2024 ANNUAL HYDROLOGY REPORT

HAYDEN GULCH TERMINAL LOADOUT

PERMIT C-92-081

FEBRUARY 2025

Submitted To: Colorado Division of Reclamation, Mining and Safety
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1.0 INTRODUCTION

This Annual Hydrology Report presents the hydrologic monitoring data collected for the 2024 water year (October 2023 – September 2024) at the Hayden Gulch Terminal, LLC Hayden Gulch Loadout (HGT). The AHR fulfills the reporting requirements under the Colorado Division of Reclamation, Mining, and Safety (CDRMS) Permit No. C-1992-081.

1.1 BACKGROUND

The HGT is a former coal loadout located in Routt County, approximately 2 miles southeast of Hayden, Colorado (Figure 1). The tipple and coal storage area were reclaimed in 2011, followed by the east office in 2013, and the west office in 2014. On February 18, 2022, the Division approved bond release package SL-2, allowing for the release of the reclaimed rail spur area. This area has been transferred to the Town of Hayden as part of their Track to Trails program and will serve as a recreational park for residents and visitors. On January 4, 2024, the Division approved bond release package SL-3, allowing the haul road to remain in place and be transferred to the Routt County for use as a public county road. Only 2.3 acres of agricultural/hayland along Highway 40 remains in the permit.

In August 2024, the Colorado Department of Public Health Water Quality Division terminated the Coal General Discharge Permit (COG85008) and replaced it with individual discharge permit CO0049071. As part of this change, Outfall 001A and 002A were removed from the Hayden Gulch discharge permit because the watersheds draining to them had received Phase III Bond Release. Stormwater outfalls 003A, 004A, and 005A were established along the western perimeter of the reclaimed 2.3 acre agriculture parcel.

2.0 METEOROLOGICAL

Meteorological data for the 2024 water year is presented in Appendix A. The 2024 data was obtained from the Hayden Weather Station (053867) located in Hayden, Colorado (Colorado Climate Center - Data Access). A total of 20.37 inches of precipitation was measured in 2024, which is 2.12 inches greater than the 1981-2024 average of 18.25 inches. December, January, February, March, and August were wetter than normal, but the remaining months were drier than normal. Potential snowpack runoff, as estimated by totaling November through March precipitation, was 10.96 inches, which was 3.22 inches above the 1981-2024 average of 7.74 inches.

3.0 GROUNDWATER

The HGT groundwater monitoring program includes one monitoring well (HGDAL4). Monitoring well HGDAL3 was abandoned in late 2021 and is no longer part of the groundwater monitoring program. The following table identifies the water bearing unit HGDAL4 is screened in and its required monitoring frequency and parameter list. The well location is shown on Figure 1. Groundwater monitoring was completed by experienced personnel and samples were collected following the monitoring practices described in Tab 13 of Permit C-1992-081. All samples were analyzed by ACZ Laboratories.

Site	Unit	Monitoring Frequency		Parameter List
		Water Level	Water Quality	
HGDAL4	Dry Creek Alluvium	A	A	GW

Note
HGDAL3 was abandoned in December 2021 for the SL-2 Bond Release
A: Annual
GW: Field conductivity, field pH, field temperature, dissolved iron, dissolved manganese, total dissolved solids

3.1 WATER LEVELS

The static water level and groundwater quality measured at HGDAL4 for the 2024 water year is included in Appendix B and the water level hydrograph is provided in Appendix C. The static water level measured at HGDAL4 was within its historic range. The water table in the alluvial well fluctuates in response to seasonal precipitation events, with the water table typically at its highest during the spring snowmelt season and then declining through late summer/early fall in response to the dry conditions.

