

# 2024 ANNUAL HYDROLOGY REPORT

YOAST MINE

PERMIT C-94-082

March 2025



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## **1.0 INTRODUCTION**

This Annual Hydrology Report presents the hydrologic monitoring data collected during the 2024 water year (October 2023 - September 2024) at the Seneca Coal Company's (SCC) Yoast Mine (Yoast). The AHR fulfills the reporting requirements under the Colorado Division of Reclamation, Mining, and Safety (CDRMS) Permit No. C-1994-082.

### **1.1 BACKGROUND**

Yoast is a surface coal mine located in Routt County, approximately 25 miles west of Steamboat Springs, Colorado (Figure 1). The Yoast permit went into effect on August 8, 1995. Overburden removal began in 1996 in the Grassy Creek watershed and 2000 in the Sage Creek watershed. The last of the coal at Yoast was removed in February 2006. The mine has been reclaimed and vegetated for many years and SCC is actively pursuing bond release. Bond Release application SL-9, which requested Final Bond Release for all remaining reclaimed areas at the mine, was submitted in the fall of 2024 and is currently under agency review.

In 2014 the Water Quality Control Commission (WQCC) granted a temporary modification of the chronic selenium TVS in Sage Creek to current conditions to allow SCC to collect additional biologic and water quality data needed to develop a site-specific standard. In 2017, the WQCC extended the selenium temporary modification for Sage Creek to 12/31/2023. This temporary modification expired on 12/31/2023. SCC has continued to coordinate with the WQCD, Colorado Parks and Wildlife, and EPA on the development of this standard and intends to propose its site-specific standard during the WQCC Regulation 33 Hearing in June 2025. This AHR will only discuss data relevant to the requirements of the CDRMS permit.

## 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 Yoast groundwater monitoring program includes 10 monitoring wells. The following table includes the wells monitored, the water bearing unit they are screened in, the frequency of monitoring, and the required parameter list. The monitoring well locations are shown on Figure 1. Groundwater monitoring was completed by experienced personnel and samples were collected following the monitoring practices described in Tab 15 of Permit C-1994-082. All samples were analyzed by ACZ Laboratories.

Site	Unit	Monitoring Frequency		Parameter List
		Water Level	Water Quality	
YAAL14	Annand Draw Alluvium	A	A	GW Long
YGAL16	Grassy Creek Alluvium	A	A	GW Long
SGAL70	Grassy Creek Alluvium	A	A	GW Long
YSAL1	Sage Creek Alluvium	A	A	GW Long
YSAL3	Sage Creek Alluvium	A	A	GW Long
YOV30	Wadge Overburden	A	A	GW Long
YW30	Wadge Coal	A	A	GW Long
YWU30	Wadge Underburden	A	A	GW Long
YWC33	Wolf Creek Coal	A	A	GW Short
YWCU33	Wolf Creek Underburden	A	A	GW Short

**Note**

A: Annual

GW Long: Field conductivity, field pH, field temperature, fluoride, dissolved iron, dissolved manganese, nitrate, nitrite, dissolved selenium, sulfate, total dissolved solids

GW Short: Field conductivity, field pH, field temperature, dissolved iron, dissolved manganese, total dissolved solids

### 3.1 WATER LEVELS

The static water levels measured during the 2024 water year are included with the groundwater quality data in Appendix B. Water level hydrographs for each of the wells are also provided in Appendix C. The static water levels were measured at all wells except for YWC33, where the well casing was damaged, and a measurement

could not be made. The water levels measured at all wells this year were within their respective historic range. The water levels in most of the water bearing units at Yoast exhibit seasonal fluctuations. The water table in the shallow alluvial wells fluctuates in response to seasonal precipitation events, with the water table typically at its highest during the spring snowmelt seasons and then declining through late summer/early fall in response to the dry conditions. The water levels in the bedrock overburden and coal seams also fluctuate in response to recharge from seasonal precipitation but are partially influenced by interactions with groundwater in the reclaimed mine spoil. Due to the bedrock unit depths and lower hydraulic conductivity, the water level fluctuations are typically muted relative to the fluctuations observed in the shallow alluvium.

### 3.2 GROUNDWATER QUALITY

The Yoast Mine Groundwater Points of Compliance (GWPOC) were established in Technical Revision 39 (TR-39) (see Attachment 15-1 of Permit C-1994-082). The two GWPOC monitoring wells are YSAL3 which is screened within the Sage Creek Alluvium and SGAL70 which is screened within the Grassy Creek Alluvium (Figure 1). SGAL70 is located downgradient of both the Yoast Mine and the adjacent Sage Creek Mine. Bedrock GWPOC wells were deemed unnecessary in TR-39 due to the limited potential for the mine to negatively impact the quality of bedrock groundwater. The Wadge and Wolf Creek Coal exhibit low hydraulic conductivity (Wadge Coal:  $2.45\text{E-}7$  to  $3.5\text{E-}7$  cm/sec; Wolf Creek Coal:  $4.55\text{E-}6$  cm/sec) which impedes the migration of mine-impacted groundwater through these units. Attenuation and dilution should further limit water quality impacts. Aquifers of regional significance include the Trout Creek Sandstone and the Twentymile Sandstone. The Twentymile Sandstone is located approximately 500 ft above the Wadge Coal seam and is not found within the Yoast permit boundary. Low permeability confining layers of the Williams Fork Formation isolate the Trout Creek Sandstone from the mine. The Trout Creek Sandstone lies approximately 300 to 400 feet below the Wadge Coal seam and approximately 60 to 100 feet below the Wolf Creek Coal Seam. The groundwater in the Trout Creek Sandstone is under confined conditions and exhibits an upward hydraulic head that further limits the potential for mine affected groundwater to infiltrate into this unit.

See TR-39 located in the Appendix 15-1 of the Yoast Mine permit package for additional justification for the Groundwater Points of Compliance.

Tables B.1 and B.2 in Appendix B include the analytical results for samples collected from wells YSAL3 and SGAL70 in 2024 and provide a comparison to the Grassy Creek and Sage Creek Alluvial GWPOC water quality standards established in TR-39. Table B.3 includes the analytical results for the remaining monitoring wells however no comparison to water quality standards were made as these wells are not GWPOC. Groundwater monitoring was taken over by SCC staff in 2024. During this transition the GW Short parameter list was mistakenly requested for the samples collected at well SGAL70. The GW Long parameter list will be analyzed going forward. The groundwater quality at SGAL70 and YSAL3 complies with the TR-39 water quality standards.

Predictions for the potential TDS increases at several of the Yoast monitoring wells were made in the Probable Hydrologic Consequences (PHC, Tab 17) section of Permit C-1994-082. The table below outlines these predictions along with this year's observed value. In 2024, the TDS at five of the seven wells exceeded the predicted value. Although the predicted TDS values for the Grassy Creek (YAAL14, YGAL16) and Sage Creek (YSAL1, YSAL3) alluvial wells were exceeded it's important to acknowledge that the 2024 values remain within the range of ambient, pre-mine, TDS measured in alluvial monitoring wells in these same drainages. Overburden removal in the Grassy Creek basin began in 1996. The pre-mine (1/1/1980 -

Well	Predicted TDS (mg/L)	This Years TDS (mg/L)
YAAL14	2036	2050*
YGAL16	1296	1350*
YSAL1	798	1700*
YSAL3	798	1330*
YOV30	3201	2820
YW30	2570	6490*
YWC33**	2721	-

**Note**

\*Indicates value above prediction

\*\* YWC33 well casing broken. Sample could not be collected.



1/31/1994) TDS measured in Grassy Creek alluvial wells YGAL15, YGAL16, YGAL17 and YGAL18 ranged from 546 - 4030 mg/L (mean:1603 mg/L) (see Table 6 TR-39). The pre-mine (1/1/1980 - 12/31/1999) TDS measured in Sage Creek alluvial wells YSAL1, YSAL12, YSAL3, and YSAL8 ranged from 230 - 2140 mg/L (see Table 2 TR-39). This suggests that the slightly elevated TDS concentrations could be from non-mine related sources such as bedrock groundwater contributions from the underlying Lewis Shale or agriculture, which can concentrate dissolved salts, which weren't considered as part of the post mine predictions.

The TDS measured at bedrock well YW30 in 2024 also exceeded its predicted values. As described above the low hydraulic conductivity of the bedrock units will inhibit groundwater from migrating away from the mine. Groundwater from the Wadge Coal and its overburden have not historically been used in this area because groundwater yields from these units are insufficient for irrigation or domestic use. Low permeable confining bedrock units separating the mine from usable aquifers will continue to isolate the mine water from these systems.

## 4.0 SURFACE WATER

The Yoast Mine lies within the headwaters of the Grassy Creek and Sage Creek watersheds. The southwest portion of the permit drains to the west towards Sage Creek, which ultimately flows to the north-northeast towards the Yampa River. A small area on the southeastern end of the permit drains southeast towards Grassy Creek, which flows to the northeast near the southern end of the permit area before bending to the north towards the Yampa River. The remainder of the permit area drains to the north-northeast towards Annand Draw, which drains north to Scotchmans Gulch, before eventually flowing to the east-northeast to Grassy Creek. The following table includes the Yoast surface water monitoring points, the watershed they are located in, the frequency of monitoring, and the required parameter list. See Figure 1 for the location 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 15 of Permit C-1994-082. All samples were analyzed by ACZ Laboratories.

