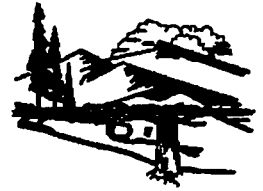




Department of Environmental Quality

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



Matthew H. Mead, Governor

Todd Parfitt, Director

March 4, 2016

Mr. Larry Reimann
Cameco Resources
550 N. Poplar Street, Suite 100
Casper, WY 82601

**RE: Cameco Resources, North Butte ISR Project, Brown Ranch Amendment,
LQD Round 1 Technical Review, Permit No. 632, TFN 5 3/328**

Dear Mr. Reimann,

Enclosed are memorandums containing DEQ Land Quality Division (LQD) District 3 staff review comments on the North Butte ISR Project, Brown Ranch Amendment Application. As noted in the memos, we have found that the application is *Technically Incomplete* for the purpose of W.S. § 35-11-406(h).

Also enclosed are letters from the US Army Corp of Engineers and the Wyoming Game and Fish Department which provide their response to their respective review of the subject application. LQD has reviewed these letters and the recommendations included their-in appear to be adequately addressed in the subject application.

To date no review comments have been received from the U.S. Fish and Wildlife Service, the State Historical Preservation Office, and the Bureau of Land Management. Although the BLM is not a surface owner within the Brown Ranch Amendment Area it is listed as a mineral owner within the amendment area and therefore has been extended the courtesy to review the application. LQD is currently following up with these agencies and will forward their comments to Cameco upon their receipt.

Please direct all comments to the LQD District 3 office in Sheridan. Cameco's responses to comments from other agencies will be forwarded to those agencies by LQD. If you have any questions, please contact me at the LQD Sheridan Office, 307-675-5619.

Respectfully,

Luke McMahan, P.G.
Project Geologist
WDEQ-LQD District 3

\lm



LMK
3/7/16

PT632, North Butte ISR Project, Brown Ranch Amendment Application
Technical Review Round 1, TFN 5 3/328
March 4, 2016
Page 2 of 2

Enc.: Technical Review memoranda (LQD District 3 Staff)
Wyoming Game & Fish Department letter (January 29, 2016)
Army Corp of Engineers letter (January 19, 2016)

cc: Cheyenne LQD File (w/ attachments)
Doug Mandeville, US NRC, MS T8-F5, 11545 Rockville Pike, Rockville, MD 20852
(w/ attachments)



WYOMING

MEMORANDUM

TO: File: TFN 5 3/328, Permit No. 632, Cameco Resources, North Butte-Brown Ranch Amendment

FROM: Luke McMahan, Project Geologist, District 3 LM

DATE: March 4, 2016

SUBJECT: Round 1 Technical Review, North Butte-Brown Ranch Amendment, TFN 5 3/328

DISCUSSION:

The North Butte-Brown Ranch Amendment Package was received by Wyoming Department of Environmental Quality-Land Quality Division (LQD) District 3 on July 9, 2015 under cover letter dated July 8, 2015 from Mr. Larry McGonagle of Cameco Resources. The Application was declared *Complete* for first Public Notice per LQD's letter dated October 6, 2015.

The amendment application proposes to expand the North Butte ISR Uranium Mine permit area onto 3,430 acres of additional land located adjacent to the currently approved permit area. The Round 1 Technical Review was conducted by LQD District 3 personnel Stacy Page, Kim Medina, David Myers, David Schellinger, and Luke McMahan. The Form 1-UIC and Form 3 were reviewed by LQD District 1 Natural Resources Program Principal Mr. Craig Hults. Mr. Hults' review found the content of the Form 1 and Form 3 to be acceptable, however, as noted in Luke McMahan's review comments, due to personnel changes at Cameco these forms will need to be updated with Cameco's current contact personnel for the subject operation. The following comments contained in this memorandum are from the Round 1 Technical review conducted by Mr. Luke McMahan, LQD District 3 Project Geologist. The Technical Review Comments resulting from the other reviewers listed above are provided as an attachment to this memorandum.

REVIEW COMMENTS (Luke McMahan):

General Comments (LM)

1. WDEQ Access to the Permit Area; with the enactment of the Trespass Law, Senate File 12, the Administrator has stated that no new permit or amendment will be approved unless access by WDEQ staff is secured. Since there is no direct access from a government controlled roadway LQD is requiring Cameco, North Butte to obtain permissions for WDEQ staff to have access through the private property to the permit (amendment area). LQD requires Cameco to provide proof that the easement which Cameco uses to access the site includes access for WDEQ employees or Cameco may arrange for a legal document from the landowner stipulating access is allowed for WDEQ staff in the course of their duties.

LM
3/11/16

2. Map Revisions; when revising any maps in response to the Round 1 Technical Review, please ensure that all maps are provided with the appropriate information in association with Guideline 4, Reference Document 1, Attachment IV; specifically, please include a revision date.
3. Certifications; Please ensure that all geologic / hydrogeologic material is certified by a Professional Geologist or Engineer in accordance with LQD Guideline 4, Section I. Applicable materials would include geologic/hydrogeologic cross-sections, potentiometric surface maps, isopach maps and any other geologic/hydrogeologic interpretation. Cameco may either individually certify these documents or provide a certification page to be placed in the appropriate Appendix/Addendum that lists all the applicable documents and is certified by the applicable professional. The certification page should be stamped, signed and dated.
4. Index of Change; please provide an updated index of change to address the revisions associated with this review. Please be specific in regards to what materials are to be removed and replaced and what materials are to be brought forward from the existing approved permit.
5. Using the word “proposed” when referring to the Brown Ranch Amendment; when preparing the revisions in response to the Round 1 Technical review memoranda, please remove the word “proposed” from all references to the Brown Ranch Amendment (pages with revised text, figures, plates, tables, etc.). When an application is submitted, whether it’s for a new permit, an amendment to an existing permit, or a simple permit revision, the language should be written as if the materials are already approved. This way, when the application is approved, the permit isn’t presented to the reader as something that is proposed. The reference to the “proposed Brown Ranch Amendment Area” permeates the entire amendment application and removing all of these references at this point would not be reasonable. Therefore, I request that Cameco please pay close attention to removing the “proposed” language when preparing the revisions to the Brown Ranch Amendment wherever possible.

