AATA INTERNATIONAL, INC.

October 22, 2009

Ms. Tanya Oxenberg
U.S. Nuclear Regulatory Commission
Two White Flint North
11545 Rockville Pike
Mail Stop 8F5
Rockville, MD 20852-2738

RE: Responses to WDEQ/LQD Technical Comments
Lost Creek Project - Great Basin, Wyoming
NRC Docket No. 40-9068

Dear Ms Oxenberg:

Enclosed are two copies of the October 2009 response package to the Wyoming Department of Environmental Quality - Land Quality Division technical comments. As outlined in the enclosed transmittal letter to WDEQ/LQD, each package includes:

The responses to the individual comments;
An Index Sheet to indicate where materials need to be removed from, replaced in, or added to the application; and
The replacement materials.

If you have any questions or need additional information, please let us know.

Sincerely,

AATA International, Inc.

Roberta Hoy

Roberta Hoy, Project Manager

AATA INTERNATIONAL, INC.

October 22, 2009

Mr. Harold Backer
Ur-Energy USA, Inc.
10758 W. Centennial Road, Suite 200
Ken Caryl Ranch, CO 80127

RE: Responses to WDEQ/LQD Technical Comments

Harold -

Enclosed is one copy of the October 2009 response package to the WDEQ/LQD technical comments on the Lost Creek permit-to-mine application. As outlined in the enclosed transmittal letter to WDEQ/LQD, each package includes:

The responses to the individual comments;
An Index Sheet to indicate where materials need to be removed from, replaced in, or added to the application; and
The replacement materials.

If you have any questions or need additional information, please let us know.

Sincerely,

AATA International, Inc.

Roberta Hoy

Roberta Hoy, Project Manager

RESPONSES TO WDEQ/LQD COMMENTS
of 1/30/2009
and
NEW INFORMATION

for the
LOST CREEK PROJECT
Wyoming

October 2009

ADJUDICATION FILE

WDEQ-LQD Comments of 1/30/09 for Volume 1 (Adjudication)

1) ***The Appendix E map (Plate E-1) must show all lands to be affected by the operation, including all proposed or potential well fields. The permit boundary should be reflective of the extent of proposed mining. The permit area should encompass all lands that are proposed to be affected and some reasonable buffer around the affected lands. Conversely, if an area is not going to be affected by the proposed operation then it shouldn't be in the permit area. Based on Figure OP-2a, there are large portions of the permit area (entire sections or half sections) where no proposed operations are shown. Unless there are reserves that are proposed to be mined in these areas, then these lands should not be included in the permit area. The "additional resources known to exist within the permit area", mentioned on page OP-6, must be shown in some fashion order to justify the size of the permit area. (MM)***

The size of the Permit Area was based on a number of factors, in particular: the necessary spacing for the deep disposal wells; potential development; and practical land use considerations.

With respect to the deep wells, five wells are currently planned. To accommodate regulatory requirements and meet the necessary injection criteria, the wells are widely spaced and located in Sections 16, 18, and 19 of Township 25 North, Range 92 West and Sections 13 and 25 in Township 25 North, Range 93 West. Plate OP-1 has been updated to show the locations of the wells.

With respect to potential development, LC ISR, LLC is interested in potential exploration and production targets in areas near (or vertical to) the proposed mine units. Rather than 'piecemeal' the baseline data for these areas, LC ISR, LLC considered it more effective to cover a larger area at one time. In addition, this approach provides more data for these areas than would be obtained for a Drilling Notification.

With respect to practical land use considerations, the Permit Area boundaries are in some cases designed to coincide with 'claim block' or lease boundaries. These boundaries may extend outside areas of interest for exploration or production, but for easier administration, they were included in the Permit Area.

2) ***The Appendix E map (Plate E-1) as well as all of the maps that are presented on a USGS quad map base, should be presented at a standard USGS scale of 1"=2,000'so that they are easily comparable. (MM)***

The map scale has been changed, as requested, In addition, the map now shows the East and West Access Roads, which were added to the Permit Area after discussions between WDEQ-LQD and BLM (September 2009).

New Information

A) Form 1-UIC - The acreage listed on Page 2 of the form has been updated to include the acreage for the East and West Access Roads and submitted to LQD. The start and end dates for the Project have also been updated.

B) Appendix C - The plate and text have been updated to include the acreage for the East and West Access Roads.

C) Table ADJ-1 - The table has been updated with the most recent information on the status of the various permits required for the Lost Creek Project.

D) List of Preparers - The list has been updated in response to comments on other sections of the permit application.

APPENDIX D-1 (LAND USE)

New Information

A) The permit acreage noted in the first paragraph has been updated to include the East and West Access Roads, and a cross-reference to the Appendix D information for the East and West Roads has been added.

B) Figures D1-1a and D1-1b have been updated to include the East and West Access Roads.

APPENDIX D-3 (ARCHEOLOGY)

New Information

A) Attachment D3-2, which is a mitigation plan for an NRHP site, has been added to the Confidential Volume. The Table of Contents for Appendix D3 and Section D3.1.3 (Agency and Public Consultation) have been updated to reflect this addition.

B) The References page was replaced to correct a typo in the 'Thompson' reference.

APPENDIX D-5 (GEOLOGY)

WDEQ-LQD Comments of 1/30/09 for Volume 2 (Appendices D-1 through D-5)

1) ***Section D5.2.4, "Historic Uranium Exploration Activities", Page D5-6:*** ***The last paragraph states that historic and current uranium explorations exist in "other" areas of the Basin. There is no mention of the adjacent Sweetwater Uranium project in this section. Due to that project's proximity to the Lost Creek project, it must be discussed here. (MLB)***

   Section D5.2.4 was revised and submitted to WDEQ-LQD in April 2009 in response to WDEQ-LQD's August 2008 comments on Appendices D5 and D6 (Comment 13 on Appendix D5). The section was renamed Subsurface Exploration Activities and separated into two subsections - Section 5.2.4.1 (Uranium Exploration) and Section 5.2.4.2 (Other Mineral Exploration). The text of concern is now part of Section 5.2.4.1. Because the Sweetwater Uranium Project involved both exploration and production, the title of the section has been changed to Exploration and Production Activities, with the titles of the subsections changed accordingly - Section 5.2.4.1 (Uranium) and Section 5.2.4.2 (Other Minerals). At the beginning of Section 5.2.4.1, a brief description of the Sweetwater Uranium Project has been added.

2) ***Attachment D5-2, Plates AD5-2a,b,c:*** ***These maps need to include section lines, township and range lines, topography, roads, and other ground features. During the meeting among LQD and Lost Creek personnel held in at the Lander WDEQ/LQD office on September 22, 2008, an example of the type of base map features that should appear on all plates/maps in the Permit was demonstrated and discussed. (MLB)***

   The figures and plates in Appendices D5 and D6 were revised to include the requested features, updated with new information, and submitted to WDEQ-LQD in April 2009 in response to WDEQ-LQD's August 2008 comments on Appendices D5 and D6.

Comments by Ms. Amy Boyle dated August 26, 2008 incorporated by reference in WDEQ-LQD Comments of 1/30/09

LC ISR, LLC sent responses to these comments to WDEQ-LQD on May 4, 2009. WDEQ-LQD's comments on those responses were received by LC ISR, LLC on June 22, 2009, and LC ISR, LLC is in the process of addressing those comments.

APPENDIX D-6 (HYDROLOGY)

WDEQ-LQD Comments of 1/30/09 for Volume 3 (Hydrology Appendix D-6)
[Note: Volume 3 became Volume 3a and a new Volume 3b was added as part of the April 2009 responses to the August 2008 WDEQ-LQD Appendix D5 and D6 comments. The volume numbering has now been updated as part of these September 2009 responses. There are now seven volumes, without any 'a' or 'b' suffixes. Volume 3a is once again Volume 3.]

1) ***Section D6-1:*** ***The purpose of this section is to characterize the baseline hydrology of the proposed permit area. The information provided concerning the surface water portion is not acceptable for the following reasons:***

   a. ***A map was not provided that delineates the three drainage basins as described in the text on page D6-1. Figure D6-1, the drainage basin map provided, is a gross illustration of regional drainage basins. Please provide a drainage basin map that describes the three primary drainage basins within the permit area.***

      Figure D6-1 has been revised to reflect the three principal drainages in the Permit Area, named (for the purposes of the application) Western Draw, Western Battle Spring Draw, and Eastern Battle Spring Draw.

   b. ***Please provide the total areal extent within each drainage basin and within the permit area for the three basins described.***

      The third paragraph in Section D6.1.1 has been revised to include this information, along with channel slope, sinuosity, and drainage density data for the three principal watersheds.

   c. ***Please provide runoff estimates for various events for the three drainage basins. (BRW)***

      Table D6-1b has been revised to include this information.

2) ***Section D6-2:*** ***Figure D6-2 is a longitudinal profile of North Battle Spring Draw. Please illustrate the location on a map of the longitudinal profile; mark the two end points as A and A' or use similar notation. Please also state how the profile was generated (e.g., actual survey or using USGS topographic mapping. (BRW)***

   Figure D6-1 has been revised to include endpoints for the longitudinal profiles of the three principal drainages; these points correspond to where the drainages enter and leave the Permit Area. Figure D6-2 has been revised to include all three principal on-site drainages.

Longitudinal profiles were generated from 1:24,000 USGS topographic maps that were imported into GIS; the third paragraph in Section D6.1.1 has been revised to include this information.

3) <u>Section D6-3:</u> ***The text indicates that any runoff quickly infiltrates and is either lost to ground water recharge or evapotranspiration. The text in Appendices D6 and D7 has not provided any information regarding the hydrologic characteristics of the soils present within the proposed permit area. Please provide information to support the text (e.g., provide a relationship based on texture to hydrologic soil group, infiltration rates, etc.). (BRW)***

Baseline studies have shown that soils are loams and sandy-loams. The steady-state infiltration rate for soils with this texture under laboratory conditions is estimated as 0.2 to 0.8 in/hr (Hillel, 1980). However, the practical infiltration rate is much higher because: a) more macropores are present under field conditions and at large scales; and b) saturated conditions are rare in this climate. Infiltration excess (Hortonian) overland flow has not been observed at the site. The first paragraph in Section D6.1.1 has been revised to include this information.

4) <u>Section D6-4:</u> ***The text indicates that the shallow aquifer is typically 150 to 200 feet below ground surface. The BLM well (WSEO Permit 3 P55113W) located in Township 25N, Range 92W, Section 30 is completed to a depth of approximately 220 and screened from 185 to 215 feet. Between 128 and 134 feet there is a layer of gray shale and the static water level at the time of completion was reported to be 109 feet. It appears that at a minimum semi-confined conditions exist rather than unconfined as portrayed in the text. Please explain the disparity. (BRW)***

The text at the end of the first paragraph in Section D6.1.1 (Drainage Characteristics) was intended to provide some very basic information (e.g., type of material and approximate depth to ground water) on the material underlying the drainages. That text (now in the second paragraph in Section D6.1.1) has been revised to more closely reflect the discussion of the regional hydrogeology in Section D6.2.1.5 (Battle Spring Formation - Wasatch Formation) that the Battle Springs Formation is "typically under confined conditions, although locally unconfined conditions exist". The variation from unconfined to confined conditions is due to the interfingering of sands and shales throughout the Battle Springs Formation (see, e.g., Section 5.2.1 (Stratigraphy)). As water was reportedly encountered in BLM Well 4777 at 184 feet below surface (fbs), below the shale layers, the static water level of 109 fbs would indicate confined to semi-confined conditions, at least locally.

5) ***Section D6-5:*** ***Section D6.1.2 contains a discussion of the Robinson Reservoir. I have searched the WSEO database believe it was a typo based on other information presented; the true location of this reservoir being in Township 25N, Range 72W, Section 26. Please remove the discussion concerning this reservoir and revise the water rights table accordingly. (BRW)***

This typo was verified by WSEO the 26th of May, 2009. Therefore, the discussion was removed from the text, and Figure D6-3b and Table D6-2 were updated accordingly.

6) ***Section D6-6:*** ***Please indicate what type of sampler was used to collect water quality samples. (BRW)***

Nalgene Storm Water Samplers were used to collect 0.26 gallon (1L) samples of first-flush streamflow during runoff events. Section D6.1.3 has been revised to include this information.

7) ***Section D6-7:*** ***Please indicate if discharge measurements were taken and/or can be estimated for each sample procured. (BRW)***

Figure D6-5 was renamed D6-5a, and Figure D6-5b was added, showing snowmelt discharge in one of the stream channels in the Permit Area on April 17, 2007. Due to the lag between the first runoff flush and sample retrieval, the wetted perimeter of the channels during first flush is not known. In the absence of wetted perimeter or cross-sectional area, discharge cannot be estimated using typical empirically-based approximations such as Manning's or Limerino's equations. When present, surface water discharge at the Lost Creek Permit Area has always been estimated by qualified personnel as less than 0.5 cfs, so it is believed that the discharge was less than 1 cfs when the samples were collected. The fourth paragraph in Section D6.1.3 has been revised to include this information.

Comments by Mr. Matthew Kunz dated August 8, 2008 incorporated by reference in WDEQ-LQD Comments of 1/30/09

1) ***Please submit the station site information for the thirteen surface water monitoring stations (LC1 through LC13) shown on Figure D6-5 in Appendix D-6. An Excel spreadsheet template for surface water stations will soon be available on the LQD website, http://deq.state.wy.us/lqd/Uranium_Data.htm. A copy of this file is also attached to this memo. In particular, please provide the station type (stream station, reservoir, stockpond, etc.), stream or waterbody name, and the location coordinates for each station. Also please note that a separate spreadsheet (also attached and on the LQD website) can be used to submit surface water flow data if this type of monitoring will occur.***

The requested surface water information is provided in digital form (Microsoft Excel) on a CD attached to these responses.

2) ***Please submit the baseline lab water quality data that were collected on April 17, 2007 at seven of the surface water monitoring stations. The lab data are shown in the permit application in Table D6-4 and Attachment D6-1 of Appendix D-6.***

Please see Response to Comment #1.

3) ***In future submissions of lab water quality data, please use the preferred list of parameter names. LQD staff in Cheyenne (Kathy Muller Ogle and Matt Kunze) are available to work with Energy Laboratories, Inc. to make them aware of the preferred formats for submitting water quality data electronically.***

LC ISR, LLC will try to ensure the preferred parameter names are used for future submittals. However, please be aware that whle LC ISR, LLC will use a certified laboratory for analytical work, it may not always be Energy Laboratories, Inc.

4) ***In future submissions of lab water quality data, please provide the laboratory detection limit used for parameters that were reported as "ND." LQD stores the value of the detection limit, even if a parameter is reported as not detected by the lab. LQD prefers the non-detect values be reported as negative numbers (i.e., -0.001). The baseline data submitted in Lost_Creek_Uranium_Lab_Water_Quality_Data.xls used both negative numbers and "ND."***

LC ISR, LLC will try to ensure the detection limits are reported as requested.

New Information

A) In the fifth paragraph in Section D6.3 (Groundwater Use), a cross-reference has been added to Appendix D11 and Figure D11-4. BLM Well No. 4551, which was not in use when this application was originally prepared, has been put back into service. Figure D11-4 includes photographs of the well in November 2007 and April 2009.

APPENDIX D-7 (SOILS)

WDEQ-LQD Comments of 1/30/09 for Volume 4 (Appendices D-7 through D-11)
[Note: The volume numbering has been updated as part of these September 2009 responses. There are now seven volumes, and what was Volume 4 when these comments were received is now Volume 5.]

1) ***Lands to be affected by the operation (plant site, ponds, roads, well fields, etc.) must be outlined on the soils map. (MM)***

   Plate D7-1 and Figure D7-2 were revised to delineate the areas of anticipated disturbance. In addition, the soil mapping information was added to Figure D7-2.

2) ***The soils map should be presented at a normal engineering scale (i.e. 1"=400' or 1"=500'). The township, range and county should be clearly noted on the map. (MM)***

   Plate D7-1 was revised to a normal engineering scale and clearly identifies the township, range and county. The scale for Figure D7-2 has also been standardized.

3) ***The soils on lands to be affected must be mapped at an Order 1-2 level. (MM)***

   Order 1 soil surveys were conducted in 2008 and 2009 for the Plant site (2008), the deep injection well locations (2009), and Mine Unit One (2008). The results of the surveys for the Plant site and the deep well locations are discussed briefly in Section D7.4 and in more detail in Attachments OP-5a and OP-5b. The results of the survey of Mine Unit One will be included with the mine unit package. As the areas for additional mine units are delineated in more detail, Order 1 surveys will be conducted and the results submitted with the respective mine unit packages.

4) ***A map must be presented to show topsoil suitability/stripping depths. (MM)***

   Topsoil suitability/stripping depths are included in Section OP 2.5.

5) ***Coarse fragments is one of the criteria in LQD Guideline No. 1 for establishing soil suitability. However, where soils resources are limited and marginal in quality LQD recommends that coarse fragments not be used as the determining factor for soil suitability. (MM)***

   The text in the last paragraph of Section D7.4 has been revised to reflect this recommendation, and it was kept in mind in the evaluation of the Order 1 survey results (Attachments OP-5a and 5b).

6) ***The volumes of soil to be salvaged and stockpiled from the various major affected areas (plant site, ponds, roads, etc.) should be listed. (MM)***

Please see Section OP-2.5.

7) ***The person(s) who conducted the soils study should be identified. (MM)***

The Order 3 survey was completed by Victor Meyer, a Senior Soil Specialist at Tetra Tech, and Daniella Rough and Ethan Brown of AATA International Inc. (AATA) in 2006. The 2008 Order 1 soil survey was completed in September 2008 by Dr. Jan Cipra with the assistance of Duncan Eccleston and Heidi Netter of AATA, and the 2009 Order 1 soil survey was completed by Jim Nyenhuis with the assistance of Duncan Eccleston. The List of Preparers in the Adjudication File has been updated to provide more detail if a person worked only on specific portions of the application.

New Information

A) In Section D7.6 (Geotechnical Investigations), a cross-reference was added to Attachment OP-7 of the Operations Plan, which includes results of the geotechnical work for the Storage Ponds.

B) In Section D7.7 (Historical Disturbance), a sentence about the acreage associated with the existing two-track roads was added in the first paragraph.

APPENDIX D-8 (VEGETATION)

WDEQ-LQD Comments of 1/30/09 for Volume 4 (Appendices D-7 through D-11)
[Note: The volume numbering has been updated as part of these September 2009 responses. There are now seven volumes, and what was Volume 4 when these comments were received is now Volume 5.]

1) ***Lands to be affected by the operation must be outlined on the vegetation map. (MM)***

   Figure D8-1 was revised to outline the lands to be affected.

2) ***The vegetation map should be presented at a normal engineering scale (i.e. 1"=400' or 1"=500'). (MM)***

   Plate D8-1 was created to present the vegetation map at a normal engineering scale; references to the plate have been added to the text (next to references to Figure D8-1).

3) ***<u>On page D8-6, section D8.4.1.2</u>, the third sentence refers to Upland Big Sagebrush Shrubland. It appears that the correct reference would be Lowland Big Sagebrush Shrubland. (MM)***

   The text has been revised accordingly.

4) ***Sample site/transect locations should be identified by number on the map. (MM)***

   The sample site/transect locations are identified by number on Figure D8-1 and Plate D8-1.

5) ***<u>Appendix D8.2, Description of Study Area</u>: Precipitation data references appendix 4. Also reference the weather station as per Chapter 2, Section 2(a)(i)(C)and (D) of the DEQ non-coal rules. (CS)***

   The text in Section 8.2 has been modified to reference the weather station.

6) ***<u>Appendix D8.3.3, Sampling Design:</u> It is stated that "no control areas or reference areas were established. The design described is referred to as an "Extended Reference Area" in DEQ/LQD Guideline 2 Section 3 (B). It can be referred to as such in the permit application. (CS)***

   The text has been revised accordingly.

7) ***Appendix D8.3.5, Collection and Analysis of Vegetation Cover Data:*** ***A parenthetical comment is included explaining what constitutes a "hit". The remarks are unclear and should be reworded to better explain what data was recorded. Please explain which hits were used in calculating total vegetation cover, just first hits or all hits recorded. (CS)***

The text has been reworded to better explain how data were recorded in accordance with WDEQ Guideline No. 2 for Vegetation Studies:

8) ***Appendix D8.4.1.1, Upland Big Sagebrush Shrubland Type:*** ***The total number of acres disturbed is not provided. The Operations Plan is referenced; however the number of acres to be affected needs to be provided as per DEQ/LQD Guideline 2 Section 1 (D). (CS)***

This information has been added to Section OP 2.7 of the Operations Plan.

9) ***Appendix D8.4.1.2, Lowland Big Sagebrush Shrubland Type:*** ***The total number of acres disturbed is not provided. The Operations Plan is referenced; however the number of acres to be affected needs to be provided as per DEQ/LQD Guideline 2 Section 1 (D). (CS)***

This information has added to Section OP 2.7 of the Operations Plan.

10) ***Appendix D8.4.1.2, Lowland Big Sagebrush Shrubland Type:*** ***In the first paragraph fourth sentence there is a reference to Upland Big Sagebrush Shrubland. The reference should read Lowland Big Sagebrush Shrubland. (CS)***

The text has been revised accordingly.

11) ***Appendix D8.4.1.2, Lowland Big Sagebrush Shrubland Type:*** ***The first paragraph includes a discussion of the differences between the sagebrush growing in the upland and lowland big sagebrush shrubland types. These differences could be a sub-species variation in Big sagebrush (Artemisia tridentata spp. tridentata vs. Artemisia tridentata spp. wyomingensis). If applicable add discussion about Big sagebrush subspecies. (CS)***

Although both Artemisia tridentata spp. tridentata and Artemisia tridentata spp. wyomingensis may occur within the Permit Area, the species was not identified to the subspecies level. The two vegetation types of the Permit Area were generally delineated based on the height of the big sagebrush, which is likely attributed to the conditions in which the big sagebrush was located. The big sagebrush growing in the shallow draws of the Lowland Big Sagebrush Shrubland type was often only one to two feet taller than the big sagebrush growing on the adjacent Upland Big Sagebrush Shrubland areas and, in many cases, was probably the same subspecies. The slightly deeper soil of the shallow draws most likely provides a better environment for shrub growth. In other cases, especially along the

14) ***Table D8-5, List of Vegetation Species Observed:*** ***The cool season perennial grasses and grass like plants section contains many perennial forbs. Please separate out the perennial forbs into their own section. This would be constant with the other vegetation tables. (CS)***

The table was revised accordingly.

15) ***Table D8-9, Evaluation of Sample Adequacy:*** ***The variance entries are incorrect. It appears these entries are variance^2. Please correct the entries of the row title. (CS)***

The variance entries are correct since variance is the standard deviation squared. However, the "s" variable in the footnote should be defined as the "sample standard deviation". The variance label and the footnote were revised for clarity. In addition, the text in Section D8.4.5 was revised.

New Information

Two notes have been added to Table D8-1, and one of the table headings has been slightly modified. The first note discusses the acreage of the study area versus the Permit Area, and the second note is a cross-reference to the vegetation information for the East and West Access Roads.

APPENDIX D-1 (LAND USE)

New Information

A) The permit acreage noted in the first paragraph has been updated to include the East and West Access Roads, and a cross-reference to the Appendix D information for the East and West Roads has been added.

B) Figures D1-1a and D1-1b have been updated to include the East and West Access Roads.

APPENDIX D-3 (ARCHEOLOGY)

New Information

A) Attachment D3-2, which is a mitigation plan for an NRHP site, has been added to the Confidential Volume. The Table of Contents for Appendix D3 and Section D3.1.3 (Agency and Public Consultation) have been updated to reflect this addition.

B) The References page was replaced to correct a typo in the 'Thompson' reference.

APPENDIX D-5 (GEOLOGY)

WDEQ-LQD Comments of 1/30/09 for Volume 2 (Appendices D-1 through D-5)

1) ***Section D5.2.4, "Historic Uranium Exploration Activities", Page D5-6:*** ***The last paragraph states that historic and current uranium explorations exist in "other" areas of the Basin. There is no mention of the adjacent Sweetwater Uranium project in this section. Due to that project's proximity to the Lost Creek project, it must be discussed here. (MLB)***

   Section D5.2.4 was revised and submitted to WDEQ-LQD in April 2009 in response to WDEQ-LQD's August 2008 comments on Appendices D5 and D6 (Comment 13 on Appendix D5). The section was renamed Subsurface Exploration Activities and separated into two subsections - Section 5.2.4.1 (Uranium Exploration) and Section 5.2.4.2 (Other Mineral Exploration). The text of concern is now part of Section 5.2.4.1. Because the Sweetwater Uranium Project involved both exploration and production, the title of the section has been changed to Exploration and Production Activities, with the titles of the subsections changed accordingly - Section 5.2.4.1 (Uranium) and Section 5.2.4.2 (Other Minerals). At the beginning of Section 5.2.4.1, a brief description of the Sweetwater Uranium Project has been added.

2) ***Attachment D5-2, Plates AD5-2a,b,c:*** ***These maps need to include section lines, township and range lines, topography, roads, and other ground features. During the meeting among LQD and Lost Creek personnel held in at the Lander WDEQ/LQD office on September 22, 2008, an example of the type of base map features that should appear on all plates/maps in the Permit was demonstrated and discussed. (MLB)***

   The figures and plates in Appendices D5 and D6 were revised to include the requested features, updated with new information, and submitted to WDEQ-LQD in April 2009 in response to WDEQ-LQD's August 2008 comments on Appendices D5 and D6.

Comments by Ms. Amy Boyle dated August 26, 2008 incorporated by reference in WDEQ-LQD Comments of 1/30/09

LC ISR, LLC sent responses to these comments to WDEQ-LQD on May 4, 2009. WDEQ-LQD's comments on those responses were received by LC ISR, LLC on June 22, 2009, and LC ISR, LLC is in the process of addressing those comments.

APPENDIX D-6 (HYDROLOGY)

WDEQ-LQD Comments of 1/30/09 for Volume 3 (Hydrology Appendix D-6)
[Note: Volume 3 became Volume 3a and a new Volume 3b was added as part of the April 2009 responses to the August 2008 WDEQ-LQD Appendix D5 and D6 comments. The volume numbering has now been updated as part of these September 2009 responses. There are now seven volumes, without any 'a' or 'b' suffixes. Volume 3a is once again Volume 3.]

1) ***Section D6-1:*** ***The purpose of this section is to characterize the baseline hydrology of the proposed permit area. The information provided concerning the surface water portion is not acceptable for the following reasons:***

   a. ***A map was not provided that delineates the three drainage basins as described in the text on page D6-1. Figure D6-1, the drainage basin map provided, is a gross illustration of regional drainage basins. Please provide a drainage basin map that describes the three primary drainage basins within the permit area.***

      Figure D6-1 has been revised to reflect the three principal drainages in the Permit Area, named (for the purposes of the application) Western Draw, Western Battle Spring Draw, and Eastern Battle Spring Draw.

   b. ***Please provide the total areal extent within each drainage basin and within the permit area for the three basins described.***

      The third paragraph in Section D6.1.1 has been revised to include this information, along with channel slope, sinuosity, and drainage density data for the three principal watersheds.

   c. ***Please provide runoff estimates for various events for the three drainage basins. (BRW)***

      Table D6-1b has been revised to include this information.

2) ***Section D6-2:*** ***Figure D6-2 is a longitudinal profile of North Battle Spring Draw. Please illustrate the location on a map of the longitudinal profile; mark the two end points as A and A' or use similar notation. Please also state how the profile was generated (e.g., actual survey or using USGS topographic mapping. (BRW)***

   Figure D6-1 has been revised to include endpoints for the longitudinal profiles of the three principal drainages; these points correspond to where the drainages enter and leave the Permit Area. Figure D6-2 has been revised to include all three principal on-site drainages.

Longitudinal profiles were generated from 1:24,000 USGS topographic maps that were imported into GIS; the third paragraph in Section D6.1.1 has been revised to include this information.

3) <u>Section D6-3:</u> ***The text indicates that any runoff quickly infiltrates and is either lost to ground water recharge or evapotranspiration. The text in Appendices D6 and D7 has not provided any information regarding the hydrologic characteristics of the soils present within the proposed permit area. Please provide information to support the text (e.g., provide a relationship based on texture to hydrologic soil group, infiltration rates, etc.). (BRW)***

Baseline studies have shown that soils are loams and sandy-loams. The steady-state infiltration rate for soils with this texture under laboratory conditions is estimated as 0.2 to 0.8 in/hr (Hillel, 1980). However, the practical infiltration rate is much higher because: a) more macropores are present under field conditions and at large scales; and b) saturated conditions are rare in this climate. Infiltration excess (Hortonian) overland flow has not been observed at the site. The first paragraph in Section D6.1.1 has been revised to include this information.

4) <u>Section D6-4:</u> ***The text indicates that the shallow aquifer is typically 150 to 200 feet below ground surface. The BLM well (WSEO Permit 3 P55113W) located in Township 25N, Range 92W, Section 30 is completed to a depth of approximately 220 and screened from 185 to 215 feet. Between 128 and 134 feet there is a layer of gray shale and the static water level at the time of completion was reported to be 109 feet. It appears that at a minimum semi-confined conditions exist rather than unconfined as portrayed in the text. Please explain the disparity. (BRW)***

The text at the end of the first paragraph in Section D6.1.1 (Drainage Characteristics) was intended to provide some very basic information (e.g., type of material and approximate depth to ground water) on the material underlying the drainages. That text (now in the second paragraph in Section D6.1.1) has been revised to more closely reflect the discussion of the regional hydrogeology in Section D6.2.1.5 (Battle Spring Formation - Wasatch Formation) that the Battle Springs Formation is "typically under confined conditions, although locally unconfined conditions exist". The variation from unconfined to confined conditions is due to the interfingering of sands and shales throughout the Battle Springs Formation (see, e.g., Section 5.2.1 (Stratigraphy)). As water was reportedly encountered in BLM Well 4777 at 184 feet below surface (fbs), below the shale layers, the static water level of 109 fbs would indicate confined to semi-confined conditions, at least locally.

5) ***Section D6-5:*** ***Section D6.1.2 contains a discussion of the Robinson Reservoir. I have searched the WSEO database believe it was a typo based on other information presented; the true location of this reservoir being in Township 25N, Range 72W, Section 26. Please remove the discussion concerning this reservoir and revise the water rights table accordingly. (BRW)***

This typo was verified by WSEO the 26th of May, 2009. Therefore, the discussion was removed from the text, and Figure D6-3b and Table D6-2 were updated accordingly.

6) ***Section D6-6:*** ***Please indicate what type of sampler was used to collect water quality samples. (BRW)***

Nalgene Storm Water Samplers were used to collect 0.26 gallon (1L) samples of first-flush streamflow during runoff events. Section D6.1.3 has been revised to include this information.

7) ***Section D6-7:*** ***Please indicate if discharge measurements were taken and/or can be estimated for each sample procured. (BRW)***

Figure D6-5 was renamed D6-5a, and Figure D6-5b was added, showing snowmelt discharge in one of the stream channels in the Permit Area on April 17, 2007. Due to the lag between the first runoff flush and sample retrieval, the wetted perimeter of the channels during first flush is not known. In the absence of wetted perimeter or cross-sectional area, discharge cannot be estimated using typical empirically-based approximations such as Manning's or Limerino's equations. When present, surface water discharge at the Lost Creek Permit Area has always been estimated by qualified personnel as less than 0.5 cfs, so it is believed that the discharge was less than 1 cfs when the samples were collected. The fourth paragraph in Section D6.1.3 has been revised to include this information.

Comments by Mr. Matthew Kunz dated August 8, 2008 incorporated by reference in WDEQ-LQD Comments of 1/30/09

1) ***Please submit the station site information for the thirteen surface water monitoring stations (LC1 through LC13) shown on Figure D6-5 in Appendix D-6. An Excel spreadsheet template for surface water stations will soon be available on the LQD website, http://deq.state.wy.us/lqd/Uranium_Data.htm. A copy of this file is also attached to this memo. In particular, please provide the station type (stream station, reservoir, stockpond, etc.), stream or waterbody name, and the location coordinates for each station. Also please note that a separate spreadsheet (also attached and on the LQD website) can be used to submit surface water flow data if this type of monitoring will occur.***

The requested surface water information is provided in digital form (Microsoft Excel) on a CD attached to these responses.

