Department of Environmental Quality

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

Dave Freudenthal, Governor

John Corra, Director

July 23, 2010

Mr. John Cash
Lost Creek ISR, LLC
5880 Enterprise Drive, Suite 200
Casper, WY 82609

RE: **Lost Creek ISR LLC, In-Situ Recovery (ISR) Permit Application, TFN 4 6/268, 4th Round Technical Review Comments**

Dear Mr. Cash,

Enclosed please find the fourth round of technical comments to responses which were received by the Wyoming Department of Environmental Quality – Land Quality Division (WDEQ/LQD) District II Field Office on June 25, 2010. The June 25, 2010 submittal contained several requests to consider relegating certain topics to be a condition on the permit. LQD personnel feel that at this stage of the review process it is premature to consider conditions. Therefore, those topics were addressed like any other comment. Also, in order to track the status of the comments in this review, the enclosed spreadsheet (table) is provided.

Please provide responses to the comments in the attached memorandum following the Index Sheet format and protocol you have followed in the past. Direction to proceed with Second Public Notice will not be given until the WDEQ/LQD receives a Letter of Application Approval / Concurrence from the Bureau of Land Management (landowner). That Letter would serve as the required Surface Owner Consent per W.S. §35-11-406 (b)(xii).

If you have specific questions regarding the enclosed review, it is suggested that you contact the individual reviewer for clarification. However, please feel free to contact me at (307) 332-3047 with any questions as well.

Respectfully,

Melissa L. Bautz, P.G.
District II Natural Resources Analyst

w/ enclosures, 4th Round of Technical Comments Memorandum (69 pages, double sided), Summary/Status of 4th round comments (2 pages, one double-sided sheet)

Cc Mr. Harold Backer, Ur-Energy USA, 10758 W. Centennial Rd. Suite 200, Littleton, CO 80127 (w/encl)
Mark Newman – BLM Rawlins, P. O. Box 2407, Rawlins, WY 82301 (w/encl)
Tanya Oxenberg, U.S. Nuclear Regulatory Commission, Federal and State Materials and Environmental Management Programs Uranium Recovery Licensing Branch, Mail Stop T-8F5, Washington, D.C. 20555-0001 (w/encl)
Don McKenzie, Cheyenne WDEQ/LQD→ TFN 4 6/268 Lost Creek ISR File (w/encl)
Mark Moxley - Lander WDEQ/LQD→ TFN 4 6/268 Lost Creek ISR File (w/encl)
Chron (w/encl)

Memorandum

File: Lost Creek ISR, LLC Uranium Project, Permit Application, TFN 4 6/268

From: Melissa L. Bautz – WyDEQ/LQD District II Geologist (MLB)
Amy Boyle – WyDEQ/LQD District II Hydrogeologist (AB)
Mark Moxley – WyDEQ/LQD District II Supervisor (MM)
Steve Platt – WyDEQ/LQD District Wildlife Biologist (SP)
Brian R. Wood – WyDEQ/LQD District II Hydrologist (BRW)

Date: July 23, 2010 MLB

Subject: Fourth round of Technical Review comments on Lost Creek ISR Application, TFN 4 6/268

This memorandum contains the WDEQ Land Quality Division's (LQD's) technical comments on Lost Creek ISR's (LC's) responses to LQD's preliminary and final technical comments on the above mentioned application.

The application was originally hand-delivered to the WDEQ/LQD Lander office on December 20, 2007 and it achieved completeness on May 20, 2008. Preliminary technical comments were provided by Matthew Kunze (LQD Cheyenne) in a memorandum dated August 8, 2008 and by Amy Boyle (LQD Lander) in a memorandum dated August 26, 2008. Final technical comments were provided by LQD Lander staff in a memorandum dated January 30, 2009.

Responses to Amy Boyle's 44 comments (August 26, 2008) were received on May 5, 2009. A second round of comments was sent to LC on June 19, 2009. Eighteen of the original comments were resolved, and two new comments were generated as part of that review.

On October 19, 2009, LC submitted responses to the final technical comments (those cited in the January 30, 2009 memo). In a review memorandum dated November 20, 2009, LQD provided a review of those responses. On February 25, 2010, LC personnel hand delivered their most recent responses to LQD's comments to date. That is, the February 25, 2010 submittal included responses to the following:

1. Second round of technical comments from LQD's January 30, 2009 Technical Review of the entire Permit; and
2. Third round of technical comments from Amy Boyle's August 26, 2008 Technical Review of Appendices D5 and D6.

LQD provided the third round of technical comments on the February 25, 2010 submittal under cover letter dated March 26, 2010. In a meeting among LC and LQD personnel on May 6, 2010, it was agreed that several comments that occurred in the Mine Unit 1 (MU1) review should be moved to the Main Permit review (this review). Based on that conclusion, LC included several responses formerly handled under the MU1 review in their responses to comments received at the LQD Lander office on June 25, 2010. Below is LQD's review of the June 25, 2010 submittal; that is, the fourth round of technical comments is presented below. The format used in LC's June 25, 2010 correspondence has been used. It preserves the original comment number from applicable LQD reviews. However, items that are deemed "resolved" based on this (fourth) round of comments have had the historical/background comments dropped.

APPENDIX D-5 (GEOLOGY) - AUGUST 2008 - LQD REVIEW OF APPENDICES D5 AND D6 OF THE MAIN PERMIT DOCUMENT

D5-4) *LQD (8/08) - Plates D5-1a - D5-1e. These plates provide one generalized and several detailed geologic cross sections down the centerline of the ore body, and across the centerline of the ore body. In addition, Figure D5-2a provides a very generalized geologic cross section across the northern portion of the permit area. LQD Non-Coal Rules, Chapter 11, Section 3(a)(viii) requires cross sections that show geologic features within the entire permit area, and how they relate to the production zone. Extending cross sections F, G, and H to the boundaries of the permit area with any available drill hole data, will help to provide this information.*

LC ISR, LLC (4/09) - The cross sections have been updated with the information from new borings and wells completed in 2008. As noted on the Index Sheet for the changes to Appendix D-5, Plates D5-1b through D5-1e have been replaced, and two new plates (Plates D5-1f and D5-1g) have been added. The references in the text to these plates have also been updated.

b) *LQD (6/09) - The piezometric surfaces are indicated for the DE, LFG, HJ and UKM aquifers, though it is not clear if there are any monitoring wells on the cross sections from which the water tables were derived. Please designate any monitoring wells on the cross section, and indicate their screened intervals and water levels with date.*

LC ISR, LLC (11/09) - A reference to the cross-sections and an explanation of how the potentiometric surfaces were projected onto the cross-sections has been added to D6.5.2.2 (Potentiometric Surface, Groundwater Flow Direction and Hydraulic Gradient).

(LQD 12/09) - *As stated previously, the cross section should indicate where specific groundwater elevation data is available from monitoring wells, and if the data points are close enough it can be extrapolated, otherwise projecting a potentiometric surface across an entire cross section could be misrepresentative. For example, on Plate D5-1e, cross section F-F', there are two clusters of monitoring wells that fall on the cross section yet are not indicated. Wells MB-01, MB-02, MB-03A, and MB04 lay in a cluster approximately 312 feet south of the North Fault. There is no groundwater data north of the fault yet the cross section assumes that the water level across the fault is consistent. Similarly, there is a well cluster (LC21M, LC22M, LC23M, and LC30M approximately 250 feet south of the Lost Creek Fault (Subsidiary) yet these wells are also not indicated on the cross section. The potentiometric surface is projected on the cross section, an additional 1.5+ miles to the south, with no data available. Granted, the surfaces appear as dashed lines or implied, however, please add the known groundwater elevations on the*

cross section for each available monitoring well, and indicate the screened interval and the date for the water elevation. Extrapolation should be limited to those areas on the cross sections where there is enough data available. Please also revise Section D5.2 by deleting the statement that "Depiction of these (potentiometric) surfaces on the cross sections were generated by tracking the intersection of the plane of the cross section profile with potentiometric contours plotted for the given horizons ... ".

LC ISR, LLC (2/10) - The original focus of the cross sections was to provide information on the stratigraphy in the Permit Area, so no monitor wells were included on the cross-sections. Illustration of water levels on the cross sections was requested by NRC (*see* LC ISR, LLC's December 2008 Response to NRC's November 2008 Comment #2 on Section 2.7.2 of the Technical Report) and subsequently included in documents submitted to WDEQ-LQD for consistency. The location of monitor wells with relation to cross sections is shown on Plate D5-3, 'General Location Map – Geology'. The data requested to be illustrated from adjacent monitor wells [water elevations, screened intervals, measurement dates] is available in tables, appendices and Completion Logs elsewhere in the application therefore LC ISR, LLC does not believe that adding this specific information onto the cross sections is necessary.

Additionally, as with the potentiometric surface contour maps (Figures D6-11e through 11h), the potentiometric surfaces which are illustrated on the cross sections are generated from raw data collected from the monitor wells. The method of projecting this data onto the cross sections is explained in the statement: " Depiction of these (potentiometric) surfaces on the cross sections were generated by tracking the intersection of the plane of the cross section profile with the potentiometric contours plotted for the given horizons..." Where monitor wells are in close proximity to the plane of a cross section, this projection can be considered reasonably accurate. In regions of sparse data, the projection of the potentiometric surface can be considered more interpretive. In either case, the potentiometric surfaces illustrated on the cross sections can be considered as valid and accurate as those depicted on the potentiometric surface contour maps.

The DEQ comment stating that "There is no groundwater data north of the northern fault, yet the cross section [F-F'] assumes that the water level is consistent," makes a valid point. Therefore, Cross-Section F-F' has been revised by removing the potentiometric surfaces as shown north of the fault.

LQD (3/10) - Specific water level elevations were not provided, as LC does not believe it to be necessary, yet if there are precise points along a cross section where specific information is known, then that information should be on the cross section, and not an interpolation from a potentiometric surface map. Since the scale of the cross sections would not easily incorporate the monitoring wells and their screened intervals, please add a note and/or sticker to the legends which indicates that the potentiometric surfaces are

interpolated from the regional potentiometric surface map, and not based on real data points along the cross sections. In closer examination of trying to correlate known groundwater elevations, there is a significant discrepancy on Plate D5-1e, the F-F' cross section. It shows the DE potentiometric surface at approximately 6750 ft., yet Figure D6-11e, the DE Potentiometric Surface Map shows the water level in nearby monitoring well MB-1 as 6,853 ft., a 100 ft. difference. In attempting to find the correct elevation of the water table in MB-01 it was noted that the MB well water elevations were not provided on Table D6-6. Please revise this Table to include the MB wells. However, when looking at the completion log for MB-01 it appears that the water elevation should read 6,752.9 and it is most likely that Figure D6-11e needs to be corrected. (AB)

LC ISR, LLC (6/10) - The explanation that the piezometric surfaces shown on the cross-sections (Plates D5-1a through D5-1g) are based on interpolation from regional monitor wells (and not from the drill holes shown on the cross sections) will be added to the cross-sections in conjunction with the changes requested in Comment D5 #4(c).

The water level for well MB-1 in Figure D6-11e has been corrected.

Table D6-6 was revised to include the available water level data for the MB wells, and the revised table was submitted to LQD in May 2010. Three quarters of data are currently available, and the table will be updated once the fourth quarter of data is collected.

LQD (7/10) - Item unresolved. Stickers for Plates D5-1a through D5-1g, which indicate that the potentiometric surface shown on the cross sections is based on interpolation and not the drill holes shown, are to be provided. An updated Table D6.6 will be submitted once all of the wells have four quarters worth of baseline monitoring data. A revised Figure D6-11e was provided with the correction to the water elevation in MB-1. **(AB)**

c) LQD (6/09) - *Additional faults are indicated on the north/south trending cross sections. Please add these faults to the map key, as well as within the discussion of Section D5.2.2 the permit document. In addition, these faults should be indicated on all maps where the Lost Creek Fault is included, if they fall within the scale of the map.*

LC ISR, LLC (11/09) - The text in Section D5.2.2 (Structure) has been replaced to discuss the newly identified faults, and the location of all the faults are illustrated on a new map as Plate D5-3 (General Location Map - Geology).

(LQD 12/09) - *Plate D5-3 has been added and indicates the location of the other known faults in the permit area. The text states that the southern fault's downthrown block is on the north side, yet Plate D5-3 indicates that the downthrown block is to the south. Please correct this deficiency. As requested previously, any map (e.g. Plates D5-2a through D5-*

2d) which showed the location of the Lost Creek Fault needs to be revised to indicate the updated version of the multiple fault locations within those maps. The permit area template within the map legends will also need to be revised to include the additional fault locations.

LC ISR, LLC (2/10) - Plate D5-3 has been revised to show that the downthrown block is on the north side of the "South Fault".

Pursuant to discussions in the February 3, 2010 phone call between Melissa Bautz (WDEQ-LQD) and John Cash (LC ISR, LLC), only Plates D5-2a through D5-2d have been revised to include the multiple fault locations.

LQD (3/10) - Plates D5-2a – D5-2d which are the isopach maps have been updated to indicate the locations of all of the known faults. However, the Plates presenting the cross sections (Plates D5-1a through D5-1g) will also need to be revised to indicate the additional fault locations on the cross section and on the reference maps.

- Plate D5-1a, which dates back to the December 2007 submittal, needs to be revised. The cross section A-A' crosses the fault six times, but only three fault crossings are indicated on the cross section.
- Plate D5-1b which indicates Cross Section B-C crosses the Lost Creek Subsidiary fault twice, but the cross section only indicates that it crosses the fault once.
- Plate D5-1c, Cross Section C-D crosses the Lost Creek Subsidiary Fault and the Lost Creek Fault, but only shows the Lost Creek Fault displacement.
- Plate D5-1d, Cross Section D-E, crosses the Lost Creek fault and the splinter fault only indicates the displacement of the Lost Creek Fault.
- Plate D5-1e may need to be revised in response to Comment 4b, above, and the reference map should be updated at that time to include all of the fault locations.
- The geologic cross section maps D5-1f and D5-1g, do not require revision due to the faults, but do include a reference map which does not include the new fault locations. For these cross sections, please add a sticker to the reference map, which refers the reader to Plate D5-3 for cross section locations. (AB)

LC ISR, LLC (6/10) – The changes requested above for Plates D5-2a through D5-2e will be forthcoming in the near future, once they are complete. The requested stickers for Plates D5-1f and D5-1g (for the reference map and the note about the source of the potentiometric surface information [Comment D5 #4(b)] will also be sent at that time.

LQD (7/10) - Item unresolved. Changes requested to Plates D5-2a through D5-2e are said to be forthcoming. **(AB)**

D5-12) LQD (7/10) - **This item is resolved.** A sentence was added to the text in Section D5.2.1 clarifying that an aquitard thickness of five feet has a six inch margin of error given interpretation of geophysical logs. Therefore the thinnest known thickness of the Lost Creek and Sage Brush Shales is 4.5 feet. **(AB)**

D5-13) LC ISR, LLC (6/10) - As agreed upon during the February 25, 2010 meeting between LC ISR, LLC and LQD, Figure OP-2a and Plate OP-1 were revised to show the location of the proposed Mine Unit 1 Pattern Area. As proposed pattern areas for Mine Units 2 through 6 are developed, this figure and this plate will be updated with the proposed areas, rather than the conceptual areas currently shown for those mine units. However, updating of all figures and maps in the application to show proposed versus conceptual mine unit boundaries would not be required because of the additional detail provided on maps in the mine unit applications. For example,, Plate MU1 5-1 of the Mine Unit 1 Application shows the proposed Mine Unit 1 Pattern Area in relation to historic drill holes. (See also Comments OP #11 and MU1-27.)

