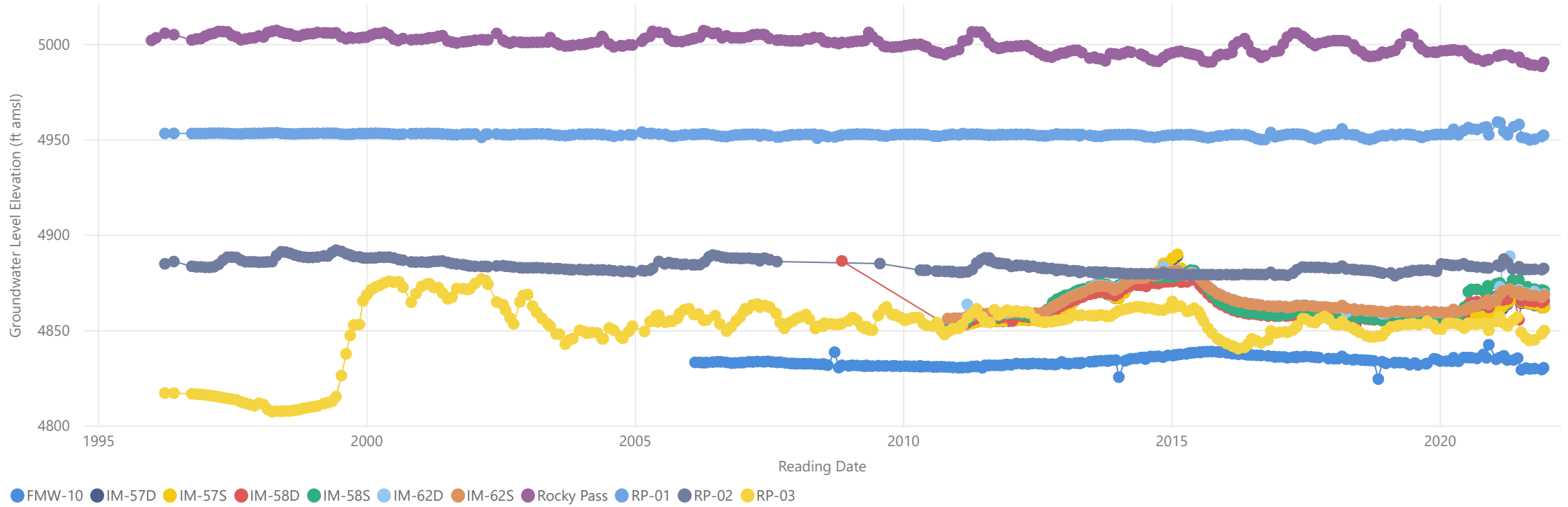
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
DB-28	10/1/2021		No Data	Equipment Failure
DB-22	7/1/2021		No Data	Equipment Failure
DB-25	7/1/2021		No Data	Transducer failure
CRA-05	10/23/2019	12/12/2019	Pumping	Pumping
CRA-2	10/9/2019		Inactive	Inactive plugged and abandoned
CRA-4	10/8/2019		Inactive	Inactive plugged and abandoned
SH-01B	9/14/2019		No Data	500 feet DTW reel gets caught on something. Well casing collapsed
AW-17	8/26/2019	12/31/2021	No Data	Converted to drains - no water Levels after 8/26/19 D. Peters

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Rocky Pass ▼



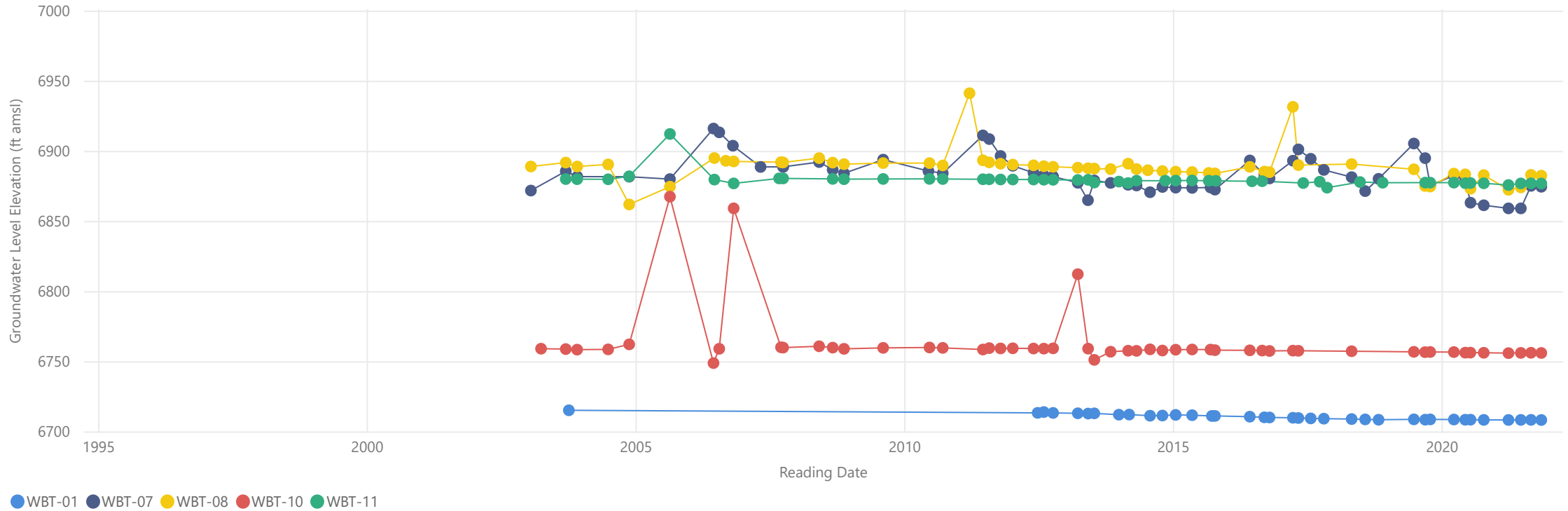
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
RP-02	1/1/2019	1/31/2019	No Data	

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Toiyabe ▼



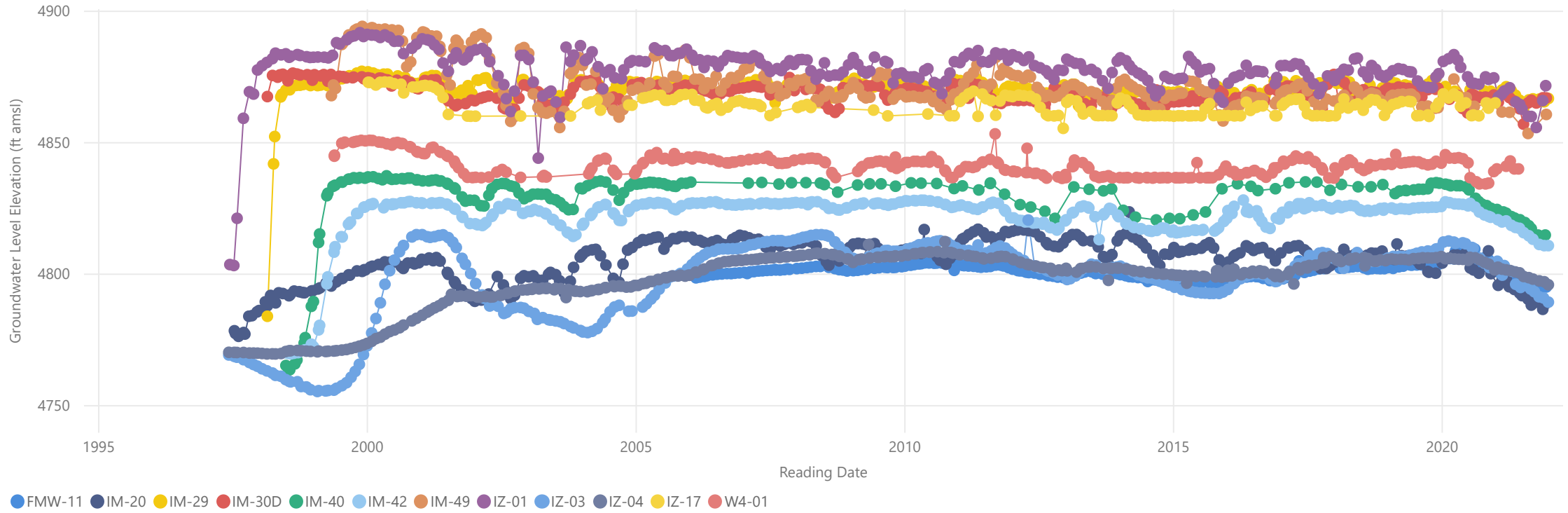
Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
WBT-01	1/15/2019	4/1/2019	No Data	Biannual measurement until 2Q2019
WBT-07	1/15/2019	4/1/2019	No Data	Biannual measurement until 2Q2019
WBT-10	1/15/2019	4/1/2019	No Data	Biannual measurement until 2Q2019
WBT-08	1/2/2019	4/1/2019	No Data	Biannual measurement until 2Q2019
WBT-11	1/2/2019	4/1/2019	No Data	Biannual measurement until 2Q2019
WBT-10	1/2/2019	9/10/2019	No Access	No Access

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Groundwater Hydrographs

Windmill RIBs ▼



Events

Well Station Name	Event Start Date	Event End Date	Event Type	Event Description
W4-02	10/1/2021		No Data	Dry
W4-01	7/1/2021		No Data	Dry
FMW-11	1/2/2021	1/31/2021	No Access	No Access
IZ-17	1/1/2021		No Data	Dry
IM-40	1/15/2019	2/1/2019	No Data	Monthly measurements commenced 2/19

HYDROGEOLOGY TABLES

TABLES 4A and 4B SUMMARY OF WELLSTATUS, COMPLETION, AND GROUNDWATER-LEVEL INFORMATION

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

TABLE 4A - WELL COMPLETION AND GROUNDWATER-LEVEL INFORMATION (ACTIVE STATUS)