2) ***Please submit the baseline lab water quality data that were collected on April 17, 2007 at seven of the surface water monitoring stations. The lab data are shown in the permit application in Table D6-4 and Attachment D6-1 of Appendix D-6.***

Please see Response to Comment #1.

3) ***In future submissions of lab water quality data, please use the preferred list of parameter names. LQD staff in Cheyenne (Kathy Muller Ogle and Matt Kunze) are available to work with Energy Laboratories, Inc. to make them aware of the preferred formats for submitting water quality data electronically.***

LC ISR, LLC will try to ensure the preferred parameter names are used for future submittals. However, please be aware that whle LC ISR, LLC will use a certified laboratory for analytical work, it may not always be Energy Laboratories, Inc.

4) ***In future submissions of lab water quality data, please provide the laboratory detection limit used for parameters that were reported as "ND." LQD stores the value of the detection limit, even if a parameter is reported as not detected by the lab. LQD prefers the non-detect values be reported as negative numbers (i.e., -0.001). The baseline data submitted in Lost_Creek_Uranium_Lab_Water_Quality_Data.xls used both negative numbers and "ND."***

LC ISR, LLC will try to ensure the detection limits are reported as requested.

New Information

A) In the fifth paragraph in Section D6.3 (Groundwater Use), a cross-reference has been added to Appendix D11 and Figure D11-4. BLM Well No. 4551, which was not in use when this application was originally prepared, has been put back into service. Figure D11-4 includes photographs of the well in November 2007 and April 2009.

APPENDIX D-7 (SOILS)

WDEQ-LQD Comments of 1/30/09 for Volume 4 (Appendices D-7 through D-11)
[Note: The volume numbering has been updated as part of these September 2009 responses. There are now seven volumes, and what was Volume 4 when these comments were received is now Volume 5.]

1) ***Lands to be affected by the operation (plant site, ponds, roads, well fields, etc.) must be outlined on the soils map. (MM)***

   Plate D7-1 and Figure D7-2 were revised to delineate the areas of anticipated disturbance. In addition, the soil mapping information was added to Figure D7-2.

2) ***The soils map should be presented at a normal engineering scale (i.e. 1"=400' or 1"=500'). The township, range and county should be clearly noted on the map. (MM)***

   Plate D7-1 was revised to a normal engineering scale and clearly identifies the township, range and county. The scale for Figure D7-2 has also been standardized.

3) ***The soils on lands to be affected must be mapped at an Order 1-2 level. (MM)***

   Order 1 soil surveys were conducted in 2008 and 2009 for the Plant site (2008), the deep injection well locations (2009), and Mine Unit One (2008). The results of the surveys for the Plant site and the deep well locations are discussed briefly in Section D7.4 and in more detail in Attachments OP-5a and OP-5b. The results of the survey of Mine Unit One will be included with the mine unit package. As the areas for additional mine units are delineated in more detail, Order 1 surveys will be conducted and the results submitted with the respective mine unit packages.

4) ***A map must be presented to show topsoil suitability/stripping depths. (MM)***

   Topsoil suitability/stripping depths are included in Section OP 2.5.

5) ***Coarse fragments is one of the criteria in LQD Guideline No. 1 for establishing soil suitability. However, where soils resources are limited and marginal in quality LQD recommends that coarse fragments not be used as the determining factor for soil suitability. (MM)***

   The text in the last paragraph of Section D7.4 has been revised to reflect this recommendation, and it was kept in mind in the evaluation of the Order 1 survey results (Attachments OP-5a and 5b).

6) ***The volumes of soil to be salvaged and stockpiled from the various major affected areas (plant site, ponds, roads, etc.) should be listed. (MM)***

Please see Section OP 2.5.

7) ***The person(s) who conducted the soils study should be identified. (MM)***

The Order 3 survey was completed by Victor Meyer, a Senior Soil Specialist at Tetra Tech, and Daniella Rough and Ethan Brown of AATA International Inc. (AATA) in 2006. The 2008 Order 1 soil survey was completed in September 2008 by Dr. Jan Cipra with the assistance of Duncan Eccleston and Heidi Netter of AATA, and the 2009 Order 1 soil survey was completed by Jim Nyenhuis with the assistance of Duncan Eccleston. The List of Preparers in the Adjudication File has been updated to provide more detail if a person worked only on specific portions of the application.

New Information

A) In Section D7.6 (Geotechnical Investigations), a cross-reference was added to Attachment OP-7 of the Operations Plan, which includes results of the geotechnical work for the Storage Ponds.

B) In Section D7.7 (Historical Disturbance), a sentence about the acreage associated with the existing two-track roads was added in the first paragraph.

APPENDIX D-8 (VEGETATION)

WDEQ-LQD Comments of 1/30/09 for Volume 4 (Appendices D-7 through D-11)
[Note: The volume numbering has been updated as part of these September 2009 responses. There are now seven volumes, and what was Volume 4 when these comments were received is now Volume 5.]

1) ***Lands to be affected by the operation must be outlined on the vegetation map. (MM)***

   Figure D8-1 was revised to outline the lands to be affected.

2) ***The vegetation map should be presented at a normal engineering scale (i.e. 1"=400' or 1"=500'). (MM)***

   Plate D8-1 was created to present the vegetation map at a normal engineering scale; references to the plate have been added to the text (next to references to Figure D8-1).

3) ***On page D8-6, section D8.4.1.2, the third sentence refers to Upland Big Sagebrush Shrubland. It appears that the correct reference would be Lowland Big Sagebrush Shrubland. (MM)***

   The text has been revised accordingly.

4) ***Sample site/transect locations should be identified by number on the map. (MM)***

   The sample site/transect locations are identified by number on Figure D8-1 and Plate D8-1.

5) ***Appendix D8.2, Description of Study Area: Precipitation data references appendix 4. Also reference the weather station as per Chapter 2, Section 2(a)(i)(C)and (D) of the DEQ non-coal rules. (CS)***

   The text in Section 8.2 has been modified to reference the weather station.

6) ***Appendix D8.3.3, Sampling Design: It is stated that "no control areas or reference areas were established. The design described is referred to as an "Extended Reference Area" in DEQ/LQD Guideline 2 Section 3 (B). It can be referred to as such in the permit application. (CS)***

   The text has been revised accordingly.

7) ***Appendix D8.3.5, Collection and Analysis of Vegetation Cover Data:*** ***A parenthetical comment is included explaining what constitutes a "hit". The remarks are unclear and should be reworded to better explain what data was recorded. Please explain which hits were used in calculating total vegetation cover, just first hits or all hits recorded. (CS)***

The text has been reworded to better explain how data were recorded in accordance with WDEQ Guideline No. 2 for Vegetation Studies:

8) ***Appendix D8.4.1.1, Upland Big Sagebrush Shrubland Type:*** ***The total number of acres disturbed is not provided. The Operations Plan is referenced; however the number of acres to be affected needs to be provided as per DEQ/LQD Guideline 2 Section 1 (D). (CS)***

This information has been added to Section OP 2.7 of the Operations Plan.

9) ***Appendix D8.4.1.2, Lowland Big Sagebrush Shrubland Type:*** ***The total number of acres disturbed is not provided. The Operations Plan is referenced; however the number of acres to be affected needs to be provided as per DEQ/LQD Guideline 2 Section 1 (D). (CS)***

This information has added to Section OP 2.7 of the Operations Plan.

10) ***Appendix D8.4.1.2, Lowland Big Sagebrush Shrubland Type:*** ***In the first paragraph fourth sentence there is a reference to Upland Big Sagebrush Shrubland. The reference should read Lowland Big Sagebrush Shrubland. (CS)***

The text has been revised accordingly.

11) ***Appendix D8.4.1.2, Lowland Big Sagebrush Shrubland Type:*** ***The first paragraph includes a discussion of the differences between the sagebrush growing in the upland and lowland big sagebrush shrubland types. These differences could be a sub-species variation in Big sagebrush (Artemisia tridentata spp. tridentata vs. Artemisia tridentata spp. wyomingensis). If applicable add discussion about Big sagebrush subspecies. (CS)***

Although both Artemisia tridentata spp. tridentata and Artemisia tridentata spp. wyomingensis may occur within the Permit Area, the species was not identified to the subspecies level. The two vegetation types of the Permit Area were generally delineated based on the height of the big sagebrush, which is likely attributed to the conditions in which the big sagebrush was located. The big sagebrush growing in the shallow draws of the Lowland Big Sagebrush Shrubland type was often only one to two feet taller than the big sagebrush growing on the adjacent Upland Big Sagebrush Shrubland areas and, in many cases, was probably the same subspecies. The slightly deeper soil of the shallow draws most likely provides a better environment for shrub growth. In other cases, especially along the

larger drainages, the big sagebrush, probably spp. tridentata, was as much as three to four feet taller than those growing on the Uplands. Overall, the height of big sagebrush plants varied a great deal.

The differences between the Lowland and Upland Big Sagebrush Shrubland are not simply explained based on two different subspecies of big sagebrush. While the tridentata subspecies may be more or less restricted to the Lowland areas, the wyomingensis subspecies occurs in both the Lowland and Upland environments of the Permit Area.

The original text was not modified in response to this comment.

12) Appendix D8.4.3, Weeds, Selenium Indicators, Endangered or Threatened Species: It is stated that "the permit area has very few weeds". This statement should be defined quantitatively. For example it could be defined in terms of percent cover, number of individual encountered or some other measureable way. (CS)

Only one listed noxious weed species, tansy mustard (*Descurainia pinnata*), was noted on the Permit Area. Tansy mustard was observed as scattered individuals in the Lowland Big Sagebrush Shrubland. Tansy mustard was not actually encountered as part of the cover sampling; however, it did occur within one meter of either side of five of the 20 Lowland Big Sagebrush Shrubland transects and has a relative frequency of 1.97 percent. The text has been modified to include this information.

13) Appendix D8.4.3, Weeds, Selenium Indicators, Endangered or Threatened Species: It is stated that Tansy mustard is a "listed noxious weed species". Tansy mustard is a restricted noxious weed. Please update to reflect the correct status of Tansy mustard. (CS)

The text in Section D8.4.3 has been revised accordingly.

14) Appendix D8.6, Conclusions: There is no discussion of vegetative cover in the conclusions section. Please add a general statement addressing vegetative cover. (CS)

Two bullets concerning vegetative cover were inserted into Section 8.6.

15) Figure D8-1, Vegetation Map: The scale of this map is approximately 1"=1760'. The scale of the vegetation map must be greater than 1"=1000' as per DEQ/LQD Guideline 2 Section 1 (A). Please reconstruct map at a scale of 1"=1000" or greater. (CS)

Please see Response to Comment V4, D8, #2.

14) ***Table D8-5, List of Vegetation Species Observed:*** ***The cool season perennial grasses and grass like plants section contains many perennial forbs. Please separate out the perennial forbs into their own section. This would be constant with the other vegetation tables. (CS)***

The table was revised accordingly.

15) ***Table D8-9, Evaluation of Sample Adequacy:*** ***The variance entries are incorrect. It appears these entries are variance^2. Please correct the entries of the row title. (CS)***

The variance entries are correct since variance is the standard deviation squared. However, the "s" variable in the footnote should be defined as the "sample standard deviation". The variance label and the footnote were revised for clarity. In addition, the text in Section D8.4.5 was revised.

New Information

Two notes have been added to Table D8-1, and one of the table headings has been slightly modified. The first note discusses the acreage of the study area versus the Permit Area, and the second note is a cross-reference to the vegetation information for the East and West Access Roads.

APPENDIX D-11 - WETLAND

WDEQ/LQD COMMENTS of 1/30/09 for Volume 4 (Appendices D-7 through D-11)

1) ***The person(s) who conducted the wetlands study should be identified. (MM)***

   The List of Preparers in the Adjudication File has been updated to provide more detail if a person worked primarily on specific portions of the application.

2) ***Section D11-1: The text on page D11-1 states that "wetland delineation is based on the presence and abundance of obligate wetland plants...." Wetland delineation is based on three basic site characteristics: (1) vegetation, as noted in the text, (2) presence or absence of hydric soils, and (3) hydrology. Please revise the text accordingly. (BRW)***

   The text was clarified to indicate that all three of the delineation criteria were taken into account initially, but the more detailed wetland vegetation inventory was only done where at least one of the other criteria (hydrology) might have been met.

3) ***Section D11-2: The text appears to indicate that wetland hydrology does not exist at the site. Assuming the average growing season for the area is 100 days, according to the 1987 ACOE Wetlands Manual, if the area is inundated for a period of five days (5% of the growing season) annually, the potential for wetland hydrology exists. I understand that runoff occurs infrequently in this area, however, given the fact all three wetland areas are identified under the National Wetlands Inventory (NWI) program appear to be depressional and over time the bottom of these features should seal through the deposition of silts, it is certainly plausible that these areas could hold water for five day minimum period. Therefore, hydrology does not appear to a limiting factor in a wetland determination; please revise the text accordingly. (BRW)***

   As noted in the revised text, hydrology is apparently a limiting factor at one of the three potential wetlands identified under the National Wetlands Inventory. Battle Spring Well No. 4551 may have been the water source supporting another of the potential wetlands, but the well had not been in use for some time prior to the April 2006 field work, so hydrology may have also been a limiting factor at this location. As noted above, the text has been clarified, and photographs added, to provide more information about all three of the potential wetlands.

4) ***Section D11-3:*** ***No photos were provided for the two other NWI mapped wetland areas in Township 25N, Range 93W, Section 24 and Township 25N, Range 92W, Section 21. Please provide. (BRW)***

Figures D11-3 and D11-4, which include photographs of the two potential wetlands noted in the comment, have been added. Figure D11-2 has also been updated to include an April 2009 photograph.

5) ***Section D11-4:*** ***From on-site inspections during exploration, etc., I would agree that no wetlands exist within the proposed permit area, however the documentation provided to render this decision is lacking as alluded to in the first three comments. Please re-write this section to better support the supposition that no wetlands exist within the proposed permit area. (BRW)***

The text has been clarified to provide a more complete description of the wetland evaluation process.

6) ***On Figure D11-1, the legend shows the symbol for the plant site but it does not appear that the plant site is actually shown on the map. Also, some of the potential wetland locations are obscured by the cross hatch symbol used to show the mine units. (MM)***

The location of the Plant has been added to the map. The symbols for the Mine Units have also been changed because the 'center' of each Mine Unit, represented by a circle within the cross-hatch, was difficult to distinguish from the symbol for a potential wetland, particularly in the Mine Units with blue cross-hatch. As discussed in the text, none of three potential wetlands were within the Mine Units.

New Information

There has been a change in conditions at the location in T25N, R92W, Section 21 since Appendix D-11 was originally written. The well at that location, Battle Spring Draw Well No. 4551, has been put back into service and a dirt 'tank' established. These changes have been documented in Appendix D9, and cross-referenced in Section D6.3 of Appendix D6.

ADJUDICATION FILE

WDEQ-LQD Comments of 1/30/09 for Volume 1 (Adjudication)

1) ***The Appendix E map (Plate E-1) must show all lands to be affected by the operation, including all proposed or potential well fields. The permit boundary should be reflective of the extent of proposed mining. The permit area should encompass all lands that are proposed to be affected and some reasonable buffer around the affected lands. Conversely, if an area is not going to be affected by the proposed operation then it shouldn't be in the permit area. Based on Figure OP-2a, there are large portions of the permit area (entire sections or half sections) where no proposed operations are shown. Unless there are reserves that are proposed to be mined in these areas, then these lands should not be included in the permit area. The "additional resources known to exist within the permit area", mentioned on page OP-6, must be shown in some fashion order to justify the size of the permit area. (MM)***

The size of the Permit Area was based on a number of factors, in particular: the necessary spacing for the deep disposal wells; potential development; and practical land use considerations.

With respect to the deep wells, five wells are currently planned. To accommodate regulatory requirements and meet the necessary injection criteria, the wells are widely spaced and located in Sections 16, 18, and 19 of Township 25 North, Range 92 West and Sections 13 and 25 in Township 25 North, Range 93 West. Plate OP-1 has been updated to show the locations of the wells.

With respect to potential development, LC ISR, LLC is interested in potential exploration and production targets in areas near (or vertical to) the proposed mine units. Rather than 'piecemeal' the baseline data for these areas, LC ISR, LLC considered it more effective to cover a larger area at one time. In addition, this approach provides more data for these areas than would be obtained for a Drilling Notification.

With respect to practical land use considerations, the Permit Area boundaries are in some cases designed to coincide with 'claim block' or lease boundaries. These boundaries may extend outside areas of interest for exploration or production, but for easier administration, they were included in the Permit Area.

2) ***The Appendix E map (Plate E-1) as well as all of the maps that are presented on a USGS quad map base, should be presented at a standard USGS scale of 1"=2,000'so that they are easily comparable. (MM)***

The map scale has been changed, as requested, In addition, the map now shows the East and West Access Roads, which were added to the Permit Area after discussions between WDEQ-LQD and BLM (September 2009).

New Information

A) Form 1-UIC - The acreage listed on Page 2 of the form has been updated to include the acreage for the East and West Access Roads and submitted to LQD. The start and end dates for the Project have also been updated.

B) Appendix C - The plate and text have been updated to include the acreage for the East and West Access Roads.

C) Table ADJ-1 - The table has been updated with the most recent information on the status of the various permits required for the Lost Creek Project.

D) List of Preparers - The list has been updated in response to comments on other sections of the permit application.

RESPONSES TO WDEQ/LQD COMMENTS
of 1/30/2009
and
NEW INFORMATION

for the
LOST CREEK PROJECT
Wyoming

October 2009

APPENDIX D-9 (WILDLIFE)

WDEQ-LQD Comments of 1/30/09 for Volume 4 (Appendices D-7 through D-11)
[Note: The volume numbering has been updated as part of these September 2009 responses. There are now seven volumes, and what was Volume 4 when these comments were received is now Volume 5.]

1) ***Section D9 3.6, Wildlife:*** ***The sage thrasher (ST) is listed in both the third and fourth paragraphs. In the first instance, ST was not documented on the study area and in the second instance, it is know to breed on the study area. Please correct. (SP)***

   The Sage Thrasher should not appear in the third paragraph. Section D9.3.6 has been edited to correct this error.

2) ***Attachment D9-2, Wildlife:*** ***On page 2 of the attachment, the table of contents should contain the page numbers of the identified sections. Please correct. (SP)***

   Page numbers have been added to the Table of Contents of Attachment D9-2.

3) ***Figure D9-6, Sage Grouse Lek Map:*** ***Oral and written communication between Melissa Bautz (LQD) and Ms. Carrie Dobey (WGFD – Lander) on January 15 and 16, 2009 revealed that the Crooked Well sage grouse lek in UTM Zone 13 E 267113 N 4669158 (NAD 1983) at the eastern end of the proposed Permit Boundary is considered active by the WGFD. On Figure D9-6, the Crooked Well lek is designated as "unoccupied". The WGFD considers this lek to be "occupied". This is because the WGFD considers a lek to be "unoccupied" only after 10 years of inactivity at the lek. Figure D9-6 must depict the Crooked Well lek as "occupied" given the WGFD's criteria. Please revise the map accordingly. (MLB)***

   Figure D9-6 has been revised to reflect the Crooked Well lek's WGFD designation as "occupied and inactive" (see new Attachment D9-4).

New Information

Appendix D9 has been updated to include 2008 and 2009 information. Changes to the text include:

- Revised permit acreage at the end of the first paragraph in Section D9;
- Revised dates in the fourth paragraph in Section D9, the second paragraph in Section D9.3.2 (Upland Game Birds), and first and third paragraphs in Section D9.3.3 (Raptors);
- Information on the expanded sage grouse survey area in 2009 (next to last paragraph in Section D9);
- Updated Table D6-3 with the 2008 and 2009 sage grouse survey data;
- A cross-reference at the end of Section D9.3.4 (Waterfowl and Shorebirds) to the new information on BLM Well No. 4551, which is summarized in Appendix D11.

OPERATIONS PLAN

WDEQ/LQD COMMENTS of 1/30/09

Volume 5 – (Operations Plan and Reclamation Plan):

Operations Plan (OP)

1) ***All maps must be presented at a standard engineering scale which should be stated on the map, in addition to the bar scale. Odd scales such as 1"=110' (Fig. OP-7c), 1"=1,760' (Fig. OP-2a), 1"=1,540' (Plate E-1), 1"=1,620' (Plate C-1), 1"=16' (Plate OP-1) or 1"=1,700' (Figure RP-2) are not acceptable. Typical map scales used in mine permit applications are 1"=2,000' and/or 1"=500'. It is helpful to present all maps in the application at a few consistent scales to facilitate comparison of maps or overlaying them on a light table. (MM)***

   Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to Lost Creek ISR, LLC (LC ISR, LLC): Wyoming Statutes (W.S.) § 35-11-406(b)(v) and WDEQ Guideline (GL) 6, Sec. V.

   The map scales have been reviewed and adjusted to allow for similar and standard scales. When appropriate, maps were plotted on 11" x 17" paper. However, when greater detail was needed, maps were plotted on plates.

2) ***The LQD Administrator has determined that an ISL mine permit application must, at a minimum, include a detailed plan for the first well field. (MM)***

   Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: See WDEQ-LQD letter of March 13, 2009 to the Wyoming Mining Association (WMA).

   Pursuant to discussions during the June 22, 2009 meeting in Casper between LQD and LC ISR, LLC, the wellfield package for the first mine unit will be supplied to LQD for review and approval prior to issuance of the permit to mine.

3) ***Section OP 1.0, Overview of Proposed Operation. In the first paragraph it states that "the surface area to be affected by the ISR operation will total 285 acres". However, this figure is inconsistent with Table OP-2 which indicates 58 acres will be affected by the operation. It should be noted that all of the site's roads (including so-called "tertiary" roads or two-tracks) must be included in the total***

affected acreage. Refer to Mark Moxley's comment number 6 below for more suggestions on how to address this. (MLB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. §§ 35-11-406(a)(vi)(C) and 103(e)(xvi) and LQD Permit-to-Mine Form 1.

Areas of disturbance have been calculated by type of facility (Table OP-2) and by township, range, and section (Table OP-3). As discussed in Section OP 2.5, LC ISR, LLC has not equated vegetation and topsoil disturbance because of the need to differentiate between:

areas of complete topsoil and vegetation removal (e.g., the Plant); and

areas of vegetation disturbance, without topsoil removal, to allow for root retention, especially for shrubs (e.g., portions of the Mine Units).

Therefore, Table OP-2 differentiates between acres from which topsoil is stripped and acreage disturbed, on which topsoil is left in place but vegetation may be affected.

4) ***<u>Section OP 1.1, Site Facilities Layout.</u> should include a detailed facilities site plan map presented on a topographic base at a scale of 1"=100' with a 2' contour interval. All facilities and structures should be shown, including lay-down yards, parking areas, site drainage control features, ponds and topsoil stockpiles. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. §§ 35-11-406(b)(v) and 428(a)(iii)(D).

Plate OP-2, which shows the locations of the facilities within the Plant, has been added to the permit.

5) ***<u>Figure OP-2a (and Plate E1):</u> All roads to be improved or constructed, including primary, main and secondary, should be clearly identified and shown on the maps (e.g. Plate E-1 and Fig. Op-2a) and should be included in the permit area. Roads that provide access to the site from a formally designated public road (e.g., name and road number) and where maintenance will be incumbent on Lost Creek must be made part of the permit. Please provide a ROW agreement and revise the permit area boundary to include all access roads. Legal descriptions should be provided for the primary access roads from that point that they leave the county roads (i.e. the Baroil Road, the Minerals Ex Road and the Wamsutter Road). (BRW and MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-103(e)(xvi), LQD NonCoal Rules and Regulations (R&R), Ch. 11, Secs. 2(ao) and 2(aw) and Ch. 3 Sec. 2(i), and BLM/LQD Locatable Minerals Memorandum of Understanding Sec. D(i).

The permit area has been enlarged to include the eastern and western access roads per WDEQ-LQD's request. Figure OP-1 and Plate E-1 have been revised accordingly to show the new permit area and the access roads. Appendix C has been updated to include the legal description of the permit area including the eastern and western access roads. The permit area added for the roads is 100 feet wide for the entire length of the road.

The BLM confirmed in a letter dated September 10, 2009 to Lost Creek ISR, LLC that *"Roads constructed or upgraded for access to mining claims and powerlines constructed for uses incidental and necessary for mining operations do not require a right of way permit."* Therefore, no right of way permit will be sought from BLM.

6) ***Section OP 1.0, Overview of Proposed Operation (Page OP-1) and Section OP 2.3, Land Use (Page OP-7): These sections state that the operation will affect approximately 285 acres. Form 1 also lists 285 acres. Does this figure include all affected lands such as roads? On page OP-3 it is stated that each well field will cover about 50 acres. Six well fields @ 50 acres would total 300 acres. Table OP-2 only lists 58 acres to be affected, which is inconsistent and unrealistic. Table OP-2 should be removed. Table OP-4 contains a better accounting of affected areas (285 acres). Well fields should be considered to be affected and should be accounted as such (the monitor well ring is a reasonable affected area boundary). An accurate estimate of affected lands for the life of the mine, within the proposed permit boundary, is required. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. §§ 35-11-406(a)(vi)(C) and 103(e)(xvi) and LQD Permit-to-Mine Form 1.

Please see Response to Comment V5, OP Comment 3.

7) ***Section OP 1.0, Overview of Proposed Operation: The text indicates that the proposed permit area encompasses 4,220 acres and the disturbance area will encompass approximately 285 acres. The application goes on to state that each well field will consist of a reserve block of approximately 50 acres and there are six proposed well fields. This later figure does not include the disturbance associated with the facilities area. None of the above figures account for the access road. Needless to say, all of the above is contradictory. While it is understood that there will be some need for ancillary areas, Lost Creek has not demonstrated by the permit area must be 10 times greater than the proposed disturbance. Please address the above. (BRW)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. §§ 35-11-406(a)(vi)(C) and 103(e)(xvi) and LQD Permit-to-Mine Form 1.

The size of the Permit Area was based on a number of factors, in particular: the necessary spacing for the deep disposal wells; potential development; and practical land use considerations.

With respect to the deep wells, five wells are currently planned. To accommodate regulatory requirements and meet the necessary injection criteria, the wells are widely spaced and located in Township 25 North, Range 93 West, Sections 13, 17, 18, 19, and 25. Plate OP1 has been updated to show the locations of the wells.

With respect to potential development, LC ISR, LLC is interested in potential exploration and production targets in areas near (or vertical to) the proposed mine units. Rather than 'piecemeal' the baseline data for these areas, LC ISR, LLC considered it more effective to cover a larger area at one time. In addition, this approach provides more data for these areas than would be obtained for a Drilling Notification.

With respect to practical land use considerations, the Permit Area boundaries are in some cases designed to coincide with 'claim block' or lease boundaries. These boundaries may extend outside areas of interest for exploration or production, but for easier administration, they were included in the Permit Area.

8) <u>Plate OP-1</u>. The proximity of the pond directly adjacent to the processing facilities raises concerns regarding the following: ability to monitor the pond or conduct any potential future corrective action with little to no room on the west side; the inability to expand the processing building to the east; the inability to use sprayers for enhanced evaporative effect, due to the proximity to the building; the limited use of noise deterrents to prevent waterfowl from landing on the pond, due to its proximity to the plant. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. §§ 35-11-406(b)(ix) and 428(a)(iii)(C) and LQD/WQD Working Agreement Sec. IIIA.

The location of the ponds adjacent to the processing facilities was selected based on a variety of factors related to construction and operation needs, including those noted above. The pond construction, with double liner, leak detection, and redundant capacity (Section OP 2.9.4), is designed to prevent the need for such extensive corrective action that would require work under the processing facilities. Should expansion of the processing building be necessary, other options than expansion to

the east are considered preferable for a variety of reasons not related to the ponds. Sprayers are not needed because the ponds will not be used for evaporation (Section OP 3.6.3.1). The proximity of the ponds to the active areas of the Plant may provide as effective as noise deterrents in discouraging water fowl from landing on the ponds. In addition, the proximity of the ponds allows for a shorter pipeline to the ponds, reducing the possibilities for leakage along that length, and for easier access for daily checks of the ponds (Section 2.9.4).

9) ***Plate OP-1: The pond designs are unacceptable for several reasons including, but not limited to the following:***

- ***No location map was provided; Plate OP 1 is not considered a location map as it is of unacceptable scale and is not tied to any coordinate system;***
- ***No contour interval is provided on schematics;***
- ***No description or detail as to what part of the pond is above and below existing grade;***
- ***No details concerning the piping system for the supply of water to the ponds and transfer of water between ponds;***
- ***No specifications concerning seaming of the liner system and QA/QC procedures to be employed to evaluate the seaming; and***
- ***Pond sizing calculations to address evaporative loss, inflows, etc. under a variety of conditions to demonstrate that adequate redundancy in disposal exists.***

Please present a complete set of designs and specifications for the two proposed ponds. (BRW)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix), R&R Ch. 11, Sec. 4(a)(iv), and LQD/WQD Working Agreement Sec. IIIA.

Plate OP-1 has been updated and revised to show the Plant and pond locations relative to the Permit Area as a whole. Plate OP-2 has been added to show more detail in the area of the ponds, including topographic contours. Design details for the ponds are included in Attachment OP-A6 to the Operations Plan. The two reports in the attachment are "Design Report, Ponds 1 & 2", dated January 2009, and "Technical Specification", dated April 2008, both by Western States Mining Consultants. Appendix B of the Design Report provides the results of the geotechnical investigation at the proposed pond location ("Subsurface Exploration and Geotechnical Engineering Report" by Inberg Miller Engineers dated September 2008).

The storage ponds will be filled from the plant waste water tank(s) via a buried line except where it is above grade to cross the storage pond embankment. The storage pond fluid will be transferred between Ponds 1 and 2 by above grade transfer pumps and piping with suctions in the storage pond fluid. Fluid will be transferred back to the waste water tank(s) for disposal via the same methods.

The primary purpose of the storage ponds is to allow for maintenance of the disposal wells *not* for evaporation of waste water. (The "Operations Plan, Sections OP 2.9.4 and OP 5.2.3.1 detail that purpose.) Therefore, evaporative loss is not included in the water balance calculations, and any evaporative losses will simply enhance the disposal capacity of the waste water system. See Figures OP-5a through OP-5f for water balance diagrams.

Pond sizing was based on a normal maintenance or testing schedule for the disposal wells, or two weeks of 1% bleed from the production stream at maximum design capacity (6,000 gpm).

Single Pond Capacity = 1% x 6000 gpm x 1440 min/day x 14 days
= 1,209, 600 gallons / 7.48 gal/cu. ft.
= 161,711 cubic feet

Pond Fluid Depth = 161711 cu. ft. / (160 ft. wide x 260 ft. long)
= 3.9 feet deep

The ponds are redundant in capacity allowing for maintenance of the ponds in the event of a liner problem.

10) ***<u>Figures OP-2a and OP-2b</u> show the powerline and pipeline layout along with the ore body. Please include the location of the Lost Creek fault(s) on these figures as well, as its location is a factor in the mine's operations. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 3(a)(viii).

Figures OP-2a and OP-2b have been revised to show the fault location.

11) ***<u>Figure OP-2a Site Layout:</u> A much more detailed Mine Plan map will need to be included in the permit. It should indicate all roads, fencing, topsoil pile locations, stormwater diversion structures, chemical storage areas, lay down yards, easements, utilities, pipelines, monitor well locations, air and weather monitoring stations, etc. There should be one comprehensive map that indicates where any surface disturbance or feature is planned. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(v).

Plate OP-1 has been updated and revised to show the life-of-project disturbance, and Plate OP-2 has been added to show more detail at the Plant. Plate OP-1 also shows estimated locations of disturbance within the mine units, based on currently available information. The specific locations of all the surface features in the mine units have not yet been determined and will be based on the ore distribution within each mine unit. Therefore, the Mine Unit packages will include the details requested above as they pertain to the individual mine units..

