UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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July 17, 1998

Mr. Donald R. Metzler, Project Manager
U.S. Department of Energy
Grand Junction Office
2597 B3/4 Road
Grand Junction, CO 81503

SUBJECT: REVIEW OF AMBROSIA LAKE GROUND WATER COMPLIANCE ACTION PLAN

Dear Mr. Metzler:

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the Ambrosia Lake, New Mexico, Ground Water Compliance Action Plan (GCAP), dated April 1998, which was submitted by a U.S. Department of Energy (DOE) letter dated June 1, 1998. The GCAP reiterates DOE's strategy of "No-Ground-Water-Remediation," based on the ground water in the uppermost aquifer being classified as limited use and, thus, no program to monitor ground water is required.

As discussed in the enclosed Supplemental Technical Evaluation Report (STER), the NRC staff has reviewed the GCAP, and agrees with DOE that the uppermost aquifer does not represent a ground-water resource, because of the limited extent of saturation in the aquifer and its inability to sustain a yield of 150 gallons (570 liters) per day to wells. The uppermost aquifer is expected to return to its premilling and mining condition of little-to-no saturation, further eliminating the unit as a potential future ground-water resource. Ground water does not discharge to the land surface, and the nearest surface water is located approximately 1.5 miles (2.4 kilometers) southwest of the site. No current exposure pathways due to ground-water contamination exist, nor are any foreseen.

Based on the above, the NRC staff concurs with the GCAP. If you have any questions concerning this letter or the enclosed STER, please contact the NRC Project Manager, Ken Hooks, at (301) 415-7777.

Sincerely,

Joseph J. Holonich, Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No. WM-67
Enclosure: As stated

cc: W. Woodworth, DOE Alb
F. Bosiljevac, DOE Alb
E. Artiglia, TAC Alb
M. Leavitt, NMED Santa Fe, NM

SWAMB 1.9

SUPPLEMENTAL TECHNICAL EVALUATION REPORT
TITLE I GROUND-WATER REMEDIATION

DATE: July 13, 1998

FACILITY: Ambrosia Lake, New Mexico, Title I Site

PROJECT MANAGER: Kenneth Hooks

TECHNICAL REVIEWER: William Ford

BACKGROUND:

The U.S. Department of Energy (DOE) submitted a Final Remedial Action Plan and Site Conceptual Design for Stabilization of the Inactive Uranium Mill tailings at Ambrosia Lake, New Mexico, by letter dated September 30, 1990. The NRC staff reviewed the remedial action plan and conditionally concurred on the proposed remedial action in its Technical Evaluation Report (TER) transmitted on December 31, 1990.

In the TER, the NRC staff concurred with the application of supplemental standards at the Ambrosia Lake disposal site under 40 CFR 192, Subpart C. The staff concluded that, "DOE has adequately justified that the proposed supplemental standards are protective of human health and the environment." The classification of the ground water as Class III (i.e., the ground water that is not a current or potential source of drinking water) leads to a ground-water compliance strategy of no remediation. Furthermore, in the TER the NRC staff concurred with the DOE that this site should be exempted from both compliance and performance ground-water monitoring requirements.

This Supplemental Technical Evaluation Report documents the NRC staff review of DOE's Ground Water Compliance Action Plan for the Ambrosia Lake, New Mexico, site, which was transmitted by letter dated June 1, 1998, and confirms the staff concurrence documented in its December, 1990, Technical Evaluation Report.

SUMMARY AND CONCLUSIONS:

Staff has determined that the DOE's Ground Water Compliance Action Plan satisfies the requirements set forth in the Uranium Mill Tailings Radiation Control Act of 1978, as amended (UMTRCA), and the standards in 40 CFR 192, Subparts B and C, for the cleanup of ground-water contamination resulting from the processing of ores for the extraction of uranium. No modifications to the DOE's Long Term Surveillance Plan are required by this action.

Enclosure

DESCRIPTION OF DOE'S REQUEST:

DOE submitted information in support of its earlier decision that ground-water restoration and long-term monitoring activities were not required at the Ambrosia Lake site.