LQD (7/10) - **This item is resolved,** based on the above response by LC. **(AB)**

*******THIS CONCLUDES COMMENTS ON APPENDIX D-5*********

APPENDIX D-6 (HYDROLOGY) - AUGUST 2008 - LQD REVIEW OF APPENDICES D5 AND D6 OF THE MAIN PERMIT DOCUMENT

D6-14) *LQD (8/08) - Section D-6. Detailed stratigraphic and well completion logs should be provided within the permit document for all monitoring wells. It is preferable if this information can be compiled on one log form. Notation of each horizon within the stratigraphic column would also be helpful. LQD Guideline 8, Appendix 5 describes the information to be included for each well.*

LC ISR, LLC (4/09) - A new attachment has been added with the well completion logs for the permit area monitoring wells. The existing Attachment D6-3 (Groundwater Quality Laboratory Results) has been renumbered to Attachment D6-4, and the title page and CD changed. Attachment D6-3 is now titled Well Completion Logs. A list of the wells for which logs are included in the attachment is at the beginning of the attachment.

Cross references to the new attachment have been added at the end of Section D6.2.2 and in Attachment D6-2a (Comment #44). Because of the size of the new Attachment D6-3 (Well Completion Logs), Volume 3 of the application has been separated into Volume 3a, which contains all of Appendix D6 through Attachment D6-2b, and Volume 3b, which contains Attachments D6-3 and D6-4.

LQD (6/09) - The following comments have been generated from a review of the well logs:

e) **LQD (7/10) - This item is resolved.** Well development records were located for LC21M and LC27M, and this information was added to revised completion logs for those wells. **(AB)**

i) LQD (6/09) - *There are many wells where there is additional footage between the base of the well screen and the bottom of the hole, yet it is not indicated on the well diagram (e.g. LC29M, MBOl, MB07, MBIO, HJMO-I05, HJMO-I06, HJMO-112, HJMO-113, MB-02, MB-05, MB-08, HJMP-IOl, HJMP-I02, HJMP-I09, HJT-I02, MB-06, MB-09, HJMU-I05, HJMU-113, HJMU-114, UKMP-I02, UKMP-I03, MB-04, UKMU-IOl, UKMU-I03). Please indicate on the schematic if the boring caved into this level, if there is a sump below the screen, or if it is an open hole.*

LC ISR, LLC (11/09) - Notes on the well completion logs have been added at the beginning of Attachment D6-3.

(LQD 12/09) - *LC added a page at the beginning of Attachment D6-3 to explain some of the drill log discrepancies. The page is titled "Notes on the Well Completion Logs in Attachment D6-3". In the first paragraph, please explain in further detail the penetration into the EF shale at wells MB-1 and MB-7. Specifically, how far into the shale did each drill hole penetrate, and what is the approximate thickness of the shale at the location.*

LC ISR, LLC (2/10) - The page titled "Notes on the Well Completion Logs in Attachment D6-3" has been updated with the requested information.

LQD (3/10) - Discussion regarding an additional shale layer below the EF shale at MB-01 was provided, yet no discussion regarding the potential of MB-07 penetrating the EF was provided. Please specifically discuss MB-07. In addition, in the discussion, please note how far these wells may have penetrated into the EF shale, and what the thickness of the EF shale was at these locations. (AB)

LC ISR, LLC (6/10) - A detailed review of the stratigraphy of well MB-7 indicates that the EF shale had been improperly fully penetrated by the pilot hole. LC ISR, LLC has no records to indicate that the rat-hole below the well screen has been back-plugged. Although well MB-07 has insufficient water to sample, it is important that the well's completion is correct. Therefore, LC ISR, LLC will pull the screen and back-plug the rat-hole with grout and then re-set the screen. Water levels will continue to be collected to see if sufficient water is available for well development and sampling. If sufficient water is available, the well will be sampling in accordance with the standard presented in the Operations Plan.

LQD (7/10) **Item unresolved.** There were no records to indicate that the rat hole at the bottom of MB-07 was backfilled, therefore this monitoring well may be penetrating below the EF Shale. Lost Creek is committed to pull the screen and back plug the rat hole. Depending on the water quality and quantity after this effort, new baseline may be required. **(AB)**

D6-16) *LQD (8/08) - Figure D6-27a, Piper Diagram - Average Water Quality at Individual Monitoring Wells. The legend designates which well is represented by which symbol, and the wells are grouped by color, yet it does not indicate which horizon the wells are monitoring. Please add the horizon noted by each color. (The colors are not consistent with which formation they represent, i.e. other Figures use green to indicate the DE horizon wells, whereas the Piper diagrams use red).*

LC ISR, LLC (4/09) - The figure has been revised to clearly indicate which horizon each well is monitoring.

LQD (6/09) - *There are 27 baseline monitoring wells, yet the two Piper Diagrams are only based on data from 17 wells. Please add the additional baseline information to the diagram, or provide an explanation as to why certain wells were not included.*

LC ISR, LLC (11/09) - Data from the MB wells is still being collected so the Piper Diagrams have not been updated. The first round of sampling results from the MB wells have been received and inserted into Table D6-15a. Once all of the data is received the Piper Diagrams will be updated. Please note that the order of the entries in Table D6-15a has also been updated, which is intended to make review and reference easier. Before, the table was grouped first by type of parameter (e.g., major cations and anions, radionuclides, and so forth) and then by completion interval. The table is now grouped by completion interval and then by type of parameter.

LQD (12/09) - The diagrams will be updated once the data becomes available. This comment will remain open until that time. In addition, Comments 35, 36, and 37 have been dropped and are noted here. Table D6-15a and Section D6.4.2.2 will also need to be updated when the 2009 groundwater monitoring data is finalized and incorporated into the permit.

LC ISR, LLC (2/10) - The diagrams, tables, and text will be updated once the data is available.

LQD (3/10) - Revisions are pending availability of new data. (AB)

LC ISR, LLC (6/10) - LC ISR, LLC continues to collect chemistry data from the MB wells on a quarterly basis. (Three quarters have been collected to date). LC ISR, LLC requests that this item be included as a condition of the Permit to Mine and toward that end suggests the following language:

> "The Permittee may not initiate injection of mining solutions until such time that a complete year of quarterly ground water samples have been collected from regional monitor wells MB 1, 2, 3, 4, 5, 6, 8, and 9 and the resulting chemistry is included in Table D6-15a, the Piper Diagrams in Figures D6-27a and b, and the text in Section D6.4.2.2."

LQD (7/10) - Item unresolved. The updated Piper Diagrams are awaiting the final quarter of sampling for the MB wells. Lost Creek has requested that the submittal of this information be addressed through a Permit Condition, and have provided draft language. The Division will not issue a permit condition as the final round of sampling and analysis should be complete, and the final Piper Diagrams should be submitted. **(AB)**

FEBRUARY 2010 - LQD COMMENTS, ON THE MINE UNIT 1 APPLICATION, RELEVANT TO THE MAIN PERMIT DOCUMENT

MU1-13) LQD (7/10) - This item is resolved. Table D6-11 was revised to list the Transmissivity units in both gpd/ft and ft^2/day. In addition, the vertical conductivity units are listed in both US (ft/day) and metric (cm/sec). **(AB)**

*****THIS CONCLUDES COMMENTS (INITIATED IN FEBRUARY 2010) ON THE MU-1 PACKAGE RELEVANT TO THE MAIN PERMIT******

OPERATIONS PLAN - JANUARY 2009 - LQD COMMENTS ON THE MAIN PERMIT DOCUMENT

OP-9) *LQD (1/09) - 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)

LC ISR, LLC (10/09) - 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.

LQD (11/09) - Response not acceptable. The original comment stated that the pond designs were not acceptable for several reasons, but not limited to several items identified above. The proposed designs do not meet the criteria as outlined in 40 CFR 264, SubPart K (see attached). In addition, no details were provided concerning QA/QC criteria that would be used to evaluate seam quality, only that a factory representative would be on hand. Please make the appropriate revisions to the designs. **(BRW)**

LC ISR, LLC (2/10) - It is unclear what WDEQ-LQD's authority is to regulate pond design under 40 CFR 264, Subpart K, especially since this portion of regulations applies only to the storage of hazardous waste and not to 11e(2) byproduct material pursuant to the RCRA Beville Amendment. Nor did the reviewer specify with what portion of the cited regulation the pond design does not comport. Nonetheless, Attachment OP-7 has been revised to include a new Pond Design Report, Technical Specifications, slope stability calculations, and engineering drawings. The Technical Specifications address the ASTM Standards that will be used for QA/QC of the liner installation.

LQD (3/10) – Response not acceptable. Thank you for revising the design specification regarding the storage ponds. The reviewer understands that the design sheets provided are limited in terms of as there is insufficient detail for bidding as well as guidance for construction. However, in the reviewer's opinion the detail provided on the design sheets is a little too limited. For example, there is no indication as to where and how the liners are tied into the embankment, no indication of three feet of sub-excavation to install a prescriptive clay liner (a three-foot zone where $K = 10^{-7}$ cm/sec or less), and no indication of the cutoff key depth. Please make the appropriate revisions to the design sheets. (BRW)

LC ISR, LLC (6/10) - Attachment OP-7 details the construction specifications for the Lost Creek storage ponds. Section TS 3.3.4 in Report 0802 (Lost Creek ISR – Ponds 1&2, Technical Specifications) details the foundation preparation, and Figure 0802.103 R2 details the liner key location and depth (5 feet deep and 10 feet wide at the base).

LQD (7/10) - Response not acceptable. LC's response references a Figure 0802.103 – **Revision 2**. No additional material concerning pond design was included in the June 2010 submission. Reviewing the previously submitted material (March 2010), the drawing presently found in the application is labeled Figure 0802.103 – **Revision 1**. The reviewer has checked all superseded materials to ensure there was not an error during the insertion process; no drawing identified as Figure 0802.103 – **Revision 2** was located. Therefore, it is assumed that LC inadvertently submitted the wrong drawing with the March 2010 submission. Please see the reviewer's previous comment-response and provide the requested information. **(BRW)**

OP-11) LQD (7/10) . This item is resolved. Figure OP-2a and Plate OP-1 are titled Site Layout, yet the Mine Unit boundaries are considered Conceptual and noted as such in the Legend. Section OP1.1, paragraph 6 was revised to reference both Figure OP-2a and Plate OP-1. **(AB)**

OP-19) LQD (7/10) – Item is resolved. Sediment and erosion control will be part of WDEQ/LQD inspections. If problems are noted at the outfall of this ditch LC will be directed to install some type of energy dissipation device. LC's response indicates that approximately one-inch of water could impound against the north embankment of the north surge pond. The reviewer is unclear how this depth was calculated as no basis for the estimate was provided. Nevertheless, the reviewer is willing to accept LC's response and leave this issue as an inspection item. **(BRW)**

OP-23) LQD (7/10) – This item is resolved. LC has revised the text as requested. **(BRW)**

OP-29) LQD (7/10) – This item is resolved. The updated version of Figure OP-2a and the sticker that reads "Primary Access Road" to be placed over the text that reads "Main Access Road" on Plate OP-1 adequately addresses this reviewer's concerns regarding consistency among road terminology. **(MLB)**

OP-36) *LQD (1/09) - 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)**

LC ISR, LLC (10/09) - 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 periodically, the parameter concentrations are not anticipated to increase as would the concentrations in an evaporation pond. The pond sampling parameters and schedule are discussed in Section OP 2.9.4. As noted in the Response to Comment V5, OP#54, a copy of Attachment OP-6 will be sent to WGFD and USFWS for review.

LQD (11/09) - Response not acceptable. Pond sampling schedule and the parameters to be monitored were provided in Section OP2.9.4. However, the need for any deterrents to birds landing on the ponds and ingesting the water is under review of WGFD and USFWS. This comment will remain unresolved pending the review of WGFD and USFWS. (AB)

LC ISR, LLC (2/10) - The permit application will be updated as necessary in response to the WGFD and USFWS comments.

LQD (3/10) – Response not acceptable. FWS issued comments dated 12/18/09 expressing concerns about selenium and waste water disposal (i.e., land application vs. deep well disposal) and the potential for bioaccumulation in terrestrial and aquatic flora and fauna. LC should address these concerns in the permit document. (SP for AB)

LC ISR, LLC (6/10) - The USFW comments have been received and LC ISR, LLC is waiting for comments from the WGFD which should be forthcoming after the Governor issues a second Executive Order pertaining to the establishment of sage grouse core areas.

LQD (7/10) – Item is unresolved. The LQD will wait for an updated response to this comment from Lost Creek. **(MLB for SP)**

OP-44) *LQD (1/09) - Section OP 2.8 Wildlife Monitoring. Only monitoring of raptors and sage grouse is listed, yet vertebrates are also required to be monitored.* **(AB)**

LC ISR, LLC (10/09) - 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.

LQD (11/09) - Response not acceptable. Attachment OP-6, Wildlife Protection Plan and Wildlife Monitoring Plan has been added to the permit. Big game (pronghorn), lagomorphs, raptor, sage grouse and migratory birds are all included as part of the monitoring plan. This plan has been submitted to USFWS and WGFD and the permit will need to include their recommendations. The monitoring will need to comply with the recommendations. The LQD (Steve Platt) will need to review the written responses from these agencies. This item is unresolved pending submittal and review of the USFWS and WGFD recommendations. (AB)

LC ISR, LLC (2/10) - Please see response to previous comment.

LQD (3/10) – Response not acceptable. A review letter from the WGFD has not been submitted by the operator. A letter must be included and any concerns addressed by LC. (SP for AB)

LC ISR, LLC (6/10) - Please see Response to Comment OP#36.

LQD (7/10) – Item is unresolved. The LQD will wait for an updated response to this comment from Lost Creek. **(MLB for SP)**

OP-48) *LQD (1/09) - Section OP 2.8.2.1 Raptors. 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)*

LC ISR, LLC (10/09) - 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-6 Section 1.1.2.2 commits to using agency-approved designs for anti-roosting raptor deterrents.

LQD (11/09) - Response not acceptable. Attachment OP-6, Section 1.3.1 Locations and Disturbance Area states that if a raptor nest if found within 0.5 miles of project activities, that USFWS and WGFD will be consulted and if needed appropriate mitigation permits will be obtained. Following USFWS and WGFD review, they may require that a nesting deterrence plan or other mitigation be in place prior to mining. This comment is unresolved, pending the review of Attachment OP-6 by USFWS and WGFD. (AB)

LC ISR, LLC (2/10) - Please see Response to Comment V5, OP#36.

LQD (3/10) – Response not acceptable. LC will update as necessary in response to WGFD comments when received. (SP for AB)

LC ISR, LLC (6/10) - Please see Response to Comment OP#36.

LQD (7/10) – Item is unresolved. The LQD awaits an updated response to this comment from Lost Creek. **(MLB for SP)**

OP-65) LQD (7/10) – This item is resolved. The updated version of Section OP 2.9.4 coupled with the fact that the proposed holding ponds for the project are exempt from WQD Chapter 11, Section 30 have adequately addressed this reviewer's concerns regarding pond design. **(MLB)**

OP-72) *LQD (1/09) - Section OP 2.9.2, Fuel Storage Area: 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)*

LC ISR, LLC (10/09) - 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.

LQD (11/09) - Response not acceptable. Section OP 2.9.5, Fuel Storage Areas, needs to be revised to include the information outlined in the above response. (MLB)

LC ISR, LLC (2/10) - The information has been incorporated into Section OP 2.9.5 (Fuel Storage Areas), as requested. However, commitment to the Spill Prevention Control and Countermeasure Plan has been removed since the EPA regulations in 40 CFR 112 do not apply to a closed basin like the Great Divide and because WDEQ has not implemented state regulations pertaining to Spill Prevention Control and Countermeasure Plans. Nonetheless, the commitments for the design and routine inspection of the fuel storage facility stand.

LQD (3/10) – Response partially acceptable. The additional text added to Section OP 2.9.5 is satisfactory. However, it does not specify the type or minimum thickness of liner to be used for spill containment. Please add a discussion of the type of liner and minimum liner thickness to Section OP 2.9.5. (MLB)

LC ISR, LLC (6/10) - As indicated in Section OP 2.9.5, LC ISR, LLC has committed to installing containment sized to hold at least 110% of the largest tank. The containment structure final design will occur upon procurement of the fuel tanks and will be dimensionally and structurally appropriate for those particular tanks. The containment will be impermeable to gasoline and diesel fuel and will have a manually controlled sump pump to collect rain or snow melt from the containment. The materials of construction may include concrete, polyethylene or equivalent.

