



LICENSE NO. SUA-1341  
DOCKET NO. 40-8502

November 7, 2005

Mr. Gary Janosko, Chief  
Fuel Cycle Facilities Branch  
Division of Fuel Cycle Safety and Safeguards  
Office of Nuclear Material Safety and Safeguards  
U.S Nuclear Regulatory Commission  
11545 Rockville Pike  
Rockville, Maryland 20852

**RE: Request for NRC Concurrence, Irigaray Restoration Approval**

Dear Mr. Janosko,

By letter dated July 26, 2004, COGEMA Mining, Inc. submitted to the Wyoming Department of Environmental Quality (WDEQ) the results of our groundwater restoration program at the Irigaray Mine, Production Units 1 through 9. The WDEQ has completed their review of that program and issued their formal decision approving the restoration. In their approval letter dated November 1, 2005, the WDEQ determined the following:

- Twenty-seven of twenty-nine constituents were restored below the restoration target values. Only bicarbonate and manganese did meet the baseline range. However, these two constituents meet the criteria of pre-mining class of use.
- The groundwater, as a whole, has been returned to its pre-mining class of use.
- Because the current groundwater conditions do not significantly differ from the background water quality, no natural attenuation monitoring is required.
- Wells within the wellfield may be abandoned as described in the Mine and Reclamation Plan.

Condition No. 10.16 of COGEMA's NRC license, SUA-1341, addresses groundwater restoration and states the following:

*"The licensee shall conduct groundwater restoration and post-restoration monitoring as described in Section 6.1 of the approved license application. The primary goal of restoration shall be to return the groundwater quality, on a production-unit average, to baseline concentrations on a parameter-by-parameter basis. If the primary goal cannot be achieved, the groundwater will, at a minimum, be returned to the pre-mining use category. ..."*

Condition No. 10.16 is a performance-based license condition, with no specific requirement for COGEMA to submit the restoration results to NRC for subsequent approval. Because SUA-

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1341 is a performance-based license, our plan is to conduct a SERP review of the Irigaray restoration results based upon NRC requirements for the SERP, the determination of restoration approval by the WDEQ, and our own internal presentation of the data. Our initial review of the SERP requirements indicates that a license amendment will not be necessary from the NRC as the Irigaray Production Units 1 through 9 were restored to baseline conditions on a parameter-by-parameter basis with few exceptions, and restoration to pre-mining use was accomplished consistent with the requirements of Condition 10.16. After completion of the SERP, assuming an NRC amendment is not necessary for the Irigaray restoration approval, COGEMA would go forward with the plugging and abandonment of the wells pursuant to methods contained in the application.

If I am misinterpreting the manner in which we should proceed, please advise. If you do not interpret the license as I do, and determine that a concurrence review of the restoration by NRC is necessary, I have attached the complete correspondence file with WDEQ beginning with our July 26, 2004 submittal and ending with their November 1, 2005 approval, as follows:

- July 26, 2004 – COGEMA submittal of the Irigaray Wellfield Restoration Report to WDEQ.
- January 10, 2005 – WDEQ review comments.
- May 4, 2005 – COGEMA response to WDEQ comments.
- August 12, 2005 – WDEQ letter to COGEMA (replaced by November 1, 2005 letter).
- November 1, 2005 – WDEQ letter to COGEMA, final approval of restoration.

I would appreciate hearing from you as soon as possible regarding our interpretation of how to proceed with the Irigaray restoration, or whether NRC concurrence is necessary. We have begun a campaign of plugging and abandoning wells that are not of consequence to the restoration, and would like to continue with that campaign with the Irigaray wellfield wells, as soon as possible.

Sincerely,



Donna L. Wichers  
General Manager

Enclosures

cc: Stephen Cohen, NRC Project Manager – with attachments  
NRC Region IV – with attachments  
COGEMA – L. Arbogast



# 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



November 1, 2005

## FAXED AND MAILED

Ms. Donna Wichers  
Cogema Mining Inc.  
P.O. Box 730  
Mills, WY 82644

**RE: Postmining Groundwater Restoration Demonstration for the Irigaray Mine,  
Permit No. 478, TFN 4 1/170, Change No. 34**

Dear Ms. Wichers:

The Land Quality Division (LQD) has completed its review of the "Wellfield Restoration Report - Irigaray Mine" submitted under your letter of July 26, 2004 as well as the related supplementary information included with your letter of May 4, 2005. The report was excellent which included supporting data and discussions to demonstrate the groundwater restoration has been completed. This letter contains my formal decision concerning the restoration of the Irigaray Mine wellfield Units 1 through 9.

