November 9, 1998

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



ATOMIC SAFETY AND LICENSING BOARD PANEL



Before Administrative Judges:
Peter B. Bloch, Presiding Officer
Thomas D. Murphy, Special Assistant

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| In the Matter of: | ) | |
| | ) | |
| HYDRO RESOURCES, INC. | ) | Docket No. 40-8968-ML |
| 2929 Coors Road, Suite 101 | ) | ASLBP No. 95-706-01-ML |
| Albuquerque, New Mexico 87120 | ) | |
| | ) | Re: Leach Mining and Milling License |

**INITIAL WRITTEN PRESENTATION OF GRACE SAM AND MARILYN MORRIS**

**INTRODUCTION**

Pursuant to 10 C.F.R. § 2.1233, the Presiding Officer's Memorandum and Order (Scheduling and Partial Grant of Motion for Bifurcation) of September 22, 1998, and their own Notice of Written Presentations dated October 2, 1998, Intervenors Grace Sam and Marilyn Morris ("Ms. Sam and Ms. Morris") hereby submit their initial written presentation. The scope of this presentation is limited to a discussion of those aspects of the licensing of the Crownpoint Uranium Project ("CUP") relating to waste disposal. Ms. Sam and Ms. Morris contend that the license application process, which ended with the Nuclear Regulatory Commission's ("NRC") issuance of a source materials license to Hydro Resources, Inc. ("HRI") on January 5, 1998, see Material License SUA-1508 (the "materials license" or "license") [Notebook No. 11, Acc. No. 9801160076, 1/5/98], as well as the terms and conditions of the license itself, are deficient in a number of respects relating to the issue of waste disposal. First, they believe that the Commission issued the license in violation of its own regulations because HRI failed to timely

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submit the detailed information regarding liquid waste disposal required pursuant to 10 C.F.R. § 40.31(h) and 10 C.F.R. Part 40, Appendix A ("Appendix A"). Second, they assert that, because the license lacks specific freeboard restrictions for surface impoundments, it fails to adequately protect human health and safety and the environment in violation of 10 C.F.R. § 40.32. Finally, Ms. Sam and Ms. Morris maintain that, because License Condition ("LC") 9.6 allows HRI to generate and accumulate 11e(2) byproduct material on-site for up to three months in the absence of an agreement with a properly licensed waste disposal facility that will ensure the proper disposal of such material, it fails to adequately protect human health and safety and the environment in violation of 10 C.F.R. § 40.32.

## ARGUMENT

### I. THE NRC ISSUED THE MATERIALS LICENSE TO HRI IN VIOLATION OF ITS OWN REGULATIONS RELATING TO WASTE DISPOSAL.

Before it could engage in in situ leach ("ISL") uranium mining at the CUP, HRI had to obtain a source materials license pursuant to the Atomic Energy Act of 1954, 42 U.S.C. § 2011 et seq., as amended ("the Act"), and the regulations found at 10 C.F.R. Part 40 governing the issuance of such licenses. 10 C.F.R. § 40.32 sets out the general requirements which HRI's application had to meet before the NRC could issue it a license. Section 40.32 states in relevant part:

> An application for a specific license will be approved if:
> (a) The application is for a purpose authorized by the Act; and
> (b) The applicant is qualified by reason of training and experience to use the source material for the purpose requested in such manner as to protect health and minimize danger to life or property; and
> (c) The applicant's proposed equipment, facilities and procedures are adequate to protect health and minimize danger to life or property; and
> (d) The issuance of the license will not be inimical to the common defense and

security or to the health and safety of the public; and

(e) In the case of an application . . . for a license to possess and use source and byproduct material for uranium milling, . . . the Director of Nuclear Material Safety and Safeguards or his designee, before commencement of construction of the plant or facility in which the activity will be conducted, on the basis of information filed and evaluations made pursuant to subpart A of part 51 of this chapter, has concluded, after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license. . . .

10 C.F.R. § 40.32. On January 5, 1998, the NRC issued Materials License SUA-1508 to HRI. Ms. Sam and Ms. Morris contend that the NRC issued the license in violation of section 40.32. As stated more fully below, Ms. Sam and Ms. Morris believe that HRI entirely failed to supply as part of its application materials the specific information regarding its proposed waste disposal practices for the CUP described in Appendix A of 10 C.F.R. Part 40 ("Appendix A"). Ms. Sam and Ms. Morris assert that 10 C.F.R. § 40.31(h) requires that this information be submitted during the application process. Ms. Sam and Ms. Morris maintain that, by issuing the license when HRI's application materials failed to contain the required information, the NRC has failed to adequately protect health and human safety and the environment in violation of section 40.32.