LQD (7/10) – Response not acceptable. The reviewer understands LC's claim that a containment structure for the fuel storage area cannot be finalized until the fuel tanks are procured and on site. However, there are minimum standards for fuel storage areas that can be specified in Section OP 2.9.5 at this time. Specifically, a statement regarding the range of possible liner media must be stated. That is, if a plastic liner will be used, its composition and minimum thickness (E.g. 40 mils) must be stated in Section OP 2.9.5. Or if a clay liner will be used, the clay's composition and minimum permeability (E.g. 10^{-7} cm/sec) must be state in Section 2.9.5. Or if coated concrete could potentially be implemented, the specifications of the concrete and coating must be state in Section OP 2.9.5. Please provide revised text for Section OP 2.9.5 to include the above-prescribed information. **(MLB)**

OP-74) LQD (7/10) – **Item is resolved.** LC has revised the text to eliminate the conflicting statements in Section OP 2.11.2.1. **(BRW)**

OP-77) *LQD (1/09) - 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)*

LC ISR, LLC (10/09) - The Lost Creek Water Well Sampling Procedure is attached as Attachment OP-8.

LQD (11/09) - Response not acceptable. Attachment OP-8 is a welcome addition to the application. Please include a Table which lists the monitoring wells, grouped by category, and includes their screened interval, which formation is being monitored, and the frequency and constituents to be monitored. In addition, please address Chain of Custody procedures and the disposal of purged water on the ground. If the monitoring well is impacted in any way the purge water may need to be disposed in either the storage ponds or deeper injection wells. Section III, Part C-iii, the text stating that if a parameter is below detection limit during the initial round of sampling that no additional analysis will be performed during quarterly sampling is unacceptable and should be removed from the text. Section IV, note 1 in both tables should be revised to indicate water level as a field parameter. Section 5, Part E should indicate that all sampling will follow the preservation and holding time procedures as outlined in Methods for Chemical Analysis of Water and Wastes, USEPA, 1983. Section VII regarding the use of compositing is not acceptable for several reasons, which include the fact that compositing tends to mask the presence of analytes at low levels and it will be impossible to detect if there are only parts of the wellfield are problematic. See also the text in Section RP 2.4. (AB and BRW)

LC ISR, LLC (2/10) -

- Generic sampling frequencies for each type of operational monitor well are provided in Section IV of the Lost Creek Water Well Sampling Procedure. Tables and completion reports which list the specific monitor wells, grouped by category, and includes their screened interval, which formation is being monitored, and the constituents to be monitored have been included with the MU1 data package submitted December 21, 2009. These types of tables and reports will be included with each successive mine unit data package. LC ISR, LLC believes that providing this information in these data packages will eliminate the need to update a monitor well table included in the Lost Creek Water Well Sampling Procedure which would

require a permit amendment each time a new mine unit is proposed. Please also see Section OP 2.11.1 as well as the Response to Comment V5, OP#89.The requested information for these wells has been previously provided in the main permit document in Attachment D6-3 and Section D6.4.2.2.

- A discussion about the use of a Chain of Custody form has been added to Section VI of the Lost Creek Water Well Sampling Procedure.

- A discussion about the disposal of affected well purge water has been added to Section V(C) of the Lost Creek Water Well Sampling Procedure.

- The text stating that if a parameter is below detection limit during the initial round of sampling then no additional analysis of that parameter will be performed during quarterly sampling in Section III(C) (iii) has been removed from the text.

- In Section IV of the Lost Creek Water Well Sampling Procedure, note 1 of both tables has been revised to include water level as a field parameter.

- Section V (E) of the Lost Creek Water Well Sampling Procedure has been revised to indicate that all sampling will follow the preservation and holding time procedures as outlined in Methods for Chemical Analysis of Water and Wastes, USEPA, 1983.

- Please see LC ISR, LLC's response to Comment RP-7, which contains a discussion on the use of composite samples.

Additional revisions to the Lost Creek Water Well Sampling Procedure were made to match the text in the main permit document. The revisions include the following:

- The first sentence of the first paragraph of Section III(C) (iii) was changed to "During restoration the perimeter and underlying and overlying monitor wells will continue to be sampled at least twice per month, and no less than ten days apart, for UCL parameters". Also, the second sentence was deleted.

- The second and third sentences of the second paragraph of Section III(C) (iii) were changed to "Each production monitor well will be sampled at the beginning of stabilization and once per quarter for a period of 12 months and analyzed for Guideline 8 parameters. This will yield a total of 5 sample rounds".

- The last sentence of the second paragraph of Section III(C) (iii) was changed to "The monitor ring, overlying, and underlying monitor wells will be sampled for the

UCL parameters once every two months throughout stabilization". Also, the following sentence was added to the end of the second paragraph "If an excursion occurs during stabilization, then the sampling will revert to weekly for the affected monitor well until the excursion is resolved".

- In Table C, the text was changed in the Wellfield row under the Frequency column to match the text in Section III(C) (iii).

LQD (3/10) - The requested information was incorporated into Attachment OP-8. Regarding the disposal of purged water on the ground surface, there is a concern that when the natural groundwater contains levels of radium and uranium disposal on the ground surface may have the potential to impact the background gamma survey levels in the soils within the permit area. The Division recommends that any purged water with detectable levels of these constituents, be transferred to the holding ponds in order to preserve the baseline conditions. (AB)

LC ISR, LLC (6/10) - LC ISR, LLC appreciates the concern raised by the reviewer regarding the buildup of radium and/or uranium in the soil, and LC ISR, LLC has considered this potential in the past. To ensure this is not an issue, LC ISR, LLC reviewed the sample results of all Mine Unit 1 monitor wells, including those within the pattern area, to determine the worst case scenario. The first sample round for monitor well MO-111 contained 360 pCi/l of radium-226. This is the highest concentration of radium-226 in all of the Mine Unit 1 monitor wells completed in the ring, overlying and underlying. When compared to the results of the second through fourth round of analysis of well MO-111 it is clear that this is an outlier. Nonetheless, 360 pCi/l radium-226 was used to analyze the maximum buildup that could occur. The calculation assumed a total of 96 sample rounds over the life of the well and an average purge volume of 500 gallons per sample event. Assuming the water is discharged through a sprinkler and 100% of the radium-226 is captured in the top 15 centimeters of soil the buildup will be approximately 0.36 pCi/gram of soil. The soil clean-up standard required by the NRC in 10 CFR 40 Appendix A Criterion 6 is 5 pCi/g in the top 15 centimeters. Therefore, even in the conservative scenario considered, the build-up of radium-226 in the soil is far below the level of concern. During reclamation, radiometric surveys it may be possible to see a slight increase in activity but not to the level of any concern.

With regard to uranium, the monitor well baseline sampling shows that the highest concentration in a Mine Unit 1 monitor well was 0.916 mg/l in well MO-114. Using the assumptions outlined above, the maximum concentration of uranium that could occur is 9 x 10^{-7} mg U/gram of soil. The annual ingestion limit for a member of the public is 0.813 grams and the limit for inhalation is 4.5 mg. Therefore, a member of the public would have to inhale more than 4,980 grams of soil/year or ingest more than 900,000 grams of soil/year before exceeding regulatory limits. Finally, since uranium is an alpha emitter there are no

direct radiation concerns. The regulatory limits are based on chemical toxicity for uranium since its heavy metal properties are more of a concern than its radiologic properties.

Therefore, based on the above assessment, LC ISR, LLC does not plan to capture well purge water unless the water has been affected by mining lixiviant and falls under the immediate jurisdiction of the NRC.

LQD (7/10) – Item unresolved. An analysis of MO-111 with the highest baseline radium 226 levels (360 pCi/l) was presented showing that the cumulative effects on the soil are more than ten times less than the NRC soil clean-up standard. Yet Best Management Practices should dictate that the operator will not impact the background soil radiological levels. If a monitoring well shows a constituent that by being discharged onto the ground it will adversely affect the soils, then that well should have the purge water transported to the evaporation ponds or deep disposal well. Prior to start up, an alternate method for disposal should be proposed. **(AB)**

OP-84) *LQD (1/09) - Section OP 3.2 Mine Unit Design. The last paragraph of this section states that the operator has made an effort to properly 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)*

LC ISR, LLC (10/09) - 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.

LQD (11/09) - Response not acceptable. Drilling currently taking place in the Battle Springs formation has illustrated the problem with plug gel loss down the hole. The plug gel will fall

100-300 feet, often exposing the water table. If past practices were to inject plug gel to the surface and cap the hole then there is no documentation of the plug gel falling back down the hole. The Tg NOV provides some documentation that historically the holes were left in various stages of abandonment. It can be stated with fair certainty that many of the historic drill holes are open more than a hundred feet below any surface cap, and many of them most likely are in at least the first water table. Ur Energy has made an effort to locate these holes, without much success (only finding 2 out of 20 which were searched). The DEQ will make an independent effort to locate the holes within the first mine unit, with the commitment by Lost Creek to plug them if we find them. (AB)

LC ISR, LLC (2/10) - LC ISR, LLC appreciates the WDEQ-LQD's willingness to assist with this issue. It is important that work on this project begin during the spring of 2010 so the holes can be plugged in a timely manner that does not impact the operations schedule. We look forward to discussing this schedule with you in the coming weeks.

LQD (3/10) - This item is unresolved. (AB)

LC ISR, LLC (6/10) - In the interest of resolving this item for the purposes of the application review, LC ISR, LLC suggests the following language be inserted into the permit as a condition:

> "Prior to injecting mining solutions in a wellfield, LC ISR, LLC will attempt to locate and properly abandon all historic drill holes that may be improperly abandoned within the pattern area. WDEQ-LQD will assist LC ISR, LLC in the process of locating the historic holes. The failure to locate 100% of the holes will not be the sole justification for LQD denying LC ISR, LLC the ability to mine the wellfield in question."

LQD (7/10) - Item unresolved. Location and abandonment of the historic drill holes within the area of the first mine unit has not been addressed in the field beyond a demonstration of Ground Penetrating Radar. LC is proposing a Permit Condition stating that prior to injection of any mining solution, an attempt will be made to locate the historic drill holes. Failure to locate the holes will not be justification for LQD denying LC to move forward with mining.

From the ongoing discussions on this topic the LQD's understanding has been that the holes within the first mine unit would be located and properly abandoned. A new pump test would then be conducted to determine if there was an improvement in the amount of leakage observed in the overlying and underlying aquifers. If there was no improvement then it would indicate that the leakage was not from the improperly abandoned historic drill holes, but from lack of geological controls. A proposal should be submitted which outlines how this effort will be undertaken, the pump test specs, and how the new test will be correlated to the results of the previous pump test. **(AB)**

OP-89) LQD (7/10) – This item is resolved. The revision of the language in Section OP 3.2.2.4 to be consistent with Attachment OP-8, which includes a commitment to sample regional wells completed in the DE horizon when they are located in a mine unit, adequately addresses this reviewer's concerns. **(MLB)**

OP-90) *LQD (1/09) - Section OP3.3 Well Completion: 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)**

LC ISR, LLC (10/09) - 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.

LQD (11/09) - Response not acceptable. The burst pressure and collapse pressure values and calculation for the SDR17 pipe should be presented in the permit document. The reviewer

does not necessarily agree with the calculations presented for external pressure. For example, Well LC24M is cased for 478 feet with a static water level of 204 feet. The grout used was Portland Cement and assuming a mixture of 1 sack per six gallons of water gives a unit weight of approximately 10.7 lbs/gal. So (478 feet x 10.7 x 0.052) – (274 x 8.34 x 0.052) = 266 – 119 = 147 psi net collapse pressure. While the estimated collapse pressure is less than the CertainTeed specification of 224 psi, the Factor of Safety (FOS) is estimated at approximately 1.5 which is less than the factory recommended FOS of 2.0. Please address the above. (BRW for AB)

LC ISR, LLC (2/10) - LC ISR, LLC's engineers and well installation personnel understand that many variables can affect a successful well installation. Some of these include static water level, installation water level, grout density, chase fluid density, depth of casing and environmental conditions such as fluid temperatures. LC ISR, LLC also understands that the most critical time for mechanical integrity of the well typically occurs during installation, particularly during grouting. The time of highest risk occurs when either:

- the casing is full of grout and the annulus is full of drilling mud/formation water, (failure mode is burst), or
- the annulus is full of grout and the casing is full of chase fluid (failure mode is collapse).

LC ISR, LLC designs its well installations to minimize failure during these times.

LC ISR, LLC's design personnel are experienced in the design and installation of many PVC cased wells and have a deep understanding of the factors that can cause well failure. The defining criteria for success of the installation is the passing of the mechanical integrity test. Regardless of safety factor, well design or installation practices, the each well must pass this test prior to its use.

The calculation provided as an example by the reviewer assumes that the static water level inside the casing is equal to the static formation water level. However, this is not the case because the water or "chase fluid" in the casing is used to push the cement into the annulus and maintain it there. Therefore, the casing is always full. The calculation should be:

(478 feet x 10.7 x 0.052) – (478 x 8.34 x 0.052) = 266 – 207 = 59 psi net collapse pressure

224/59 = 3.8 Factor of Safety for this application.

Regardless of the calculation, the well must still pass the MIT.

As for inclusion of the casing data in the permit application, LC ISR, LLC believes that this data should not be included as the manufacturer or the pressure ratings may routinely change during the course of the Project. However, the data will be available on site for review

during inspection.

LQD (3/10) - Response not acceptable. The reviewer understands the procedure as outlined in LC's response. However, this is not conveyed within the text. The revised text provided concerning the calculation does not match those provided in the recently submitted response. Lastly, the calculation should actually reflect the weight of the cement utilized in sealing the annulus. Please make the appropriate revisions to the text. (BRW for AB)

LC ISR, LLC (6/10) - The text in OP 3.3 has been revised.

LQD (7/10) – Response not acceptable. The submitted revised text for Section OP 3.3 reads exactly the same as previously submitted. Please see the reviewer's response dated March 2010 and make the appropriate revisions to the text as requested. **(BRW)**

OP-93) LQD (7/10) – This item is resolved. The change to the language in Section OP 3.4 which commits to the implementation of a tracking system for MIT failures addresses this reviewer's concerns. **(MM)**

OP-97) LQD (7/10) – Item is resolved. The addition of text to Section OP 3.6.3.1 adequately addresses this reviewer's concerns. **(MM)**

OP-99) *LQD (1/09) - Section OP 3.6.3.1 Water Balance. (Table OP-6): 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)*

LC ISR, LLC (10/09) - 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.

LQD (11/09) - Response not acceptable. Text in the third full paragraph on page OP-34 states "The design basis for the Lost Creek Project is derived to provide the nominal maximum production plant capacity (6,000 gpm) from each typical mine unit. Therefore, each typical mine unit includes approximately 180 (32 x 180 = 5,760 gpm) production wells…". Figure OP-4A indicates that in year two there will be production in MU-1 and MU-2 with no restoration indicated. Given the description in the text above, it would seem that the plant would essentially be operating at capacity with one unit in production, let alone the additional production from a second wellfield. Therefore, the text does not appear to jive with the schedule. Additionally, though not stated in the text, but only in the response, that "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," is not completely acceptable as the LQD has indicated to LC that restoration will not suffer at the hand of production. Please address. (BRW for AB).

LC ISR, LLC (2/10) - The text in Section OP 3.6.4.1 and Figures D6-5a through 5h describe the system which includes both the *production* circuit (6,000 gpm) and the *restoration* circuit (600 gpm), i.e., a production flow rate of 6,000 gpm does not preclude a restoration flow rate of 600 gpm (See Response to Comment V5, #97 for discussion of the differences in the flow rates.) The text also includes a discussion of the progressive water balance (i.e., for bringing the first mine unit on line through restoration of the last mine unit), including the relative to production and restoration rates, and ties it to the schedule presented in Figure OP-4a. The text in Section OP 3.6.4.1 has been edited to clarify the progression.