Well Monitoring Area	Well Name ²	Latitude (NAD83) ¹	Longitude (NAD83) ¹	Collar Elevation (feet amsl)	Screen Top Elevation (feet amsl)	Screen Bottom Elevation (feet amsl)	Status	Measurement Date	Depth to Water (feet)	Groundwater-Level Elevation (feet amsl)	Groundwater-Level Change; 2020 - 2021 (feet) ³	Total Drawdown to Date (feet)
Carico Valley	Carpenter Stock Well	40.029708	-117.010564	5187.704	NA	NA	Active	22-Oct-21	35.70	5152.00	-6.70	-0.12
	Filippini Well #1	40.041458	-116.970004	5145.326	NA	NA	Active	22-Oct-21	6.15	5139.18	-0.65	-0.85
	Strawberry Well Pmt 53459	39.989148	-116.883714	5645.438	5305.438	5247.438	Active	22-Oct-21	295.28	5350.16	-2.58	20.16
Cortez Hills North	CHMW-03	40.170427	-116.650704	5275	4995	4595	Active	6-Dec-21	145.02	5129.98	-2.82	-65.02
	CHMW-04	40.164281	-116.596799	6876.74	5836.74	5436.74	Active	3-Feb-19	1323.26	5553.48	NA	-426.52
	CHPZ-09 PVC	40.176785	-116.615448	5648.68	4568.68	4448.68	Active	15-Dec-21	1181.83	4468.53	-3.73	-531.47
	CHPZ-135 Steel	40.170056	-116.619124	5954.858924	NA	NA	Active	30-Apr-21	2255.64	3700.87	-21.51	-1099.13
	CHPZ-180 PVC	40.162682	-116.600812	5267.43	NA	NA	Active	15-Nov-21	1601.30	3666.13	0.10	-1133.87
	CHPZ-279 P2	40.154956	-116.597853	6667.145669	NA	NA	Active	15-Dec-21	1653.03	5015.40	-0.94	-642.20
	CHPZ-329 Steel	40.15984	-116.613088	5999.186352	4479.71	4419.71	Active	15-Dec-21	639.04	5361.62	10.71	-171.34
	CHPZ-360 P1	40.165446	-116.599561	6320.036089	NA	NA	Active	17-Jul-20	1096.55	5223.49	NA	-168.58
	CHPZ-370	40.173621	-116.603052	6081.338583	NA	NA	Active	15-Dec-21	847.63	5236.46	11.84	-33.20
	CHPZ-49 PVC	40.173342	-116.67551	5794.72	5034.72	4934.72	Active	15-Nov-21	148.47	5647.79	-4.19	-11.21
	CHPZ-69 PVC	40.157279	-116.60391	6385.45	4405.45	4385.45	Active	23-Dec-21	1519.68	4867.61	-33.34	-844.39
	DC-166	40.169901	-116.61636	5857.67	5857.67	5857.67	Active	15-Dec-21	1055.94	4801.73	-16.99	-220.27
	DW-15	40.163255	-116.613896	5959.37	3460.37	2859.37	Active	15-Dec-21	2822.71	3138.50	-415.45	-2198.50
	DW-20	40.161144	-116.614017	5958.99	2938.99	2858.99	Active	15-Dec-21	2660.18	3298.81	-49.77	-2210.19
	MW89R	40.196474	-116.619857	4818.59	4020.59	3620.59	Active	6-Dec-21	145.02	5129.98	-30.76	-65.02
PD-07	40.154957	-116.620889	5783.26	5583.26	5483.26	Active	12-Dec-21	93.74	5691.52	-10.54	-53.48	
PPW-03	40.156105	-116.60818	6183.89	5374.89	4779.89	Active	20-Jun-07	446.21	5739.62	NA	-5.38	
Cortez Hills South	CHPZ-128 Steel	40.118099	-116.610112	5738.98	4698.98	4638.98	Active	15-Nov-21	57.78	5682.69	-1.82	-2.31
	CHPZ-129	40.114052	-116.609956	5735.91	4975.91	4875.91	Active	15-Nov-21	92.08	5645.57	2.96	-9.43
	CHPZ-137 P1	40.111916	-116.583788	6072.158	3852.158	3812.158	Active	6-Dec-21	999.68	5070.60	-32.81	-854.40
	CHPZ-48 PVC	40.131149	-116.608002	5927.35	5187.35	5027.35	Active	15-Nov-21	282.42	5646.75	-1.33	-18.25
	GVPW-01	40.118085	-116.609663	5738.53	5370.53	4850.53	Active	15-Nov-21	112.90	5627.70	-3.16	-20.30
	GVI-1D	40.117474	-116.590588	5952.16	5657.16	5332.16	Active	15-Dec-21	217.29	5734.31	82.66	77.15
	GVI-2D	40.115964	-116.598038	5787.29	5662.29	5507.29	Active	15-Sep-21	59.46	5724.81	68.19	63.52
	GVI-3D	40.106744	-116.598028	5711.68	5660.68	5579.68	Active	15-Sep-21	43.60	5664.94	9.48	5.26
	GVPW-02	40.113704	-116.609989	5737.7	5295.89	4815.89	Active	15-Nov-21	81.99	5655.71	4.03	17.71
	GVPZ-02	40.107644	-116.636497	5802	NA	NA	Active	15-Nov-21	140.30	5662.05	-6.23	-77.95
	PD-03	40.146656	-116.614866	5912.89	5532.89	5432.89	Active	12-Dec-21	316.52	5602.90	4.29	-87.10
	PD-06	40.120364	-116.603762	5788.64	5643.64	5563.64	Active	12-Dec-21	118.51	5670.13	16.61	0.13
Cottonwood Ribs	Cottonwood Well	40.313258	-116.494705	4810.85	4610.85	4210.85	Active	22-Oct-21	9.61	4801.24	-3.31	35.24
	IM-63S	40.293144	-116.471807	5091.42	4743.42	4723.42	Active	11-Dec-21	273.30	4816.68	-4.75	44.72
	IM-64D	40.316683	-116.49252	4815.16	4697.16	4677.16	Active	27-Dec-21	24.80	4790.36	0.00	22.35
	IM-64S	40.316654	-116.492472	4815.91	4747.91	4727.91	Active	20-Dec-21	28.15	4787.76	0.50	19.58
	IM-65D	40.316504	-116.481583	4841.38	4696.38	4673.38	Active	27-Dec-21	43.80	4797.58	0.25	27.62
	IM-65S	40.316514	-116.481547	4841.09	4741.09	4721.09	Active	27-Dec-21	43.50	4797.59	1.95	27.60
	IM-66D	40.326924	-116.499404	4775.76	4708.76	4706.76	Active	15-Dec-21	5.84	4772.77	-0.12	5.04
	IM-66S	40.326914	-116.499515	4775.4	4758.4	4728.4	Active	15-Dec-21	5.22	4772.18	-0.34	0.98
	IM-67D	40.359944	-116.46307	4797.06	4737.06	4707.06	Active	14-Dec-21	7.25	4791.76	0.12	11.58
	IM-67S	40.359944	-116.463181	4797.01	4787.01	4757.01	Active	14-Dec-21	8.26	4790.70	0.05	12.98

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

TABLE 4A - WELL COMPLETION AND GROUNDWATER-LEVEL INFORMATION (ACTIVE STATUS)

Well Monitoring Area	Well Name ²	Latitude (NAD83) ¹	Longitude (NAD83) ¹	Collar Elevation (feet amsl)	Screen Top Elevation (feet amsl)	Screen Bottom Elevation (feet amsl)	Status	Measurement Date	Depth to Water (feet)	Groundwater-Level Elevation (feet amsl)	Groundwater-Level Change; 2020 - 2021 (feet) ³	Total Drawdown to Date (feet)
Rocky Pass	RP-01	40.188717	-116.786593	4959.53	4952.53	4937.53	Active	9-Dec-21	7.40	4952.13	-0.20	-0.90
	RP-02	40.184699	-116.786319	4970.2	4891.2	4876.2	Active	9-Dec-21	91.55	4882.30	-0.23	-2.43
	RP-03	40.193669	-116.744285	4918.35	4828.35	4808.35	Active	13-Dec-21	68.65	4849.70	-0.10	32.70
	Rocky Pass	40.186953	-116.800977	5010.38	5002.38	4975.38	Active	9-Dec-21	20.05	4990.33	-1.42	-11.49
Toiyabe	WBT-01	40.041662	-116.75471	6988	6693	6688	Active	9-Nov-21	279.87	6828.82	-0.07	-6.92
	WBT-07	40.034134	-116.741647	7069	6834	6829	Active	9-Nov-21	194.58	6874.42	13.20	2.72
	WBT-08	40.033684	-116.746127	7046	6851	6846	Active	9-Nov-21	163.67	6882.33	-0.39	-6.52
	WBT-10	40.032217	-116.752489	7040	6795	6735	Active	9-Nov-21	284.08	6708.94	-0.14	-50.03
	WBT-11	40.054235	-116.729064	7050	6870	6840	Active	9-Nov-21	173.27	6876.73	-0.15	-3.17
Windmill RIBs	FMW-11	40.207454	-116.686037	4826.97	4726.97	4706.97	Active	13-Dec-21	34.07	4794.90	-6.67	-3.47
	IM-20	40.208068	-116.744657	4921.2	4784.2	4763.2	Active	9-Dec-21	132.60	4788.60	-11.35	10.36
	IM-29	40.199785	-116.729038	4883.16	4788.16	4768.16	Active	27-Dec-21	14.31	4866.58	0.35	82.83
	IM-30D	40.205336	-116.727217	4881.59	4801.59	4781.59	Active	13-Dec-21	13.02	4866.79	-1.11	-0.52
	IM-40	40.20935	-116.705274	4847.37	4789.37	4759.37	Active	6-Dec-21	34.73	4814.64	-10.17	49.61
	IM-42	40.197504	-116.699499	4839.8	4771.8	4751.8	Active	27-Dec-21	31.18	4810.62	-10.79	125.97
	IM-49	40.200505	-116.747247	4911.42	4842.42	4822.42	Active	13-Dec-21	52.91	4860.51	-4.18	-8.16
	IZ-01	40.202487	-116.743857	4901.55	4813.55	4773.55	Active	9-Dec-21	32.10	4871.45	-2.97	68.04
	IZ-03	40.21659	-116.700007	4840.23	4782.23	4742.23	Active	27-Dec-21	53.10	4789.13	-15.01	20.09
	IZ-04	40.202887	-116.6787	4823.04	4777.04	4737.04	Active	27-Dec-21	26.24	4795.74	-5.62	25.70
	IZ-17	40.21198	-116.73699	4900.9	4880.9	4860.9	Active	31-Dec-20	38.00	4864.90	0.00	-7.84
	W4-01	40.214736	-116.715071	4857.8	4842.8	4837.8	Active	7-Jun-21	20.00	4839.80	1.00	-4.83
	W4-02	40.211232	-116.715212	4858.04	4843.04	4838.04	Active	13-Sep-21	17.65	4842.39	-1.65	-6.28
	W5-01	40.195789	-116.732131	4882.61	4860.61	4855.61	Active	27-Dec-21	20.50	4864.11	-2.00	-3.00
W5-02	40.194411	-116.729731	4877.09	4859.09	4854.09	Active	20-Dec-21	17.90	4861.19	-3.40	-3.73	

amsl = above mean sea level

NA = not available

Locations are organized first alphabetically by monitoring well area and second alphanumerically within the monitoring well area.

¹ All data are based on horizontal datum NAD83 and a vertical datum of NAVD88.

² The letter codes "S" and "D" for the same well indicate the shallow and deep completions, respectively. The letter codes "A", "B", and "C" for the same well indicate increasingly deeper completions with "A" being the shallowest.

³ Groundwater-level change was calculated between the most recent 2020 reading and the most recent 2021 reading.

TABLE 4B - WELL COMPLETION AND GROUNDWATER-LEVEL INFORMATION (INACTIVE STATUS)

Well Monitoring Area	Well Name ²	Latitude (NAD83) ¹	Longitude (NAD83) ¹	Collar Elevation (feet amsl)	Screen Top Elevation (feet amsl)	Screen Bottom Elevation (feet amsl)	Status	Comments
Cortez Hills South	GVI-1S	40.117474	-116.590588	5952.26	5708.26	5424.26	Inactive	Dry but, will likely have water as RIBs become fully utilized
	GVI-2S	40.115964	-116.598038	5787.39	5711.39	5595.39	Inactive	Dry but, will likely have water as RIBs become fully utilized
	GVI-3S	40.106744	-116.598028	5711.55	5699.55	5657.55	Inactive	Dry but, will likely have water as RIBs become fully utilized
Goldrush - Central Horse Canyon	GRMW-06 Steel	40.129924	-116.542988	6653.78	4223.78	4023.78	Inactive	Obstructed by a pump
Goldrush - Horse Creek Area	GRMW-15 Steel	40.121402	-116.473834	5908.3	4108.3	3908.3	Inactive	Obstructed by a pump
Goldrush - Upper Pine Creek Area	PVI-1S	40.057964	-116.509298	5872.43	5728.43	5544.43	Inactive	Dry but, will likely have water as RIBs become fully utilized
	PVI-2S	40.058064	-116.487008	5905.92	5662.92	5379.92	Inactive	Dry but, will likely have water as RIBs become fully utilized
	PVI-3S	40.076874	-116.473208	5774.77	5659.77	5504.77	Inactive	Dry but, will likely have water as RIBs become fully utilized
North of Mill Site	IZ-05	40.224876	-116.670345	4810.31	4775.31	4735.31	Inactive	No safe access as of June 2019
North Pipeline	SMA-15R	40.266134	-116.710915	5164.65	4262.65	4202.65	Inactive	Dry since 2001
Pipeline	AW-17	40.229549	-116.699684	4857.024	4638.3	3958.3	Inactive	Converted to a drain
	CRA-1	40.228165	-116.690381	4835.69	3883.62	3783.62	Inactive	Mined out
	CRA-2	40.230705	-116.695702	4857.89	3876.89	3771.89	Inactive	Mined out
	CRA-4	40.229496	-116.703419	4864.93	4269.93	4164.93	Inactive	Mined out
	DBPZ-01	40.229415	-116.708782	4871.161417	NA	NA	Inactive	Replaced by DBPZ-02
	SMB-21R	40.25864	-116.716353	5106.59	4166.59	4106.59	Inactive	Dry since 1997

amsl = above mean sea level

NA = not available

Locations are organized first alphabetically by monitoring well area and second alphanumerically within the monitoring well area.

¹ All data are based on horizontal datum NAD83 and a vertical datum of NAVD88.