Adjudication (LM)

6. Form 1-UIC and Form 3, Jeanie Wolford is listed as the agent or person to whom any notice under the provisions of Wyoming Environmental Quality Act or Rules and Regulations adopted thereunder may be sent. It is the understanding of LQD that Jeanie Wolford is no longer working in this capacity with Cameco. Please update the Form 1 and Form 3 with the applicable agent or person. Also, please verify that Cameco has provided the \$25.00 filing fee for the Form 3.
7. Adjudication Appendices, Certification Page; please provide a signed Certification Page for inclusion into the Adjudication as required by LQD R&R Chapter 11. Please see Guideline 4, Reference Document 2 for requirements regarding preparation of this information.
8. Appendix C; Please closely review Form C-1, Legal Description of Permit Area to ensure that all lands included within the new permit area (i.e. the NB-BRAA) are appropriately represented on this form (see LQD Guideline 4, Reference Document 2, Section I(F)). Please ensure that what is described on this form can be correlated to what is represented on Appendix C Map. Where only a portion of a quarter-quarter is applicable, language such as “part of” is acceptable.

(Comment #8 continued)

- a. Form C-1 does not list Sections 17, 20 and 29 (T44N, R75W) which are included in the amended permit area. Please revise Form C-1 to include all lands within the permit area.
9. Appendix C; a legal description (Form C-1 or Form C-2) of areas within the amended permit area where there is “No Right to Mine” has not been provided. The Index of Change indicates that the entire Appendix C is to be removed and replaced with the revised Appendix C. Please provide a legal description of all areas where there is No Right to Mine. If applicable, please clarify in the revised Index of Change if the existing No Right to Mine area description is to be brought forward from the currently approved permit.
10. Appendix C; the Adjudication does not address lands in the amended permit area which also occur in other permit areas (LQD Guideline 4, Reference Document 2, Section I(F)(d)). Review of the Uranerz Nichols Ranch-Hank Unit Permit Area (PT778) finds that the NB-BRAA overlaps PT778 in Sections 30 & 31, T44N, R75W.
 - a. Please provide additional information in Appendix C which details the legal description of the boundary overlap between the North Butte Mine (NB-BRAA) and the Hank Unit of the Nichols Ranch Mine. If this area can sufficiently be described using QQ, Section, Township and Range, then a Form C-1 will be adequate. If the area cannot be sufficiently described using QQ, Section, Township and Range, then a Form C-2 should be used.
 - b. Please revise Appendix C, Page 7 and Appendix C Map to address the overlap of the NB-BRAA and the PT778 permit area.
11. Appendix C Map; the Appendix C Map should directly correlate to the legal description of the permit area provided in Appendix C. The NB-BRAA (i.e. the new North Butte Mine permit area) is shown on this map to extend into Sections 21 & 28, T44N, R75W. Based on the information provided with this submittal, these sections are not included within the NB-BRAA. Please revise this map accordingly.
12. Form C-2, Bearing and Distance Description; per Guideline 4, Reference Document 2, a certified statement from a licensed surveyor stating that the metes and bounds of the permit area close must be included (as provided in the currently approved permit, Appendix C, Page 5). Please provide this certified statement.
13. Appendix E Map; Please review this map and verify that all appropriate easements are shown on the map and indicated in the legend. There are multiple O&G sites within the permit area but no road easements are indicated. Additionally, signify in the legend what is an easement. For example, there are multiple pipelines shown on the map. This map should clarify if these pipelines are associated with the North Butte ISR Mine or if they are associated with an O&G easement (or other easements as applicable).

14. Appendix E Map; Please see LQD Guideline 4, Reference Document 2, Section 2(E). The map needs to show the lands to be affected over the life of the mine (i.e. affected area boundary). It is anticipated that the affected area boundaries are primarily (but not entirely) associated with the mine units. These affected areas should correlate to the Total Approved Acreage to Affect listed on the Form 1-UIC (705 acres).
- a. It is interpreted that the 705 acres represents the area of all of the mine units (existing and proposed) shown on this map. The affected area should be the area encompassed by the existing and/or anticipated monitoring well ring or AEB (i.e. like that shown on the Figure OP-6, which also correspond to the existing and anticipated monitor well ring and/or AEB shown on the Appendix D12 maps). Please signify in the Legend that the mine units shown represent the Total Approved Acreage to Affect (i.e. affected area boundary/boundaries).
 - b. In addition to the affected areas of the existing and proposed mine units, please signify on the map and in the legend any additional affected areas such as laydown area, facilities areas, primary and secondary roads, etc., if not already included within a mine unit area. All affected areas (existing and proposed) need to be accounted for in the Approved Acreage to Affect designated on the Form 1.
15. Appendix E Map; A digital file containing the proposed permit boundary in .DWG or shapefile format has not been provided. Per GL4, Ref.Doc.2, please provide this item.
16. Appendix E Map; a well symbol is not shown with Brown #6 at the Pfister Ranch site. The currently approved Appendix E Map (drawn 2/25/11) shows three (3) wells at this location. Please clarify what type of well Brown #6 is (stock, misc., domestic?), how many wells are at this location and update the map accordingly. Additionally, please clarify the type use for wells indicated as “storage wells”. How are these wells permitted with the SEO; stock, misc., domestic? It is unclear what the use of some of these storage wells is. For example, NB1 in the NW1/4 of Section 20, T44N, R76W and Brown #6 do not appear to be listed in Table D6-2.16.

