



OGMCOAL DNR <ogmcoal@utah.gov>

West Ridge- Seismic Monitoring at Grassy Trail Reservoir

Steve Christensen <stevechristensen@utah.gov>

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To: "Odendahl, Karin" <kodendahl@coalsource.com>

Cc: Bret Dixon <bret Dixon@utah.gov>, David Marble <davemarble@utah.gov>, OGMCOAL DNR <ogmcoal@utah.gov>

Hi Karin,

I've got a couple questions about Grassy Trail Reservoir. I had a conversation with Bret Dixon from UT Dam Safety this afternoon about the seismic monitoring requirements for the Grassy Trail Reservoir. We're unsure as to when the last time monitoring was done.

Per the West Ridge MRP, the same frequency and scope of monitoring was to be conducted during the mining of panel blocks 18 through 21 as was done during the mining of Panel 7. The monitoring is spelled out on pages 5-29 and 5-30 in Chapter 5 as well as in Appendix 5-13A. I've attached the specific language from Appendix 5-13A.

So my questions at this point would be: 1) Was the monitoring conducted? 2) If it was conducted, was the data submitted to the respective agencies? and 3) If the monitoring wasn't conducted, was there a reason for that?

The reason I ask is that last question is because of some language on the 3rd page of what I attached. Under "Note 1" it discusses how if Dam Safety, DOGM, BLM, East Carbon City and Sunnyside City reached a consensus, a determination could be made to "reduce, modify and/or eliminate the various elements of the monitoring program".

If such a consensus was formulated, I'm not aware of it and Bret Dixon didn't mention it this afternoon.

Let me know what you can find out on your end and we'll go from there.

Thanks Karin,
Steve

p.s. I hope you had a fun and relaxing honeymoon.

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Steve Christensen
Utah Division of Oil, Gas and Mining
1594 W North Temple, Suite 1210
Salt Lake City, Utah 84116
(801) 538-5350
stevechristensen@utah.gov



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GRASSY TRAIL DAM MONITORING/INSPECTION PLAN PANEL BLOCK #18-21

(NOTE: The following monitoring plan was approved for and implemented during the previous mining of Longwall Panel #7, and has been updated accordingly for Panel Block 18-21.)

- *Prior to previous longwall mining of Panel #7, additional subsidence control monuments were established across the crest of the dam on 100' centers, across the face of the dam midway down the slope on 200' centers, and along the toe of the dam on 200' centers.*
- *Prior to previous longwall mining of Panel #7, the upper hillside accelerometer was removed, recalibrated, and relocated at the dam. The dam site accelerometer was removed, recalibrated, and relocated at a new location on the hillside approximately midway between the dam and the previous upper hillside location. In 2010, the hillside accelerometer was recalibrated and relocated northwest of the reservoir in the Left Fork of Whitmore canyon.*
- *Prior to previous longwall mining of Panel #7, a seepage collection system was installed at the seep area located along the east abutment of the dam. This system was designed to collect the entire flow of the seep to a common point to allow accurate measurement of the seepage flow.*
- *Prior to longwall mining of Panel Block 18-21 a complete set of premining baseline data will be established including:*
 - Peizometer readings.*
 - Accelerometer readings.*
 - Inclinometer readings.*
 - Relative elevations of all subsidence monitoring monuments located on the dam. (Absolute elevations of all monuments will be surveyed before, during and after extraction of longwall Panel Block 18-21)*
 - Flow rates at the east abutment seep, west abutment seep, and toe drain.*
 - Visual inspection of the dam, seeps, and slide area.*
 - Electronic photographs at predetermined designated viewpoints.*
- *RB&G will be responsible for compiling and distributing the following weekly, monthly, and event-driven inspection and monitoring reports. These reports will be generated in an electronic format and emailed on a timely basis to the Division of Dam Safety, Division of Oil, Gas & Mining, Bureau of Land Management, East Carbon City, Sunnyside City, and WEST RIDGE Resources (herein after referred to as the designated parties).*

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- **Weekly basis:** After longwall mining has commenced in Panel Block 18-21 the following monitoring will be done on a weekly basis:

-Site reconnaissance/visual inspection, including reservoir level (to be taken by RB&G Engineering and/or East Carbon City, in cooperation)

-Piezometer readings level (to be taken by RB&G Engineering and/or East Carbon City, in cooperation)

-Accelerometer readings (to be taken by RB&G)

-Flow rates at the east seep, west seep, and toe drains. (These flow rates will be determined by actual measurements not by visual estimates to be taken by RB&G Engineering and/or East Carbon City, in cooperation)

- **Monthly basis:** In addition to the weekly monitoring the following monitoring will be conducted on a monthly basis:

-Inclinometer readings (to be taken by RB&G)

-Relative elevations of subsidence monitoring monuments located on the dam. These surveys will be conducted by a registered professional surveyor under contract with West Ridge Resources.

-Electronic reporting (emails) of the monthly accelerometer, piezometer and inclinometer measurements will be prepared by RB&G Engineering and will be sent out on a monthly basis to the designated parties. Emails of the monthly monument measurements will be prepared by West Ridge Resources or its contracted surveyor and will be sent on a monthly basis to the designated parties. If conditions warrant, Division of Dam Safety may require more frequent reporting of any or all data.

- **Event-driven basis:** In addition to the weekly and monthly inspections the following measures will be taken on an event-driven basis:

-The University of Utah seismic readings will be monitored on a daily basis. This monitoring will be done by RB&G Engineering and/or West Ridge Resources, in cooperation. If any events are recorded greater than a magnitude 3.0 within 5 miles of the dam then, within 24 hours of such readings, a full site reconnaissance and visual inspection will be conducted, and accelerometer readings will be taken. If any accelerometer readings show a recorded value greater than 0.2g and/or 0.1g for any pga values

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recorded at the dam, then inclinometer readings, piezometer readings and drainflow measurements (east seep, west seep, and toe drain) will be taken at that time. The results of these measurements will be emailed immediately by RB&G Engineering to all designated parties.

- The standardized form of the inspection/monitoring reports is included as an attachment.

NOTE 1 *Monitoring and reporting will continue on the prescribed weekly, monthly, and event driven basis during the mining of Panel Block 18-21 as long as seismic events continue to be recorded. Based on the results of the monitoring, Utah Division of Dam Safety has the authority to increase the level or frequency of monitoring at any time as required to ensure safety of the dam and reservoir. At such time that the frequency and magnitude of the events diminishes sufficiently the agencies (Dam Safety, DOGM, BLM, East Carbon City, and Sunnyside City) will make a collective consensus determination to reduce, modify, and/or eliminate the various elements of the monitoring program.*

NOTE 2 *In the 2005 approval of Panel 7, BLM added a special stipulation #17 to the federal lease related specifically to the Grassy Trail Reservoir, stating, "The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease." The latest 2010 BLM approval for panel block 18-20 contains reference to this same lease stipulation #17*

NOTE 3 *It should also be noted that, as with previous mining of panel 7, the Utah Division of Dam Safety will have authority to stop any longwall mining of panel block 18-21 if it determines that mining-related seismicity or subsidence is creating, or has created, an unacceptable level of risk to the Grassy Trail dam or reservoir, based on monitoring at the time.*

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