## Statutory and Regulatory Requirements

There are several statutes and Land Quality Division's regulations which govern evaluation of groundwater restoration. The most important of these are listed below.

*W.S. §35-11-103(f)*

*(iii) "Groundwater restoration" means the condition achieved when the quality of all groundwater affected by the injection of recovery fluids is returned to a quality of use equal to or better than, and consistent with the uses for which the water was suitable prior to the operation employing the best practicable technology.*

(i) "Best practicable technology" means a technology based process justifiable in terms of existing performance and achievability in relation to health and safety which minimizes, to the extent safe and practicable, disturbances and adverse impacts of the operation on human or animal life, fish, wildlife, plant life, and related environmental values.

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Cogema Mining Inc.  
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*Land Quality Division Non-Coal Rules and Regulations, Chapter 11, Section 5(a)*

*(ii) The ...operation will achieve the standard of returning all affected groundwater to the pre-mining class of use or better using Best Practicable Technology,...*

*(B) The evaluation of restoration of the groundwater within the production zone shall be based on the average quality over the production zone. For groundwater affected outside the production zone, the restoration shall be evaluated separately for each well.*

*(D) Regardless of the restored groundwater in the production zone, the adjacent aquifers and other waters within the same aquifers must be fully protected to their class of use and, outside the aquifer exemption boundary, to applicable Maximum Contaminant Levels from the U.S. Environmental Protection Agency Rules (40 CFR 141 as amended July 1, 2001). If the restored groundwater in the production zone poses a threat to groundwater outside the production zone, then flow and/or transport models shall be used to assist in determining what action, including monitoring sufficient to verify the model, needs to be taken. A monitoring program sufficient to verify the model may be required.*

**Facts and Restoration Results**

The Irigaray Mine pre-dates LQD's specific Rules & Regulations concerning in situ mining and the joint LQD/WQD Advisory Board Policy on in situ mines. The groundwater in these wellfield units was historically classified as Class I. Applying the new joint policy, the "pre-discharge use suitability of the water" is Class IV(A) (not Class V as proposed in the restoration report) suitable for industry as determined by WQD and LQD due to naturally high concentrations (i.e. >5pci/l) of radium in the groundwater.

The permit established target restoration values for twenty-nine constituents. Twenty-five were established at the baseline range. Three were established higher than the baseline range but below Class I standards. The remaining constituent (bicarbonate) does not have a Class I, II, or III standard. Twenty-seven of the twenty-nine were restored below the target restoration values. Only bicarbonate and manganese did not meet their target restoration value. The target restoration value for bicarbonate is 295 mg/l and the post-restoration mean is 423 mg/l. However, as noted bicarbonate does not have a Class I, II, or III standard.

The post-restoration mean concentration for manganese is 0.226 mg/l. Both the baseline range (0.005 to 0.19 mg/l) and the restoration result for manganese exceed the WQD Class I standard for manganese (0.05 mg/l)



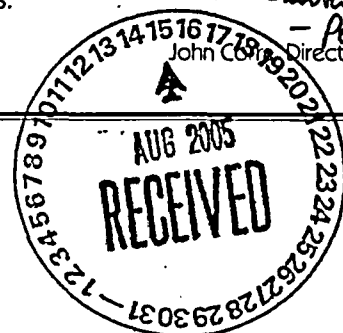
Dave Freudenthal, Governor

# Department of Environmental Quality

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

CC: C. Arbegast  
R. Enkin  
B. Gacio

For: Hal Demuth  
Emil Lamm  
John C. ... Director



August 12, 2005

Ms. Donna Wichers  
COGEMA Mining, Inc.  
P.O. Box 730  
Mills, WY 82644

**RE: Irigaray Mine, Wellfield Restoration Report; TFN 4 1/170, Permit 478**

Dear Donna:

We have your letter of May 4, 2005 which included a copy of the above-mentioned revised report. We have completed our reviews of this restoration report and have consulted with the Water Quality Division.