Operations Plan (LM)

17. Section 2.10.2.2, Ground Water; on Page OP-25, this section states that the process for determining mine unit baseline UCL and RTV is described in Section 3.3.6; and that the excursion monitoring process is described in Section 3.3.7. It appears that these section references should be 3.3.8 and 3.3.9 respectively. Please revise.
18. Section 2.11.1, Page OP-28; discussion of groundwater impacts on this page indicates that the WorleyParsons is provided in Attachment OP-4. The Index of Change for the application indicates that the existing Attachment OP-4 (WorleyParsons) will be removed and replaced by the updated report provided with the application. Please clarify if Cameco would like to bring forward the WorleyParsons report into the revised permit. If not, please revise the Table of Contents, the Index page at the beginning of Attachment OP-4 and the language in this section of the Operations Plan to reference the correct report.

19. Section 3.3.2.2, Drill Hole Site Preparation, Hole Abandonment and Site Reclamation; Page OP-34 states that subsoil will be stockpiled on native ground. Please update this section with a commitment that states; unless administrator authorization is granted prior to disturbance {per LQD Noncoal Rules & Regulations, Chapter 3, Section 2(c)(i)(a)}, topsoil will be stripped from the area where subsoil from the mud pit excavation is stockpiled.
20. Section 3.3.2.3 Older Drill Hole Abandonment, Page OP-36 and OP-37; this section references that Addendum D5-1 to Appendix D5 provides an abandoned drill hole tabulation as well as maps showing the locations of approximately 6,000 known abandoned drilled locations within the North Butte Permit Area and the proposed amendment area. It appears that this reference should be to (or include) Addendum D5-2. Please clarify and/or revise this reference.
21. Section 3.3.3 Well Stimulation Program, Page OP-47; this section states that items 7-12 from section 3.3.2.4.3 may be repeated to improve performance. It appears that this should reference items 5-10 from section 3.3.2.4.3. Please revise this reference.
22. Section 3.3.6 Well Repair, Page OP-50; this section state that the repair is verified by conducting an MIT in accordance with the procedures discussed in Section 5.4.7. It appears that this reference should be to section 3.3.2.4.7 Well Mechanical Integrity Testing. Please revise this reference.
23. Section 3.3.7, Pipelines and Power Lines, Page OP-51; please update this section with a commitment that states; for large trench excavations, such as trunk line installation, unless administrator authorization is granted prior to disturbance {per LQD Noncoal Rules & Regulations, Chapter 3, Section 2(c)(i)(a)}, topsoil will be stripped from the area where subsoil from the trench excavation is stockpiled.
24. Table OP-10, Baseline Water Quality Parameters; please update this table to include all parameters listed in Guideline 4, Reference Document 10, Table 2. Please note, Guideline 4, Reference Document 10, Table 2 has a typo regarding Gross Alpha analysis. Gross Alpha analysis should be analyzed in accordance with WQD Chapter 8, Table 1 which specifies; “Gross Alpha particle radio activity (including Radium 226 but excluding Radon and Uranium)”.
25. Section 4.1.3.2 Oxygen; this section states “the design and installation of underground and above ground gaseous oxygen piping at Moore Ranch including...” It appears this reference to another project was inadvertently retained in the application language of this text. Please clarify or revise to make it applicable to the North Butte Mine.
26. Section 6.2, Item 13, Page OP-83; regarding annual reporting, this items states “results of any excursion related monitoring per LQD Rules and Regulations Chapter 11, Section 12 and Section 5.6 of this Operations Plan”. The Operations Plan provided with the application does not have a Section 5.6. It appears that this reference should be to Section 3.3.9.5 Excursions. Please clarify or revise as needed.
27. Figure OP-1 Mine Unit Site Plan; although slightly different, it appears that this map (Figure OP-1) and Plate OP-1 may have been provided with the same intent. The Index of Change indicates that Figure OP-1 of the Operations Plan is to be removed and replaced with the revised Figure OP-1. Figure OP-1 in the approved permit is the ISR Schematic, not the Mine Unit Site Plan.

(Comment #27 continued)

Please clarify the intent of this revised map in association with the revised Plate OP-1 and whether or not Figure OP-1 ISR Schematic is to be replaced with an updated ISR Schematic (which has not been provided with the application).

28. Figure OP-6 Mine Unit Location Map; for consistency of maps showing existing and proposed mine units, please represent each mine unit as a whole, i.e. showing the extent of the mine unit out to the existing monitoring well ring or proposed monitoring well ring (i.e. as shown on the Appendix 12 map). Where there is existing mine unit patterns (like Mine Unit 1 and Mine Unit 2), the pattern can be shown within the mine unit area. Where mine unit patterns do not exist in proposed mine units, the ore body can be shown within the mine unit area. Basically, an amalgamation of what is shown on Plate OP-1 and Figure OP-6. An example of this is what is shown on Figure OP-9 of the approved North Butte permit and of the NB-BRAA application.
29. Figure OP-6, Mine Unit Location Map; the NB-BRAA (i.e. new permit area) is shown on this map to extend into Sections 21 & 28, T44N, R75W. If possible, please re-align the permit layer so that it matches up with the USGS base map layer.
30. Plate OP-1 Proposed Site Layout; please update this map in accordance with the items listed below.
 - a. The Primary Access Road needs to be updated so that it shows access extending to/from the new permit boundary (i.e. the NB-BRAA).
 - b. Please update this map to show any construction that has been completed in Mine Unit 2 and Mine Unit 3 (header houses, secondary access roads, power, pipelines, completed monitoring well ring(s), any new long-term topsoil stockpiles, etc.).
 - c. Please revise the Permit Boundary (NB-BRAA) to correct gaps that exist in the projection.
 - d. Please update the map to show any public roads which lead to/intersect the NB-BRAA boundary (i.e. county road which will be utilized by WDEQ to access the site, such as Christensen Rd 21 in Sections 21 & 28, T44N, R75W).
 - e. Proposed locations of chemical storage areas per Page OP-70. Also include on-site landfill if applicable.
 - f. Please add to the Legend the NB-BRAA boundary (i.e the new permit boundary).
 - g. This map (or at least one map in the Operations Plan, in addition to that shown on the Appendix E Map) should designate the Affected Area Boundaries as discussed in Comment #14. Please indicate in the Legend that the existing and proposed mine units shown represent the affected area/disturbance boundary (both existing and projected) and represent the Mine Units as discussed in Comment #28).