3.2 GROUNDWATER QUALITY

Groundwater points of compliance (GWPOC) were determined to be unwarranted at the HGT (CDRMS GWPOC Determination Memo dated June 5, 2008). The basis for this finding were: 1) alluvial groundwater in this area has naturally elevated total dissolved solids concentrations which results in the groundwater having a “Limited

Use and Quality" designation; and, 2) insufficient hydraulic head is present to allow for any recharge originating at the site to migrate into the underlying, low permeable, Lewis Shale. Native groundwater in the Lewis Shale exhibits high concentrations of dissolved solids, and irrigation return water upstream of the HGST which is in contact with soils derived from the Lewis Shale, also contribute to elevated concentrations of selenium and dissolved solids. Table B.1 includes the analytical results for well HGDAL4. The monitoring conducted for this year continues to support CDRMS findings.

4.0 SURFACE WATER

The HGT is located principally (former coal handling facility area and majority of the railroad spur) in the lower portion of the Dry Creek watershed (Yampa River Segment 13h). The surface water monitoring program includes two stream points. The following table provides the required monitoring frequency and parameter list for the stream points. As noted in Section 1.1, the NPDES outfalls associated with NPDES1H and NPDES2H were removed from the discharge permit effective August 1, 2024. Hayden Gulch also received three new NPDES stormwater outfalls as part of this action. These outfalls are inspected biannually but do not have effluent monitoring requirements with numeric limits, therefore they are not included in the table below. See Figure 1 for the locations of the surface water monitoring points. Surface water monitoring was completed by experienced personnel and samples were collected following the monitoring practices described in Tab 13 of Permit C-1992-081. All samples were analyzed by ACZ Laboratories.

Site	Type	Watershed	Monitoring Frequency		Parameter List
			Flow	Water Quality	
HGSD1	Surface Water	Dry Creek	SA	SA	SW
NPDES1H*	NPDES	Dry Creek	M	M	NPDES
NPDES2H*	NPDES	Dry Creek	M	M	NPDES
HGSD3	Surface Water	Dry Creek	SA	SA	SW

Note
* Site NPDES1H and NPDES2H were removed from discharge permit effective August 1, 2024.
SA: Semiannual
M: Monthly
SW: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, nitrate, nitrite, dissolved selenium, total dissolved solids, total suspended solids
NPDES: See NPDES permit COG85008

