



# Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.



Matthew H. Mead, Governor

John Corra, Director

August 22, 2011

Mr. Larry Teahon  
Interim Manager, Safety, Health, Environment & Quality  
Cameco Resources  
P.O. Box 1210  
Glenrock, WY 82637

**RE: TFN 5 1/119, Third Round Review of Revised Restoration Schedule  
Permit 603, Highland Uranium Project, Cameco Resources**

Dear Mr. Teahon:

The Land Quality Division (LQD) has reviewed the responses to T2 comments and the additional changes to the restoration plan. These changes were discussed during a meeting with LQD on August 9, 2011 where it was explained that the proposed changes are beyond the scope of the review. The LQD has been concerned with the extended period of the review and the lack of a current/updated restoration schedules. In addition, LQD learned of restoration delays in MU-15 during the June 2011 inspection which further heightened concerns for restoration.

Therefore, during our meeting on August 9, 2011, LQD requested the referenced revision be expedited by limiting the scope of the review to schedule updates. Other proposed restoration methodology changes will need to be submitted following the approval of this revision.

LQD recognizes many changes have been proposed under this revision and recommends CR summarize the changes needed to justify the schedule update. CR should meet with LQD to discuss all changes and responses to comments in effort to meet the deadline agreed upon for this revision; i.e., October 19, 2011.

If you have any questions, please contact me at [prothw@wyo.gov](mailto:prothw@wyo.gov) or 307-777-7048.

Sincerely,

Pam Rothwell  
Permit Coordinator/District I Assistant Supervisor  
Land Quality Division

Enclosures

Cc: Cameco Resources, 2020 Carey Ave, Cheyenne, WY 82001  
Doug Mandeville, NRC

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## INTRODUCTION

On July 23, 2009 Cameco Resources (CR), Land Quality Division (LQD) and the Nuclear Regulatory Commission (NRC) discussed groundwater restoration plans at the Smith-Highland ISL mines. CR proposed using less groundwater sweep (GWS) than had traditionally been utilized as little benefit has been recognized with GWS. The focus would be a slower process, maintaining the cone of depression with a 20% bleed and using reverse osmosis (RO). It was suggested by CR that groundwater modeling would be used to develop plans for wellfield restoration. During the meeting CR indicated a new restoration schedule would be submitted to reflect these proposed changes.

LQD received the proposed change on August 17, 2009 which consisted of a single page change to the permit reclamation plan (Attachment 1, Highland Uranium Project – Estimated Time Table of Restoration Activities). Technical review comments were sent to CR on December 21, 2009. CR submitted responses to comments on September 17, 2010 with a completely new schedule for review and included text changes to the operations and reclamation plans. The LQD reviewed the new changes with comments sent on November 8, 2010. CR again revised plans for restoration including methodology and schedule changes which were received on May 6, 2011.

The LQD repeatedly requested meetings to discuss the restoration schedule and the proposed changes. On April 13, 2011, CR agreed to meet to discuss the proposed changes. Although the proposed changes could be conceptualized as making progress toward expediting restoration, the LQD was concerned with the scope of the changes without opportunity to review. In fact, LQD understands that CR has proceeded with implementation of many of the changes without LQD review and approval. The LQD Noncoal Rules and Regulations (R&R) Chapter 7, Section 2(b)(ii)(G) provides that a major revision (i.e., requiring public notice) may be warranted for changes which propose significant alterations in the approved mining or reclamation operations as determined by the Administrator.

Therefore, with the recent discovery of potential idling (lack of production or restoration activities) in MU-15 during the June, 2011 inspection, combined with the extended delays for a revised and current restoration plan, the LQD is considering issuing a violation for restoration delays. CR is attempting to resolve the compliance issue with commitment to 1) revert to the approved restoration methods, 2) resolve the restoration revisions with updated schedules and water balances for both permits 603 and 633 by October 19, 2011, and 3) re-submit changes to the restoration methodology following approval of the schedule changes.

The following comments address the May 6, 2011 responses to comments, however, LQD is requesting that any changes that are not within the scope of the review (i.e., combining GWS and RO) be withdrawn from the submittal. There are some changes which LQD is open to discussion for inclusion in the submittal such as the discussion of progressive change-over to restoration

within a wellfield, pre-restoration activities and including bio/reductant and stabilization on the schedule. It is suggested that CR meet with LQD to discuss these issues for inclusion under the scope of the revision. CR should step back and evaluate all review comments submitted since the original submittal to understand LQD concerns. Each of the reviews (T1, T2 and T3) addressed different changes and therefore, any changes that are proposed to remain in the revision may have specific comments. It is requested that CR identify the specific changes that are requested for the approval of the revision and a summary of changes that will not be included in the proposal rather than expect the LQD to locate and identify the specific changes. CR should not introduce new changes in the next round of review.