31. Overlapping Permit Lands and Proposed Mining in Section 30, T44N, R75W; both Uranerz and Cameco plan to mine the F-Sand where the North Butte Mine Unit 8 and the Nichols Ranch-Hank Unit lie adjacently in Section 30, T44N, R75W. Please provide a discussion in the Operations Plan regarding how Cameco will adjust their mining operations in order to mine in such close proximity to another ISR operator. The brief discussion regarding Mine Unit 8 and its relation to the Hank Unit in Addendum D6-2 states that Cameco anticipates that Uranerz will have completed production and restoration on their property before Cameco's production will take place. The Uranerz Jane Dough Amendment currently projects restoration in the northern portion of the Hank Unit to be complete in 2023. Cameco projects Mine Unit 8 monitor well installation to begin in 2024. These mining schedules are likely to change over the coming years. Therefore, a plan for concurrent operation of these two well fields is warranted.

Please note, the following items (a, b, and c below) are intended to point out just a few questions that arise when considering the fact that two different operators are proposing to mine adjacent wellfields in the same production zone. And, because this application does not provide a discussion for concurrent operation or a combination of concurrent operation in one mine unit and restoration in the other, these questions are not intended to touch upon all potential issues that could arise from this situation. Therefore, an opportunity for LQD to review Cameco's discussion in the Operations Plan addressing this situation still remains and it is likely additional review comments will be generated regarding this topic.

- a. How will mining be conducted in the event that both the Nichols Ranch-Hank Unit and North Butte Mine Unit 8 are being mined concurrently?
 - b. How will operational monitoring be conducted if these two mine units are being mined concurrently? How could this impact the ability to affectively conduct excursion monitoring? Will there be a gap between the two wellfields, or will they coalesce?
 - c. How will Cameco adjust mining in Mine Unit 8 in the event that the Hank Unit is in restoration while Mine Unit 8 is in operation?
32. Index of Change, Operations Plan; revise the removal column to state Attachment OP-7, Attachment B.

Reclamation Plan Comments (LM)

33. Section 2.4, Pre-restoration Planning Activities, Page RP-5; the fifth paragraph discusses the procedures for reporting the construction of restoration wells and references Section 6.0 of the Operations Plan regarding the submittal of a NOCC. Wellfield Data Packages and associated NOCC's do not appear to be discussed in Section 6.0. Discussion of the notice of completion is provided in Section 3.3.2.4.8. Please clarify and/or revise this reference.
34. Table RP-2, Groundwater Restoration Monitoring Parameters; please update this table to include all parameters listed in Guideline 4, Reference Document 10, Table 2. Please note, Guideline 4, Reference Document 10, Table 2 has a typo regarding Gross Alpha analysis. Gross Alpha analysis should be analyzed in accordance with WQD Chapter 8, Table 1 which specifies; "Gross Alpha particle radio activity (including Radium 226 but excluding Radon and Uranium)".

35. Overlapping Permit Lands and Proposed Mining in Section 30, T44N, R75W; Please provide a discussion regarding Cameco's plans for surface reclamation and groundwater restoration where Cameco's surface and groundwater disturbances associated with Mine Unit 8 are adjacent to Uranerz's surface and groundwater disturbances associated with the Nichols Ranch-Hank Unit. The brief discussion regarding Mine Unit 8 and its relation to the Hank Unit in Addendum D6-2 states that Cameco anticipates that Uranerz will have completed production and restoration on their property before Cameco's production will take place. The Uranerz Jane Dough Amendment currently projects restoration in the northern portion of the Hank Unit to be complete in 2023 and surface reclamation to be complete in 2024. Cameco projects Mine Unit 8 monitor well installation to begin in 2024. These mining schedules are likely to change over the coming years. Therefore, a plan for concurrent operation of these two well fields is warranted.

Please note, the following questions (a & b below) are intended to point out just a few questions that arise when considering the fact that two different operators are proposing to mine adjacent wellfields in the same production zone. And, because this application does not provide a discussion for concurrent operation or a combination of concurrent operation in one mine unit and restoration in the other, these questions are not intended to touch upon all potential issues that could arise from this situation. Therefore, an opportunity for LQD to review Cameco's discussion in the Reclamation Plan addressing this situation still remains and it is likely additional review comments will be generated regarding this topic.

- a. How will restoration in Mine Unit 8 be conducted in the event that the Nichols Ranch-Hank Unit is concurrently in production?
- b. Will surface disturbances associated with these two wellfields potentially overlap? How will overlapping surface disturbance be addressed under the reclamation bond?