### A. The Regulations Require An Applicant To Submit Specific Information Regarding Waste Disposal In Its Application.

10 C.F.R. § 40.31 sets out the guidelines which an applicant must follow in submitting an application for a materials license. Among other things, these guidelines concern the timing of the application's submittal and what information it must provide. Subsection 40.31(h) requires that an applicant submit specific information regarding the methods of waste disposal it intends to use as part of its operation. It states:

> An application for a license to receive, possess, and use source material for uranium or thorium milling or byproduct material, as defined in this part, at sites formerly associated with such milling shall contain proposed written specifications relating to milling operations and the disposition of the byproduct material to achieve the requirements and objectives set forth in appendix A of this part. Each application must clearly demonstrate how the requirement and objectives set forth in appendix A of this part have been addressed. Failure to clearly demonstrate how the requirements and objectives in appendix A have been addressed shall be grounds for refusing to accept an application.

10 C.F.R. § 40.31(h). Section 40.31(h) makes clear not only that HRI must demonstrate how it intends to comply with the requirements of Appendix A, but that it must have made such a demonstration in its application for a materials license.[1] HRI has failed to do this.

**B. HRI Has Failed To Submit The Requisite Information.**

HRI attempted in its Consolidated Operations Plan, Revision 2.0 ("COP") [Notebook No. 10.3, Acc. No. 9708210179, 8/15/97] to "extract, and combine the information in previously submitted documents into one consolidated specification report." COP at 2. HRI intended that the COP "contain all the specifications, and representations which have been articulated to NRC in the past under one cover." Id. The COP fails to live up to HRI's intentions. It neither specifies the particular method of liquid waste disposal HRI will use at the CUP nor provides the detailed specifications for any of the liquid waste disposal options discussed.[2] Before HRI can

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[1] The NRC's own interpretation of section 40.31(h) supports Ms. Sam's and Ms. Morris's position. Its Staff Technical Position on Effluent Disposal at Licensed Uranium Recovery Facilities, Division of Waste Management, NRC, April, 1995 ("Staff Technical Position"), plainly reiterates that an application for a license must comply with the criteria found in Appendix A. Staff Technical Position at 2, attached as exhibit 1.

[2] The COP discusses the following methods of liquid waste disposal as possible option for use at the CUP: evaporation ponds, surface discharge under a National Pollution Discharge Elimination System ("NPDES") permit, deep-well injection, and land application.

employ any of the methods discussed, it must have demonstrated in its application compliance with the requirements of 10 C.F.R. § 40.31(h) and Appendix A. Because of HRI's failure to provide the requisite level of detail in its application for a license, the NRC should have denied the application.

**1. HRI's application failed to provide sufficient information concerning its planned use of surface impoundments to dispose of liquid waste as required by Criterion 5A of Appendix A.**

HRI discusses the use of evaporation ponds as one option for disposal of liquid waste at the CUP. COP at 59. Yet in its discussion HRI fails to directly address how its plan for the use of evaporation ponds will comply with the specific requirements and objectives found in Appendix A.

Criterion 5A of Appendix A contains specific requirements for the evaporation ponds HRI's application indicates it will utilize.[3] In particular, Criteria 5A(1) and 5A(2) contain specific requirements for the liners used in the design and construction of evaporation ponds, Criterion 5A(4) contains specific requirements for the design, construction, maintenance, and operation of the ponds generally, and Criterion 5A(5) contains specific requirements for the design, construction, and maintenance of dikes, if they are to be utilized in the design of the ponds. HRI's explication of its plan to use evaporation ponds falls far short of clearly demonstrating how the requirements and objectives set forth in Criterion 5A of Appendix A have been addressed. The full extent of HRI's plans for evaporation ponds is found in one paragraph

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[3] The requirements of Criterion 5A clearly apply to HRI's proposed evaporation ponds. Appendix A defines "surface impoundment" to mean "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well."

in the COP. COP at 59. The information provides no detail at all regarding design. Its states that approximately 100 acres of double-lined ponds will be required to dispose of the 150 to 250 gpm of liquid wastes that will be produced during restoration; that the aerial evaporative extent required will be approximately 45 acres if a spraying system was installed in the ponds; and that evaporative solids formed at the conclusion of mining and restoration will be disposed appropriately. Id. HRI sums up its plans for evaporation ponds by stating that "[v]olume reduction by solar evaporation from ponds will generally be used for all waste streams." Id.

As mentioned previously, Criteria 5A(1) and 5A(2) enumerate specific requirements for liners of all surface impoundments, including evaporation ponds. Criterion 5A(1) requires that all surface impoundments "have a liner that is designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil, ground water, or surface water at any time during the active life of the impoundment." Criterion 5A(2) elaborates that the liner must be constructed of "materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients. . . , physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation." Although Criterion 5A(3) allows for exemptions from the requirements of Criteria 5A(1) and (2), an applicant must still show an alternate design and operating plan that will prevent the migration of any hazardous constituents into ground water or surface water at any future time. HRI's application fails to address any of the specific requirements in any of the criteria. It fails to mention the type of liner it will use in the evaporation ponds, the material out of which it will be made, how the liner will prevent migration of wastes out of the evaporation ponds, or what alternatives HRI will use if it intends

to use liners not in compliance with Criterion 5A(1).[4]

Similarly, HRI has failed to comply with the requirements of Criteria 5A(4) and (5) and provide any specific details concerning its plans for the design, construction, maintenance, and operation of any evaporation ponds it will use at the CUP. Criteria 5A(4) requires that surface impoundments "must be designed, constructed, maintained and operated to prevent overtopping resulting from normal or abnormal operations, overfilling, wind and wave actions, rainfall or run-on; from malfunctions of level controllers, alarms, and other equipment; and from human error." This absence of any detail regarding evaporation ponds made HRI's application defective and should have compelled NRC to deny the application.