Site	Type	Watershed	Monitoring Frequency		Parameter List
			Flow	Water Quality	
NPDES11	NPDES	Grassy Creek	M	M	NPDES
YSGF5	Surface Water	Grassy Creek	SA	SA	SW Long
NPDES10	NPDES	Grassy Creek	M	M	NPDES
YSG5	Surface Water	Grassy Creek	SA	SA	SW Long
YSSF3	Surface Water	Sage Creek	SA	SA	SW Short
NPDES14	NPDES	Sage Creek	M	M	NPDES
NPDES13	NPDES	Sage Creek	M	M	NPDES
NPDES12	NPDES	Sage Creek	M	M	NPDES
YSS2	Surface Water	Sage Creek	SA	SA	SW Long

**Note**

SA: Semiannual during spring snowmelt and summer baseflow

M: Monthly

SW Long: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, total mercury, ammonia, nitrate, nitrite, dissolved selenium, sulfate, sulfide, total dissolved solids, total suspended solids

SW Short: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, total suspended solids, total dissolved solids

NPDES: See NPDES permit CO-0000221

The Colorado Water Quality Control Commission (CWQCC) has established segment specific aquatic life water quality standards for Grassy Creek (Segment 13i and 13j) and Sage Creek (Segment 13e) of the Yampa River. The water quality standards for these segments are included in CWQCC Regulation 33. Therefore, the following surface water quality discussion has been organized by drainage basin. The 2024 Water Year surface water quality data is provided in Appendix D. Samples from this year's stream points are compared to both the Colorado Department of Public Health & Environment (CDPHE) surface water agricultural use standards (CDPHE, Reg. 31) and the appropriate segment specific aquatic life water quality standards. Samples from NPDES outfalls are compared to NPDES discharge limits as well as the segment specific aquatic life standards. Additional discussion of the water quality in each stream segment follows.

#### 4.1 GRASSY CREEK

Analytical results for the 2024 surface water monitoring conducted at upper Grassy Creek Segment 13i stream point YSGF5 and NPDES Outfall 011 are provided in Tables D.1 and D.2 of Appendix D. Analytical results for lower Grassy Creek stream point YSG5 and NPDES Outfall 010 are provided in Table D.3 and D.4. As described in CWQCC Regulation 33, the current conditions temporary modification of the chronic dissolved selenium standard for Yampa River Segment 13i and Segment 13j, which includes upper and lower Grassy Creek, expired on 12/31/2023. At one time a current conditions temporary modification of the chronic iron standard was also in place for both segments. However because the elevated iron in the stream is not the result of the iron in the mine discharges the temporary modification was deleted and the iron standard was returned to 1 mg/L.

There were no exceedances of NPDES permit limits or instream water quality standards at Outfalls 010 or 011. Outfall 011 rarely discharges and unfortunately during the May discharge event the incorrect sample type was collected. Cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc, which have a quarterly monitoring frequency, were not analyzed. These parameters will be analyzed in future discharge samples.

There was one exceedance of the Yampa Segment 13i chronic total recoverable iron water quality standards at upper Grassy Creek stream point YSGF5 and one exceedances of the Yampa Segment 13i chronic total recoverable iron water quality standards at lower Grassy Creek stream point YSG5. The iron measured in the samples collected on June 12<sup>th</sup> at YSGF5 was 2.03 mg/L and the iron at YSG5 was 1.01 mg/L, just above the 1 mg/L standard. Monitoring completed at Outfall 011 and Outfall 010 on June 10<sup>th</sup> indicated Outfall 011 was not discharging and that the iron at Outfall 010 outfall was < 0.06 mg/L. Baseline monitoring completed at YSGF5 between 1991 and 1993 indicates iron was routinely above (mean: 1.34 mg/L; range: 0.15 - 9.9 mg/L; n:19) the 1 mg/L Segment 13j iron standard. Pre-mine total recoverable iron data is not available for YSG5, however the concentration observed in the June 2024 sample does not exceed the pre-mine concentration at YSGF5. Total recoverable iron at the Grassy Creek stream point are strongly correlated with suspended solids ( $r^2$ : 0.65 - 0.91) which become naturally elevated during rain and snow melt runoff events (Figure D.1). The total suspended solids in the June YSGF5 and YSG5 samples were elevated (40 - 84 mg/L). This indicates the elevated iron observed in Grassy Creek is unrelated to the runoff from the reclaimed mine and is likely the result of natural erosional processes that are occurring within the unmined portions of the watershed.

The method detection limit for the sulfide analysis (MDL: 0.02 mg/L) conducted by SCC's lab exceeds the 0.002 mg/L Yampa Segment 13i and 13j water quality standard for un-ionized sulfide ( $H_2S$ ). All of the sulfide samples analyzed were non-detect. This analytical method detects both dissolved sulfides and acid-soluble metallic sulfides that are present in suspended matter and provides a single cumulative concentration. Furthermore, dissolved sulfide includes both the ionized ( $HS^-$ ) and un-ionized forms of hydrogen sulfide ( $H_2S$ ). The distribution of sulfide between the un-ionized hydrogen sulfide and ionized form is dependent on the temperature and pH. At low pH most of the dissolved sulfide exists as the toxic un-ionized hydrogen sulfide. In alkaline waters, like those present at Yoast, most of the dissolved sulfide is present as non-toxic ionized sulfide.

The method detection limit for mercury (0.2  $\mu g/L$ ) used by SCC's lab is above the 0.01  $\mu g/L$  aquatic life standard. None of the samples collected during 2024 exceeded the labs method detection limit. CDPHE previously performed a reasonable potential analysis for Outfall 010 and determined that there was no reasonable potential for

discharges from this outfall to exceed the mercury limit and the monitoring requirement was dropped from the NPDES permit. There is no reason to believe total mercury in Grassy Creek exceeds the aquatic life standard.

## 4.2 SAGE CREEK

Analytical results for the 2024 surface water monitoring conducted at Sage Creek stream points YSSF3 and YSS2 are provided in Table D.5 of Appendix D and the analytical results for Outfalls 012, 013, and 014 that report to Sage Creek are included in Table D.6 through D.8. There was one exceedance of the Yampa Segment 13e chronic aquatic life selenium standard at Outfall 013. Outfall 013 only discharges in response to the spring snowmelt and the flows are typically limited in volume and duration. The selenium exceedance occurred during the April 23<sup>rd</sup> sampling event. The discharge was only 33 gpm (0.047 MGD) and the flow ceased by the next monitoring event in May. Downstream point YSS2 was not monitored in April but selenium samples collected in May and June were < 1 µg/L, which is less than the Yampa Segment 13e chronic aquatic life selenium standard.

All mine disturbance within the Sage Creek watershed has been reclaimed. Marine shale deposits, including the Williams Fork and Lewis Shale Formations, that are present in this area are known to be laden with selenium. Selenium is naturally mobilized to surface water and groundwater through weathering processes. Extensive monitoring within this watershed has indicated that the selenium found within these formations causes elevated selenium both instream and at the outfalls, particularly during the spring snowmelt season. SSC collects biological data within these streams, and the data continues to demonstrate that there is no toxic effect to the downstream aquatic species from this discharge. SSC is continuing to work with the WQCD towards a site-specific standard that more appropriately reflects the conditions in this stream. There were no other exceedances of the NPDES limits, Yampa Segment 13e aquatic life standards, or agricultural use standards at Outfalls 012, 013, and 014.

As discussed in Section 4.1, the lab used by SCC has a method detection limit for mercury and sulfide that are above the Segment 13e water quality standard. None of the samples collected from YSSF3 and YSS2 in 2024 exceed the labs mercury or sulfide

method detection limit. All other parameters sampled at Sage Creek stream points YSS2 and YSSF3 were within the applicable water quality standards.

In the Probable Hydrological Consequences (PHC, Tab 17) section of Permit C-1994-082, predictions were made for the expected TDS increases to be observed at several stream points. The following table outlines these predictions along with 2024's average concentration.

Stream Point	Predicted TDS (mg/L)	Mean TDS (mg/L)
NPDES10	3938	2740
YSGF5	1337	846
NPDES12	4291	2873
WSSF3*	2118	830

\* WSSF3 is a Seneca II-W stream point located in Sage Creek, downstream of the Yoast outfalls. See the 2024 Annual Hydrology Report for Permit C-1982-057 for the full dataset.

The annual average TDS measured at each of the four monitoring locations was less than the predicted value.

## 5.0 SPRINGS

The Yoast monitoring program includes four spring sites. The following table includes the list of springs monitored, the frequency of monitoring, and the parameter list. See Figure 1 for the location of the spring points. Spring monitoring was completed by experienced personnel and samples were collected following the monitoring practices described in Tab 15 of Permit C-1994-082. All samples were analyzed by ACZ Laboratories.