12) ***Section OP1.1 Site Facility Layout:*** ***The underground power lines should be in conduit, as opposed to direct burial. This should be specified in the plan. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C).

All powerlines to the point of transform from 34,500 volts to 480 volts will be overhead lines built compliant to regional raptor specifications (see Response to Comment V5, OP#34). After transform, lines will be installed per the NEC 2008 Handbook. Specifically, Table 300.5 details the depth of burial and Article 340, Section II, 340.10, (1) specifies the use of Type UF cable for direct burial.

LCI plans to use direct burial cable as allowed in the NEC 2008 Handbook to deliver power to the header house and to the production wells as needed.

13) ***Section OP 2.1 Project Schedule:*** ***How is the amount of time for mine unit development, production, ground water sweep, reverse osmosis etc. determined. Calculations should be presented which indicate the time it will take to perform each step, based on the hydrologic conditions of the ore body. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Secs. 4(a)(ii) and 5(a)(i).

The time frames associated with development, production, restoration and reclamation are based on numerous factors. The main factors in determining the progression of mining at a site are hydrologic conditions, corporate production expectations and corporate capabilities which include knowledge and experience in the application of in-situ uranium production and restoration operations. The

following information details how LC ISR, LLC has determined the time requirements for the ISR steps in Figure OP-4a.

Development is defined herein as the installation of mining facilities associated with a discrete ore resource. The end goal of development is commonly the installation of a mine unit. The time requirement for mine unit development is a function of manpower and drill rigs dedicated to the task. The under-riding driver for the development timeline is the production schedule requirements. Many aspects of the development time line can be adjusted as needed by increasing or decreasing the quantity of drilling rigs and people dedicated to the effort. Development starts with the installation, pump testing and sampling of the mine unit monitor well ring. Development also includes the installation of the mine unit pattern wells, pipelines and associated header houses. Figure OP-4a reflects an approximate twenty-four month plan to complete the development work as follows:

A. Monitor Well Installation: Typically 60 to 70 wells, plan two drill rigs for five months.
B. Pump Test and Sampling: Allow for three months.
C. Mine Unit Application Preparation: Allow for two months.
D. Injection/Production Well Installation: Typically nine header houses per unit, 60 wells per header house. Requires 10 drill rigs to complete one header house in approximately 40 days. Allow for 13 months total.
E. Construction – Allow one month per header house (final header house completed in Month 24).

Production is defined herein as the recovery of the developed resource of a mine unit. The time requirement for mine unit production is a function of the size of the mine unit, the hydrologic properties of the formation, the available capacity of the Plant and the economic cut-off point for uranium grade and recovery.

Mine units are generally developed and activated in stages. Commonly, new production is staged in on the level of header houses (also called 'modules') rather than staging in complete new mine units. Depending on available pipeline and process plant capacity, an operator may initiate new production in areas as discrete as individual patterns. Production begins once injection of fortified groundwater (lixiviant) begins. The total time for production of a pattern is dependent on the efficiency of the areal sweep of the lixiviant, the effectiveness of the oxidation of the uranium in place and the injectivity and productivity of the formation (well flow rates). The factors listed below were incorporated into the estimation of the average time for economic production from a pattern at the proposed project.

A. Production Rate: 32 gallons per minute per production well. This is based on hydrologic results of several formation characterization tests.
B. Pore Volumes (PV): The estimated number of PVs processed to achieve economic depletion of the pattern is approximately 60 PV for the purpose of the production model.
C. Recovery Percentage: 80%. "NI-43-101 Preliminary Study for the Lost Creek Project" prepared by Lyntek, Inc., presents an 84 to 93% recovery rate for Lost Creek ore from laboratory tests. The 80% recovery rate as used for calculations in the production model is regarded as conservative and reasonably achievable.
D. Production Grade: The grade at which a pattern is expected to be turned off because the lixiviant grade has diminished to an uneconomic level was selected to be 10 milligrams per liter U_3O_8 for the purpose of the production model.

The assumptions above have been used in conjunction with a proprietary production model. The production model indicates that required time for the economic depletion of a single pattern is 12 months. Therefore, production in a mine unit is modeled to be completed 12 months after the initiation of production in the last developed header house in the unit. There is commonly a delay between the completion of development and the commencement of production at a given header house as determined by the availability of flow capacity within the process facility, specifically the ion exchange section.

Figure OP-4A (Lost Creek Project Development, Production and Restoration Schedule) was developed on the premise that the header houses within a mine unit will be activated in stages and that the final header house will be activated approximately one year after the first. Consequently, each mine unit has an expected production life cycle of approximately two years.

Groundwater Restoration, when completed, is defined in WDEQ-LQD Guideline 4 as the condition achieved when the quality of all groundwater affected by the injection of recovery fluids is returned to a quality of use equal to or better than, and consistent with the uses for which the water was suitable prior to the operation by employing the best practicable technology. Schedule OP-4A is based on 0.30 PV of groundwater sweep, six PVs of reverse osmosis treatment, and one PV of recirculation followed by one year of stabilization and sampling. Refer to Figures OP-5A through OP-5F for detailed scenarios of the water balance. The determination of the anticipated required amount of treatment for each restoration stage is discussed in detail the Responses to Comments V5, RP#1 through RP#3 and summarized below.

A. **Groundwater Sweep (GWS)**: The flow rate for groundwater sweep is anticipated to be typically 30 gallons per minute (gpm). The selection of this flow

rate is consistent with the principles of timely and efficient ground water restoration, i.e., Best Practicable Technology, as discussed in the Responses to Comments V5, OP#16, OP#97, and OP#101. The following calculations determine the twelve month per mine unit time requirement for GWS.

Pattern PV = Area x Completion Interval x Flare (horizontal & vertical) x Porosity x Gallon Conversion Factor
Pattern PV = 9000 ft^2 x 12 ft x 1.44 x 0.25 x 7.48 gal/ft^3 = 290,822 gallons

Time per Pattern = Pattern PV x Number of PV / GWS Flow Rate/ Time Conversion factor
Time per Pattern = 290,822 gallons x 0.30 PV / 30 gpm / 1,440 minutes per day
Time per Pattern = 2.0 days

Time per Mine Unit = Time per Pattern x # of Patterns per Header House x # of Header Houses per Mine Unit
Time per Mine Unit = 2.0 days per Pattern x 20 Patterns per Header House x 9 Header Houses per Mine Unit
Time per Mine Unit = 360 days (or about 12 months)

B. **Reverse Osmosis (RO)**: The life of project average recovery flow rate for RO as it relates to groundwater restoration is anticipated to be 600 gpm. As water balance Figures OP-5A to 5F indicate, the Mine Unit recovery rate for restoration areas undergoing reverse osmosis treatment will range between 570 and 800 GPM with the 570 GPM being the most common rate (Figure OP-5C). The total number of pore volumes of reverse osmosis required is estimated to be six as discussed in Responses to Comments V5, RP#1 and RP#3. The following calculations determine the thirteen-month requirement for RO treatment of a typical Mine Unit:

Pattern PV = Area x Completion Interval x Flare (horizontal & vertical) x Porosity x Gallon Conversion Factor
Pattern PV = 9000 ft^2 x 12 ft x 1.44 x 0.25 x 7.48 gal/ft^3 = 290,822 gallons

Time per Pattern = Pattern PV x Number of PV / Flow Rate / Time Conversion Factor
Time per Pattern = 290,822 gallons per PV x 6 PV / 570 gpm / 1,440 minutes per day
Time per Pattern = 2.1 days

Time per Mine Unit = Time per Pattern x # of Patterns per Header House x # of Header Houses per Mine Unit

Time per Mine Unit = 2.1 days per Pattern x 20 Patterns per Header House x
9 Header Houses per Mine Unit
Time per Mine Unit = 378 days (or about13 months)

Recirculation: The groundwater within each Mine Unit (1 PV by definition) will be homogenized by distributing the cumulative recovery flow back to the injection well system without treatment or deduction for bleed. In theory, this activity could take as few as seven days (see calculation below). To reflect the time required for implementation and execution, Figure OP-4a indicates a one month schedule for recirculation.

Pattern PV = Area x Completion Interval x Flare (horizontal & vertical) x Porosity x Gallon Conversion Factor
Pattern PV = 9000 ft^2 x 12 ft x 1.44 x 0.25 x 7.48 gal/ft^3 = 290,822 gallons

Time per Pattern = Pattern PV x Number of PV / Flow Rate /
Time Conversion Factor
Time per Pattern = 290,822 gallons per PV x 1.0 PV / 32 gpm /
1,440 minutes per day
Time per Pattern = 6.3 days

Time per Mine Unit = Time per Pattern = 6.3 days

Stabilization: Per Guideline 4, Section III(D)(1)(d) a stability period of "at least six months will begin". The guideline specifies that the restoration samples are to be taken monthly over the six month period to insure that the water quality within the wellfield has stabilized. LCI has committed to an extended stabilization period with a reduced sampling frequency to ensure geochemical stability. Samples will be taken at the outset of Stabilization and at the end of each of three calendar quarters (four total sampling events).

3 quarterly samples: 3 samples x ¼ year x 12 months per year = 9 months

14) <u>Section OP 2.1 Project Schedule</u>: What are the criteria to move from production into restoration, and restoration to stability monitoring? This should be specified. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11 Secs. 4(a)(ii) and 5(a)(i).

The criteria for moving from production to restoration are described in Section RP 1.0. A cross-reference to that section has been added to Section OP 2.1.

The monitoring that will take place during restoration and prior to transition from restoration to stability are described in the last paragraph of Section RP 2.3.2 and in Section RP 2.5, respectively. Development of the restoration criteria is discussed in Section RP 2.2. A cross-reference to the appropriate sections has been added to Section OP 2.1.

15) ***Section OP 2.1, Project Schedule:*** ***should demonstrate that reclamation will be contemporaneous with mining operations. Since the schedule presented in Figure OP-4a is considered to be somewhat conceptual and subject to change, definitive commitments such as the following should be provided, for example:***

- ***seamless transition from production to restoration with no well field down time***
- ***no inactive well fields for periods exceeding 30 days***
- ***specified minimum restoration flow rates***
- ***no more than two well fields in production at any given time***
- ***complete restoration of the first well field, through stabilization, before initiating production from the 5th well field. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 3, Sec. 2(k)(i).

As required in R&R Ch. 3 Sec. 2(k) and Ch. 11 Sec. 5(a)(i), the project schedule (Figure OP-4a) shows clearly that groundwater restoration activities will commence directly after mining operations are completed in each mine unit and restoration operations will occur concurrently with mining operations in other units as long as mining operations are ongoing. The schedule demonstrates a coordinated sequence of mining, restoration and reclamation with ground water restoration commencing directly following the determination of completion of uranium recovery (mining) in the first production area, consistent with the orderly and economic development of the property. Further, the capacity of the water/waste water treatment systems and correlation of the capacity with the mining and restoration schedule is clearly demonstrated in the presentation and discussion of Figures OP-5a through OP-5f.

R&R Ch. 3 Sec. 2(k), and/or other (non-cited) WDEQ-LQD regulations, do not suggest that definitive commitments should be provided when a schedule is "considered to be somewhat conceptual and subject to change." Indeed, the requirement to include a project schedule update with each annual report reflects an understanding that industrial operations are subject to changing economic and political conditions. Activities that may be deemed economic can change from year to year. Never the less, as stated in Section OP 2.1 of the permit application, LC ISR, LLC has committed to installing the specified restoration equipment and waste water disposal systems prior to commencement of mining at the site.

Figure OP-4a illustrates that the purchase of the restoration equipment and waste water disposal systems prior to the commencement of production will result in an idle investment for the first two years of the operational life. This action unequivocally demonstrates LC ISR, LLC's commitment to achieve the earliest possible reclamation consistent with the orderly and economic development of the property and to meet the WDEQ staff requirements of this Technical Comment. In fact, this commitment goes beyond the R&R Ch. 3, Sec 2(k)(i)(d) requirement of "orderly and economic development" by truly ignoring the fundamental economic principles of opportunity cost, deferring discretionary capital expenditures, and preservation of finite capital resources.

Responsible capital budgeting practices give explicit consideration to the time factor in the value of money. Timing of capital expenditures is therefore crucial to an investment's success. The opportunity cost of an expenditure made in advance of when necessary is detrimental to the investment's overall return. In other words, the money could have been put to better use at the time and the loss of this alternative use represents an opportunity cost. LC ISR, LLC projects that the advanced expenditure required to meet this commitment will approach eight million dollars.

Another consideration is the scarcity of capital. LC ISR, LLC presently has no sources of operating cash flows and thus has a finite amount of capital resources available to satisfy the nearly eight million dollar capital requirement of this project commitment. Any discretionary capital expenditures should normally be deferred until operating cash flows are available to fund the expenditures. The finite capital resources of the company should be preserved to enable the company to achieve production and subsequently generate operating cash flow. A discretionary capital expenditure made in advance of when necessary decreases the capital resources of the company and increases the project's risk without any corresponding increase in return.

Figure OP-4b presents the proposed restoration equipment installation schedule. The figure has been revised in light of regulatory/permitting delays with both the NRC and the WDEQ-LQD with the understanding that neither agency will allow construction of process facilities prior to issuance of the license/permit. In combination, Figures OP-4a and OP-4b represent LC ISR, LLC's detailed level of advanced planning and its unprecedented financial commitment to restore the affected aquifers in an orderly timeframe.

16) ***<u>Section OP 2.1, Project Schedule, Page OP-5:</u> The use of ground water sweep with direct disposal of the produced water, is no longer considered to be BPT due to excessive consumption of ground water and resultant impacts to ground water***

resources. This section (as well as section RP 2.3.1), should be revised to clarify that ground water sweep will only be employed when the produced water can be treated and re-injected. (MLB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-103(f)(i).

Please see Response to Comment V5, RP#1.

17) ***Page OP-5 (and RP-1), the statement is made that an updated schedule will be supplied with the annual report if the operation or restoration schedule varies from that shown in Figure OP-4a (and Figure RP-1). Lost Creek ISR should understand that they are obligated to follow the approved mine and reclamation schedule (refer to W.S. 35-11-415). If Lost Creek ISR plans to revise the approved schedule then it must be submitted as a permit revision for review and approval by LQD. An updated schedule submitted with an annual report would be informational, (and would probably trigger a request for a permit revision from LQD) but would not replace the schedule in the approved permit. Please revise these sections to reflect this understanding. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-429(a)(iv) and R&R Ch. 11 Sec. 19.

The next to last paragraph in Section OP 2.1 and the first paragraph in the Reclamation Plan have been revised to include a commitment to follow the approved schedule or to seek a revision if necessary.

The last sentence in the first paragraph of Section OP 2.1 has also been edited to reflect the anticipated average annual production.

18) ***Figures OP-5a-e. These water balance flow charts should include the average and minimum evapotranspiration rates of the evaporation ponds to show the full water balance of the ponds, and that the ponds are up to capacity requirements. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11 Sec. 4(a)(ii)(D).

The primary purpose of the storage ponds is to allow for maintenance of the disposal wells. The "Operations Plan, Section OP 5.2.3.1, Storage Ponds" details that purpose. Evaporative loss is not included in the water balance calculations and any evaporative losses will enhance the disposal capacity of the waste water system.

19) ***Section OP 2.2, Additional Regulatory Requirements. Reference is made to the SWPPP, yet a complete hydrologic control plan for the facilities area and associated appurtenances as well as the first mine unit must be included in the Operations Plan. Will water from the facilities area be diverted to a lined site containment pond. The hydrologic control plan for the remaining well fields maybe submitted with the individual well field packages. (BRW and AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. §§.35-11-406(b)(v), (ix) and (xiv) and 428(a)(iii)(C) and (D).

The drainage plan, stamped by a Professional Engineer, is included as Attachment OP-4 to the Application. It is important to note that the drainage plan was developed to ensure that surface water runoff will not cause undue soil erosion or excessive pooling of water. The drainage plan was not developed to prevent the migration of chemical spills. Due to the low relief of the area, lack of contaminant sources, and arid conditions, no lined containment ponds for runoff or other substantial erosion surface water control structures are required. No diversion structures are anticipated. When roads cross an ephemeral drainage a culvert will be installed. The culvert will be designed by a professional engineer in accordance with WDEQ-LQD Guideline 15 (see Sections OP 1.1 and 2.5.2).

During construction activities, erosion of topsoil into drainages will be minimized as required by the use of silt fence, hay bales, or other similar systems. There are no plans to alter the natural drainage within the wellfield areas.

20) ***Table OP-2 and the text on Page OP-7: Section "OP 2.3 – Land Use" states that a total of approximately 285 acres will be affected throughout the project. However, Table OP-2 only indicates 58 acres as being affected. This inconsistency should be clarified. It should be noted that Table OP-2 should include all disturbed areas throughout the life of the mine including all "tertiary roads". (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(a)((vi)(C) and LQD Permit-to-Mine Form 1.

Please see Response to Comment V5, OP#3.

21) ***Section OP 2.4, Cultural Resources Mitigation Program, Page OP-8: In the middle of line 7 in the first paragraph, after the sentence ending in the word "excavations", another sentence should be added. The new sentence must make a commitment to add via permit revision any/all archaeological restrictions and protocol in to the permit document. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: GL 11.

A paragraph which discusses existing and future restrictions and protocol has been added at the end of Section OP 2.4.

22) ***Section OP 2.5, Topsoil Management, Page OP-8: The second paragraph of this section reiterates that only 58 acres will be affected. However, this value disagrees with the previously stated value of 285 acres (in the Land Use section of the Operations Plan, Page OP-7). Please clarify which value is accurate: 58 acres or 285 acres. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(a)(vi)(C).

Please see Response to Comment V5, OP#3.

23) ***Section OP 2.5, Topsoil Management, Page OP-8: The text on page OP-8 states that detailed soil surveys will be conducted at the plant site as well as each mine unit to provide specific information for topsoil protection and management. Given that the first well field package must be included with the application, this is not acceptable. The detailed soil survey(s) necessary for topsoil management decisions and commitments at the first mine unit must be included in the Permit Application. (BRW and MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 2, Sec. 2(a)(i)(F)(II) and Ch. 11, Sec. 3(a)(iii).

With respect to the life-of-mine disturbance, the detailed soil survey information is included in Attachments OP-5a and 5b. With respect to Mine Unit One, please see Response to Comment V5, OP#2.

24) ***Section OP 2.5, Topsoil Management: should include a plan for well field layout and installation to accompany Figure OP-7c. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11 Sec. 4(a)(iii).

Pursuant to discussions at the June 22, 2009 meeting in Casper with WDEQ and LCI, a generic discussion of wellfield design criteria is included in Section OP 2.5 of the permit application.

25) <u>Section OP 2.5, Topsoil Management, Page OP-8:</u> The third paragraph of this section states that "Per WDEQ-LQD requirements, topsoil will not be stripped from areas where there is minor disturbance, such as light-use-roads, monitoring stations, fences, and drill sites (except for the mud pits);". Given the definition of "minor disturbance" as maintaining 50% of the native land remaining undisturbed, it has been the experience of this reviewer that in practice, it is not feasible to assume that the well fields will witness only minor disturbance. That is, based on this reviewers observations of the disturbance levels associated with delineation drilling at the Lost Creek Project, it is expected that greater than 50% of the native vegetation will be adversely affected during the construction of the mine units. In light of that, the LQD will require that mine units and the roads leading to them be completely stripped of topsoil. (MLB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: Ch. 3 Sec. 2(c) and Ch. 11 Sec. 4(a)(iii).

Pursuant to discussions during the June 22, 2009 meeting in Casper between LQD and LC ISR, LLC, the mine unit area will not be stripped unless greater than 50% of the area inside the monitor well ring will be disturbed. Areas impacted by main and secondary roads will be stripped of topsoil prior to road construction. Tertiary (two-track) roads will not be stripped of topsoil as a general practice. However, portions of tertiary roads may be stripped of topsoil and improved as needed to ensure the road remains in good condition.

While LC ISR, LLC fully intends to comply with the verbal agreement from the June 22, 2009 meeting, LC ISR, LLC believes it is important to document why stripping of topsoil within the mine unit is not considered a regulatory requirement or advisable from a technical standpoint. Regulations pertaining to topsoil protection can be found in WDEQ-LQD Rules and Regulations Chapter 3 Section 2(c)(i) through (iii) and Chapter 11 Section 4(a)(iii). The language in both chapters is very similar. With regard to topsoil protection in the wellfield, Chapter 11 Section 4(a)(iii) states in pertinent part,

> *"The Administrator may authorize topsoil to remain on areas where minor disturbance will occur associated with construction and installation activities including but not limited to light-use roads, signs,* ***wellfields*** *<u>(emphasis added)</u>, utility lines, fences, monitoring stations, and drilling provided that the minor disturbance will not destroy the protective vegetative cover, increase erosion, nor adversely affect the soil resource."*

It is LC ISR, LLC's position that stripping of topsoil within the wellfield area will create more disturbance (water and wind erosion and topsoil degradation) than leaving it in place. This assertion is based on many factors including:

- Experience at other facilities, such as Wellfield 1 at Smith Ranch. Because of the sandy nature of the soils in this wellfield, erosion and re-establishment of vegetation were problematic after wellfield installation, even though topsoil was not stripped. Ultimately, use of a cover crop (alternated in rows with the permanent seed mix) was necessary. Had the topsoil been stripped, it is likely the problems would have been even worse;
- The results of a study performed by the University of Wyoming College of Agriculture entitled *"Final Research Report: Topsoil Management on In-Situ Uranium Wellfields"* by P. Stahl et. al. This study, funded by the Wyoming Mining Association and developed from suggestions and comments from the Wyoming Department of Environmental Quality was finalized in January 1998.
- A September 14, 1998 letter from WDEQ Director Dennis Hemmer to the Director of the Wyoming Mining Association Marion Loomis stating in pertinent part, *"With regard to topsoil management at in-situ operations, you were concerned that DEQ would require stripping of the entire wellfield. I will not support a requirement to strip the entire wellfield. While our first priority in reclamation must be preserving topsoil, other than wasting or losing topsoil and contaminating topsoil, I believe one of the most destructive actions we take is stripping and stockpiling topsoil."*

Stripping the topsoil will result in the removal and destruction of 100% of the vegetation cover and associated root systems. By leaving the topsoil in place, at least some of the vegetation will survive, and the root system will help maintain the soils integrity thereby minimizing wind and water erosion. The subsoil at the site is composed of generally unconsolidated fines. When exposed to wind and rain this subsoil easily erodes and may contribute to increased sediment load in ephemeral drainages and decreased air quality. In addition, a particular concern at the Lost Creek site is the preservation of sagebrush. The ability of sagebrush to recover after mechanical damage (as opposed to fire damage) has been a bane to those trying to clear lands for other purposes. In this case, retaining as much sagebrush as possible should help with respect to wildlife habitat.

Finally, stripping of topsoil requires the use of heavy equipment such as scrapers and blades. This equipment will cause as much soil compaction as the relatively light equipment that will be used at the sight otherwise. A loaded scraper commonly used to strip topsoil tips the scale at 70,000 to 144,630 pounds (Caterpillar 613G and 623G respectively). The next heaviest piece of equipment at the site will be a 60,000 pound drill rig. Stripping of topsoil requires that the scraper drive over the soil to pick it up

and then drive over the topsoil pile to lay down the load. During reclamation the process will be reversed and the scraper will drive over the soil twice more. The rough soil will then have to be smoothed with a motor grader before revegetation. LC ISR, LLC realizes that typical operations within a mine unit will result in topsoil compaction. However, the effect of compaction will be mitigated by freeze/thaw cycles and if necessary by ripping of some areas before revegetation.

LC ISR LLC's agrees with WDEQ-LQD Guideline 4 Attachment III Section I which states in part, *"To minimize disturbance below the surface, preserve soil structure and facilitate the reestablishment of native vegetation, topsoil and subsoil are generally not stripped and stockpiled for the entire wellfield." Areas where the topsoil resource cannot be protected should be stripped (i.e. building sites, trenches, graveled roads, and areas susceptible to deleterious contamination from chemicals).*

26) <u>Section OP 2.5.2 Long Term Topsoil Protection</u>, Section OP2.6 Roads, Figure OP-2c. Topsoil stripping of roads has not been mentioned but is required for topsoil protection. The text should commit to topsoil stripping for roads and Figure OP-2c should also indicate that topsoil will be stripped. The amount of topsoil to be stripped should be specified and the height, dimensions, and locations of topsoil piles should be detailed. In addition, the seed mixture for the topsoil piles should be specified. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 3, Sec. 2(c).

The text in Section OP 2.6 has been revised to state primary and secondary roads (as defined in WDEQ-LQD Guideline 4 Attachment III Section III(B) will be stripped of topsoil. Figure OP-2c is intended to show road design and therefore has not been revised to discuss topsoil removal.

Topsoil depths in the areas around the plant facility, primary and secondary roads, and the first wellfield have all been characterized by Order 1-2 soil surveys. The results of the soil surveys in the area of the plant facility and roads is provided in Attachments OP-5a and 5b of the permit application. Results of the soil survey for the first mine unit will be provided in the mine unit package.

The long-term seed mixture to be used on long-term topsoil piles is given in Table RP-3 with the exception that shrubs will be removed from the mix. An initial vigorous cover crop, such as sterile rye, may be planted to stabilize the topsoil pile and then the final long-term seed mixture interseeded.

27) ***Section OP 2.5, Topsoil Management. Paragraph 3 states that topsoil will not be stripped from light use roads. It is stated that roads to monitoring wells will not be upgraded. Given that the monitoring wells will need to have year round access, if snow removal is necessary to access an area, then the road should be upgraded, and the topsoil should be stripped. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 3, Sec. 2(c) and Ch. 11, Sec. 4(a)(xxii).

Pursuant to discussions held on June 22, 2009 in Casper between LQD and LC ISR, LLC, roads to monitor wells will only be stripped of topsoil if the roads must be upgraded to maintain their integrity. The statement referenced in Section OP 2.5 has been revised to document this agreement. This approach is consistent with WDEQ-LQD Guideline 4 Attachment III Section VI(E) which states that topsoil is generally not salvaged from monitor well roads.

28) ***Section OP 2.5.2, Long Term Topsoil Protection: should specify that all topsoil stockpiles will be sloped on all sides to 3:1 or flatter and will be promptly drill-seeded with the permanent seed mix, minus the shrub species. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 3, Sec. 2(c).

Section OP2.5.2 has been revised to state that all long-term stockpiles of topsoil will be sloped on all sides at a slope of 3:1 or less and reseeded as soon as possible using the approved seed mix, minus the shrub species.

29) ***Section OP 2.6, Roads, Page OP-10 and Figure OP-2a: The first paragraph of Section OP 2.6 as well as Figure OP-2a neglect to acknowledge and/or depict the roads that will be needed to access monitoring wells (sometimes referred to as "tertiary" roads). These roads must be discussed in the text and must depicted on Figure OP-2a. Tertiary roads must also be depicted on any other figures depicting the project's roads. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 4(a)(i).

Plate OP-1 has been updated to show the approximate location of all proposed roads. The location of roads will be need to be adjusted as the ore body is further delineated. LC ISR, LLC will submit the proposed changes to WDEQ-LQD for review and approval. The site road map will subsequently be adjusted to accurately reflect road locations.

Please note that the first paragraph in Section OP 2.6 is intended to discuss primary and secondary roads. The fourth paragraph discusses two track roads that will be used to access monitor wells.

Each figure within the application serves a specific purpose(s). For example, Figure OP-1 shows the site layout including the roads. Therefore, it is not reasonable to put all the roads on all of the figures. This would result in illegible figures.

30) ***Section OP 2.6, Roads, Page OP-11:*** ***The fourth paragraph acknowledges that tertiary (two-track) roads will be needed and used to access the monitoring wells and header houses at the project. The text indicates that some pre-existing two tracks can and will be used for these purposes. However, the text also refers to the routes that will be taken to some monitoring wells and header houses as "travel routes". The inference of this reviewer is that these are paths beaten through the sage brush where there is no preexisting two-track. Travel routes will quickly become two-tracks which will, in turn, require reclamation at the end of the project. All of the site's roads, two-tracks, and travel routes must be accounted for in the text as well as site maps. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 4(a)(i).

Figure OP-1 has been updated to show the approximate location of all new two-track roads. The text in Section OP 2.6 has also been updated to discuss the two track roads.

31) ***Section OP 2.6, Roads:*** ***discusses the primary access road to the plant and secondary access roads to the mine units. Figure OP-2c illustrates the main access road with a 20' wide surface and secondary access road with a 12' surface. Figure OP-7b is somewhat inconsistent. It shows a "main road" with a 20' surface accessing the well field and a 15' wide secondary road in the well field. Table OP-4 lists main access road, main roads and secondary roads. Clarification is needed relative to road classifications and widths. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 1, Sec. 2(ax).

Figures OP-2c and OP-7b are incorrect based on the Bureau of Land Management publication "Engineering Road Standards, Excerpts From BLM Manual, Section 9113, 1985". Figure OP-2c has been revised to show the "Secondary Access Road" width as 14 feet and the borrow ditches as 3 feet each. Figure OP-7b has been revised

to show the "Secondary Road" as 14 feet wide. Table OP-4 has also been revised based on the above as well as the Response to Comment V5, #3.

32) ***Section OP 2.7, Vegetation Protection and Weed Control, Page OP-11:*** ***The second paragraph in this section end with an ending quote, with no preceding quotation mark. This appears to merely a typographical error. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: N/A (typo).

The typo has been corrected.

33) ***Sections OP 2.8.1.2 and OP 2.8.1.5 should discuss speed limits on the various roads, including signage, employee training and enforcement policies, specifically in regards to minimizing vehicle collisions with wildlife and livestock. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii).

The specific provisions of the Wildlife Protection and Monitoring Plans have been moved from Section OP 2.8 to Attachment OP-6. Section 1.4.1 of the attachment now includes information on speed limits, training, and road usage.

34) ***Section 2.8.1.4, Transmission Line: discusses power transmission lines. Raptors perching on power poles are a threat to sage grouse. Power lines should either be buried or raptor perch guards should be provided to deter raptor perching, in addition to minimizing the risk of electrocution. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii).

The specific provisions of the Wildlife Protection and Monitoring Plans have been moved from Section OP 2.8 to Attachment OP-6. Section OP 2.8.1.4 stated that roost guards would be included on transmission lines and power poles, and that commitment is now in Section 1.2.2 of the attachment.

35) ***Section OP 2.8.1.3, Fencing and Screening. Fencing design and specifications should be presented in the Operations Plan. Wildlife fencing, mud pit fencing and security fencing should each be specified. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii).

The specific provisions of the Wildlife Protection and Monitoring Plans have been moved from Section OP 2.8 to Attachment OP-6. Section OP 1.3.3 of Attachment OP-6 discusses fencing. Based on preliminary discussions with Mr. Scott Gamo of WGFD on August 18, 2009, use of fencing that is intended to preclude access by all wildlife to the mine units (e.g., Type I and II fencing) is not recommended due to mortality and injury concerns. Use of Type III fencing (to restrict access by cattle and wild horses) would be consistent with the approach used at other ISR operations. The exception would be in areas of the Plant, such as around the Storage Ponds.

36) ***Section OP 2.8.1.3, Fencing and Screening. As water in the ponds becomes concentrated over time, it is likely that screening will be required. US Fish and Wildlife Service (USFWS) and Wyoming Game and Fish (WG&F) should be consulted regarding the ponds and their requirements. Pond sampling schedule, the type of analysis to be performed, and screen design should all be presented in the Operations Plan. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii).

Table OP-5 includes the anticipated water quality in the pond, and Section OP 1.3.3 of Attachment OP-6 discusses the pond water quality relative to wildlife. Because the ponds are not evaporation ponds and because the water in the pond will be replaced periocially, the parameter concentrations are not anticipated to increase as would the concentrations in an evaporation pond. The

37) ***Section OP 2.8.2, Wildlife Monitoring, Page OP-13: A separate table summarizing the annual wildlife monitoring schedule should be created and referenced in this section. This table must include a commitment to survey the two mile radius around the permit boundary every year for new sage grouse leks. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii), R&R Ch. 11, Sec. 4(a)(viii), and GL 5.