LQD (3/10) – Response not acceptable. Thank you for attempting to provide better clarification of the schedule as it relates to Figure OP-4A and how the operation will proceed from production to restoration. However, there is a statement on page OP-52 that states" Restoration will not typically begin in any mine unit until all production flow has ceased to facilitate proper control of both production and restoration fluids. Because of this, production may occur from more than one mine unit to maintain maximum allowable production flow without restoration occurring simultaneously in those mine units." This statement is extremely convoluted.

I assume during operations that there will be a blending of high grade production streams from new fields with low grade streams from nearly depleted mine units to maximize recovery from the nearly depleted field. This part makes sense, but the last part "without restoration occurring simultaneously in those mine units." is a problem because at some point LC will need to begin restoration, at the same time production from the next well field

is occurring. It is understood that to maximize restoration effectiveness that it is necessary to establish a "buffer zone of sorts" to ensure that production fluid is not being pulled in during Ground Water Sweep. Thus, one or more header houses maybe shut in and left idle once the ore is played out of an area and LC will rely on maintaining control of the lixiviant by adjacent operational header houses. Idling all or portions of a well field will, however, be watched with close scrutiny to ensure that fluid control is maintained by adjacent header house patterns within the unit. When LC can no longer demonstrate that fluid control is maintained, LC will be required to initiate restoration. Please provide clarification of the statement cited in the above paragraph. (BRW for AB)

LC ISR, LLC (6/10) - The response has been broken down into its major components, (numbered 99(a), (b), and (c)) to allow for more concise answers.

a. LQD (3/10) - "…there is a statement on page OP-52 that states" Restoration will not typically begin in any mine unit until all production flow has ceased to facilitate proper control of both production and restoration fluids. Because of this, production may occur from more than one mine unit to maintain maximum allowable production flow without restoration occurring simultaneously in those mine units." This statement is extremely convoluted."

LC ISR, LLC (6/10) - The 2nd sentence in Paragraph 10 of Section OP 3.6.3.1, Paragraph 10 has been reworded for clarification, including addition of a cross-reference to Section OP 2.1 (Project Schedule).

b. LQD (3/10) - "…"without restoration occurring simultaneously in those mine units." is a problem because at some point LC will need to begin restoration, at the same time production from the next well field is occurring. It is understood that to maximize restoration effectiveness that it is necessary to establish a "buffer zone of sorts" to ensure that production fluid is not being pulled in during Ground Water Sweep. Thus, one or more header houses maybe shut in and left idle once the ore is played out of an area and LC will rely on maintaining control of the lixiviant by adjacent operational header houses. Idling all or portions of a well field will, however, be watched with close scrutiny to ensure that fluid control is maintained by adjacent header house patterns within the unit. When LC can no longer demonstrate that fluid control is maintained, LC will be required to initiate restoration. Please provide clarification of the statement cited in the above paragraph.

LC ISR, LLC (6/10) - Section 3.6 (Mine Control) details the evaluations of fluid balance and water quality that will be used to ensure fluid control is maintained, and Attachment OP-2, which is being updated, details more specific assessments which will be used to evaluate fluid control (as well as mining efficiency).

LQD (7/10) – Response partially acceptable. The response indicates that Attachment OP-2 is in the revision process (not included in the June 2010 submittal) to better detail how fluid control will be evaluated and maintained. The reviewer awaits the submittal of a revised Attachment OP-2 before making a final determination. **(BRW)**

OP-105) *LQD (1/09) - 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)**

LC ISR, LLC (10/09) - 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:

$(u)_p$- $r_p^2S/4Tt$
$(u)_t$ - $r_t^2S/4Tt$

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.

LQD (11/09) - Response partially acceptable. Impacts to the HJ aquifer have been projected to extend well beyond five miles from the permit area. Other aquifers that may be affected must also be addressed. Drawdown maps must be provided to show the extent of projected drawdown in each affected aquifer. All known water resources (wells, lakes, wetlands, springs, etc.) within the projected 5 foot drawdown area must be identified on the maps. Monitoring plans must be presented for monitoring of impacts to these water resources. Actions to be taken to mitigate the impacts must be described. (MM)

LC ISR, LLC (2/10) - Please see Response to Comment V5, RP#5.

LQD (3/10) Response partially acceptable. A drawdown map is required to illustrate the extent of the five foot drawdown and all of the water resources within that area that may be affected. It is requested that this be a USGS topographic map on a scale of 1"=2,000'. Mitigation measures also need to be addressed. (MM)

LC ISR, LLC (6/10) - Please see Response to Comment RP#5. (See also Comment OP #114.)

LQD (7/10) – Response not acceptable. Comment stands as written. **(MM)**

OP-112) LQD (7/10) – Item unresolved. The text in Section OP 5.2.1.3 was revised to state that 40-80 gallons per month of waste petroleum products are generated. Table OP-10 does not specify in footnotes 6 or 7 the ultimate disposal locations for the waste petroleum products or the hazardous material generated outside of the laboratory. Please revise these footnotes to designate their disposal options. **(AB)**

OP-114) *LQD (1/09) - 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)**

LC ISR, LLC (10/09) - Please see Response to Comment V5, OP#74.

LQD (11/09) - Response not acceptable. Please see the response to Comment OP-74 and if Well LC229W is to be used as the potable water supply well furnish a copy of the UW-6 associated with this well. (BRW for AB)

LC ISR, LLC (2/10) - Please see the response to OP 74. It was LC ISR, LLC's original intent to use Well LC229W to supply potable water. However, LC229W is within ¼ mile of the anticipated aquifer exemption boundary, so a new well further to the north will need to be installed.

LQD (3/10) This item is unresolved. Detailed information regarding the new potable water supply well, and the drawdown effects anticipated from its usage will need to be added to the permit document. (AB)

LC ISR, LLC (6/10) - Section OP 2.11.2.1 includes the list of water supply wells that LC ISR, LLC anticipates using, and Section OP 3.6.3.4 includes an assessment of the impacts of the drawdown from those wells. LC229W is one of those wells. However, in order to ensure the water supply well is beyond the ¼ mile buffer around the aquifer exemption, LC ISR, LLC plans on drilling a new water supply well a few hundred feet north of the Plant, rather than using LC229W. Because the list of water supply wells is not finalized (e.g., a new FG well is discussed in Section OP 2.11.2.1, but may not be necessary), LC ISR, LLC suggests the following permit condition in the interest of resolving this item for the purposes of the LQD application review:

> "The number, location, construction information, and usage of the water supply wells will be updated as part of the Annual Report. If the drawdown assessment from the water supply wells is anticipated to change substantially, the assessment will also be updated in the Annual Report."

A reassessment of the total consumption of potable water reveals that daily use will be approximately 188 gallons per day or 0.13 gpm. Potable water usage is predicted to be as follows:

Showers: 1/day x 10 minutes each x 2.5 gpm = 25 gallons/day

Handwashing: Weekdays 3 washes/day x 5 days x 90 people x 1 gpm x 0.5 minutes = 675 gallons/week
Weekends 3 washes/day x 2 days x 2 people x 2 shifts x 1 gpm x 0.5 minutes = 12 gallons/week

675 gallons/week + 12 gallons/week = 687 gallons/week = 98 gallons/day

Drinking: Weekdays 90 people x 5 days x 0.3 gallons = 135 gallons/week
Weekends 2 people x 2 shifts x 2 days x 0.3 gallons = 2.4 gallons/week

Total of 137 gallons/week = 20 gallons/day

Dishes: 1 gpm x 30 minutes/day = 30 gallons/day

Janitorial: 1 gpm x 15 minutes/day = 15 gallons/day

Grand Total of 188 gallons/day (0.15 gallons per minute)

To reflect the revised calculation, the text in Section OP 2.11.2.1 under the bullet "Potable Water" has been revised to 200 gallons per day from 250 gallons per day. However, the drawdown assessment in Section 3.6.3.4 was left at the more conservative 250 gallons per day. (See also Comments OP #105 and RP #5).

LQD (7/10) – Item unresolved. At this point the Division is not prepared to drop comments for a permit condition. The recalculation of the water usage seems low. Shower usage assumes only one person per day is taking a shower. Also, there is no allocation of water for toilet usage or laboratory. Hydrologic Consequences to aquifers needs to be defined as part of the permit application. Please provide a reassessment of the water supply well usage, and predicted drawdown to the aquifer. **(AB)**

OP-118) *LQD (1/09) - 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)**

LC ISR, LLC (10/09) - 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. Top-off – 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.

LQD (11/09) - Response partially acceptable. The discussion provided in LC's comment response should be incorporated into Section OP 2.12 of the permit. (MM)

LC ISR, LLC (2/10) - The information has been incorporated into Section OP 2.12 as requested.

LQD (3/10) Response partially acceptable. Please add a description of surface preparation and seeding. The broadcast seeding and hand-raking procedure currently in use on the site does not appear to be achieving reclamation success. Please include some sort of mechanical scarification or disking to level the sites and prepare a suitable seedbed. (MM)

LC ISR, LLC (6/10) - The basis for the reviewer's statement that *"The broadcast seeding and hand-raking procedure currently in use on the site does not appear to be achieving reclamation success"* is unclear. LC ISR, LLC had not been informed by LQD that the seeding methods used under the DN were not achieving reclamation success until receiving this round of comments. In fact, during the most recent field inspection (February 24, 2010) the LQD Project Manager told the reviewer that re-vegetation at Lost Creek had been successful (paraphrased).

Experience has shown that the use of a seed drill in a small area can cause unwarranted damage to surrounding sage brush due to the turning radius of the equipment and the low clearance. Therefore, broadcast seeding and raking has become the method of choice when reclaiming small areas such as drill pits. Hand broadcasting and raking is more time intensive but has been shown to be successful.

Section OP 2.12 is not intended to discuss re-vegetation methods in detail since its focus is on drilling. However, RP 4.5 provides a detailed discussion on re-vegetation including contouring, top soil placement, scarification, and seeding methods. A cross-reference to that section has been added at the end of Sections OP 2.12.1 and OP 2.12.2.

LQD (7/10) – Response not acceptable. Revegetation on drill sites at the Lost Creek site has not been particularly successful to date. This appears to be due to inadequate topsoil salvage from the entire drill site and inadequate revegetation practices. Specific procedures need to be described in the permit to assure more successful reclamation of drill sites. LC's response references section RP 4.5 of the reclamation plan. This section of the reclamation plan does not specifically address drill sites. Please add further detail specific to drill sites, including plans for: 1.) topsoil salvage from all areas that will be substantially affected (by repeated traffic or by burial with overburden), 2.) disking or scarification to prepare a seedbed, and 3.) drill seeding, or if broadcast seeding is used, light harrowing to cover the seed. **(MM)**

OP-119) *LQD (1/09) - 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)**

LC ISR, LLC (10/09) - Please see Response to Comment V5, #84.

LQD (11/09) - Response not acceptable. The issue of how to address old abandoned drill holes is one that will obviously require continuing evaluation and discussion. Questions relating to who is responsible for the old holes are irrelevant at this point. We are not blaming LC for the existence or the condition of the holes. We would not be asking LC to plug the holes, except for the fact that LC is proposing an ISL operation on a site that resembles Swiss cheese. ISL operators are responsible for controlling their production fluids and for restoring the groundwater affected by their operations. We believe that the old improperly abandoned drill holes will seriously impair these efforts and thus affect LC's ability to conduct a successful operation. LQD cannot ignore this issue. We acknowledge that locating old abandoned drill holes is problematic and that efforts involving extensive surface disturbance are not desirable. LQD will continue to evaluate information (e.g. pump tests) as it becomes available. It is hoped that we can jointly arrive at a reasonable approach to address the problem. (MM)

LC ISR, LLC (2/10) - Please see Response to Comment V5, #84.

LQD (3/10) This remains an open item. (MM)

LC ISR, LLC (6/10) - Please see Response to Comment OP #84.

LQD (7/10) – This remains an open item. (MM)

*****This concludes the comments on the OPERATIONS PLAN in the MAIN Permit Document *****

NOVEMBER 2009 - NEW LQD COMMENTS ON THE MAIN PERMIT DOCUMENT

NC10) LQD (7/10) – This item is resolved. The text in Section 2.3.1 in Attachment OP-6 has been changed to read as requested. **(MLB for SP)**

NC40) LQD (7/10) – This item is resolved. The title of Table OP-A6-1 has been corrected as requested. **(MLB for SP)**

*****This concludes the review of NEW COMMENTS (from November 2009) on the Main Permit Document*****

FEBRUARY 2010 - LQD COMMENTS, ON THE MINE UNIT 1 APPLICATION, RELEVANT TO THE MAIN PERMIT DOCUMENT

MU1-4) *LQD (2/10) - The following comment was part of the permit application review, and the response from LC indicated that it would be addressed through the Mine Unit Package submittal. Figure OP-2a Site Layout: 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) Figure MU1 1-3 Surface Facilities provides details for the Mine Unit, but greater detail is required as listed below:*

A larger scale map (e.g. 1" = 100')
All pipelines, powerline, roads, fencelines, staging areas, culverts and topsoil stockpiles (some of these are already included)
The proposed layout of the wellfield production and monitoring wells (The Division is interested in how the proposed wellfield layout will address the fault zone)
The wellfield layout should indicate which sand (UHJ, MHJ, or LHJ) is being mined or monitored based on screened interval)
The temporary vs. long term disturbances associated with the wellfield should be distinguished (well pad, header houses, pipelines, utilities)
The primary, secondary, and 2-track roads should be mapped out. (The Division is interested in how the proposed layout will minimize surface disturbances and travel ways) (AB)

LC ISR, LLC (3/10) - As outlined below, LC ISR, LLC believes that the information requested in this comment has been provided to WDEQ-LQD in: the main permit document; the original MU1 application; or the updates to MU1 per these responses. As outlined below, the rest of the information has been provided in as much detail as possible prior to installation of the production and injection wells. Therefore the requested map has not been included with this submittal.

Figure MU1 1-3 provided in the MU1 application shows the locations of the following items:

- The main wellfield trunkline (pipeline);
- Powerlines;

- The fence surrounding the wellfield;
- The main access road, roads located within the wellfield and existing two track roads inside the monitor well ring;
- Staging area;
- Culverts; and
- Topsoil stockpile locations.

There will not be a chemical storage area, weather station, or air monitoring station within MU1.

Figures MU1 5-1 through MU1 5-4, which replace Figures MU1 5-1 and MU1 5-2, provide additional information on the proposed layout of the pattern areas and monitor wells, along with information on which sands are being mined and how the perimeter monitor wells are screened to monitor the those sands. Additionally, a discussion of the proposed pattern layout, which addresses monitoring across the Lost Creek Fault through the use of overlying and underlying monitor wells, has been added to Section 5.2.1 of the MU1 Application.

The information that has not and cannot be provided prior to the actual installation of the production and injection wells is the layout of travel ways within the pattern areas. The travel ways used for the construction and operation of the mine unit will be developed in accordance with the guidance provided in Section OP 2.6 (Roads) of the main permit document. This type of detailed information has never been presented in a mine unit package, before the wells are installed, simply because it is not possible to determine this amount of detail until the work begins. At that time, the engineers and geologists, actually walk the pattern area and stake well locations based on the most up-to-date surface and subsurface information. Even as the wells are installed, the information obtained from the early wells may influence the locations of the later wells. For this reason, LC ISR, LLC presented a generic wellfield layout on Figure OP-6b of the main permit document.

