STATE OF COLORADO

DIVISION OF RECLAMATION, MINING AND SAFETY
Department of Natural Resources

1313 Sherman St., Room 215
Denver, Colorado 80203
Phone: (303) 866-3567
FAX: (303) 832-8106

COLORADO DIVISION OF RECLAMATION MINING & SAFETY

John W. Hickenlooper
Governor

Mike King
Executive Director

Loretta E. Piñeda
Director

11 October 2013

Rob Harries, P.E.
Goff Engineering & Surveying, Inc.
126 Rock Point Drive
P.O. Box 97
Durango, Colorado 81302

Re: Carbon Junction Mine – Permit No. C-1992-080
Technical Revision No. 17 (TR-17) – Response to Notice of Violation
Preliminary Adequacy Review - UPDATED

Dear Mr. Harries:

The Division prepared a Preliminary Adequacy Review for TR-17 on September 20, 2013. On October 1, you informed me that you had come across a bound volume entitled "Appendix 5-9 and 5-10", and accompanying 1996 maps, at the offices of Goff Engineering. You provided the Division with a PDF version of the document and hard copies of the maps. We have completed our review of the new information. Adequacy items 1 and 3, below, have been modified from the original; updated language is identified by bold-italicized text.

An application for Technical Revision No. 17 (TR-17) was submitted by your office, on behalf of Oakridge Energy, Inc., on August 28, 2013. The application was prepared and submitted in fulfillment of Abatement Steps #1 and #2 for Notice of Violation No. CV-2013-005, issued on May 28, 2013. The abatement steps are provided here, for reference.

Abatement Step #1: *Submit a complete Technical Revision to the permit that accurately represents the as-built configuration of the Carbon Junction Permanent Diversion, with supporting design details per Rule 4.05.3. This revision shall also include an updated, accurate post-mining topography map for the entire permit area and a map delineating the Carbon Junction drainage area.*

Abatement Step #2: *Submit a complete Technical Revision to the permit that presents designs and plans for reestablishment of the Upper Carbon Junction Channel, including the un-named tributary that enters the drainage from the east, and reclamation and stabilization of the Carbon Junction Temporary Diversion and gully erosion. [The Upper Carbon Junction channel segment runs from the undisturbed channel upstream of the North Pit down to the beginning of the rip-rapped Carbon Junction* Permanent Diversion, a distance of approximately 1900 feet.]

The TR-17 application was determined to be Complete for purposes of filing on September 4, 2013. It is our understanding that Public Notice of the revision was subsequently published in *The Durango Herald.* ***Please submit Proof of Publication at your earliest convenience.***

The TR-17 application package included the following items:

- Cover letter, application form, and proposed public notice;
- May 7, 2007 memo from Goff Engineering to Mike Savage regarding the flow capacity of the culverts installed beneath the permanent haul road;
- HEC-RAS analysis using a design flow of 346 cfs, the 100-year storm event as described in the permit, for the Upper Carbon Junction Channel and the Carbon Junction Permanent Diversion; and
- Six maps: C1.0 (Post-Mining Topography), C1.1 (Carbon Junction Drainage Basins), C1.3 (Permanent Diversion As-Built), C1.4 (Upper Carbon Junction Profile), C1.5 (Permanent Diversion Cross Sections), and C2.0 (Channel Improvement Plan).

Background

Approved designs for the Carbon Junction Channel and Permanent Diversion Channel are found in Section 2.05 (Operations and Reclamation) of the Carbon Junction Mine Permit Application Package (PAP) on Pages 5-8 thru 5-18. The channel is featured on the Mine Hydrology Map, the Post-Mining Topography Map, and the Site Cross Sections Map, each of which was approved in October 2002 under TR-11.

Engineered designs for the Carbon Junction drainage and East Collection Channel were first incorporated into the permit with TR-06 in April 1997. The newly discovered Appendices 5-9 and 5-10 and associated maps were prepared by Goff Engineering for TR-06. Drainage around the permanent spoil pile (the "PRSA", which filled a segment of the original Carbon Junction drainage) was further modified under TR-08 in January 1998. Division records do not indicate that Appendices 5-9 and 5-10 were revised, but certain maps were updated with TR-08.

Adequacy Comments

1. We are unable to locate supporting documentation for the flow values used in the design information for the Carbon Junction Permanent Diversion, the upper portion of Carbon Junction Channel, or the unnamed channel to the east of upper Carbon Junction. Page 5-4 of Section 2.05 of the approved permit application package makes reference to design information contained in Appendices 5-2, 5-9, and 5-10. ~~In the approved permit application package we are unable to locate an Appendix 5-10; Appendix 5-9 consists of a minor revision for a road accessing the Ewing Mesa Pit; and~~ Appendix 5-2 does not appear to include any information on the design of the above listed channels. Appendix 5-2 did include channel size calculations for several channels, but did not include any documentation for the assumed discharge volumes. ~~Please provide the supporting documentation so that the Division can verify the anticipated discharge volume in Carbon Junction Channel, the Carbon Junction Channel Diversion, and the Unnamed Channel~~