For ease of review by WGFD and USFWS, Attachment OP-6 (Wildlife Protection Plan and Wildlife Monitoring Plan) has been added to the Operations Plan. Section OP 2.8 has been shortened substantially and summarizes the detailed information presented in Attachment OP-6. Table OP-A6-6 in Attachment OP-6 summarizes the wildlife monitoring schedule, and includes a commitment to survey the two-mile radius around the Permit Area for new sage grouse leks every year.

***38) Section OP 2.8.1, Wildlife Monitoring:** This section indicates that "...additional [protection] measures will be implemented as on-site activities..." but they are not specified. Please correct. (SP)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and R&R Ch. 11, Sec. 4(a)(viii).

Wildlife protection measures are described in Attachment OP-6 Section 1.1. Specific wildlife protection measures are grouped according to Operation restrictions and New Activity/Mortality Reporting (Section 1.1.1), Infrastructure (Section 1.1.2), Human Activity (Section 1.1.3), Site Maintenance and Reclamation (Section 1.1.4), and Habitat Enhancement (Section 1.1.5).

***39) Section OP 2.8.1.3, Wildlife Monitoring:** This section indicates that "...Mine units will be fenced..."; however, wildlife friendly fences identified in LQD Guideline #10 should be used for the perimeter fence. This would mean that all mud pits would need to be fenced as pronghorn antelope and other wildlife are capable of penetrating the perimeter fence. Please correct. (SP)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii).

Please see Response to Comment V5, OP#35.

***40) Section OP 2.8.1.3, Wildlife Monitoring:** Fences should not be removed until vegetation is well established. Please correct. (MM)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 3, Sec. 2(d)(viii).

Attachment OP-6 Section 1.1.2.3 states that the mine unit fences will be removed after ISR operations are complete and vegetation has become reestablished unless otherwise approved and agreed upon with the Landowner (BLM).

***41) Section OP 2.8.1.3, Wildlife Monitoring:** By only committing to net or use other deterrence only IF fluid storage ponds are determined "to be harmful" to birds, LC ISL is proposing to wait until a violation of the Migratory Bird Treaty Act (1971) occurs. Before a "taking" occurs, LC ISL should take preventative measures. Netting or other measures should be put in place immediately upon construction of any fluid holding structure larger than a mud pit. Please correct. (SP)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and R&R Ch. 11, Sec. 4(a)(viii).

Please see Response to Comment V5, OP#36.

42) ***Section OP 2.8.1.5, Wildlife Monitoring:*** ***This section should commit to a speed limit of no more than 30 mph to minimize vehicle collisions with wildlife. Please correct. (SP)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii).

Section 1.1.3.1 of Attachment OP-6 commits to a speed limit of 30 mph for the main access routes, and no more than 20 mph on secondary roads.

43) ***Section OP 2.8.1.6, Wildlife Monitoring:*** ***This section identifies "...wildlife enhancements in the Permit Area or nearby areas not proposed for disturbance...". Do "nearby areas" include only lands within the permit area or are those outside the permit area included as well ? Affecting areas outside the permit boundary may represent an LQD Regulatory conflict. Although interagency coordination may relieve LQD concerns. Please correct. (SP)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-103(e)(xvi) and Ch. 1 Sec. 2(ao).

Attachment OP-6 Section 1.1.5 describes a commitment to work with BLM and WGFD to develop habitat enhancements in areas that are outside the Permit Area, but nearby, if these are deemed desirable by permitting agencies. If these measures represent a regulatory conflict, or are not deemed desirable and feasible, they will not be undertaken.

44) ***Section OP 2.8 Wildlife Monitoring.*** ***Only monitoring of raptors and sage grouse is listed, yet vertebrates are also required to be monitored. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and R&R Ch. 11, Sec. 4(a)(viii).

The Wildlife Monitoring Plan is presented in Attachment OP-6 Section 2.0. LC ISR, LLC commits to monitoring: big game; sage grouse/upland birds; raptors; Migratory Birds of High Federal Interest; and lagomorphs (as prey abundance for raptors, Section 1.2.3). When completing other wildlife surveys, incidental observations of federally listed Threatened and Endangered Species, non-game mammals, non-game

birds, and reptiles and amphibians made will be recorded, and these will be summarized in the Annual Report.

45) ***Section OP 2.8.1.4, Transmission Line: Raptor deterrents designs on the transmission lines should be presented in the Operations Plan, and also approved by USFWS and WG&F.I (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and R&R Ch. 11, Sec. 4(a)(viii).

Please see Response to Comment V5, OP#34.

46) ***Section OP 2.8.2, Wildlife Monitoring: This section indicates that the annual report will be formatted to "...meet BLM requirements...". The LQD requires an annual report written to the format specification of the WQED-LQD (see Required Annual Report Information – For Large Mine Operations, rev. 10/93 on the LQD website: http://deq.state.wy.us/lqd/). BLM can receive a copy of the annual report to the LQD. Please correct. (SP)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-411.

The Annual Wildlife Monitoring Report will be formatted to meet WDEQ-LQD standards. This commitment is made in Attachment OP-6 Section 1.2.

47) ***Section OP 2.8.2.1 Raptors. It is stated that monitoring will be conducted between April and July, and also states that it will be scheduled as late in the nesting season as possible. Given known nesting seasons for the likely raptors to be present, the months to conduct the monitoring should be specified. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and GL 5.

A survey for signs of golden eagle and great horned owl courtship or nesting will be conducted during the first two weeks of February. A survey for great horned owl and golden eagle nests will be completed in March. A survey will be completed in April to locate most of the nests of other species. Another survey will be completed from mid-May to mid-June to locate raptor nests that have become established since the April survey, and to check the status (activity, number of young birds) of all nests. These commitments are described in Attachment OP-6 Section 1.2.3.

48) <u>Section OP 2.8.2.1 Raptors.</u> The potential need for wildlife mitigation measures should be outlined in the Operations Plan. Approval from USFWS and WGF will be required for taking a nest, or any raptor deterrence plan. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and GL 5.

Attachment OP-6 Section 1.2.3 describes the potential need for mitigation measures, if a raptor nest is found within the area covered by surface activity restrictions. That section also commits to consulting USFWS and WGFD to determine appropriate mitigation measures. Attachment OP-XX Section 1.1.2.2 commits to using agency-approved designs for anti-roosting raptor deterrents.

49) <u>Section OP 2.8.2, Wildlife Monitoring:</u> Annual wildlife monitoring reports also need to be included in the LQD Annual Report. This should be added to the text in paragraph one. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. 35-11-411 and GL 5.

Attachment OP-6 Section 1.0 states that the results and conclusions from each year's wildlife protection and monitoring measures will be included in LC ISR, LLC's Annual Report to WDEQ-LQD. Section 1.2 of the attachment states that the complete wildlife monitoring report--including survey methods, results, any trend, an assessment of protection measures implemented during the past year, recommendations for protection measures for the coming year, recommended modifications to monitoring or surveying, and any recommendations for additional species to be monitored (e.g., a newly listed species) will be submitted to WDEQ-LQD each year.

50) <u>Section OP 2.8.2, Wildlife Monitoring:</u> Once the mine permit is approved the wildlife monitoring plan will be clearly defined in the permit and it should not be necessary to coordinate with the BLM and WGFD "annually" prior to commencing or during monitoring unless unusual circumstances occur. Annual consultation with USFWS is generally not necessary unless a T&E species is seen or if a nesting raptor is found in spring within 1 mile of current operations or if planned expansion of the operation area is to occur within 1 mile that season. Please correct. (SP)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and R&R Ch. 11, Sec. 4(a)(viii).

Attachment OP-6 Section 1.2 states that consultation with BLM, WGFD, and USFWS will be occur on an as-needed basis as needed prior to annual survey work.

51) ***Section OP 2.8.2, Wildlife Monitoring:*** ***On page OP-13 it is indicated that LC ISL will "...document [the] circumstances..." of each wildlife incident with the operation and will included the information in the LQD annual report. LC ISR should commit to recording all incidences in a log book kept at the mine site and available for LQD inspection. Please correct. (SP)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii).

In Attachment OP-6 Section 2.0, LC ISR, LLC commits to documenting all instances where Project activities may have impacted wildlife (such as wildlife/vehicle collisions on roads, or other mortality within the Permit Area).

52) ***Section OP 2.8.2.1, Wildlife Monitoring:*** ***All available nesting habitat for raptors on the permit area and within a 1 mile perimeter should be checked for new nests every year (i.e., when the first survey of each nesting season is conducted). The volume of suitable nesting habitat is relatively small; therefore, it is not a huge task. Please correct. (SP)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and GL 5.

Section 2.3 of Attachment OP-6 describes the extent of the areal coverage and timing for the raptor surveys. As with the baseline surveys (Appendix D9), the perimeter will extend out one mile from the permit boundary.

53) ***Section OP 2.8.2.2, Wildlife Monitoring:*** ***"Standard protocol" in both instances should be changed to cite methods in the baseline study and if different, the method should be clearly stated here. Please correct. (SP)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and GL 5.

Sage grouse lek search and lek attendance survey protocols approved by WGFD and BLM for the baseline studies are detailed in Appendix D9. These methods will be used for future surveys, as noted in Section 2.0 of Attachment OP-6, unless alternate protocols are required by USFWS or WGFD.

54) ***Section OP 2.8.2.2, Sage Grouse, Page OP-15:*** ***Written documentation from the Wyoming Game & Fish and U.S. Fish and Wildlife Service which addresses any specific permitting requirements that they wish to impose based on the wildlife survey results, needs to be included in the permit document. Oral and written communication between Melissa Bautz (LQD-Lander) and Ms. Carrie Dobey (WGFD-Lander) reveal that the WGFD consider in situ uranium activities to have a similar effect on sage grouse and sage grouse habitat as does oil and gas activities.***

Specifically, WGFD's "Stipulations for Development in Core Sage Grouse Population Areas" (dated July 31, 2008) states the following regarding in-situ uranium: "There is no published research on specific impacts on sage grouse. Since development scenarios (well density, roads, activity) are similar to oil and gas, assume impacts are similar to oil and gas development. Use same stipulations used for oil and gas. In-situ uranium permitting should include a requirement to acquire data on sage grouse response to development and operation." In light of these concerns LQD will require that a section be added to the Wilfdlife Monitoring portion of the Operations Plan that addresses acquisition of data on sage grouse response to development and operation. Attached is a copy of the above-referenced document from the WGFD entitled "Stipulations for Development in Core Sage Grouse Population Areas". The stipulations on oil and gas development can be found at the beginning of that document. (MLB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and R&R Ch. 11, Sec. 4(a)(viii).

For ease of review by WGFD and USFWS, Attachment OP-6 (Wildlife Protection Plan and Wildlife Monitoring Plan) has been added to the Operations Plan. Section OP 2.8 has been shortened substantially and summarizes the detailed information presented in Attachment OP-6. The attachment includes Table OP-A6-1 which lists the stipulations and mitigation (including comparison of ISR and oil and gas operations). LC ISR, LLC also met with Mr. Scott Gamo of WGFD on August 18, 2009, primarily to discuss sage grouse protection. A printed copy of Appendix D9, the Operations Plan, and Attachment OP-6 will be sent to Mr. Gamo and the appropriate contact at USFWS, along with an electronic copy of the entire permit document. Correspondence with WGFD and USFWS related to the protection and monitoring plans will be included in an addendum to Attachment OP-6.

55) ***Section OP 2.8.2.2, Sage Grouse:*** ***discusses monitoring for sage grouse. It should be noted that the project is within the WG&F designated sage grouse Core Area. Please revise this section to include annual surveys for new leks on the permit area***

and a one mile perimeter. Also please reference WG&F approved survey methods which are described in Appendix B of LQD Coal Rules. (MM)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xiii) and R&R Ch. 11, Sec. 4(a)(viii).

Attachment OP-6 Section 1.1.1 states that the Permit Area is located within the South Pass Sage-Grouse Core Breeding Area. Sage grouse lek search and lek attendance survey protocols approved by WGFD and BLM are detailed in Attachment OP-6 Section 2.0. This section commits to conducting lek searches and lek attendance surveys within a 2-mile radius of the Permit Area.

56) ***Section OP 2.9, Prevention and Remediation of Accidental Releases: In the second paragraph of this section, the commitment to contact the WDEQ/LQD and WDEQ/WQD within 24 hours of a release must specify that the contact will be verbal (not merely via e-mail or voice mail). (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 12(a)(i).

Section OP 2.9 has been revised to confirm LC ISR, LLC's commitment to comply with existing regulations by verbally notifying WDEQ/LQD and WDEQ/WQD within 24 hours of a qualifying release.

57) ***Section OP 2.9, Prevention and Remediation of Accidental Releases: This section needs significantly more detail. What is the specific training that will be provided all employees? What is the frequency of the training? What is the frequency of the inspections to be conducted? How will the inspections be documented? The detailed procedures to be outlined in the Environmental Management Programs should be presented as part of the mine permit. Surface and pipeline spills have been a common occurrence at ISL facilities in the past. The Division is requiring that detailed, documented, training and inspections be clearly outlined in the Operations Plan. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(F) and R&R Ch. 11, Sec. 4(a)(vii).

Pursuant to discussions during the June 22, 2009 meeting in Casper between LQD and LC ISR, LLC, Standard Operating Procedures (SOP) addressing spill prevention and mitigation will be developed and implemented at the site. The SOPs will specifically address: pipeline installation and testing; automated system monitoring and alarming; site inspections; spill mitigation; and employee training.

58) ***Section OP 2.9, Prevention and Remediation of Accidental Releases:*** ***This section must include a discussion of how contaminated soils resulting from a spill are to be delineated horizontally and vertically. Gamma ray and SAR must be included in the parameters measured in the soil. Specifics on how the depth of contamination will be determined and mapped must be provided. Treatment protocol must also be addressed in this section. Additionally, the permit must contain a commitment to report and track annual releases from the site via a map in the WDEQ/LQD Annual report. The map should be a cumulative map indicating the footprint of the recent years spills in addition to any previous spills. This map should be accompanied by a table outlining the history of each release, including the estimated amount (gallons) of the release, footprint of contamination, depth of contamination, initial contamination levels, their sample locations, and any history of remediation efforts. (MLB and AB)***

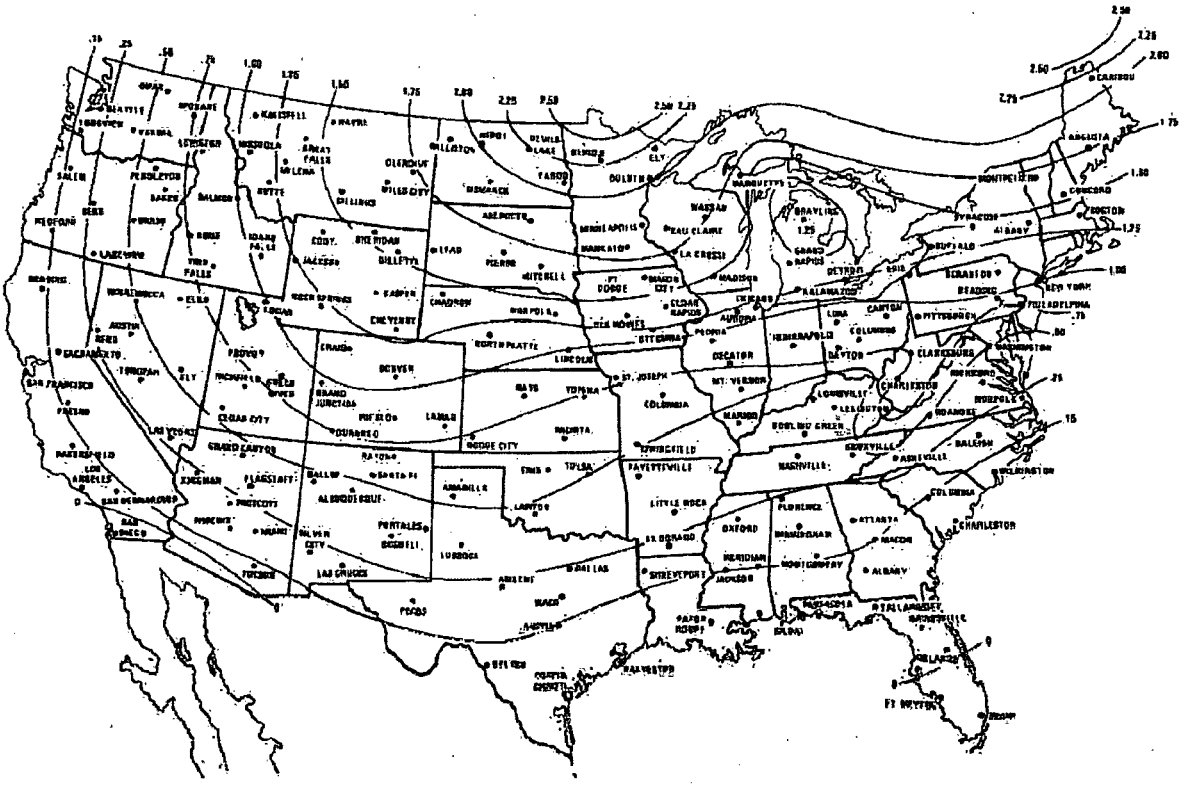
Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. §§ 35-11-428(a)(iii)(F) and 406(b)(ix) and R&R Ch. 11, Sec. 4(a)(vii).

Section OP 2.9 has been revised to address this comment.

59) ***Section OP 2.9.1, Pipelines, Fittings, Valves and Tanks, Page OP-15:*** ***In the second paragraph, the depth at which pipes will be buried as well as the depth to which freezing occurs at the site should be discussed. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C).

Pipelines will generally be buried between 48 and 72 inches below surface. The maximum Project frost line according to the National Oceanic and Atmospheric Administration (NOAA) is approximately 1.3 meters or 51 inches. However, this depth is highly dependent upon temperature, traffic, moisture, soil type, etc. The pipelines are buried to prevent freezing when the fluid is not flowing, such as during a significant power outage or a long term process shutdown. The chart from the NOAA is shown below:



60) ***<u>Section OP 2.9.1, Pipelines, Fittings, Valves and Tanks Page OP-16:</u> In the first paragraph, more detail on how the flow through pipelines will be monitored must be provided. Specifically, there should be as commitment to having a central control room where monitoring of pressure and flow of individual wells and pipelines and system balance on a mine wide and unit basis is automated. It is expected that there will be alarms requiring a response by a human being and documentation that the alarm was answered and by whom it was answered, etc. It is the reviewers' belief that a human being should not have to occupy a header house to monitor what is occurring in that particular sector of a given well field. A central control room will also minimize traffic across the site, a stated goal of the project. Other items to be addressed include how the alarm system will be tested to verify its integrity, use of tolerance limits to account for nominal deviations in flow and pressure, who/how the entire system will be monitored, whether the system will be monitored 24 hours per day and seven days per week by a human. Will the system have redundancy? In the earliest meetings among LQD and Lost Creek ISR personnel (along with AATA personnel), a central control room style of monitoring***

was explained (by AATA to LQD) to be an integral part of this project's design. (MLB and BRW)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C) and (F) and R&R Ch. 11, Sec. 14(a).

The following response is grouped by topic (Leak Detection, System Integrity, Tolerance Limits, Oversight, and Redundancy).

Leak Detection:
The basis for monitoring flow and pressure in pipelines is the prevention of leaks. There will be three layers of protection associated with the wellfield instrumentation:

1. Monitoring and Data Output
2. Alarm and Notification
3. Control and Shutdown

1. Monitoring and Data Output:

   a. Oxygen: Oxygen pressures will be monitored for abnormal operating conditions.
   b. Production Systems: The main header pressure and flow rate will be monitored as well as the flow rate of each of the production wells for abnormal operating conditions. The On/Off status of each of the pumps will also be monitored.
   c. Injection Systems: The main header pressure and flow rate will be monitored as well as the flow rate of each of the injection wells for abnormal operating conditions.
   d. Header House Sumps: Sump levels and the operating status of the sump pumps in the header house basements will be monitored and transmitted to the Plant for review/alarm.

2. Alarm and Notification:

   a. Oxygen: High and low data points will be set for oxygen injection piping within the header houses. If pressures are outside the set points, Operators will be notified via alarm and Wellfield Operators will address the upset condition.
   b. Production Systems: The main header pressure and flow rate will have high and low set points. If there is an upset condition, Operators will be notified via alarm and Wellfield Operators will address the upset condition. The same is true for individual production well flow rates as well as the On/Off status of

the pumps. Differential flow algorithms may be utilized to review differential flow status to determine if there is a potential problem. Production wellheads will have fluid detection systems to alarm of a leak. The fluid will close a circuit that will generate an alarm either locally, at the plant, or both.

c. Injection Systems: The main header pressure and flow rate will have high and low set points. If there is an upset condition, Operators will be notified via alarm and Wellfield Operators will address the upset condition. The same is true for individual injection well flow rates. Differential flow algorithms may be utilized to review differential flow status to determine if there is a potential problem. Injection wellheads will have fluid detection systems to alarm of a leak. The fluid will close a circuit that will generate an alarm either locally, at the plant, or both.
d. Header House Sumps: If sumps have fluid in them, the sumps will be activated and the fluid pumped into the production header. Anytime the sumps are activated, the Plant Operator will receive an indication. If a high level is the sump is received, the Operator will receive an alarm and the Wellfield Operator will address the upset condition.

3. Control and Shutdown:

a. Oxygen: Pressure switches and interlocks with the injection system will be utilized to insure that oxygen injection cannot occur without adequate flow and pressure in the injection header. The concept being that if oxygen is only allowed to enter the injection header when water is present, then dangerous concentrations cannot build up in the piping.
b. Production Systems: There are several levels of control and shutdown within the production system. The PLC will be connected to the Plant and will allow for shutdown/startup of all production wells in upset conditions. The main valve will be capable of being shut based on operating conditions, i.e. sump overflow, ruptured flowline, etc. The motor control center (MCC) will typically be interlocked with the sump high level shutoff to shut down operating pumps. The wellheads will typically utilize any leaking fluid to complete a circuit and initiate an alarm in the form of either an audible/visible alarm locally or by transmitting an alarm to the operations center. Simple systems included in the piping include check valves to insure that pipeline production fluid cannot enter shutdown sections of pipe.
c. Injection Systems: Control of this system begins with the control valve where the injection fluid enters the header house. This valve will maintain the appropriate pressure and flow for the local operating conditions as well as allow for complete shutdown of injection. Data from the main flow line and the individual injection wells will be transmitted to the Plant for review. If there is an upset condition, operators will be notified and suspect area will be

shut down for maintenance. The wellheads will typically utilize any leaking fluid to complete a circuit and initiate an alarm in the form of either an audible/visible alarm locally or by transmitting an alarm to the operations center.

d. Header House Sumps: High sump levels will initiate a shutdown in the production wells and alarm the Operators.

System Integrity:
As with any system, one of the keys to the overall integrity is a regular presence of Operators in the mine units. The Operators will be responsible for taking measurements and looking for leaks and problems at the header houses. In addition, their regular routine will include checking each of the wellheads for leaks or salts and repairing them as needed. They will also be required to the drive the pipeline right-of-way and check the valve stations for leaks and signs of moisture. Also key to the proper operation is the additional review of operational data by managers and engineers. Verifying data through calculation and providing technical support to the operators will be routine to their activities.

Tolerance Limits:
Differential flow algorithms may be utilized to review differential flow status to determine if there is a potential problem.

Oversight:
The facility will have coverage 24 hours a day, 7 days a week from both Wellfield Operators and Plant Operators.

Redundancy:
The system has multiple components with varying points of redundancy, including:

- Flow data capture/analysis and sump alarms and wellhead leak detection in header houses;
- Flow data capture/analysis from the plant to the disposal well and from the disposal well pump to the wellhead;
- Pipelines have flow measurement at the distribution and reception points as well as pressure comparison.

61) <u>Section OP 2.9.1 Pipelines, Fittings, Valves and Tanks</u>. Preventive maintenance procedures should then be described. Visual inspection of pipelines, fittings and valves should be conducted to detect seeps or deteriorating conditions. Preventive maintenance schedule for replacement of pumps or valves, should also be discussed. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(F) and R&R Ch. 11, Sec. 9(a)(iv).

Information on equipment design life and inspection has been added to Section OP 2.9.1.

62) ***Section OP 2.9.1 Pipelines, Fittings, Valves, and Tanks. What will be considered a significant change in flow rate or pressure to activate the alarm? Which will actually be monitored – flow rates or pressures? (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(F).

The minimum detectable leakage will typically depend on the area, the system and the location of the leak. For example:

LCI is planning on installing wellhead leak detection inside the wellhead covers. This detection system will typically use simple circuit completion as the tool to alarm in the event of a leak. In this case, anything from a drip to a small leak will be detectable if it will "puddle" water.

LCI is also planning on installing sumps in the wellfield header houses. The sump pumps will provide notification to the main system when they become operational. Again, if the leak is large enough to generate two or more gallons, the alarm should initiate. This will alarm and contain all leaks within the header houses. In the case of a catastrophic type failure within the header house, the sump pump will not be able to keep up and a high level shut down point will be reached. At that time, the injection and production line control valves will shut and the pumps associated with that motor control center will shut down.

Leaks between the header house and the wellhead are the hardest to detect and at the same time the rarest. There are typically no fittings outside the header house or the wellhead cover, only High Density PolyEthylene (HDPE) pipe. Typical failures occur at connections or fusion joints. The flow rates and pressures for injection and production wells will normally be monitored and compared against themselves through the main system. This is what is normally referred to as differential flow and pressure analysis. An upset will usually be defined in the 10% to 25% range and generate an alarm for the operator's attention. It is percentage based, so the individual alarm status will depend on the flow and pressure input/output.

As with all leak detection systems, they are augmented by a strong operations and field presence with routine checks on pipelines, wellheads and other production components.

63) ***Section OP 2.9.3 Buildings.*** ***Header house and pumphouse details should be presented which indicate the inclusion of a sump and fluid detection sensors. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(F).

Please see Response to Comment V5, OP#60.

64) ***Section OP 2.9.3 Buildings.*** ***The height of the concrete curbing, the capacity and location of the sumps in the buildings, and the sloped curb at the overhead doors should all be described in greater detail. What will the storage capacity be of the building acting as a secondary containment should there be a leak, spill, or tank failure. i.e. how many tank failures can the storage capacity accommodate? (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C).

The Plant design incorporates concrete berms designed to contain a spill of one or more vessels. The largest tanks in the plant are approximately 21,000 gallons each and the total berm containment volume is approximately 163,000 gallons. The berms will also contain waste fluid released if either the piping or the transfer pumps were to fail. All the systems will use instrumentation in the form of level indication and pump operation indication to support leak detection. The volume of containment in each of the main areas of the Plant is:

Precipitation Room:
Area of precipitation room: 39 ft x 178.5 ft ≈ 6961 ft^2
Area taken up by tanks/filter presses/pumps/ramps: ≈700 ft^2
Total useable area: 6961 ft – 700 ft = 6261 ft^2
Volume of sloping foundation: (0.5) x (6261 ft^2) x (.396 ft) ≈1240 ft^3
Minimum height of berm: 0.5 ft
Volume of bermed area: 0.5 ft x 6261 ft^2 ≈3130 ft^3
Volume of sumps (2 at 18 ft^3 each) = 36 ft^3
Total containment volume: 3130 ft^3 + 1240 ft^3 + 36 ft^3 = 4406 ft^3 or ≈ 33,000 gallons

Chemical Room:
Area of chemical room: 39 ft x 77 ft ≈ 3003 ft^2
Area taken up by tanks/pumps/berms: ≈ 1075 ft^2

Total useable area: 3003 ft – 1075 ft = 1928 ft^2
Volume of sloping foundation: (0.5) x (1928 ft^2) x (.396 ft) ≈ 382 ft^3
Minimum height of berm: 1 ft
Volume of bermed area: 1 ft x 1928 ft^2 = 1928 ft^3
Volume of sumps (2 at 9.5 ft^3 each) = 19 ft^3
Total containment volume: 1928 ft^3 + 382 ft^3 + 19 ft^3 = 2329 ft^3 or ≈ 17,400 gallons

MAINTENANCE/FUTURE DRYER/AREA:
Area of interest: 39 ft x 178.5 ft ≈ 6961 ft^2
Area taken up by tanks/pumps/berms: ≈ 1030 ft^2
Total useable area: 3003 ft – 1075 ft = 5931 ft^2
Volume of sloping foundation: (0.5) x (5931 ft^2) x (.396 ft) ≈ 1175 ft^3
Minimum height of berm: 0.5 ft
Volume of bermed area: 0.5 ft x 5931 ft^2 = 2966 ft^3
Volume of sumps (3 at 9.5 ft^3 each) = 28.5 ft^3
Total containment volume: 2966 ft^3 + 1175 ft^3 + 28.5 ft^3 ≈ 4170 ft^3 or 31,200 gallons.

Ion Exchange / Elution / Restoration:
Area of interest: ≈ 18563 ft^2
Area taken up by tanks/pumps/berms: ≈ 2927 ft^2
Total useable area: 18563 ft – 2927 ft = 15636 ft^2
Volume of sloping foundation: (0.5) x (15636 ft^2) x (.396 ft) ≈ 3096 ft^3
Minimum height of berm: 0.5 ft
Volume of bermed area: 0.5 ft x 15636 ft^2 = 7818 ft^3
Volume of sumps (2 at 9.5 ft^3 each) = 19 ft^3
Total containment volume: 3096 ft^3 + 7818 ft^3 + 19 ft^3 ≈ 10,933 ft^3 or 81,780 gallons

TOTAL STORAGE VOLUME OF BERMS = 21,838 ft^3 or ≈ 163,350 gallons

65) ***Section OP 2.9.4, Storage Ponds, Page OP-16:*** ***In the first paragraph of this section it is stated that pond capacity will be designed to accommodate two weeks of plant operation. However, the sixth paragraph of this section (on Page OP-17) states that the ponds will be kept full at all times to maintain the integrity of the liner (due to exposure of the elements including UV from sunlight). It appears, then, that at any given time the pond will actually have no capacity if it is full all the time. Please explain. Additionally, actual pond design plans must be provided. The schematic view of the ponds provided in Plate OP-1 are not sufficient. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C) and R&R Ch. 11, Sec. 4(a)(ii)(D) and (iv).

The discussion of the ponds being kept full is misleading as the permit states that "water will be kept in the ponds at all times" to "reduce" (not prevent) liner exposure to sun, wind, and freezing temperatures. LC ISR, LLC's primary intent is to maintain a small amount of water in the bottom of the ponds to insure the liner stays in place during elevated winds. The depth of fluid is expected to be no more than one foot. The normal use of the storage ponds will be for waste water holding during a "Falloff Test" of a disposal well. Pond use will only be required if the remaining wells will be used to their capacity.

The response to Volume 5, Comment # 9 discusses in detail the specifications for the storage ponds as well as the construction drawings and supporting engineering information.

66) ***Section OP 2.9.4 Storage Ponds. The ponds are said to be designed to store two weeks of plant operations at a rate of 60 gpm, yet according to the water balance on Figure OP-5c, the maximum capacity should be based on 115 gpm of flow during maximum operations. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 4(a)(ii)(D).

The water balance (Figures OP-5a–5f) details the anticipated normal operating scenarios at the Lost Creek Project. Testing or a failure of a disposal well when operating at maximum capacity would not be considered a normal scenario. During this case, non-essential activities would be reduced, all other disposal wells would be brought up to full injection capacity and only mandatory flows to disposal would be maintained. In the case of Figure OP-5c, these might include:

- A temporary shutoff of low production wells not necessary to maintain wellfield balance;
- A reduction in groundwater sweep flow while still maintaining a cone of depression, and
- A reduction in reverse osmosis flow and treatment while still maintaining restoration balance.

This reduction is estimated to be as much as 55 gpm, yielding a maximum flow to the storage ponds of 60 gpm. The pond design is for redundant capacity to allow 4 feet of storage in one pond with the other on standby.