A discussion of topsoil management, which includes long-term and short-term topsoil protection, is provided in Section OP 2.5 (Topsoil Management) of the main permit document. Also, a discussion of vegetation protection during wellfield construction is provided in Section OP 2.7 (Vegetation Protection and Weed Control) of the main permit document. The amount of topsoil disturbance for the facilities shown on Figure MU1 1-3 is provided in Table MU1 3-1 of the Mine Unit 1 Application and is allocated by short-term and long-term stockpiles. Also provided in Table MU1 3-2 of the Mine Unit 1 Application is the amount of vegetation disturbance for the facilities shown on Figure MU1 1-3.

LC ISR, LLC will not construct a sedimentation pond or other permanent structures as sediment control measures for MU1. LL ISR, LLC will use alternate sediment control measures in accordance with WDEQ-LQD Guideline #15. Since the area surrounding the mine site is relatively flat-lying, LC ISR, LLC will use sediment control features such as silt fences and hay bales appropriately placed for erosion control. The locations of these sediment control units will be determined during construction.

LQD (4/10) - Response not acceptable. Due to potential changes in the as-built lay out of the well field during construction, the operator is reluctant to provide the level of detail requested. Much of the layout indicating soil and vegetation disturbance is outlined in Figure OP -6b. This schematic does not provide a true picture of the disturbed area within a typical pattern area. Please revise the schematic to show the total disturbance associated with each drill site, not just the mud pit. In addition, the trench layout is shown as a line on the drawing yet the actual width of disturbance associated with a 3' wide trench is more likely 20' wide. (given a 3:1 angle of repose for the topsoil and subsoil piles, as opposed to vertical). The actual footprint of these disturbances should be indicated on a revised Figure OP-6b and the square footages and percentages of disturbance re-calculated.

The attached site map (enclosure) of Mine Unit One is representative of the disturbance prior to any header houses, roads or pipelines and is indicative of how significant the surface impacts will be. Although long and short term disturbances are broken out separately on Figure OP-6b, the reality is that even the short term disturbances will have long term impacts due to the time it takes to reach reclamation success.

The 1"=100' map indicating the proposed lay out of the well field and the disturbances associated within the wellfield is still requested. In addition to the proposed wellfield layout, the existing disturbances caused by the exploration holes will also need to be indicated on the map. This map will need to also include the fencing around the large staging area, and the 2-track around the monitor well ring. In addition, the current staging area on the eastern part of the mine unit already appears to have approximately an acre or more of disturbance, far greater an area than that depicted on Figure MU1 1-3. The justification for this was presented in the March 11, 2010 clarification of comment letter. The as-built version of this map will then need to be included in the Annual Report each year. (AB)

LC ISR, LLC (6/10) - The original intent of Figure OP-6b was to show how operations will be designed in a generic sense. In fact, the actual wellfield layout will not be as symmetrical as that shown in the figure. Given the size of the equipment used, current state of knowledge and the density of drilling, it is impossible to define at this point in time where all disturbance will be other than to say that disturbance from construction and operations will be limited generally to the pattern area and utility routes.

Pursuant to guidance provided by LQD during several meetings and correspondence, LC ISR, LLC commits to maintaining the level of total disturbance from construction and operations to less than 50% of the area within each respective mine unit monitor ring. For example, the area within the monitor ring boundary of Mine Unit 1 is 212.8 acres while the entire proposed pattern area, including isolated areas where no wells are planned, covers 45.6 acres. Therefore, if 100 percent of the proposed wellfield pattern area is disturbed (including isolated areas where no wells are planned), the disturbed area will only equate to 21% of the area within the monitor well ring. It is worth pointing out that if LC ISR, LLC applied conventional open pit mining techniques, the area of the Mine Unit 1 pit would be on the order of 200 acres plus a few hundred acres of overburden piles and tailings. It is unclear why LQD continues to require such fine detail for this ISR permit to mine when LC ISR, LLC has already made significant commitments to minimize disturbance.

LC ISR, LLC recognizes there are two types of disturbance associated with mine unit construction and operation. Those disturbances that are transient (temporary, minor) in nature and those disturbances that are long-term and repetitive in nature. Examples of transient disturbance include: drill pits; pipe lines; two-track roads; off road vehicle traffic, power-line installation; and installation of fences, Examples of long-term disturbance include: primary and secondary roads; header houses; and lay-down areas. Any time excavation or long-term disturbances are planned, topsoil will be properly segregated and stored until reclamation (Sections OP 2.5 and RP 4.5). Interim vegetation will be established if native vegetation is damaged during construction or operational activities (Section OP 2.7). Regardless of the nature of the disturbance, transient or long-term, all disturbance will be reclaimed during decommissioning of the area.

LC ISR, LLC believes that the long-term removal of topsoil in areas with transient disturbance would create significant problems with interim stabilization of subsoil, which in turn would result in challenges with airborne particulate and sediment loading of drainages. LC ISR, LLC understands LQD's concern with topsoil compaction but the sandy nature of the topsoil at Lost Creek will minimize compaction. LC ISR, LLC believes the most protective method for soil management, related to transient disturbances, is to leave the topsoil and root systems in place. This is consistent with current practices at existing ISR facilities in Wyoming as well as direction from a previous WDEQ Director (Dennis Hemmer letter to PRI, September 14, 1998).

In light of the above discussion, as well as clarification letters from LQD, LC ISR, LLC does not propose to amend Figure MU1 1-3 at this time as originally requested in the February 2010 comments from LQD. The response to item 5 should also be reviewed

in response to this item. LC ISR, LLC would like to hold additional conversations with LQD with regard to revising Figure OP-6b and inclusion of a 1"=100' map.

LQD (7/10) – This item is unresolved pending further discussion. **(AB)**

MU1-5) LQD (7/10) – This item is resolved. LC has revised the text in Section OP 3.3 to be consistent with the text in Section OP 3.6.1. **(BRW)**

MU1-6) LQD (2/10) *- Neither the mine permit application nor this first mine unit package provide a thorough assessment of the projected impact of the operation on regional water resources or plans to mitigate such impacts. Please reference comment no. OP-105 from the 11/20/09 review (W.S. §35-11-428(a)(ii)(B) and W.S. §35-11-428(a)(iii)(E)). Additionally, WDEQ/LQD Non Coal R&R's Chapter 11 Sec 4(a)(x)(F) requires the following to be provided in the Mine Unit Package: Expected changes in pressure, native groundwater displacement, direction of movement of injection fluid and a drawdown projection, including a map, which describes the extent of groundwater drawdown in the ore zone aquifer for the life of the first wellfield, through restoration. And the MU 1 package must address the ROI in overlying and underlying aquifers. Several comments in this review have addressed portions of these requirements. However, LQD expects the entire suite of requirements in Chapter 11, Sec 4(a)(x)(F) and W.S. §35-11-428(a)(ii)(B) and W.S. §35-11-428(a)(iii)(E) to be addressed in the MU1 Package.*[18] *(MM, BRW)*

LC ISR, LLC (3/10) - Per the discussion during the February 25, 2010 meeting between WDEQ-LQD and LC ISR, LLC, LC ISR, LLC believes the Response to Comment V5, RP#5 and the associated changes to Section OP 3.6.3.3, submitted in February 2010, address this comment as well. LQD will review that information in relation to this comment.

LQD (4/10) – Response partially acceptable. The reviewers will await acceptable responses to Master Permit Comments OP-111 and RP-5. (BRW)

LC ISR, LLC (6/10) – Please refer to Responses to Comments OP #111 and RP #5.

LQD (7/10) – Response not acceptable. Please see Comment RP-5. **(BRW)**

MU1-8) LQD (7/10) – This item is resolved. The text has been revised as requested. **(BRW)**

MU1-11) LQD (2/10) *Section OP 3.2.2.2 in the main permit discusses the use of observation wells in situations where multiple ore horizons will be produced. No observation*

wells are described in this mine unit package, even though there are several locations where multiple ore horizons are being developed. Please address. (MM)

LC ISR, LLC (3/10) - LC ISR, LLC will incorporate existing wells HJMU-101 and HJMU-110 into the MU1 monitor well system as observation wells. These wells will be used as observation wells by taking water level measurements at a frequency as discussed in Attachment OP-8 of the main permit document. The data will be reported to the WDEQ-LQD. The locations of these wells are shown on Figure MU1 4-1, and initial water levels are shown on Table MU1 4-3. A discussion of the use of these wells has been included in Section 5.2.1 of the MU1 Application (see Response to Comment MU1 #23).

LQD (4/10) - Response not acceptable. Lost Creek makes brief reference to the use of observation wells and permanent piezometers in section 1.2.3 in Attachment OP-2, Summary of Engineering Controls. However, aside from the two pre-existing wells mentioned in the above response, there are no definite plans provided for any such wells to be installed in mine unit #1. LQD has repeatedly expressed concerns regarding issues of confinement and control of production fluids. It is incumbent on Lost Creek to demonstrate how engineering controls will be used to prevent the movement of production fluids into unauthorized zones. Specific commitments for the installation and use of observation wells and permanent piezometers would be helpful in this demonstration. This is particularly true in areas where there are stacked ore zones and the monitor well ring wells are not monitoring all of the appropriate zones. See comment no. 33 for further discussion. (MM)

LC ISR, LLC (6/10) - LC ISR, LLC is expanding the information in Attachment OP-2, including description of the technically justifiable method for when and where to use observation monitor wells when there is juxtaposition of the production zone and an overlying or underlying aquifer. The results of this effort were not finalized at the time this response was submitted but will be provided as soon as possible. (See also Comments MU1-20b and 20e, MU1-24, and MU1-33.)

LQD (7/10) – This remains an open item pending the submittal of revised Attachment OP-2. **(MM)**

MU1-20) *LQD (2/10) - Please describe how water level monitoring data will be collected and evaluated in the various operational situations. For example:*

b. *Section OP 3.6.3 in the main permit document states: "The water level changes, including both the drawdown and mounding from production and injection, respectively, will be evaluated to minimize interference among the mine units and*

to determine cumulative drawdown." How will the data be evaluated? (MM, BRW)

LC ISR, LLC (3/10) - Water level data will be evaluated using a "rose" diagram as discussed in Section 1.2.3 of Attachment OP-2 to evaluate interference among mine units.

LQD (4/10) - Response not acceptable – LC indicates that water level data will be evaluated using a Rose Diagram. However, the text provided does not give an indication as to the frequency at which the evaluation will be performed and what magnitude of change triggers a reassessment of and associated readjustment of injection and production rates. Please also see Comment #33. (BRW)

LC ISR, LLC (6/10) –Section OP 3.6.4.2 Excursion Detection states that:

"Excursion detection will consist of sampling the monitor wells at least twice per month, and no less than ten days apart, and analyzing the samples for the UCL parameters." and "Water levels will be measured at the same frequency as the monitor well sampling."

The frequency of evaluation will be consistent with the frequency of sampling and water level data collection. In other words, it will occur at least twice per month. The magnitude of change which will trigger an action is somewhat subjective. A change in water level will be relative to operational activities such as the start up or shut down of a header house or a pump test in an adjacent mine unit. Basic to the review is the baseline water level data and, more importantly, the trending of the water levels. Irrespective of operational activities, the reviewer will look for significant changes in water level (approximately 10 feet or more) that continue for more than one sampling cycle.

The "Rose Diagram" provides a quick, visual method to accentuate these changes over time and aids the reviewer in identifying anomalous regional trends. Changes will trigger a review of operational activities within the area of interest and a possible modification of operating flow rates and pattern balance.

LC ISR, LLC is expanding the information in Attachment OP-2, and the above description will be incorporated into the updated version. The results of this effort were not finalized at the time this response was submitted but will be provided as soon as possible. (See also Comments MU1-11, MU1-20e, MU1-24, and MU1-33).

LQD (7/10) – Response partially acceptable. The reviewer understands that monitoring wells will be sampled and water levels procured on a bi-weekly basis. However, the text does not indicate that an analysis (e.g., Rose Diagrams, etc.), beyond a single well evaluation of level and quality will occur. It is possible that full analysis of the results may be inferred from the text, but nothing more. The reviewer awaits the submittal of a revised Attachment OP-2 before making a final determination. **(BRW)**

e. *Section 5.1.3 (page MU1-25) states: "Sudden increase in water levels in overlying and underlying aquifers may be an indication of casing failure in a production, injection or monitor well." Are there other possible explanations, such as improperly plugged drill holes? Please describe the likely scenarios and how these will be addressed if increases in water levels are detected.*[5,13,21] *(MM, BRW)*

LC ISR, LLC (3/10) - LC ISR, LLC does not believe that a sudden increase in water levels in overlying and underlying monitor wells would generally be caused by an improperly plugged drill hole. It is more likely that steady increases in water levels would occur due to an improperly plugged borehole. Therefore, LC ISR, LLC believes that the only credible scenario that would result in a sudden increase in water levels is a casing failure in a production, injection or monitor well. Increased water levels in overlying and underlying monitor wells, regardless of perceived cause or how suddenly it occurred, would result in an investigation to determine the cause. Please see Section 1.2.3 of Attachment OP-2 for a response to changes in water levels in overlying and underlying monitor wells.

LQD (4/10) - Response not acceptable – LC has provided several courses of action that maybe implemented to reverse water level changes that indicate that the potential for excursion exists. All of the procedures presented appear to be valid approaches to rectify the problem. The reviewers realize that there are a host of potential causes to water level rise and there is some "trial and error" associated with rectification, but it would seem that a more systematic approach to the solution would make the most sense. In other words, a particular condition is the most common cause of problems with water level rise, so this becomes the starting point for the effort. Please take the solutions presented in Section 1.2.3 of Attachment OP-2 and develop a systematic approach for the remediation of changes in water levels. Please also see Comment #20b. (BRW, MM)

LC ISR, LLC (6/10) - The attached flowsheet details the typical process involved in evaluating water level changes in the monitor well ring. This will become part of Attachment OP-2 when it is resubmitted. (See also Comments MU1-11, MU1-20b, MU1-24, and MU1-33).

LQD (7/10) – Response partially acceptable. The reviewer awaits the submittal of a revised Attachment OP-2 before making a final determination. Please note, the reviewer has looked at the attached flow chart that is to be incorporated into the revised Attachment OP-2. As the reviewer believes was stated in meetings and other correspondence, the WDEQ/LQD has a problem with using the term "significant change". It is understood that there is variability in the wellfield and 0.75' feet of change in a given well may be substantial and require attention while 3.5' of change in another be attributed to background noise and not a major cause for concern. Thus, there is no enforceability with this terminology; which is not acceptable, and conversely it is understood that utilization of a single prescribed value, such as 4.0' feet is not realistic. Perhaps a better way to look at the subject is in terms of baseline water surface elevation because once baseline elevation is exceeded then there is the potential for production fluid to migrate. Please, consider the above in the rewrite of Attachment OP-2. **(BRW)**

MU1-22) *LQD (2/10) - Section 5.1.4: This section explains that the monitoring well ring distance was chosen to be 500' in the fall of 2008 because it was considered industry standard. Subsequent to the construction of the monitor well ring, the November and December 2008 pump tests were conducted. The results of the pump tests showed a minimum ROI after two days of pumping of approximately 2,600 feet (North Pump Test). The conclusion was essentially that any ROI greater than 500 feet would render the 500' monitor well ring viable. However, Guideline 4 asks that the location of the monitoring wells be based on gradient considerations, dispersivity of recovery fluids, the initial excursion recovery measures employed by the operator, the normal mining operational flare, and the recoverability with the allowable regulatory time frame. Monitor well locations should be based on a groundwater flow model or other technically justified methods. Please provide a scientific, site specific justification for the monitor well spacing. (MLB, AB)*

LC ISR, LLC (3/10) - As discussed in Response to Comment MU1 #9, installation of the monitor well ring, including well spacing, was discussed with LQD staff during a meeting on June 25, 2008. The approval to install the monitor wells was received and bond posted prior to installation (see Update 3 of DN334 which was approved on May 14, 2008 in a letter from Don McKenzie). Approval of the plan was included with the approval of the Revision to Update 4 for Drilling Notification No. 334DN which was received on October 23, 2008. Therefore, based on this approval, the perimeter monitor wells were installed. At that time, two regional pump tests had been conducted; therefore, information on aquifer characteristics and anticipated well responses was available.