Site	Type	Unit	Monitoring Frequency		Parameter List
			Discharge	Water Quality	
YSSPG1	Spring	Spoils	A	A	SW Long
YSSPG2	Spring	Spoils	A	A	SW Short
YSSPG3	Spring	Spoils	A	A	SW Short
YSSPG4	Spring	Spoils	A	A	SW Short

**Note**

A: Annual

SW Long: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, total mercury, ammonia, nitrate, nitrite, dissolved selenium, sulfate, sulfide, total dissolved solids, total suspended solids

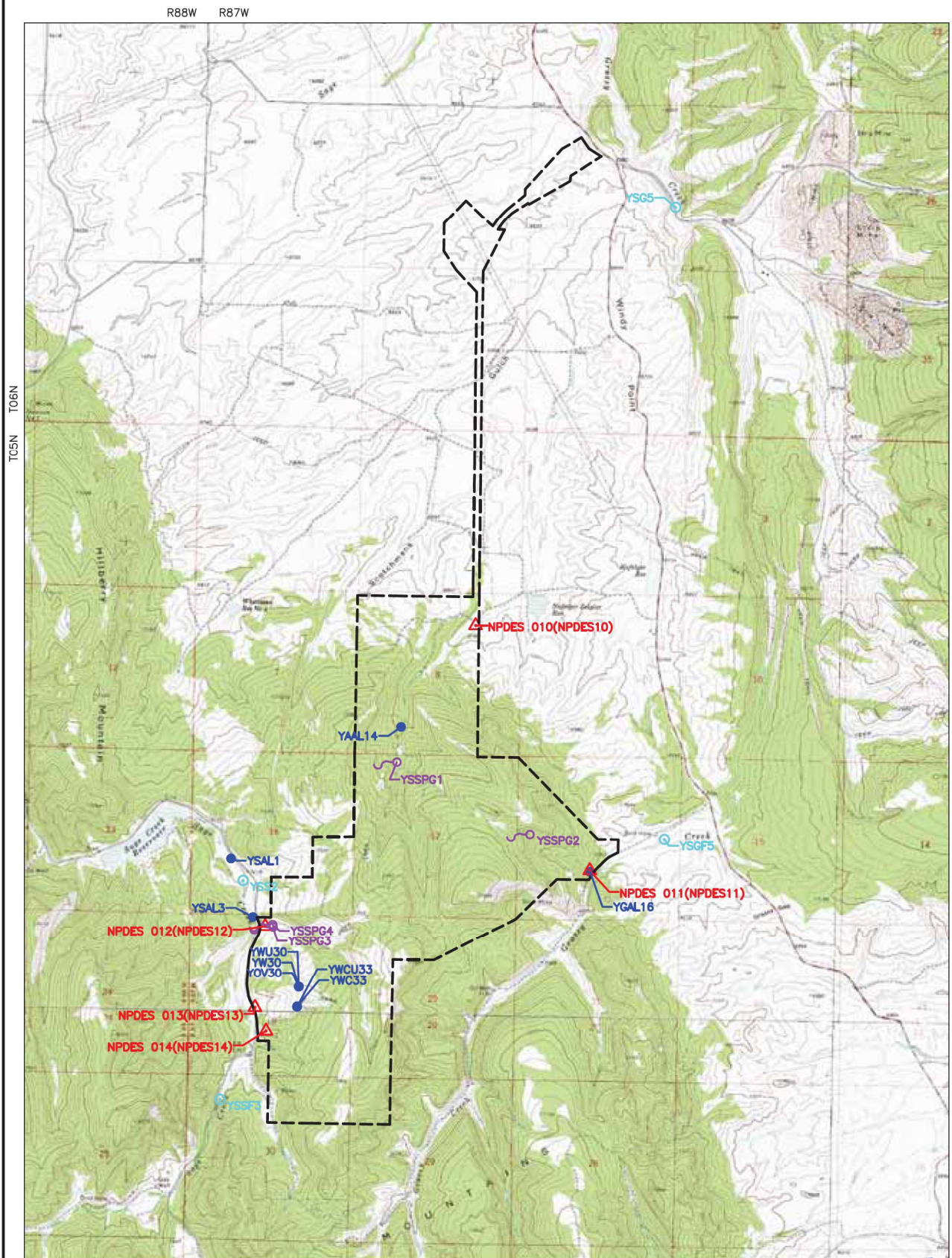
SW Short: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, total suspended solids, total dissolved solids

Table E.1 in Appendix E includes the analytical results for samples collected from the four spoil springs in 2024. The primary post-mine land use in this area is livestock grazing and wildlife habitat. Therefore, the water quality collected from the spoil springs is compared to the CWQCC agricultural use standards established in CDPHE Regulation 31. There was one exceedance of the dissolved manganese agricultural use standard at spring YSSPG4 in 2024. The 0.2 mg/L Manganese agricultural use standard is only applicable when irrigation water is applied to acidic soils (<6.0 pH). For alkaline soils, as are found at Yoast, a more appropriate standard would be 10 mg/L (EPA, 1976). Therefore, none of the manganese results above 0.2 mg/L are considered exceedances of the standard. There were no other exceedances of the agricultural use standards at the springs in 2024.

## 6.0 SUMMARY

No significant hydrologic impacts, attributable to activities at Yoast, were noted during 2024. Groundwater levels in all monitoring wells were within their historic range. No measured water quality exceedances occurred at the GWPOC. Exceedances of the total recoverable iron chronic aquatic life standards occurred at YSGF5 and YSG5 in Grassy Creek. Monitoring completed at Outfall 011 and Outfall 010 indicated the outfalls were not the source of the iron and that the iron was more likely the result of natural erosional processes that are occurring within the unmined portions of the watershed. There were no other exceedances of the surface water quality standards at the stream monitoring points.





GROUNDWATER  
 SURFACE WATER  
 NPDES  
 SPRING  
 PERMIT BOUNDARY

0 4000'  
SCALE

IMAGE SOURCE:  
 DIGITAL RASTER GRAPHIC COUNTY MOSAIC BY NRCS  
 OF ROUTT COUNTY, COLORADO FROM GEOSPATIAL  
 DATA GATEWAY ([HTTPS://GDG.SC.EGOV.USDA.GOV](https://gdg.sc.egov.usda.gov))  
 DOWNLOADED 10/16

DESIGNED BY:  
 JAH  
 DRAWN BY:  
 SDG  
 CHECKED BY:  
 TNS  
 DATE:  
 2019

FIGURE 1  
 MONITORING SITE LOCATIONS

YOAST MINE  
 PEABODY SAGE CREEK MINING, LLC  
 PEABODY ENERGY

WWCENGINEERING

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 precipitation collected at the Hayden Colorado Airport Weather Station 053867  
Data accessed from: [https://climate.colostate.edu/data\\_access\\_new.html](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_me n_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.** Groundwater analytical results for Point of Compliance (POC) well YSAL3 during water year 2024.

Location	Date	Static Water Level FT BTOC	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N DEG-C	Fluoride N MG/L	Iron D MG/L	Manganese D MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L	Sulfates N MG/L	TDS, Lab N MG/L
YSAL3	5/20/2024	4.07	1690	7.4	8.1	0.34	1.1	0.213	0.064	< 0.01	< 2	674	1330
Sage Creek TR39 GWPOC Standards*			-	6.5 - 8.5	-	2	4.91	0.76	10	1	20	1200	2675

Notes  
\* See Yoast Mine Technical Revision 39 (TR-39) for GWPOC standards  
**Exceeds groundwater quality standard**

**Table B.2.** Groundwater analytical results for Point of Compliance (POC) well SGAL70 during 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	Fluoride N MG/L	Iron D MG/L	Manganese D MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L	Sulfates N MG/L	TDS, Lab N MG/L
SGAL70	6/6/2024	9.7	3280	6.9	16.9	0.24	< 0.12	0.122	0.04	< 0.01	< 2	2220	3660
SGAL70	9/24/2024	10.53	3150	6.9	14.6	0.29	< 0.12	0.278	0.159	< 0.01	< 2	2190	3510
GWPOC Water Quality Standards*			-	6.5 - 8.5	-	2	14.1	2.44	10	1	20	2517	5038

Notes

\* See Yoast Mine Technical Revision 39 (TR-39) for GWPOC standards

<b>Bold</b>	Analyte exceeds the TR-39 GWPOC Standard
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**Table B.3.** Groundwater analytical results for Non-Point of Compliance wells during water year 2024.

Location	Date	Static Water Level FT BTOC	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N DEG-C	Fluoride N MG/L	Iron D MG/L	Manganese D MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L	Sulfates N MG/L	TDS, Lab N MG/L
YAAL14	5/20/2024	4.32	3310	7.3	10.1	0.25	0.276	< 0.02	0.516	< 0.01	< 2	1150	2050
YGAL16	5/20/2024	4.16	1830	8.5	11.3	0.26	0.074	< 0.01	0.031	< 0.01	< 2	766	1350
YSAL1	5/20/2024	5.31	1780	7.3	8.4	0.25	0.123	< 0.01	0.672	< 0.01	3.2	925	1700
YOV30	5/20/2024	134.83	3480	7.8	9.9	1.11	0.169	0.029	0.057	< 0.01	< 2	1330	2820
YW30	5/20/2024	132.91	6780	7.6	9.6	0.89	1.11	0.084	1.33	0.034	< 2	3730	6490
YWU30	5/20/2024	214.79	1710	7.4	9.8	0.18	0.109	0.108	0.174	< 0.01	< 2	129	776
YWC33*	5/20/2024												
YWCJ33	5/20/2024	245.79	1570	8.6	12.4		0.457	< 0.01					1020