² The letter codes "S" and "D" for the same well indicate the shallow and deep completions, respectively. The letter codes "A", "B", and "C" for the same well indicate increasingly deeper completions with "A" be

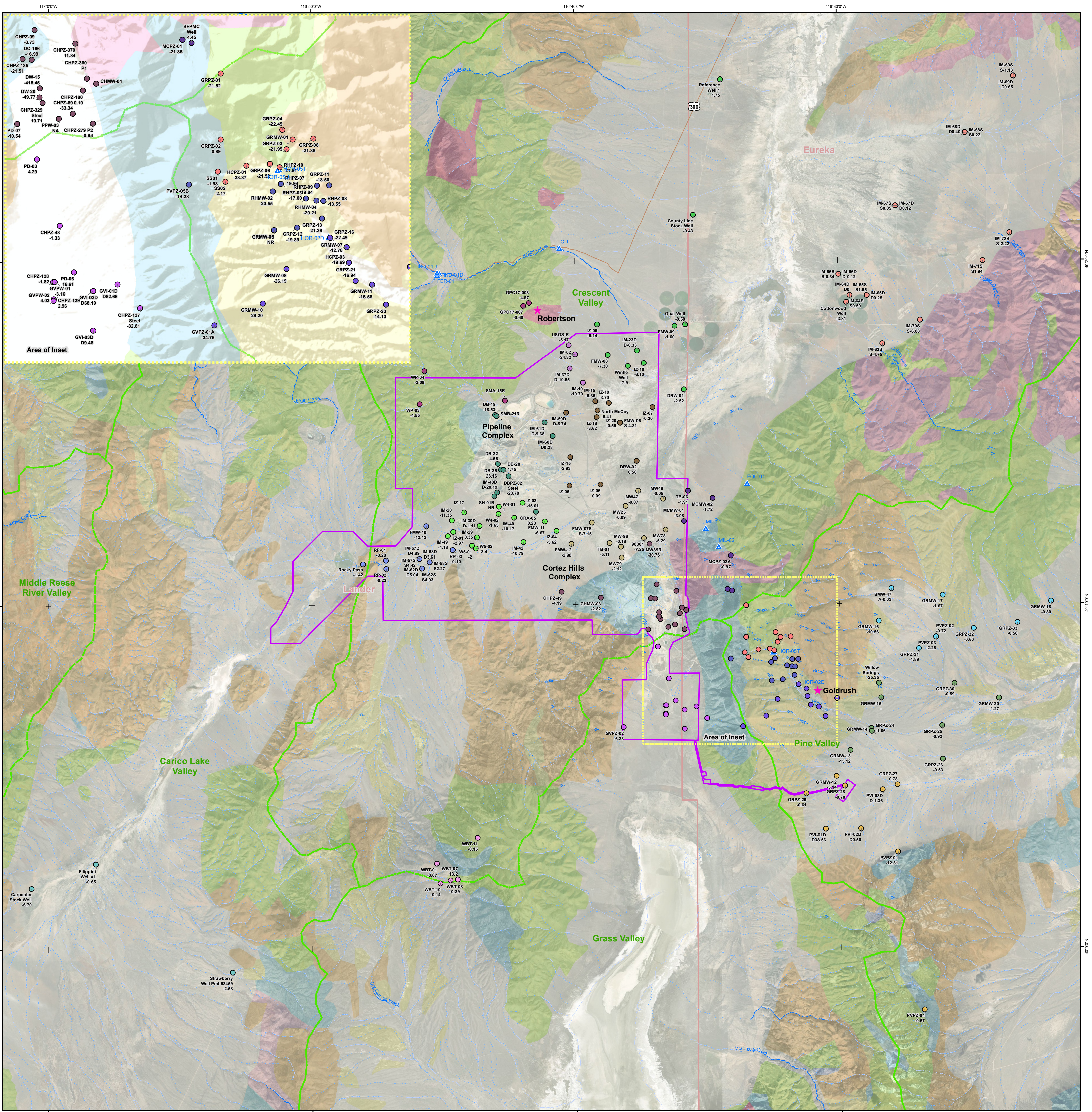
³ Groundwater-level change was calculated between the most recent 2020 reading and the most recent 2021 reading.

HYDROGEOLOGY MAPS

MAP 3: GROUNDWATER LEVEL CHANGE, AREAS OF SURFACE WATER, AND CONVEYANCE SYSTEMS

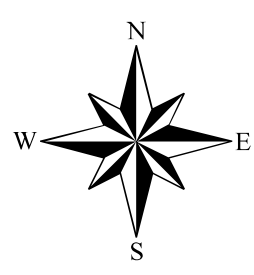
MAP 4: POTENTIOMETRIC SURFACE ELEVATION

MAP 5: CUMULATIVE POTENTIOMETRIC SURFACE CHANGE THROUGH DECEMBER 2021



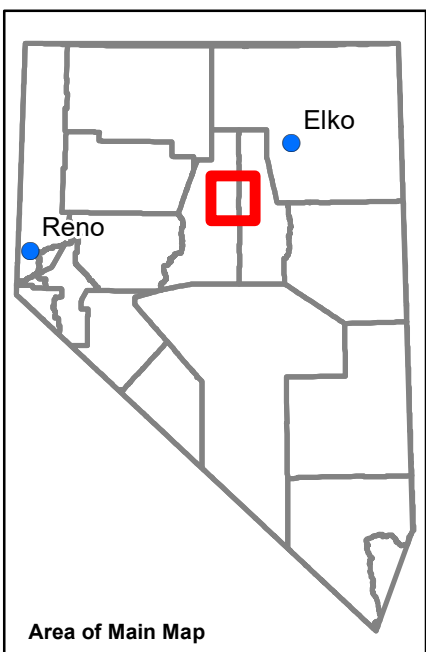
CORTEZ MONITORING PLAN
Groundwater Level Change in 2021 &
Areas of Surface Water & Conveyance System

Map 3



0 55 110 220 330 Miles

1:102,000
 1 inch = 8,500 feet



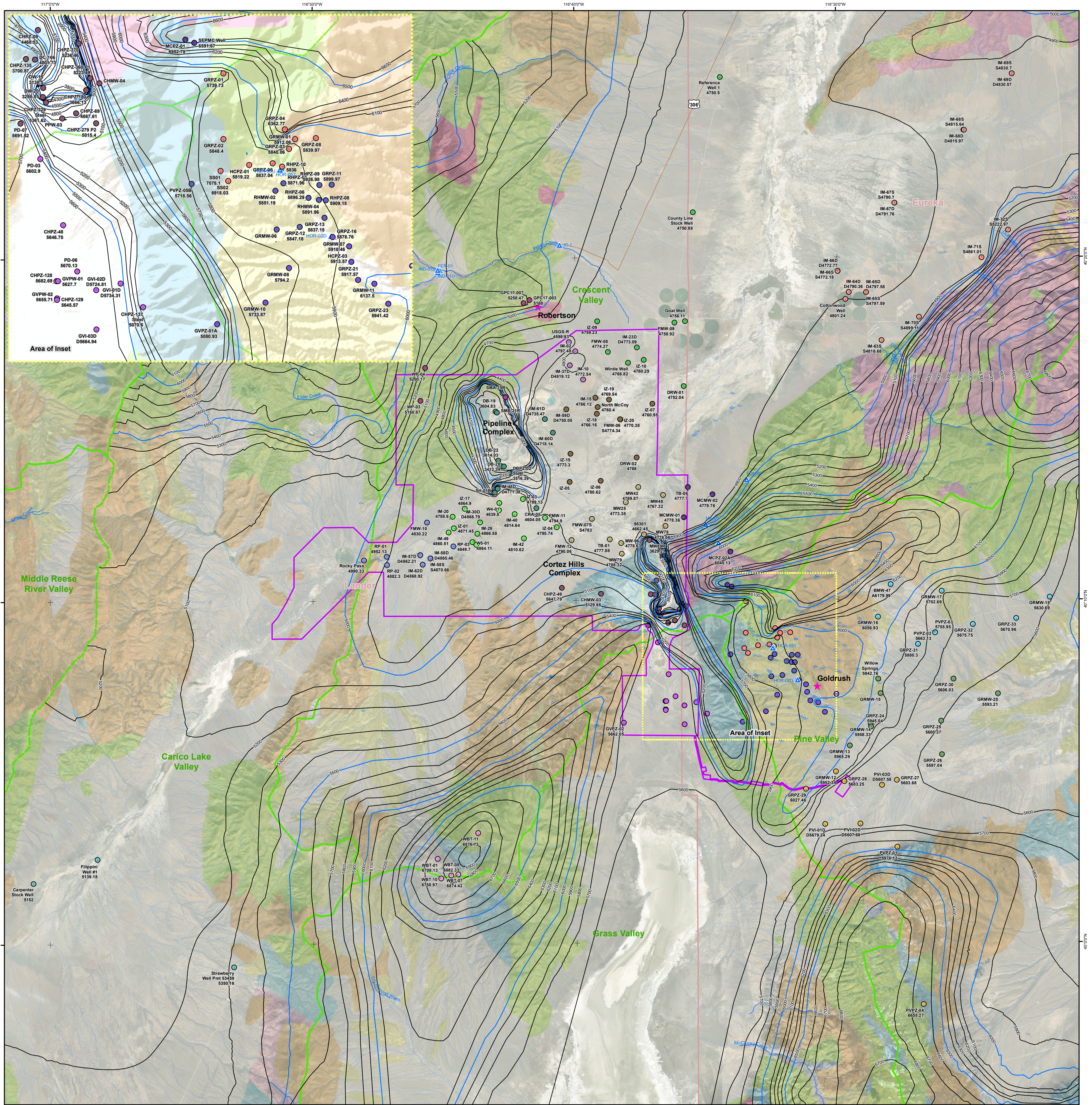
- | | | |
|---------------------------------|----------------------------------|-----------------------------|
| Carico Valley | Goldrush - Upper Pine Creek Area | Springs |
| Cortez Hills North | Goldrush - Willow Creek Area | Surface Monitoring Station |
| Cortez Hills South | Highway Ribs | Perennial Streams |
| Cottonwood Ribs | Mill Canyon | Intermittent Streams |
| Farm Area | Mill Site | Hydrographic Basin Boundary |
| Goldrush - Central Horse Canyon | North Pipeline | Cortez POO Boundary |
| Goldrush - Horse Creek Area | North of Mill Site | NGM Mineral Occurrence |
| Goldrush - Lower Horse Canyon | Pipeline | |
| Goldrush - Upper Horse Canyon | Rocky Pass | |
| Goldrush - Upper Horse Canyon | Toiyabe | |
| Goldrush - Upper Horse Canyon | Windmill Ribs | |

- s & d Shallow & Deep Completions
 a, b & c Different Completion Depths, a= Shallow, b= Intermediate, c= Deep
 NR No Reading
 -- No Previous Reading to Calculate Change

Surface Geology

- | |
|-----------------------------------|
| Quaternary Alluvium/ Colluvium |
| Tertiary Sediments |
| Tertiary Volcanics |
| Jurassic/ Cretaceous Granodiorite |
| Paleozoic Siltstones |
| Paleozoic Limestones |

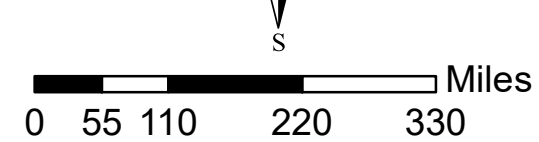
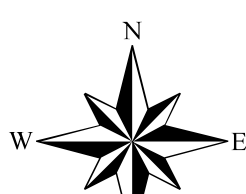
SOURCE: Nevada Geology from Stewart & Carlson, 1978



CORTEZ MONITORING PLAN

2021 Potentionmetric Surface

Map 4



1:102,000

1 inch = 8,500 feet

General Location

- Carico Valley
- Cortez Hills North
- Cortez Hills South
- Cottonwood Ribs
- Farm Area
- Goldrush - Central Horse Canyon
- Goldrush - Horse Creek Area
- Goldrush - Lower Horse Canyon
- Goldrush - Upper Horse Canyon
- Goldrush - Upper Horse Canyon
- Goldrush - Willow Creek Area
- Highway Ribs
- Mill Canyon
- Mill Site
- North Pipeline
- North of Mill Site
- Pipeline
- Rocky Pass
- Toiyabe
- Windmill Ribs

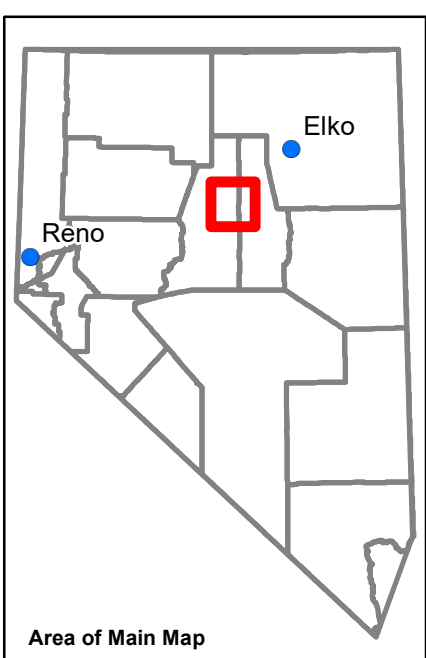
- s & d Shallow & Deep Completions
- a, b & c Different Completion Depths, a= Shallow, b= Intermediate, c= Deep
- NR No Reading
- No Previous Reading to Calculate Change