TECHNICAL EVALUATION:

The NRC staff concurs with the DOE conclusions that the uppermost aquifer at the Ambrosia Lake site does not represent a ground-water resource because of the limited extent of saturation and the inability to consistently sustain a yield of 150 gallons (570 liters per day to wells. In addition, the uppermost aquifer is expected to return to its premilling and mining condition of little-to-no saturation, further eliminating the unit as a potential future ground-water resource. This is because the major sources of recharge, water disposal and infiltration, and water from mine pumping, no longer exist. Ground water does not discharge to the land surface and the nearest surface water is located approximately 1.5 mi (2.4 Km) southwest of the site. Land use in the future is not expected to change. Therefore, no current exposure pathways due to ground-water contamination to humans, livestock, or wildlife exist, nor are any foreseen. The DOE has further determined that a program to monitor ground water is not required for the Ambrosia Lake site because ground water in the uppermost aquifer is of limited use.

The NRC staff concurs with the decision that ground-water restoration should not be conducted and that long-term ground-water monitoring is not required at this site. The staff also concludes that the approach described in the Ground Water Compliance Action Plan is consistent with requirements in the regulations and DOE's Programmatic Environmental Impact Statement. Therefore, the NRC staff concurs with the DOE ground water reclamation plan for the Ambrosia Lake site.

REFERENCES:

U.S. Department of Energy, 1990. Remedial Action Plan and Site Conceptual Design for the Stabilization of the Inactive Uranium Mill Tailings Site at Ambrosia Lake, New Mexico, Final. UMTRA-DOA/AL-650516.0000, September 1990. Transmitted by DOE letter dated September 25, 1990.

U.S. Department of Energy, 1991, Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Ambrosia Lake, New Mexico, Final Appendix B, UMTRA-DOE/AL-050516.0000, November 1991.

U.S. Department of Energy, 1995a, Site Observational Work Plan for the UMTRA Project Site at Ambrosia Lake, New Mexico, DOE/AL/62350-159, Rev. 0, February 1995.

U.S. Department of Energy, 1995b. Supplement to the Site Observational Work Plan for the UMTRA Project Site at Ambrosia Lake, New Mexico, DOE/AL/62350-159S, Rev. 0, November 1995.

U.S. Department of Energy, 1996. Long-Term Surveillance Plan for the Ambrosia Lake, New Mexico Disposal Site, DE/AL/62350-211, Rev 1, July.

U.S. Department of Energy, 1996. Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project, DOE/EIS-0198, October 1996.

U.S. Department of Energy, 1998a. UMTRA Ground Water Project Ground Water Document Compilation, Ambrosia Lake, New Mexico, April 1998. Transmitted by DOE letter dated June 1, 1998.

U.S. Department of Energy, 1998b. Ground Water Compliance Action Plan (GCAP) for the UMTRA Project Site at Ambrosai Lake, New Mexico, May 1998. Transmitted by DOE letter dated June 1, 1998.

U.S. Nuclear Regulatory Commission, 1990. Final Technical Evaluation Report for DOE's Proposed Remedial Action, Ambrosia Lake UMTRA Project Site, New Mexico, December 1990. Transmitted by NRC letter dated December 31, 1990.

U.S. Nuclear Regulatory Commission, 1996. Site Observational Work Plan for the Ambrosia Lake Uranium Mill Tailings Remedial Action Project Site, April 9, 1996.

U.S. Nuclear Regulatory Commission, 1997. Ambrosia Lake Completion Report, May 1,1997.

(GCAP)

May 21, 1998

40 CFR 192 (Subpart B) Ground Water Compliance Modification to the Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Ambrosia Lake, New Mexico (November, 1991)

The following sections will be modified:

SECTION 2.0 EPA STANDARDS
Subsection 2.4 Water-Quality Protection;

SECTION 5.0 GROUNDWATER PROTECTION

To achieve compliance with Subpart B of 40 CFR 192, (aquifer restoration) at the Ambrosia Lake, New Mexico, UMTRA site, the DOE proposes implementation of the No-Ground-Water-Remediation strategy. This determination utilizes a consistent and objective strategy selection framework developed in the Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project (October, 1996).