**Notes**

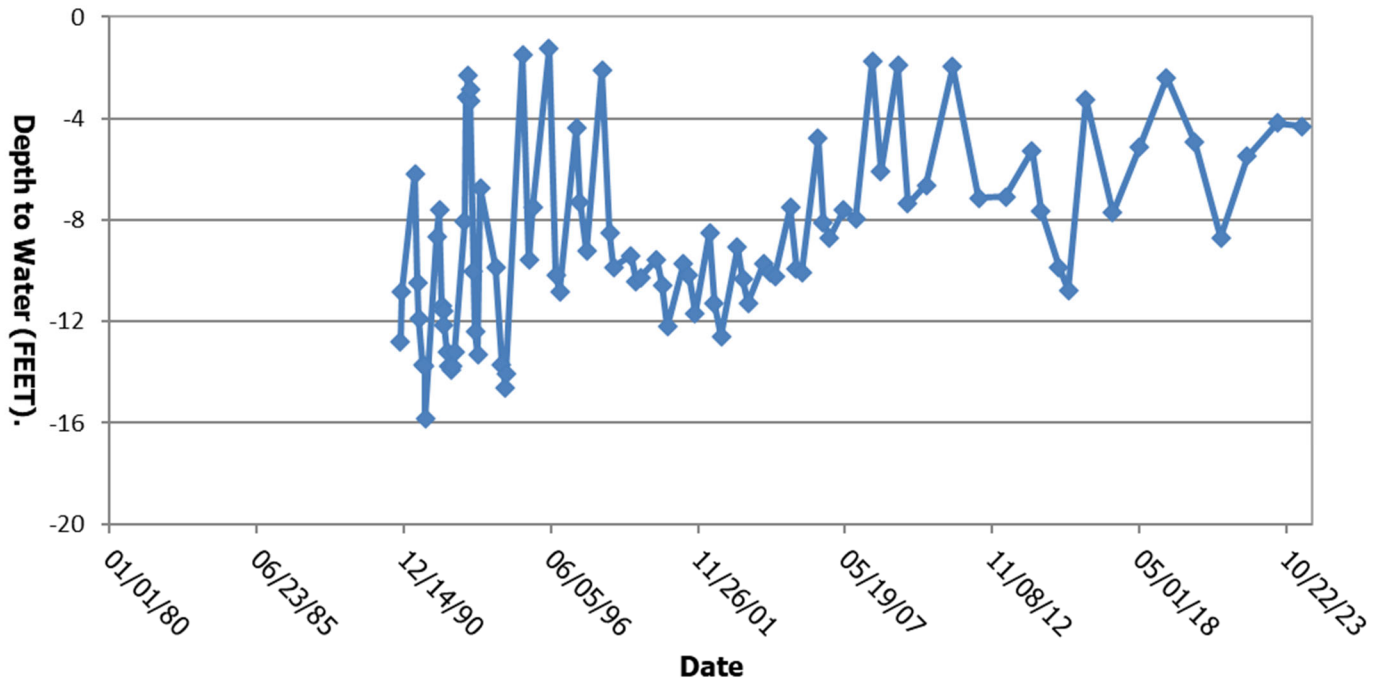
\*YWC33 well casing broken. Water level could not be measured and a sample could not be collected.



