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

January 6, 2010

Mr. Michael Thomas
Uranerz Energy Corporation
1701 East "E" Street
P.O. Box 50850
Casper, WY 82605-0850

RE: Hank - Nichols Ranch In Situ Recovery Mining Permit Application, TFN 4 2/284

Dear Mr. Thomas:

Enclosed is a consolidated review memo containing comments from the Land Quality Division staff's review of the above application. As noted in the memo, these reviews found that the application remains technically incomplete as per W. S. § 35-11-406(h). However, as obvious by the smaller size of the memo, we are making considerable progress.

If you have any questions concerning any comment in this memo, please feel free to contact me or the author of the comment in question.

A digital copy of this memo will be emailed to you to aid in your reply.

Sincerely,

Glenn Mooney
Senior Geologist

\gm

Enclosure

Cc: Cheyenne File w/enc.
NRC-MD w/enc.

Urancrv3cvlet.10gm

NMSS01

MJR 1/19/10

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AIR, LAND AND WATER DIVISIONS
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MEMORANDUM

To: File, Uranerz Energy Corporation's Nichols Ranch ISL Project, TFN 4 2/284

From: Glenn Mooney, Senior Geologist GM

Date: January 6, 2010

Subject: Third Consolidated Technical Reviews

Introduction

On December 7, 2007, Uranerz Energy submitted an application under cover of Mike Thomas' letter of November 30, 2007, to conduct in situ recovery uranium mining. The proposed permit area covers 3,370.53 acres in Campbell and Johnson counties. Completeness and some technical comments were sent February 11, 2008, under cover of my letter of the same date.

The application was declared Complete as per W.S. § 35-11-406(e) via my letter of August 13, 2008, to Michael Thomas of Uranerz.

A response package was received June 17, 2008, under cover of Mike Thomas' letter of June 16, 2008. Additional material was submitted under Mike Thomas' letter of January 23, 2009. Comments on this material were submitted to Uranerz under cover of my consolidated review memo dated April 9, 2009. A response was received November 9, 2009, under cover of Mike Thomas' letter dated October 29, 2009.

Reviews of this application were carried out by Larry Barbula, Deanna Hill, Glenn Mooney, Stacy Page, David Schellinger, Jon Sweet and Mark Taylor. Their initials follow each of their comments.

These reviews were carried out for technical adequacy as per W.S. § 35-11-406(h). All previous comments not requiring responses have been eliminated.

REVIEW

Index of Changes

A detailed Index of Changes was provided with the November submittal. For the most part it accurately listed the changes made with the November submittal. A couple of problems were noted and Mike Thomas provided a revised Index of Changes Pages 8, 9, 10, 15 of 21 on November 30. (GM)

MJR 1/11/10

Continuity

Volume V, Reclamation Plan, Section 2.2, Page RP-12

The last sentence on this page cuts off mid-sentence and is not continued on the following Page RP-13. The Index of Changes does not show a revised Page RP-13 was submitted.

Please correct. (GM)

Completeness

The application was declared Complete on August 13, 2008. The following items were originally Completeness concerns but are now considered technical comments.

Adjudication

7. Appendix E

   Uranerz has committed to providing updated Appendix E maps at a future date just prior to going to public notice. This will allow depiction on the Appendix E map(s) of the latest coal bed methane-related wells and structures now under construction.

   This is acceptable; no response is necessary at this time.

Technical Review

Adjudication

24. Reclamation Performance Bond

   An acceptable bonding instrument must be submitted prior to permit approval. (DH)

Appendix D-1, Land Use

26. Land Use, Map D1-3

   After review of responses, I have no further issues with the application. (DS)

Appendix D-7, Soils

51. Section D7.3.2, Soil Mapping Unit Interpretation, Page D7-4

The applicant has submitted new text. The response is acceptable. (JS)

52. Section D7.1.0, Introduction, Page D7-1

The applicant has submitted new maps. The response is acceptable. (JS)

Appendix D-8, Vegetation

57. Addendum D8D, Correspondence with the U.S. Fish and Wildlife Service..., Pages D8D-11 through D8D-30

After review of responses, I have no further issues with the application. (DS)

Mine Plan

65. Section 3.11, Access Roads, Page MP-30

The clarification satisfies my concern. The response is acceptable. (JS)

67. Section 3.3. Construction Considerations and Topsoil Handling

Topsoil will be salvaged construction staging areas and drilling staging areas as requested.

