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TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Susan White, Sr. Reclamation Specialist/Biology SMW
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RE: Bond Release Inspection for Miller Canyon Portals, PacifiCorp, Cottonwood/Wilberg Mine, C/015/019-BR99D

Other Attendees: Chuck Semborski (PacifiCorp), Dennis Oakley (PacifiCorp), and Dale Harbor (Manti LaSal Forest)

Date & Time: September 6, 2001, 10:30 a.m. to 12:30 p.m.

PURPOSE:

This field visit was conducted as required by R645-301-880.210 for Phase I bond release. The portals were sealed in 1987 and backfilled and seeded in 1999. The area of disturbance is 0.02 acres.

OBSERVATIONS:

General

The portals are on the steep, south facing slope of a box canyon about 150 - 200 feet above the canyon floor. Evidence of the coal outcrop is noticeable on the opposite side of the canyon at two elevations. All three portals drain water which enter the canyon bottom. In total, the amount of water seen during the bond release inspection was estimated to be approximately 5 gal/min.

Vegetation on all three portals was sparse but establishing. Some observed species included: Fourwing saltbush, rabbitbrush, bluebunch wheatgrass, flax, thistle, shadscale, combed eriogonum, penstemon, bulrush, colombine, and willow. The flax and fourwing had been browsed by wildlife. The seeded areas around the portals had roughly 10 to 20 percent vegetative cover.

Portal #1: This portal lies the farthest east in the box canyon. It is the largest disturbance due to the fact that native soils were raked from the areas above and to the sides of the backfilled opening. The disturbed ground has rilled, but between rills the surface has cemented. A small micro-drainage channel has formed though the backfilled area. The channel appeared stable with some rock armoring. Water was observed flowing from the sandstone ledge. The water is supporting a small wetland of sedges. A sample of the water was last taken in 1999. The pH was 7.7, and total Iron was 1.0 ppm. A reddish-orange color appears below the point where water flows from the french drain. It appears to be oxidized, but may also be related to an algae growth in the small stream of water (approx. 3 gpm) that emanates from the drain. The measured iron in samples appears low with manganese somewhat higher. It was noticed that flows from the cliffs were not new. Evidence of old algal growth was observed near the stream channel in the chunks of travertine.

Portal #2: A very large rock sits on the sandstone ledge approximately 10 feet from the portal and holds the soil. Soil was backfilled against the rock and the portal face up. Coal chunks are scattered on the surface.

Portal #3: Willows have established at the base of Portal #3 along the sandstone ledge. An erosion gully approximately 6 to 7 inches wide, 4 to 8 inches deep, and 4 to 6 feet long was observed. Coal fines were visible. Pinyon or juniper dead fall had been placed on the surface during reclamation.

Backfilling and Grading

The slopes were backfilled to a 2H : 1V slope. The slopes have been in place since 1999, and appear to be stable. Some minor erosion was seen at the site, but appears to be stable. Most of the rills seemed to be self-armoring with time. All the portals have french drains, which discharge water.

Approximate Original Contours

No off-site impacts were noticed from backfilling and grading activities. Some of the Division's staff had concerns about coal on the surface. However, coal naturally outcrops in the area and the amount of coal is minor.

The portals were backfilled and graded so that they blend into the surrounding area. The Permittee placed logs and other materials at the site so that it blends into the adjacent areas. See the photos for more details.

The portals were break-outs and were constructed from inside the mine. The amount of surface disturbance at the site was minimal. The area of the highwalls that was disturbed amounted to little more than the portals which were 20 feet wide by 6 feet high. The highwall areas were backfilled and graded. Some coal outcrops about the portal entrances were seen during the visit. Since those areas were not disturbed, they do not need to be backfilled. Since coal outcrops naturally occur in the area, the Division is not concerned that some of the coal

above the highwalls was left exposed.

Water Quality

The UPDES monitoring discharge point for the Miller Canyon Portals is below the reach of the spring discharge. Monthly UPDES monitoring does not represent the Miller Canyon Portal discharge.

During the bond release period, the operator should monitor the flows from the portals. This should be done at least once a year at the confluence of the three discharges. The Forest Service also requested continued flow monitoring of the discharge during this inspection.

Water quality should be sampled at Portal #1 for Class 3D parameters (during early summer) to identify increases in flow patterns and changes in water quality. Sampling should be done at the point where water emanates from the french drains. Sampling should be adequate to demonstrate the post-mining land use. Class 3D is protected for non-game fish and other aquatic life, including the necessary aquatic organisms in their food chain. (Although, Cottonwood Creek and its tributaries, from Highway U-57 crossing to headwaters is protected by Class 1C, 2B, 3A, and Class 4 quality parameters as noted for in the Classification of Waters of the State R317-2-13, it would seem that the amount of water and the remote location limits the use of the water to wildlife.) For informational purposes, the classes of protection listed in R317-2-13 are included in this report as Attachment 1.

RECOMMENDATIONS/CONCLUSIONS:

The reclamation of the Miller Canyon Portals meet the requirements for Phase I bond release. As a result of this inspection, the following three actions are recommended for future bond releases.