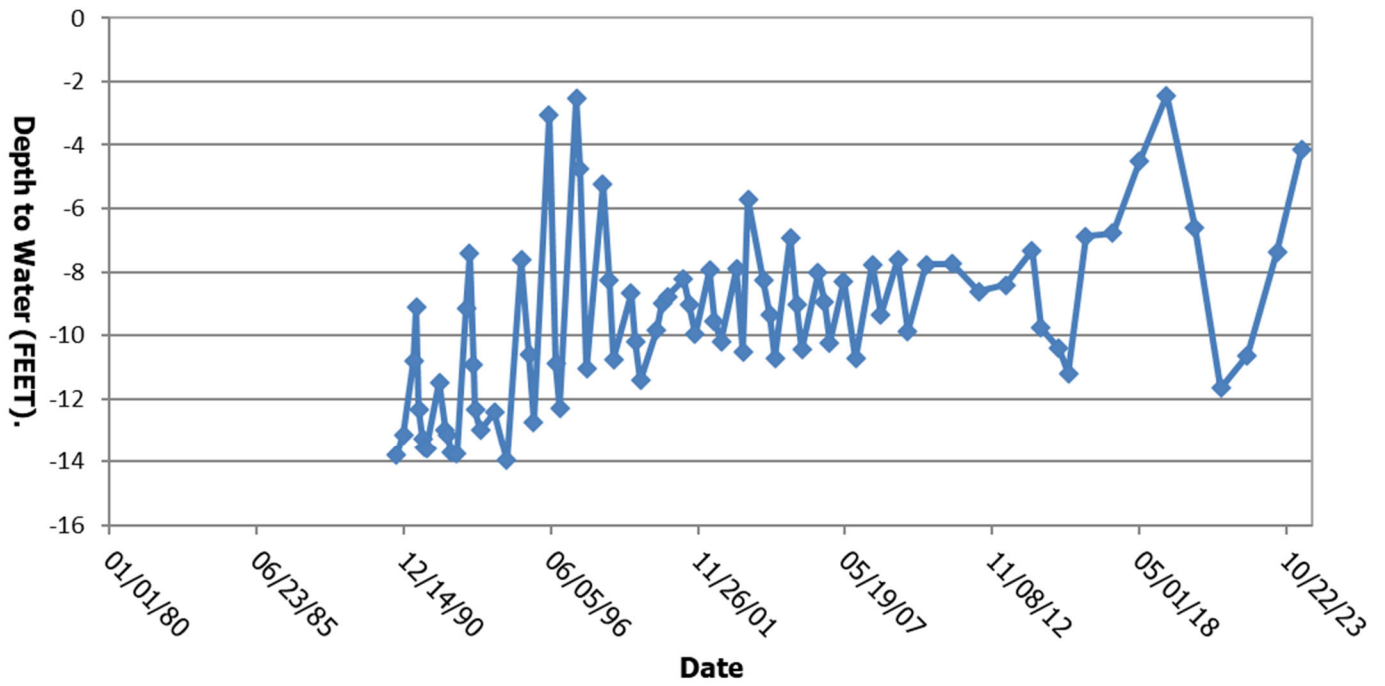
APPENDIX C

GROUNDWATER HYDROGRAPHS

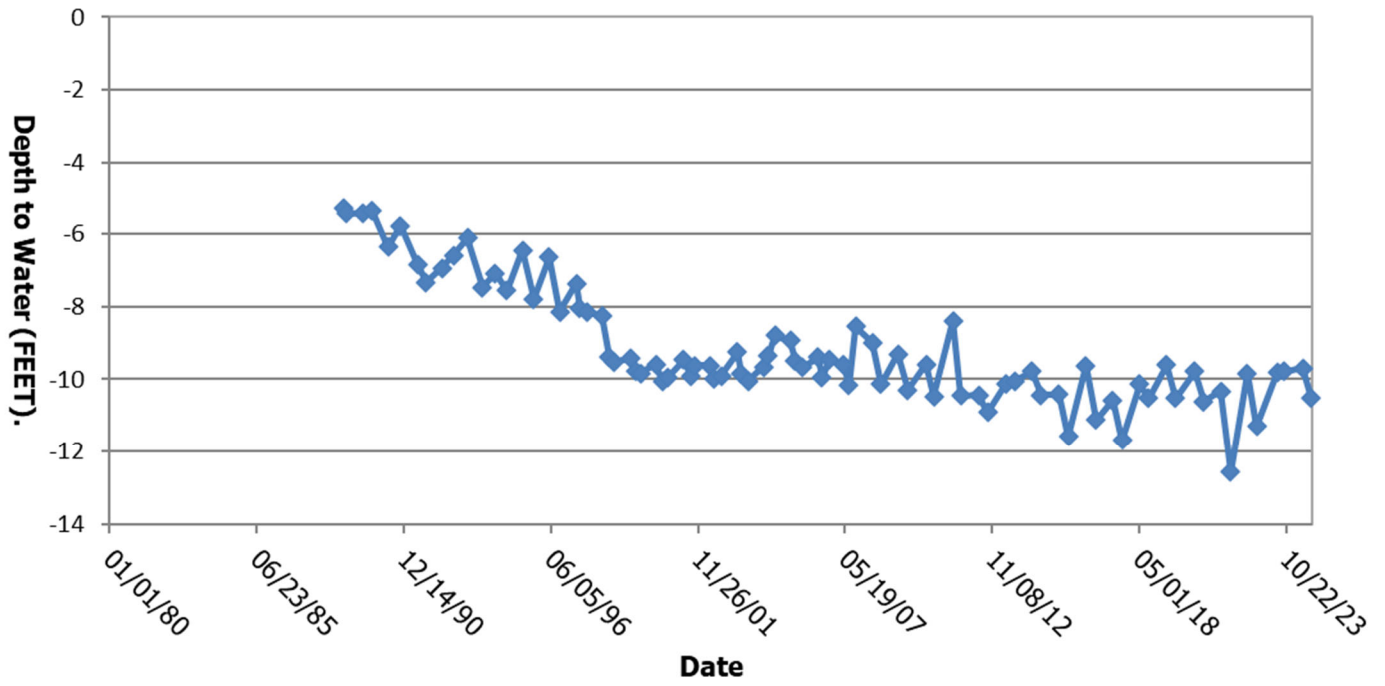
### YAAL14



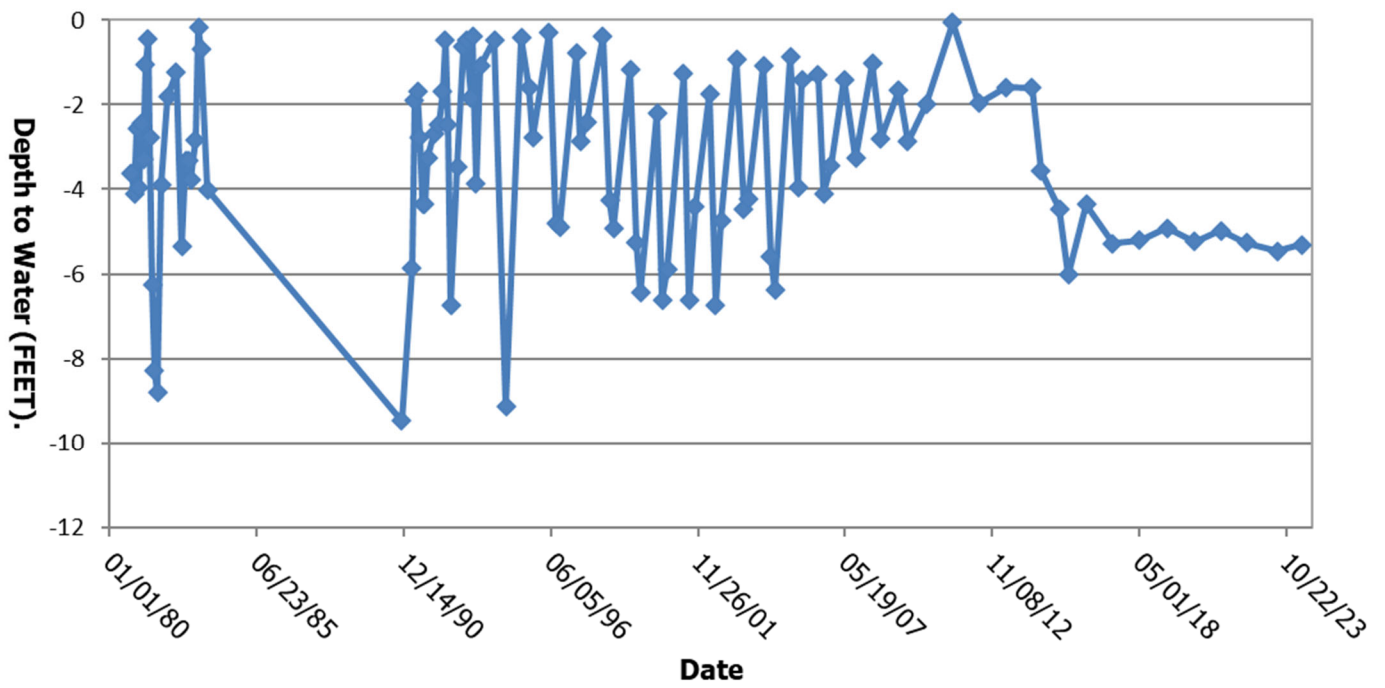
### YGAL16



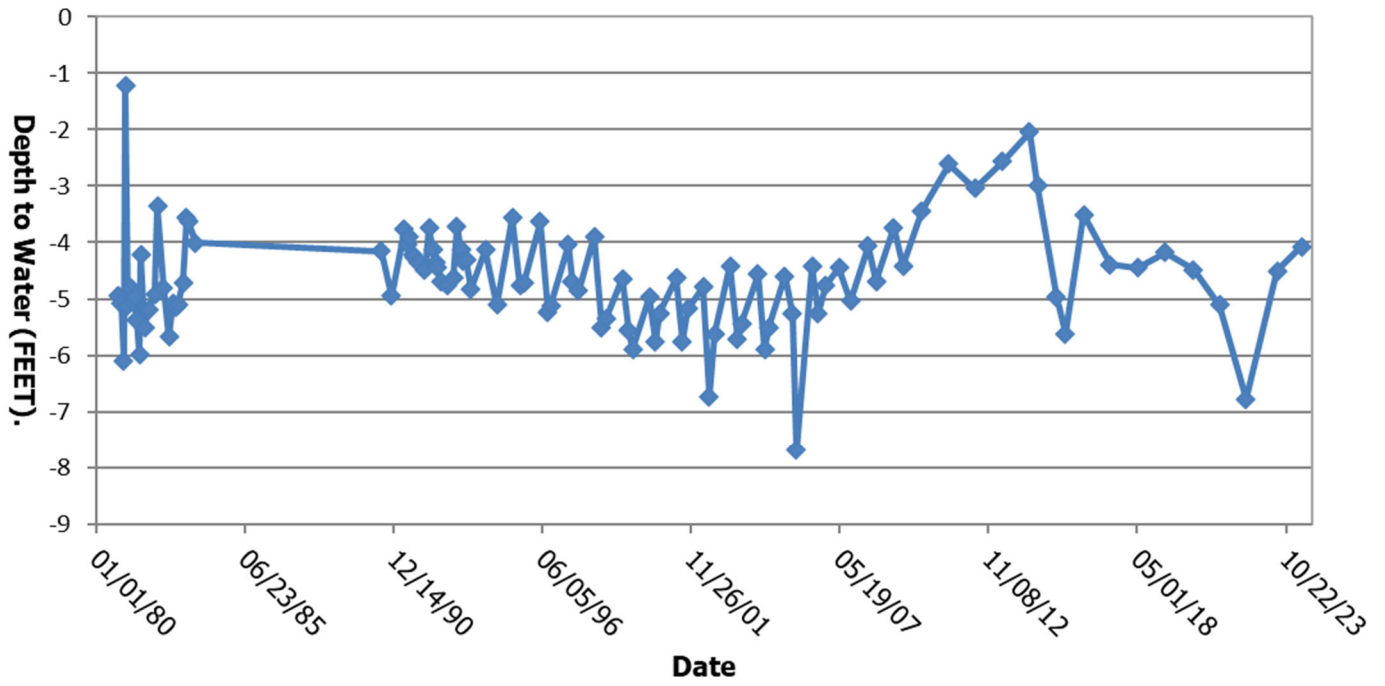
### SGAL70



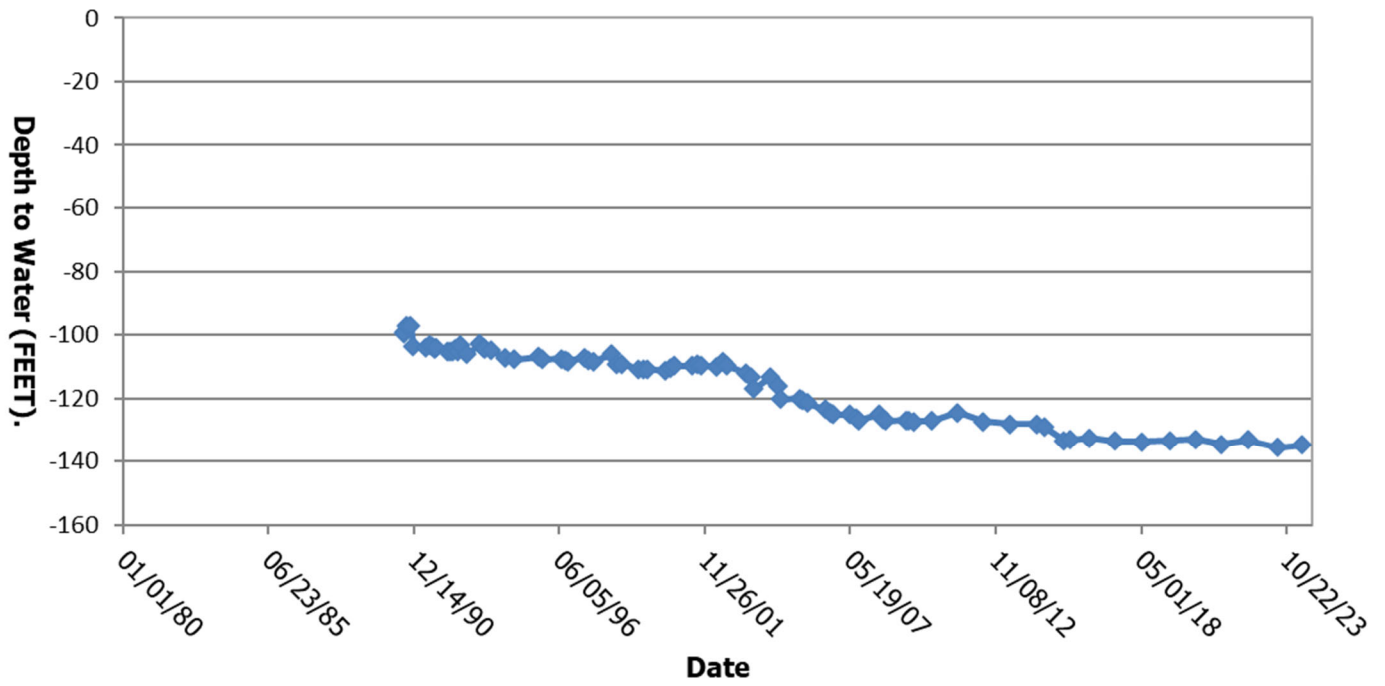
### YSAL1



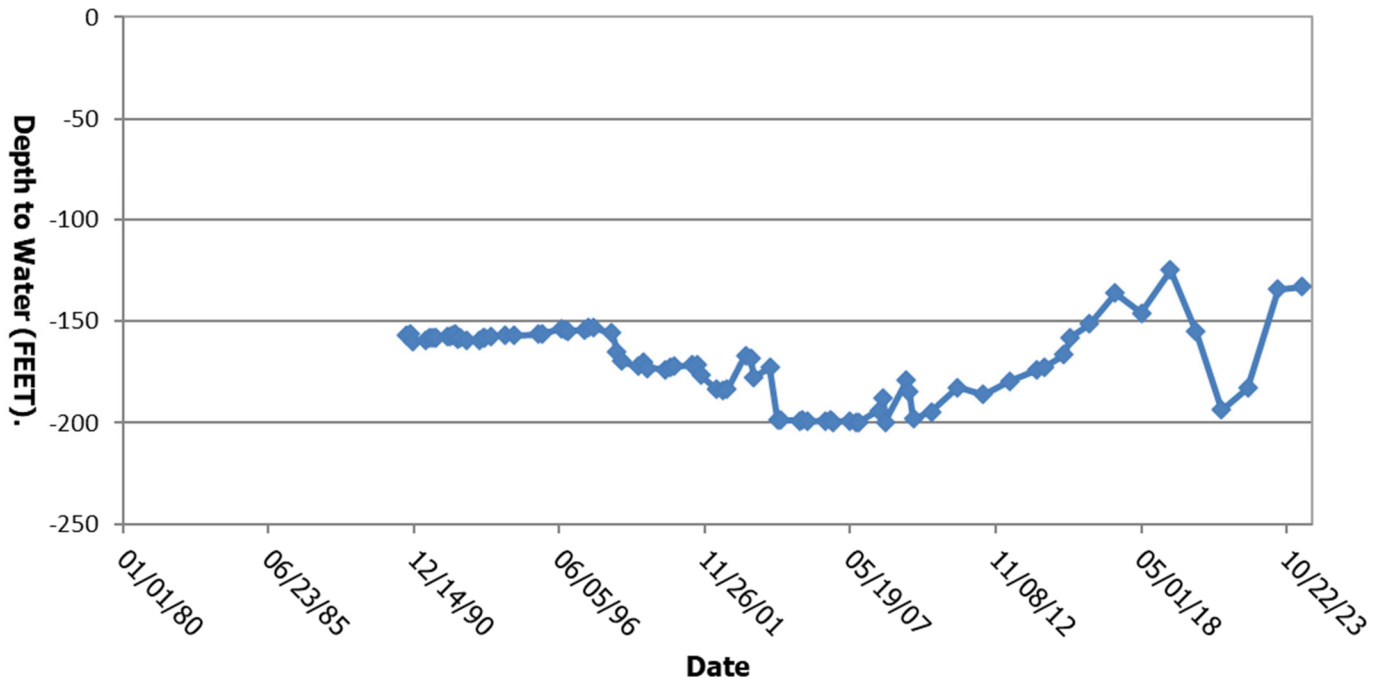
### YSAL3



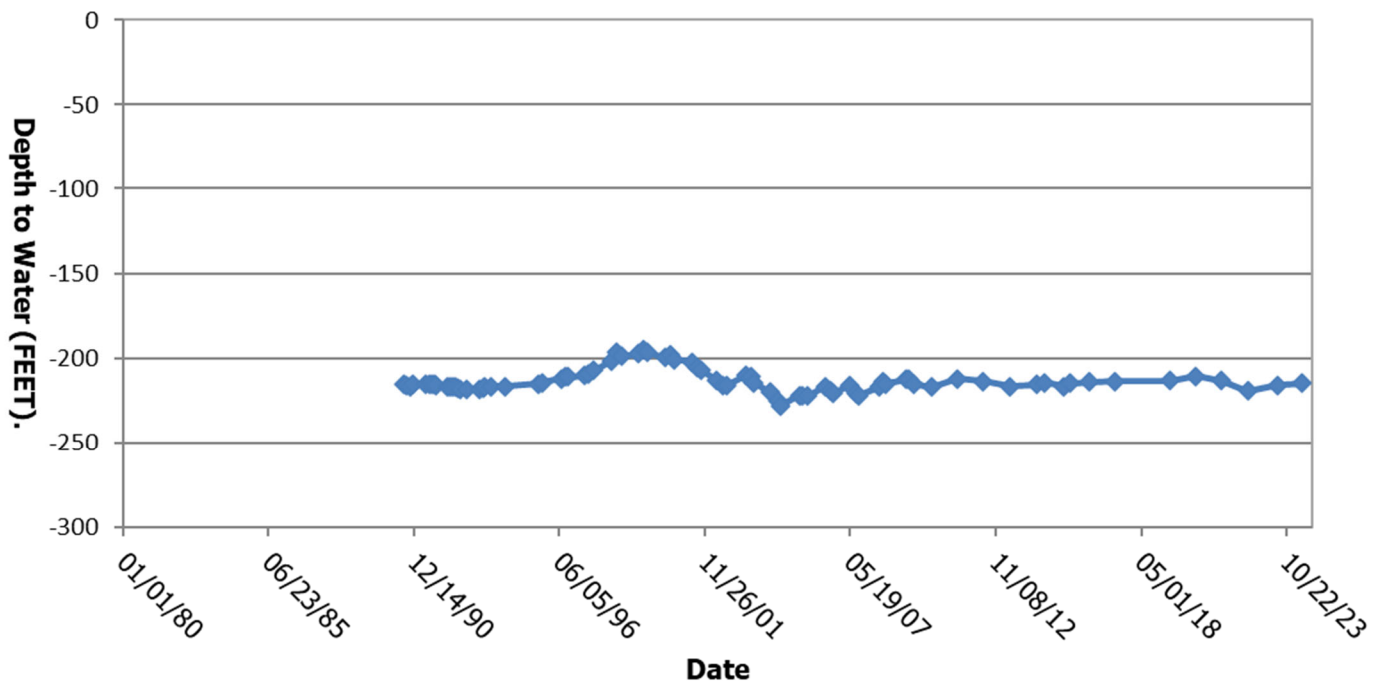
### YOV30



### YW30



### YWU30





APPENDIX D

SURFACE WATER QUALITY DATA

**Table D.1** Upper Grassy Creek Yampa Segment 13i 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 D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese D MG/L	Mercury T UG/L	Ammonia N. N MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L
YSGF5	5/20/2024	2.701	973	8.3	16.2									0.53
YSGF5	6/12/2024	0.069	1150	8.3	11	0.0577	0.876	2.03	0.0477	< 0.2	< 0.1	< 0.02	< 0.01	0.34
YSGF5	7/8/2024	0.014	1384	8.1	21.4	0.068	0.491	0.939						
YSGF5	9/3/2024	0												
Yampa Segment 13i Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01**	Varies	100	0.05	18.4
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-	1	2.618	-	Varies	-	-	4.6
Agricultural Use Standards		-	-	-	-	-	-	-	0.2*	-	-	100	10	20

Location	Date	Selenium PD UG/L	Selenium TR UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	TSS N MG/L
YSGF5	5/20/2024	0.5	0.51	371		778	
YSGF5	6/12/2024	0.26	0.33	433	< 0.02	840	84
YSGF5	7/8/2024					920	35
YSGF5	9/3/2024						
Yampa Segment 13i Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

**Notes**

The ammonia standard varies based on stream classification, pH, and temperature. See Regulation 33 Table Value Standard calculation formula. Each samples water quality was compared to calculated standard.

The current conditions temporary modification for the Segment 13i chronic selenium standard expired on 12/31/2023

\* The manganese agricultural use standard is only applicable for areas with acidic soils. This areas soils are alkaline.

\*\* The mercury standard is an order of magnitude less than the labs 0.2 mg/L analytical detection limit.