In summary, the No-Ground-Water-Remediation strategy is based on ground water in the uppermost aquifer being classified as limited use, thus providing the basis for the application of supplemental standards. The term "limited use" is defined in the final EPA ground water standards (60 FR 2854). The uppermost aquifer does not represent a ground water resource because of the limited extent of saturation and the inability to sustain a yield of 150 gallons per day to wells. The sources of past recharge such as waste water disposal and infiltration, and water from mine pumping, no longer exist. Further, the tailings and other contaminated material are now encapsulated in a long-term engineered disposal cell. The disposal cell has a cover design feature that will minimize infiltration through the tailings. Therefore, the saturated unit (uppermost aquifer) is expected to return to its premilling and mining condition of little-to-no saturation, further eliminating the unit as a potential future ground water resource.

The DOE has determined that the ground water in the uppermost aquifer was contaminated by uranium processing activities at the Ambrosia Lake site, but qualifies for supplemental standards based on the limited-use conditions. This decision was determined by applying the decision-framework developed in the Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project (October, 1996) as the strategy selection process in the Site Observational Work Plan (SOWP) for the UMTRA Project Site, at Ambrosia Lake, New Mexico (February, 1995, and subsequent addendum's). The framework as applied to the Ambrosia Lake site consists of five evaluative steps that are discussed below.

The first step of the decision framework was an assessment of existing data. The uppermost aquifer is defined as the alluvium and Tres Hermanos-C Sandstone. Ground water contaminants are a result of uranium processing activities that occurred from 1958 until 1963. Section 3.0 of the SOWP provides a conceptual site model that includes the hydrogeologic setting, nature and extent of ground water contamination, contaminant fate and transport, and risk evaluation. Evaluation of previous site data, and additional field data collection - at the request of the State of New Mexico (1997), coupled with the Ambrosia Lake site conceptual model indicate that sufficient hydrological and ground water contamination characterization data exists to make an appropriate (Subpart B) compliance strategy selection.

The second step compares the list of ground water contaminants with MCLs or background ground water quality. However, this site is unique because background ground water quality in the alluvium and the

Tres Hermanos-C standstone at the Ambrosia lake site is considered to be the same as existing water quality due to the limited-saturation created by the past mining and milling activities. Outside of the limited saturation, the unit is essentially dry. Within the area of limited-saturation contaminants that have exceeded MCLs in the past includes uranium, selenium, cadmium, chromium, molybdenum, nitrate, combined radium -226 and -288, and arsenic. An additional constituent that is an indicator of process-related contaminated ground water is sulfate. Ground water contaminants from the uranium milling operation have seeped into the subsurface and migrated into the ground water system creating a limited zone of saturation that encompasses an area slightly larger than the fenced disposal site.

The third step determines whether the contaminated ground water qualifies for supplemental standards based on the classification of ground water as limited use. The conceptual model reasonably depicts the uppermost aquifer's hydraulic properties as unable to sustain a yield of 150 gallons per day to wells. Additional field work conducted in 1997 adds further confidence that the limited-saturation is well defined and the Tres Hermanos-B is contaminated in one very localized area, and the Dakota is not contaminated. With time the limited saturated zone created by past mining and milling practices will diminish.

The fourth step determines whether human health and environmental risks that result from applying supplemental standards are acceptable. There is no risk to human health and the environment because there are no known exposure pathways, for ground water from the uppermost aquifer to reach a receptor. No one is using or is projected to use the ground water from this aquifer for any purpose. Further, there is no discharge of ground water from the uppermost aquifer to a deeper aquifer used for domestic and/or agricultural purposes, nor a surface water body or surface expression.

