

Taproot Rockies Midstream  
Hale Produced Water Release #2  
Spill/Release Point ID 480563  
Briggsdale, Colorado

Table 1. Summary of Analytical Results

Station Name	CAS Number	Units	Protection of Groundwater Soil Screening Level	Residential Soil Screening Level Concentrations	FS-01	SS1	SS2	SS3	SS4	SW-01	SW-02
Sample Date					8/20/2021	9/24/2021	9/24/2021	9/24/2021	9/24/2021	8/20/2021	8/20/2021
Sample Depth					5 - 5.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	2 - 2.5 ft	2 - 2.5 ft
Metals											
ARSENIC	7440-38-2	mg/kg	0.29	0.68	2.42	3.52	3.2	2.41	3.13	2.82	2.45
BARIUM	7440-39-3	mg/kg	82	15,000	230	315	301	184	247	180	200
CADMIUM	7440-43-9	mg/kg	0.38	71	0.127	0.257	0.301	0.33	0.282	0.138	0.198
COPPER	7440-50-8	mg/kg	46	3,100	12.7	11.3	12.5	12.5	12.5	12.7	12
CHROMIUM (VI)	18540-29-9	mg/kg	0.00067	0.3	<1	<1	<1	<1	<1	<1	<1
LEAD	7439-92-1	mg/kg	14	400	8.96	11.5	10.6	10.1	19.2	9.4	9.87
NICKEL	7440-02-0	mg/kg	26	1,500	10.8	10.1	11.6	11.2	11.4	10.6	10.2
SELENIUM	7782-49-2	mg/kg	0.26	390	1.54	<2	<2	<2	<2	1.51	1.45
SILVER	7440-22-4	mg/kg	0.8	390	<1	<1	<1	<1	<1	<1	<1
ZINC	7440-66-6	mg/kg	370	23,000	45	38.7	43.3	44	43	47.1	43.8
VOCs											
BENZENE	71-43-2	mg/kg	0.0026	1.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
ETHYLBENZENE	100-41-4	mg/kg	0.78	5.8	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
TOLUENE	108-88-3	mg/kg	0.69	490	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00155
XYLENES, TOTAL	1330-20-7	mg/kg	9.9	58	0.00103	<0.0065	<0.0065	<0.0065	<0.0065	0.00123	0.0137
1,2,4-TRIMETHYLBENZENE	95-63-6	mg/kg	0.0081	30	0.00188	<0.005	<0.005	<0.005	<0.005	0.00178	<0.005
1,3,5-TRIMETHYLBENZENE	108-67-8	mg/kg	0.0087	27	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0093
Semi-VOCs											
1-METHYLNAPHTHALENE	90-12-0	mg/kg	0.006	18	0.0336	<0.02	<0.02	<0.02	<0.02	0.0755	0.133
2-CHLORONAPHTHALENE	91-58-7	mg/kg	--	--	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
2-METHYLNAPHTHALENE	91-57-6	mg/kg	0.019	24	0.0284	<0.02	<0.02	<0.02	<0.02	0.0535	0.0589
ACENAPHTHENE	83-32-9	mg/kg	0.55	360	<0.006	<0.006	<0.006	<0.006	<0.006	0.00361	0.0101
ACENAPHTHYLENE	208-96-8	mg/kg	--	--	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
ANTHRACENE	120-12-7	mg/kg	5.8	1,800	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
BENZO(A)ANTHRACENE	56-55-3	mg/kg	0.011	1.1	<0.006	<0.006	<0.006	<0.006	<0.006	0.00254	<0.006
BENZO(A)PYRENE	50-32-8	mg/kg	0.24	0.11	<0.006	<0.006	<0.006	<0.006	<0.006	0.003	<0.006
BENZO(B)FLUORANTHENE	205-99-2	mg/kg	0.3	1.1	<0.006	<0.006	<0.006	<0.006	<0.006	0.00637	0.0028
BENZO(G,H,I)PERYLENE	191-24-2	mg/kg	--	--	<0.006	<0.006	<0.006	<0.006	<0.006	0.00213	<0.006
BENZO(K)FLUORANTHENE	207-08-9	mg/kg	2.9	11	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
CHRYSENE	218-01-9	mg/kg	9	110	<0.006	<0.006	<0.006	<0.006	<0.006	0.00436	0.0107
DIBENZ(A,H)ANTHRACENE	53-70-3	mg/kg	0.096	0.11	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
FLUORANTHENE	206-44-0	mg/kg	8.9	240	<0.006	<0.006	<0.006	<0.006	<0.006	0.00389	0.0049
FLUORENE	86-73-7	mg/kg	0.54	240	0.00495	<0.006	<0.006	<0.006	<0.006	0.0138	0.0451
INDENO(1,2,3-CD)PYRENE	193-39-5	mg/kg	0.98	1.1	<0.006	<0.006	<0.006	<0.006	<0.006	0.00226	<0.006
NAPHTHALENE	91-20-3	mg/kg	0.0038	2	<0.0125	<0.02	<0.02	<0.02	<0.02	0.00895	0.0104
PHENANTHRENE	85-01-8	mg/kg	--	--	0.012	<0.006	<0.006	<0.006	<0.006	0.0311	0.112
PYRENE	129-00-0	mg/kg	1.3	180	<0.006	<0.006	<0.006	<0.006	<0.006	0.0062	0.00908
TPH**											
TPH (GC/FID) LOW FRACTION	8006-61-9	mg/kg	--	500	0.0725	<0.1	<0.1	<0.1	<0.1	0.781	2.18
C10-C28 DIESEL RANGE	NA	mg/kg	--	500	6.42	8.62	4.01	4.24	4.22	43.1	166
C28-C36 MOTOR OIL RANGE	NA	mg/kg	--	500	5.75	18	14.9	16.4	10.6	32	111