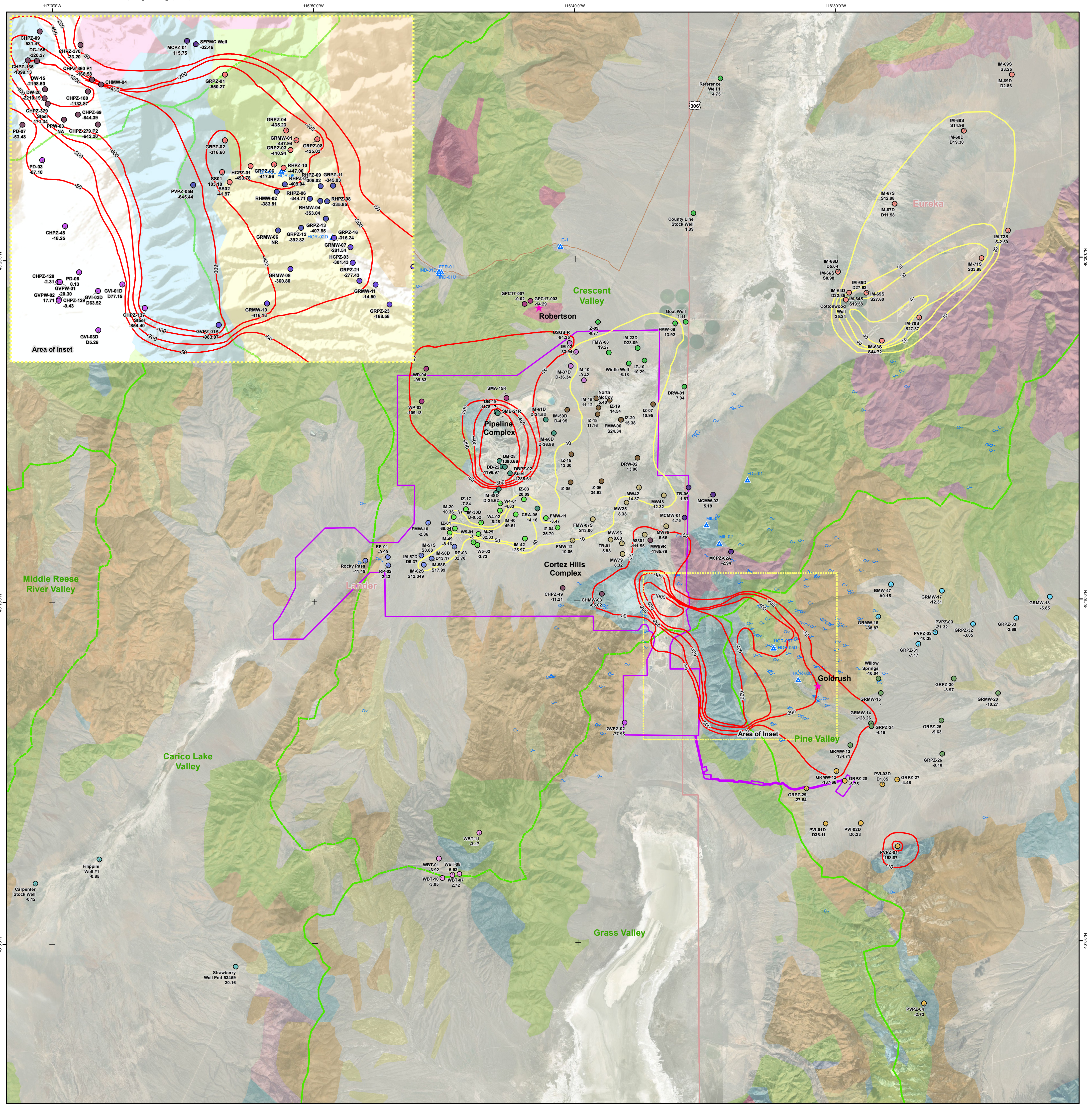
Surface Geology

- Quaternary Alluvium/ Colluvium
- Tertiary Sediments
- Tertiary Volcanics
- Jurassic/ Cretaceous Granodiorite
- Paleozoic Siltstones
- Paleozoic Limestones

Potentionmetric Surface Contours

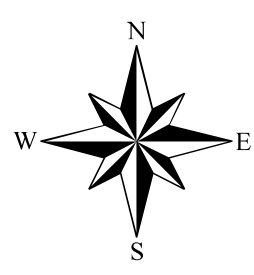
- Springs
- ▲ Surface Monitoring Station
- Perennial Streams
- Intermittent Streams
- Hydrographic Basin Boundary
- Cortez POO Boundary
- ★ NGM Mineral Occurrence
- Contour
- Index





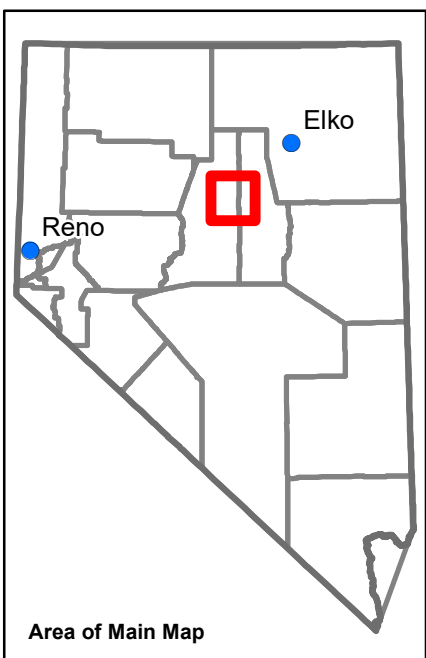
CORTEZ MONITORING PLAN
Cumulative Change to Potentiometric Surface
Through December 2021

Map 5



0 55 110 220 330 Miles

1:102,000
 1 inch = 8,500 feet



- General Location**
- Carico Valley
 - Cortez Hills North
 - Cortez Hills South
 - Cottonwood Ribs
 - Fam Area
 - Goldrush - Central Horse Canyon
 - Goldrush - Horse Creek Area
 - Goldrush - Lower Horse Canyon
 - Goldrush - Upper Horse Canyon
 - Goldrush - Upper Horse Canyon
 - Goldrush - Upper Pine Creek Area
 - Goldrush - Willow Creek Area
 - Highway Ribs
 - Mill Canyon
 - Mill Site
 - North Pipeline
 - North of Mill Site
 - Pipeline
 - Rocky Pass
 - Toiyabe
 - Windmill Ribs
- s & d Shallow & Deep Completions
 a, b & c Different Completion Depths, a= Shallow, b= Intermediate, c= Deep
 NR No Reading
 -- No Previous Reading to Calculate Change

- Total Drawdown to Date Contours**
- Springs
 - ▲ Surface Monitoring Station
 - Perennial Streams
 - Intermittent Streams
 - ▭ Hydrographic Basin Boundary
 - ▭ Cortez POO Boundary
 - ★ NGM Mineral Occurrence
- Surface Geology**
- Quaternary Alluvium/ Colluvium
 - Tertiary Sediments
 - Tertiary Volcanics
 - Jurassic/ Cretaceous Granodiorite
 - Paleozoic Siltstones
 - Paleozoic Limestones

SOURCE: Nevada Geology from Stewart & Carlson, 1978

Drawn by: Erica
 Revision: 2/25/2022
 Nevada State Plane 1983 East

SURFACE WATER HYDROLOGY

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5 SURFACE WATER HYDROLOGY

In this section, hydrographs illustrating instantaneous flow rates in gpm at stream monitoring locations are presented. Stream-flow data were measured at surveyed sites through profiled channel cross sections using an electronic current meter and graduated staff gauge. Also included in this section are brief discussions of observations made during Seeps and Springs monitoring activities. Surface water monitoring sites are depicted in Maps 1 through 3. Additional data such as seeps and springs hydrographs and field parameters are provided in the Seeps and Springs Studies provided on flash drives.

5.1 STREAMS

Surrounding the Cortez Mine are eight surface water monitoring stations along four streams including Ferris Creek, Fourmile Creek, Indian Creek, and Mill Creek. As significant flows have been historically observed at the Hot Creek Spring, it has been included in this section. Hydrographs of flows at each of the monitoring stations following this section. During the 2021 monitoring period there was minimal data provided for the Ferris Creek and Indian Creek sites due to private land access agreements. NGM is currently working to resolve this issue.

5.1.1 Ferris Creek

Ferris Creek is located northwest of Pipeline and acts as a tributary to Indian Creek. Monthly monitoring of Ferris Creek began at the end of 2007. Increasing annual flows were observed from 2008 through 2011 before drought struck the area causing minimal flows to be observed until 2016. Between 2016 and 2018, annual flows continued decreasing until April 2019 when flow rates in March through June were the highest since monitoring initiated in 2007. In 2020, flow rates again decreased, and the highest flow rate was recorded in May 2020 with a measured flow of 715 gpm. There is one flow measurement recorded for 2021 during January at 15 gpm. However, due to private land access agreements, no other site visits or measurements were completed at Ferris Creek in 2021.

5.1.2 Fourmile Creek

Fourmile Creek is located north of CHOP in the Cortez Mountains. Flow has been detected in this creek intermittently during very wet years such as 2010, 2011, 2016 through 2019. No flow was observed in 2020 or 2021.

5.1.3 Hot Creek

The Hot Creek Group is located on the eastern side of Pine Valley on the Eureka and Elko County line and is comprised of one spring that is the headwaters of Hot Creek. In the 2020 COGSWMP Annual Report, there were discrepancies in the flow measurements reported between 2016 and 2018. NGM inadvertently reported duplicate measurements thus causing the reported flow rates to double during those 3 reporting periods. The hydrographs have been corrected for the 2021 report. Since monitoring of this location began in 2016, the spring has exhibited an average quarterly flow rate of 2,220 gpm. The peak flow rate observed in 2021 occurred in May and was measured at 902 gpm.

5.1.4 Indian Creek

Indian Creek is located to the north of both the Pipeline and Cortez Hills areas and is monitored at three different surface monitoring locations. The flow in Indian Creek is characterized by high

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

seasonal variability and exhibits the greatest flow rates of all the streams monitored around the Cortez Mine. Peak flow is consistently observed in the beginning of the second quarter, coinciding with spring snowmelt and runoff. The creek shows a strong correlation to changes in annual precipitation as is observed in higher than normal flow rates in 2016 and 2017 that ultimately taper off in 2018. In 2019, these reduced flows persisted at location IC-1 but flows at the two upstream locations, IND-01U and IND-01D, increased dramatically relative to 2018. Due to private land restrictions flow measurements in Indian Creek were only collected for the month of January at IND-01D and IND-01U with flow rates of 561 gpm and 374 gpm, respectively.

5.1.5 Mill Creek

Mill Creek is located northwest of CHOP in the Cortez Mountains and is monitored at two different locations. The flow of Mill Creek is similar to the above creeks, in that it shows a strong correlation to annual precipitation rates. Peak flows were observed in 2011, 2016, and 2019. Flow rates observed in 2021 were greatly reduced compared to years 2019 and 2020. MIL-01 was dry in September and October 2021, while MIL-02 was dry between April and December 2021, with the exception of June when flow measurement of 14.38 gpm was recorded.

5.2 PIPELINE/PEDIMENT SEEPS & SPRINGS

5.2.1 Rocky Pass

The Rocky Pass Group is located on the eastern side of the Shoshone Mountain Range in the southern portion of Crescent Valley. It is comprised of three springs and one developed source piped to a trough. Since monitoring began in 1996, annual flows decreased steadily at each of these sites through 2008. Increases in flow were observed during the wet years of 2005, 2006, 2008, and 2011. In 2017, the impacts of the wet year were observed at locations 27-46-28-221 and 27-46-28-11, but the minimal flows observed at all the sites in 2018 have continued through 2021. During 2021, no flow was observed at sites 27-46-16-11 and 27-46-28-11. The peak flow at Site 27-46-28-221 during 2021 decreased from 2020 and 2019 to 2 gpm.