67) ***Figures OP-5a, b, c, Water Balance Diagrams: According to water balance diagrams presented, the deep disposal well(s) must have a minimum capacity of roughly 100 gpm. No information has been provided regarding the viability of a***

deep disposal well(s) and whether the characteristics of the intended formation would be sufficient to meet the project demand stated above. Prior to WDEQ/LQD permit approval, plans and specifications and approval for a deep disposal well(s) must be secured from the appropriate regulatory authority. Permits for such wells must be included in the WyDEQ/LQD permit application. This comment can be cross referenced with comment number 115 below which addresses "Section 5.2.3.2, UIC Class I Wells". Please provide. (BRW)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and 427 and R&R Ch. 11, Secs. 3(a)(ii), 4(a)(vi) and (vii).

LC ISR, LLC submitted the UIC Class I Disposal Well Application on June 29, 2009 for the Lost Creek Project to WDEQ-WQD. The application requests a disposal capacity of 50 gpm per well with a total of five wells (250 gpm). The data in the application is supported by actual field data obtained during the drilling and testing of the Lost Creek Test Well #1. Figures OP 5a – 5f detail the required disposal requirements. Figure OP-5c details the worst case with Production, Reverse Osmosis and Groundwater Sweep all occurring simultaneous. The required disposal in this case is 115 gpm.

The WDEQ-LQD was copied on this application when it was submitted, and a copy is included in Attachment OP-4A. Also, Table ADJ-1 has been updated to show the status of each permit/license required to construct and operate the facility.

68) <u>Section OP 2.9.4 Storage Ponds:</u> What consideration has been given to the ponds freezing over. With only four feet of fluid capacity it is possible that the materials in the ponds could freeze solid. Does this have any implications to the liner strength and integrity. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 4(a)(iv) and LQD/WQD Working Agreement Sec. IIIA.

LCI contacted the manufacturer and vendor with the questions above. The response from Mr. Steve Wilson of Geotec Industrial Supply is:

> "The 45mil Polypropylene Liner is a very durable choice for this application. The material is black which has a tendency to absorb heat year round. I haven't heard of a pond this size ever completely freezing. If the pond becomes covered with ice you will not want to drain the pond."

The staff at LCI has had similar experience with pond liners. It is normal for a thin layer of ice to form during extreme cold temperatures, however the ice does not typically last for long.

69) ***Attachment OP-2, Figure titled Embankment Details:*** ***If the excavated material at the pond site is not suitable for embankment material, it states that material will be removed from a borrow area. Given the amount of drilling that has taken place within the permit area, has a source for embankment material been identified? The proposed borrow area should be identified, and it's size, depth of excavation, and reclamation requirements should be outlined in the attachment. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(i) and (iii)(G) and LQD/WQD Working Agreement Sec. IIIA.

Appendix B of the Design Report for the storage ponds, included in Attachment OP-XX provides the results of the geotechnical investigation at the pond location (see Response to Comment V5, OP#9). The results of the investigation indicate the conditions under the Plant and the storage ponds and allows for the use of native soils in construction.

During excavation and construction of the storage ponds, an engineer will be on-site monitoring the soil quality and the compaction. If the engineer deems the excavated material unfit for construction purposes, a borrow area will be defined at that time.

70) ***Attachment OP-2, Figure titled Embankment Details:*** ***Although the text says fluid height will be four feet and freeboard 3, please indicate on the figure that the embankment height is 7.0 feet. Also there appears to be a typo on the Embankment Detail typ. Cross section, with a number three (3) in large font. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 4(a)(iv) and LQD/WQD Working Agreement Sec. IIIA.

The typo on Attachment OP-2, Figure "Embankment Details" has been fixed.

71) ***Plate OP-1, Plant Site Plan:*** ***This plate must be upgraded to an actual design including a conventional scale (the current scale is 1" = 16') and the location of the Plant Site must be depicted on a topographic map with township, range, and section lines as well as roads and other pertinent landmarks. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(v) and 428(a)(iii)(D) and R&R Ch. 11, Sec. 4(a)(i).

Please see Response to Comment V5, OP#4.

72) ***Section OP 2.9.2, Fuel Storage Areas:*** ***More detail is needed in this section. Specifically, secondary containment must be addressed and explained. Additionally, the weekly inspection criteria should be stated here. If an inspection checklist is to be used, the items on the checklist should also be listed. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C).

Fuel storage at the site will consist of an above ground gasoline tank with a maximum volume of 5,000 gallons and an above ground diesel tank with a maximum size of 5,000 gallons (Plate OP-2). The tanks will be within a lined spill containment system sized to contain at least 110% of one of the largest tank. A Spill Prevention Control and Countermeasure Plan is required and will be in place before the tanks are placed into service. The tanks and the containment area will be checked at least weekly for vessel, piping and containment integrity as well as indications of leaks or spills. All are planned to be documented as part of the routine inspection process.\

73) ***Section OP 2.9.5 Fuel Storage areas. How much fuel will be on-site? The Plant Site Plan (Plate OP-1) shows a gasoline and diesel tank. Is there enough fuel to qualify for Spill Prevention Control and Countermeasure Plan requirements under the Clean Water Act? If the volumes are less than the threshold, good management practices would dictate that there should be secondary containment for the tanks, capable of holding the capacity of the largest of the two tanks. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C).

Please see response to the previous comment.

74) ***Section OP 2.10, Air Monitoring:*** ***Please indicate the source and quantity of water expected to be used for dust suppression, potable water supply, etc. for the proposed mine activity. (BRW)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xvi).

Dust Suppression:
The Air Quality Permit submitted to WDEQ-AQD addresses dust suppression and/or the use of a chemical suppressant such as magnesium chloride (Attachment OP-1).

The need for dust suppression will be highly variable dependant on weather conditions, moisture content in the soil/roadbase, drilling density and construction activities. It is anticipated that some water will be used for dust suppression during the late summer months. The normal anticipated volume during a calendar year is estimated at 8 to 80 barrel water trucks per suppression event and 4 suppression events per year. The total usage is estimated at 110,000 gallons per year or 300 gallons per day. The source for the water supply is planned to be one of the permitted water supply wells within the Permit Area.

Potable Water:
For the Lost Creek Project, potable water is defined as that which will be used for drinking, handwashing or showering. That volume is estimated at 250 gallons per day. The supply will typically be from the water well installed adjacent to the Plant (well LC229W).

Non-Potable Water:

1. Toilets/Urinals: is estimated at 270 gallons per day and the supply will be from the Plant water well.
2. Plant Use: will consist of water for process and wash water. That amount is estimated at 10 gallons per minute or 14,400 gallons per day and will come from the Plant water well or treated water from the production stream as is appropriate.
3. Drill Water: LCI estimates it will use 10 drill rigs per week day during the drilling phase of the project. Each drill rig will typically use 150 to 200 barrels of water per day while drilling. Estimated drill rig productivity is four days per week for 50 weeks per year. Therefore, the total estimated drill water usage is 34,500 gallons per day. Supply will normally come from any/all of the permitted water supply wells on the Lost Creek Permit Area.

75) <u>Section OP 2.11.1, On-Site Wells, Page OP-18:</u> Is the reference to "17 wells used to establish baseline" now outdated in light of the new wells installed at the site in late 2008? Please update if necessary. (MLB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 3(a)(xi)(A).

Section OP 2.11.1 was updated to reflect the addition of ten monitor wells in 2008 (MB-01 thru MB-10).

76) <u>Section OP 2 11.2 Off-Site Wells.</u> The BLM stock wells are said to be analyzed quarterly at a minimum for natural uranium and radium-226, yet if the mine operations are going to impact these off-site wells there are other parameters that

would be early detectors of a problem that should be analyzed. Quarterly analysis should also include Cl, sulfate, bicarb, TDS, and pH. If these elements are showing trends, then action will be required, similar to the monitoring well ring. Please revise the text accordingly. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 14(a).

The commitment to sample operational BLM stock wells near the Permit Area was made in order to comply with NRC Regulatory Guide 4.14 Table 2 and is not intended to satisfy any WDEQ requirements. The commitment was placed in the state permit to mine application to maintain consistency across the agencies. The monitor well system surrounding each respective mine unit is the sole detection system for excursions. The stock wells near the permit area (within 2 kilometers of an active wellfield pursuant to the standard interpretation of Regulatory Guide 4.14) will be so far from active mining that it is not reasonable to expect an undetected excursion to reach the wells within the life of the project; especially given a natural groundwater flow rate of approximately 4 feet per year. Therefore, the analyte list presented in OP 2.11.2 will be maintained to comply with NRC requirements.

77) ***Section OP 2.11.2 Off-Site Wells Section OP 3.6.4.1 Mine Unit Baseline Water Quality and Upper Control Limits. These sections reference Lost Creek's Environmental Manual, and states that it discusses the sampling protocols. What is and where is this document? Sampling protocols need to be outlined in the permit document, as stated in Comment 28 from my August 26, 2008 comments on Appendix D-5 and D-6. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 15(a)(i).

The Lost Creek Water Well Sampling Procedure is attached as Attachment OP-8.

78) ***Section OP 3.2, Mine Unit Design: LQD Chapter 11, Section 6(d), states that casing requirements must be specified to prevent casing collapse during installation; convey liquid at the predicted injection / recovery rate and pressure; and allow for sampling. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 6(d).

Please see Response to Comment V5, OP#90.

79) ***Section OP 3.2, Excursions:*** ***A section specifying the corrective action that will be taken in the event of an excursion must be added to this section. A concrete commitment describing the handling of an excursion must be provided. Specifically, if an excursion is not in control within 60 days the [LQD] Administrator, with concurrence of the Director of the DEQ, has the authority to terminate the mining operation and revoke the permit (Chapter 11, Section 12(d)(ii)). Additionally, this reviewer would like to see text in this section regarding the steps Lost Creek plans to take in the event of an excursion. A discussion of the cessation of injection into the area under question, prior to 60 days into the corrective action process may be warranted. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(F) and R&R Ch. 11, Sec. 4(a)(xx).

The comment refers to Section OP 3.2 which is entitled Wellfield Design and is not intended to address excursions. The language regarding excursion detection and corrective action can be found in Section OP 3.6.4. Commitments within Section 3.6.4.3 include suspending injection into the pattern area adjacent to the monitor well where the excursion is being detected. A cross-reference to Section OP 3.6.4 has been added at the end of the 3rd paragraph in Section OP 3.2

80) ***Figures OP-8a, 8b, and 8c.*** ***How far is the sand trap and base of the well bore expected to extend into the lower aquitard? With the Sage Brush shale pinching out to five feet in some locations, this aquitard should not be intersected if its integrity could be questioned. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 4(a)(xii) and (xiv)(B).

The typical screen and trap assembly is less than three feet in length. Figures OP-8a, 8b and 8c depict worse case scenarios where the desired screen interval is immediately above the underlying aquitard. This is typically not the case. Every effort will be made to insure production and injection well assemblies do not penetrate through the lower aquitard. In the unlikely event that the wellbore penetrates the lower aquitard into the underlying zone, the penetrating portion of the wellbore will typically be plugged with the appropriate sealing material (grout or cement). In addition, the wellbore is typically resealed during the casing and cementing phase as the cement is pumped down the casing and up the annulus.

Also, because baseline water quality and water levels are obtained in the underlying sand prior to operational activities, injection or production from the underlying sand

would typically be seen in the nearest underlying monitor well. This would typically be seen first in the water level changes and second in water chemistry.

81) <u>Section OP 3.2 Mine Unit Design.</u> Mine Unit 1's well field package will need to be submitted for review and approval prior to approval of the ISL Permit application. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: See WDEQ-LQD letter of March 13, 2009 to WMA.

Please see Response to Comment V5, OP#1.

82) <u>Section OP 3.2 Mine Unit Design.</u> Mine Unit 1's monitoring wells will require at least four sampling events to establish the upper control limits for the indicator constituents. The process to develop the UCL's, the number and spacing of the samples required should be outlined in the Operations Plan. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Secs. 1(w) and 3(a)(xv) and see WDEQ-LQD letter of March 13, 2009 to WMA.

Please see OP Section 3.6.4.1

83) <u>Section OP 3.2 Mine Unit Design.</u> The details for the Hydrologic Test Report for the first wellfield package should include a refined water balance based on the hydrologic information for the wellfield. Minimum, maximum and average pumping rates, as well as the capacity of the ion exchange units, injection well(s) and evaporation pond(s) should be included. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 4(a)(ii)(D) and see WDEQ-LQD letter of March 13, 2009 to WMA.

The requested data will be included in the respective mine unit packages.

84) <u>Section OP 3.2 Mine Unit Design.</u> The last paragraph of this section states that the operator has made an effort to properly abandon abandon historic drill holes or wells. As noted earlier regarding Section D5.2.4 Historic Uranium Exploration Activities, all historic drill holes must be located and a determination made if they were properly abandoned. If they were not, then they must be re-entered and grouted from the bottom up to the surface. All of this effort must be clearly documented in the permit, on a hole by hole basis. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Secs. 3(a)(xii) and 8(a) and (b) and see WDEQ-LQD letter of March 13, 2009 to WMA.

Pursuant to discussions during the June 22, 2009 meeting in Casper between WDEQ and LC ISR, LLC, the letter from Don McKenzie to the Wyoming Mining Association dated February 25, 2009 will serve as the guidance document with regard to re-abandonment of historic holes. Item 1 of this memo states, *"Re-entering and re-plugging old drill holes within a proposed mine unit boundary area is not warranted unless there is evidence of poor plugging practices determined either through record review or pump tests results."* In order to satisfy this requirement two separate issues must be satisfactorily addressed: a record review and a pump test.

LC ISR, LLC has submitted to WDEQ-LQD all records in its possession with regard to historic abandonment of holes and wells at the Lost Creek Project. Included within the records is a Notice of Violation issued to Texasgulf on May 20, 1982 for improper hole abandonment and surface capping as well as memos from Texasgulf to WDEQ-LQD describing their corrective actions. The Texasgulf memos describe the depth to water and drill mud in each hole they could locate. Although the specific details of the corrective actions are unknown, it appears that WDEQ-LQD and Texasgulf agreed to re-abandon all holes where the mud depth was greater than about 200 feet below the water surface. A review of these memos reveals that Texasgulf attempted to locate and collect subsurface data on a total of 261 historic holes. This number does not include holes where a surface cap was replaced but no subsurface data is provided in the historical record. Of these 261 holes, 230 (88%) were located. Of the 230 located, a total of 16 were re-plugged with grout because the grout level was greater than about 200 feet below the water surface. The above statistics are based only on those holes for which we have complete and reliable records. Texasgulf also installed new surface caps on a large group of holes. WDEQ-LQD subsequently approved the corrective work and released the bond for the entire project. Based on WDEQ-LQD approval, one could conclude that the record clearly demonstrates the historic holes were abandoned using acceptable plugging practices and further effort is not warranted.

Additional efforts to relocate historic holes will likely meet with limited success. The historic holes in question were mostly drilled between 1968 and 1980. After 29 to 41 years of vegetation growth and additional drilling disturbance, only a portion of the holes are locatable. Today it is rare to find the wooden markers placed so many decades ago. Any attempt to relocate the historic holes will result in considerable surface disturbance will little to no benefit.

Pump tests performed to date, including the 2008 Mine Unit One pump test, reveal that there is minor communication between the overlying and underlying aquifers and the HJ Horizon. The drawdown in the overlying and underlying aquifers is on the order of one magnitude or less than the drawdown in the HJ Horizon The majority of hydrologic communication is likely through the displacement of the Lost Creek Fault and not through improperly abandoned drill holes. LC ISR will employ engineering controls to prevent migration of mining solution through the fault and into a USDW.

The historical record suggests the holes were properly abandoned by the original operator pursuant to regulations that were in place at that time. LC ISR, LLC believes WDEQ-LQD, as the agency with regulatory authority over uranium exploration, should have enforced existing regulations and required the grout column to extend above the water table. If WDEQ-LQD approved improper hole abandonment, the WDEQ-LQD is now transferring the liability onto a company with no responsibility, and in fact WDEQ-LQD's actions may jeopardize one of the state's uranium resources.

Today's WDEQ-LQD comments suggest improper oversight by WDEQ-LQD in the past. LC ISR, LLC understands WDEQ-LQD's request for the holes to be re-abandoned and hereby proposes the following path forward. This proposal is intended to provide a framework for this situation, which will undoubtedly be encountered at this and other sites as uranium resources are developed in the future. LC ISR will agree to re-abandon and re-surface cap all historic holes within pattern areas that have not already been re-abandoned by a previous operator or by LC ISR, LLC and which may impact LC ISR, LLC's operations in a given mine unit, based on pumping test results for that mine unit. For other historic holes, LC ISR, LLC will agree to re-abandon and re-surface cap all historic holes within pattern areas that have not already been re-abandoned by a previous operator or by LC ISR, LLC; however, WDEQ-LQD must take on the responsibility of locating each of the holes and either perform surface reclamation or advance funds for LC ISR, LLC to conduct surface reclamation. WDEQ-LQD and BLM must agree in writing that LC ISR, LLC takes on no liability, financial or otherwise, for the re-abandonment and associated work. Nor shall LC ISR, LLC have to bond for the work since it is being performed largely for the benefit of the state and BLM.

WDEQ-LQD will have the following responsibilities and absorb the associated costs:

- Locate the holes based on historic survey records before November 30, 2009.
- Either perform surface reclamation at the appropriate season or reimburse LC ISR, LLC to perform the surface reclamation work. Surface reclamation includes leveling of the site and reseeding with an approved mixture of native seed.

LC ISR, LLC will perform the following tasks and absorb the associated costs:

- Provide WDEQ-LQD with a backhoe and one backhoe operator for a total of 40 hours at no charge for the purpose of locating the holes. Any use of the backhoe and operator above 40 hours will be charged at a rate of $75/hour;
- Excavate the surface cap;
- Enter the hole with HDPE tremmie and go as deep as possible without drilling or washing out the hole.
- Tremmie grout into the hole until the hole is filled to surface;
- Return to the hole no sooner than two days later and top the hole off to approximately 17 feet below ground surface;
- Dump two bags of bentonite chips into the hole;
- Dump one bag of cement or concrete into the hole;
- Backfill the final two feet of hole with native vegetation;
- Mark the hole with a piece of HDPE pipe with a metal name plate.

WDEQ-LQD must agree that its inability to locate all holes will not result in the denial of the permit to mine or subsequent mine unit packages.

The commenter states that the re-abandonment effort must be documented in the permit on a hole by hole basis. This request is unreasonable since the work will take place over a number of years as additional mine units are brought into production and the permit will have to be revised accordingly. LC ISR, LLC proposes that the information regarding re-abandonment efforts be documented in the annual reports.

85) <u>Section 3.2.1, Injection and Production Well Patterns:</u> The text on page OP-22 indicates that each sand within the HJ horizon will be mined separately beginning from the bottom and progressing up. Restoration will begin with the upper most sand and progress downward. It is conceded that there is communication between the three sands. However, following the schematic in Figure OP-9a when mining the upper sand, the screens in the middle and lower sands are to be sealed off. Monitoring wells are to be screened in all three sands. Given that pumps will be set in the production zone only, please explain how stability will be maintained in the middle and lower sands until restoration occurs. Furthermore, given the above scenario and the fact that monitoring wells are screened in all three sands; if an excursion occurs, how can the source sand from which the excursion is associated be detected? Alternately, there is the potential that an excursion will not be detected due to dilution. Please address. (BRW)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(F) and R&R Ch. 11, Sec. 4(a)(xiii).

Mine planning has been changed with regard to the production sequence in areas where multiple mineral horizons are to be mined. The original plan, as discussed above, called for the mineral horizons to be mined in sequence from bottom to top; and then subsequently restored in sequence from top to bottom. Within that scenario, all of the mineral horizons would be mined by one set of wells. The current revised plan calls for all of the multiple mineral horizons to be addressed simultaneously by multiple sets of wells. In other words, each individual mineral horizon will be addressed by its own set of wells completed within that particular horizon. Under the new plan, all horizons will be mined concurrently. Restoration would also be concurrent for all of the mineral horizons.

As outlined in Section 3.2.2 Monitor Well Locations in the Operations Plan, the monitor wells will be screened only in the stratigraphic horizons which are being mined in the vicinity and at a spacing prescribed by regulations. This has been previously reviewed by WDEQ. This will minimize the risk of dilution of potential excursion parameters and maximize the ability of excursion detection. In addition, these wells will be sampled during stabilization to demonstrate the success of groundwater restoration.

86) <u>Section 3.2.2 Monitor Well Locations.</u> Paragraph one states that monitor wells will be completed in ore-bearing sands to be mined and in the overlying and underlying horizons. Depending on the hydraulic connectivity between multiple ore-bearing sands, multiple monitoring wells may be required in each sand unit within the HJ horizon. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(F) and R&R Ch. 11, Sec. 4(a)(xiii).

The three sub-sands units within the HJ Horizon are only loosely defined stratigraphically. While the HJ Horizon commonly contains interbedded low permeability units, these shaley units are localized in areal extent and therefore do not divide the HJ Horizon into well defined, separate confined aquifers. Thus, hydraulic connectivity exists between the HJ Sands. This allows for groundwater movement vertically. Results of site pumping tests indicate that the various sand units within the HJ Horizon are hydraulically well connected and respond as a single, confined hydro-stratigraphic unit. As a result, the water quality throughout the HJ remains significantly consistent regardless of vertical position.

The first indication of a potential excursion will typically be a noticeable change in water level in adjacent monitor wells. This usually will precede the detection of elevated chemical parameters. Recognition of this situation will result in an

immediate review by wellfield operators to identify the cause of the problem and, if necessary, remedial action to correct the imbalance. The hydro-stratigraphic unity of the HJ aquifer will ensure that water level changes will be detected regardless of which sand is being mined or monitored within the HJ Horizon. Furthermore, pump test results have indicated that an excursion detected at the monitoring ring placed 500 feet from the wellfield could be readily recovered by adjusting extraction and injection rates in nearby well patterns (see Response to Comment V5, OP#88).

87) <u>Section 3.2.2 Monitor Well Locations.</u> Section OP 3.6.3.3 states that mining of the overlying FG and underlying KM sands is anticipated in the future. Baseline conditions for the aquifer underlying the KM sands, should be conducted prior to any mining at the site. Regional monitoring wells of this lower aquifer will need to be installed prior to mining the HJ horizon. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(ii)(B) and R&R Ch. 11, Sec. 3(a)(xiii), (xiv) and (xv).

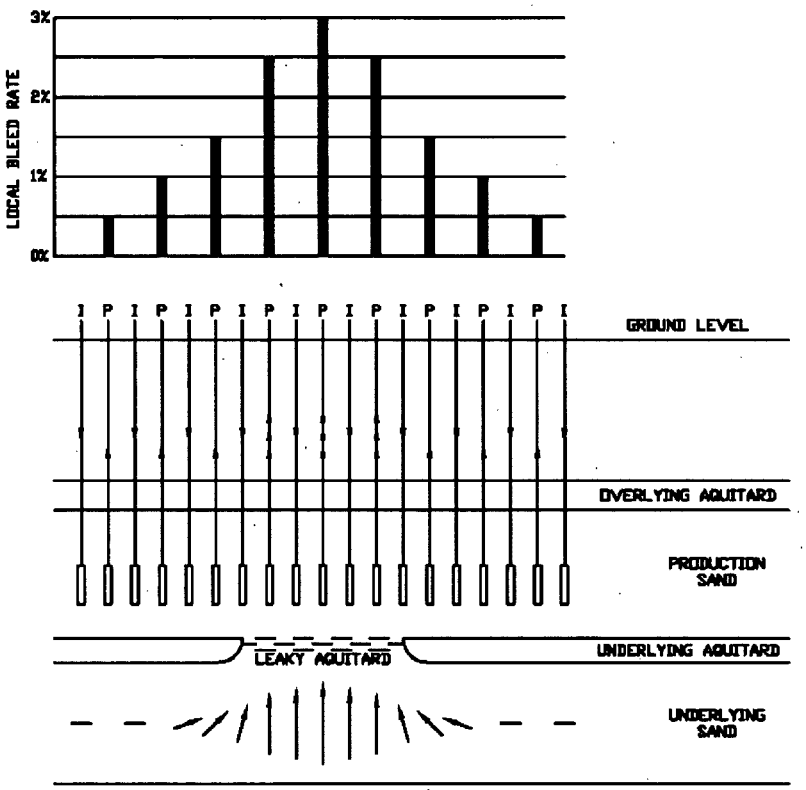
This permit application specifically addresses mining within the HJ Sand. Therefore, characterization of all aquifers potentially impacted by operations have been characterized (DE, FG, HJ, and KM). It is not necessary to characterize a deeper aquifer that will not be impacted by mining performed under this permit application. If in the future LC ISR, LLC desires to recover mineral from the KM Horizon then the underlying horizon will be characterized.

88) <u>Section OP 3.2.2.4 Overyling and Underlying Monitor Wells.</u> Paragraph 2 states that operational controls, such as higher production rates may be used to control fluid migration when vertical confining layers are thin or absent. How would higher production rates control fluid migration? Would a higher bleed rate be required? How would a higher bleed rate affect the water balance and facility capacity projections. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Secs. 4(a)(ii)(D), 10(a)(iii) and 11(d).

Section OP 3.2.2.4 discusses the use of "higher production rates" as one operating scenario to control fluid through a thin or leaky aquitard. In essence, higher localized production rates without increasing injection rates provides a more focused bleed rate and therefore greater localized control of production and injection fluids.

A higher overall bleed rate is not required as the overall bleed will typically remain the same, therefore the water balance would not change. An example of localized higher production rates is shown below:



***89) Section OP 3.2.2.4, Overlying and Underlying Monitoring Wells:** Given the discussion that ensued in the September 22, 2008 meeting at the LQD Lander office among your staff and LQD staff regarding Ms. Boyle's preliminary technical comments, the third paragraph of this section may need to be reevaluated/reworded. The third paragraph of this section discusses the shallowest water table at the site. Specifically, LQD staff understands that in the fall of 2008 Lost Creek ISR installed several new monitoring wells closer to the extents of the permit boundary in order to generate a potentionmetric surface across the entire permit boundary. Some wells were installed at a relatively shallow depth of approximately 50 feet below ground surface (bgs) in order to assess the presence/absence of an aquifer at that depth. The results of the fall 2008 well installation activities are not reflected in the version of the application reviewed here. This reviewer requests that Lost Creek ISR provide documentation regarding the presence/absence of water at depths shallower than 150' bgs in Section OP 3.2.2.4. Some of your staff may recall that during the summer 2006 drilling, one of*

Lost Creek ISR's field staff (Dawn Schippe) contacted Ms. Bautz at the LQD Lander office via telephone explaining that a shallow (potential) aquifer had been encountered during drilling at approximately 50' bgs. (MLB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(ii)(B) and R&R Ch. 11, Sec. 3(a)(xiii), (xiv) and (xv).

The ten new monitor wells installed in 2008 were completed in various horizons to provide additional piezometric and water quality data. The shallowest water level in any of the wells was at 123 feet in Well MB-07 which is completed in the DE sand; the uppermost aquifer. Section OP 3.2.2.4 was revised to reflect the most up to date information.

The installation of over 80 monitor wells to date has not shown the presence of any perched water tables. Ms. Dawn Schippe was contacted to determine the nature of the conversation with Ms. Bautz which is referenced in the comment. Ms. Schippe had maintained her field notes from the conversation in question and they are attached to this response for review. The following two paragraphs from Ms. Schippe describe the events in question.

> *On Thursday, August 17, 2006, monitor well LC29M was airlifted to evaluate if there is any water in the targeted completion formation (the DE sand/the anticipated shallowest aquifer on site). The pilot hole on this well was 171 feet deep. The driller tripped in his drill pipe to the bottom of the hole and turned on his air compressor to force all of the drilling mud and any water the formation produced to the surface. After the drilling mud had been evacuated, the well produced approximately ¼ gallon per minute. Due to the extremely low flow rate of the DE sand based on the airlifting of LC29M from a depth of approximately 171', Dawn Schippe (Lost Creek ISR's field staff) contacted Ms. Melissa Bautz at the WDEQ-LQD office in Lander to advise her of the situation. Ms. Bautz indicated that a yield of ¼ gallon per minute is sometimes sufficient for watering cattle, therefore the DE sand is indeed an aquifer. Ms. Bautz re-emphasized the need for LC ISR to install the three agreed-upon monitoring wells in the DE sand, which Ms. Schippe promised to do. Subsequently, LC29M had slotted casing and a gravel pack installed from 140-164' (the target sand completion interval) with the rat hole from 164-171' filled in with drill cuttings as this depth was dominated by a non-water-bearing lithology. Also, LC30M and LC31M, the two remaining DE sand wells, were installed at other locations across the property.*

Ms. Schippe also took photographs and a video of the airlifted yield of LC29M, which she believes she emailed to Ms. Bautz. These photos and video are available to WDEQ-LQD. However, the water was coming from a depth of approximately 164 ft bgs, not 50 ft bgs, as casing was later cemented in place from surface to 140 ft bgs at this location with no change in the yield. Therefore, this water could not have come from 50 ft bgs.

90) <u>Section OP3.3 Well Completion.</u> The burst pressure and collapse pressure of the SDR 17 pipe to be used is presented. Please also provide information on the pressures to be experienced with the well depths in the ore zone, i.e. at what depth and/or pressures will the SDR 17 be unsuitable for use. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Secs. 4(a)(xiv) and 6.

The HJ Production Zone is approximately 425 feet below surface while the static water level for the same formation is approximately 175 feet below surface. A typical casing will be CertainTeed's spline-locking standard dimension ratio (SDR) 17 PVC well casing, which has a nominal 4.5 inch diameter, 0.291 inch minimum wall thickness, and is rated for 160 pounds per square inch (psi) burst pressure and 224 psi collapse pressure.

The maximum external pressure possible is represented by the calculation below. A rare example of this would be if the well were to pump dry with no recharge, especially given the hydrologic properties of the HJ sand unit.

External Pressure = (Depth of Casing – Depth to Water) x Weight of Fluid x 0.052
= (425 ft – 175 ft) x 8.33 lbs/gal x 0.052
= 108.3 psi which is less than the 224 psi collapse pressure

The maximum internal pressure or injection pressure will be governed by the fracture pressure, which is governed by the regional fracture gradient, or 0.7 psi/ft.

Injection Pressure = Depth to Injection Zone x (Fracture Gradient – Water Gradient)
= 425 ft x (0.7 psi/ft – 0.433 psi/ft)
= 113.5 psi which is less than the 160 psi burst pressure

The pressure ratings provided by the manufacturer are at ambient conditions without the benefit of cement supporting the casing or the lower temperatures typically seen subsurface at the Lost Creek Project. Experience at other ISR operations has shown that, using the proper weighting materials during cementing, PVC casing can be used

at depths in excess of 1,000 feet below ground surface. In addition, each well must pass a mechanical integrity test prior to operation.

91) <u>Section OP 3.3 Well Completion.</u> The last paragraph states that well completion information will be submitted to the WDEQ. In addition, a boring log indicating the stratigraphy of each hole should also be included. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 6(g).

Pursuant to discussions on June 22, 2009 at Casper between WDEQ and LCI ISR, LLC LCI will submit well completion information to WDEQ for all monitor wells; including geophysical log, stratigraphy, and completion information. Data for all open holes and production and injection wells will be maintained at the site and will be available for inspection.

92) <u>Section OP 3.4 Well Integrity Testing.</u> Paragraph 2 states that the pressure in the sealed casing is then increased to a specified test pressure. Please indicate what that test pressure will be, e.g. 125% of operating pressure (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 7.

The mechanical integrity test (MIT) pressure is determined by the well properties and the type of well. As noted in Section OP 3.4, there are three types of wells that will be tested at the Lost Creek Project: monitor well; production well; and injection well.. The following discusses the MIT tests for each:

Monitor Well – The purpose of an MIT on a monitor well is to insure casing integrity and that the samples received are only from the zone of interest; not from fluid leaking into the wellbore from other zones sealed off by the casing. Because a monitor well is only used for pumping fluid out of the well, no pressure is seen on the casing. Therefore, the MIT pressure cannot be based on the maximum operating pressure. Typically a representative MIT pressure will be chosen that will insure the well has mechanical integrity. Normally this pressure will be at least 50 pounds per square inch (psi) as measured at the wellhead.