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Station Name	CAS Number	Units	Protection of Groundwater Soil Screening Level	Residential Soil Screening Level Concentrations	FS-01	SS1	SS2	SS3	SS4	SW-01	SW-02
Sample Date					8/20/2021	9/24/2021	9/24/2021	9/24/2021	9/24/2021	8/20/2021	8/20/2021
Sample Depth					5 - 5.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	2 - 2.5 ft	2 - 2.5 ft
Soil Suitability for Reclamation**											
HOT WATER SOL. BORON	7440-42-8	mg/l	--	2	1.41	0.511	0.332	0.139	0.133	0.514	0.953
PH	NA	s.u.	--	6 - 8.3	8.06	8.13	8.03	7.97	7.79	7.81	7.62
SODIUM ADSORPTION RATIO	NA	Na/(Ca+Mg)	--	6	5.21	3.2	3.29	0.517	1.08	2.65	7.15
SPECIFIC CONDUCTANCE	Specific Conductance	mmhos/cm	--	4	1.75	0.575	1.1	0.25	1.6	0.983	3.06

**NOTES:**  
Boldface type indicates the analyte was detected above the reporting limit.  
Highlighted text indicates an exceedance of either the protection of groundwater soil screening level or residential soil screening level.  
\*\* Where RSSL or protection of groundwater screening level is not present, Table 915-1 Cleanup Concentrations are used.  
-- No standard established.  
NA Not applicable.  
NS Not sampled.  
FS indicates a sample collected from the floor of an excavation.  
SS indicates a surface sample collected from the area of shallow excavation with limited impact from produced water.  
SW indicates a sample collected from the sidewall of an excavation.