In 2012, mitigation at Site 27-4-28-224 was triggered by a reduction of flow to less than 3.0 gpm in summer and fall monitoring events for two consecutive years coincident with a reduction in groundwater levels in this area, as determined from the existing groundwater monitoring wells. As such a well and stock trough were installed per the requirements of the 2011 Final Supplemental Environmental Impact Statement (FSEIS) in 2013. The well is currently permitted for permanent stock water under permit 83240 which allows for a total diversion rate of 16.13 acre-feet per year for 720 head of cattle.

5.2.2 Peripheral Area

The Peripheral Area is located on the eastern side of the Shoshone Mountain Range in the southern part of the project area. The one monitoring location within the Peripheral Area consists of a developed source piped to a trough. Between 1996 and 1999, flows averaged 0.3 gpm. However, since 1999, flowrates have averaged less than 2 gpm and in 2021 the average flow rate was 0.17 gpm.

5.2.3 Toiyabe Catchment

The Toiyabe Catchment is located in two sections of the project area and contains four springs and two developed sources piped to troughs. While most of the sites have showed decreasing or highly ephemeral flows, Site 27-48-19-24 had remained relatively consistent since monitoring

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began in 1996. The highest flow rates of 2021 were observed in April and measured 5.15 gpm. Flows recorded at Site 26-47-04-24 were lower in 2021 than what was measured in 2020 and similar to what was measured in 2019.

In 2016, data collected at spring 27-47-33-42 triggered mitigation activities as defined by Monitoring and Mitigation Item WR1b of the Cortez Hills Final Environmental Impact Statement (September 2008). For this site, the mitigation was triggered by “a reduction in flow to less than 0.25 gpm for 2 consecutive years in summer and fall monitoring events coincident with a reduction in groundwater levels in this area, as determined from groundwater monitoring.” While the spring and the nearest monitoring well, CHMW-03, did exhibit reductions, the two were likely not directly connected as the well is over 7,000 ft away from the spring and completed in the Vinini Formation, not the perched alluvial aquifer that the spring is drawing from. While the drawdown in the well is attributable to dewatering activities, the reduction in spring flow is likely related to drought and the wet and dry climatic episodes typical of northern Nevada. Regardless of the true cause of the reduction in spring flow, NGM is fulfilling its mitigation commitment by provisioning water from a new well at a rate of approximately 0.5 gpm to maintain water supply to livestock and wildlife. A new groundwater well was drilled at the site and application 88538 was issued by NDWR on September 9, 2019 that allows for 0.81 acre-feet per year to water 36 head of cattle.

Site 27-48-16-31 has also triggered mitigation activities. In the 2011 FSEIS, the trigger criteria for this site were “a reduction of flow to less than 2.0 gpm observed in summer and fall quarterly events for two consecutive years coincident with a reduction in groundwater levels as determined from the existing alluvial groundwater monitoring wells.” A reduction of flow to less than 2.0 occurred at the site between July 2010 and November 2011. However, during site assessments in February 2021, approximately 400 feet upgradient of the historic monitoring location surface water was emerging at approximately 3.56 gpm. Measurable flows continued throughout the remainder of 2021. Because the site is located in a drainage where surface water can commonly emerge then go back to the subsurface several times and water was found about 400 feet upgradient from the original monitoring location, NGM has moved the monitoring location to the current emergence point in the drainage. Since the measured flow of 3.56 gpm is above the mitigation threshold (2.0 gpm), mitigation is not required at this time.

A flow-based trigger dictates that if there is a reduction in flow coincident with a reduction in groundwater levels in the area, a mitigation action is triggered. As the flow at sites 26-47-04-24 and 27-48-19-24 has intermittently reduced to below their respective flow-based trigger levels as established by the 2011 FSEIS, groundwater levels and flow rates were reviewed. Based on the evaluation criteria, it was concluded that sites 26-47-04-24 and 27-48-19-24 have not been impacted by the Cortez dewatering program and mitigation actions are not triggered.

5.2.4 Shoshone

The Shoshone Group is in the northwest section of the project area in the Shoshone Mountain Range and is comprised of twelve seeps and springs. Seven of the seeps are monitored semi-annually, while the others are monitored on a quarterly basis. Early monitoring of the Shoshone Group measured the greatest flow rates at all of the sites despite some peaks during notably wet years. Though the seeps and springs monitored as part of the Shoshone Group consistently showed decreasing flow rates since the beginning of monitoring, almost all of the sites began showing increased flow rates starting in 2016, illustrating the influence of variable annual precipitation rates.

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Between November 2007 and August 2009, flows at Site 28-46-02-34 reduced to below its flow-based trigger level as established by the 2011 FSEIS. In 2018, flows continued declining since the wet year of 2017. However, by the end of 2019, flows had begun increasing again. As a review of the groundwater levels in this area has yet to be conducted in the context of these triggers, the level of required mitigation is still to be determined.

Similarly, Site 28-46-05-42 showed reduced flows in 2018 relative to those recorded in 2017, but then in March of 2019, a flow rate of 26.31 gpm was measured, marking the highest flow rate ever recorded at that site. Site 29-46-29-234 had not shown much change since 2006, but in March of 2019, a flow rate of 22.57 gpm was recorded which was more than double the historic maximum rate measured at that site.

The remainder of the Shoshone Group exhibited little deviation from historical trends. This includes Site 28-46-15-32 which has not exhibited measurable flow since 1998. However, at this site, one out of the three mitigation criteria for a vegetation-based trigger as required by the 2011 FSEIS has been met as hydrophytic vegetation has been below the 50 percent dominance line for all surveys except the second quarter of 2017 and the third quarters of 2017 and 2018. Vegetation-based triggers are based on the following three criteria:

- 1) Less than 50 percent of the total species present at the surface water feature are obligate, facultative wetland, or facultative species (i.e., the dominance test);
- 2) Criterion 1, above, occurs for four consecutive monitoring events over two years during average or above average precipitation years as defined by the National Oceanic and Atmospheric Administration; and
- 3) Groundwater levels have declined in the intervening groundwater monitoring wells as the result of pumping for mine dewatering (CGM and JBR, 2010).

Implementation of a contingency mitigation plan based on vegetation triggers occurs when the BLM determines that all three criteria have been met. As the Palmer Hydrological Drought Index (PHDI) has been below zero for the majority of the survey periods when the hydrophytic vegetation has been below the 50 percent dominant line at Site 28-46-15-32, the reduction in hydrophytic vegetation is attributable to drought conditions and review of groundwater levels is not warranted at this time.

5.2.5 East Valley

The East Valley Group is located in the eastern portion of the project area above the Cortez Hills Mine and across the valley from Pipeline. The East Valley Group is comprised of eight excavated ponds that were built to collect groundwater and runoff water for livestock use. While recurrent flow has only been observed at Site 28-48-21-14, the other ponds show frequent changes in their measured areas. For example, the average area of Site 28-48-28-342 in 2020 was 1,950 cu-ft. In 2021, the average area was 2,563 cu-ft, significantly greater than what was recorded in 2020. This highlights that there is hydrologic activity present even when flowing seeps or springs are not always apparent. In 2021, the average annual measured areas at Sites 28-48-32-24, 28-48-32-32, 28-48-32-33, 28-48-32-34 were all greater than those measured in 2020.

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5.2.6 Mapped Cortez Spring

The Mapped Cortez Spring is a developed source piped from a discharging adit to a trough. While early flows were noted as being nothing but a trickle, flow rates have been shown to increase since 2011. Despite the peak in flows in 2017 and 2019, more typical flows were observed in 2021.

5.2.7 Northeast Toiyabe Seeps

The two hillside seeps of the Northeast Toiyabe Seeps Group are located south of the Cortez Hills Mine. These seeps are almost entirely reliant on precipitation as they do not exhibit flow except for in major precipitation years such as 2005, 2011, and 2016-2019. Both seeps were dry for the duration of 2020 and minimal flows occurred in 2021.

At sites 26-47-01-43 and 26-47-12-21, hydrophytic vegetation has been below the 50 percent dominance line for all surveys since monitoring began in the second quarter of 2017. However, as the PHDI was above zero in 2017 but below zero in 2018 and 2021, only one of the three vegetation trigger criteria has been met to date.

5.2.8 Cortez Canyon

The Cortez Canyon Seeps Group is located south of CHOP and is comprised of four in-channel seeps. Besides low flows being observed at site 27-47-36-433 in 2011, 2012, and 2018, the Cortez Canyon seeps have only exhibited measurable flows in 2002, 2016, 2017, and 2019. All four monitoring locations were dry in 2020 and 2021.

5.2.9 Northeast Survey Area Seep

The one seep located in the Northeast Survey Area is located east of CHOP within the Plan of Operations (PoO) boundary. While the seep has shown evidence of active hydrology via wetting surfaces and saturated soils, volumes sufficient for flow and field parameter collection have not been observed since 2004.

At site 27-48-30-44, two of the three vegetation trigger criteria established by the 2011 FSEIS have been met as hydrophytic vegetation was below the 50 percent dominance line and the PHDI was above zero during the second and third quarter monitoring events of both 2016 and 2017. The site has been monitored since the second quarter of 2002 and is located in a stagnant water pool with dry vegetation. However, since large-scale dewatering commenced in 2011 at CHOP, the site has been reported as dry. As this site is adjacent to the pit and close to the center of the drawdown cone, it is most likely that the seep has been impacted by the CHOP dewatering program and warrants mitigation. Due to the highwall failures at CHOP, further planning is required to determine what well(s) are a potential source for mitigation and will not be further affected by the highwall failures. Mitigation is planned to be completed during the 2022 calendar year.

5.2.10 Northeast Corner Seeps and Springs

The Northeast Corner Seeps and Springs Group is located east of CHOP within the PoO boundary and is comprised of three monitoring locations. None of the sites have exhibited volumes sufficient for flow and field parameter collection since monitoring began in 2002. Trigger criteria has not been met at these three monitoring locations.

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5.2.11 Wilson Canyon-Cooks Creek

The Wilson Canyon-Cooks Creek Group is in northern Carico Lake Valley and is comprised of fifteen seeps. Four of these seeps are located at the headwaters of Cooks Creek and one seep is located at the headwaters of Wilson Canyon. As monitoring was only initiated in 2016, trends in baseflow are difficult to determine due to the small dataset. In comparing third and fourth quarter data from 2017 through the end of 2020, all 15 locations exhibited reduced flows in 2020. This is likely attributable to reduced precipitation in 2020 as flows began to increase in 2021.

5.3 GOLDRUSH SEEPS & SPRINGS

5.3.1 Brock Canyon

The Brock Canyon Group is located in the northwest portion of the study area and is comprised of three springs. While there was measurable flow at spring 27-49-14-413, it was less than that observed in 2018. No flow was detected at spring 28-49-30-231 or 28-49-30-443 in 2021.

5.3.2 Cortez Hills

The Cortez Hills spring is also known as site 27-48-30-44 and is reported above under the Northeast Survey Area. Section 5.3.2 will be removed from future reports to reduce redundancy.

5.3.3 Cottonwood Creek

The Cottonwood Creek Group is located in the northwest portion of the study area and is comprised of eight seeps, two springs, and one fringe wetland. In 2021, none of the sites exhibited measurable flows. Despite the low flows, no significant changes to the Cottonwood Creek locations were noted.

5.3.4 Dry Creek

The Dry Creek Group is located on the southern slope of the Cortez Mountain Range within the Buck Exploration boundary and is comprised of four seeps, one spring, and one developed source piped downslope. These sites are monitored quarterly for the Cortez District, but annually to establish baseflows for the Goldrush Project. Flows recorded in 2021 were either the same as or slightly less than flows observed in 2020 at all of the Dry Creek sites.

5.3.5 Dry Hills

The Dry Hills Group is located southwest of Horse Canyon and is comprised of two developed sources piped to troughs and eleven monitoring locations present in rocky drainages, along hillsides, and in channels with shallow gradients. These sites are monitored quarterly for the Cortez District, but annually to establish baseflows for the Goldrush Project. Only Site 26-48-26-123A exhibited flow during 2020. However, during 2021, ten sites recorded measurable flow. The remaining sites were either ponded and saturated or dry and snow-covered throughout the 2021 year.

5.3.6 Fourmile Canyon

The Fourmile Canyon Group is located on the northern slope of the Cortez Mountain Range near and within the Horse Canyon/Cortez Unified Exploration Project boundary and is comprised of four seeps and springs and one monitoring location within a reclaimed road. These sites are monitored quarterly for the Cortez District, but annually to establish baseflows for the Goldrush Project. In 2021, all of the sites exhibited lower or similar flowrates to those measured in 2020.