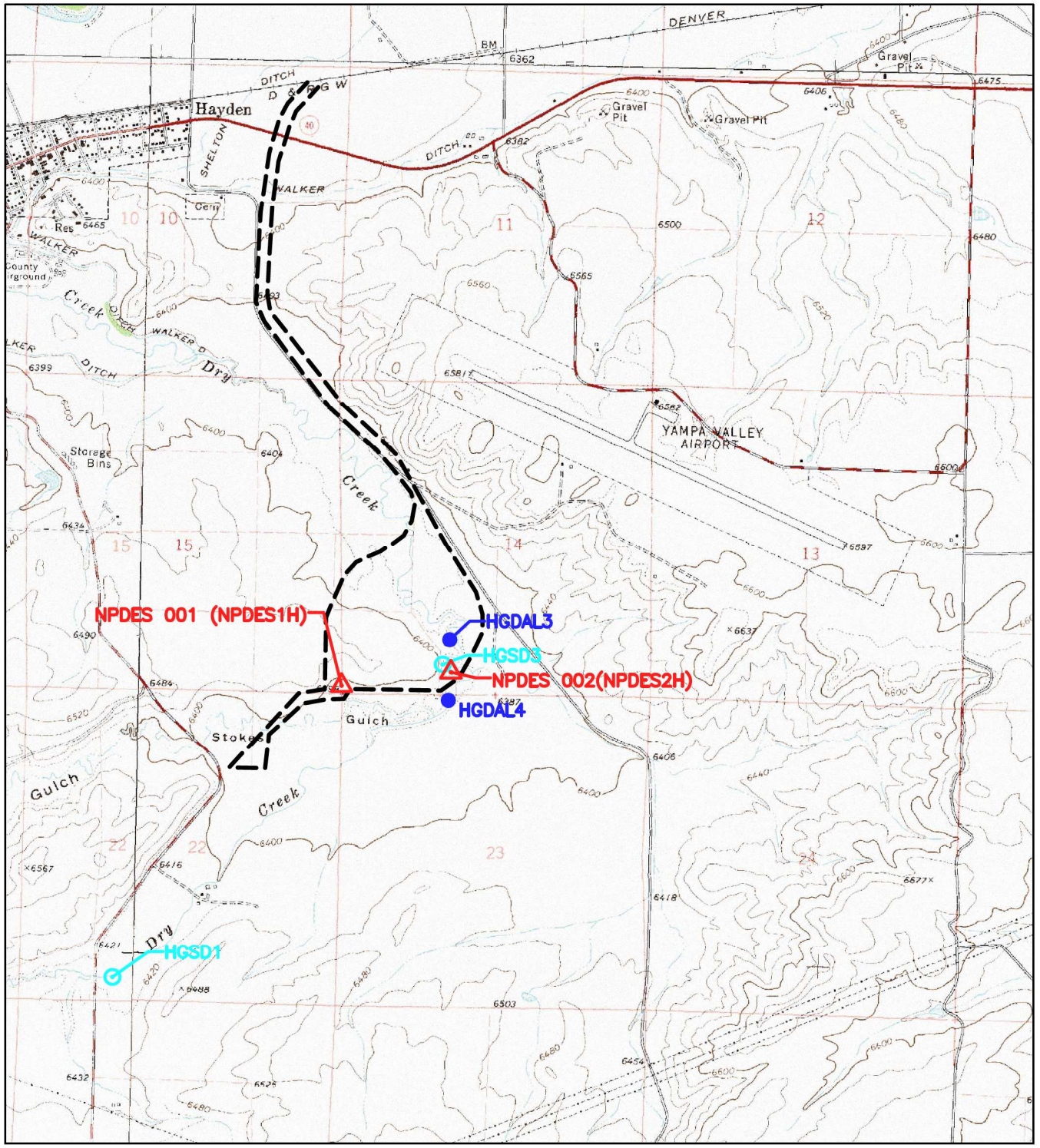
Analytical results for the 2024 monitoring conducted at stream point HGSD1 and HGSD3 are provided in Table D.1. Analytical results for NPDES outfalls NPDES1H and NPDES2H are provided in Table D.2. Outfall's NPDES1H or NPDES2H did not discharge during the 2024 Water Year. Exceedances of the chronic dissolved selenium aquatic life standard occurred at monitoring points HGSD1 and HGSD3 in June. HGSD1 is located upstream of the reclaimed Hayden Gulch site. Although HGSD3 is located

downstream, discharge was not occurring from the Hayden Gulch site and the selenium was not influenced by any activities at the site. Dry Creek flows through the selenium laden Lewis Shale and the elevated selenium is the result of natural baseflow contributions and irrigation return water that contacts soils derived from the Lewis Shale. There were no other exceedances of the Yampa Segment 13h acute and chronic aquatic life standards or agricultural use standards in 2024.

5.0 SUMMARY

No hydrologic impacts attributable to the HGT were noted. The groundwater level at HGDAL4 was within its historic range. Groundwater monitoring continues to demonstrate that the native Dry Creek alluvium contains naturally elevated concentrations of dissolved solids, providing further support for CDRMS's determination that it is of limited use and quality. Exceedances of the selenium chronic aquatic life standard occurred at stream monitoring points HGSD1 and HGSD3. HGT is fully reclaimed and the selenium was not influenced by any activities at the site. Dry Creek flows through the selenium laden Lewis Shale and the elevated selenium was the result of natural baseflow contributions and irrigation return water that contacts soils derived from the Lewis Shale. There were no exceedances of the NPDES permit limits or water quality standards at the Hayden Gulch outfalls.