The MU1 pump tests confirm that the well spacing is appropriate in that all of the wells responded to pumping, as discussed in Response to Comment MU1 #16. (In some cases, the response was greater than required for other ISR operations.) Based on the discussion in Section 5.1.4 of the Mine Unit 1 Application concerning the radius of influence and the lack of the influence on groundwater flow due to paleochannels within the HJ Horizon LC ISR, LLC believes that the spacing of the monitor wells is appropriate for MU1.

LQD (4/10) - Response not acceptable. The LQD refers LC personnel to LQD's clarification letter dated March 11, 2010 with regard to the pertinence and applicability of LQD's approval of revisions to DN 334 as a mechanism for approval of monitor well ring wells. LC is directed to the original question which, restated, is as follows: Please provide a scientific, site specific justification for the monitor well spacing. The justification should include Guideline 4, Section III C, 5(b), requirements listed above in the original comment. (AB and MLB)

LC ISR, LLC (6/10) – Pursuant to the results of the May 6, 2010 meeting with the LQD Lander Field Office, LC ISR, LLC is currently assembling a model to support the placement of the monitor wells. The results of the model were not finalized at the time this response was submitted but will be provided as soon as possible.

LQD (7/10) – Item unresolved. Rationale was presented to the LQD during a July 6, 2010 meeting in Lander. A series of Figures showing the location of the wells relative to each of the ore zones in the four sands within the HJ horizon. These figures explain the geometry of the well spacing and are still under review. Beyond this demonstration, there will need to be a presentation of the scientific basis for the 500 feet based on hydrologic conditions, and not just because it is the 'industry standard'. As stated in the original comment, "*the location of the monitoring wells must be based on gradient considerations, dispersivity of recovery fluids, the initial excursion recovery measures employed by the operator, the normal mining operational flare (the lateral and vertical extend of affected area under normal operating conditions), and the recoverability with the allowable regulatory time frame. Monitor well locations should be based on a groundwater flow model or other technically justified methods. Please provide a scientific, site specific justification for the monitor well spacing.* "

During a July 20th meeting between DEQ and EPA to discuss the approach for an aquifer exemption, the EPA continued to emphasize that there must be a scientific basis for the aquifer exemption boundary. It was conveyed that the monitor well ring location has a scientific basis, yet that information still needs to be presented for this application. Once presented those hydrologic parameters may then be utilized for establishing the aquifer exemption boundary.

Beyond the Monitoring Well Ring spacing of 490-500 feet, the LQD has ongoing concerns regarding the screened intervals of the wells. As conveyed during recent discussions, the LQD ideally would like each of the four sands monitored individually. This is based on the way the HJ horizon has been presented as having four discrete sand horizons, splitting rather than lumping the HJ aquifer. Screening across discrete multiple sands creates the potential for cross contamination; dilution of a plume limiting its detection; the inability to determine the source of the plume; and the misrepresentation of each horizon in the sample depending on the pump location down the well. The LQD and WQD are still discussing this issue internally. **(AB)**

MU1-24) *LQD (2/10) - Section 5.3 The role of historic drill holes needs to be addressed in far greater detail than is currently provided. The late 2008 pump test results show that the upper KM (UKM) and the lower FG (LFG) sands are hydraulically connected to the HJ horizon. The drawdown observed in the UKM and LFG monitoring wells during the north and south pump tests was noted in Attachment MU1 2-1 as being an order of magnitude less than what was observed in the observation wells completed in the HJ horizon (ore zone) monitoring wells. The implication was that an order of magnitude less (in the vertical versus the horizontal) is somehow not a concern. It would seem that, during a pump test, one should expect the drawdown observed in an overlying or underlying unit to be substantially lower than the drawdown observed within the formation being pumped. Therefore, simply dismissing the significance of the observed drawdown as an "order of magnitude" less is not acceptable.*

The reality at the LC site is that the overlying and underlying aquifers are in communication with the HJ. This is a considerable concern because it implies that protection of the overlying and underlying aquifers is untenable. It is unclear to this reviewer whether the cause of communication between the HJ and its overlying and underlying aquifers is due to:

1) cross fault communication,
2) void space in historic drill holes functioning as vertical conduits,
3) gaps in the Sagebrush or Lost Creek Shales, or
4) a combination of all three above factors.

Given the above doubts about the possibility of protecting the overlying and underlying aquifers during the proposed solution mining at the LC project, LC must take greater steps to address the above listed three concerns in the Mine Unit Package. The most glaring concern (of the three listed above) is the role of historic drill holes functioning as vertical conduits.

The attached table (Table 1) provides a comparison of overlying and underlying wells (that had one foot or greater drawdown during the pump tests) with their proximity to

1) the fault and 2) historic drill holes. Table 1 indicates that there are at least 30 instances in which historic drill holes have the potential to be affecting the drawdown observed (I.e. where the historic drill hole may be functioning as a conduit for vertical communication between the HJ horizon and the LFG and UKM horizons).

Moreover, Table 1 indicates two instances, involving monitoring well MO-106, where 1 foot of drawdown was observed but the fault is a significant distance away (480') from the well. There are two historic drill holes that are 50 feet (TG8-18) and 160 feet (TG15-18) from the MO-106. Both historic drill holes (TG8-18 and TG15-18) are open holes in the same depth where MO-106 is screened. No discussion of the potential for TG8-18 and TG15-18 functioning as conduits for vertical communication was provided in Attachment MU1 2-1. It is expected that the role of historic drill holes be more thoroughly addressed in the context of the drawdown observed during the late 2008 pump tests.[11] (MLB, BRW)

LC ISR, LLC (3/10) - There are select locations where responses greater than one foot of drawdown have been observed at overlying or underlying monitor wells during the north and south hydrologic tests. LC ISR, LLC is continuing to investigate each of those locations to determine if the cause of hydraulic communication is likely to be a historic borehole or local thinning of a confining unit. To date, there is no direct evidence that an abandoned borehole has created an artificial pathway at the Lost Creek site. Two wells installed by LC ISR, LLC that were determined to have been damaged may have resulted in temporarily establishing hydraulic communication between the Production Zone and overlying or underlying units (e.g. Well MU-108). Those wells have been abandoned. LC ISR, LLC has also committed to attempt to locate and abandon all historic boreholes within MU1 (as well as the entire Permit Area). Many historic boreholes have already been abandoned.

Regardless of the cause of the hydraulic communication, LC ISR, LLC will conduct adequate monitoring during ISR operations to ensure that a vertical excursion into the overlying or underlying aquifers is promptly detected and that appropriate corrective actions are applied to prevent loss of fluids and impacts to overlying and underlying aquifers. Should an excursion be detected, LC ISR, LLC will engage in recovery and restoration operations, as required to return water quality in the affected aquifer to pre-mining conditions.

The 6th bullet under the Executive Summary of Attachment MU1 2-1 was revised to read:

"Responses in the overlying and underlying aquifers were minor and an order of magnitude lower than responses observed in the HJ Horizon. Additional evaluation as to the cause of the responses is being conducted. LC ISR is pursuing the proper

plugging and abandonment of historic wells to mitigate the potential for communication through improperly abandoned wells."

The following statement was also added as the 4th bullet in Section 8.0 of Attachment MU1 2-1:

"LC ISR is conducting a program of locating, plugging and abandonment of historic wells within MU1 to mitigate the potential for hydraulic communication through improperly abandoned wells."

LQD (4/10) – Response not acceptable - In the near future, if not already done, LC will be submitting an application for an aquifer exemption for the proposed production zone, the HJ horizon, within the permit area boundary. The exemption would allow for the temporary degradation of water quality within the production zone. Aquifers outside the exemption boundaries must be protected from diminution of water quality; more succinctly the measures LC will employ to prevent excursions from occurring in fulfillment of the requirements described in the LQD NonCoal R&R's, Chapter 11, Section 4 (a)(xx) must be described.

As expressed during meetings and through comments, containment can be achieved geologically and/or operationally. The intent of this comment was to clarify that complete geological containment does not appear possible, based upon the geological and hydrogeological investigations performed to date. At the time of the initial review, specific to achieving operational containment, the only information/statements provided by LC were (paraphrased) "through the use of engineering controls similar to those that have been used successfully by other ISR operations." In the reviewers' minds, this statement does not fulfill the requirements of the above cited regulation, which brings us to the present.

Thank you for providing a commitment to perform an additional evaluation of the potential causes for communication between the production and the over and under lying aquifers and initiating a program to locate and properly/completely abandon historic drill holes. As discussed in the reviewer's response to Comment #32, this effort to locate and properly/completely abandon historic drill holes should assist in reducing the degree of communication between the production and over and under lying aquifers.

Below are the 3 outstanding issues (labeled a – c) pertaining to this comment and comment #32 which has been combined with this comment. The bold faced print is the action/response expected for each issue (a – c).

a. Please refer to Mine Unit One Comments at the end of this response document.

b. Please refer to Mine Unit One Comments at the end of this response document.

c. There are still concerns with the role of the fault as well as potential thinning of the shale layer that acts as an aquitard; I.e. geologic conditions that cannot be mitigated must be dealt with from an operational standpoint. The engineering controls discussion in Attachment OP-2 does not provide the needed level of technical confidence that production fluids will be controlled, given the fault, questionable confining layers, and presence of historic drill holes (ones that are not located during LC's field inventory and abandonment effort).

The use of groundwater monitoring to detect and react to an excursion is not considered an engineering control to prevent an excursion. Rather the idea is to utilize the instantaneous flow and pressure data being collected and sent to a central control room to establish and maintain a balanced well field in real time. In addition, the water level data collected from interior monitoring and monitor ring wells must be used to make adjustments to production and injection flow rates as changes in water level should be detected in advance of changes in quality. Attachment OP-2 will need to provide a more in depth discussion regarding the control of fluids within the production zone. Please also see Comment #33. (BRW and MLB)

LC ISR, LLC (6/10) – LC ISR, LLC is expanding the information in Attachment OP-2. The results of this effort were not finalized at the time this response was submitted but will be provided as soon as possible. (See also Comments MU1-11, MU1-20b and 20e, and MU1-33.)

LQD (7/10) – Response partially acceptable. The reviewers await the submittal of a revised Attachment OP-2 before making a final determination. Please also see the response to Mine Unit 1 - Comment # 20e. **(BRW, MLB)**

MU1-27) LQD (2/10) - Figure MU1 1-2 Location of MU1 within Permit Areas. The footprint of Mine Unit 1 does not coincide with the footprint of Mine Unit 1 in the Operations Plan (Figure OP-2a) or Plate OP-1 Site Layout. It appears to now be part of what was originally described as Mine Units 1, 2, and 4. Figure OP-2a and Plate OP-1 (and any other effected Figure) will need to be updated accordingly. **(MM)**

LC ISR, LLC (3/10) - Pursuant to the discussions held during the February 25, 2010 meeting, a summary of the Project Development has been provided in the Adjudication volume. This summary explains how the project has evolved from discovery through permitting and how knowledge has changed through that process. The summary also describes how the areal extent of MU1 has moved from conceptual

in the original Permit Application to a refined area in the MU1 Data Package. Both Plate OP-1 and Figure OP-2a have been revised to show how the refined MU1 area overlays the conceptual mine unit area.

LQD (4/10) – Response partially acceptable. The project overview explains the evolution of the project and the reasons why the mine unit boundaries have changed. As agreed in the 2/25/10 meeting, LQD will not require that all maps in the permit be updated to reflect the revised mine unit boundary, however Chapter 11, section 4.(a)(ii) and section 5.(a)(i) clearly require mining and reclamation schedules, including maps that show the mining and reclamation sequence for the proposed wellfields. Accordingly, Plates OP-1 and Figs. OP-2a and RP-2 will all need to be revised to show the future mine units and their mining and reclamation sequence. (MM)

LC ISR, LLC (6/10) - LC ISR, LLC provided the information necessary to comply with the LQD NonCoal Rules in Chapter 11 Section 5(a)(i) in the original permit application. However, over the 2½ year review period subsequent to the original submission of the Permit to Mine Application, LC ISR, LLC has completed additional drilling and refined the conceptual boundary of the first mine unit. The revised boundary of the first mine unit has been included on Figure OP-2a and on Plate OP-1 per the request of LQD during the February 26, 2010 meeting.

In order to be consistent with past practice and to enable the permitting process to move forward, LC ISR, LLC proposes that future revisions to the mine unit boundaries be updated each year as part of the Annual Report. LC ISR, LLC does not wish its current and relevant application document to become mired in a protracted process of ongoing updates with newly acquired data. The well documented LQD requests for data obtained post-submittal have led to lengthy and unwarranted delays in this permitting process. (See also Comments D5 #13 and OP #11.)

LQD (7/10) – Item is unresolved. Comment stands as written. Chapter 11 Sections 4(a)(ii) and 5(a)(i) clearly require maps showing the proposed mine units and the sequence of mining and restoration. **(MM)**

MU1-33) *LQD (2/10) - Attachment MU1 2-1, Section 8.0, Summary and Conclusions, Bullet 3: In the third bullet in the list in this section, it is concluded that despite the hydraulic connectivity revealed during the North and South Pump tests conducted in late 2008, that engineering practices have been used at other ISR operations with similar subsurface conditions to prevent lixiviant from entering overlying and underlying aquifers.*

Merely stating that "engineering practices" will be employed to protect the overlying and underlying aquifer from lixiviant is not sufficient to demonstrate that the overlying and underlying zones will be protected. W.S. §35-11-406(m)(v) states that a permit shall not be denied except for...(one or more of)...the following reason(s):

If the proposed mining operation will cause pollution of any waters in violation of the laws of this state or of the federal government;

To achieve the end of demonstrating that the overlying and underlying aquifers at the Lost Creek project will be protected from pollution in the form of lixiviant during ISR mining operations, LC ISR must provide a detailed groundwater model showing exactly how lixiviant will be controlled by engineering practices. This discussion must be very specific and should include volumes anticipated to be lost to the upper and lower aquifers (based on the pump tests) and pumping rate calculations projected through the life of the operation including unexpected down time from pumping. That is, this discussion must include more than merely a commitment to maintain a "bleed" on the operation. (MLB)

LC ISR, LLC (3/10) - Per the discussion during the February 25, 2010 meeting between WDEQ-LQD and LC ISR, LLC, Attachment OP-2 (Summary of Engineering Controls) has been added to the main permit document. The focus is to identify: the specific practices (e.g., water level measurements); the operational limits (e.g., whether the rate of change in a parameter is of concern or an upper or lower limit); and the responses.

LQD (4/10) -. Response not acceptable. The addition of Attachment OP-2 (Summary of Engineering Controls) does not adequately addresses concerns regarding control of production fluids. Chapter 11, section 10(a)(iii) and 11(d) require that the applicant demonstrate that mining fluids can be controlled and that movement into unauthorized zones (excursions) will be prevented. Simply monitoring to detect excursions is not adequate to control or prevent the movement of fluids out of the ore zone. Lost Creek has the burden of showing how the operation will be conducted to prevent excursions. It appears that Lost Creek is relying on the monitoring wells outside of the production zone as their primary source of operational data for managing the wellfield. Chapter 11 section 14.(a)(iii)(A) requires semi-monthly monitoring of the fluid levels in the production zone, yet there is no discussion of this in Attachment OP-2. Given the marginal ore zone confinement at this site, it is appropriate for LC to directly monitor the water levels in the production zone. There are 13 existing MP wells in the production zone that would serve this purpose. It is requested that these wells be included in the monitoring program.

Attachment OP-2, Summary of Engineering Controls, does not provide sufficient detail as to how the wellfield operations will be managed to prevent excursions. Figures OP-A2-1 and OP-A2-2 show examples of "mounding" conditions in a monitor ring well. An approximate 6 foot rise in water levels is shown in a time plot chart and in a monitor ring "rose" chart. Such examples are helpful but much more discussion is needed. There is no discussion of how and when such charts would be prepared and evaluated. The monitor wells are only sampled on a twice-monthly basis. There is no discussion of what would be considered significant water level changes (hopefully something less than 6 feet) that would trigger operational adjustments. There is no discussion of what operational measures would be taken as a result of these examples.