This is acceptable; no response is necessary. (GM)

70. Figure 3-13, Nichols Ranch Unit Flow Diagram

A revised diagram, Figure 3-13, Proposed Nichols Ranch Process Flow Diagram Details, was supplied which shows the location of the reverse osmosis units.

This is acceptable; no response is necessary. (GM)

71. Figure 3-14, Hank Unit Flow Diagram

A revised diagram, Figure 3-14, Hank Unit Process Flow Diagram Details, was submitted which shows the location of the reverse osmosis units.

This is acceptable; no response is necessary. (GM)

Reclamation Plan

84. Section 3.3, Topsoil Handling and Replacement, Page RP-16.

The response is acceptable. The seeding rate has been revised to 14 pounds. (SP)

Comments – Glenn Mooney March 31, 2009 Review

Adjudication

1-G. Appendix C – Legal Description of Proposed Permit Area

a. The description for this section was replaced by a listing of the lots involved.

This is acceptable; no response is required. (GM)

b. The acreages for Section 31 now add up correctly, according to the acreages listed on the BLM Master Title Plat. However, there is a typographical error on Page C-4 for Sections 31 and Section 5. Lots 13-20 which belong in Section 31 appear on the same line as the tracts belonging to Section 5.

Please correct. (GM)

c. Uranerz is correct in that Lot 10 on Page A-9 is described correctly. However, on Page C-15, Lot 10 is described as the SW¼NW¼ when it should be the SE¼NW¼ of Section 31. A replacement Page C-14 was supplied but a corrected Page C-15 is needed instead.

Please correct. (GM)

d. Section C-2, Right to Mine and Section C-3, No Right to Mine Claimed

Uranerz has explained its reasons for listing certain lots in Section 31 in both the sections of Appendix C for right-to-mine and no-right-to-mine are that Uranerz's mining claims do not fully cover all portions of these lots. If that is the case, Uranerz should list the names of the claims which it holds and forego the less precise listings by lots.

Failure to list a precise description of the lands to be mined leaves this application extremely vulnerable to objection of the permit approval by the other mineral owners.

Please correct. (GM)

e. Section C-3, No Right to Mine Claimed

i. The NW¼SE¼ of Section 7, T.43., R.75W is listed on Page C-16 of this section, but the southern-most end of the Hank well field is depicted on Figure 1-8 as located in this tract. Uranerz stated that they are aware that they have no right-to-mine for this tract. They have modified Figure 1-8 by moving the monitor well ring to the north, but the Figure still shows that wellfield extending into this area but outside the monitor well ring. This is unacceptable. Please remove the depiction of the well field outside the monitor well ring.

Please correct. (GM)

ii. The NE¼NE¼ (Lot 5) Section 31, T.44N., R.75W. listed on Page C-14 of this section and the NW¼NE¼ (Lot 6) Section 31, T.44N., R.75W. listed on Page C-15 of this no-right-to-mine section but the northern end of the Hank well field is depicted on Figure 1-8 as being located in these tracts.

Uranerz states they understand that they understand that they have no right-to-mine for Lot 5 and will not mine it. However, Figure 1-8 still shows Lot 5 inside the wellfield. This is not acceptable; please remove the well field from Lot 5.

Uranerz replied that they now have a mining claim in Lot 6 so they will be removing Lot 6 from the Appendix C section where no right-to-mine is claimed and listing it in the right-to-mine section of Appendix C. Lot 6 is still listed on Page C-18 of the no-right-to-mine section, however.

Please provide the corrected pages and a revised Figure 1-8. (GM)

f. Section C-3, No Right to Mine Claimed

To avoid mineral trespass by the installation of monitor wells, Uranerz has indicated they have either signed agreements with Power Resources, Inc. or located new mining claims to cover the listed areas.