K:\Laramie\Peabody\2018-005_PEC_PSCM_HydrologicServices(2018)\05Cad\CADD base maps\190205_Field mapmoffat and routt_C083-NF_quads.dwg HGT-1 2/6/2019 4:07:34 PM



LEGEND

- GROUNDWATER
- SURFACE WATER
- NPDES
- PERMIT BOUNDARY

IMAGE SOURCE:
DIGITAL RASTER GRAPHIC COUNTY MOSAIC BY NRCS OF ROUTT COUNTY, COLORADO FROM GEOSPATIAL DATA GATEWAY (HTTPS://GDG.SC.EGOV.USDA.GOV) DOWNLOADED 10/16

0 2500'
SCALE

DESIGNED BY: WWC	FIGURE 1 MONITORING SITE LOCATIONS
DRAWN BY: SDG	
CHECKED BY: TNS	HAYDEN GULCH TERMINAL LOADOUT HAYDEN GULCH TERMINAL, LLC PEABODY ENERGY
DATE: 2019	WWC ENGINEERING

APPENDIX A

METEOROLOGICAL DATA

PERIOD OF RECORD PRECIPITATION SUMMARY													
Water Year	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**TOTAL**
2024	1.7	0.73	1.83	2.19	3.34	2.87	1.68	1.49	0.96	0.53	2.14	0.91	20.37
2023	1.23	2.06	4.12	3.79	1.04	3.11	1.37	0.52	1.69	0.29	1.33	0.44	20.99
2022	1.82	0.62	2.79	1.18	0.85	1.43	2.07	3.14	0.61	1.14	0.99	2.1	18.74
2021	0.87	0.74	1.46	1.03	1.59	1.67	0.5	1.02	0.15	0.86	1.09	1.46	12.44
2020	1.90	1.37	2.60	2.53	2.40	1.67	1.75	1.63	0.77	0.71	0.43	0.43	18.19
2019	2.14	1.81	1.62	2.45	1.46	2.89	1.66	1.88	3.57	0.38	0.44	1.53	21.83
2018	2.45	1.31	1.36	1.65	1.92	1.90	2.95	0.85	0.15	0.15	1.33	0.17	16.19
2017	1.29	0.91	2.06	2.70	1.47	0.84	2.06	1.85	0.13	1.68	0.46	1.74	17.19
2016	1.39	1.90	2.55	2.65	1.16	1.40	3.02	1.94	0.40	0.81	0.19	1.02	18.43
2015	1.60	2.10	1.84	0.55	1.02	1.30	1.60	4.36	0.61	2.36	1.53	0.90	19.77
2014	2.69	1.75	1.42	2.02	0.78	1.96	1.19	2.58	0.72	1.50	3.77	0.87	21.25
2013	0.86	0.46	3.21	1.02	0.73	1.29	3.58	1.67	0.06	0.46	1.48	2.76	17.58
2012	1.41	1.65	0.36	0.87	1.97	0.50	1.13	0.22	0.15	2.43	0.55	1.56	12.80
2011	2.18	1.91	2.98	1.59	2.09	2.52	4.50	3.56	0.85	1.82	0.65	1.14	25.79
2010	1.22	0.77	1.24	0.75	0.90	0.73	1.98	2.80	1.34	1.19	1.56	0.62	15.10
2009	0.53	1.16	1.38	2.80	0.60	1.32	1.40	1.89	2.08	0.51	1.04	0.48	15.19
2008	1.41	0.13	3.36	2.51	1.70	1.64	0.94	1.68	0.37	0.57	0.75	0.91	15.97