**2. HRI's application failed to provide sufficient information concerning its plan to utilize surface water discharge as a means of liquid waste disposal as required by Criterion 8 of Appendix A.**

In order to use surface water discharge as a method of liquid waste disposal, HRI must have clearly demonstrated in its application that it will conform with the applicable provisions of Criterion 8 of Appendix A, which incorporates by reference 40 C.F.R. Part 440. Criterion 8 states in relevant part:

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[4] It should be pointed out that HRI does discuss surface impoundment liners in the COP in the section on retention ponds. See COP at 28-29. Because of the inherent differences between retention ponds and evaporation ponds, it cannot be assumed that the details HRI provides regarding its plans to use retention ponds apply to evaporation ponds. First, retention ponds are used for a different purpose than evaporation ponds. "The purpose of retention ponds is to store waste, or restoration water until treatment. . . ." Id. at 29. This purpose differs markedly from that of evaporation ponds, which are intended to handle the final disposition of liquid wastes. Second, HRI in its application materials does not conclude that it will utilize evaporation ponds for liquid wastes or that the standards for liners mentioned in its discussion of retention ponds applies to evaporation ponds.

> Uranium and thorium byproduct materials must be managed so as to conform to the applicable provisions of Title 40 of the Code of Federal Regulation, Part 440, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory," as codified on January 1, 1983.

10 C.F.R. Part 40, App. A, Criterion 8. The liquid wastes that will be produced from the uranium recovery process at the CUP are "process wastewater" within the meaning of 40 C.F.R. § 440.32(b) since they are from "mill-mine facilities and mines using in-situ leach methods."[5] Such liquid wastes must conform to specific concentration limits. Because the CUP qualifies as a "new source" since it will be constructed after December 3, 1982. see id. at § 122.2, HRI must have shown in its application materials that there will be no discharge of process wastewater to navigable waters from the Crownpoint processing plant. See id. § 440.34(b)(2). HRI has failed to do this. HRI's discussion on surface water discharge as a means for liquid waste disposal is even more superficial than its discussion regarding evaporation ponds. Its application is devoid of any discussion of limitation of discharge of process wastewater to navigable waters if surface discharged is to be used as an liquid waste disposal option. The COP simply states that HRI must acquire an EPA permit to surface discharge wastewater. COP at 54-55. Although the discharge limits set in 40 C.F.R. Part 440 are used in obtaining a NPDES permit, Criterion 8 of Appendix A requires more: it compels HRI specifically to address in its application how it can meet these concentration limits. This HRI simply does not do. Consequently, its application for a materials license failed to meet the requirements of 10 C.F.R. § 40.31(h).

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[5] Such liquid wastes are described as "process wastewater" in the Staff Technical Position at 5 and Appendix at A-1 (citing 40 C.F.R. Part 440, Subpart L, and 47 Federal Register 54604).

### 3. HRI's application failed to provide sufficient information concerning its plans to utilize deep disposal wells as a means of disposing of liquid waste as required by Criterion 7A of Appendix A.

HRI mentions that the use of deep disposal wells is "[t]he most cost-effective method for disposal of waste water, and brines from in situ leach mining," COP at 57, but stops short of committing to the method's use at the CUP or of even articulating a plan of any detail for its proposed use. The Final Environmental Impact Statement to Construct and Operate the Crownpoint Uranium Solution Mining Project, Crownpoint, New Mexico, NUREG-1508 ("FEIS") [Notebook No. 10, Acc. No. 9703200270, 2/28/97]) indicates that HRI must provide some level of detail regarding its plans. It states that "[t]o be allowed to conduct deep well disposal, HRI would be required to submit information to NRC in a license amendment application, as per 10 C.F.R. § 20.2002, detailing the operations and hazards of the proposed deep well." FEIS at 4-87. In addition, HRI was obligated to include in its license application materials any information concerning its plans to utilize deep well disposal as a liquid waste disposal option at the CUP the submittal of which is mandated by Appendix A.