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5.3.7 Horse Creek

The Horse Creek Group is located near and within Horse Canyon and is comprised of thirty-four seeps and springs and three developed sources piped downslope or to a trough. This Group is further divided into the Upper Horse Canyon, East Slope, Horse Canyon Tributaries, and Lower Horse Canyon Subgroups.

1.1.1.1 Upper Horse Canyon

The Upper Horse Canyon Subgroup consists of 10 seeps and springs. Most of these springs exhibited their peak flows between 2009 and 2011 followed by no significant flow through 2018. In 2019, Sites 26-48-11-422, 26-48-03-114, 26-48-03-143, and 26-48-03-213 exhibited their highest recorded flow rates since monitoring began in 2008. In 2021, flowrates were less than those observed in 2019 but, more than those observed in 2020.

1.1.1.2 East Slope

The East Slope consists of 22 seeps and springs. These seeps and springs have consistently shown high flows during the wet years of 2009, 2010, 20011, 2014, and 2016. In 2019, every site except for 6 exhibited their highest ever recorded flows. In 2021, sites 26-48-01-212, 26-48-01-212B, 26-48-01-223, 26-48-01-234, 26-48-12-341, 26-48-01-241, 26-49-18-332, 26-48-01-142, exhibited higher flows than those measured in 2020.

1.1.1.3 Horse Canyon Tributaries

The Horse Canyon Tributaries Subgroup consists of eight seeps and springs. The trends in these seeps and spring are dissimilar from one another, with most exhibiting peak flows during wet years. During 2020, all the Horse Canyon Tributaries exhibited reduced flows relative to those measured in 2019 but, in 2021 flows increased or remained the same as recorded in 2020, except for site 26-48-11-312 which exhibited its greatest flowrate in February 2021.

1.1.1.4 Lower Horse Canyon

The Lower Horse Canyon Subgroup consists of six seeps and springs. Trends at all of these seeps and springs show higher flow rates between 2009 and 2011 followed by no significant flows through 2018 and high flows in 2019. In 2020 and 2021, both flow rates and ponded areas were reduced relative to those measured in 2019.

5.3.8 Mill Canyon

The Mill Canyon Group is located on the northern slope of the Cortez Mountain Range northeast of Cortez Hills Mine and is comprised of four seeps and one wetland area with two monitoring locations. The monitoring locations within the wetland are monitored monthly, while the seeps are monitored biannually. The wetland is supported by Cherry Tree Spring. All of the Mill Canyon seeps and springs exhibited lower flowrates in 2020 and 2021 than those observed in 2019. However, most sites exhibited increased flowrates from 2020 to 2021. Only Site 27-48-21-421 did not exhibit any measurable flow in 2021, but the site produced a larger ponded and/or saturated area throughout 2021 compared to 2020.

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5.3.9 North Toiyabe Range East

The North Toiyabe Range East Group is located on the eastern and southern slopes of the Toiyabe Mountain Range in the west-southwest portion of the study area and is comprised of ten seeps and springs and one developed source piped to a trough. In 2021, four of the eleven sites exhibited no flow but most contained ponded water and saturated areas. Flows that were measured were greater than those reported in 2020.

5.3.10 North Toiyabe Range West

The North Toiyabe Range West Group is located on the western and northern slopes of the Toiyabe Mountain Range in the west-southwest portion of the study area and is comprised of 4 seeps and springs and one large wetland complex with four monitoring locations. In 2021, most of the locations had flowrates similar to those observed in 2020.

5.3.11 Rocky Hills

The Rocky Hills Group is located in the south and southwest portions of the study area and is comprised of three developed sources piped downslope or to troughs. Sites 25-49-11-423 and 25-49-29-213 had been exhibiting reductions in flow since 2014 until the rates drastically increased in 2018. However, neither of these sites exhibited measurable flows in 2019 and most of 2020. Flow rates increased in 2021 with Site 25-49-29-213 exhibiting flow during quarters 2, 3, and 4 while site 25-49-11-423 remained ponded with no observed flow. In contrast, flows at Site 25-48-25-341 continued to be observed in 2021 with a peak flow rate of 23.24 gpm in February.

5.3.12 Southeast Crescent Valley

Site 27-48-19-24 is a single monitoring location within a large wetland area in Southeast Crescent Valley just west of the entrance to Mill Canyon. Peak flows were measured at the site in 2014 and 2015, but had been at a steady 0.45 gpm since 2016 until they increased slightly to 1 gpm from 2019 through 2021.

5.3.13 Willow Creek

The Willow Creek Group is located on the southern slopes of the Cortez Mountain Range, within multiple plan boundaries; and is comprised of 31 seeps and springs, one developed source piped downslope, and one fringe wetland. All sites that exhibited flows in 2021 were observed as greater than those observed in 2020, whereas, the sites below exhibited no flow:

27-48-34-322B	27-48-25-324A	26-49-07-111
27-48-35-442B	WIL-06D	26-49-07-221
27-48-35-234	27-48-35-441	27-49-31-344
27-48-36-321A	27-48-35-442B	
27-48-25-324	27-48-25-313	

5.3.14 Willow Springs

The Willow Springs Group is located primarily in the northwest corner of the West Pine Valley boundary and is comprised of nine seeps and springs and three monitoring locations within the Willow Springs wetland complex. Five locations exhibited measurable flow, and the remaining sites contained no flow in 2021.

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5.3.15 Pine Valley Hot Springs

Monitoring of the Pine Valley Hot Springs ceased in 2017. Therefore, this section will be removed from future reports.

SURFACE WATER HYDROLOGY

CORTEZ MINE FLOW HYDROGRAPHS

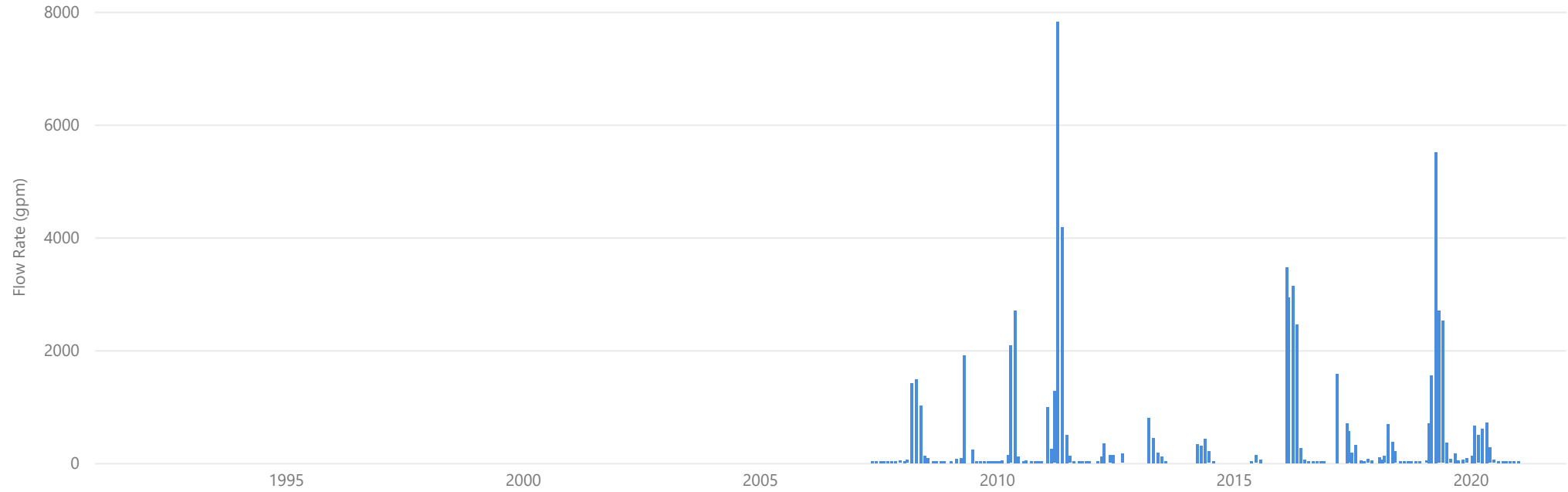
STREAMS

FERRIS CREEK (FER-01)
FOURMILE (FOU-01)
HOT CREEK SPRINGS (HCS-1)
INDIAN CREEK (IC-1)
INDIAN CREEK 1D (IND-01D)
INDIAN CREEK 1U (IND-01U)
MILL CREEK 1 (MIL-01)
MILL CREEK 2 (MIL-02)

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Surface Water Hydrographs

FER-01



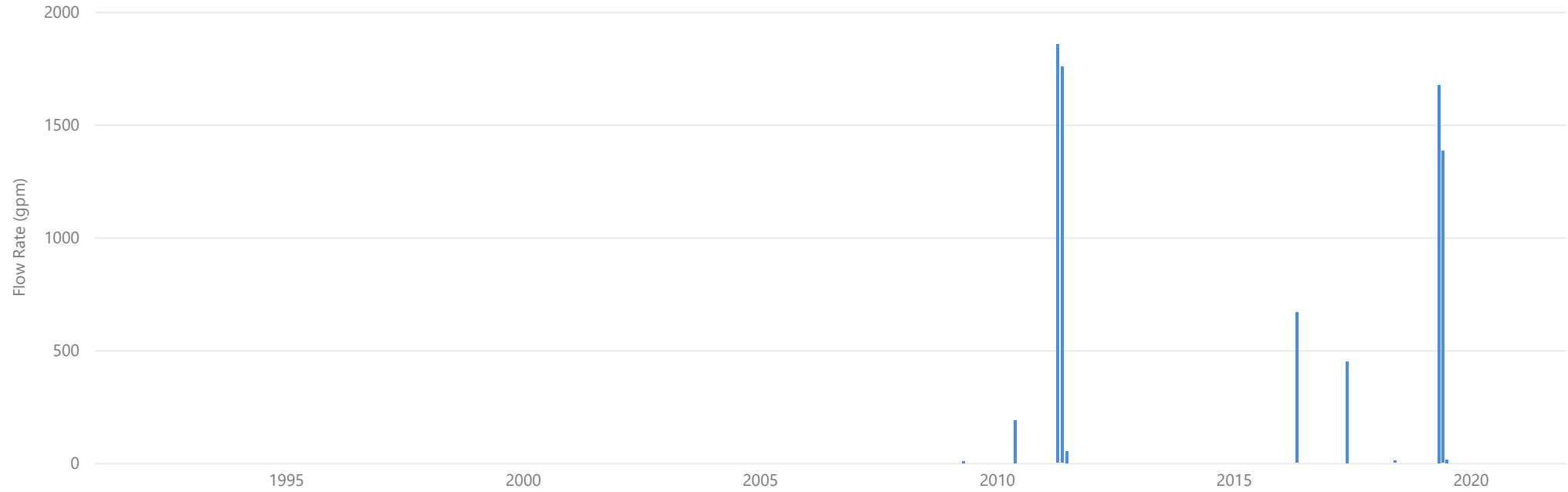
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Station Name	Event Start Date	Event End Date	Event Type	Event Description
FER-01	2/1/2021		No data	Private land restrictions
FER-01	1/27/2016		Insufficient Flow	Dry
FER-01	8/25/2015	12/30/2015	Insufficient Flow	Dry
FER-01	8/21/2014	4/23/2015	Insufficient Flow	Dry
FER-01	8/26/2013	2/25/2014	Insufficient Flow	Dry
FER-01	9/18/2012		Insufficient Flow	Dry
FER-01	1/17/2012		Insufficient Flow	Dry
FER-01	12/16/2008		Insufficient Flow	Dry