Production Well – The purpose of an MIT on a production well is to insure casing integrity below the static and pumping fluid level and for potential future use as an injection well. Because a production well is used for pumping fluid out of the well, no pressure is seen on the casing other than that generated by the production fluid in the wellbore. Therefore, the MIT pressure cannot be based on the maximum

operating pressure. However, during the operational life of a wellfield, injection and production wells may be switched to modify production flow paths and increase overall recovery. Because of this, the production well MITs are performed at the same pressure as the injection wells within the same header house. That pressure is detailed in this response under "Injection Well".

Injection Well – The purpose of an MIT on an injection well is to insure casing integrity through the entire cased well. The MIT will typically be performed at 125% of the maximum injection pressure as dictated by the fracture gradient and the casing depth. An example is shown below:

MIT Pressure = Casing Depth x (Fracture Gradient – Water Gradient) x 1.25
= 425 ft x (0.7 psi/ft – 0.433 psi/ft) x 1.25
= 142 psi

93) Section OP 3.4, Well Integrity Testing: should describe protocols for investigating, evaluating and tracking MIT failures and also determining the impacts of the casing failure and any resulting leakage from the well. (MM)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 7(a)(v).

As with any operational or engineering activity, any abnormal or unexplained failures will be investigated. A variety of measures may be used during the investigation including subsequent tests at varying depths and pressures. In addition, a downhole camera may be used to support data obtained during the MIT(s). Also, typical to any investigation will be the correlation of materials, equipment, personnel and downhole conditions to the failure to determine if there is an ongoing problem. Any documentation associated with investigations will typically be kept in the well files and may be included as part of the Quarterly MIT Report to the WDEQ-LQD.

In the event of a casing failure on an operating well, investigations will typically include all of the above as well as a determination of the extent of the leakage. Once the areal/vertical extent of the release has been determined, a program of remediation will be reviewed with the WDEQ-LQD and appropriate measures determined for containment and/or recapture. Once approved, the remedial action will be initiated and reported in the Quarterly MIT Report to the WDEQ-LQD.

94) Section OP 3.5, Mine Unit Piping and Instrumentation: should clearly specify the instrumentation that will be installed for each well (i.e. each well, production and injection, will have a flow meter, a control valve and a pressure alarm installed). (MM)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C) and (F) and R&R Ch. 11, Sec. 4(a)(xx).

Each injection well and production well will have what is known as a "meter run" inside its associated header house. The meter run will include a control valve, a flow meter, and a pressure gauge. Each group of injection wells and production wells within a house will be attached to a header.

Fluid detection systems will be used in the header houses and at the wellheads to alarm the Operators of potential upset conditions. These systems will typically use the leaking fluid to complete a circuit and initiate an alarm in the form of either an audible/visible alarm locally or by transmitting an alarm to the operations center. The second component of fluid detection systems is a local shutdown of operations at a header house. This will typically occur in the case of a large failure where a sump level reaches the shut down point and flow is stopped and the Operators are notified via alarm at the Plant. As with all leak detection systems, they are augmented by a strong operations and field presence with routine checks on pipelines, header houses, wellheads and other production components.

There will be three layers of protection associated with the wellfield instrumentation:

1. Monitoring and Data Output
2. Alarm and Notification
3. Control and Shutdown

1. Monitoring and Data Output:

   a. Oxygen: Oxygen pressures will be monitored for abnormal operating conditions.
   b. Production Systems: The main header pressure and flow rate will be monitored as well as the flow rate of each of the production wells for abnormal operating conditions. The On/Off status of each of the pumps will also be monitored.
   c. Injection Systems: The main header pressure and flow rate will be monitored as well as the flow rate of each of the injection wells for abnormal operating conditions.
   d. Header House Sumps: Sump levels and the operating status of the sump pumps in the header house basements will be monitored and transmitted to the Plant for review/alarm.

2. Alarm and Notification:
   a. Oxygen: High and low data points will be set for oxygen injection piping within the header houses. If pressures are outside the set points, Operators will be notified via alarm and Wellfield Operators will address the upset condition.
   b. Production Systems: The main header pressure and flow rate will have high and low set points. If there is an upset condition, Operators will be notified via alarm and Wellfield Operators will address the upset condition. The same is true for individual production well flow rates as well as the On/Off status of the pumps. Differential flow algorithms may be utilized to review differential flow status to determine if there is a potential problem. Production wellheads will have fluid detection systems to alarm of a leak. The fluid will close a circuit that will generate an alarm either locally, at the plant, or both.
   c. Injection Systems: The main header pressure and flow rate will have high and low set points. If there is an upset condition, Operators will be notified via alarm and Wellfield Operators will address the upset condition. The same is true for individual injection well flow rates. Differential flow algorithms may be utilized to review differential flow status to determine if there is a potential problem. Injection wellheads will have fluid detection systems to alarm of a leak. The fluid will close a circuit that will generate an alarm either locally, at the plant, or both.
   d. Header House Sumps: If sumps have fluid in them, the sumps will be activated and the fluid pumped into the production header. Anytime the sumps are activated, the Plant Operator will receive an indication. If a high level is the sump is received, the Operator will receive an alarm and the Wellfield Operator will address the upset condition.

3. Control and Shutdown:

   a. Oxygen: Pressure switches and interlocks with the injection system will be utilized to insure that oxygen injection cannot occur without adequate flow and pressure in the injection header. The concept being that if oxygen is only allowed to enter the injection header when water is present, then dangerous concentrations cannot build up in the piping.
   b. Production Systems: There are several levels of control and shutdown within the production system. The PLC will be connected to the Plant and will allow for shutdown/startup of all production wells in upset conditions. The main valve will be capable of being shut based on operating conditions, i.e. sump overflow, ruptured flowline, etc. The motor control center (MCC) will typically be interlocked with the sump high level shutoff to shut down operating pumps. The wellheads will typically utilize any leaking fluid to

complete a circuit and initiate an alarm in the form of either an audible/visible alarm locally or by transmitting an alarm to the operations center. Simple systems included in the piping include check valves to insure that pipeline production fluid cannot enter shutdown sections of pipe.

c. Injection Systems: Control of this system begins with the control valve where the injection fluid enters the header house. This valve will maintain the appropriate pressure and flow for the local operating conditions as well as allow for complete shutdown of injection. Data from the main flow line and the individual injection wells will be transmitted to the Plant for review. If there is an upset condition, operators will be notified and suspect area will be shut down for maintenance. The wellheads will typically utilize any leaking fluid to complete a circuit and initiate an alarm in the form of either an audible/visible alarm locally or by transmitting an alarm to the operations center.

d. Header House Sumps: High sump levels will initiate a shutdown in the production wells and alarm the Operators.

95) <u>Section OP 3.5 Mine Unit Piping and Instrumentation.</u> Please also describe how the pressure and flow rate information will be managed at one control point. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C) and (F) and R&R Ch. 11, Sec. 4(a)(xx).

Please see Response to Comment V5, OP#60.

96) <u>Section OP 3.5 Mine Unit Piping and Instrumentation.</u> It is stated that individual well lines and trunk lines will be buried to prevent freezing. Figure OP-7c indicates he typical trench layout to be 6.0 feet deep. In Section OP 3.5 please discuss the burial depth relative to the known frost line in the Red Dessert, as well as how the lines under high traffic areas will be protected. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C) and (F).

For discussion of pipeline freezing, please see Response to Comment V5, OP#59.

Pipelines under traffic areas will typically be constructed of High Density PolyEthylene (HDPE). They will be buried at approximately 6 feet below the lowest point of the travel route (including the borrow ditch). Compaction during backfill will more than adequately support the pipeline from the traffic load.

Due to the flexibility of HDPE pipe, it will deflect when it is buried. The Plastic Pipe Institute's Handbook of PE Pipe (Second Edition), Chapter 6, Section 3 details the requirements in which HDPE pipe will support direct burial and traffic loads. As seen in Table 3-1 from the handbook, the minimum cover required for the buried pipe is 3 feet:

TABLE 3-1
AWWA M-55 Design Window Maximum and Minimum Depth of Cover Requiring No Calculations

DR	Min. Depth of Cover With H20 Load	Min. Depth of Cover Without H20 Load	Maximum Depth of Cover
7.3	3 ft	2 ft	25 ft
9	3 ft	2 ft	25 ft
11	3 ft	2 ft	25 ft
13.5	3 ft	2 ft	25 ft
17	3 ft	2 ft	25 ft
21	3 ft	2 ft	25 ft

* Limiting depths where no calculations are required. Pipes are suitable for deeper depth provided a sufficient E' (1,000 psi or more) is accomplished during installations. Calculations would be required for depth greater than 25 ft.

97) <u>Section OP 3.6.3.1, Water Balance:</u> should contain an explanation for why the restoration flow rates are so low in comparison to production flow rates (i.e. less than 10%). Would it not be feasible to have higher restoration flow rates, perhaps equal to production flow rates? (MM)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 3, Sec. 2(k) and Ch. 11, Sec. 5(a)(i).

It would not be technically feasible to have restoration *flow* rates equal to production *flow* rates. The restoration processes produce a higher ratio of waste water to produced water than production processes, creating a more pronounced drawdown of the aquifer's piezometric surface. Therefore, to avoid 'pulling in' considerable quantities of unaffected groundwater (i.e., a higher bleed rate), dropping water levels below pumps; and other consequences of pronounced drawdown, the flow *rate* during restoration is not the same as the production *flow* rate. Further, restoration is expected to be completed in a fraction ($1/10^{th}$) of the pore volumes it takes to complete production. If an operator restored wellfields at a flow *rate* equal to the production flow *rate*, the restoration circuit would be idle nearly 80% of the time and the required waste water disposal rate would be many times higher (when operated)

than the disposal rate included in the operating plan. This scenario could not be justified because of: the extreme rate and volume of waste water generated over short periods of time (estimated at 1,150 GPM); extreme and unsustainable drawdown and recharge during the periodic restoration activities; and economic considerations (capital requirements for a 6,000 GPM water purification facility).

It should however be feasible to maintain a rate of restoration *progress* equal to the rate of production *progress*. The result of a proper design would be that wellfields are restored in an equal amount of time as the production life of a typical wellfield. This is the design basis for LC ISR LLC's proposed mine plan (**Figure OP-4a**) and water balance (**Figures OP-5a through OP-5f**). LC ISR, LLC planned for a 60 pore volume (PV) production life at 6,000 GPM. The critical restoration stage (RO) is projected to require 10% of the production PVs (i.e., 6 PVs) and to thus operate at 10% of the production flow rate (average over life-of-project is approximately 600 GPM). The rate of completion of the groundwater sweep (GWS) phase of restoration would also match the rate of depletion of the production areas when properly designed and planned. Since GWS will involve less than one pore volume (see response to Response to Comment OP5, RP#1 for complete explanation), the required flow rate for GWS is designed to commonly be 30 GPM. Operating GWS at pre-determined/controlled flow rate will minimize the likelihood of excessive consumption of groundwater resources for this minimally effective restoration activity. The end result of proper design and planning is that there is adequate and appropriate restoration capacity available for each wellfield at the point in time that it is expected to be depleted and ready for restoration. When the restoration rate equals the production rate, operations would not be extended in one operational phase due to lack of capacity for the next sequential phase.

As required in LQD NonCoal R&R Ch. 3 Sec. 2(k) and Ch. 11 Sec. 5(a)(i), restoration is planned to occur concurrently with mining, the schedule demonstrates a coordinated sequence of mining and reclamation and there is a clearly demonstrated correlation between the capacity of the water/waste water treatment systems and of the capacity requirements of the mining and restoration operations.

98) <u>Section 3.6.3 Projected Water Balance and Water level Changes.</u> This section states that the water balance considers the "capacity of the Plant and Class III UIC wells for production and for restoration". Other critical factors will include the capacity of the Class I UIC well(s) and the capacity of the evaporation ponds. These should be included in the discussion and in Figures OP -5a through 5f. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 5(a)(i)(D).

Please see Response to Comment V5, OP#67.

99) <u>Section OP 3.6.3.1 Water Balance. (Table OP-6)</u> Are the flow capacity's presented in this Section, Table and in Figures OP-5a through 5f, for the first mine unit or for multiple mine units? Please clarify by indicating how many mine units will be in production and restoration at one time, and how the rates presented are a compilation of that information. A table detailing this information for each mine unit, at each stage of production and restoration, for each year in the life of the mine would be useful. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 5(a)(i)(D).

Figure OP-4a illustrates the Lost Creek Project Development, Production and Restoration Schedule. A review of the schedule reveals that normally two mine units are anticipated to be in production and up to three mine units are anticipated to be in various phases of groundwater restoration (GWS, RO, Recirculation and Stability), not including the time required for regulatory approval and surface reclamation.

Section OP 3.6.3.1 states; "The water balance discussion, figures and tables included in this section consider the production and restoration phases to be operating at maximum flow capacity. At maximum flow capacity, the full potential contribution of each unit operation to the water balance can be analyzed." LC ISR, LLC as operator, will have the full discretion to determine the actual operational flow rates that meet the economic objectives of the project. Since portions of mine units are brought into and out of production and restoration as a function of the daily operational control of the facility, a table detailing the contribution of each mine unit to each stage of production and restoration summarized for each year in the life of the mine, would not provide any more useful information than Figure OP-4a already provides.

100) <u>Section OP 3.6.3.1 Water Balance.</u> Paragraph 2 mentions the supplemental use of WYPDES discharge as part of the water balance for liquid waste. What is the source of this end of pipe discharge? What treatment standards will apply? What flow rates are anticipated? If a WYPDES discharge is going to be part of the water balance for the site, it should be included in Figures OP-5a through 5f. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(H) and R&R Ch. 11, Sec. 3(a)(ii)(C) and (I).

LC ISR, LLC does not intend to discharge water under a WYPDES permit. The reference to a WYPDES permit was put into the application to show that it might have been an option in the future (after a permit revision). However, the language is confusing so the reference to the WYPDES discharge has been removed.

101) ***Section OP3.6.3.1 Water Balance. Paragraph 3 states that in the operational mode of production operations, restoration sweep, and groundwater treatment, that the net consumptive removal will be 3% or 190 gpm, It is not clear how this correlates with Figure OP-5c, Project Water Balance Production with GWS and RO. Please provide greater details regarding each stage of the mine life and water balance. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(H) and R&R Ch. 11, Sec. 4(a)(ii)(D).

It is not necessary to determine net consumptive removal from Figures OP- 5a through 5f since the net consumptive removal is clearly presented in Table OP-6. However, Section OP 3.6.3.1 has been modified. A discussion of how Figures OP-5a through 5f correspond with Table OP-6 to determine the net consumptive removal has been added. Details regarding how the water balance figures relate to each stage of the mine life have also been added.

102) ***Section OP 3.6.3.1 Water Balance. Please provide details on the storage capacity of the permeate storage pond(s) and the concentrated brine storage pond(s), and the estimated average evaporation rate for these facilities. This information should also be included on Figures OP-5c through 5f. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(H) and R&R Ch. 11, Sec. 4(a)(iv) and (vi).

Please see Response to Comment V5, OP#9 (3rd paragraph).

103) ***Section OP 3.6.3.1 Water Balance. If efforts will be made to enhance the evaporation rate from the ponds with sprayers, this should be discussed. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: N/A (type or clarification issue).

Please see Response to Comment V5, OP#9 (3rd paragraph).

104) ***Section OP 3.6.3.1 Water Balance. The required injection / disposal rate for the UIC Class I well(s) should also be included in the water balance. Once the aquifer characteristics are known, the capability of the aquifer to handle the disposal rate will need to be presented in detail. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(H) and GL 4 Sec. III(c)(4)(a).

Please see Response to Comment V5, OP#67.

105) ***Section OP 3.6.3.3, Cumulative Drawdown: W.S. 35-11-428(a)(iii)(E) requires an assessment of impacts to water resources on adjacent lands and the steps that will be taken to mitigate the impacts. Section OP 3.6.3.3 should include drawdown projections for all aquifers that could potentially be affected by the operation for the life of the mine, including drawdown maps to illustrate the horizontal and vertical extent of projected drawdown. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(E).

The parameters necessary to provide an estimate of drawdown during life of the mine include transmissivity, storativity, net extraction rate, and duration of operation. Transmissivity of the HJ Production Zone has been determined from pumping tests, conducted on either side of the Lost Creek Fault. Because of the influence of the fault, the transmissivity determined from this pumping test is viewed as an 'effective" transmissivity.

A value of transmissivity that is not influenced by the fault can be estimated using the principle of superposition and image well theory (Stallman 1952). The principle of superposition simply states that the total effect resulting from pumping multiple wells simultaneously is equal to the sum of the individual effect caused by each of the wells acting separately. The principle of superposition is commonly used to evaluate well interference problems by summing the drawdown determined using the Theis equation for a homogeneous, isotropic, infinite extent aquifer. Image well theory is used to address hydraulic impacts of a bounded (non infinite extent) aquifer for either no flow or recharge boundaries (Domenico and Schwartz 1990). In the application of image well theory for a no flow barrier, an imaginary well is placed directly across the no flow boundary at an equal distance from the boundary as the pumping well. The image well is assigned a pumping rate equal to that of the real pumping well. Then the drawdown can be calculated at any point within the aquifer (on the side with the real well) by summing the impacts from both the real and image well, using a modification of the Theis equation:

$s = -s_p + s_i = Q/(4\Pi T) \times [W(u)_p + W(u)_t]$

where:
s is the observed drawdown at any point;
s_p - drawdown resulting from pumping the real well;
s_i - drawdown resulting from pumping the image well;
Q - the pumping rate;
T - aquifer transmissivity;
$W(u)_p$ - well function for the real well;
$W(u)_t$ - well function for the image well;
and:
$(u)_p - r_p^2 S/4Tt$
$(u)_t - r_t^2 S/4Tt$
where:
r_p is the distance from the pumping well to the observation point;
r_i is the distance from the image well to the observation point; and
S - aquifer storativity.

In the case of the Lost Creek Project, image well theory was applied using the drawdown resulting from the LC19M pump test. The pumping well LC19M is located 482 feet from the fault, based on mapped data. An image well was assumed at a distance of 964 from the pumping well, on the other side of the fault. The drawdown at the end of the pump test at three wells were used to back calculate the transmissivity and storativity of the aquifer. The LC19M pump test was run for a period of 8,252 minutes at an average rate of 42.9 gpm. The wells and respective drawdown (at the end of the test) used to solve the Theis equation for transmissivity and drawdown were LC19M (93.32 ft), HJMP111 (35.56 ft) and HJMP104 (36.44 ft). The distance from LC19M to HJMP-111 is 473 ft and from LC19M to HJMP104 is 637 ft. The distances from the image well to HJMP-111 and HJMP-104 are 1,043 and 847 feet, respectively. A series of calculations were performed varying the transmissivity and storativity to find the best fit to the observed drawdown at the end of the test. Results of the effort indicate that a transmissivity of 144 ft^2/d and a storativity of 7e-05 provide a very good fit to the data with residuals (difference between the observed and calculated drawdown) of 0.06 ft at LC19M, -1.04 ft at HJMP-111 and 1.00 ft at HJMP-104. Although this calculation does not account for the partial penetration effects of the pumping and observation wells or the minor leakage from overlying and underlying aquifers (as evidenced by the slight drawdown response in overlying and underlying observation wells during the test), it does provide a reasonable estimate of the aquifer properties within the vicinity of Mine Unit 1 (by removing the effects of the fault on the pump test results). Table OP-9 shows the best-fit drawdown

calculations. Figure OP-10a shows the location of the wells used to calculate transmissivity with the image well method.

The transmissivity and storativity values 144 ft^2/d and 7E-05, respectively were used to predict drawdown at distances of 2 and 5 miles from the centroid of production after 8 years of production and restoration activities, for two scenarios. One case assumes that the impacts of the Lost Creek Fault are negligible at distances of 2 miles or greater. This case is supported by data from site borings that indicate that the Lost Creek Fault appears to extend less than 1 mile on either side of the centroid. The other case assumes that the fault acts as a no flow boundary. The second case assumes that the fault is of infinite extent (which it is not) and all of the production will occur on the same side of the fault (which it will not because the projected mine units are on both sides of the fault). This case would provide a maximum drawdown estimate. For both cases the average pumping rate is assumed to be 89 gpm for the 8-year mine life.

The predicted drawdown at the end of production/restoration operations at an average pumping rate of 89 gpm for the first scenario (neglecting the impacts of the fault) will be 45 ft at 2 miles from the centroid of production and 28 ft at 5 miles. A projection of drawdown at the end of production and restoration under that scenario is shown in Figure OP-10b. Note that the drawdown is less at 2 miles and 5 miles from the Permit Boundary than from the centroid of production which is near the center of the Permit Area. For the scenario where the fault is assumed to be of infinite extent and acting as a no flow boundary, the aquifer is essentially reduced by half and the drawdown is doubled to 90 ft at 2 miles from the centroid of production and 56 ft at 5 miles. A projection of drawdown at the end of production and restoration under that scenario is shown in Figure OP-10c. Note that if the infinite acting fault scenario is utilized, the drawdown would only occur on the side of the fault where pumping is occurring. While the fault will have substantial impacts on localized drawdown in the vicinity of the mine units, the effect at great distance will be noticeably reduced. Therefore, the calculated drawdown using the infinite extent fault should be considered as a worst case (maximum) value These two calculations provide a reasonable bounding limit to the drawdown that can be expected as a result of ISR activities at the projected rates. The drawdown at the 2 mile radius from the centroid of production should be between 45 and 90 ft, and the drawdown at the 5 mile radius should be between 28 and 56 ft.

The depth to water for the HJ Horizon in the vicinity of MU1 is generally 170 to 180 feet. The depth to the top of the HJ Horizon in the same area averages 360 feet. Based on these values, there is approximately 180 to 190 feet of hydraulic head above the top of the HJ Horizon at MU1. Assuming that 150 to 200 feet of head are present within 5 miles of the center of the projected mining, the estimated

drawdown from production and restoration should not result in dewatering of the HJ Horizon within that same area. A projection of drawdown at the end of production and restoration is shown in Figure OP-10b.

A calculation of the time required for water levels to recover to pre-mining or near pre mining levels following completion of the ISR project was also performed.

The analysis of recovery is based on the principle of superposition which was described previously. For this case it is assumed that after the pump has been shut down (at the centroid of production), the well continues to be pumped at the same discharge as before and that an imaginary recharge equal to the discharge is injected into the well. The recharge and discharge thus cancel each other resulting in a well that is effectively no longer being pumped. The recovery of the well is measured as "residual" drawdown. Applying the Theis equation to this problem the residual drawdown is

$s' = (Q/4\pi T)\{W(u)-W(u')$
where
$u = (r^2S)/(4Tt)$ and $u' = (r^2S')/(4Tt')$
where
s' = residual drawdown in ft
r = distance from well to observation point in ft
T = transmissivity of the aquifer in ft2/d
S' = storativity of the aquifer during recovery, unitless
S = storativity of the aquifer during pumping, unitless
t = time in days since start of pumping in days
t' = time in days since the cessation of pumping in days
Q = rate of recharge = rate of discharge in ft^3/d
The calculated residual drawdown (in feet) using the equation above for various times at 2 miles and 5 miles from the centroid is shown in the table below.

Residual Drawdown After End of ISR Operations

Distance	Time Since End of Operations			
	1 yr	2 yr	4 yr	8 yr
2 miles	20.5 ft	15.1 ft	10.3 ft	6.5 ft
5 miles	18.9 ft	14.4 ft	10.0 ft	6.4 ft

Average pumping rate of 89 gpm (or 17,134 ft3/d).
Distance measured from centroid of production.

106) ***Section OP 3.5.4.2 Excursion Detection: In addition to the use of water levels to detect excursions, will barometric pressure within the well be monitored to detect excursions? (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: N/A (type or clarification issue).

In addition to water levels, water quality (indicator parameters) will be used to detect excursions. Monitoring of barometric pressure will not be used to detect excursions. Barometric pressures can undergo large fluctuations due to changing weather patterns. These fluctuations would be unrelated to water level changes that would be caused in the event of an excursion. Monitoring of water levels to observe trends in water level elevation, coupled with changes in water quality will provide the best indication that an excursion may be occurring.

107) ***Section OP 3.6.4.1 Mine Unit Baseline Water Quality and Upper Control Limits. The last sentence of this section states that 'UCL's will be set at five standard deviations to the baseline average for the indicator." It would be clearer to state that "the UCL will be set as the baseline mean plus five standard deviations". (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: N/A (type or clarification issue).

The last sentence in Section OP 3.6.4.1 has been changed as requested.

108) ***Section OP 3.6.4.2 Excursion Detection. The second paragraph states that increased water levels could be indicative of casing failure, and that isolation and shutdown of individual wells would be used to isolate the problem. In addition, please add to the text that MIT testing of suspect wells will be conducted. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(F) and R&R Ch. 11, Sec. 4(a)(xvi).

The second paragraph of Section OP 3.6.4.2 has been revised to include a reference to MITs if water levels change unexpectedly in the overlying or underlying aquifers.

109) ***Section OP 3.6.4.3 Excursion Verification and Corrective Action*** *The second paragraph states that if it is determined that a well is on excursion status, that the DEQ will be notified within 24 hours. This should be changed to read verbally notified within 24 hours. (AB)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 12(c)(i) and GL 4, Sec. III(c)(5)(f).

Section OP 3.6.4.3 has been revised to state that notification will be verbally.

110) ***Section OP 5.0 Effluent Controls.*** *Within this section there are many subsections which address the multiple solid and liquid waste streams from the facility. Please also provide a table which lists each of the facilities solid and liquid waste streams, the estimated monthly predicted volume to be generated, the storage location, and the disposal location. (AB)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C) and R&R Ch. 11, Sec. 4(a)(vi) and (vii).

Table OP-9 has been inserted into the permit application to further define the types of solid waste that will be generated at the site. It is not practical to anticipate and list all waste streams but Table OP-9 attempts to quantify the major types of waste.

111) ***Section OP 5.1 Gaseous Emissions and Airborne Particulates.*** *No mention is made of the Air Quality Division permit(s) that will be required for the site. Please add this information to the discussion within this section. (AB)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 3(a)(ii)(E) and (F).

The Air Quality Permit was noted in Section OP 2.2 (Additional Regulatory Requirements), OP 2.10 (Air Monitoring), and Table ADJ-1. A cross-reference to Section OP 2.2 and Table ADJ-1 has been added to Section OP 5.1

112) ***Section OP 5.2.1.3 Waste Petroleum Products and Chemicals.*** *It is not clear from this section specifically where petroleum and chemical products, or hazardous and non-hazardous waste streams will be stored. Preferably these containers will be stored in-doors where they are not subjected to the elements and have adequate secondary containment. If they are to be stored outdoors, please indicate whether there will be roofing, locked fencing, and secondary containment. (AB)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C) and (F) and R&R Ch. 2, Sec. 2(b)(iii)(I).

Storage of waste petroleum products is planned within the maintenance shop at the Lost Creek Facility. This shop will have a specific area adjacent to the maintenance area that will be bermed and adequately vented. The area will be indoors and will, therefore, be controlled and not subject to the elements.

Waste chemicals will typically be associated with the laboratory and its operations. All liquid wastes will be captured in the drains and/or sumps within the laboratory and will go straight to plant waste tanks for eventual deep well disposal.

113) ***Section OP 5.2.1.4, Domestic Liquid Waste: The permit for the domestic sewage/septic system should be included in the mine permit application. Additionally the disposal of domestic waste must be addressed. (MM and BRW)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(C) and (F) and GL 6, Sec. III(D).

A permit application for the installation of two septic systems with leach fields was submitted to Sweetwater County on June 29, 2009. The septic system to support the Maintenance Shop will be located north of the shop while the septic system for the office will be located southwest of the Plant (Plate OP-2). Portable chemical toilets to support drilling and field staff will be placed in appropriate locations relevant to ongoing work and will be maintained by a licensed contractor.

Pursuant to discussions held on June 22, 2009 in Casper between WDEQ and LC ISR, LLC, Table ADJ-1 of the application has been updated to include the status of the various permits/licenses required to construct and operate the facility.

114) ***Section OP 5.2.1.4 Domestic Liquid Wastes. There is no previous discussion of a water supply well for potable water. Please provide a discussion within the permit of the proposed aquifer and location for the potable water supply. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(xvi) and GL 6, Sec. III(A)(7)(a).

Please see Response to Comment V5, OP#74.

115) ***Section OP 5.2.3.2, UIC Class 1 Wells: This section addresses deep disposal wells which are a key component of this project. Permits for these wells should be included as part of the mine permit application. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and 427 and R&R Ch. 11, Sec. 3(a)(ii) and 4(a)(vi) and (vii).

Please see Response to Comment V5, OP#67.

116) ***Section OP 5.3.2, Disposal of Liquid 11(e)(2) Byproduct Materials should specify the disposal site for 11(e)(2) byproduct waste. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and R&R Ch. 11, Sec. 4(a)(vii).

As discussed on June 22, 2009 at Casper between WDEQ and LC ISR, LLC, an 11(e)(2) byproduct disposal agreement has not been reached. However, the expected disposal cost, based on discussions with the managers of various disposal sites, is between $150 and $325 per cubic yard. Shipping costs, based on quotes from a hazardous materials shipper currently contracted to haul byproduct material from the Smith Ranch/Highland Project to the Shirley Basin Pathfinder facility or the White Mesa Mill in Blanding Utah are $1,075 and $2,600 per shipment, respectively.

117) ***Section OP 5.3.2 Solid 11(e)(2) Byproduct Materials. Will there be any employee Personal Protection Equipment (PPE) that will be generated on a regular basis as 11(e)(2) waste? If a waste stream, it should also be listed in paragraph one of this section. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and R&R Ch. 11, Sec. 4(a)(vii).

Please see Response to Comment V5, OP#110.

118) ***The operations plan should include a section detailing procedures for exploration and delineation drilling, including: topsoil protection measures; drill hole abandonment procedures, including provision for backfilling to the surface with bentonite chips; and surface reclamation procedures. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(A) and (G) and R&R Ch. 11, Sec. 8(a).

The following procedures are expected to be used during normal drilling operations:

Exploration Drilling: will typically occur prior to installation of fences or roads to an area. This type of drilling will occur at various depths and may or may not conform to a grid. Density of drilling is highly dependent upon the results of previous work. Drill locations should be modified, where possible, to reduce the need for drilling in major drainage ways and/or major modifications to terrain. If successful, exploration drilling will be followed by Delineation drilling at, typically, a higher density.

The steps in exploration drilling are normally as follows:

1. Surveying – initial target locations are surveyed in with stakes placed. For exploration drilling, very few locations are known initially.
2. Access Planning – the access routes for the initial holes are planned and the backhoe operator and drill contractor informed of the routes. If necessary, access may be delineated with markers or posts.
3. Drill Pits – will be installed by the backhoe operator.
   a. Install erosion protection as necessary;
   b. Excavate drill pit, segregating topsoil and subsoil;
   c. Clear/level drill pad as necessary.
4. Fence Drill Pit
5. Drill Exploration Hole
6. Geophysical Log
7. Abandonment – use drill rig or LCI equipment to plug the hole
   a. Initial – typically, grout or cement is pumped into the hole from the bottom up. Depending on hole conditions, bentonite chips may be used to assist in the plugging process. A temporary cover is placed over the hole after plugging is complete.
   b. Topoff – after the plugging material is allowed to settle, the hole will be revisited and the grout or cement will be topped off to approximately 17 feet below the ground surface. Approximately 10 feet of bentonite chips will be placed on top of the grout or cement column.
   c. Surface plug – A plug capable of supporting approximately 5 feet of cement or concrete will be placed on top of the plug. The remaining upper two feet of the hole will be backfilled with native soil.
8. Backfill Pit – the drill pit will be backfilled with subsoil so as not to allow the displacement of drilling fluid from the pit. The temporary fence will be permanently removed once the pit is backfilled. After the pit is backfilled and the fence removed, the topsoil will be evenly applied over the excavated area.