Appendix D-1 Comments (LM)

36. Addendum D1-1, Page 1; the first paragraph is missing Section 14, T44N, R76W from the description of lands. Please revise.
37. Addendum D1-1, Section 2.0; this section indicates that the Nichols Ranch-Hank Project is located southwest of the North Butte Project. The Nichols Ranch-Hank Project (PT778) extends into the southern portion of the NB-BRAA in Section 30 & 31, T44N, R75W. Please revise this section to explain that the NB-BRAA overlaps the Nichols Ranch-Hank Project, LQD Permit to Mine No. 778.

Appendix D-2 Comments (LM)

38. Appendix D-2, Section 1.0, Page 1; the third paragraph has not been updated to include the area being added to the North Butte Permit (i.e. NB-BRAA). This paragraph does not reference the man-made structures associated with the Pfister Ranch. Please update this section (and any other sections of this Appendix as applicable) to address the amendment area that will be part of the North Butte Permit PT632 upon approval of the amendment.

Appendix D-3 Comments (LM)

39. Appendix D-3, Cultural Resources; please provide a Table of Contents and a summary of studies conducted for Cultural and Paleontological Resources in association with the North Butte Project (i.e. both the initial studies for the approved permit and those conducted for the NB-BRAA). Please see LQD Guideline 4, Section IV(B) regarding this summary. For additional reference, see the TOC and summary provided in Cameco's Smith Ranch Permit (PT633).

Appendix D-5 Comments (LM)

40. Addendum D5-2; none of the cross sections have been certified. Cameco will need to individually certify these documents or provide a certification page for Addendum D5-2 listing the applicable documents (see Comment #3). The certification page should be stamped, signed and dated.

Appendix D-6 Comments (LM)

41. Addendum D6-2, Section 1.0, Page 1; the first paragraph states that the amendment area is in Sections 18-20 and 29-31, T44N R75W and portions of sections 24 and 25 T44N, R76W. Based on the adjudication materials provided with this application, please update this section to include Section 17, T44N, R75W and Sections 14, 23, and 26 T44N, R76W.
42. Plate D6-2.1, Plate D6-2.2, Plate D6-2.3, Plate D6-2.4; the amendment area on these maps is projected so that it appears to extend into Sections 21 and 28, T44N, R75W. Based on the adjudication materials provided with this application, no part of these sections are included in the amendment area. Overall, the permit area (and the overlapping area of the Uranerz Hank Unit) is offset to the east. Please revise these maps so that the permit boundary location is accurately represented and does not extend into sections that are not part of the permit area.

Appendix D-12 Comments (LM)

43. Appendix D-12 Electronic Data; upon completing review of D-12 (by LQD and WQD), WQD will require a shape file of the permit area and aquifer exemption area (Figure D12-A-1). The shape file will be submitted to EPA along with the D-12 document for EPA's review. Additionally, if revisions to the text are requested by WQD, please submit a Word document file of the text for ease of revision of that text by WQD. LQD will request the shape file and the word document from Cameco following WQD's initial review of Appendix D-12. A response to this comment is not needed.
44. Appendix D-12; Figure D12-A-1 Aquifer Exemption Boundary (AEb) for Mine Units 1–8 does not show the areas of mineralization (ore body) within the proposed aquifer exemption areas. It is anticipated that EPA will require presentation of this information in order to determine if the proposed AEb is appropriately positioned in relation to the mineralization and monitoring well ring. Please see Comment #28 for further discussion regarding how the existing and proposed mine units should be represented and revise this map accordingly.

45. Appendix D-12; Page D12-2 states that the following lands (or portion of) are included in the Brown Ranch Amendment Area; T43N, R75W Section 6 and T44N, R75W Sections 21 & 28. Although Figure D12-4 indicates that there are lands in Sections 21 & 28, the NB-BRAA Application Adjudication materials do not show any lands in these areas. Please revise this statement.
46. Appendix D-12, Figures D12-4 and D12-A-1; the NB-BRAA (i.e. new permit area) is shown on this map to extend into Sections 21 & 28, T44N, R75W. Based on the information provided with this submittal, these sections are not included within the NB-BRAA. Please revise this map accordingly.
47. Appendix D-12, Section 4.6, Page D12-6; to facilitate ease and efficiency of review for the DEQ-Water Quality Division and the EPA, please specify specifically which baseline water quality tables on the Addendum G disc the WQD and EPA are to utilize in reclassifying the groundwater(s) containing the production zones to Class V groundwater, and reviewing the aquifer exemption request.
48. Appendix D-12; A map showing the locations of the wells used for the baseline water quality data included in Appendix D12 (as provided on disc in Addendum D6-2) has not been provided with Appendix D-12 in hard copy or on the Addendum G disc. Please provide a map showing the locations of the baseline monitoring wells used to support Cameco's request for aquifer reclassification and exemption (i.e. Plate D6-2.1).
49. Appendix D-12, Section 4.7, Page D12-6; this section discusses the Pfister Ranch well located adjacent to Mine Unit 8. Review of the groundwater rights for the Pfister Ranch "site" does not find this well. Is it permitted with the SEO? Please specify the location of this well and the State Engineer's Office (SEO) permit number (and/or name) if available.
50. Appendix D-12, Section 4.7; this section does not discuss Brown #5 which is located adjacent to (or potentially in) the proposed Mine Unit 8 aquifer exemption area (see Appendix E Map). Please identify this well in this section and specify how this well is permitted with the SEO (permit number, stock, misc., domestic, etc.) and the completion interval. Please note, Per LQD Non-coal Rules and Regulations, Chapter 11, Section 10 (revised 5/3/2005);

(b) An aquifer, or a portion thereof, which meets the criteria of an Underground Source of Water as defined in Section 1 of this Chapter may be designated an "exempted aquifer":
 - (i) If it meets the following criteria:*
 - (A) It does not currently serve as a source of water for Class I, II, III, Special (A), or Class IVA uses as described in Chapter 8 of the Water Quality Rules and Regulations (as amended March 12, 1993).*

Although this well, permitted as a stock well with the SEO (P36013.0W), may not be a source of drinking water per 40 CFR 146.4(a), it is still subject to LQD R&R as indicated above. As a result, a stock well may not remain in the aquifer exemption area if it is completed within the production zone. Please clarify whether or not this well is located within Mine Unit 8 and completed in the F-Sand.