- The rate of water discharge from the three portals should be monitored at their confluence annually in summer through final bond release. If substantial changes in flow should occur, ie, a 3 fold increase, then a water sample should be taken and analyzed. The sample taken at the French drain should be analyzed for flow, pH, oil and grease, temperature, TSS, dissolved iron, dissolved manganese and TDS.
- An initial red precipitate sample from Portal #1 should be analyzed in the laboratory to determine the composition of the red precipitate.
- The water should be sampled at the three portals confluence and analyzed for Class 3D parameters. The frequency should be adequate to demonstrate compatibility with the post-mining land use.

Photos from this field visit are located at:
ftp://dogm.nr.state.ut.us/PUB/MINES/Coal/C015/019/IMAGES/09/06/2001/

Attachment 1

Repeated below is an abbreviated table of quality parameters for Class 3, Aquatic Life.

c. Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water

b. Class 2B -- Protected for secondary contact recreation such as boating, wading, or similar uses.

6.3 Class 3 -- Protected for use by aquatic wildlife.

a. Class 3A -- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.

b. Class 3B -- Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

c. Class 3C -- Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.

d. Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.

e. Class 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.

6.4 Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

6.5 Class 5 -- The Great Salt Lake. Protected for primary and secondary contact recreation, aquatic wildlife, and mineral extraction.

TABLE 2.14.2
NUMERIC CRITERIA FOR AQUATIC WILDLIFE

Parameter	Aquatic Wildlife 3A	3B	3C	3D
PHYSICAL				
Total Dissolved Gases	(1)	(1)		
Minimum Dissolved Oxygen (MG/L) (2)				
30 Day Average	6.5	5.5	5.0	5.0
7 Day Average	9.5/5.0	6.0/4.0		
1 Day Average	8.0/4.0	5.0/3.0	3.0	3.0
Max. Temperature (C)	20	27	27	
Max. Temperature Change (C)	2	4	4	
pH (Range)	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
Turbidity Increase (NTU)	10	10	15	15

METALS (3) (DISSOLVED, UG/L) (4)				
Aluminum				
4 Day Average (12)	87	87	87	87
1 Hour Average	750	750	750	750
Arsenic (Trivalent)				
4 Day Average	190	190	190	190
1 Hour Average	360	360	360	360
Cadmium (5)				
4 Day Average	1.1	1.1	1.1	1.1
1 Hour Average	3.9	3.9	3.9	3.9
Chromium (11) (Hexavalent)				
4 Day Average	11	11	11	11
1 Hour Average	16	16	16	16
Chromium (Trivalent) (5)				
4 Day Average	210	210	210	210
1 Hour Average	1700	1700	1700	1700
Copper (5)				
4 Day Average	12	12	12	
1 Hour Average	18	18	18	18
Cyanide (Free)				
4 Day Average	5.2	5.2	5.2	
1 Hour Average	22	22	22	22
Iron (Maximum)	1000	1000	1000	1000
Lead (5)				
4 Day Average	3.2	3.2	3.2	3.2
1 Hour Average	82	82	82	82
Mercury				
4 Day Average	0.012	0.012	0.012	0.012
1 Hour Average (11)	2.4	2.4	2.4	2.4
Nickel (5)				
4 Day Average	160	160	160	160
1 Hour Average	1400	1400	1400	1400
Selenium				
4 Day Average	5.0	5.0	5.0	5.0
1 Hour Average	20	20	20	20
Silver				
1 Hour Average (5)	4.1	4.1	4.1	4.1
Zinc (5)				
4 Day Average	110	110	110	110
1 Hour Average	120	120	120	120

FOOTNOTES:

(1) Not to exceed 110% of saturation.

(2) These limits are not applicable to lower water levels in deep impoundments. First number in column is for when early life stages are present, second number is for when all other life stages present.

(3) Where criteria are listed as 4-day average and 1-hour average concentrations, these concentrations should not be exceeded more often than once every three years on the average.

(4) The dissolved metals method involves filtration of the sample in the field, acidification of the sample in the field, no digestion process in the laboratory, and analysis by atomic absorption spectrophotometry or inductively coupled plasma (ICP).

(5) Hardness dependent criteria. 100 mg/l used. Conversion factors for ratio of total recoverable metals to dissolved metals must also be appied. See Table 2.14.3 for complete equations for hardness and conversion factors.

(6) Un-ionized ammonia toxicity is dependent upon the temperature and pH of the water body.

(7) Numeric criteria will be established based on a site-specific assessment of potential impacts to aquatic wildlife.

(8) Investigations should be conducted to develop more information where these levels are exceeded.

(9) pH dependent criteria. pH 7.8 used in table. See Table 2.14.4 for equation.

(10) Total Phosphorus as P (mg/l) limit for lakes and reservoirs shall be 0.025.

(11) Total recoverable metals to dissolved metals conversion factors must be applied to arrive at correct dissolved metals criteria. The conversion factors are: chronic helavalent chromium criteria, 0.962; acute hexavalent chromium criteria, 0.982; acute mercury criteria, 0.850.

(12) The criterion for aluminum will be implemented as follows: Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaCO3 in the receiving water after mixing, the 87 ug/l chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 ug/l acute aluminum criterion.