2007	2.64	0.76	0.86	1.04	1.34	1.46	0.62	0.87	0.33	0.52	1.12	2.72	14.28
2006	2.27	2.04	2.01	1.78	0.58	1.06	0.95	0.93	0.24	1.48	2.71	2.75	18.80
2005	1.34	1.68	0.50	1.49	0.84	0.99	1.97	1.41	3.36	0.57	1.57	1.30	17.02
2004	0.44	2.90	1.58	0.74	1.64	0.40	1.57	1.26	0.86	1.00	1.44	2.76	16.59
2003	1.88	1.09	1.28	0.74	1.95	0.99	2.57	1.15	1.33	0.47	0.62	1.83	15.90
2002	1.14	1.17	0.54	0.88	0.92	1.06	1.39	0.40	0.37	0.78	1.26	1.94	11.85
2001	0.67	1.60	1.16	0.96	1.41	1.07	1.28	1.15	0.85	1.11	2.06	1.66	14.98
2000	0.43	0.61	1.66	1.66	1.68	1.46	1.84	1.94	0.54	0.75	2.38	2.00	16.95
1999	1.85	0.81	1.13	2.13	0.99	0.57	3.21	2.00	1.39	2.10	1.85	0.78	18.81
1998	2.37	1.08	0.95	1.34	1.93	1.77	1.77	0.62	2.51	1.50	0.48	1.50	17.82
1997	1.79	2.39	1.69	2.88	0.97	0.48	3.19	2.75	1.60	1.05	3.57	5.48	27.84
1996	1.32	2.20	1.26	3.60	2.19	0.99	1.34	2.10	1.00	1.33	0.35	1.37	19.05
1995	0.95	2.09	0.68	1.47	0.97	0.82	3.36	4.48	1.54	1.23	0.73	2.69	21.01
1994	3.02	1.61	1.16	0.69	1.13	0.56	1.85	1.07	0.43	0.24	0.98	0.72	13.46
1993	1.46	1.48	1.33	2.28	1.66	1.53	2.55	1.14	1.29	0.65	1.37	1.39	18.13
1992	1.18	2.79	0.85	0.88	1.16	1.20	1.66	3.08	1.15	4.38	0.95	0.98	20.26
1991	3.20	1.71	1.18	1.75	0.86	2.42	1.09	0.96	1.74	1.59	2.00	1.32	19.82
1990	0.77	1.38	2.08	0.65	1.64	1.54	1.36	1.12	1.38	1.14	0.51	1.22	14.79
1989	0.13	2.79	1.13	1.02	2.50	1.38	0.45	1.39	0.53	1.82	1.33	1.52	15.99
1988	1.27	1.22	2.32	2.80	0.70	1.31	0.83	1.85	1.93	0.60	1.03	2.31	18.17
1987	2.65	1.00	0.56	1.28	1.35	1.50	1.60	1.92	0.64	1.78	1.35	0.46	16.09
1986	3.51	4.19	1.34	0.79	3.01	1.59	2.70	0.99	1.00	1.65	1.96	2.12	24.85
1985	2.61	1.68	1.80	2.40	1.01	2.40	3.77	1.40	0.68	1.28	0.64	1.17	20.84
1984	2.16	2.82	5.03	0.59	0.43	2.31	2.68	1.33	2.36	1.84	2.61	1.31	25.47
1983	1.64	1.52	1.03	1.10	1.66	2.17	2.28	1.57	2.76	1.88	1.08	0.79	19.48
1982	3.76	0.78	2.51	1.71	0.62	2.64	1.92	0.97	0.46	1.60	1.19	2.64	20.80
1981	1.09	0.33	0.43	0.53	0.45	2.50	0.69	3.97	1.65	2.24	1.12	1.33	16.33
AVG	1.69	1.53	1.69	1.62	1.38	1.53	1.91	1.75	1.10	1.23	1.32	1.53	18.25