Particularly applicable is Criterion 7A of Appendix A, which requires that a licensee establish a detection monitoring program in order to detect leakage of hazardous constituents from the disposal area, and, if leakage is detected, to generate data and information needed for the NRC to establish groundwater protection standards pursuant to Criterion 5B of Appendix A. 10 C.F.R. Part 40, App. A, Criterion 7A. HRI's disposal well option involves injection of liquid wastes into a deep well. COP at 57-58. HRI concedes that, before it can use this method of liquid waste disposal, "confinement from overlying fresh water aquifers must be demonstrated." Id. at 57. The NRC requires that proposals for deep well disposal

> must also demonstrate that the injection zone is confined, that it is not a drinking water source, and that the injected contaminants will not cause exceedence of any established site-specific ground-water protection standards in the uppermost aquifer or result in any cross contamination that would adversely impact another zone that is a source of drinking water.

Staff Technical Position at 7. Given such concerns, HRI's use of the deep well disposal option must comply with the requirements of Criterion 7A. However, as with all the other liquid waste disposal options mentioned by HRI, no detailed plan is provided, least of all a description of a monitoring program to comply with Criterion 7A. Absent the required information in its application, HRI, if it ultimately chooses to integrate the deep well disposal option into its operations at the CUP, must seek a license amendment pursuant to 10 C.F.R. § 20.2002.

**4. HRI's application failed to provide sufficient information concerning its plans to utilize land application as a means of disposing of liquid waste as required by Criterion 7A of Appendix A.**

The requirements of Criterion 7A concerning the establishment of a detection monitoring program apply with equal force to land application as well as to deep well disposal. Because HRI failed to provide in its application materials any detailed information regarding its plan to establish such a system in conjunction with its use of land application as method of liquid waste disposal, it failed to satisfy the requirements of 10 C.F.R. § 40.31(h). [6]

As with deep well disposal, HRI discusses land application only as a possible option for liquid waste disposal, but fails to elaborate any plans about how it will utilize land application at the CUP. The NRC itself appears to recognize that HRI's plans regarding land application fall short of the mark. The FEIS states that "HRI did not submit a detailed plan for land application

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[6] See note 1, supra.

and would need to submit a detailed license amendment in the future to use land application for wastewater." FEIS at 4-80.[7]

Although HRI mentions four possible options for liquid waste disposal, it failed to elaborate upon any of them with sufficient specification in its application materials to satisfy the requirements of section 40.31(h) and Appendix A. By issuing HRI a materials license without requiring that it first submit all requisite information, the NRC has abdicated its responsibility under the Act and the Part 40 regulation and failed to ensure that the license will adequately protect human health and safety and the environment.

## II. THE LICENSE FAILS TO ADEQUATELY PROTECT HUMAN HEALTH AND SAFETY AND THE ENVIRONMENT BECAUSE IT DOES NOT CONTAIN SPECIFIC FREEBOARD RESTRICTIONS FOR SURFACE IMPOUNDMENTS.

Notwithstanding HRI's failure to submit in its license application the specific information regarding its waste disposal plans required by section 40.31(h) and Appendix A, the NRC did impose conditions in the license in an attempt to ensure that, whatever HRI's waste disposal plans might be, human health and safety and the environment are adequately protected. For example, LC 10.5 requires HRI to install a leak detection monitoring system in all retention ponds and to monitor and document, on a daily basis, "pond freeboard and fluid levels in the leak detection system. . . ." Materials License SUA-1508 at 5. These requirements appear intended to ensure that retention pond liner leaks are quickly discovered and remedied.

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[7] The FEIS also points out that "[t]he land application option would only be used for mine wastewater resulting from restoration activities at each of the facilities," id., making it clear that, whatever, HRI's proposal, land application is not an option for liquid wastes resulting from production bleed, wastewater from yellowcake processing, and reject brine from reverse osmosis treatment of contaminated water.

While LC 10.5 hopefully will prevent any serious excursions of liquid waste through the retention pond liners, the license contains no condition calculated to ensure that liquid waste does not enter the environment by spilling over the top of the retention ponds. Ms. Sam and Ms. Morris contend that the license fails to adequately protect human health and safety and the environment, and thus violates 10 C.F.R. § 40.32 (c) and (e), in the absence of such a specific license condition.

The Part 40 regulations specifically state that "[a] surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal to abnormal operations, overfilling, wind and wave actions, rainfall, or run-on; from malfunctions of level controllers, alarms, and other equipment; and from human error." 10 C.F.R. Part 40, App. A, Criterion 5A(4). HRI failed to submit any information in its license application detailing how it plans to ensure compliance with the requirements of Criterion 5A(4). Considering that the NRC still issued the license in the absence of such information,[8] Ms. Sam and Ms. Morris believe it is absolutely necessary that the license impose a condition mandating a minimum amount of freeboard at the top of every surface impoundment which HRI ultimately uses in its operation. Other NRC-licensed ISL extraction facilities of which Ms. Sam and Ms. Morris are aware must comply with specific freeboard requirement for all surface impoundments utilized in their operations. See, e.g., COGEMA Mining, Inc., Materials License SUA-1341, Amendment No. 45, December 24, 1996, section 34 (attached as exhibit 2); Power Resources, Inc., Materials License SUA-1511, August 23, 1995, section 10.6 (attached as exhibit 3); Crow

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[8] As discussed in Part I, infra, Ms. Sam and Ms. Morris contend that the NRC's issuance of the license in the absence of such information violates 10 C.F.R. Part 40.