We feel the current model, which uses average constituent concentrations within the wellfield, does not adequately demonstrate the protection of groundwater outside the monitoring well ring. Accordingly, please revise and rerun the model using the maximum values recorded during the stability sampling period on a well-by-well basis for the constituents (i.e., selenium, manganese, uranium, radium-226, TDS, ammonia, and iron) which exceeds Class 1 standards. The hydrogeologic properties and assumptions used in the model need not be revised.

Should you have any questions please contact Mark Taylor.

Sincerely,

*Richard A. Chancellor*

Richard A. Chancellor  
Land Quality Division Administrator  
Department of Environmental Quality

RAC/mt

xc: DEQ Sheridan Field office

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Dave Freudenthal, Governor

# Department of Environmental Quality

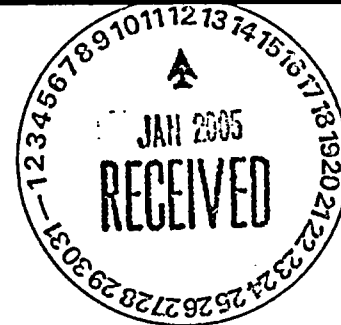
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TGN RLL  
LLA WG



John Corra, Director

January 10, 2005



Ms. Donna Wichers  
COGEMA Mining, Inc.  
P.O. Box 730  
Mills, WY 82644

**RE: Irigaray Mine (PT-478) Wellfield Restoration Report - TFN 4 1/170**

Dear Donna:

We have your letter of July 26, 2004 which included a copy of the above-mentioned report. We have completed our initial reviews of this restoration report and have consulted with Kevin Frederick of the Water Quality Division. The following are our review comments:

- 1.) Ammonia within the production zone, while achieving the Target Restoration Value, still remains well above what would be considered natural background.
- 2.) Manganese within the production zone, while achieving the Target Restoration Value, remains above background within the groundwater adjacent to (i.e., associated or other groundwater) the production zone.
- 3.) Manganese and ammonia within the production zone appears to threaten to degrade the Class 1 use of adjacent groundwater outside the production zone.

Accordingly, you are requested to augment the model presented in Appendix C of the restoration report to demonstrate that the adjacent groundwater will not be impacted by manganese or ammonia above background or the Class 1 use standard. In addition, for natural attenuation to be considered a corrective measure then Cogema must provide a plan for continued monitoring until Class 1 use standards have been achieved.

Sincerely,

Mark Taylor  
Senior Analyst

mt  
xc: Cheyenne File



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PERMIT TO MINE NO. 478

May 4, 2005

Mr. Mark Taylor  
Land Quality Division, District III  
Department of Environmental Quality  
1866 South Sheridan Ave.  
Sheridan, Wyoming 82801

**RE: Irigaray Mine Wellfield Restoration Report – TFN 4 1/170  
Response to LQD's January 10, 2005 Comments**

Dear Mark,

This letter and attached report (three copies) are in response to your January 10, 2005 letter that contained review comments on COGEMA's Irigaray Wellfield Restoration Report submitted to your office on July 26, 2004. Our responses are as follows:

**LQD Comment No. 1:**

"Ammonia within the production zone, while achieving the Target Restoration Value, still remains well above what would be considered natural background."

**COGEMA Response:**

As stated by LQD, ammonia within the production zone has been restored to concentrations that are above natural background. However, as shown in the attached report, the restored ammonia concentrations are well below the WQD Chapter 8 Class I Domestic Use standards for un-ionized ammonia ( $\text{NH}_3$  as N). Furthermore, the Target Restoration Value for ammonium ( $\text{NH}_4$ ) was the subject of lengthy negotiations with the WDEQ and was approved as part of the original issuance of Permit to Mine No. 478. It was known at that time that restoration of ammonia would not be to background levels, therefore a separate target, other than background, was approved.

**LQD Comment No. 2:**

"Manganese within the production zone, while achieving the Target Restoration Value, remains above background within the groundwater adjacent to (i.e., associated or other groundwater) the production zone."