9. Seeding – surface preparation and reseeding will occur at the next available time period appropriate for planting.

Delineation Drilling: may occur prior to installation of fences or roads to an area or may occur in areas with significant infrastructure. This type of drilling will occur at various depths and may or may not conform to a grid. Density of drilling is reasonable dependent upon the results of previous work. Drill locations may be modified, where possible, to reduce the need for drilling in major drainage ways and/or major modifications to terrain. Once completed, delineation drilling will be followed by monitor well and production well installation.

The steps in delineation drilling are normally as follows:

1. Surveying – initial target locations are surveyed in with stakes placed. Drilling may be expanded depending on results.
2. Access Planning – the access routes for the holes are planned and the backhoe operator and drill contractor informed of the routes. If necessary, access may be delineated with markers or posts. Existing access routes will be used wherever possible.
3. Drill Pits – will be installed by the backhoe operator.
   a. Install erosion protection as necessary;
   b. Excavate drill pit, segregating topsoil and subsoil;
   c. Clear/level drill pad as necessary.
4. Fence Drill Pit as necessary. If drilling is within existing wellfield fencing, then temporary fencing will not be required.
5. Drill Delineation Hole
6. Geophysical Log
7. Abandonment – utilize drill rig or LCI equipment to plug the hole
   a. Initial – typically, grout or cement is pumped into the hole from the bottom up. Depending on hole conditions, bentonite chips may be used to assist in the plugging process. A temporary cover is placed over the hole after plugging is complete.
   b. Topoff – after the plugging material is allowed to settle, the hole will be revisited and the grout or cement will be topped off to approximately 17 feet below the ground surface. Approximately 10 feet of bentonite chips will be placed on top of the grout or cement column.
   c. Surface plug – A plug capable of supporting approximately 5 feet of cement or concrete will be placed on top of the plug. The remaining upper 2 feet of the hole will be backfilled with native soil.
8. Backfill Pit – the drill pit will be backfilled with subsoil so as not to allow the displacement of drilling fluid from the pit. The temporary fence will be

permanently removed once the pit is backfilled. After the pit is backfilled and the fence removed, the topsoil will be evenly applied over the excavated area.

9. Seeding – surface preparation and reseeding will occur at the next available time period appropriate for planting.

119) The operations plan should include a section detailing procedures and a schedule for locating, investigating and properly abandoning all historical drill holes on the permit area. (MM)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Secs. 3(a)(xii), 8(a) and (b) and GL 4, Sec. III(B)(5)(f).

Please see Response to Comment V5, #84.

26

Location Lost Creek Date Thurs WK10 8/17/06

Project / Client

7:30 Arrived on site

7:45 Jerry from Strata Data arrived to log 4 holes.
LC29, 24M, 20M, 25M. uses Mt. Sopris equip
Kenny reaming LC15M @ 160'.
Buster tripping out of LC25M

10 AM - Rob Shook + Devon on site
Jerry says Century equip is more reliable than Mt. Sopris, also Century is better at fixing.

* 7/26/06 → Δ from 7 Rig/5 standby to 11 rig/1 standby

1 pm - Kenny finished casing + cementing LC15M
Will air lift LC29M (DE sand) to see if any water in it or just drlg mud
Buster about to case LC25M

1:15 - Airlifted LC29M - maybe getting ¼ gal/min
→ probably not a DE aquifer. Took pics + video, will email to WDEQ
gal/day for generator 307-262-3704 George cell
Kenny started UR LC16M
Buster started reaming LC20M

George Hoffman sampling @ LS

RECLAMATION PLAN

WDEQ/LQD COMMENTS of 1/30/09

Volume 5 – (Operations Plan and Reclamation Plan)

1) *Section RP 2.3 must specify and describe in detail the methods and efforts that will be employed to restore the ground water to background water quality levels (i.e. define BPT). This description should specify the volumes of water (pore volumes, including the PV calculation) to be treated, re-injected and circulated and the specific treatments to be used. The application must provide detailed justification to demonstrate that the prescribed process has been proven to be successful in restoring ground water to background water quality levels and thus constitutes BPT. Once approved, LQD will expect the operator to employ these prescribed restoration efforts. The reclamation bond will be calculated based on the estimated cost of completing these prescribed efforts. BPT will thus be defined and approved up-front for each well field. Restoration will be considered to be complete once the approved BPT efforts have been conducted, assuming that the class of use has been achieved. This process of defining and approving BPT will provide a measure of certainty to all parties. It is envisioned that the definition of BPT could change for future well fields, based on changes in technology and/or results of on-site restoration efforts. (MM)*

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and GL 4, Sec. III(D)(b).

Section RP 2.3 has been revised in its entirety to provide additional information about LC ISR, LLC's restoration process, and information specific to each mine unit (e.g., baseline water quality and pore volume) will be provided prior to mining of that unit. The reclamation bond calculation has been revised to reflect the estimated cost of completing the efforts determined as BPT that are expected to result in successful groundwater restoration at the Lost Creek Project. As with the mine units, the bond will be updated as necessary to reflect the more specific information developed for each mine unit. The in situ rules also imply that the determination of what constitutes BPT is not made *a priori*, rather it is made after the operator has completed some restoration effort (LQD NonCoal Rules, Ch. 11, §5(a)). For example, if *only* groundwater sweep were used, it could be effectively argued that other readily available processes (e.g., reverse osmosis or reductant addition) would also be required. In addition, changes in technology may also make an *a priori* decision moot between the time a mine unit is approved and mining completed. For example, if bioremediation techniques are improved, then they may become BPT.

The restoration process described in Section RP 2.3 has been proven successful for analogous mine units at the in the Powder River Basin of Wyoming (Highlands Ranch Wellfield A and Irigary Ranch). The process is justifiable in terms of performance and achievability in relation to health, safety and the minimization of adverse impacts to the environment. With respect to the number of pore volumes necessary for restoration, the restoration efforts and results from the restored Christensen Ranch Mine Units 5 and 6 (Wellfield Restoration Report, Christensen Ranch Project, March 2008) are herein reviewed and compared to the process proposed for the Lost Creek Project. Although located in a distinctly separate geographic basin, the two mine units were selected as analogs for the following reasons:

1. Restoration began soon after production operations ended;
2. RO treatment of lixiviant was employed throughout the production life (see OP 4.1);
3. Average flow rates on a per well basis for these fields most nearly approach the average flow rate per well predicted for Lost Creek (low flow rate per well is not analogous);
4. The pore volume calculation method was comparable;
5. There were mixed pattern types addressing multiple ore horizons within the sand unit; and
6. Hydrogeologic properties are similar (see table below).

Project & Mine Unit	Confined ?	Sand Unit Thickness (ft)	Transmissivity (ft^2/d)	Hydraulic Conductivity (ft/d)
Christensen MU5	Yes	190	87	0.46
Christensen MU6	Yes	50 - 60	84	1.58
Lost Creek	Yes	120 - 140	60 – 80	0.50 - 1.50

The groundwater restoration process used at the Christensen Ranch Project is similar to that in Section RP 2.3 for the Lost Creek Project in that it used the staged approach of groundwater sweep followed by reverse osmosis (RO) permeate injection and then recirculation. The following table presents the actual number of pore volumes processed in each restoration stage at the Christensen Ranch Project as compared to the Lost Creek restoration plan.

Project & Mine Unit	Pore Volumes			
	Groundwater Sweep	Reverse Osmosis	Recirculation	Total
Christensen MU5	1.1	8.0	1.0	10.1
Christensen MU6	1.5	3.5	1.0	6.0
Lost Creek (projection)	0.3	6.0	1.0	7.3

Ground water within the Christensen Mine Unit 5 production zone was restored to the pre-mining class of use, using best practicable technology (BPT), as required by the WDEQ. In Mine Unit 5, 25 of the 35 constituents were restored to at or below their target restoration values. Concentrations of most constituents were reduced by more than 75% of the post-mining values. Table 5.2 from the Mine Unit 5 Wellfield Restoration Report, Christensen Ranch Project (March 2008) is presented below to compare the restoration results to the various regulatory standards.

Table 5-2. Comparison of Fourth Round Stability Monitoring Water Quality to Target Restoration Values and Regulatory Standards, Mine Unit 5, Christensen Ranch, Wyoming

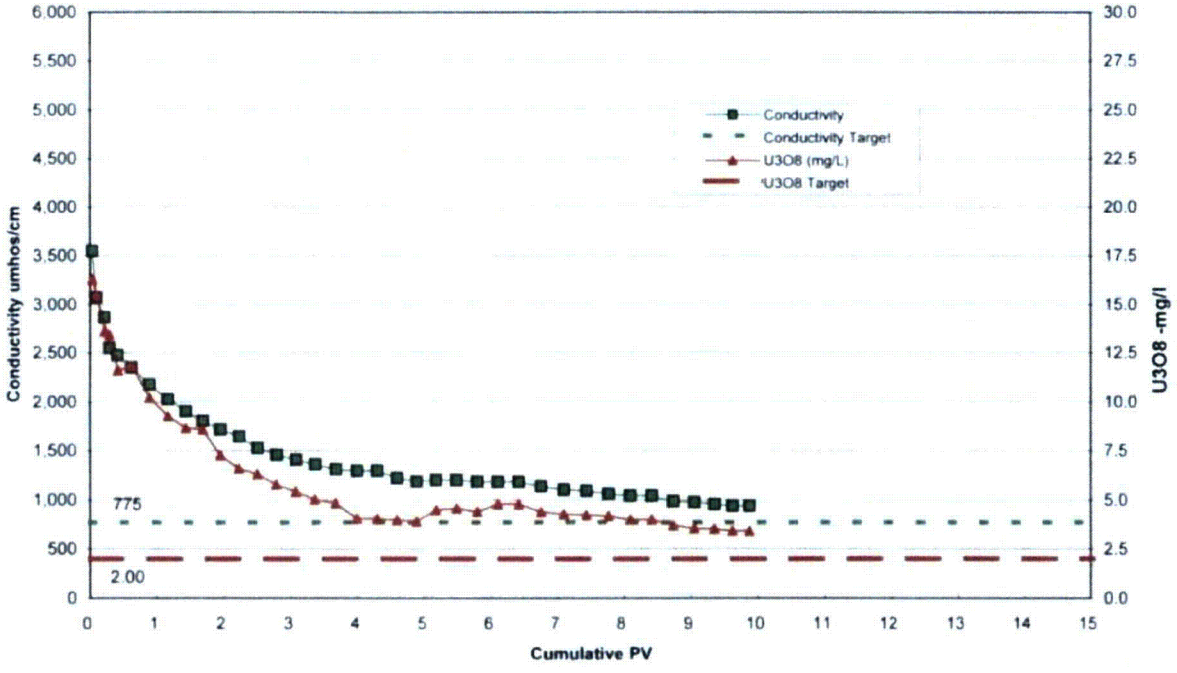
	Round 4 Stability Monitoring Mean	TRV	Exceeds TRV ?	Wyoming Class I	Exceeds Wyoming Class I ?	EPA MCL	Exceeds EPA MCL ?
Major Ions mg/l:							
Ca	35.6	24.1	Yes	-	NA	-	NA
Mg	7.2	3.7	Yes	-	NA	-	NA
Na	157.0	191.7	No	-	NA	-	NA
K	4.0	19.9	No	-	NA	-	NA
CO3	1.2	61.9	No	-	NA	-	NA
HCO3	356.6	217.6	Yes	-	NA	-	NA
SO4	159.0	348.2	No	250	No	-	NA
Cl	11.4	11.9	No	250	No	-	NA
NH4	0.10	0.72	No	0.5	No	-	NA
NO2 (N)	0.09	0.10	No	1	No	1	No
NO3 (N)	0.12	16.8	No	10	No	10	No
F	0.10	0.31	No	1.4	No	4	No
SiO2	7.1	12.3	No	-	NA	-	NA
TDS	589.2	619.3	No	500	Yes	500	Yes
Cond. (umho/cm)	944.6	1095.0	No	-	NA	-	NA
Alk. (as CaC03)	293.1	158.4	Yes	-	NA	-	NA
pH (units)	8.10	10.16	No	6.5-8.5	No	6.5-8.5	No
Trace Metals mg/l:							
Al[a]	0.11	0.10	Yes	-	NA	0.05 to 0.2	No
As	0.008	0.006	Yes	0.05	No	0.01	No
Be[b]	0.50	0.10	No	1	No	2	No
B	0.07	0.10	No	0.75	No	-	NA
Cd	0.00	0.01	No	0.01	No	0.005	No
Cr	0.01	0.05	No	0.05	No	0.1	No
Cu	0.01	0.10	No	1.00	No	1.3	No
Fe	0.10	0.05	Yes	0.3	No	0.3	No
Pb	0.02	0.05	No	0.05	No	0.06	No
Mn	0.08	0.01	Yes	0.05	Yes	0.05	Yes
Hg	0.001	0.001	No	0.002	No	0.002	No
Mo	0.02	0.10	No	-	NA	-	NA
Ni	0.01	0.05	No	0.01	No	-	NA
Se	0.41	0.026	Yes	0.05	Yes	0.05	Yes
V	0.12	0.14	No	-	NA	-	NA
Zn	0.01	0.107	No	5	No	5	No
Radiometric							
U (mg/l)	2.05	0.076	Yes	-	NA	0.03	Yes
Ra 226 (pCi/l)	238.0	289.8	No	5	Yes	5	Yes

[a] - all samples except one (5BL76-1) were below the detection limit of 0.1 mg/l
[b] -All samples were below detection limit which is greater than the TRV
TRV -Target Restoration Value-established from baseline water quality
Wyoming Class I- Drinking Water Standard
EPA MCL-US Environmental Protection Agency Maximum Contaminant Level

There are reasons to expect that restoration of Mine Unit 5 could have been achieved with fewer pore volumes of treatment. Plots of uranium concentration and total dissolved solids for each module (header house) during RO clearly indicate that the effort extended well beyond the point where beneficial gains were being obtained.

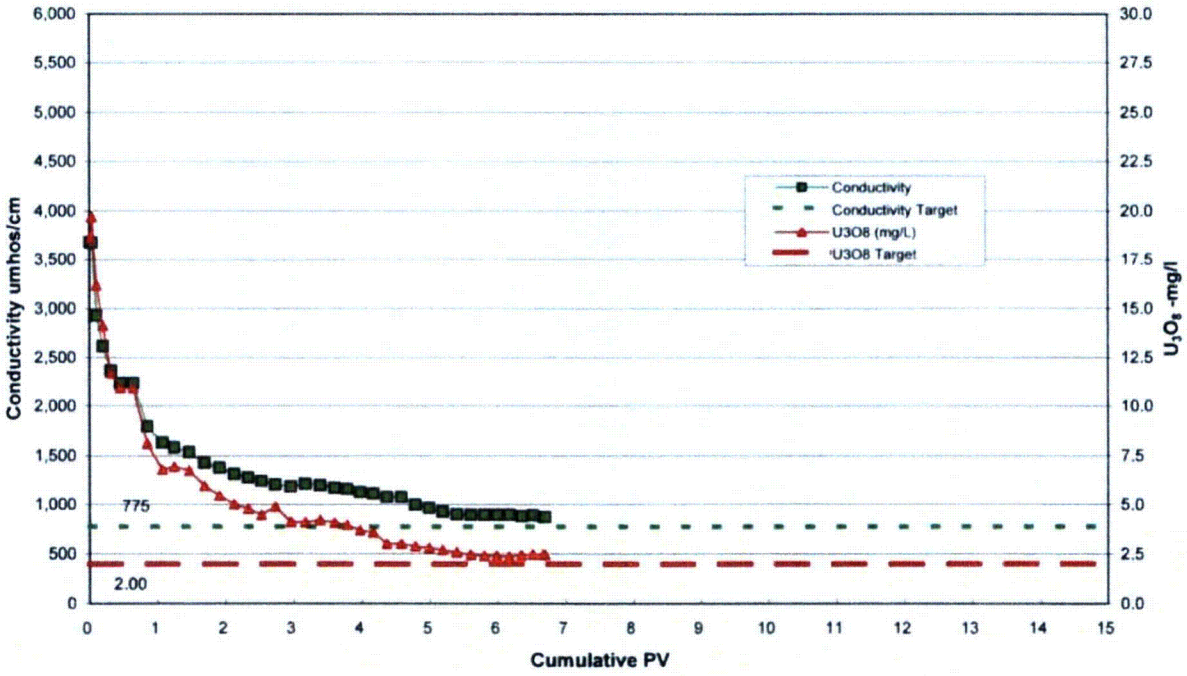
In Module 51, RO (including recirculation) was conducted for nearly 10 pore volumes (PV). The uranium and TDS concentration graphs indicate a meaningful plateau was reached near four PV and little improvement in water quality occurred beyond that point (see Figure 4-1 below).

Figure 4-1 Uranium and Conductivity Trends During the RO Permeate Injection Phase of Restoration, Module 51, , Mine Unit 5, Christensen Ranch, Wyoming



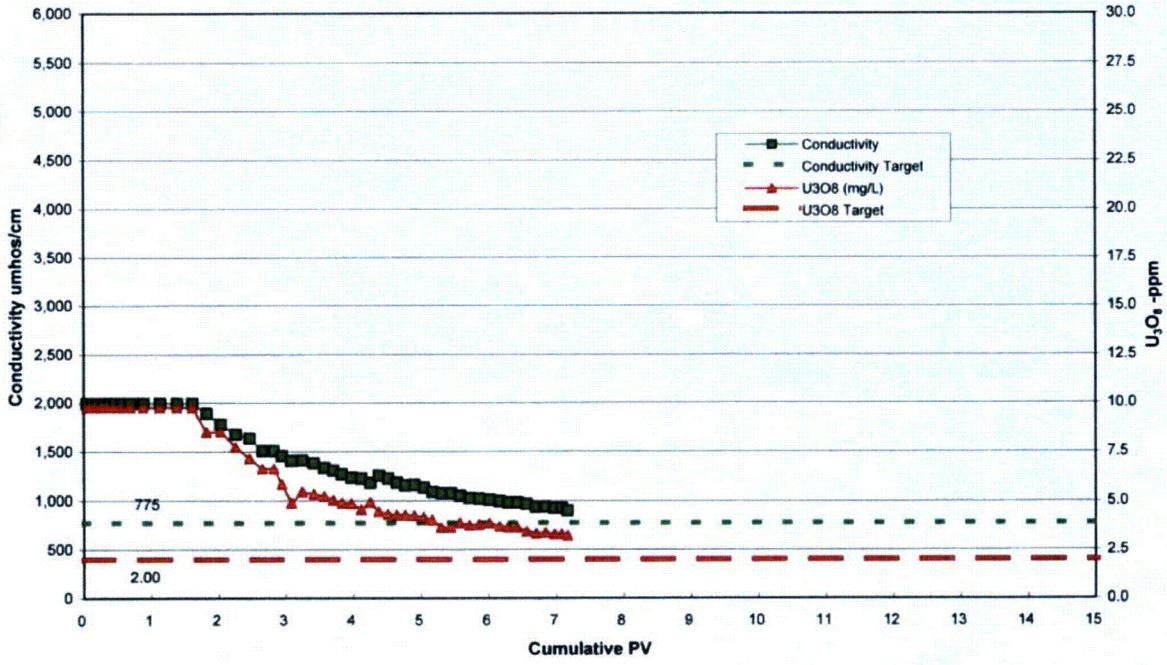
In Module 52, RO (including recirculation) was conducted for nearly seven PV. The uranium and TDS concentration graphs indicate a meaningful plateau was reached near four and one-half PV and little improvement in water quality occurred beyond that point (see Figure 4-2 below).

Figure 4-2 Uranium and Conductivity Trends During the RO Permeate Injection Phase of Restoration, Module 52 , Mine Unit 5, Christensen Ranch, Wyoming



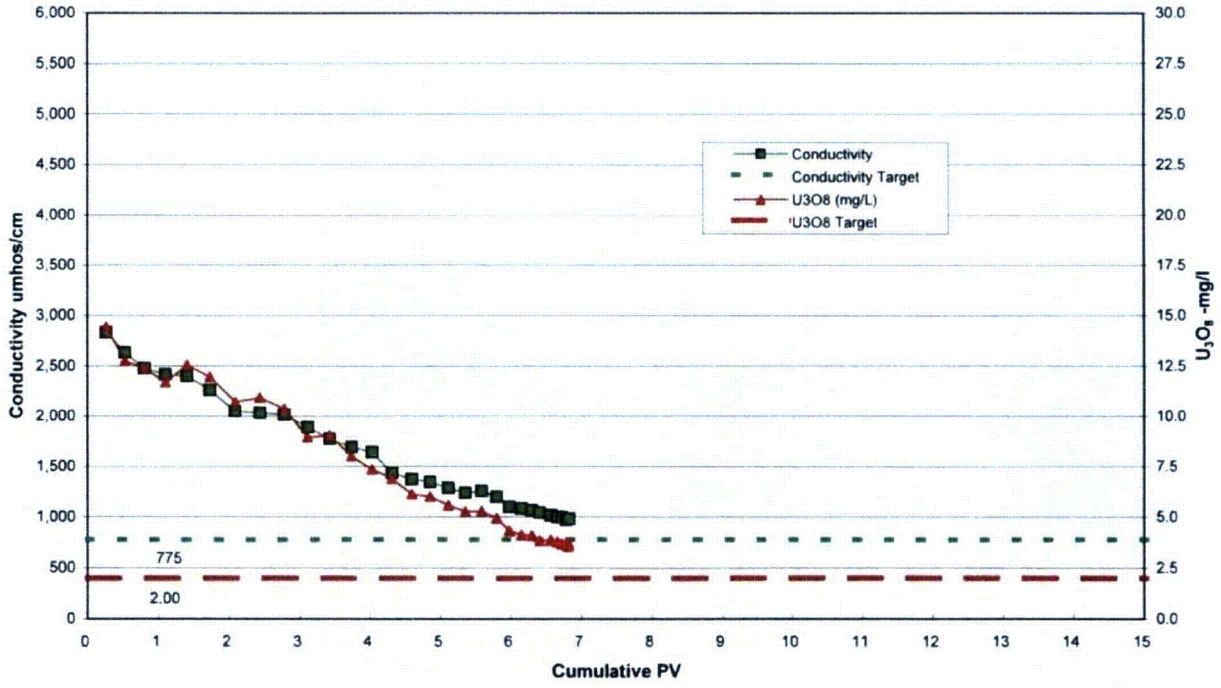
In Module 53, RO (including recirculation) was conducted for more than seven PV. The uranium and TDS concentration graphs indicate a meaningful plateau was reached near five PV and little improvement in water quality occurred beyond that point (see Figure 4-3 below).

Figure 4-3 Uranium and Conductivity Trends During the RO Permeate Injection Phase of Restoration, Module 53, Mine Unit 5, Christensen Ranch, Wyoming



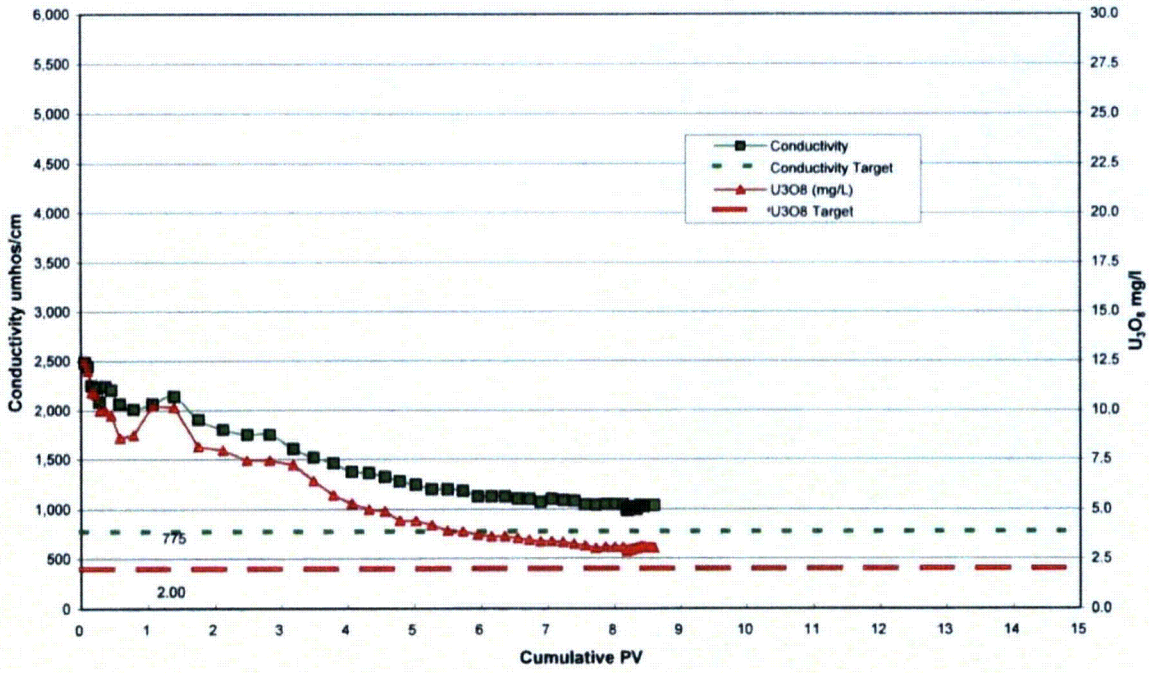
In Module 54, RO (including recirculation) was conducted for nearly seven PV. The uranium and TDS concentration graphs indicate a meaningful plateau was reached before 5 PV and little improvement in water quality occurred between five and six PV (see Figure 4-4 below). Pore volumes 6 through 7 were recirculation only.

Figure 4-4 Uranium and Conductivity Trends During the RO Permeate Injection Phase of Restoration, Module 54 , Mine Unit 5, Christensen Ranch, Wyoming



In Module 55, RO phase was conducted for nearly nine PV. The uranium and TDS concentration graphs reached a meaningful plateau before six PV and little improvement in water quality occurred beyond that point (see Figure 4-5 below).

Figure 4-5 Uranium and Conductivity Trends During the RO Permeate Injection Phase of Restoration, Module 55, Mine Unit 5, Christensen Ranch, Wyoming



It is apparent in the above graphs that RO operations were continued in the Mine Unit 5 modules long after the water quality improvement was reduced to a point of uneconomic gain. The data supports a technical conclusion that the completion of the restoration operations in Mine Unit 5 could have been achieved with six or less pore volumes of RO operations instead of the eight PV that were completed.

Ground water within the Christensen Mine Unit 6 production zone was also restored to the pre-mining class of use, using BPT, as required by the WDEQ. In Mine Unit 6, 27 of the 35 constituents were restored to at or below their target restoration values. Concentrations of most constituents were reduced by more than 75% of the post mining values. Table 5.2 of from the Mine Unit 6 Wellfield Restoration Report, Christensen Ranch Project (March 2008) is presented below to compare the restoration results to the various regulatory standards.

Table 5-2. Comparison of Fourth Round Stability Monitoring Water Quality to Target Restoration Values and Regulatory Standards, Mine Unit 6, Christensen Ranch, Wyoming

	Round 4 Stability Monitoring Mean	TRV	Exceeds TRV ?	Wyoming Class I	Exceeds Wyoming Class I ?	EPA MCL	Exceeds EPA MCL ?
Major Ions mg/l:							
Ca	54.8	50.1	Yes	-	NA	-	NA
Mg	12.0	10.8	Yes	-	NA	-	NA
Na	188.5	278.5	No	-	NA	-	NA
K	4.0	15.3	No	-	NA	-	NA
CO3	5.0	18.2	No	-	NA	-	NA
HC03	337.6	138.3	Yes	-	NA	-	NA
SO4	296.1	680.5	No	250	Yes	-	NA
Cl	10.4	8.6	Yes	250	No	-	NA
NH4	0.13	0.27	No	0.5	No	-	NA
NO2 (N)	0.05	0.50	No	1	No	1	No
NO3 (N)	0.06	0.31	No	10	No	10	No
F	0.10	0.34	No	1.4	No	4	No
SiO2	9.84	10.80	No	-	NA	-	NA
TDS	717.7	1160.8	No	500	Yes	500	Yes
Cond. (umho/cm	1082.8	1697.7	No	-	NA	-	NA
Alk. (as CaC03)	277.1	106.6	Yes	-	NA	-	NA
pH (units)	7.98	13.60	No	6.5-8.5	No	6.5-8.5	No
Trace Metals mg/l:							
Al	0.10	0.30	No	-	NA	0.05 to 0.2	No
As	0.01	0.01	No	0.05	No	0.01	No
Ba *	0.50	0.05	No	1	No	2	No
B	0.07	0.10	No	0.75	No	-	NA
Cd	0.002	0.050	No	0.01	No	0.005	No
Cr	0.01	1.54	No	0.05	No	0.1	No
Cu	0.01	0.05	No	1.00	No	1.3	No
Fe	0.45	0.81	No	0.3	Yes	0.3	Yes
Pb *	0.02	0.01	No	0.05	No	0.05	No
Mn	0.30	0.05	Yes	0.05	Yes	0.05	Yes
Hg	0.001	0.002	No	0.002	No	0.002	No
Mo	0.02	0.14	No	-	NA	-	NA
Ni	0.01	0.26	No	0.01	No	-	NA
Se	0.08	0.02	Yes	0.05	Yes	0.05	Yes
V	0.06	0.78	No	-	NA	-	NA
Zn	0.01	0.04	No	5	No	5	No
Radiometric							
U (mg/l)	1.18	0.06	Yes	-	NA	0.03	Yes
Ra 226 (pCi/l)	181.01	428.50	No	5	Yes	5	Yes

* All samples were below detection limit which is greater than the TRV
TRV -Target Restoration Value-established from baseline water quality
Wyoming Class I- Drinking Water Standard
EPA MCL-US Environmental Protection Agency Maximum Contaminant Level

The Mine Unit 6 Restoration Report (COGEMA, March 2008) stands alone as a significant technical demonstration supporting the conclusion that six PV of active restoration is sufficient to successfully complete restoration operations in mine units using the BPT practices proposed for the Lost Creek Project. Lost Creek ISR, LLC has included seven and one-third PV of active restoration in its Restoration Plan. The proposed process is justifiable in terms of performance and achievability in relation to health, safety and the minimization of adverse impacts to the environment.

2) ***Section RP2.3 groundwater Restoration Methods. Please provide greater detail including chemical equations (similar to Figure OP-6) to explain the processes that the groundwater will undergo to create the reducing conditions. The chemistry that will take place in the ion exchange and RO circuits should be presented. Further explanation of the how possible reductants or bioremediation additives will affect the chemistry of the groundwater should also be provided. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and GL 4, Sec. III(D)(b).

Ion Exchange. The chemistry of the ion exchange circuit used in restoration is identical to the chemistry of the ion exchange circuit used in production. Ion exchange resins preferentially remove the uranyl dicarbonate and/or uranyl tricarbonate compounds from the solution. Bicarbonate compounds are displaced from the resin into the solution.

Reverse Osmosis. Reverse osmosis systems are physical separation units and do not rely on chemical processes. Water containing chemical impurities is pressurized to force small molecules through a semi-permeable membrane barrier. The membrane is designed to allow water molecules, gases and other small molecules to permeate (pass) through the membrane. Larger ions, molecules and chemical compounds are physically unable to pass through the membrane due to their size and are thus separated and collect as a concentrate (brine) (See Table RP-2).

Reductants. No specific chemical reductant additives have been proposed in the application. LCI advocates an approach where WDEQ-LQD would review and approve any proposed chemical reductant additive, and how such additives will affect the chemistry of the groundwater, prior to commencement of addition at the site. Text to this effect has been added in Section RP 2.3.

Bioremediation. No specific bioremediation process has been proposed in the application. The field of bioremediation is rapidly advancing as is the technical understanding of the technique. It would be highly speculative at this time to discuss any or all potential additives. LCI advocates an approach where WDEQ-LQD would review

and approve any proposed bioremediation technique, and how such additives will affect the chemistry of the groundwater, prior to commencement of addition at the site. Text to this effect has been included in Section RP 2.3.

3) ***Section RP2.3 Groundwater Restoration Methods. This section provides pore volume exchanges for groundwater sweep (one pore volume) groundwater treatment (six pore volumes) and groundwater recirculation (one pore volume). Please cite where this is documented to be BMP. Is it based on any real life success of an existing well field? (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 5(a)(i) and (ii).