Butte Resources, Inc, Materials License SUA-1534, Amendment No. 1, May 8, 1998, section 10.6 (attached as exhibit 4) . Ms. Sam and Ms. Morris are unaware of any factors in the record here justifying the absence of a similar condition in HRI's license; on the contrary, such a license condition is all the more compelled by HRI's failure to provide in its application materials the specific information regarding surface impoundments required by 10 C.F.R. § 40.31(h) and Appendix A. Thus, if the Presiding Officer is not convinced that the NRC issued the license to HRI in violation of its own regulations and lets its issuance stand, Ms. Sam and Ms. Morris alternatively request a finding that the license violates 10 C.F.R. § 40.32 because it fails to contain specific freeboard requirements for surface impoundments.

## III. THE LICENSE FAILS TO ADEQUATELY PROTECT HUMAN HEALTH AND SAFETY AND THE ENVIRONMENT BECAUSE IT ALLOWS HRI TO ACCUMULATE 11(e)2 BYPRODUCT MATERIAL ON SITE FOR UP TO THREE MONTHS IN THE ABSENCE OF AN AGREEMENT WITH A WASTE DISPOSAL FACILITY THAT WILL ENSURE THE PROPER DISPOSAL OF SUCH MATERIAL.

It "is a standard requirement at all NRC-licensed ISL extraction facilities" that the licensee "have an agreement for the disposal of 11e(2) by-product material with a facility licensed to accept such material." FEIS at 2-14. Consistent with this requirement, the NRC included LC 9.6 in HRI's materials license. LC 9.6 states:

> The licensee shall dispose of 11e(2) byproduct material from the Crownpoint Project at a waste disposal site licensed by the NRC or an Agreement State to receive 11e(2) byproduct material. At each project site, the licensee shall maintain an area within the restricted area boundary for storing contaminated materials prior to their disposal. The licensee's approved waste disposal agreement must be maintained on-site. Should this agreement expire or be terminated, the licensee shall notify the NRC pursuant to LC 12.6. A new agreement shall be ratified within 90 days of expiration or termination of the previous agreement, or the license will be prohibited from further lixiviant injection.

Materials License SUA-1508 at 3. Ms. Sam and Ms. Morris contend that this license condition fails to adequately protect human health and safety and the environment by expressly allowing HRI to accumulate byproduct material for up to three months in the absence of an agreement with a licensed waste disposal facility that will ensure the proper disposal of such material. Ms. Sam and Ms. Morris believe this is especially true in light of the fact that neither the FEIS, the COP, nor the Safety Evaluation Report ("SER") [Notebook No. 10.3, Acc. No. 9709050033, 8/28/97], discuss the amount of such waste that the CUP will generate, how it will be stored pending ultimate disposal, and to what extent it poses a radiological hazard.

Aside from identifying the existence of such material and the need to dispose of it off-site, FEIS at 2-14, and proposing the restriction that became LC 9.6, id. at 4-88, the FEIS makes no attempt to characterize potential impacts the prolonged accumulation of byproduct material on-site might have on human health and safety and environment. Perhaps most notable is the FEIS's response to several commenters concerned about this very issue:

> There are no prescriptive restrictions on the volume or time limit HRI could store 11e(2) by-product material on-site before shipment to an off-site disposal facility. ISL facilities typically generate small volumes of 11e(2) by-product material. HRI would be required by the NRC license condition to maintain an arrangement at a licensed facility for the disposal of 11e(2) by-product material or cease lixiviant injection. The timing of waste shipments would be determined by HRI and is generally dictated by the economies of transportation and the need to keep worker exposure as low as reasonably achievable.

Id. at A-12. What this response reveals is the NRC's failure to consider how 11e(2) byproduct material would or should be stored pending its transfer to an off-site facility, as well as what precautions ought to be taken during such storage to ensure that human health and safety and the environment are adequately protected. The COP, HRI's master plan for its operation of the CUP,

similarly fails to discuss this issue at all. See COP at 17, 51-60. So too is the SER silent. Besides stating that "[c]ontaminated materials would be stored adjacent to the waste retention ponds prior to shipment for disposal," SER at 29, it contains nothing even remotely indicating that human health and safety and the environment will be adequately protected in the event HRI's waste disposal agreement expires or is terminated and HRI is forced to accumulate 11e(2) byproduct material on-site for as long as three months. In short, the record fails to support the 90-day window LC 9.6 gives HRI to obtain a new waste disposal agreement and thus issuance of the license violated 10 C.F.R. § 40.32.