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Surface Water Hydrographs

FOU-01



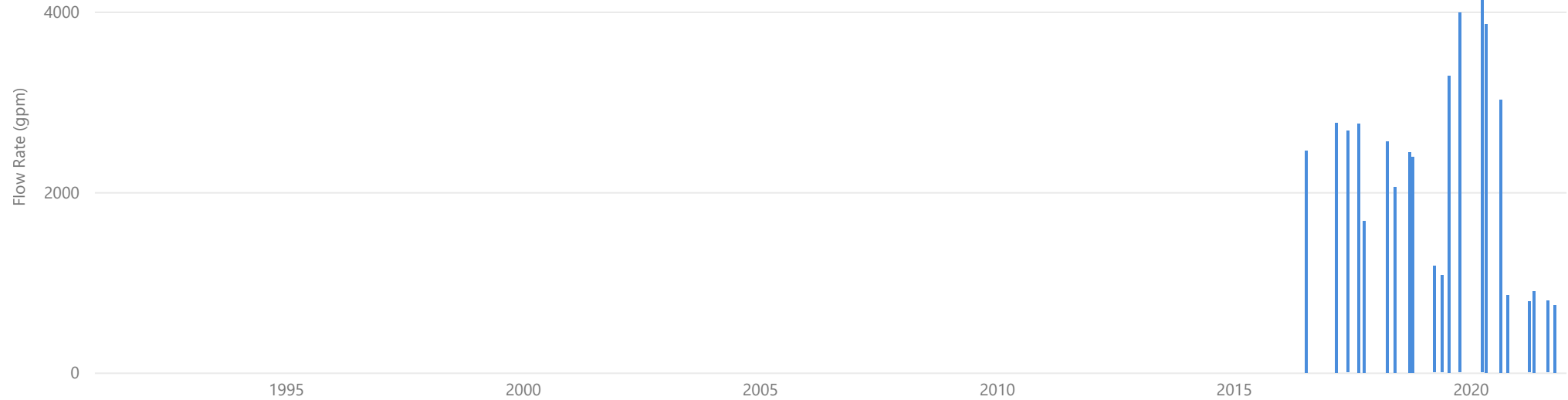
Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
FOU-01	1/1/2021	12/31/2021	Insufficient Flow	Dry
FOU-01	1/1/2020	12/31/2020	Insufficient Flow	Dry
FOU-01	8/2/2019	12/31/2019	Insufficient Flow	Dry
FOU-01	1/31/2019	4/5/2019	Insufficient Flow	Dry
FOU-01	7/20/2018	12/7/2018	Insufficient Flow	Dry
FOU-01	6/8/2017	5/11/2018	Insufficient Flow	Dry
FOU-01	3/6/2017		Insufficient Flow	Dry
FOU-01	6/5/2016	12/1/2016	Insufficient Flow	Dry
FOU-01	1/27/2016	4/7/2016	Insufficient Flow	Dry
FOU-01	8/26/2013	12/30/2015	Insufficient Flow	Dry

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Surface Water Hydrographs

HCS-1



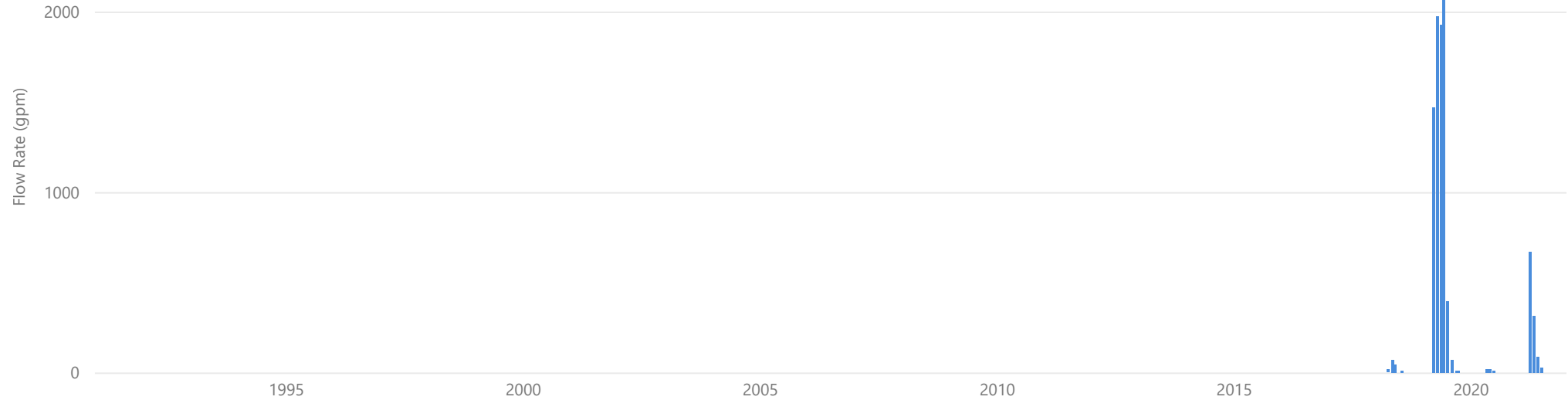
Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
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2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Surface Water Hydrographs

HOR-02D



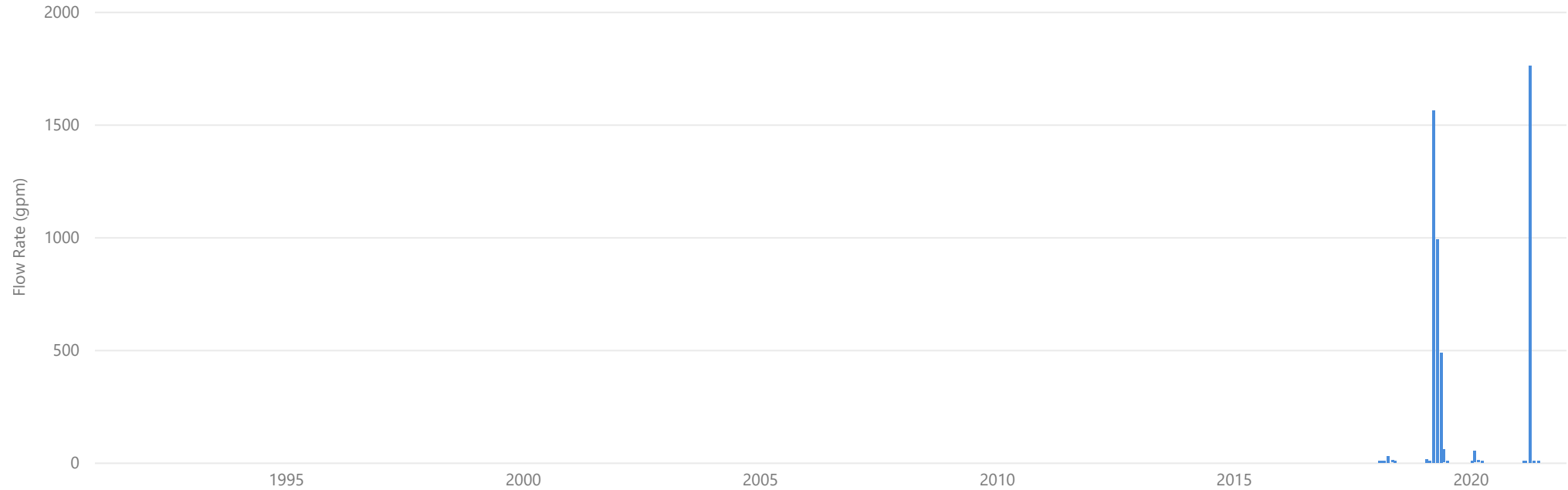
Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
HOR-02D	8/1/2021	12/31/2021	Insufficient Flow	Dry
HOR-02D	1/1/2021	3/31/2021	Frozen	Snow-covered
HOR-02D	8/1/2020	12/31/2020	No data	Dry
HOR-02D	3/1/2020	4/30/2020	No data	Dry
HOR-02D	1/1/2020	2/28/2020	Frozen	Snow-covered
HOR-02D	8/6/2018	12/7/2018	Insufficient Flow	Dry
HOR-02D	1/30/2018	3/6/2018	Insufficient Flow	Dry

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Surface Water Hydrographs

HOR-05T



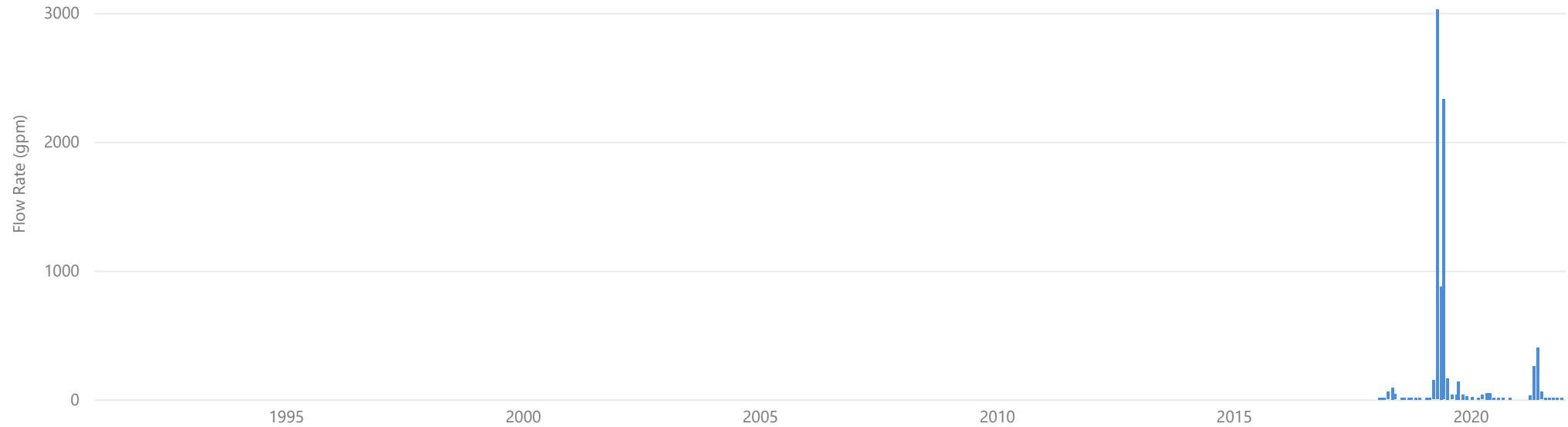
Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
HOR-05T	7/1/2021	12/31/2021	Insufficient Flow	Dry
HOR-05T	7/1/2020	12/31/2020	No data	Dry
HOR-05T	10/1/2019		Insufficient Flow	Dry
HOR-05T	9/17/2019		Insufficient Flow	Dry
HOR-05T	8/13/2019		Insufficient Flow	Dry
HOR-05T	7/20/2018	12/7/2018	Insufficient Flow	Dry

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Surface Water Hydrographs

HOR-05U



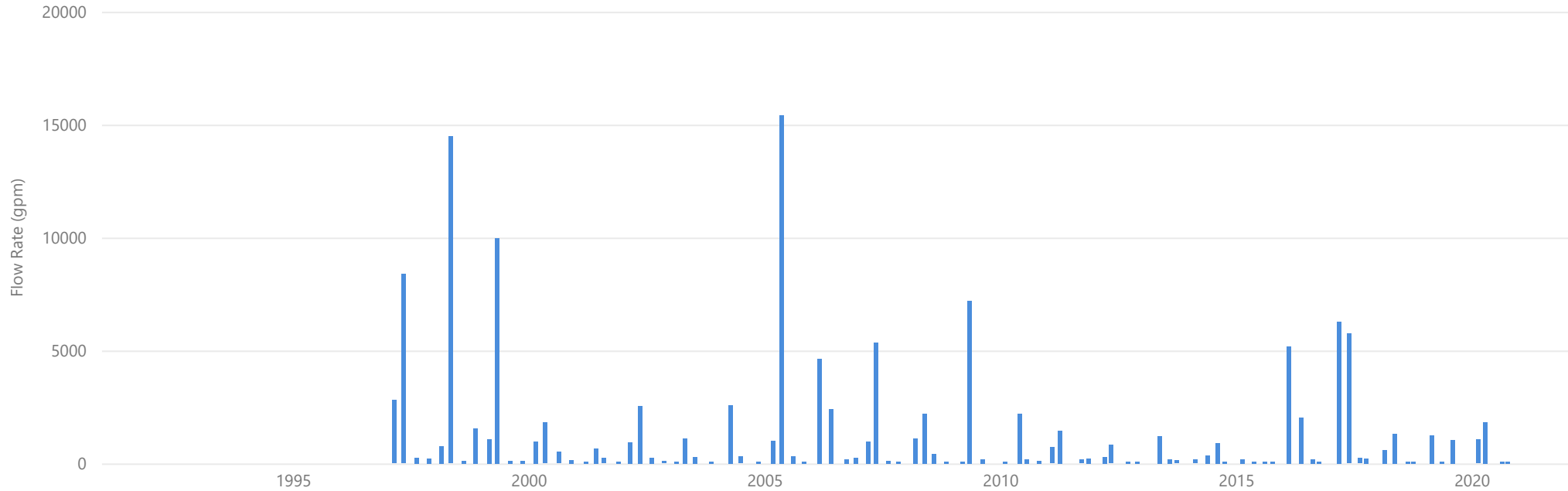
Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
HOR-05U	1/1/2021	3/31/2021	Insufficient Flow	Dry
HOR-05U	12/1/2020	12/31/2020	Frozen	Snow-covered
HOR-05U	10/1/2020	10/31/2020	Insufficient Flow	Dry
HOR-05U	2/1/2020	2/28/2020	Frozen	Snow-covered
HOR-05U	12/7/2018		Flow Estimated	Flow estimated