\*\*\* The sulfide standard is an order of magnitude less than the labs 0.02 mg/L sulfide analytical detection limit.

**Bold** Analyte exceeds the Yampa Segment 13i or Agricultural Use Standards



**Table D.2.** Upper Grassy Creek Segment 13i NPDES Outfall 011 analytical data for water year 2024.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	Iron TR MG/L	TDS, Lab N MG/L	Cadmium PD UG/L	Chromium PD UG/L	Copper PD UG/L	Lead PD UG/L	Mercury T UG/L	Nickel PD UG/L
NPDES11	10/27/2023	0										
NPDES11	11/6/2023	0										
NPDES11	12/5/2023	0										
NPDES11	1/11/2024	0										
NPDES11	2/1/2024	0										
NPDES11	3/27/2024	0										
NPDES11	4/23/2024	0										
NPDES11	5/20/2024	0.075	8.2	NA	< 0.06	1450						
NPDES11	6/10/2024	0										
NPDES11	7/8/2024	0										
NPDES11	8/20/2024	0										
NPDES11	9/3/2024	0										
NPDES Limit	Daily Max		6.5 - 9.0	10	Report	Report	Report	Report	Report	Report	Report	Report
	Monthly Avg.		NA	NA	1	Report	Report	Report	Report	Report	Report	Report
Yampa Segment 13i Standards - Acute			6.5 - 9.0	-	-	-	9.2	1773	50	281	0.01	1513
Yampa Segment 13i Standards - Chronic			-	-	1	-	1.2	231	29	11	-	168
Agricultural Use Standards			-	-	-	-	10	100	200	100	-	200

Location	Date	Selenium PD UG/L	Selenium* TR UG/L	Silver PD UG/L	Zinc PD MG/L
NPDES11	10/27/2023				
NPDES11	11/6/2023				
NPDES11	12/5/2023				
NPDES11	1/11/2024				
NPDES11	2/1/2024				
NPDES11	3/27/2024				
NPDES11	4/23/2024				
NPDES11	5/20/2024	0.51	0.51		
NPDES11	6/10/2024				
NPDES11	7/8/2024				
NPDES11	8/20/2024				
NPDES11	9/3/2024				
NPDES Limit	Daily Max	Report	-	Report	Report
	Monthly Avg.	Report	-	Report	Report
Segment 13i Standards - Acute		18.4	-	22	0.565
Segment 13i Standards - Chronic		4.6	-	3.5	0.428
Agricultural Use Standards		-	20	-	2

**Note**

The Yampa Segment 13i current conditions temporary modification for chronic selenium expired on 12/31/2023

\*NPDES11 does not have a Total Recoverable Selenium NPDES monitoring requirement.