SUMMARY:

As indicated in the comments above, additional information is required in order to recommend The North Butte-Brown Ranch Amendment for approval. Once adequate responses and/or revisions are received, the amendment package will be recommended for approval.

\lm


cc: LQD Cheyenne

PT632_TFN 5_3-328_NB-BRAA_Rnd1RevMemo_03.04.16LM

5 3/328
LM

MEMORANDUM

TO: File, Cameco North Butte ISR Project, Brown Ranch Amendment, Permit No. 632, TFN 5 3/328

FROM: Stacy Page 

DATE: October 21, 2015

SUBJECT: Review of Baseline and Revegetation Plan for Brown Ranch Amendment, Cameco North Butte ISR Project, Permit No. 632, TFN 5 3/328

Appendix D8-2

1. Page 1. First paragraph. Please state that the lands listed are the study area. Please state that the 3,727 acres is the study area which includes all of the Brown Ranch Amendment. Once this amendment is approved it will no longer be proposed so please remove the word proposed from other sentences.
2. Page 5. Please make it clear that the 3,727 represents the study area. You may also wish to remove 3,727 from other locations if is not necessary to restate the acreage.
4. Page 18. Last paragraph. Crested is listed twice. I think one of them should be thickspike.
5. The Baseline Vegetation Assessment Map does not appear to have the correct amendment boundary. Please correct the purple line and also label the Map with a D8-2.

Operations Plan

6. Page OP-11. Last Paragraph. Seeding a cover crop if the permanent seed mix cannot be seeded within 3 months is a good commitment. Please also add that the permanent seed mix will be seeded during the next seeding season spring or fall.

Reclamation Plan

7. Page RP-15. Section 3.5.2. Please add a commitment to seeding on the contour when possible.
8. Table 3 Seed Mix. Pre-mining the proposed permit is native rangeland and postmining will be grazing. You might consider reducing the seeding rate of 5.4 lbs for pubescent and intermediate wheatgrass to reduce the amount of your rangeland that may become decadent and unpalatable.

sp\
xc: Cheyenne File

MSR
10/21/15

5 3/32 8
LM

MEMORANDUM

TO: Luke McMahan, Permit Coordinator

THROUGH: Mark Rogaczewski

FROM: Kim Medina, Project Geologist *VS*

DATE: January 19, 2016

SUBJECT: Technical Review, North Butte ISR Uranium Mine, Permit No. 632
Brown Ranch Amendment, TFN 5 3/328

I have reviewed the subject report and have the following comments and/or questions:

Operations Plan

1. Please update the MRLs on Table OP-10. The reporting limits for some of the constituents have changed.
2. Why was lead210 included in the pre-mine monitoring but is not included in the operational monitoring?
3. Please update page OP-26 to be consistent with the monitoring and reporting requirements listed in Attachment OP-7, "Surge Pond Design Report".
4. In the first paragraph on page OP-27, the ore body aquifer is listed as "A", "B", "C", "F", and "G" sands. In other places in the permit application, "G" sand is considered an overlying aquifer; not an ore body.
5. Please include the installation of underground piping as a potential impact to source water in Section 2.11.2
6. Please update the well construction and well abandonment sections in the Operational Plan to be consistent with Chapter 8, which was updated in September 2012. Specifically Sections 3.3.2.4.3 (Well Installation) and 3.3.2.4.6 (Monitor well installation) need to have the sections pertaining to sealants updated.
7. As per W.S. § 33-41-115 (Wyoming Geologists Practice Act), "All documents offered to the public and prepared or issued by or under the supervision of a professional geologist, shall include the full name, signature, date, license number and seal of the license." Please have the geologist who prepared the Cumulative Hydrologic Impact Assessment date the report.
8. The Operation and Maintenance Manual for the surge pond (Attachment OP-7) should be updated to reflect current LQD staff contacts.

med

Appendix D6

9. Table D6-2.1 states that several wells were damaged. What is the current status of these wells?
10. On page Addendum D6-2, it is stated that five alluvial wells were sampled; however the corresponding table only shows that three wells were sampled. Further Table D6-2.1 shows only 3 alluvium wells that either had water or were able to be sampled. Please correct this discrepancy.
11. Please provide a brief discussion how non-detects (for water quality) are handled in the statistical analysis. Does Cameco use the non-detection limit value when calculating means or some other method (such as half of the non-detection value)?

General Comment

This reviewer was unfamiliar with the geology of the project site. When reviewing the documents for this amendment, some aspects of the geology were simplified in such a way as to cause confusion. For example, "A" and "C" sands are listed as production sands, however discussions concerning aquifer characteristics or aquifer extent were not presented in the main part text of the application. Sand "G" was listed as an overlying aquifer; however information concerning this sand was sketchy in the main text of the permit application.

Volume 3A of the application submittal provided substantially more information about why these units were strata not tested and provided sufficient answers this reviewer had about why certain units were or were not tested. It would be helpful to have expanded discussion in the main body of the text for an average reviewer to understand why certain units were not fully tested.

/km

xc: Cheyenne

5 3/328
DM

MEMORANDUM

TO: File: TFN 5 3/328
FROM: David J. Myers – LQD DIII Natural Resources Analyst
DATE: February 9, 2016
SUBJECT: Review of Cameco North Butte ISR Project Brown Ranch Amendment

As requested I have reviewed Appendix D6 Addendum D6-2, Appendix D11 Addendum D11-1, and the Reclamation Plan for surface water concerns.