## COMMENTS

- 1 Response Not Acceptable.** The response states that Cameco now has sufficient RO capacity for wellfield restoration. However, the RO capacity is not included in the response or attachments. The permitted deep disposal well capacity is shown, but the permitted capacity may not be the operating waste water deep disposal capacity. Chapter 11, Section 5(a)(i)(D) requires this information. Please include the RO capacity and the deep disposal operational capacity and correlate it with the restoration schedule. **(SI)**

**NOTE:** As discussed during the meeting with LQD on August 9, 2011, CR will need to revise the restoration schedule to reflect the approved format for restoration (the line items as approved including production/pre-restoration, GWS, RO, Reclamation.) The schedule should be updated as well as the water balance to reflect the current capacities for disposal, RO, and irrigation. CR has agreed to revert back to the approved restoration methods in order to expedite the approval of the revised restoration schedule. Other proposed changes introduced to the TFN will need to be resubmitted upon approval of the revised restoration schedule for LQD technical review. LQD realizes that additional line items including biorestitution/reductant and stabilization are needed in the schedule. These items can be added to the current format if necessary to tie to other proposed changes to the revision. However, if these changes have prompted comments through T1, T2 or T3 reviews it may be best to delay the text or schedule inclusion until the next proposed revision which will include more technical changes to the restoration methods. **(PCR)**

- 3 Response Not Acceptable.** The text on Pages RP-6 and RP-6A discusses developing a wellfield specific restoration plan during the late stages of wellfield production, as required in Chapter 11, Section 5(a)(iii). The text does not discuss any delays that may occur between the end of production and beginning of restoration. CR needs to provide LQD with assurance that after production ends, the wellfield(s) will not be inactive for an extended length of time. Please provide assurance that the wellfield(s) will not be inactive for an extended length of time. **(SI)**

- 4 **Response Not Acceptable.** Section 4.3 on Page RP-6B (revised May 4, 2011) states that the first phase of restoration will be groundwater sweep. There have been numerous recent discussions regarding groundwater sweep. In a meeting in July, 2009 CR suggested using the RO bleed as a substitute for groundwater sweep. This proposed change is outside of the scope of this review and should be removed from this revision and introduced under a separate revision following the approval of this revision. The permit text needs to clearly state that groundwater sweep is removal of groundwater without reinjection. **(SI/PCR)**
  
- 5 **Response Not Acceptable.** The response to Comment #3 discusses developing a wellfield plan, but does not include actions that can be taken during the late stages of wellfield production, such as pipeline installation, re-plumbing of header houses and well cleanouts, etc. The text should include a discussion of operations that will be performed prior to the end of production to prepare for restoration. The pre-restoration (i.e., pre-conditioning) phase can be discussed as part of this revision or deferred to next restoration plan change. **(SI)**
  
- 9 Response Acceptable. The inflow to the irrigator has been corrected to show 180 gallons per minute inflow from the Highland permit. **(SI)**
  
- 10 Response Acceptable. The text has been clarified to indicate Target Restoration Values. **(PCR)**
  
- 11 **Response Not Acceptable.** The concept of progressive change-over from mining to restoration of a wellfield seems elusive. CR is opposed to using an ore grade cut-off value to define when a wellfield is sufficiently mined out. Therefore, the LQD requests that CR not declare a wellfield is officially in restoration until all injection (of lexivient) has ceased for all wellfield pattern areas (i.e., the entire wellfield). CR will need to consider and plan for the end of injection to meet the restoration schedule.  
  
**NOTE: Although CR will not declare a wellfield is officially in restoration, until all lexivient injection has ceased, this does not preclude the initiation of restoration activities including developing the wellfield restoration plan for LQD review and approval, refurbishing the wellfield as needed, restoring patterns within the wellfield, etc. By conducting the pre-restoration activities, CR will meet the intent of “concurrent reclamation” which can be demonstrated through the annual report by detailing the flows going toward restoration (i.e., DDW, GWS, RO, irrigation). The LQD will monitor concurrent restoration progress through the annual report reviews. (PCR)**
  
- 12 Response Acceptable. The reviewer now understands the restoration well pattern is specific to the each wellfield (conditions). The wellfield restoration plan will identify the restoration wells that are needed including any new wells which will be submitted to