\*\* A current conditions temporary modification is in place for the Segment 13i chronic selenium standard.

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

**Table D.3** Lower Grassy Creek Yampa Segment 13j 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 D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese D MG/L	Mercury T UG/L	Ammonia N. N MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L
YSG5	5/20/2024	3.136	2362	8.3	16.6			0.454	0.141	< 0.2	< 0.1	0.205	< 0.01	1.67
YSG5	6/12/2024	0.393	3017	8	17.8			<b>1.01</b>	0.062	< 0.2	< 0.1	0.098	< 0.01	1.05
YSG5	7/8/2024	0.006	3192	8	21.6									0.67
YSG5	9/3/2024	0.021	2613	8.1	15.2			0.484	0.08	< 0.2	< 0.1		< 0.02	0.51
Yampa Segment 13j Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01**	Varies	100	0.05	18.4
Yampa Segment 13j Standards - Chronic		-	-	-	-	-	-	1	2.618	-	Varies	-	-	4.6
Agricultural Use Standards		-	-	-	-	-	-	-	0.2*	-	-	100	10	20

Location	Date	Selenium PD UG/L	Selenium TR UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	TSS N MG/L
YSG5	5/20/2024	1.69	1.79	1280	< 0.02	2160	< 5
YSG5	6/12/2024	0.89	1.26	1340	< 0.02	2230	40
YSG5	7/8/2024		0.69	1250		2100	
YSG5	9/3/2024	0.55	0.56	1420	< 0.02	2430	13
Yampa Segment 13j Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13j Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

**Notes**

The ammonia standard varies based on stream classification, pH, and temperature. See Regulation 33 Table Value Standard calculation formula. Each samples water quality was compared to calculated standard.

The current conditions temporary modification for the Segment 13j chronic selenium standard expired on 12/31/2023

\* The manganese agricultural use standard is only applicable for areas with acidic soils. This areas soils are alkaline.

\*\* The mercury standard is an order of magnitude less than the labs 0.2 mg/L analytical detection limit.

\*\*\* The sulfide standard is an order of magnitude less than the labs 0.02 mg/L sulfide analytical detection limit.

**Bold** Analyte exceeds the Yampa Segment 13j or Agricultural Use Standards

**Table D.4.** Lower Grassy Creek Segment 13j NPDES Outfall 010 analytical data for water year 2024.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	Iron TR MG/L	TDS, Lab N MG/L	Copper PD UG/L	Selenium* D UG/L	Selenium PD UG/L	Selenium* TR UG/L
NPDES10	10/27/2023	0								
NPDES10	11/6/2023	0.003	8.2	N	0.135	3360	< 1.6		0.45	0.46
NPDES10	12/5/2023	0.003	8.2	N	0.066	3450	< 1.6		0.68	0.63
NPDES10	1/10/2024	0.003	8.2	N	0.406	3110	< 1.6		0.75	0.87
NPDES10	2/1/2024	0.003	8.3	N	0.118	2990	< 0.8		4	1.48
NPDES10	3/26/2024	0.017	8.2	N	0.104	1810	< 0.8		2.22	0.41
NPDES10	4/23/2024	0.057	7.8	N	< 0.06	2010	< 0.8		0.62	0.58
NPDES10	5/20/2024	0.025	7.8	N	0.125	2400	< 0.8	0.42	0.43	0.54
NPDES10	6/10/2024	0.012	8	N	< 0.06	2480	< 0.8		0.42	0.48
NPDES10	7/8/2024	0.002	8	N	< 0.12	2810		0.36	0.6	0.38
NPDES10	8/19/2024	0.002	8	N	< 0.12	2980	< 0.8		0.3	0.35
NPDES10	9/3/2024	0								
NPDES Limit	Daily Max		6.5 - 9.0	10	Report	Report	Report	-	Report	-
	Monthly Avg.		NA	NA	1	Report	Report	-	Report	-
Yampa Segment 13j Standards - Acute			6.5 - 9.0	-	-	-	50	18.4	-	-
Yampa Segment 13j Standards - Chronic			-	-	1	-	29	4.6	-	-
Agricultural Use Standards			-	-	-	-	200	-	-	20

**Note**

The Yampa Segment 13j current conditions temporary modification for chronic selenium expired on 12/31/2023

\*NPDES10 does not have a Dissolved or Total Recoverable Selenium NPDES monitoring requirement.

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

**Table D.5.** Sage Creek Segment 13e 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 D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese D MG/L	Mercury T UG/L	Ammonia N. N MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L
YSSF3	5/29/2024	1.463	320	8.2	11	0.0493	0.206	0.471	0.0125					0.15
YSSF3	6/12/2024	0.766	627	8	9.3	0.0762	0.292	0.361	0.0159					0.2
YSS2	5/29/2024	2.078	520	7.9	11	0.0601	0.228	0.437	0.0226	< 0.2	< 0.1	< 0.02	< 0.01	0.17
YSS2	6/12/2024	0.11	1813	8.3	10.3	0.0638	0.617	1.01	0.0296	< 0.2	< 0.1	0.039	< 0.01	0.3
YSS2	9/3/2024	0.011	2582	8.3	17.3	0.192	0.527	0.854	0.0543					0.31
Yampa Segment 13e Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01**	Varies	100	0.05	18.4
Yampa Segment 13e Standards - Chronic		-	-	-	-	-	-	1.25	2.618	-	Varies	-	-	4.6
Agricultural Use Standards		-	-	-	-	-	-	-	0.2*	-	-	100	10	20

Location	Date	Selenium PD UG/L	Selenium TR UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	TSS N MG/L
YSSF3	5/29/2024	0.12	0.16			250	11
YSSF3	6/12/2024	0.12	0.12			280	6
YSS2	5/29/2024	0.15	0.16	144	< 0.02	418	9
YSS2	6/12/2024	0.25	0.32	501	< 0.02	1010	37
YSS2	9/3/2024	0.28	0.38			2420	26
Yampa Segment 13e Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13e Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

**Notes**

The ammonia standard varies based on stream classification, pH, and temperature. See Regulation 33 Table Value Standard calculation formula. Each samples water quality was compared to calculated standard.

The current conditions temporary modification for the Segment 13e chronic selenium standard expired on 12/31/2023

\* The manganese agricultural use standard is only applicable for areas with acidic soils. This areas soils are alkaline.

\*\* The mercury standard is an order of magnitude less than the labs 0.2 mg/L analytical detection limit.

\*\*\* The sulfide standard is an order of magnitude less than the labs 0.02 mg/L sulfide analytical detection limit.

**Bold** Analyte exceeds the Yampa Segment 13e or Agricultural Use Standards

**Table D.6.** Sage Creek Segment 13e NPDES Outfall 014 analytical data for water year 2024.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	TDS N MG/L	Selenium* D UG/L	Selenium* TR UG/L
NPDES14	10/27/2023	0					
NPDES14	11/6/2023	0					
NPDES14	12/5/2023	0					
NPDES14	1/10/2024	0					
NPDES14	2/1/2024	0					
NPDES14	3/26/2024	0					
NPDES14	4/23/2024	0.027	7.9	N	1070		
NPDES14	5/28/2024	0.001	8.3	N	2020	0.48	0.53
NPDES14	6/10/2024	0					
NPDES14	7/9/2024	0					
NPDES14	8/19/2024	0					
NPDES14	9/3/2024	0					
NPDES Limit	Daily Max		6.5 - 9.0	10	Report	-	-
	Monthly Avg.		NA	NA	Report	-	-
Yampa Segment 13e Standards - Acute			6.5 - 9.0	-	-	18.4	-
Yampa Segment 13e Standards - Chronic			-	-	-	4.6	-
Agricultural Use Standards			-	-	-	-	20

**Note**

The Yampa Segment 13e current conditions temporary modification for chronic selenium expired on 12/31/2023

\*NPDES14 does not have a Dissolved or Total Recoverable Selenium NPDES monitoring requirement.