**COGEMA Response:**

Manganese within the production zone was restored to a level of 0.226 mg/l, which slightly exceeded the baseline range (<0.005 to 0.19 mg/l). Because this concentration also exceeded the Class I standard of 0.05 mg/l for adjacent groundwaters, numerical modeling was conducted to evaluate the potential for migration of manganese (July 2004 Irigaray Wellfield Restoration Report). The model results showed that concentrations of

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manganese will remain below WDEQ Class I domestic standards within 400 feet of the wellfield (Section 5.6.1.2, page 5-7, July 2004 Irigaray Wellfield Restoration Report).

**LQD Comment No. 3:**

"Manganese and ammonia within the production zone appears to threaten to degrade the Class I use of adjacent groundwater outside the production zone."

**COGEMA Response:**

With regard to ammonia, the concentrations within the restored wellfield do not exceed Class I standards for ammonia, therefore there is little threat to degrade the Class I use of groundwater adjacent to the production zone (see attached report). However, because ammonia concentrations are affected by pH levels, modeling has been conducted to confirm that ammonia will not threaten the Class I use of groundwater adjacent to the production zone.

With regard to manganese, modeling has confirmed that the residual manganese concentrations will not be a threat to the Class I use of adjacent groundwater outside the production zone (see response to LQD Comment No. 2, above). It should also be reiterated that the Class I use standard for manganese is not based on an EPA Primary Drinking Water Standard or MCL, but it is based on EPA's secondary standards. The secondary standards are non-enforceable guidelines that regulate constituents that may cause cosmetic effects or aesthetic effects in drinking water. For example, excess manganese may cause clothing discoloration after repeated laundering.

In addition to the above comments, you further requested COGEMA to augment the model presented in Appendix C of the July 2004 Irigaray Wellfield Restoration Report to demonstrate that the adjacent groundwater will not be impacted by manganese or ammonia above background or the Class I use standard. As noted in our above responses, the additional modeling of ammonia has been completed and the results are contained in the attached report. Contributors to the report are Resources Technologies Group, who provided an evaluation of the residual levels of ammonia in the Irigaray wellfield, and Petrotek Engineering Corporation, who conducted the solute transport modeling for ammonia. The report clearly demonstrates that there is no threat to the Class I use of groundwater adjacent to the production zone.

Additional modeling of manganese was not performed. The solute transport modeling results for manganese were previously included with the July 2004 Restoration Report (see Section 5) and will not be repeated here.

The last statement in your letter is "for natural attenuation to be considered a corrective measure then COGEMA must provide a plan for continued monitoring until Class I use standards have been achieved." First of all, COGEMA is not asking for natural attenuation to be considered as a corrective measure. We have restored the Irigaray wellfield using best practicable technology, and the groundwater clearly was returned to background levels for many constituents and to a quality of use equal to or better than the uses for which the water was suitable prior to the operation. As a further confirmation of the successful restoration, modeling was conducted to show that all constituents meet regulatory standards downgradient from the wellfield.



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The request for "continued monitoring until Class I use standards have been achieved" requires clarification as the pre-mining use standard of the Irigaray wellfield groundwater is Class IV, and downgradient water quality already meets Class I standards. As stated in the Irigaray Restoration Report, COGEMA does not feel there are applicable technical or regulatory bases to warrant additional monitoring. In this regard, please note that COGEMA has expended significant time and resources to assess future transport of constituents downgradient of Irigaray. This work was performed for the benefit of all stakeholders, including the LQD, WQD, and the general public, to demonstrate that sufficient restoration efforts had been conducted to comply with Permit to Mine No. 478, and to protect nearby sources of drinking water. We certainly would not have committed to such effort if the ultimate result, regardless of the modeling studies, was long-term monitoring.

We appreciate the time and effort that the LQD and WQD have put into this review. We are confident that the attached report will answer your remaining questions regarding ammonia and look forward to your final approval of the Irigaray restoration project. Our schedule calls for commencing the plugging and abandonment of the Irigaray wellfield during the upcoming summer, and we respectfully ask for your assistance in helping us meet that schedule.

Sincerely,



Donna L. Wichers  
General Manager

Attachment

cc: Hal Demuth, Petrotek  
Erich Tiepel, RTG  
T. Nicholson, COGEMA