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Surface Water Hydrographs

IC-1



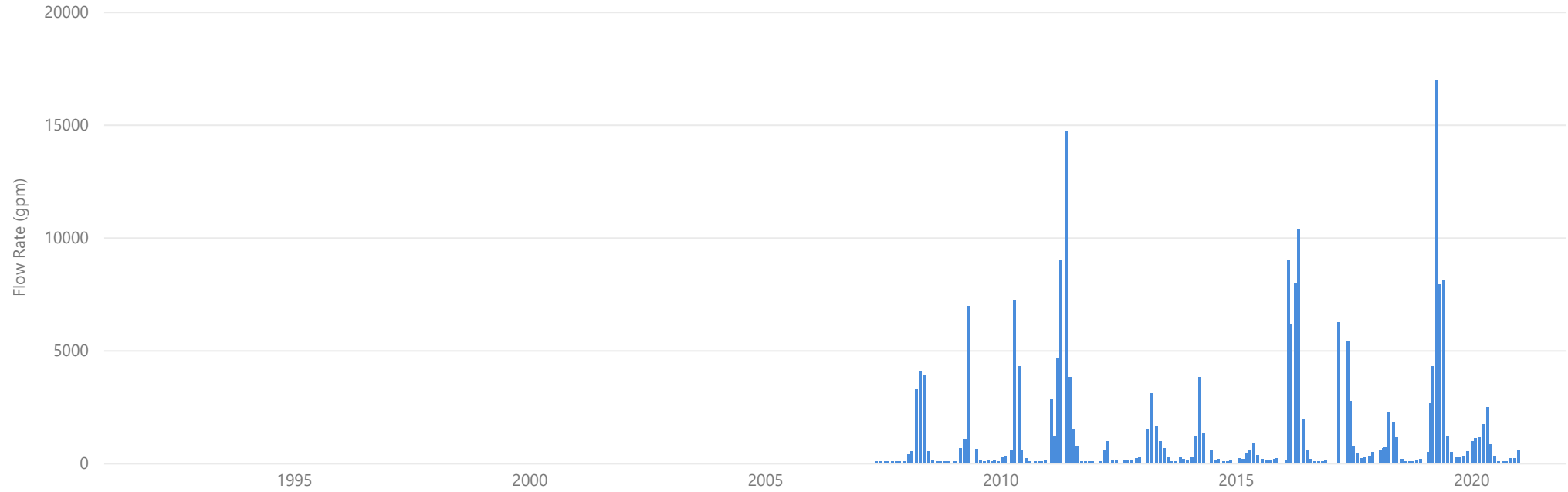
Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
IC-1	1/1/2021		No data	Private land restrictions
IC-1	8/9/2019	1/31/2019	No data	
IC-1	2/15/2013		Frozen	Frozen, snow-covered
IC-1	12/15/2009		Frozen	Creek completely frozen with several inches of ice
IC-1	8/5/2008		Flow Estimated	Flow in two channels
IC-1	5/29/2008		Flow Estimated	Two channels, track mounted equipment recently drove through
IC-1	3/18/2008		Flow Estimated	Flowing in two channels
IC-1	11/6/2007		Flow Estimated	Lots of willows, flow in one channel
IC-1	8/22/2007		Flow Estimated	Flow contained in one channel
IC-1	5/16/2005		Insufficient Flow	Influenced by flow from runoff
IC-1	4/14/2004		Flow Estimated	Two separate channels combined for flow measurement
IC-1	2/11/2004		Frozen	Frozen, could not break ice for measurement

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Surface Water Hydrographs

IND-01D



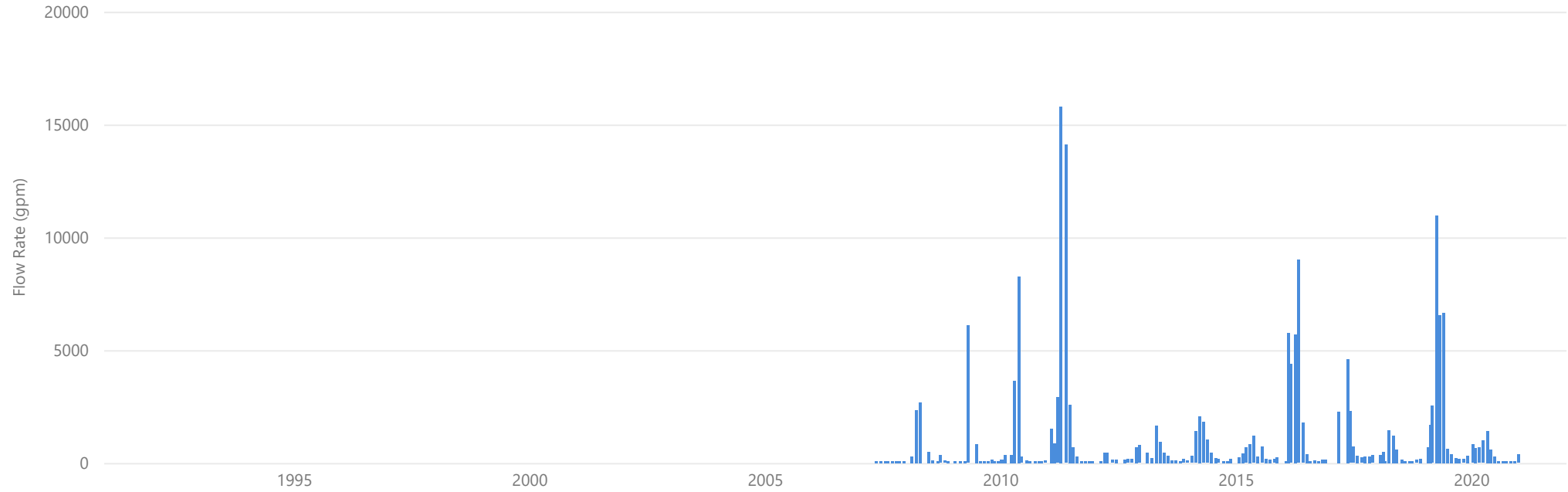
Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
IND-01D	2/1/2021		No data	Private land restrictions
IND-01D	12/30/2015		Insufficient Flow	Dry
IND-01D	12/31/2014		Insufficient Flow	Dry
IND-01D	1/17/2012		Insufficient Flow	Dry
IND-01D	12/16/2009		Insufficient Flow	Dry
IND-01D	12/16/2008		Insufficient Flow	Dry

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Surface Water Hydrographs

IND-01U ▼



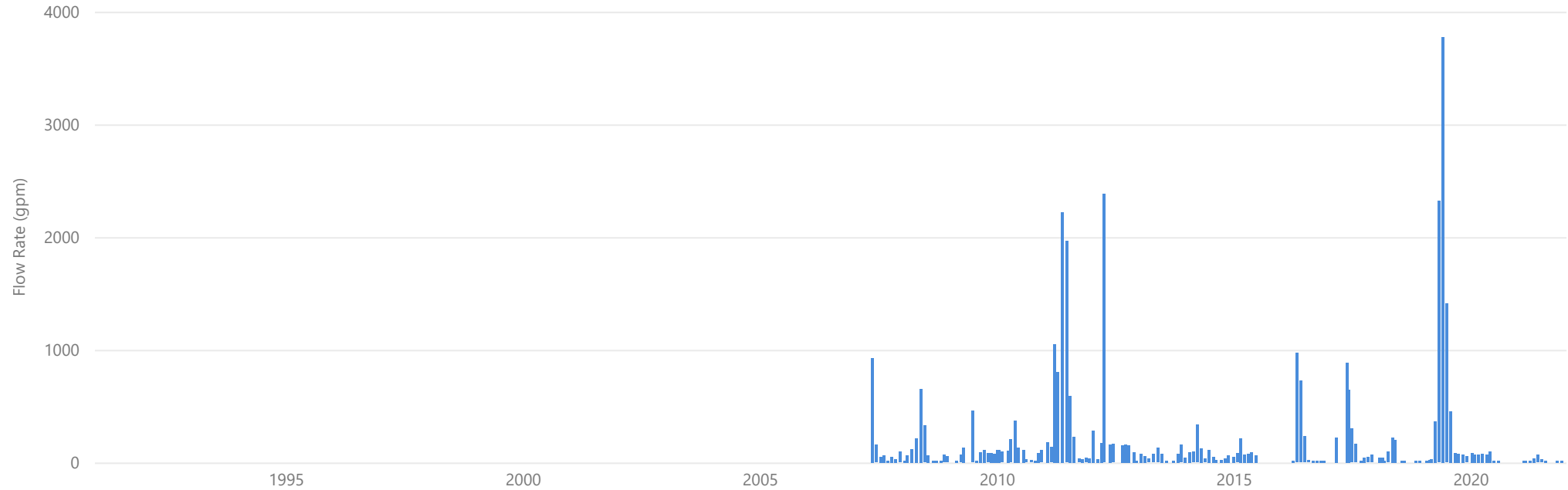
Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
IND-01U	2/1/2021		No data	Private land restrictions
IND-01U	12/30/2015		Insufficient Flow	Dry
IND-01U	12/31/2014		Insufficient Flow	Dry
IND-01U	1/17/2012		Insufficient Flow	Dry
IND-01U	12/16/2009		Insufficient Flow	Dry
IND-01U	12/16/2008		Insufficient Flow	Dry
IND-01U	5/28/2008		Insufficient Flow	Dry
IND-01U	1/24/2008		Insufficient Flow	Dry

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Surface Water Hydrographs

MIL-01



Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
MIL-01	9/1/2021	10/31/2021	Insufficient Flow	Dry
MIL-01	9/1/2020	12/31/2020	Insufficient Flow	Dry
MIL-01	9/10/2018		Insufficient Flow	Insufficient amount of water to collect sample
MIL-01	1/27/2016	3/1/2016	Insufficient Flow	Dry
MIL-01	7/27/2015	12/30/2015	Insufficient Flow	Dry
MIL-01	8/26/2013		Insufficient Flow	Dry
MIL-01	1/16/2009		No Record	No Reading

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

Surface Water Hydrographs

MIL-02



Events

Station Name	Event Start Date	Event End Date	Event Type	Event Description
MIL-02	7/1/2021	12/31/2021	Insufficient Flow	Dry
MIL-02	1/1/2021	3/31/2021	Frozen	Snow-covered
MIL-02	8/1/2020	12/31/2020	Insufficient Flow	Dry
MIL-02	1/31/2019	2/19/2019	Frozen	Snow-covered
MIL-02	9/10/2018	12/7/2018	Insufficient Flow	Dry
MIL-02	2/21/2018	3/5/2018	Frozen	Frozen
MIL-02	1/27/2016	3/1/2016	No Record	Site not visited
MIL-02	7/31/2014	12/30/2015	Insufficient Flow	Dry
MIL-02	8/26/2013	3/27/2014	Insufficient Flow	Dry
MIL-02	12/19/2011		No Record	No Reading
MIL-02	2/10/2010		No Record	No Reading
MIL-02	12/9/2009		No Record	No Reading

2021 Cortez Operations Groundwater Surface Water Monitoring Plan

6 SUMMARY

In 2021, a total of 41,997 ac-ft of water was produced across the entire Cortez Mine property. Data collection at the Cortez Hills, Pipeline, and Goldrush mines has indicated consistent dewatering of the regional carbonate aquifer. Due to the heterogeneity of the Crossroads alluvium, dewatering of that area averaged 7 feet during 2021. While 23% of the total amount of water produced was consumed by a combination of mining and milling activities, evaporation, and irrigation, the remaining 77% was reinfiltreated. As a result, mounding in the areas surrounding the RIB galleries continued, with slight reductions in cumulative mounding at RIB galleries around the Pipeline and Crossroads pits. Seeps and springs studies conducted for Cortez and the Goldrush Project captured a similar year as compared with 2020. Changes in surface water features are continually being monitored and assessed for mitigation triggers.

APPENDIX A

2021 Cortez Seeps and Springs Study

Included on 2021 COGSWMP USB storage device.

APPENDIX B

2021 Goldrush Seeps & Springs Study

Included on 2021 COGSWMP USB storage device