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Station Name	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09
Sample Date	8/20/2021	8/20/2021	8/20/2021	8/20/2021	8/20/2021	8/20/2021	9/24/2021
Sample Depth	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft
<b>Metals</b>							
ARSENIC	3.05	2.66	3.24	2.72	2.84	2.46	3.5
BARIUM	192	424	446	200	245	196	147
CADMIUM	0.175	0.113	0.143	0.145	0.21	0.146	0.309
COPPER	12.6	12.1	15.8	13.1	13.3	12.2	12.3
CHROMIUM (VI)	<1	<1	<1	<1	<1	<1	<1
LEAD	10.2	8.81	10.5	8.92	9.78	9.79	9.65
NICKEL	11.4	10.4	13.1	11	11.4	10.3	11.7
SELENIUM	2.08	1.49	2.23	1.67	1.82	2.25	<2
SILVER	<1	<1	<1	<1	<1	<1	<1
ZINC	43.2	44.8	56.1	47.1	47.3	44.4	41.3
<b>VOCs</b>							
BENZENE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
ETHYLBENZENE	<0.0025	<0.0025	<0.0025	0.0028	<0.0025	<0.0025	<0.0025
TOLUENE	<0.005	<0.005	<0.005	0.0029	<0.005	<0.005	<0.005
XYLENES, TOTAL	<0.0065	0.00425	<0.0065	0.00926	<0.0065	<0.0065	<0.0065
1,2,4-TRIMETHYLBENZENE	<0.005	<0.005	<0.005	0.0051	<0.005	<0.005	<0.005
1,3,5-TRIMETHYLBENZENE	<0.005	0.00298	<0.005	<0.005	<0.005	<0.005	<0.005
<b>Semi-VOCs</b>							
1-METHYLNAPHTHALENE	<0.02	0.00627	0.0052	0.0388	0.0303	0.0788	<0.02
2-CHLORONAPHTHALENE	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
2-METHYLNAPHTHALENE	<0.02	<0.02	0.00445	0.0302	0.0215	0.058	<0.02
ACENAPHTHENE	<0.006	<0.006	<0.006	<0.006	<0.006	0.00513	<0.006
ACENAPHTHYLENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
ANTHRACENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
BENZO(A)ANTHRACENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
BENZO(A)PYRENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
BENZO(B)FLUORANTHENE	<0.006	<0.006	<0.006	<0.006	<0.006	0.00196	<0.006
BENZO(G,H,I)PERYLENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
BENZO(K)FLUORANTHENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
CHRYSENE	<0.006	<0.006	<0.006	<0.006	<0.006	0.00677	<0.006
DIBENZ(A,H)ANTHRACENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
FLUORANTHENE	<0.006	<0.006	<0.006	<0.006	<0.006	0.00278	<0.006
FLUORENE	<0.006	<0.006	<0.006	0.00937	0.00899	0.0228	<0.006
INDENO(1,2,3-CD)PYRENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
NAPHTHALENE	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.02
PHENANTHRENE	<0.006	<0.006	<0.006	0.0248	0.0259	0.0684	<0.006
PYRENE	<0.006	<0.006	<0.006	0.0021	0.00203	0.00591	<0.006
<b>TPH**</b>							
TPH (GC/FID) LOW FRACTION	<0.1	3.23	0.0247	0.496	0.0382	0.867	<0.1
C10-C28 DIESEL RANGE	<4	4.96	<4	2.57	4.38	49.5	2.53
C28-C36 MOTOR OIL RANGE	3.67	3.51	2.54	3.23	4.9	35.2	8.65

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Station Name	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09
Sample Date	8/20/2021	8/20/2021	8/20/2021	8/20/2021	8/20/2021	8/20/2021	9/24/2021
Sample Depth	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft
Soil Suitability for Reclamation**							
HOT WATER SOL. BORON	0.407	2.04	0.744	0.674	0.733	0.999	0.235
PH	8.32	7.97	7.96	8.02	7.9	7.84	8.7
SODIUM ADSORPTION RATIO	1.52	10.5	2.73	3.68	3.51	9.8	1.64
SPECIFIC CONDUCTANCE	0.304	3.53	1.44	1.16	1.58	3.49	0.291