## CONCLUSION

For the reasons herein stated, Intervenors Grace Sam and Marilyn Morris hereby request that the Presiding Officer revoke the materials license issued to HRI on January 5, 1998, on the grounds that it fails to adequately protect human health and safety and the environment because the license application failed to comply with the requirements of the Act and Part 40 regulations. Alternatively, Ms. Sam and Morris request that the Presiding Officer impose additional specific license conditions regarding freeboard restrictions in surface impoundments and the length of time HRI may continue mining operations without an active agreement with a licensed waste disposal facility to ensure that the license adequately protects human health and safety and the environment pursuant to 10 C.F.R. § 40.32.

Dated: November 9, 1998

Respectfully submitted,

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# Staff Technical Position

on

# Effluent Disposal at Licensed Uranium Recovery Facilities

Division of Waste Management
U. S. Nuclear Regulatory Commission

April, 1995

Exhibit 1

REVISION 0



D103

Staff Technical Position
on
Effluent Disposal
at Licensed Uranium Recovery Facilities

## Background

NRC-licensed uranium recovery facilities, including milling and in situ leach (ISL) facilities, generate liquid wastes (i.e., effluent) that require proper disposal. At uranium mills, effluent may include contaminated water recovered from ground-water corrective action programs and tailings dewatering activities, and tailings liquor that must be extracted and properly disposed of before surface site reclamation can proceed.

At ISL facilities, effluent is generated from four liquid waste streams: Two involving the host aquifer and the other two originating at the main uranium recovery plant. Liquid waste streams involving the host aquifer include production bleed and ground-water sweep. Production bleed is ground water extracted from the aquifer during the uranium recovery operation, in excess of injected water, in order to maintain a net ground-water inflow into the recovery zone and minimize or eliminate the migration of lixiviant and dissolved uranium outside the recovery zone. Ground-water sweep is ground water extracted at the end of a uranium recovery operation primarily to restore ground-water quality in the recovery zone. Liquid waste streams originating at the main uranium recovery plant include wastewater from yellowcake processing and reject brine from reverse osmosis treatment of contaminated water.

Evaporation has generally been used for management of liquid waste at licensed uranium mills and mill tailings disposal sites. This practice involves discharging liquid waste in one or more on-site lined evaporation ponds where the water is lost to the atmosphere by surface evaporation and other evaporation enhancement systems, and the remaining sludge is placed in a licensed tailings disposal facility. At ISL facilities, management of liquid waste has generally involved such disposal practices as release to surface waters, on-site land applications including on-site irrigation, and injection in deep wells.

## Purpose and Applicability

This Staff Technical Position (STP) provides guidance and discusses the technical and regulatory basis for review and evaluation of proposals for disposal of liquid waste at licensed uranium recovery facilities. The STP is primarily intended to guide NRC staff reviews of site-specific proposals for disposal of liquid waste at uranium mills and ISL facilities. The STP can also be used for preparation of proposals for liquid waste disposal by uranium recovery licensees and applicants.

This STP is applicable to both licensed and new facilities. Previously

approved limits at licensed sites that may not conform to the applicable regulations can be changed by a site-specific license amendment.

## Applicable Regulation and Standards

In general, applications and proposals for disposal of liquid waste at licensed uranium recovery facilities must comply with the regulations in Appendix A to 10 CFR Part 40, and Subparts K and D, 10 CFR Part 20, as applicable depending on the proposed disposal procedure. All terms and characterizations in this STP are to be used consistent with their definitions in the applicable regulations.

Applicable regulations in Appendix A to 10 CFR Part 40 mainly include design standards for construction, maintenance, and operation of surface impoundments that are used for disposal of liquid waste or waste containing free liquids (Criteria 5A(1) through 5A(5)); installation of liners (Criterion 5E); and seepage control (Criterion 5F). Appendix A also includes other generally applicable provisions, including in particular site-specific ground-water protection standards for both radioactive and non-radioactive hazardous constituents (Criteria 5B and 5C); corrective action programs (Criterion 5D); ground-water monitoring requirements (Criterion 7); and closure requirements (Criterion 6).

Furthermore, Criterion 8 of Appendix A to 10 CFR Part 40 requires that byproduct materials must be managed so as to conform to the applicable EPA regulations in 40 CFR Part 440, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory," as codified on January 1, 1983. These regulations provide technology-based limitations for disposal of wastewater from uranium mining and milling facilities by release in surface waters.

Byproduct material disposal under Part 20 requires compliance with the applicable regulations in 10 CFR Part 20, Subpart K (§20.2001, §20.2002 and §20.2007), and Subpart D (§20.1301 and §20.1302). Subpart K offers provisions for byproduct material disposal by "release in effluents" (§20.2001), or other disposal methods proposed by the licensee (§20.2002). Among other requirements, the provisions in §20.2001 and §20.2002 require compliance with the radiation dose limits for individual members of the public in §20.1301, and a demonstration of compliance with these limits as provided in §20.1302.