This is acceptable; no response is required. (GM)

Mine Plan

2-G. Section 3.3.5, Projected Injection Procedures, Page MP-12

Uranerz has committed to banning the use of steel or iron fittings in well field plumbing. Various types of plastic and stainless steel pipe and fittings will be used.

This is acceptable; no response is necessary. (GM)

3-G. Section 3.6, Mechanical Integrity Testing, Page MP-20

If Uranerz chooses to convert a Class III well that has failed MIT into a production well, they have committed to making sure that well is pumped continuously in order to prevent excursions until the well is repaired or properly abandoned.

This is acceptable; no response is necessary. (GM)

4-G. Section 3.13.2.1, Liquid Effluents, Page MP-34

The reference to water generated during well development and aquifer testing has been changed to WDEQ/WQD Class III as requested.

This is acceptable; no response is necessary. (GM)

5-G. Section 3.18.1, Quarterly Monitoring, Page MP-84

This section was retitled "Quarterly Reporting" and revised to state the items that Land Quality Division NonCoal Rules and Regulations, Chapter 11, Section 15(b), lists for inclusion in quarterly reports,

This is acceptable; no response is necessary. (GM)

6-G. Addendum MP-C, Well Completion SOP

Uranerz has revised Standard Operating Procedures (SOPs) and well completion diagrams to demonstrate their commitment not to drill more than two feet into the aquitard below the mining zone aquifer.

This is acceptable; no response is necessary. (GM)

7-G. Figure 3-16, Hank Unit Access Roads

Replacement maps have been provided that show the location of the Hank satellite building in the same location.

This is acceptable; no response is necessary. (GM)

Restoration and Reclamation Plan

8-G. Section 1.6, Well Abandonment, Page RP-10

This section has been revised to show the use of a cement plug only to cap the abandoned well.

This is acceptable; no response is necessary. (GM)

9-G. Section 2.2, Wellfield, Page RP-12

This section has been revised to reflect that removal of well heads, wellfield piping and other equipment will be begun only after both the WDEQ/LQD and the NRC have given Uranerz approval of the wellfield restoration. Only then will abandonment of the wellfield begin. However, text in this revised section cuts off mid-sentence. The following page, RP-13, starts off with a new section. The Index of Changes does not show that a revised Page RP-13 was submitted

Please correct. (GM)

10-G. Section 3.2.2, Wellfield Access Roads, Page RP-15

This section has been revised to state that once the gravel is removed, the roadbed will be ripped to reduce compaction. After ripping, the topsoil will then be replaced.

This is acceptable; no response is necessary. (GM)

11-G. Section 3.3, Topsoil Handling and Replacement, Page RP-16

The text of this section makes it clear that these procedures will be used during construction and operational phases of the operation, as well as during final reclamation.

This is acceptable; no response is necessary. (GM)

12-G. Section 3.5, Erosion Control Practices, Page RP-17

The text of this section makes it clear that these procedures will be used during construction and operational phases of the operation, as well as during final reclamation.

This is acceptable; no response is necessary.

13-G. Bond

i. Bond - Electrical Efficiency

The bond estimate now shows that 933 watts per horsepower is now listed corresponding to an efficiency of 80% which is in line with available references.

This is acceptable; no response is necessary.

ii. Plant Equipment Removal and Disposal

The large tanks to be used for surge capacity storage have been added to the first line of the estimate on Page 7 of the estimate.

This is acceptable; no response is necessary.

iii. Building Demolition and Disposal, Bond Estimate Page 8

The errors in demolition volumes of the header houses have been corrected.

This is acceptable; no response is necessary.

iv. Wellfield Equipment Removal & Disposal, Production Well Pumps, Bond Estimate Page 12

The distances to the disposal site have been corrected as requested.

This is acceptable; no response is necessary.

v. Transferability of Agreement with Licensed Disposal Area

Uranerz has agreed to make the agreement with the owner of the Licensed Disposal site transferable to the State of Wyoming and the NRC so that in the event the State or the NRC has to assume reclamation liability, they can dispose of material at the same rate as negotiated by Uranerz.