The "rose" charts would be more useful if the charts were presented on a somewhat larger scaled map of the wellfield rather than a circle as shown on Fig. OP-A2-2. This would also allow for data for the interior wells to be plotted, giving a more complete picture of the water level status in and around the wellfield.

The use of observation wells and permanent piezometers has been mentioned but no specific plans are provided for their use in mine unit #1. Much more specificity is required to demonstrate how Lost Creek will control their wellfields, aside from maintaining a bleed. (MM, MLB)

LC ISR, LLC (6/10) - LC ISR, LLC is expanding the information in Attachment OP-2. The results of this effort were not finalized at the time this response was submitted but will be provided as soon as possible. (See also Comments MU1-11, MU1-20b and 20e, and MU1-24).

LQD (7/10) – This item is unresolved. LQD awaits the submittal of the revised Attachment OP-2 in order to adequately review LC's response to this comment. **(MLB, MM)**

MU1-36) LQD (7/10) – This item is resolved. The text in Section OP3.4 states that any new wells installed prior to a pump test will be sure to have MIT testing done prior to the test. The requested change to Attachment MU1 2-1 was not made to explain that the reason that the failure of Well MU-108 was discovered during the pump test is because the well had not undergone MIT Testing. The Division is willing to drop this portion of the comment since the well's failure is somewhat self explanatory and because well MU-108 was abandoned and a follow-up short term pump test was conducted to demonstrate its proper abandonment. **(AB)**

*****This concludes the comments on the MINE UNIT 1 APPLICATION, relevant to the Main Permit Document *****

FEBRUARY 2010 - NEW INFORMATION PROVIDED BY LC ISR, LLC

B) LQD (7/10) – This item is resolved. The reference at the end of the second to the last paragraph on Page 5 of Attachment OP-6 has been changed to Section 2.2.1.3 as requested. **(MLB for SP)**

*****This concludes the comments on NEW INFORMATION PROVIDED BY LC ISR, LLC in February 2010*****

MARCH 2010 - NEW LQD COMMENTS ON THE MAIN PERMIT DOCUMENT

NC44) LQD (7/10) – This item is resolved. The requested changes have been made to the title of Table OP-A6. **(MLB for SP)**

*****This concludes the comments on the MARCH 2010 - NEW LQD COMMENTS ON THE MAIN PERMIT DOCUMENT*****

APRIL 2010 - NEW LQD COMMENT, ON THE MINE UNIT 1 APPLICATION, RELEVANT TO THE MAIN PERMIT DOCUMENT

MU1-NC-1) *LQD (4/10) - Figure OP-A2-3, Schematic of Header House Instrumentation, does not show any control valves on any of the individual wells. The only control valve that is shown is on the injection header. Is this correct? Section OP 3.6.1 in the main permit says that individual well flows will be monitored and adjusted. Please clarify the schematic. (MM)*

LC ISR, LLC (6/10) - The purpose of Figure OP-A2-3 is to detail the instrumentation only. It does not detail or show the other manual control systems within the header houses and pattern areas. In addition to the instrumentation provided in Figure OP-A2-3, the following manual equipment is planned:

Production Meter Run Equipment:
- Check valve
- Block valve
- Control valve
- Pressure Gauge
- Sample Port

Injection Meter Run Equipment:
- Block valve
- Control valve
- Pressure Gauge

Section OP 3.6.1 states that:
"The production and injection wells within each header house will be monitored individually or by production or injection headers, which are groups of production or injection wells piped together, depending on the monitoring parameter. The instrumentation will allow: monitoring of the header house solution balance; monitoring manifold pressures; and shutdown of flows in the event of a piping failure. Other instrumentation in the header house will include automatic oxygen shut-off and leak detection."
"All production and injection headers will have pressure gauges; and the pressures will be recorded daily."

In addition, 3.6.1.1 provides the following:
3) Control and Shutdown
b) Production Systems: The main valve will be capable of being shut based on operating conditions, i.e. sump overflow, ruptured flowline, etc. 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 now 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.

The header houses are designed to provide continuous flow data with remote shut down of production pumps and of the injection header through the main injection controlled valve.

LQD (7/10) – Item unresolved. Attachment OP-2 is entitled: "Summary of Engineering Controls". The intent of this section of the permit is to clearly describe how Lost Creek will control their fluids. It would be helpful if Figure OP-A2-3 could be revised to show all of the various control systems, including manual controls. This figure is an important part of the overall picture of engineering controls. It really would behoove Lost Creek to enhance this figure to help in this demonstration. If Lost Creek is worried about being held to specific details, then perhaps a note could be added to the figure stating that minor changes may be made during installation. **(MM)**

*****This concludes comments on the APRIL 2010 - New LQD Comment, ON THE MINE UNIT 1 APPLICATION, RELEVANT TO THE MAIN PERMIT DOCUMENT*****

RECLAMATION PLAN

JANUARY 2009 - LQD COMMENTS ON THE MAIN PERMIT DOCUMENT

RP-5) *LQD (1/09) - 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)**

LC ISR, LLC (10/09) -

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.

LQD (11/09) - Response not acceptable. While the reviewer admits there will generally be no measureable impacts to the surface water drainage system as described in the text above. However, the reviewer could not find the summary discussion provided as a response within the application text. The permanent postmine impoundment at the Sweetwater Mill, whose source of supply is the Battle Springs aquifer, is not that far away from the proposed operation. There is no mention as to what impacts, if any, the project drawdown may have on this facility.

Regarding ground water, LC has provided some information in response to Comment OP #105. The majority of the response provided information could not be found in the application text. As requested, please provide maps that illustrate projected areal extent of

five or more feet of drawdown. Please provide an estimated recovery time and include the methodology used to make the calculation. While the reviewer understands that wells within one-half mile of the projected disturbance will be plugged and abandoned, there are several wells, some of which are assumed to serve as stock water supply, that are outside one-half mile radius, but easily within two miles of the permit area boundary. No assessment has been provided regarding the potential impacts to these wells, nor a commitment to replace if the well is impacted. Please make the appropriate revisions to the application text and also see the response to Comment OP #105. (BRW)

LC ISR, LLC (2/10) -

Surface Water -
Section OP 2.11 was renamed and the discussion from the above response on the limited operational impacts to surface water has been incorporated into Section OP 2.11.1. The discussion from the above response on the limited reclamation impacts to surface water was incorporated into Section RP 4.5.2.

Ground Water
The discussion in Section OP 3.6.3.3 was updated in response to the above comment.

Ground water recovery rates are discussed in a new Section RP 4.6.

With respect to the BLM wells, please see Comment V2, D6#30, which was resolved as of December 2009 (letter of December 21, 2009 from A. Boyle (WDEQ-LQD) to J. Cash (LC ISR, LLC). As part of that resolution, monitoring of the wells was added to Attachment OP-8 and a replacement commitment was added to the last paragraph of Section D6.3. A cross-reference to that commitment has been added in Section 2.11.2.2.

LQD (3/10) – Response not acceptable. Thank you for adding a section to address Cumulative Hydrologic Impacts to mining. There are some incorrect references on page OP-57; the references should be Section D6.3 and Plate D6-6A rather than Section OP 6.3 and Plate OP-6A. Two approaches are presented for analyzing drawdown within the production zone (HJ Sand): (1) Darcy Strip, and (2) Theis Analysis and both approaches have their limitations. The reviewer performed independent calculations using the Theis approach and produced estimates similar to those presented in the text.

The reviewer understands that the aquifer should be dewatered by the proposed operation, rather that there should only be a decline in head. Therefore, in theory, no impact should occur to surrounding wells. Because the formation in which the wells in the surrounding area is unknown, not to mention pump elevation and capability, there could be an impact to well production. Figure OP-10B is not adequate to represent areal extent of potential impacts as the location of the surrounding water resources is not illustrated. Please provide a map similar to Plate D6-1B that illustrates areal extent of drawdown as it relates to adjacent water resources.

The reviewer admits the areal extent of the estimated / measured five-foot drawdown associated with mining activity will be limited. A much greater impact will be associated with the water supply needs for various operations at the mine. The predictions provided use the estimated transmissivity and storativity values for HJ sand as a means of predicting impact. The reviewer questions why this was done when transmissivity estimates for the FG sand (e.g., approximately 300 gpd/ft) and KM sand (e.g., approximately 550 gpd/ft) are available. Based on actual data, the estimates for areal extent of drawdown are less than predicted. Please revise the text and estimates in Section 3.6.3.4 to reflect, to the degree possible, the available aquifer test analysis results. (BRW)

LC ISR, LLC (6/10) - The response has been broken down into its major components, (numbered (a), (b), and (c)) to allow for more concise answers. (See also Comments OP#105 and OP #114.).

a. LQD (3/10) - 1st paragraph - The incorrect references have been corrected.

LQD (7/10) – This item is resolved. The necessary corrections have been made. (MLB for BRW)

b. LQD (3/10) - 2nd paragraph - As discussed in Section D6.3 (Groundwater Use), the majority of the wells within three miles of the Lost Creek Permit Area are associated with the Kennecott Sweetwater Mine. The four supply wells of concern with respect to potential impacts are the 'BLM wells', but two of these wells are shallower than the HJ Horizon and were not in working order when last checked. Another BLM well, that was recently repaired, was converted from a very deep drill hole, and the fourth well is completed just above the HJ Horizon. With respect to mitigation measures, as discussed in Section OP 2.11.2.2, LC ISR, LLC has committed to sampling of these wells and has committed to water level measurements, if the wellhead design allows access. In addition, LC ISR, LLC has committed to working with BLM to ensure these water supplies are not interrupted due to the Lost Creek Project Activities. Therefore, it is not clear what benefit would be gained from a different map.

LQD (7/10) – Response is combined with the response to item c below.

c. LQD (3/10) - 3rd paragraph - The transmissivity used for the drawdown assessment for the water supply wells was the most conservative of the available values, and it was easier to run all the calculations with the same number. As noted in the above response, LC ISR, LLC has committed to sampling the water supply wells of concern outside the permit boundary and working with BLM to ensure the water supplies from those wells are not interrupted. Therefore, it is not clear what benefit would be gained from running the calculations with less conservative numbers.

LQD (7/10) – Response not acceptable. A telephone conversation was held (between LQD and Petrotek personnel) regarding this comment. LC's response to this comment is

contrary to what transpired during that telephone conversation. Some time ago the reviewer agreed not to require LC to go through an extended modeling exercise using a two-dimensional ground water model such as Visual Modflow. Rather, LC could take a much simpler approach to prediction of ground water impacts using Big-Well Theory (Theis analysis). The reviewer recognized and conceded that predictions would be conservative because there is no accounting for recharge.

The map provided, Figure OP-10b, is **not** acceptable as it represents nothing more than a plane floating in space. In other words, there is no attachment to the Public Land Survey System or if the grid provided actually represents a known and accepted coordinate system. There is no identification of other water resources in the area that maybe potentially impacted.

Specific to comments made regarding sands other than production zone and the potential impacts of the water supply wells; again the response is **not** acceptable. Sometime ago, the reviewer agreed not to push for performing multi-well test on those aquifers above and below the production horizon, the purpose of which was to completely characterize each of these aquifers. Estimates of transmissivity values for both the FG and KM horizons **are available** from earlier single well pump tests completed by Hydro Engineering, yet were not even mentioned in the text. LC's response was "it was easier to run all the calculations with the same number". This is an unconvincing line of reasoning for not performing a relatively simple calculation. While the reviewer acknowledges that the results produced by the generic calculations are more conservative, some mention should be made concerning actual data. Please see the original comment (LQD 3/10) and make the appropriate revisions/updates to the text and mapping. **(BRW, MLB)**

RP-14) LQD (7/10) – This item is resolved. The revision of Page 16 of 37 in Table RP-4 (Section B – Plant Building Demolition and Disposal – Worksheet 3) and resulting increase in the bond calculation addresses this reviewer's concerns. **(MM)**

RP-25) *LQD (1/09) - Section RP 5.0 Financial Assurance. Paragraph one. Please add the cost of groundwater monitoring and analysis to the list of costs. (AB)*

LC ISR, LLC (10/09) - 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.

LQD (11/09) - Response not acceptable. Aside from the monitoring during the stability period mentioned in the comment response, there does not appear to be any sampling and analysis cost included during the active restoration phase of the operation. (MM)

LC ISR, LLC (2/10) - Worksheet 1 of the bond calculation includes the following line items:

Groundwater Sweep			
Analysis ($/KGals)	$0.060	On site laboratory analysis	Unit Rate
Reverse Osmosis			
Sampling & Analysis ($/KGals)	$0.060	Estimate	Unit Rate

LQD (3/10) Response not acceptable. Please provide an itemized cost estimate for all groundwater analytical costs associated with the site reclamation. Including an accounting of the various types and number of wells that will be sampled, their respective sampling frequency, number of sampling events and analytical parameters. (MM)

LC ISR, LLC (6/10) - A detailed list of the sampling costs for each phase of restoration was performed at the WDEQ's request. That list has been incorporated into the Surety Estimate in Table RP-5.

LQD (7/10) – This item is unresolved. Section RP 5.0 still needs to be revised to address the requirements and costs associated with groundwater monitoring of the site from the potential timeframe of forfeiture at full production, to full site restoration. **(AB)**

Additionally, Table RP-5 (page 1 of 11) details the analytical costs associated with site reclamation, however the listing does not appear to be complete. Some discussion of time frames is needed to explain the discrepancies between this table and the reclamation timeline shown in Figure RP-4. The list of wells does not appear to be complete; for example, regional wells and public wells are not included. Sampling during the recirculation and stability phases is not included. Please expand on this table to cover all groundwater sampling and analysis for the entire reclamation period. Also, please clarify where these costs appear in Table RP-4. **(MM)**

RP-26) *LQD (1/09) - Table RP-4 Reclamation / Restoration Bond Estimate. Groundwater sampling and analysis could be conducted for many years, and should not be handled as an 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 on real costs.* **(AB)**

LC ISR, LLC (10/09) - Please see response to previous comment.

LQD (11/09) - Response not acceptable. See comment no. 25 above. (MM)

LC ISR, LLC (2/10) - Please see response to previous comment.

LQD (3/10) Response not acceptable. See comment no. 25 above. (MM)

LC ISR, LLC (6/10) - Please see response to previous comment.

LQD (7/10) – This item is unresolved. Groundwater monitoring and analysis has reportedly been added to Table RP-5, the Reclamation Cost Estimate. This Table only assumes the monitoring well ring wells, deep disposal well, storage pond, and four storage pond wells will be monitored for 0.3 years, or four months. There is no continued monitoring of overlying, underlying or production aquifer wells. Groundwater monitoring will be required from the time the bond would be forfeited to the time that the site has ended stability monitoring and is approved for full restoration. Please add the additional wells, reasonable maintenance of the wells and pumps, MIT Testing, the labor cost associated with sampling and maintenance of the wells. The time required to release the site from full operations mode to the end of stability monitoring should be outlined. Also, refer to response in RP-25. **(AB, MM)**

RP-27) LQD (7/10) – This item is resolved. The addition of text to Table RP-3 and in Section RP 4.5.4 adequately addressed this reviewer's concerns. **(MM)**

RP-28) LQD (7/10) – **This item is resolved**. Please see the response to Operations Plan Comment #19. **(BRW)**

*****This concludes the comments on the RECLAMATION PLAN in the MAIN Permit Document *****.

FEBRUARY 2010 - LQD COMMENTS, ON THE MINE UNIT 1 APPLICATION, RELEVANT TO THE MAIN PERMIT DOCUMENT

MU1-7) LQD (7/10) –Item will be dropped as it is being handled under Comment MU1-25b. (BRW)

MU1-25) *LQD (2/10) - Section 6.1.1: Please provide an updated pore volume calculation specific to Mine Unit #1, including an evaluation of all of the inputs and assumptions used in the calculation, based on currently available information. Particular attention should be focused on the thickness and spatial distribution of the ore horizons and calculation of an appropriate flare factor. The MU1 PV calculation in section 6.1.1 assumes an average ore zone thickness of 12 feet. This does not appear to be an appropriate value given that the average screened interval in the 13 ore zone monitor wells (MP wells, which will be utilized as injection and production wells) is 17 feet. It is also noted that section OP 1.2 in the mine permit document (bottom of page OP-3) states that the MHJ mineralized zone is about 30 ft. thick. Data should be provided to define the ore zone thickness in mine unit #1. Additionally, it should be*

noted that the mine-unit-specific water balance and mining/restoration schedule may be affected by a change in pore volume.[22,28] *(MM)*

LC ISR, LLC (3/10) -The surety estimate submitted to WDEQ-LQD in February 2010 (Table RP-4) totaled $7,532,329 and included the most current estimate of the number of MU1 patterns and size of that pattern area at that time. It was also based on complete installation of MU1 within the first year. Table RP-4 of the main permit document and Section OP 6.1.1 have been updated to reflect the most recent information. As outlined below under the discussion of 'Area', the number of patterns has changed, and the approach to determining the size of the pattern area has also been changed to better account for stacked ore zones. In addition, it has been determined that only half of MU1 could be installed within the first year.