Note

Data from October 1980 to February 1982, and 2011 Water Year and later, from U.S. Department of Commerce - NOAA - Hayden Station. All other data from Seneca II Mine Meteorological Station with Belfort Weighing Bucket Rain Gage. Site relocated to USGS site on August 31, 1991. Precipitation recorded in inches.

Monthly temperature range and preciptation collected at the Hayden Colorado Airport Weather Station 053867
Data accessed from: https://climate.colostate.edu/data_access_new.html

Station Metadata

Station Name: HAYDEN
Station ID: 053867
Longitude: -107.2548 Latitude: 40.4926
Elevation: 6467 ft.
Max Temperature: 1909-01-15 - 2025-02-06
Min Temperature: 1909-01-15 - 2025-02-06
Precipitation: 1909-01-15 - 2025-02-06
Snowfall: 1909-01-17 - 2025-02-06

HAYDEN	mly_mean_maxt (F)	mly_mean_mint (F)	mly_sum_pcpn (in)
2023-10	63.2	32.5	1.7
2023-11	47.9	21.9	0.73
2023-12	35.5	14.3	1.83
2024-01	33.3	13.9	2.19
2024-02	37.6	14.1	3.34
2024-03	45.2	20.1	2.87
2024-04	60.7	29.6	1.68
2024-05	65.9	35.9	1.49
2024-06	83.6	48.8	0.96
2024-07	87.1	49.3	0.53
2024-08	84.8	50.9	2.14
2024-09	80.5	43.9	0.91

APPENDIX B

GROUNDWATER QULITY DATA

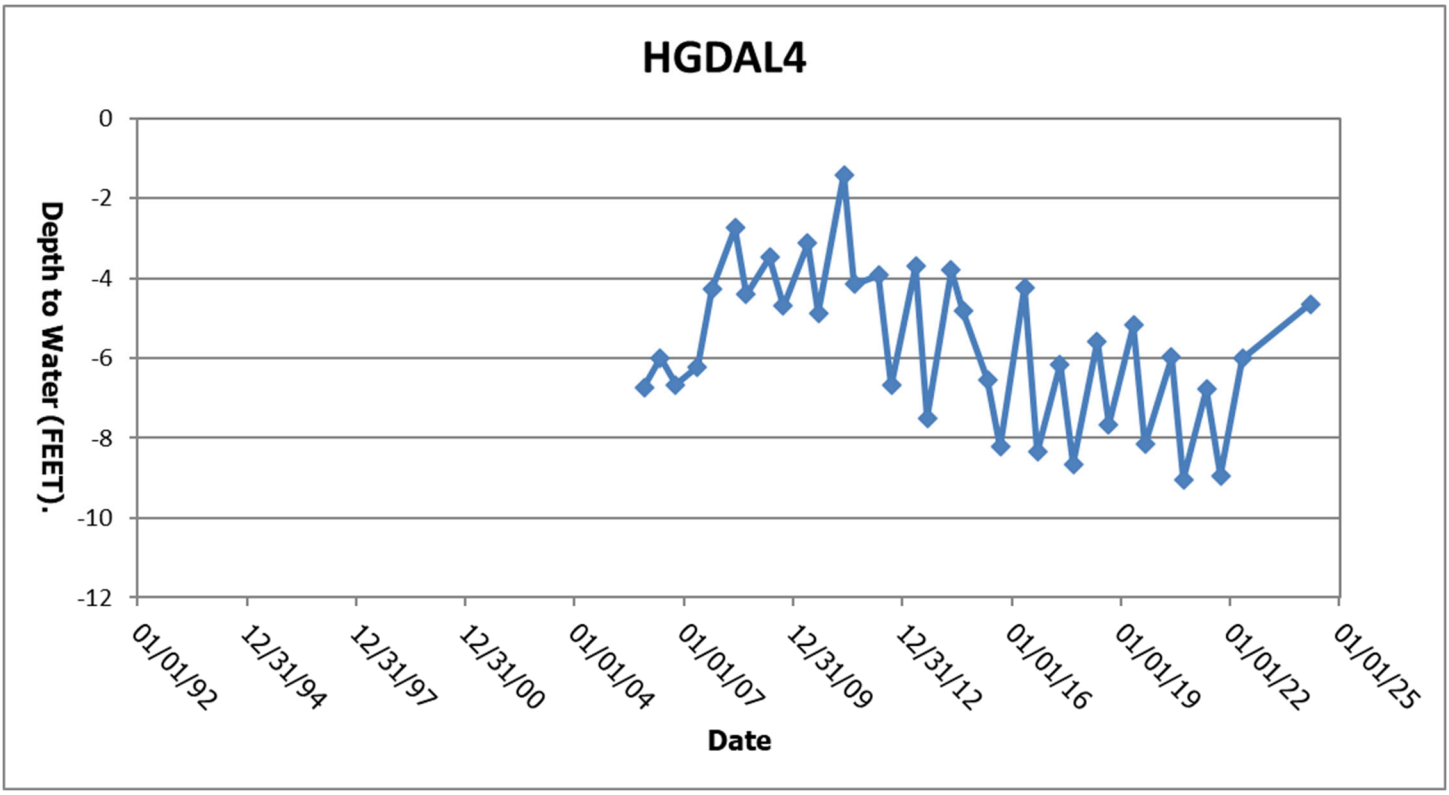
Table B.1. Analytical results for monitoring well HDAL4 for water year 2024.