**Bold** Analyte exceeds the NPDES limit or Agricultural Use standard

**Table D.7.** Sage Creek Segment 13e NPDES Outfall 013 analytical data for water year 2024.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	TDS, Lab N MG/L	Arsenic TR UG/L	Cadmium PD UG/L	Chromium PD UG/L	Copper PD UG/L	Iron TR MG/L	Lead PD UG/L	Manganese PD MG/L	Mercury T UG/L	Nickel PD UG/L
NPDES13	10/27/2023	0												
NPDES13	11/6/2023	0												
NPDES13	12/5/2023	0												
NPDES13	1/10/2024	0												
NPDES13	2/1/2024	0												
NPDES13	3/26/2024	0												
NPDES13	4/23/2024	0.047	8.5	NA	2630	0.56	< 0.05	< 0.5	1.45	0.375	0.12	0.011	0.00282	< 8
NPDES13	5/28/2024	0												
NPDES13	6/10/2024	0												
NPDES13	7/9/2024	0												
NPDES13	8/19/2024	0												
NPDES13	9/3/2024	0												
NPDES Limit	Daily Max		6.5 - 9.0	10	Report	Report	Report	Report	Report	Report	Report	Report	Report	Report
	Monthly Avg.		NA	NA	Report	Report	Report	Report	Report	Report	Report	Report	Report	Report
Yampa Segment 13e Standards - Acute			6.5 - 9.0	-	-	340	9.2	1773	50	1.25	281	4.738	0.01	1513
Yampa Segment 13e Standards - Chronic			-	-	-	100	1.2	231	29	-	11	2.618	-	168
Agricultural Use Standards			-	-	-	100	10	100	200	-	100	0.2***	-	200

Location	Date	Selenium D UG/L	Selenium PD UG/L	Selenium TR UG/L	Zinc PD MG/L	TSS* N MG/L
NPDES13	10/27/2023					
NPDES13	11/6/2023					
NPDES13	12/5/2023					
NPDES13	1/10/2024					
NPDES13	2/1/2024					
NPDES13	3/26/2024					
NPDES13	4/23/2024		10	9.33	< 0.02	< 5
NPDES13	5/28/2024					
NPDES13	6/10/2024					
NPDES13	7/9/2024					
NPDES13	8/19/2024					
NPDES13	9/3/2024					
NPDES Limit	Daily Max	-	Report	-	Report	-
	Monthly Avg.	-	Report	-	Report	-
Segment 13e Standards - Acute		18.4	-	-	0.565	-
Segment 13e Standards - Chronic		4.6	-	-	0.428	-
Agricultural Use Standards		-	-	20****	2	-

**Note**

The Yampa Segment 13e current conditions temporary modification for chronic selenium expired on 12/31/2023

\*TSS is not an NPDES monitoring requirement at this outfall

\*\* A current conditions temporary modification is in place for the Segment 13e chronic selenium standard.

\*\*\* The agricultural use manganese standard is only applicable to areas with acidic soils. These are not present at Yeast Mine.

\*\*\*\* The agricultural use standard is applied to total recoverable selenium

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

**Table D.8.** Sage Creek Segment 13e NPDES Outfall 012 analytical 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	Manganese PD MG/L	Selenium* D UG/L	Selenium PD UG/L	Selenium* TR UG/L
NPDES12	10/27/2023	0.052	8.1	N	< 0.12	3510	0.052		0.66	0.47
NPDES12	11/6/2023	0.053	8.1	N	< 0.12	3320			0.39	0.44
NPDES12	12/5/2023	0.051	8.2	N	0.092	3220			0.27	0.23
NPDES12	1/10/2024	0.05	8.2	N	< 0.12	3300	0.11		0.33	0.39
NPDES12	2/1/2024	0.051	8.2	N	0.1	3210			2.5	0.26
NPDES12	3/26/2024	0.062	8.2	N	0.085	2300			1.76	1.12
NPDES12	4/23/2024	0.254	7.7	N	0.193	1230	0.0154		1.1	1.01
NPDES12	5/28/2024	0.172	8	N	< 0.12	2680		0.68	0.6	0.62
NPDES12	6/10/2024	0.155	7.9	N	< 0.06	2770			0.68	0.77
NPDES12	7/9/2024	0.067	7.9	N	< 0.12	2980	0.055	0.71	0.57	0.42
NPDES12	8/19/2024	0.063	7.9	N	< 0.12	3000			0.45	0.53
NPDES12	9/3/2024	0.069	8	N	0.173	2960			0.4	0.47
NPDES Limit	Daily Max		6.5 - 9.0	10	Report	Report	Report	-	18	-
	Monthly Avg.		NA	NA	1	Report	Report	-	4.6	-
Yampa Segment 13e Standards - Acute			6.5 - 9.0	-	1	-	4.738	18.4	-	-
Yampa Segment 13e Standards - Chronic			-	-	-	-	2.618	4.6	-	-
Agricultural Use Standards			-	-	-	-	0.2**	-	-	20

**Note**

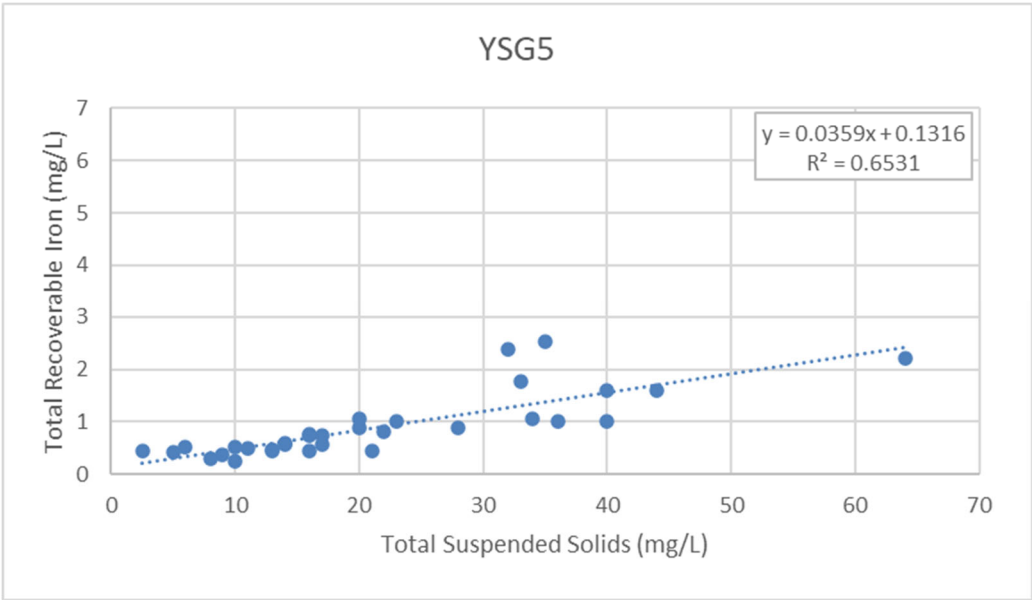
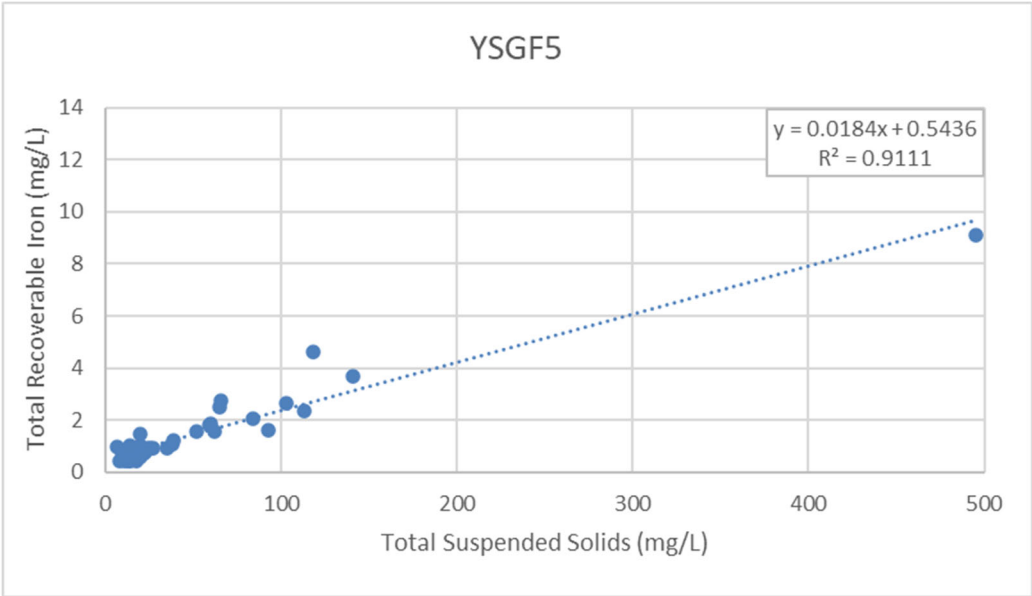
The Yampa Segment 13e current conditions temporary modification for chronic selenium expired on 12/31/2023

\* NPDES12 does not have a Dissolved or Total Recoverable Selenium NPDES monitoring requirement.

\*\* The manganese agricultural use standard is only applicable to areas with acidic soils. These are not present at Yeast Mine.

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

**Figure D.1.** Suspended solids vs total recoverable iron at Grassy Creek stream points YSGF5 and YSG5 collected between January 1, 2014 and September 30, 2024.





APPENDIX E

SPRING WATER QUALITY DATA

**Table E.1.** Analytical data for springs sampled during the 2024 water year.

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	Mercury T UG/L	Ammonia N. N MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L
YSSPG1	6/13/2024	0.004	3027	8.1	10.6	0.246	0.214	< 0.2	< 0.1	< 0.02	< 0.01
YSSPG2	6/13/2024	0									
YSSPG3	6/13/2024	0.002	2312	8	17.9	0.079	0.139				
YSSPG4	6/13/2024	0.034	3016	6.5	13.1	0.877	1.47				
Agricultural Use Standards		-	-	-	-	-	0.2*	-	-	100	10

Location	Date	Selenium D UG/L	Selenium PD UG/L	Selenium TR UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	TSS N MG/L
YSSPG1	6/13/2024	< 0.2	< 0.2	< 0.2	1290	< 0.02	2190	10
YSSPG2	6/13/2024							
YSSPG3	6/13/2024	0.33	0.22	0.31			1390	< 5
YSSPG4	6/13/2024	0.21	< 0.2	0.26			2300	< 5
Agricultural Use Standards		20	-	-	-	-	-	-

**Notes**

\* The manganese agricultural use standard is only applicable for areas with acidic soils. This areas soils are alkaline.

**Bold** Analyte exceeds the Agricultural Use Standards