Addendum D6-2

Baseline studies, as referenced from the approved permit are relevant to the amendment area. All original data gathered specifically for the amendment is relevant and appears to be complete. Proposed sampling and monitoring locations are appropriate for the proposed expansion. No Response Required.

Addendum D11-1

The baseline information collected for this amendment appears complete. If Cameco expects to place fill in or disturb any identified wetlands or potential Waters of the U.S. and invoke a Nationwide permit (NWP), LQD requests that Cameco provide information regarding which NWPs are being invoked, and illustrate that all conditions of those NWPs have been met prior to disturbance activities.

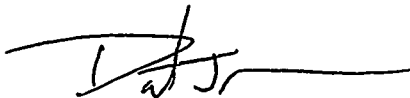
Reclamation Plan

The Reclamation Plan for the amendment appears to closely follow the Reclamation Plan for the approved permit. I have no comments on this section.

I have no further comments.

If you have any questions, please feel free to contact me (307) 675-5614

Thank you,



David J. Myers
Natural Resources Analyst
LQD District III

/dm

cc: Cheyenne LQD Files

10/16

5 3/328
LM

MEMORANDUM

TO: File, CAMECO, North Butte ISR Brown Ranch Amendment Application,
TFN 5 3/328

THRU: Luke McMahan, Project Geologist

FROM: David Schellinger, Soils Specialist

DATE: February 16, 2016

SUBJECT: Round 1 Technical Review Comments

As requested in your October 7, 2015 review request, I have reviewed Appendix D7 and soils related Operations Plan and Reclamation Plan materials for technical adequacy. I provide the following deficiencies/omissions that should be addressed before proceeding with approval.

Appendix D7

- 1) Selenium and Boron laboratory data for soil series #20 (4"-15") through #38 (26"-42") is missing from Appendix D7. Please provide the missing data.
 - 2) The map provided, and presumed maps in other sections of this application, do not appear to show all required information. Maps must show all of the following information:
 - a. Applicant's name and address
 - b. Title of the map
 - c. Date when the map was drawn
 - d. Each date of map revision
 - e. Map page number, exhibit number, etc.
 - f. Scale and contour interval
 - g. Township, range and section lines and numbers
 - h. A north arrow, and other items as described in Guideline 6, section V.
- Please also include the locations of wellfields and processing facilities on the soils map so LQD staff can determine which samples were taken from areas to be disturbed.
- 3) The terminology "Proposed" should be removed from legend labels. Once approved, the boundaries will not be proposed, but will be active boundaries.
 - 4) For future reference, only areas to be disturbed by mining activities must be sampled and analyzed for suitability properties and require an Order 1-2 survey. Areas outside the disturbance boundaries only require an Order 3 survey. Samples may be analyzed from throughout the permitted acreage, but only samples taken and analyzed inside or near disturbances should be used to determine salvage depths and to calculate soil volumes. No response is necessary.

MJR
2/18/16

Operations Plan

- 5) Section 2.2, page OP-9. The second paragraph of this section discusses a landowner letter, Attachment OP-1 of the original permit, which expresses landowner requests for topsoil handling and salvage. The letters were located in which the landowner expressed the desire to not salvage and stockpile topsoil, with one letter explaining the method of salvage and redistribution of soils in road ditches.

Currently constructed roads that use the landowner's requested method for topsoil salvaged and replacement cannot be held to the same standards as roads not yet constructed or in the proposed amendment area. Moving forward, however, the Administrator does recognize that the landowner can and should have some input in mine operations and reclamation, which is why the Form 8, Landowner Consent Form, which states that the landowner has read and approves the Mine and Reclamation Plans must be signed by the landowner. This being said, the Administrator has determined that the LQD will honor landowner requests for no topsoil salvage and handling if the following criteria are met:

- a. The landowner requests in notarized letters submitted for approval that the roads, with legal descriptions of road corridors, will remain as reclamation features (those roads not approved as reclamation features in the amendment area and that will not remain as reclamation features must have topsoil salvaged and stockpiled in compliance with LQD Rules).
- b. The letters contain statements that the landowner will not hold the LQD responsible for failed or poor quality reclamation on permitted disturbances for which the landowner wishes to control topsoil salvage, handling and reclamation;
- c. The letters presented in the permit are notarized as legally binding documents.

Whereas the Administrator has expressed some willingness to allow reduced topsoil salvage from road locations, he will not allow topsoil to be placed in ditches of roads following road construction as stated in the third paragraph of page OP-10 unless those roads will remain as reclamation features by landowner request. If CAMECO has further questions concerning these requirements, please contact Mr. Mark Rogaczewski, the LQD District 3 Supervisor.

- 6) Because the Administrator requires topsoil stockpiling/windrowing and protection during road construction on all roads except those remaining as reclamation features, CAMECO must revise Plate OP-1 to show stockpiles/windrows of topsoil associated with road construction for roads not approved as reclamation features and, if possible, the locations of header houses.
- 7) Section 2.2.1, page OP-12. Table OP-4 does not discuss topsoil salvage related to well development other than stockpiles for mud pit locations. The LQD Administrator requires that topsoil be salvaged from under subsoil stockpile locations where materials from digging mud pits is placed. Therefore, a commitment to salvage topsoil from mud pit and associated subsoil stockpile locations during wellfield development is requested. Please also provide an explanation of how temporary wellfield topsoil

stockpiles will be identified as topsoil.