The dose limits in §20.1301 include the total effective dose equivalent to individual members of the public (0.1 rem/year), as well as the dose in any unrestricted area from external sources in any one hour (0.002 rem in any one hour) (§20.1301 (a) and (b)). In addition, the regulations allow a licensee to apply for Commission authorization in advance to operate up to an annual dose limit for an individual member of the public (0.5 rem), which the Commission may generally authorize on a temporary basis or under special circumstances involving existing facilities (those designed prior to January, 1994), subject to the requirements in §20.1301 (c) (1), (2), and (3). The

regulations also require (in §20.1301 (d)) that licensees who are subject to the provisions of U.S. Environmental Protection Agency's (EPA) generally applicable environmental standards in 40 CFR Part 190 shall comply with these standards. In some cases, the Commission may impose additional restrictions on radiation levels and on the total quantity of radionuclides that may be released in effluents in order to restrict the collective dose at a particular site (§20.1301 (e)).

In order to demonstrate compliance with the dose limits for individual members of the public in §20.1301, licensees and applicants must do so according to the provisions of §20.1302, which require that licensees:

> (a) demonstrate compliance with the dose limits for individual members of the public by conducting surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas; and,
>
> (b) show compliance with the annual dose limit by demonstrating, by measurement or calculation, that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed operation does not exceed the annual dose limit; OR, by demonstrating that the annual average concentrations of released radioactive materials do not exceed the effluent concentration values (for water) provided in Table 2 of Appendix B to §20.1001-§20.2401 and that the dose from external sources to a continuously exposed individual would not exceed the established standard (0.002 rem/hour and 0.05 rem in a year).

The provisions of §20.1302 also allow licensees, upon approval by the Commission, to adjust the effluent concentration values in Table 2 of Appendix B to §20.1001-§20.2401 for members of the public to take account of the actual characteristics of effluent that will be released (§20.1302 (c)).

The provisions in §20.2007 require that licensees and applicants must also comply with other applicable federal, state, and local environmental and health protection regulations governing any other toxic or hazardous properties of licensed materials disposed of under Part 20, Subpart K.

In addition to the above requirements, licensees and applicants considering disposal of licensed materials under the provisions of either §20.2001 or §20.2002 are further required to comply with NRC's regulatory provisions for decommissioning of licensed facilities, prior to facility closure and license termination. These provisions include the interim cleanup criteria presently in use, and those specified in the final rule when the final rule is promulgated (the proposed radiological criteria for decommissioning are provided in the proposed rule in 10 CFR Part 20, Subpart E: §20.1401 through §20.1405, FR Vol 59, No. 161, page 43228, dated August 22, 1994).

**Proposal Review and Evaluation Criteria**

In general, licensees of uranium recovery facilities are required to submit proposals for disposal of liquid waste, and obtain NRC's approval of the

proposed procedures. Proposals will be approved on a site-specific basis by NRC staff based on demonstrated compliance with all of the applicable regulations.

Proposal review and evaluation criteria that will be used by the staff are discussed in the following paragraphs for four disposal procedures that have been in practice or proposed at licensed uranium recovery facilities. These include: on-site evaporation; release in surface waters; on-site land applications; and injection in deep wells.

On-Site Evaporation

In accordance with Appendix A, 10 CFR Part 40, proposals for on-site evaporation systems must demonstrate that the proposed disposal facility is designed, operated, and closed in a manner that prevents migration of waste from the evaporation systems to a subsurface soil, ground water, or surface water. In addition, applicants must demonstrate that site-specific ground-water protection standards and monitoring requirements are adequately established to detect any migration of contaminants to the ground water and to implement corrective action to restore ground-water quality if and when necessary as required by the regulations.

Evaporation pond systems will be approved if they comply with the regulatory requirements in Appendix A, 10 CFR Part 40. These mainly include the design provisions for surface impoundments (Criteria 5A(1) through 5A(5)); installation of liners (Criterion 5E); and seepage control (Criterion 5F). In addition, evaporation ponds must also meet other generally applicable regulatory provisions in Appendix A, including in particular the site-specific ground-water protection standards (Criteria 5B and 5C); corrective action programs (Criterion 5D); ground-water monitoring requirements (Criterion 7); and closure requirements (Criterion 6).

Release in Surface Waters

Proposals for release of liquid waste in surface waters must demonstrate compliance with the provisions of §20.2001 and §20.2007, and the provisions of 40 CFR Part 440 as required by Criterion 8 of Appendix A to 10 CFR Part 40, as applicable based on site-specific conditions.

Specifically, release in surface waters must meet the regulatory provisions in §20.2001 (a)(3), which requires that licensees comply with the dose limits for individual members of the public in §20.1301. In order to demonstrate compliance with the dose limits for individual members of the public in §20.1301, licensees and applicants must do so according to the provisions of §20.1302 (The provisions of §20.1301 and §20.1302 have already been discussed under Applicable Regulations).

Licensees and applicants must also comply with other applicable federal, state, and local environmental and health protection regulations governing any other toxic or hazardous properties of licensed materials disposed of under Part 20, Subpart K, pursuant to the provisions in §20.2007.