The fifth and final step in the framework selects an appropriate compliance strategy to meet the EPA ground water standards. The selected strategy is to perform no remediation based on ground water in the uppermost aquifer being classified as limited use, which allows the application of supplemental standards. Limited use ground water at the Ambrosia Lake site is neither a current nor potential source of drinking water because of low yield and its transient nature (diminishing with time) that cannot be cleaned up using treatment methods reasonably employed in public water supply systems (40 CFR 192.11(e)).

Details supporting the 1) regulatory framework requirements, 2) summary of site conditions, and 3) ground water compliance strategy selection can be found in the Ground Water Document Compilation, Ambrosia Lake, New Mexico (April, 1998). This compilation includes all NEPA documentation, the SOWP, and supplements, and pertinent correspondence with the Nuclear Regulatory Commission and the State of New Mexico.

U.S. Department of Energy
Grand Junction Office
2597 B¾ Road
Grand Junction, CO 81503

JUN 01 1998

Marcy Leavitt, Bureau Chief
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive
Santa Fe, NM 87502

Subject: Transmittal of Ground Water Compliance Action Plan and Supporting Background Information for the Ambrosia Lake, New Mexico, Title I UMTRA Site (Subpart B Compliance)

Dear Ms. Leavitt:

Enclosed are two copies of the *Ground Water Compliance Action Plan (GCAP)) for the UMTRA Project Site at Ambrosia Lake, New Mexico, May 1998*. Accompanying the GCAP are two 3-ring binders of supporting background information that includes the Site Observation Work Plan, analyses of the most recent field characterization data, and other pertinent documentation.

The GCAP is submitted as the 40 CFR 192, Subpart B, ground water modification to the Remedial Action Plan (RAP) and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Ambrosia Lake, New Mexico (November 1991). The GCAP will serve as replacement of the current text identified in the RAP: Sections 2.0 EPA Standards, Subsection 2.4 Water-Quality Protection, and Section 5.0 Groundwater Protection.

Concurrent with this transmittal, the Department of Energy (DOE) UMTRA Ground Water Project is transmitting copies of the GCAP and supporting background information to the Nuclear Regulatory Commission (NRC) for concurrence.

The final *Programmatic Environmental Impact Statement* (PEIS) for the UMTRA Ground Water Project was approved for distribution on September 19, 1996. Distribution of the final PEIS began in October of 1996. The Record of Decision was approved and published in April 1997. In 1998, the DOE Ground Water Project has completed the necessary site-specific National Environmental Policy Act documentation for Subpart B compliance at the Ambrosia Lake Site.

The Ambrosia Lake tailings were stabilized in place, encapsulated within an engineered disposal cell that was constructed to Title I design specifications. The residual radioactive material is managed under the Title I general license. The second part of the two-step general license process (10 CFR 40.27) for the Ambrosia Lake Site will be completed with NRC's concurrence on the GCAP. Further performance assessment monitoring is not required with the selection of

the No-Ground-Water Remediation Strategy. The Long-Term Surveillance and Maintenance Project will continue with annual inspections under their long-term care requirements.

Please provide your review comments or approval as soon as possible. If you have questions or need further clarification, call me at (970) 248-7612.

Sincerely,

Donald R. Metzler, P.Hg.
Technical/Project Manager

Enclosures:
GCAP
3-ring binder of supporting documentation

cc w/o enclosure:
J. Holonich, NRC
M. Layton, NRC
S. McKitrick, NMED
File GWAMB1.4 (P. Taylor)

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U.S. Department of Energy
Grand Junction Office
2597 B¾ Road
Grand Junction, CO 81503

JUN 01 1998

Joseph J. Holonich, Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
Mail Stop T7J9
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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Sincerely,

Donald R. Metzler, P.Hg.
Technical/Project Manager

Enclosures:
GCAP
3-ring binder of supporting documentation

cc w/o enclosures:
M. Layton, NRC
M. Leavitt, NMED
R. Plieness, DOE-GJO
R. Edge, DOE-GJO
File GWAMB~~1.4~~ (P. Taylor)
1.9

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