- the LQD for review. Past restoration proposals have separated the new well proposals from the plan. If possible, please include proposed new restoration wells in the wellfield restoration plan. **(PCR)**
13. **Response Not Acceptable.** The revised text discusses the mine unit restoration plan to be submitted to the LQD, "*for inclusion in the restoration volume maintained by the LQD and separate from the permit.*" The mine unit restoration plan will be reviewed by the LQD for approval into the permit as a stand-alone volume as identified on the Index of Change. The information is required according to Chapter 11, Section 5(a)(iii). Because the information is not available until CR is preparing for wellfield restoration, this method of submittal is considered a practical method for managing the records. **(PCR)**
  14. **Response Not Acceptable.** The additional of methanol in MU-C was during reverse osmosis which resulted in plugging of the RO unit. The waste stream from RO is disposed to the deep disposal wells which implies it is not a closed-loop cycle. CR should therefore, show the waste steam/flows used during the use of bio/reductant use. **(PCR)**
  15. **Response Not Acceptable.** CR will need to update the restoration schedule and water balance using the approved permit formats. See NOTE in comment no. 1 above. **(PCR)**
  16. **Response Not Acceptable.** CR will need to update the schedule and water balance of the approved permit. (Refer to comment no. 11 for discussion of progressive change-over from mining to restoration and how to address concurrent restoration expectations). **(PCR)**
  17. **Response Not Acceptable.** See New Comment no. 5 below. **(PCR)**
  18. **Response Not Acceptable.** CR has proposed changes beyond the scope of the revision. These changes could be significant to the restoration plan and will require comprehensive technical review. LQD requests unsolicited changes not agreed upon be removed from the text and be re-submitted at a later date following approval of a revised restoration schedule. **(PCR)**
  19. **Response Not Acceptable.** The correction was not noted. Please correct the text to reference Attachment 1. **(PCR)**
  20. **Response Not Acceptable.** At this time, CR has not reclaimed the surface disturbance of any wellfields. All wellfields and their phase of restoration/reclamation need to be included on the schedule. **(PCR)**

## NEW COMMENTS

Cameco Resources responded to the November 8, 2010 comments and added additional revisions to the proposed restoration schedule for the Highland Permit. The following comments were generated prior to LQD's decision to request CR to modify the revision package. The review addresses the responses to outstanding comments and provides additional comments for the new schedule. Therefore, due to LQD's request to remove some of the changes, the comments should be considered where they are applicable, either to this revision or to the next proposal for change of the restoration methodology.

- 1 Section 4.1.1 should also consider the time needed to recondition header houses, install pipelines, etc. The surety should be updated in the Annual Report for the year when restoration is anticipated to begin, provided wellfield plans can be approved a year in advance of the Annual Report. **(SI)**
- 2 Paragraph 2, page 6A does not include storativity in the aquifer hydrologic characteristics that will be used to estimate the time required to remove the estimated pore volume displacements. Please add storativity to the time estimate for the pore volume displacements.
- 3 The pore volumes shown in the unnumbered table do not match the pore volumes listed in the surety for Permit 603. The use of incorrect pore volumes in the water balance will affect the restoration schedule. Please provide the correct pore volume for either the table or the water balance or the surety for Permit 603 and revise the restoration schedule to use the correct volume per pore volume. **(SI)**
- 4 The last line on Attachment 3 is unlabeled and the attachment does not have any units. Please label the last line of Attachment 3 and show the units in the Attachment. **(SI)**
- 5 The September 10, 2010 Restoration Plan shows restoration phases for each wellfield and waste water disposal requirements. The May 2011 Attachment 1 only shows total flows and waste streams for both permits. Attachment 3 cannot be reconciled with Attachment 1, without a breakdown in Attachment 3 showing which wellfields are being restored and at what rate. Please correct Attachment 3. **(SI)**
- 6 There is no way to determine which wellfields each of the satellites or central processing plant is receiving flows from or if the treatment or disposal capacity is available at those locations to process the restoration flows. Please include a description and map showing that there is enough available capacity at the satellites and Central Processing Plant available for restoration. **(SI)**
- 7 The Mine Unit C restoration plan (TFN 5 6/241) shows the completion of the RO phase occurring at the end of the Second Quarter of 2012. Attachment 1 of this submittal

shows the completion of the RO (assumed) phase as ending in the First Quarter of 2012. Please reconcile the differences. **(SI)**

- 8 The water balance shown in Attachment 3 is the same for both the Smith Ranch and Highland Permits. The water balance for the Smith Ranch Permit needs to be separated from the Highland Permit. Please show the water balance for the Highland permit with this TFN. **(SI)**
- 9 Attachment 3 shows that there is no production waste stream from the Central Processing Plant after year 2022. However, there are production waste streams from the satellites until 2026. Please explain why there will be no waste stream from the Central Processing Plant during the four year period. **(SI)**