Please see the Response to Comment V5, RP #1.

4) ***Figure RP-1. The timeline gap for the Process Plant should indicate plant decommissioning. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(H) and R&R Ch. 11, Sec. 5(a)(iv) and (xiii)(A).

Figure RP-1 has been updated and clarified (including removal of the 'gap').

5) ***Please provide a hydrologic impact assessment (surface and ground water) of the final anticipated conditions. This should include recovery times ground water, potential changes in water chemistry, etc. (BRW)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and R&R Ch. 11, Sec. 5(a)(ii).

Surface Water

As discussed in Appendix D6, Section D6.1.1, all of the surface water features at the site are ephemeral and relatively small. The only anticipated temporary impacts to the surface water system during operations may occur along roads, where it may be necessary to route drainages through culverts under the roads (Section OP 2.6) or route runoff around facilities (Operations Plan Attachment OP-4). These features should not affect flow rates or water quality because: of the low relief across the site and the limited surface water flows; only the drainage pattern in the immediate vicinity of the roads and structures may need to be altered (if at all); the culverts will be appropriately sized; and any disturbances associated with installation of the structures will be reclaimed immediately after installation (Section OP 2.7). The Stormwater Pollution Prevention

Plan also has provisions for evaluating construction impacts and unanticipated impacts such as spills. Provisions for spill detection and response are also addressed in Section OP 2.9.

Once reclamation of the site is completed, no permanent impacts to the surface water system are anticipated. As discussed in Sections RP 3.0 and 4.0 of the Reclamation Plan, all of the surface facilities are scheduled for removal and reclamation. The landowner (BLM) could request that a road (and associated culverts) be left in place, which may mean a permanent change to the drainage pattern. However, by that time, any potential problems with the function of the culvert(s) should have been detected and repaired. As noted above, any spill-related impacts will be addressed at the time of the spill.

Groundwater

Please see OP 3.1 and Response to Comment V5, OP#105.

6) ***Section RP 2.3.1: The use of ground water sweep with direct disposal of the produced water, is not considered to be BPT due to excessive consumption of ground water and resultant impacts to ground water resources. This section should be revised to clarify that ground water sweep will only be employed when the produced water can be treated and re-injected. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(H) and R&R Ch. 11, Sec. 5(a)(ii)(A).

Please see Response to Comment V5, OP#16.

7) ***Section RP 2.4: The ground water stability monitoring phase should be 12 months with quarterly sampling (i.e. a total of 5 sampling events). (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(H), R&R Ch. 11, Sec. 5(a)(ii)(D) and GL 4, Sec. III(D)(1)(d).

WDEQ-LQD Guideline 4 Section D(1)(d) recommends a stabilization period of at least six months. LC ISR, LLC has already exceeded the minimum LQD recommendation by stating that stabilization will last nine months. Samples will be collected at the beginning of the nine-month period and once every three months for nine months. This will result in a total of four sampling rounds.

8) ***Section RP 2.4 should be revised to specify that during the stability monitoring period all monitoring wells (inside and outside of the pattern, including underlying, overlying and perimeter wells) will be individually sampled and analyzed for the complete suite of parameters, including water levels. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and GL 4, Sec. III(D)(1)(d).

Section RP 2.4 has been revised to state that, during stability monitoring, all overlying, underlying and perimeter monitor wells will be analyzed for all UCL parameters once every three months. If groundwater restoration has not been successful and an excursion occurs during stabilization then the sampling will revert to weekly for affected monitor wells.

9) ***Section RP 3.1, Well Abandonment: Item number 1 in the list beginning at the bottom of page RP-10 must specify that grouting will occur from the bottom of the well to the top. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 8(f)(i) and (ii).

Item 5 indicates that grouting will occur from the bottom of the well.

10) ***Section RP 3.1, Well Abandonment: Item number 7 in the list on Page RP-11 must be changed to acknowledge the new policy of LQD to require that all drill holes and abandoned wells are backfilled to within three feet of the surface. It is no longer considered BPT to allow open holes to be left in the ground. This means if grout settles to 40 feet bgs (or any other level greater than two or three feet bgs) and no water is on top of the grout plug, bentonite chips or a reasonable substitute must be poured into the hole to bring it to the proper level. If there is still water on top of the grout plug, the operator is expected to re-enter the hole and tremmie to the bottom so the hole may, again, be backfilled from the bottom to the top. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: R&R Ch. 11, Sec. 8(f)(iv) and see WDEQ-LQD letter of March 13, 2009 to WMA.

Please see the Response to Comment V5, OP #118.

11) ***Section RP 3.1, Well Abandonment: Item number 12 in the list on Page RP-11 must include the words "and LQD" at the end of the sentence ending with "WSEO". (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: N/A (typo).

Item 12 has been revised to include LQD.

12) ***Section RP 3.2 Facility and Road Reclamation. Paragraph 3 states that culverts and road surfacing materials will be removed. Please indicate their final disposal location(s). (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(iv) and R&R Ch. 11, Sec. 5(a)(ix).

The bond calculation provided in Table RP-4 accounts for the replacement of topsoil and revegetation for the roads in Worksheet 7. However, LC ISR, LLC neglected to include the cost of culvert and road surface removal in the bond estimate. Table RP-4 has been revised to include those items.

The bond estimate will assume that the culverts will be disposed of at the nearest municipal landfill (Rawlins, WY). The estimate will also account for the cost to gather and load the gravel surfacing from the roads. However, because there is significant value in the road material, no cost for trucking or disposal is planned. If these assumptions become invalid, LCI will modify the bond estimate in the Annual Report.

13) ***Section RP 4.0, Reclamation and Decommissioning of Processing and Support Facilities: Ponds, laydown yards, parking areas, and topsoil and subsoil stockpile location, should be included in the bullet list at the beginning of this section. (MLB & AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(iv) and R&R Ch. 11, Sec. 5(a)(iv), (vi), (vii), (ix) and (xi).

The list at the beginning of Section RP 4.0 has been updated as requested.

14) ***Section RP 4.1 discusses on-site waste disposal. Any on-site waste disposal must be permitted as part of the mine permit application. Detailed plans and specifications must be provided along with landowner's consent. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(ix) and R&R Ch. 11, Sec. 5(a)(viii) and (ix).

LC ISR, LLC has decided to not pursue an on-site landfill at this time and as such has deleted the portions of the 2nd paragraph of Section RP 4.1 describing a landfill. The

bond calculation includes the cost of shipping and disposal of all material at appropriate offsite locations.

15) ***Section RP 4.5.2, Surface Preparation:*** ***On Page RP-15 there must include a commitment to rip to a minimum depth of 12 inches as part of seedbed preparation. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(G) and R&R Ch. 3, Sec. 2(d)(iii).

The text has been revised to specify a minimum depth for the seedbed preparation.

16) ***RP4.5.2, Surface Preparation:*** ***It is stated that "Seed bed preparation will be performed under appropriate soil and climatic conditions". Please define appropriate soil and climatic conditions. (CS)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(G) and R&R Ch. 3, Sec. 2(d)(iii).

The purposes of performing seed bed preparation under appropriate conditions have been noted in the second paragraph of Section RP 4.5.2, along with examples of conditions under which seed bed preparation would be inappropriate.

17) ***RP4.5.3, Soil Placement:*** ***Stating that "soils will be replaced where excavated, whenever possible" seems inappropriate. If soils are stripped and stockpiled it should be possible to replace them. (CS)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(G) and R&R Ch. 3, Sec. 2(x)(i)(E).

The intent of LC ISR, LLC's Section RP 4.5.3 is to say that the soil will be replaced at the same location from which it was excavated, whenever possible. The text at the beginning of Section 4.5.3 has been clarified.

18) ***Section RP 4.5.3 Soil Replacement.*** ***This section states that Section OP 2.5 describes that separate handling of topsoil and subsoil is not required. No discussion of this topic was found in Section OP 2.5. Topsoil is always more valuable a planting bed than a topsoil / subsoil mixture. Especially given the dessert conditions, all efforts should be made to be protective of the topsoil layer, especially by handling it separately from the subsoil. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-406(b)(viii).

The reference to subsoil has been removed, and the discussion about topsoil and subsoil in Section OP 2.5 has been clarified.

19) ***Section RP 4.5.4 Seed Mix, Reseeding Methods and Fencing. Paragraph 4 states that re-seeded areas outside fenced mine units will be restricted until vegetation is successfully re-established. The only way to ensure access restriction from wildlife is with fencing. Please state that these area will have fencing installed to prevent access. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(G) and GL 4, Sec. III(D)(2)(g).

Those portions of the Permit Area that will require reseeding, outside the Plant and the mine units, are generally long, narrow areas, such as roads and pipeline corridors. The intent was to indicate that vehicular access will be restricted; exclusion of wildlife from such corridors is impractical and the use of fencing that could exclude wildlife would probably not be approved by the WGFD. In addition, most of the cattle in the general area do not congregate on the Permit Area because of the lack of water. The text has been revised to indicate that vehicular access will be restricted and that particular attention will be given to these areas in terms of evaluating revegetation practices and success to determine if additional weed control, use of a cover crop, or other supplemental practices will be necessary because of the exposure to forage.

20) ***RP4.5.4, Seed Mix, Reseeding Methods, and Fencing: The last paragraph states that "When reseeding areas outside fenced mine units or the Plant, grazing and access to reseeded areas will be restricted until vegetation is successfully re-established". Please clarify how access is going to be restricted. For example "with BLM and DEQ approved fencing". (CS)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(G) and GL 4, Sec. III(D)(2)(g).

Please see response to previous comment.

21) ***RP4.5.5, Revegetation Success Criteria: The second point in the list states that "the total vegetation cover of perennial species (excluding noxious weed species) and any species in the approved seed mix is at least equal to the total vegetation cover of perennial species (excluding noxious weed species) before operations". Consider rewording to "the total vegetation cover of perennial species (excluding noxious weed***

species) and any species in the approved seed mix is at least equal to the total vegetation cover of perennial species (excluding noxious weed species) of the undisturbed areas of the mine permit". This would add consistency with your proposed vegetation study parameters and helps account for climatic variability between when mining began and when reclamation evaluation occurs. (CS)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: N/A (typo).

The text has been revised to indicate that undisturbed areas will be used for the evaluation of revegetation success.

22) ***Reclamation Plan, Page RP-15. The sequencing of the sections goes from RP4.4 Roads on page RP-14 to Section RP 1.1 Soil Replacement and Revegetation on page RP-15. According to the table of Contents, this should be RP 4.5 Soil Replacement and Revegetation. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: N/A (typo).

The typo has been corrected.

23) ***Section RP 5.0 and Table RP-4: The reclamation cost estimate should be revised to include the following:***

(Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428[a][iii][J] and R&R Ch. 11, Sec. 5[a][iv] and [xiii][E].)

- ***A detailed critical-path time schedule including all phases of the reclamation.***

  A detailed critical-path schedule is included as Figure RP-4 for the operation, restoration and reclamation of the Plant and the first mine unit. This schedule supports the associated bond presented in Table RP-4. The schedule also details the projected manpower requirements through the restoration/reclamation cycle.

- ***A detailed description of labor requirements and assumptions for all phases of the reclamation. It is this reviewer's position that the reclamation cost estimate should include a workforce/payroll comparable with the production workforce/payroll or justify why this would not be the case. (MM)***

  Restoration occurs concurrently with production during most of the project life; therefore, the "production workforce/payroll" already includes the workforce required

for restoration during much of the mine life. .Restoration and reclamation do not require a workforce/payroll comparable with the production workforce. The need for several segments of the workforce are eliminated and or substantially reduced when drilling, construction and production activities cease. When production ends and restoration continues, the workforce required for production is cut while the workforce required for restoration is retained.

The operational flow rate required for restoration is a small fraction of the operational flow rate for restoration. The requirement for groundwater sweep and the rate of consumptive removal of groundwater during that stage limit the ability for an operator to increase the restoration flow rate. Lower required flow rates translate to lower workforce/payroll levels.

Table RP-4 and Figure RP-4 have been revised to include the actual monitor well counts and proposed injection and production counts. Figure RP-4 details the labor requirements during all phases of the initial bonded work. The following is a discussion of the major labor components:

Drilling and Construction: For the purposes of Figure RP-4, construction occurs from the beginning of Year 1 through the second month of Year 2. Construction includes installation and testing of wells, pipelines, powerlines and field production facilities. Because the surety bond calculation assumes shutdown of production after Mine Unit 1 (MU-1), all construction associated personnel and contractors will cease work at the project after completion of their assignments except for those that will be employed in the restoration and/or reclamation of the facility. The 17 positions associated with Drilling and Construction are planned as:

Warehouseman	Supervisor Drilling	Staff Geologist
Draftsman	Backhoe Operator	Casing Tech (3)
Geotech Logger (2)	Foreman WFC	Electrician WFC
Lead Tech WFC	Technician WFC (4)	

Production Operations: For the purposes of Figure RP-4, production will occur from the beginning of Year 1 through the second month of Year 3. Production includes injection of lixivient, production of uranium solutions, monitoring of solutions and wells, maintenance of wells and operation/maintenance of the plant facility. Because the surety bond calculation assumes shutdown of production after Mine Unit 1 (MU-1), all production associated personnel will cease work at the

project after completion of their assignments except for those that will be employed in the restoration and/or reclamation of the facility. The 35 positions associated with production operations (not exclusively) are:

Mine Manager	Supervisor IT-Administration	Accountant
Technician Instrument	Technician IT	Secretary
Supervisor EHS	Technician EHS	Sampler EHS
Site Chief Geologist	Project Engineer	Foreman Maintenance
Technician Maintenance (4)	Electrician Maintenance	Manager Operations
Foreman Operations	Wellfield Operator (4)	Tech WF Maintenance (3)
Foreman Plant	Plant Operator (4)	Dryer Operator
Lab Chemist	Technician Lab (2)	

Restoration: For the purposes of Figure RP-4, restoration will occur in two phases: Active and Passive. Phase 1, Active Restoration, will include groundwater sweep, reverse osmosis and recirculation. This will occur from the third month of Year 3 through fifth month of Year 4. Phase 2, Sampling, will include stability sampling and regulatory approval. This will occur from the sixth month of Year 4 through the eighth month of Year 5. Personnel in theses phases will be responsible for plant operation and maintenance, field operation and maintenance and sampling. All associated personnel will cease work at the project after completion of their assignments except for those that will be employed in the reclamation of the facility.

The 14 positions associated with Phase 1 (Active Restoration) are:

Mine Manager	Supervisor EHS	Technician EHS
Sampler EHS	Electrician Maintenance	Plant Operator (4)
Lab Chemist	Restoration Operator (4)	

The six positions associated with Phase 2 (Sampling) are:

Mine Manager	Supervisor EHS	Technician EHS
Sampler EHS	Electrician Maintenance	Lab Chemist

Reclamation: For the purposes of Figure RP-4, reclamation will occur from the ninth month of Year 5 through the eighth month of Year 6. Reclamation includes plugging of wells, demolition and removal of all production systems and removal of roads. The nine positions projected for reclamation are:

Mine Manager	Supervisor EHS	Technician EHS
Backhoe Operator	Electrician Maintenance	Technician Reclamation (4)

24) RP5.0, Financial Assurance; Category 2: The paragraph addressing worksheet seven indicates a "conservative" estimate of 5 out of 40 acres will need topsoil handling. Please clarify what a "conservative" estimate is and the justification for stating only 5 out of 40 acres will need topsoil handling. (CS)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(J), R&R Ch. 11, Sec. 5(a)(xii) and GL 6, Sec. IV(D).

Figure OP-7c details the vegetation and soil impacts on a "per header house" basis. The short term disturbance associated with piping and mud pits are estimated at 10%. The long term disturbance is estimated at 3%. Additional long term disturbance would be in the form of roads and laydown areas outside the pattern boundaries, as shown in Figure OP-7b. The disturbance detailed above is "conservatively" estimated at less than 12.5% or 5 of 40 acres.

25) Section RP 5.0 Financial Assurance. Paragraph one. Please add the cost of groundwater monitoring and analysis to the list of costs. (AB)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(J) and R&R Ch. 11, Sec. 5(a)(xiii)(C).

The costs associated with groundwater monitoring and analysis are dispersed within the existing bond estimate and are not just incorporated as the 0.5% allotted for on-site

monitoring under the Miscellaneous Costs Associated with Third Party Contractors in the Bond Summary (Page 1 in Table RP-4). For example, in Worksheet 1 (Groundwater Restoration), there are entries in Item IV (Stability Monitoring) specifically for the samples collected during that phase and in Item V (Labor), there are costs for a Sampler and for a Chemist. The surety will be reviewed annually and adjusted to reflect changes in cost and in the Project.

26) ***Table RP-4 Reclamation / Restoration Bond Estimate. Groundwater sampling and analysis could be conducted for many years, and should not be handled as a overhead cost of 0.5%, but as a separate line item in the bond estimate. Please indicate the initial number of monitoring wells that will be in place at the initial start-up of the mine and calculate their cost for sampling and analysis based real costs. (AB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(J), R&R Ch. 11, Sec. 5(a)(xiii)(C) and GL 4, Sec. III(D)(1)(c).

Please see response to previous comment.

27) ***Table RP-3, Seed Mix: It is requested that the seed mix be revised, contingent on BLM concurrence, to eliminate Prairie sandreed and Rubber rabbitbrush. This would reduce the overall seeding rate to 15 lbs/ac which is a more reasonable drill seeding rate. This lower seeding rate would be more conducive to sagebrush establishment, which is a primary focus of the revegetation efforts. Prairie sandreed is not native to the area and is not adapted to the arid conditions of the Red Desert. Rubber rabbitbrush is native, however it is not particularly desirable. Species that could be listed as possible alternates would include winterfat, needle-and-thread and squirreltail. (MM)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(G) and R&R Ch. 3, Sec. 2(a)(ii) and Ch. 11, Sec. 5(a)(xii).

LC ISR, LLC has sent a letter to BLM requesting concurrence on WDEQ-LQD's requested changes to the seed mix, including elimination of Prairie sandreed and Rubber rabbitbrush, which results in an overall seeding rate of 16 lbs/acre, and identifying needle-and-thread and bottlebrush squirreltail as alternatives (for all but sagebrush). If BLM concurs, LC ISR, LLC will update Table RP-3.

28) ***Please provide a sediment control plan for the reclamation phase of the operation. (BRW)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(J) and R&R Ch. 11, Sec. 4(a)(v).

The Storm Water Pollution Prevention Plan (Operations Plan Attachment OP-4) addresses sediment control for the life of the mine (cross-referenced in the second paragraph in Section RP 4.5).

29) ***As required by LQD, Chapter 11, Section 5 (a) (v), the Reclamation Plan must include a contour map showing the approximate postreclamation surface contours for affected land and the immediate surrounding areas if the operation will substantially alter the premining contours. The absence of this map must be explained in the permit text in the context of the above rule. (MLB)***

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(G) and R&R Ch. 11, Sec. 5(a)(v).

Text has been added to Section RP 4.5.2 to indicate that a post-reclamation contour map is not necessary.

30) ***A new section should be added to the Reclamation Plan entitled "Determination of Successful Groundwater and Site Restoration". The purpose of this section is to clearly state unequivocally the criteria that will be used by the WDEQ/LQD to determine whether the site has been adequately restored. It is envisioned that this section of the Reclamation Plan may become more pertinent as staff in Lost Creek ISR and WDEQ/LQD change over the upcoming 10 to 20 years. Fulfillment of the criteria in this section will be required before the operator may request/achieve final bond release. This section should include the following six bond release criteria:***

- ***Ground water treatment/restoration using approved BPT as described in Section RP 2.3 (Groundwater Restoration Methods) of the Permit;***
- ***Achievement of baseline ground water conditions. If baseline is unachievable, proceed to c.;***
- ***If baseline ground water conditions are unattainable, achievement of approved Class of Use is required;***
- ***Ground water stability monitoring of a 12 month duration with quarterly sampling (i.e. a total of 5 sampling events). If water quality trends during stability monitoring indicate class of use standards are (or will be) exceeded, the operator must return to step "a" above). Alternately if class of use standards, at a minimum, are met for the 12 month period then the well field will be considered eligible for bond release;***
- ***Reclamation of surface disturbance as described in the Reclamation Plan of the Permit which shall include all requirements of LQD Chapter 11, Section 5;***

- ***Documentation of LQD and landowner (primarily BLM) concurrence that the project is adequately reclaimed to the standards outlined in the approved WDEQ\LQD permit.***

The above bond release criteria can be considered on a well field by well field basis. Once criteria a – d have been met, the operator may request partial bond release for an individual well field. Final bond release cannot be considered until all of six of the above criteria have been met by the operator. (MLB and BRW)

Regulatory citations provided in WDEQ-LQD's letter of April 1, 2009 to LC ISR, LLC: W.S. § 35-11-428(a)(iii)(E), (H) and (J) and GL 4, Sec. III(D)(1)(g).

Pursuant to discussions on June 22, 2009 in Casper between WDEQ and LC ISR, LLC, please see the Response to Comment V5, RP #1.

INDEX SHEET FOR MINE PERMIT AMENDMENTS OR REVISIONS

Date: 10/16/09
TFN: 4 6/268

MINE COMPANY **Lost Creek ISR, LLC** MINE NAME: **Lost Creek ISR Project** PERMIT NO.: **N/A**

Statement: I, **John W. Cash**, an authorized representative of **Lost Creek ISR, LLC** declare that only the items listed on this and all consecutively numbered Index Sheets are intended as revisions to the current permit document. In the event that other changes inadvertently occurred due to this revision, those unintentional alterations will not be considered approved. Please initial and date._____

NOTES: 1) Include all revision or change elements and a brief description of or reason for each revision element.
2) List all revision or change elements in sequence by volume number; number index sheets sequentially as needed.

VOLUME NUMBER	PAGE, MAP OR OTHER PERMIT ENTRY TO BE REMOVED	PAGE, MAP OR OTHER PERMIT ENTRY TO BE ADDED	DESCRIPTION OF CHANGE
1 of 5 Adj File	Binder Cover & Inside Cover Sheet	Binder Cover & Inside Cover Sheet	Provided new covers or Volume 1 to show revision date.
	Pages i through xxii	Pages i through xxviii	Updated General and Detailed Table of Contents.
	Form 1 UIC (4 pages)	Form 1 UIC (4 pages)	Updated acreage and start/end date of Project.
	Appendix C Pages 1/5 - 5/5	Appendix C Pages 1/7 - 7/7	Updated acreage and description to include East & West Access Roads.
	Plate C-1	Plate C-1	Updated map to include East & West Access Roads.
	Appendix E	Appendix E	Updated map to include East & West Access Roads.
	Table ADJ-1	Table ADJ-1	Updated.
	List of Preparers	List of Preparers	Updated.
2 of 5 Apps D1-D5	Binder Cover & Inside Cover Sheet	Binder Cover & Inside Cover Sheet	Provided new covers & spine sheets for Volume 2 to show revision date.
	Pages i through xxii	Pages i through xxviii	Updated General and Detailed Table of Contents.
	Page D1-1	Page D1-1	Updated permit acreage.
	Figures D1-1a & D1-1b	Figures D1-1a & D1-1b	Updated permit boundaries.
	Page D5-i	Page D5-i	Updated Appendix D5 Table of Contents.
	Pages D5-4 through D5-14	Pages D5-4 through D5-14	Updated text in response to WDEQ-LQD comments. While several pages of the appendix were resubmitted due to pagination changes, the only changes to the text are those outlined in the responses.

INDEX SHEET FOR MINE PERMIT AMENDMENTS OR REVISIONS

Date: 10/16/09
TFN: 4 6/268

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VOLUME NUMBER	PAGE, MAP OR OTHER PERMIT ENTRY TO BE REMOVED	PAGE, MAP OR OTHER PERMIT ENTRY TO BE ADDED	DESCRIPTION OF CHANGE
3a of 5 App D6 through Attach D6-2b	Binder Cover & Inside Cover Sheet	Binder Cover & Inside Cover Sheet	Provided new covers for Volume 3a to show revision date.
	Pages i through xxii	Pages i through xxviii	Updated General and Detailed Table of Contents.
	Pages D6-i through D6-iii; Pages D6-1 through D6-4	Pages D6-i through D6-iii; Pages D6-1 through D6-4a	Updated Appendix D6 Table of Contents. Revised Section D6.1 - Surface Water per LQD comments.
	Pages D6-20 & D6-21	Pages D6-20 & D6-21	Updated a portion of Section D6.3 - Groundwater Use.
	Figures D6-1 & D6-2	Figures D6-1 & D6-2	Revised per LQD comments.
	Figure D6-3b	Figure D6-3b	Revised per LQD comments.
	Figure D6-5	Figure D6-5a	Renumbered figure.
	--	Figure D6-5b	New figure.
	Tables D6-1b & D6-2	Tables D6-1b & D6-2	Revised per LQD comments.
3b of 5 Attach D6-3 & D6-4	Binder Cover & Inside Cover Sheet	Binder Cover & Inside Cover Sheet	Provided new cover for Volume 3b to show revision date.
	Pages i through xxii	Pages i through xxviii	Updated General and Detailed Table of Contents.

INDEX SHEET FOR MINE PERMIT AMENDMENTS OR REVISIONS

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MINE COMPANY **Lost Creek ISR, LLC** MINE NAME: **Lost Creek ISR Project** PERMIT NO.: **N/A**

Statement: I, **John W. Cash**, an authorized representative of **Lost Creek ISR, LLC** declare that only the items listed on this and all consecutively numbered Index Sheets are intended as revisions to the current permit document. In the event that other changes inadvertently occurred due to this revision, those unintentional alterations will not be considered approved. Please initial and date._____

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VOLUME NUMBER	PAGE, MAP OR OTHER PERMIT ENTRY TO BE REMOVED	PAGE, MAP OR OTHER PERMIT ENTRY TO BE ADDED	DESCRIPTION OF CHANGE
4 of 5 Apps D7 - D11; App D References; & App D E&W Roads	Binder Cover & Inside Cover Sheet	Binder Cover & Inside Cover Sheet	Provided new cover for Volume 3b to show revision date.
	Pages i through xxii	Pages i through xxviii	Updated General and Detailed Table of Contents.
	Page D7-i	Page D7-i	Updated Appendix D7 Table of Contents.
	Pages D7-4 through D7-6	Pages D7-4 through D7-6	Revised per LQD comments and updated.
	Figure D7-2	Figure D7-2	Revised per LQD comments.
	Plate D7-1	Plate D7-1	Revised per LQD comments.
	Pages D8-i & D8-ii; D8-1 through D8-10	Pages D8-i & D8-ii; D8-1 through D8-11	Updated Appendix D8 Table of Contents. Revised text per LQD comments. While all pages of the appendix were resubmitted due to pagination changes, the only changes to the text are those outlined in the responses.
	Figure D8-1	Figure D8-1	Revised per LQD comments.
	Table 8-1	Table 8-1	Revised per LQD comments.
	Table 8-5	Table 8-5	Revised per LQD comments.
	Table 8-9	Table 8-9	Revised per LQD comments.
	--	Plate D8-1	Revised per LQD comments.
	Pages D9-i; D9-1 through D9-11	Pages D9-i & D9-ii; D9-1 through D9-11	Updated Appendix D9 Table of Contents. Revised text per LQD comments. While all pages of the appendix were resubmitted due to pagination changes, the only changes to the text are those outlined in the responses.
	Figure D9-6	Figure D9-6	Updated.
	Table D9-3	Table D9-3	Updated.
	Attachment D9-2	Attachment D9-2	Revised per LQD comments.
	--	Attachment D9-4	New Attachment D9-4 replaces existing Attachment D9-4. Existing Attachment D9-4 becomes Attachment D9-5 (with a new cover page).
	Attachment D9-4 cover page	Attachment D9-5 cover page	

INDEX SHEET FOR MINE PERMIT AMENDMENTS OR REVISIONS

Date: 10/16/09
TFN: 4 6/268

MINE COMPANY **Lost Creek ISR, LLC** MINE NAME: **Lost Creek ISR Project** PERMIT NO.: **N/A**

Statement: I, **John W. Cash**, an authorized representative of **Lost Creek ISR, LLC** declare that only the items listed on this and all consecutively numbered Index Sheets are intended as revisions to the current permit document. In the event that other changes inadvertently occurred due to this revision, those unintentional alterations will not be considered approved. Please initial and date.

NOTES: 1) Include all revision or change elements and a brief description of or reason for each revision element.
2) List all revision or change elements in sequence by volume number; number index sheets sequentially as needed.

VOLUME NUMBER	PAGE, MAP OR OTHER PERMIT ENTRY TO BE REMOVED	PAGE, MAP OR OTHER PERMIT ENTRY TO BE ADDED	DESCRIPTION OF CHANGE
4 of 5 (cont'd) Apps D7 - D11; App D References; & App D E&W Roads	Pages D11-i: D11-1, & D11-2	Pages D11-i: D11-1, & D11-2	Updated Appendix D11 Table of Contents. Updated text in response to WDEQ-LQD comments & to include new information.
	Figures D11-1 & D11-2	Figures D11-1 through D11-4	Clarified Figure D11-1; added information to Figure D11-2; and added Figures D11-3 & D11-4.
	Appendix D References Pages 19 through 21	Appendix D References Pages 19 through 21	Added reference on Page 19.
	–	Appendix D East & West Roads	New appendix containing baseline information for East & West Access Roads.

INDEX SHEET FOR MINE PERMIT AMENDMENTS OR REVISIONS

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5 of 5 Ops Plan & Rec Plan	Binder Cover & Inside Cover Sheet	Binder Cover & Inside Cover Sheet	Provided new covers & spine sheet for Volume 5 to show revision date & because of increased binder size.
	Pages i through xxii	Pages i through xxviii	Updated General and Detailed Table of Contents.
	Pages OP-i through & OP-v; Pages OP-1 through OP-48	Pages OP-i through & OP-v; Pages OP-1 through OP-55	Updated Operations Plan Table of Contents. Revised text per LQD comments. While all pages of the plan were resubmitted due to pagination changes, the only changes to the text are those outlined in the
	Figures OP-1 through OP-7c	Figures OP-1 through OP-7	Revised in response to LQD comments; updated; and/or renumbered.
	Figures OP-8c, 9a, & 9b	Figure OP-9	Removed & renumbered figures.
	Figures OP-10a & 10b	Figures OP-10a, 10b, 10c 11a, & 11b	New & renumbered figures.
	Tables OP-2 through OP-7	Tables OP-2 through OP-7	Revised in response to LQD comments; updated; and/or renumbered.
	--	Tables OP-9 & OP-10	Added in response to LQD comments.
	Plate OP-1	Plate OP-1	Updates in response to LQD comments.
	'--	Plate OP-2	Added in response to LQD comments.
	Attachments OP-1 & OP-2	Attachments OP-1 through OP-8	The only two previous attachments were renumbered; and several new attachments added in response to LQD comments.
	Attachments OP-1 & OP-2	Attachments OP-1 through OP-8	The only two previous attachments were renumbered; and several new attachments added in response to LQD comments.

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5 of 5 (cont'd) Ops Plan & Rec Plan	Pages RP-i through RP-ii; Pages RP-1 through RP-21	Pages RP-i through RP-iii; Pages RP-1 through RP-27	Updated Reclamation Plan Table of Contents. Revised text per LQD comments. While all pages of the plan were resubmitted due to pagination changes, the only changes to the text are those outlined in the responses.
	Figure RP-1	Figure RP-1	Updated.
	Figure RP-3	Figure RP-3	Updated.
	--	Figure RP-4	Added in response to LQD comments.
	Tables RP-4 & RP-5	Tables RP-4 & RP-5	Updated.
Existing Confidential Volume	Page D3-i	Page D3-i	Updated Table of Contents.
	Pages D3-6 & D3-7	Pages D3-6 & D3-7	Updated Section D3.1.3 to include Attachment D3-2 and References to correct a typo.
	--	Attachment D3-2	Mitigation Plan for Site 48SW16604.
New Confidential Volume	--	--	New CONFIDENTIAL Volume - Appendix D-E&W-3. Archeology - East & West Access Roads.