Please provide evidence of the transferability of this agreement.

Technical Review Comments and General Comments from Mark Taylor's December 28, 2009, Review Memo

Uranerz is still in the process of gathering and analyzing additional information regarding hydrologic modeling and site specific aquifer hydrologic characteristics. Once this information is presented to LQD it will likely result in additional technical comments. (MT)

My third round comments below only address unresolved issues. All other second round comment responses are considered acceptable. **(MT)**

Appendix D-5 Geology

14-M. Exhibit D5-a, Preliminary Surface Geology Map: For clarity please revise this exhibit and its legend by illustrating all of the Wasatch Formation in the same color (i.e. tan). **(MT)**

Appendix D-6, Hydrology

48-M. Please revise Exhibit D6-2 to show well BR-T as a domestic well rather than a monitoring well. Enl. Cuisine CS Federal #2 is shown on Exhibit D6-1 but not listed on Table D6G.1-1, please correct. Well 6 and BC-1A are listed on Table D6G.1-1 but not shown on Exhibit D6-1, please correct. Taylor Federal Johnson PR8MW01 and MW02 are shown on Exhibit D6-1 but not listed on Table D6G.1-1, please correct. Well BT-T is listed on Table D6G2.2 but not shown on Exhibit D6-2, please correct. Well NBHW-13 is listed in Section 13 but shown in Section

25, please correct. Well M9 is listed in Section 18 but shown in Section 19, please correct. Well Block #2, Well Block #4, Dry MW1, Dry MW3, and Pumpkin Butte Shannon Unit H2O Source Well are shown on Exhibit D6-2 but not listed on Table D6G.2-2, please correct. There are duplicate well names on Table D6G.2-2, please correct. **(MT)**

49-M. Addendum D6D, page D6D.3-1a, paragraph 2: Please revise text so that "Figure D6-8e" reads "Figure D6-8b". **(MT)**

55-M. Section D6.4, Water Rights: The information regarding the Nichols Ranch well is appreciated. Please investigate into where the Pumpkin Butte Ranch house gets or historically got its domestic water supply and provide a discussion in the text. **(MT)**

56-M. Section D6.5, Exploration Drill Holes: Given that numerous historical drillholes on the Nichols Ranch and Hank areas were drilled prior the Wyoming Environmental Quality Act and the subsequent creation of the Abandoned Drillhole Program and LQD's lack of capability to verify downhole abandonment on all but a handful of opportunistic drillholes, Uranerz should provide a commitment to locate and excavate via a backhoe some number of the historical drillholes at LQD's choosing in order to demonstrate the presents or absence of adequate downhole sealing as to prevent communication between aquifers. **(MT)**

62-M. Table D6-5, Summary of Aquifer Properties for Hank Unit, pg. D6-19: The aquifer thickness is shown at 18 feet for well BR-G for the single well tests; however, the aquifer thickness is shown at 91 feet for this well on the multi-well tests. Please investigate and explain/correct calculations and table accordingly. **(MT)**

Mine Plan

95-M. Mine Plan, General: Uranerz needs to add discussions providing clear assessments of the impact to water resources (i.e., water quantity and quality) within the permit area and on adjacent lands during mining and reclamation. These assessment must discuss what may be reasonably expected and provide mitigation plans (ref: W.S.§35-11-428(a)(iii)(E). **(MT)**

100-M. Mine Plan: Please provide tabs for Addendum MP-E and MP-F. Item 5 of EXP-SOP-01 should be revised to contain a provision to allow the abandonment sealant material to subside for a minimum of 24-hours and then adding additional sealant to the hole on an as needed basis prior to installing a surface cap. This provision would help to ensure that the shallowest aquifers are adequately sealed. **(MT)**

109-M.Mine Plan, Section 3.3.5, Proposed Injection Procedure, pg. MP-12, para.1: Uranerz must provide groundwater potentiometric maps which illustrate the projected drawdown expected during the first year of operation as wells as the potential life-of-operation drawdown (5-foot contour intervals) in both the A sand and F sand aquifers for the initial wellfields. **(MT)**