Well	Date	Depth to Water ft btoc	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N DEG-C	Iron D MG/L	Manganese D MG/L	TDS, Lab N MG/L
HGDAL4	3/13/2024	4.65	5030	7.7	4.7	<0.12	0.199	4540

Note
HGDAL3 was abandoned as part of approved Bond Release SL-2

APPENDIX C

GROUNDWATER HYDROGRAPHS


HGDAL4
Depth to Water (FEET).
0
-2
-4
-6
-8
-10
-12
01/01/92
12/31/94
12/31/97
12/31/00
01/01/04
01/01/07
12/31/09
12/31/12
01/01/16
01/01/19
01/01/22
01/01/25
Date

APPENDIX D

SURFACE WATER QUALITY DATA

Table D.1 Stream point analytical data for water year 2024.

Location	Date	Flow N MGD	SpC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N C	Iron TR MG/L	Manganese D MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L	Selenium TR UG/L	TDS, Lab N MG/L	TSS N MG/L
HGSD1	6/12/2024	1.463	2784	7.9	13.4	0.217	0.06	0.443	< 0.01	**9.62**	9.21	2680	< 5
HGSD1	9/3/2024	0											
HGSD3	6/12/2024	1.752	2948	8	15.7	0.163	0.078	< 0.02	< 0.01	**11.4**	9.4	2930	< 5
HGSD3	9/3/2024	0											
Yampa Segment 13h Standards - Acute		-	-	6.5 - 9.0	-	-	4.738	100	0.05	18.4	-	-	-
Yampa Segment 13h Standards - Chronic		-	-	-	-	1	2.618	-	-	4.6	-	-	-
Agricultural Use Standards		-	-	-	-	-	0.2	100	10	20	-	-	-

Notes

Bold	Analyte exceeds the Yampa Segment 13h or Agricultural Use Standards

Table D.2 NPDES Outfall monitoring data for water year 2024.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	Iron TR MG/L	TDS N MG/L	TSS N MG/L	Settleable Solids D ML/L
NPDES1H	10/27/2023	0						
NPDES1H	11/7/2023	0						
NPDES1H	12/6/2023	0						
NPDES1H	1/11/2024	0						
NPDES1H	2/2/2024	0						
NPDES1H	3/27/2024	0						
NPDES1H	4/24/2024	0						
NPDES1H	5/29/2024	0						
NPDES1H	6/11/2024	0						
NPDES1H	7/9/2024	0						
NPDES2H	10/27/2023	0						
NPDES2H	11/7/2023	0						
NPDES2H	12/6/2023	0						
NPDES2H	1/11/2024	0						
NPDES2H	2/2/2024	0						
NPDES2H	3/27/2024	0						
NPDES2H	4/24/2024	0						
NPDES2H	5/29/2024	0						
NPDES2H	6/11/2024	0						
NPDES2H	7/9/2024	0						
NPDES Limit	Daily Max		6.5 - 9.0	10	NA	Report	30	0.5
	Monthly Avg.		NA	NA	1	Report	70	Report
Yampa Segment 13h Standards - Acute			6.5 - 9.0	-	-	-	-	-
Yampa Segment 13h Standards - Chronic			-	-	1	-	-	-
Agricultural Use Standards			-	-	-	-	-	-

Note

Effective August 1, 2024, outfalls NPDES1H and NPDES2H were removed from the CDPHE discharge permit. Monitoring ceased at that time.

Bold Analyte exceeds the NPDES limit, Segment 13h aquatic life standard, or Agricultural Use standard