Area: is the area of the patterns projected to the ground surface. It is used in the pore volume calculations, but because of the presence of 'stacked' ore, it must be adjusted in those calculations to account for pattern overlap. The surety estimate was originally based on 180 patterns at 9,000 sq. ft. per pattern or 1,620,000 sq. ft. total. However, the pattern overlap within the HJ Sand was not taken into account in this approach. The updated estimate includes 241 patterns, and the actual surface area is 1,611,720 sq. ft. However, to account for pattern overlap in the pore volume calculations, it is has been assumed that the area is larger, i.e., the area of each pattern is taken into account in the pore volume calculation, even if it is stacked with another pattern. With this approach, the total MU1 total area has been revised to 2,115,594 sq. ft.. The surety estimate and schedule will be modified on an annual basis, and the estimated areal extent will be updated as necessary.

Thickness: is estimated to be 12 feet based on preliminary estimates for pattern completions. The average completion thickness for the MP monitor wells in MU1 is 17 feet. The MP monitor wells completions are considered 'gross' completions and are designed to capture all the ore in the immediate production horizon. The MP monitor wells also tend to be in the thickest part of the ore to insure water quality samples indicative of the ore zone. Therefore, these monitor well completion intervals are expected to be thicker than many of the actual production and injection well completions because many of the production and injection wells are located on the 'fringes' of the ore where the ore thickness is less. Because of the range of ore thicknesses, LC ISR, LLC maintains that the original estimate of 12 feet 'average' completion thickness is valid. Further, the surety estimate will be modified on an annual basis and the estimated ore thickness will be replaced with actual ore thickness as the production and injection wells are installed.

'Stacked Ore' in MU1: The HJ Sand is the production zone of interest in MU1. Production is planned from four horizons (UHJ, MHJ1, MHJ2 and LHJ) within the Sand. Production patterns will be completed with separate wells in each of these horizons and produced simultaneously regardless of whether they overlie each other or not. The surety estimate accounts for horizontal flare equal to 20% of each pattern's area and vertical flare equal to 20% of each pattern's thickness. This is regardless of

continuity with other patterns either vertically or horizontally. Therefore, every pattern is fully accounted for in the surety estimate.

LQD (4/10) – Response partially acceptable. With these responses the stacked ore zones have been properly accounted for (i.e. the area of each ore zone has been summed, instead of simply looking at a vertical projection). This has increased the mine unit pore volume by 31%. Please incorporate the above discussion into section 6.1.1. Also, as noted in the original comment, please address what impact this may have on the water balance and the mine/reclamation schedule.

A revised bond estimate (Table RP-4) was provided, apparently to account for the revised mine unit development schedule and revised pore volume calculation. Review of the bond calculation will be deferred to the main permit document since there are a number of outstanding comments related to the bond calculation contained in LQD's review dated 3/26/10. (MM)

LC ISR, LLC (6/10) - The response has been separated into MU1-25a and MU1-25b:

MU1-25a) - The requested information has been incorporated into Section 6.1.1 of the Mine Unit 1 application. All of the responses specific to MU1 and the related changes to the MU1 application will be submitted in the near future.

LQD (7/10) – This remains unresolved pending the receipt of revision to the MU1 package. **(MM)**

MU1-25b) - The Project Development, Production and Restoration Schedule (Figure OP-4a) allows for the 31% increase in the MU1 pore volume in Figure OP-4a by advancing groundwater sweep at a higher rate in the first two months before reverse osmosis begins. MU1 allows 12 months for groundwater sweep and 18 months for reverse osmosis. The other conceptual mine units (MU2 – MU6) allow for 12.5 months for groundwater sweep and 14 months for reverse osmosis. The current estimated number of patterns in MU1 is 241 at an average of 8778 square feet per pattern. The other conceptual mine units have 180 patterns at 9000 square feet each.

PORE VOLUME CALCULATIONS:

PV = Area x Thickness x Horizontal Flare x Vertical Flare x Porosity x Conversion Factor

MU1 PV = (2,115,594 ft^2)(12 ft)(1.2)(1.2)(0.25)(7.48 gal/ft^3) = 68,362,458 gallons

Conceptual MU PV = (1,620,000 ft^2)(12 ft)(1.2)(1.2)(0.25)(7.48 gal/ft^3) = 52,348,032 gallons

The calculations below show that if MU1 groundwater sweep is performed at a rate of 120 gpm for the two months before reverse osmosis starts and at 30 gpm for the remaining 10 months, the total 0.3 pore volumes of sweep can be completed in 12 months.

MINE UNIT 1 RESTORATION:

Required MU1 Groundwater Sweep (MU1 GWS) =
0.3 PV = 0.3 x 68,362,458 gallons = 20,508,737 gallons

Calculating the GWS at 120 gpm for two months and 30 gpm for 10 months yields:

MU1 GWS = (2 mo)(43,800 min/mo)(120 gal/min) +
(10 mo)(43,800 min/mo)(30 gal/min)
MU1 GWS = 23,652,000 gallons which exceeds the total required GWS.

Required MU1 Reverse Osmosis (MU1 RO) =
6.0 PV = 6.0 x 68,362,458 gallons = 410,174,748 gallons

Calculating the RO at 570 gpm for 18 months yields:

MU1 RO = (18 months)(43,800 minutes/month)(570 gallons/minute)
MU1 RO = 449,388,000 gallons which exceeds the total required RO.

CONCEPTUAL MINE UNIT (MU2-MU6) RESTORATION:

Required Conceptual MU Groundwater Sweep (MUC GWS) =
0.3 PV = 0.3 x 52,348,032 gallons = 15,704,410 gallons

Calculating the MUC GWS at 30 gpm:

MUC GWS = (12.5 months)(43,800 minutes/month)(30 gallons/minute)
MUC GWS = 16,425,000 gallons which exceeds the total required MUC GWS.

Required MU1 Reverse Osmosis (MU1 RO) =
6.0 PV = 6.0 x 52,348,032 gallons = 314,088,192 gallons

Calculating the RO at 570 gpm for 14 months yields:

MUC RO = (14 months)(43,800 minutes/month)(570 gallons/minute)

MUC RO = 349,524,000 gallons which exceeds the total required MUC RO.

LQD (7/10) – Response not adequate. There are discrepancies in the reclamation timeline between Tables RP-4 and RP-5 and Figure RP-4. Please rectify these discrepancies. **(MM)**

*****This concludes comments on the RECLAMATION Plan from the FEBRUARY 2010 LQD comments, On THE MINE UNIT 1 APPLICATION, relevant to the Main Permit Document*****

MARCH 2010 - NEW LQD COMMENTS ON THE MAIN PERMIT DOCUMENT

NC45) a. **LQD (7/10) – This item is resolved. (MM)**

b. **LQD (7/10) – Response is accepted.** Lost Creek has estimated the cost to remove 2.2 acres of pond liner at $162. This is absurd, however the reviewer is willing to drop the comment because it is relatively insignificant in the big picture. **(MM)**

c. **LQD (7/10) – This item is resolved. (MM)**

d. **LQD (7/10) – This item is resolved. (MM)**

e. **LQD (7/10) – This item is resolved. (MM)**

f. **LQD (7/10) – This item is resolved. (MM)**

g. **LQD (7/10) – This item is resolved. (MM)**

h. **LQD (7/10) – This item is resolved. (MM)**

i. **LQD (7/10) – This item is resolved. (MM)**

*****This concludes comments on the Reclamation Plan from the **MARCH 2010** - NEW LQD COMMENTS ON THE MAIN PERMIT DOCUMENT*****

New LQD comments on the OPERATIONS PLAN – July 2010

The June 7, 2010 Inspection conducted at the 334DN site revealed three main areas of concern at the Lost Creek site; specifically, proper topsoil protection/handling at drill sites and high-traffic areas, proper and consistent well head protection and construction specifications, and standardized protocol for the removal, handling and disposal of petroleum contaminated soil

(PCS).

In the aftermath of the June 7, 2010 Inspection, which resulted in the issuance of a Notice of Violation (NOV), Docket Number 4697-10, LQD staff have identified a need for the Lost Creek project to provide greater specificity regarding LC's approach to addressing the three aforementioned topics. The most logical vehicle for LC to provide the specificity needed is via the Main Permit Document. To that end, LQD has the following five new comments (NC 45 – NC 49) on the Operations Plan.

NC 46) Section OP 3.3, "Well Completion", as well as Figures OP 8a, 8b, and 8c must include a discussion and depiction of standard specifications for the various types of well heads. The discussion/designs must include 1) minimum height of the well head above the ground surface, 2) a concrete apron on monitor wells, 3) secure covers to prevent the introduction of foreign materials into the wells, 4) locking caps. This last commitment is imperative for when the site is vacated and unsecured, as it was on several occasions during the 2010 sage grouse restriction time period (March 1 through July 15). An exception can be made that wells don't have to remain locked if they are within the immediate view of mine personnel and when those personnel are on site. An additional section must be added to Section OP 3.3 addressing the surface completion of wells in drainages. Two monitor ring wells (M-106 and M-111) are located in ephemeral drainages. These wells must be equipped with extra protection from flooding (in the event of a flash flood). An oversized surface casing such as a culvert can be installed around the well head for this type of protection. However, the wells must also be secured in/by a concrete apron. **(MLB, MM)**

NC 47) Section OP 2.5.1, "Short term Topsoil Protection", and Section OP 2.12, "Exploration and Delineation Drilling" must include greater detail on topsoil salvage and handling procedures for drill sites to prevent covering native soils and vegetation with overburden. Currently, Section OP 2.5.1 addresses this topic but the bullet list is lacking a commitment to strip topsoil from the entire work area (that is, the 33' x 33' area) prior to drilling. The current commitment only mentions the stripping of topsoil from the mud pit's footprint. This practice has resulted in overburden from the mud pit being spread across the drill site atop native vegetation and soils, which is unacceptable. To remedy this problem, a commitment to strip topsoil from the footprint of the overburden pile as well as the area where overburden will be spread (which is routinely greater than the footprint of the mud pit) must be included.

Additionally, Section OP 2.12.1 should include a reference to the topsoil handling protocol outlined in Section OP 2.5.1. Currently the text in Section OP 2.12.1, in the second paragraph, it reads "While digging mud-pits, constructing drill pads, or any other excavation, topsoil will be preserved using the techniques described in the Permit to Mine Application." The words "Permit to Mine Application" must be changed to read "Section OP 2.5.1 of this Permit".

Lastly, the statement in Section OP 2.12.1 that reads "Significant disturbance will be limited to

the digging of a mud pit for each drill hole" must be removed. Reality (June 7, 2010 Inspection Report) has shown that the significant disturbance associated with drilling extends far beyond the mud pit. **(MLB, MM)**

NC 48) In the interest of minimizing disturbances in drainages at the Lost Creek site, Sections OP 2.12.1, OP 2.5.1, and (perhaps) OP 3.3 should include a commitment to avoid the installation of wells in drainages. **(MLB)**

NC 49) The handling and disposal of petroleum contaminated soils (PCS) must be addressed in Section OP 2.9, "Prevention and Remediation of Accidental Releases". If LC intends to dispose of PCS rather than treat it on site via a landfarm, this must be stated. Included in this discussion must be a commitment to provide documentation of PCS disposal to LQD via the Annual Report. For excavations, a section must be added to describe the sampling and success criteria (concentration that constitute "clean" soil) and a commitment to report that information to LQD in the Annual Report. **(MLB)**

NC 50) In order to properly address the need to minimize travel corridors, text must be changed in Sections OP 2.12.1 and 2.12.2 to state that access routes **will** be delineated with markers or posts. Also, in Section OP 2.12.1 at the end of the third paragraph, the last sentence in that paragraph reads "These roads will be reclaimed using the methods described in the Permit to Mine Application…". The words "Permit to Mine Application" must be changed to reference the appropriate portion of the reclamation plan, likely Section RP 4.5. **(MLB, MM)**

Summary:

Please respond to the above comments, where appropriate. Once the application is found to be technically complete and approval / concurrence of technical adequacy from the Bureau of Land Management is obtained, second public notice will be authorized (in writing from WDEQ Land Quality Division). Should you have any questions concerning this memorandum, please contact the individual reviewer(s) at the WDEQ-LQD District 2 Office in Lander (307-332-3047).

**********END OF MEMORANDUM**********

Summary of the status of comments addressed in the 4th round technical review of the *Main Permit Document Lost Creek ISR Permit Application - TFN 4 6/268

July 23, 2010

Comment ID	Comment Status
Appendix D5-4b, c	Unresolved
Appendix D5-12	Resolved
Appendix D5-13	Resolved
Appendix D6-14e	Resolved
Appendix D6-14i	Unresolved
Appendix D6-16	Unresolved
MU1-4	Unresolved
MU1-5	Resolved
MU1-6	Unresolved
MU1-7	Dropped, handled under MU1-25b
MU1-8	Resolved
MU1-11	Unresolved
MU1-13	Resolved
MU1-20b, e	Partially Resolved, awaiting Attachment OP-2
MU1-22	Unresolved
MU1-24	Partially Resolved, awaiting Attachment OP-2
MU1-25a	Unresolved
MU1-25b	Unresolved
MU1-27	Unresolved
MU1-33	Unresolved
MU1-36	Resolved
MU1-NC-1	Unresolved
OP-9	Unresolved
OP-11	Resolved
OP-19	Resolved
OP-23	Resolved
OP-29	Resolved
OP-36	Unresolved
OP-44	Unresolved
OP-48	Unresolved
OP-65	Resolved
OP-72	Unresolved
OP-74	Resolved
OP-77	Unresolved
OP-84	Unresolved
OP-89	Resolved
OP-90	Unresolved
OP-93	Resolved
OP-97	Resolved
OP-99	Partially Resolved, awaiting Attachment OP-2
OP-105	Unresolved

Summary of the status of comments addressed in the 4th round technical review of the *Main Permit Document Lost Creek ISR Permit Application - TFN 4 6/268 July 23, 2010	
Comment ID	**Comment Status**
OP-112	Unresolved
OP-114	Unresolved
OP-118	Unresolved
OP-119	Unresolved
NC-10	Resolved
NC-40	Resolved
NC-44	Resolved
NC-45a-i	Resolved
NC-46	New Comment this round
NC-47	New Comment this round
NC-48	New Comment this round
NC-49	New Comment this round
NC-50	New Comment this round
New Information Feb 2010, Item B	Resolved
RP-5a	Resolved
RP-b,c	Unresolved
RP-14	Resolved
RP-25	Unresolved
RP-26	Unresolved
RP-27	Resolved
RP-28	Resolved