111-M.LQD awaits the presentation of a MODFLOW groundwater model. **(MT)**

114-M.Mine Plan, Section 3.4, Lixiviant Control: Please elaborate on why Uranerz feels that the 3% bleed at the Hank Unit will "control" the lixiviant in an unconfined aquifer. Please include literature reference or cast history if possible. **(MT)**

115-M.Mine Plan, Section 3.8, Repair and Abandonment of Wells: Please provide a commitment to abandon all wells using neat cement slurry or a high-solids bentonite grout (i.e., a minimum of 20% solids or 50# of bentonite in 23 gallons of water). **(MT)**

116-M.Mine Plan, Section 3.9, Wellfield Data Package: Uranerz has responded "The details of question 116-M will be addressed in a separate document between the WDEQ and Uranerz. LQD awaits this document. **(MT)**

120-M.Mine Plan, Section 3.14.7.8.5.1, Data Collection: LQD's comment read "Uranerz must revise this text and commit to providing baseline water quality data for all aquifers (i.e., 1, A, B, C, F, G, H, and alluvium". Uranerz has responded "The details of question 120-M will be addressed in a separate document between the WDEQ and Uranerz. LQD awaits this document. **(MT)**

122-M.Mine Plan, Section 3.18.2, Annual Reporting, pg. MP-84b, paragraph 1: Please clearly commit to reporting all drillholes and wells. **(MT)**

123-M.Mine Plan, Addendum MP-B, Groundwater Model: Uranerz responded "A model using MODFLOW is being developed for the Nichols Ranch Unit and the Hank Units". LQD awaits this model. **(MT)**

Restoration and Reclamation Plan

145-M.Reclamation Plan, Section 1.6, Well Abandonment, pg. RP-10, Item #2: Please provide a commitment to abandon all wells using neat cement slurry or a high-solids bentonite grout (i.e., a minimum of 20% solids or 50# of bentonite in 23 gallons of water). **(MT)**

New Comments, Glenn Mooney January 6, 2009, Review

146-G. Figure 1-8, Hank Unit, Proposed Monitor Well Locations

The permit boundary depicted on this map does not run along the section lines which are the actual boundary, but have been shifted to the west, sometimes by hundreds of feet. Also, as discussed in Comment 1-G e.i above, portions of the wellfield extend outside the monitor well ring.

Please correct. (GM)

147-G. Completion of New Wells

Chapter 11, Section 11(b) requires that each Class III well will require submission of a notice of completion of construction for each well to the Administrator. The Administrator must then inspect or review the new injection wells and determine whether the well is in compliance with the permit. The Administrator only has thirteen (13) days to make this determination.

Also, EPA will require that digital data covering all Class III wells be incorporated into their GEM database. It is our intention to combine the well certification process and database population process into one procedure. Further information on this database, required format and procedures for certifying Class III wells will be forwarded as they are developed. (GM)

148-G. Reclamation Plan – Addendum A, Reclamation Surety Estimate

In a number of areas the where demolition of the plant buildings is discussed, the estimate uses a 50 mile distance to an approved landfill and a disposal cost of $15.00 per cubic yard.

In a January 5, 2009, discussion with Dale Anderson of the Solid and Hazardous Waste Division of DEQ, he offered the following information about the nearest landfills. The Edgerton landfill is about full and waste will soon be transferred to the Casper landfill. The Casper landfill is currently charging between $42.00 and $43.00 per ton. He said there is no room for disposal in the Kaycee landfill. The Buffalo landfill is a possibility but disposal costs there will run more than $50.00 per ton. Another possibility is the Gillette landfill which is currently charging $60.00 per ton, but will not accept out-of-county waste.

Please recalculate the disposal costs using more up-to-date disposal costs and mileages.

Conclusions

Review of the application found that it is not yet technically acceptable as per W.S. § 35-11-406(h).

/gm

Uranconrev3.10gm