- 8) A statement must be provided in section 2.2 about how CAMECO equipment operators will be able to determine and control the appropriate topsoil salvage depth during salvage operations. This is typically through recognition of color and or textural changes that may indicate transitions from suitable to less suitable soils.
- 9) A discussion is absent from sections 2.2 and 2.2.1 about topsoil salvage, handling and protection during muddy and/or frozen surface conditions. The LQD requests that access to wellfields for development be restricted to periods when surface conditions are dry or frozen to protect the native topsoil from undue compaction and/or undue destruction of vegetative cover.

/ds

xc: Cheyenne File



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
WYOMING REGULATORY OFFICE
2232 DELL RANGE BOULEVARD, SUITE 210
CHEYENNE WY 82009-4942

RR
KK
PS
JJ

KM
BK
MB
DL

DE
DM

SP
JM
DS

January 19, 2016

Wyoming Regulatory Office

Luke McMahan
Wyoming Department of Environmental Quality
2100 West 5th Street
Sheridan, Wyoming 82801

Dear Mr. McMahan:

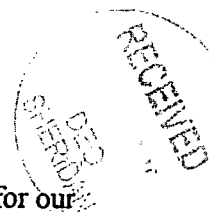
This letter is in response to your request we received on October 13, 2015, for our agency's comments concerning the proposed Brown Ranch Tract 1 Amendment for ISR (in-situ recovery) Mining Operations by Cameco Resources, North Butte ISR Mine, Permit No. 632; TFN 53/328. The proposed Amendment is located adjacent to the North Butte permit area in Campbell County, Wyoming.

The U.S. Army Corps of Engineers (Corps) regulates the placement of dredged and fill material into wetlands and other waters of the United States as authorized primarily by Section 404 of the Clean Water Act (33 U.S.C. 1344). The term "waters of the United States" has been broadly defined by statute, regulation, and judicial interpretation to include all waters that were, are, or could be used in interstate commerce such as streams (including ephemeral streams), reservoirs, lakes and adjacent wetlands. Wetlands are defined as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are characterized by growth of vegetation such as bulrush, cattails, rushes, sedges and willows.

The Corps regulations are published in the *Code of Federal Regulations* as 33 CFR Parts 320 through 332. Information on Section 404 program requirements in Wyoming can be obtained from our website: <http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/Wyoming.aspx>

It appears that the proposed Amendment Area may contain waters of the U.S. as defined above that are tributaries to Willow Creek, a tributary to Powder River.

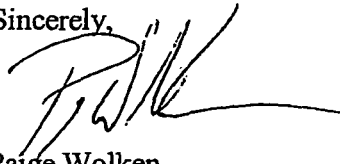
In north central Wyoming, it is common for ISR operations to develop infrastructure in upland areas and avoid potential waters of the U.S. Any efforts to avoid and minimize impacts to aquatic resources are strongly encouraged.



Cameco Resources is responsible for obtaining authorization from the Corps prior to commencing with any activities that include a discharge of dredged or fill material in jurisdictional wetlands or other waters of the U.S. Road and utility line construction can likely be authorized under Nationwide Permits, as defined in Part II of the *Federal Register* published on March 12, 2007 (Vol. 72, No. 47). Cumulative direct impacts that exceed 0.5 acres of wetland loss would require compensatory wetland mitigation that may or may not be reflected in a mine plan.

Thank you for notifying us of the Brown Ranch Tract 1 Amendment to the North Butte ISR Mine, Permit No. 632; TFN 5 3/328 and for the opportunity to provide comment. If you have any questions concerning this letter, please contact me by phone at (307) 772-2300 or via email at Paige.M.Wolken@usace.army.mil and reference file NWO-2010-02765.

Sincerely,



Paige Wolken
Project Manager
Wyoming Regulatory Office

Enclosure





WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

Phone: (307) 777-4600 Fax: (307) 777-4699

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
CHARLES PRICE – President
T. CARRIE LITTLE – Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
RICHARD KLOUDA
DAVID RAE

January 29, 2016

WER 5743.02
Department of Environmental Quality
Notice of Permit 632 Amendment
for ISR Mining Operations
by Cameco Resources
North Butte ISR Mine
Permit No 632 TFN 5 3/328
Campbell County

Luke McMahan
Department of Environmental Quality
Land Quality Division
2100 West 5th Street
Sheridan, WY 82801

Dear Mr. McMahan:

The staff of the Wyoming Game and Fish Department (WGFD) has reviewed the Notice of Permit 632 Amendment for ISR Mining Operations by Cameco Resources, North Butte ISR Mine Permit No 632 TFN 5 3/328. We offer the following comments for your consideration.

Terrestrial Considerations:

This project does not lie within a sage-grouse core area. However, there are several non-core leks nearby. We recommend no permanent activity occur within a 0.25 mile buffer of active or occupied non-core leks. We recommend activities not occur within 2 miles of said leks from March 15 to June 30 to protect sage-grouse breeding, nesting and brood rearing activities.

The area is also utilized by pronghorn and mule deer. The area may also be home to SGCN species such as swift fox and a variety of songbirds and raptors. We suggest reclamation plans include grasses, forbs and shrubs endemic to the area and conducive to providing quality habitat for wildlife.

Aquatic Considerations:

We have no aquatic concerns pertaining to this project.

Luke McMahan
January 29, 2016
Page 2 of 2 - WER 5743.02

Thank you for the opportunity to comment. If you have any questions or concerns, please contact Scott Gamo, Staff Terrestrial Biologist, at 307-777-4509.

Sincerely,


John Kennedy
Deputy Director

JK/mf/ns

cc: USFWS
Chris Wichmann, Wyoming Department of Agriculture, Cheyenne
Erika Peckham, WGFD, Sheridan Region
Lynn Jahnke, WGFD, Sheridan Region
Paul Mavrakis, WGFD, Sheridan Region