~~east of upper Carbon Junction (Rule 2.05.3(4)(a)).~~ ***This item is resolved with the submittal of the TR-06 Appendices 5-9 and 5-10.***

2. The HEC-RAS output data provided by Goff Engineering and Surveying, Inc. appears to indicate that several segments of the Carbon Junction Permanent Diversion are not adequately sized for the design event. For all of the segments except 16+00, it appears that the required top width of the channel at the design flow water surface elevation is wider than the rip rap lined portion of the ditch as constructed. DRMS independently ran a SEDCAD utility to size the channel segments, verifying that the required flow cross sectional area exceeds the constructed channel dimensions. Please review the HEC-RAS table and verify the required top widths for the channel segments. Where the required top width/flow area exceeds the channel capacity (rip rapped portion) as constructed, Oakridge Energy will need to redesign and reconstruct the channel and/or extend the channel lining to accommodate the anticipated runoff volume and prevent scour along the sides of the channel (Rules 4.05.4(2)(a) and (b)).

3. It appears that the runoff volume used for the Carbon Junction Permanent Diversion is based on the previously approved design in the permit application, which may have resulted from modeling of the site at maximum disturbance. Modeling for current conditions, using data from recent vegetation sampling may yield a lower runoff volume and subsequently indicate a smaller required ditch capacity. ***Review of Appendices 5-9 and 5-10 confirms that the previously approved model was based on maximum disturbance. Given the current conditions on site, it would be appropriate to revisit the runoff calculations and likely arrive at a lower discharge volume. This new volume might show that the existing configuration of the channels is adequate to convey the design events. (Essentially, the model will need to either be revised to show that what's on the ground will work, or else construct the design we approved with TR-11, including the 500 ft. of riprap in the Upper Carbon Junction Channel.***

4. The HEC-RAS information provided for the upper segment of the Carbon Junction Channel indicates that the existing channel capacity is adequate to convey the design event. Predicted velocities (5.17-8.08 fps), however, are in excess of the acceptable range (3-5 fps, depending on soils) for a mixed grass vegetated waterway. Please revise the proposed channel designs to include lining as necessary (in areas where the channel will be disturbed) to ensure that the channels will be stable and not contribute suspended solids to streamflow and runoff outside the permit area (Rule 4.05.3(4)). Also, the design information submitted indicates that the channel is designed to convey the 100 yr – 24 hr event. The watershed contributing to the channel is less than one square mile, so the requirements of Rule 4.05.3 would apply to this section of Carbon Junction. Rule 4.05.3(3) requires the channel to be sized to adequately convey the runoff from a 10 yr – 24 hr event. The diversion portion of the channel, however, must be sized for the 100 yr – 24 hr event. Please see comment 7, below, for further clarification.

5. The sixth page of Appendix 5-2 includes information on the Permanent Channel Realignment of Carbon Junction Channel to run through the reclaimed pit area. Since the Carbon Junction Diversion will be a permanent structure and Carbon Junction Channel

will not be restored to its original configuration, this page should be eliminated or revised to indicate that the design will not be implemented.

6. The design information and maps provided with the technical revision application have not been certified by a registered professional engineer. Please provide the required certification for all of the maps, cross-sections, and plans submitted (Rules 2.10.3(2) and 4.05.4(2)).

7. The design event requirements for the Carbon Junction channel are as follows:

   - Unnamed tributary to Carbon Junction Channel – 10 yr -24 hr (Rule 4.05.3)
   - Carbon Junction Channel upstream of the Carbon Junction Diversion Channel 10 yr - 24 hr (Rule 4.05.3)
   - Permanent Diversion of Carbon Junction around the fill – 100 yr – 24 hr (Rule 4.09)

8. It will likely be necessary to extend the rip rap upstream of the Permanent Carbon Junction Diversion Channel to ensure that flow from Carbon Junction is directed to the Permanent Carbon Junction Diversion Channel and not in the direction of the former East Diversion.

9. Maps and text provided with the application indicate that the riprapped permanent diversion ends at Station 20+20~. A comparison with aerial photos of the area appears to show that the riprap extends further upstream, to Station 23+00~. Please review, and revise the application as appropriate.

10. No elevation labels have been provided for the contour lines on the various maps. Please include this information, together with the dates the contour data was collected.

11. The boundary of the Ewing Mesa No. 1 Gravel Pit, as shown on the maps, appears to be offset and rotated with respect to its position on the ground. Please "slide" the layer to reflect the location shown on other maps for the permit.

This concludes our preliminary adequacy review for TR-17. Please contact me if you have any questions as you prepare your response package.

Sincerely,

Marcia L. Talvitie

Marcia L. Talvitie, P.E.
Environmental Protection Specialist

Cc: Chi Chi Price, Oakridge Energy, Inc.
Sandy Brown, DRMS