Compliance with Criterion 8 of Appendix A to 10 CFR Part 40 requires conformance to the provisions in 40 CFR Part 440, as applicable. These regulations provide technology-based effluent limitations for existing point sources, in §440.32 and §440.33) and new source performance standards (NSPS), in §440.34, promulgated by EPA under the Clean Water Act. Licensees must demonstrate compliance with these EPA regulations and standards, as applicable, including the obtaining of a National Pollutant Discharge Elimination System (NPDES) permit issued or approved by the EPA.

The regulatory provisions and requirements for release of liquid waste under a NPDES permit are outside the scope of this technical position; however, specific effluent limitations and standards in 40 CFR Part 440 (§440.30 through §440.34) that are applicable to discharges from mills and ISL uranium recovery facilities are provided and briefly discussed in an appendix to this STP.

As indicated in the appendix, there is a distinction in 40 CFR Part 440 Subpart C (i.e., NPDES standards) between "process wastewater" and "mine wastewater" with respect to ISL facilities. "Process wastewater" is wastewater and liquid waste generated from uranium recovery operations; it includes production bleed or ground water extracted from the aquifer during the uranium recovery operation, and liquid waste generated at the main uranium recovery plant. "Mine wastewater" is wastewater from post-operation ground water sweep, or ground water extracted to restore water quality in the recovery zone after a uranium recovery operation is stopped.

NPDES effluent limitations in 40 CFR 440 that are applicable to NRC licensed facilities are provided in the appendix in Tables A1 and A2. The effluent limitations in Table A1 are applicable to mills, including "process wastewater" from ISL facilities. The effluent limitations in Table A2 are applicable to mines, including "mine wastewater" from ISL facilities.

Staff notes that NRC's ISL licensees must comply with the NPDES effluent limitations for uranium in Table A2, which applies to existing mines, including "mine wastewater" from ISL facilities; this is because mines and "mine wastewater" are not covered by NRC regulations in Part 20. However, there is no such standard for uranium in Table A1, which applies to existing mills, including "process wastewater" from ISL facilities; licensees must in this case comply with the provisions in 10 CFR Part 20, Subpart K (i.e., meet the dose limits for individual members of the public pursuant to §20.1301 and other requirements to satisfy the provisions in Subpart K). Moreover, the NPDES effluent limitations for certain non-radioactive constituents for release of "process wastewater" may be different from those for release of "mine wastewater" (e.g., the effluent limitations for the chemical oxygen demand or COD in Tables A1 and Table A2, for example).

Therefore, ISL licensees proposing to dispose of byproduct material by release in effluents may need to satisfy different standards, depending on whether the disposal involves releasing a "process wastewater" or a "mine wastewater." Consequently, licensed ISL facilities that involve commingling of "process wastewater" and "mine wastewater" in an interim common storage facility (i.e., storage reservoir) before the wastewater is released in surface waters have

two alternative options to satisfy the regulations. Under the first option, a licensee would monitor the incoming wastewater by source and meet the corresponding effluent limitations separately for "process wastewater" and "mine wastewater" at their respective points of discharge into the interim storage facility. If both input streams were within the appropriate effluent release limits, the licensee would be free to release the wastewater from the storage facility. In the second option, a licensee would not monitor the input streams, and would need to meet the applicable standard in 10 CFR Part 20 before releasing the commingled wastewater in surface waters.

Licensees and applicants disposing effluent by release in surface waters are further required to comply with NRC's regulatory provisions for decommissioning, prior to facility closure and license termination (decommissioning requirements have already been discussed under Applicable Regulations and Standards).

Land Applications

Proposals for disposal of liquid waste by on-site land applications, including irrigation, will be approved under the provisions of §20.2002. Licensees must in this case provide a description of the waste, including its physical and chemical properties that are important to risk evaluation; the proposed manner and conditions of waste disposal; an analysis and evaluation of pertinent information on the nature of the environment; information on the nature and location of other potentially affected facilities; and analyses and procedures to ensure that doses are maintained As Low As Reasonably Achievable (ALARA) and within the dose limits in Part 20 (i.e., §20.1301).

Proposals must analyze and assess projected concentrations of radioactive contaminants in the soil; projected impacts on ground-water and surface water quality, and on land uses including particularly crops and vegetation; and projected exposures and health risks that may be associated with radioactive constituents reaching the food chain to verify that the projected doses and risks conforming to the risk levels permitted under Part 20. It is expected that proposals include provisions for periodic soil surveys that include contaminant monitoring to verify that the contaminant levels in the soil do not exceed those projected, and a remediation plan that can be implemented in the event that the projected levels are exceeded.

In addition to the radiation dose, it may also be necessary in some cases to conduct analyses to assess the chemical toxicity of radioactive and non-radioactive constituents in order to evaluate the health risks associated with land applications involving irrigation at particular sites, in compliance with other applicable Federal, State, and local environmental and health protection regulations that must also be satisfied pursuant to §20.2007. Staff will work with appropriate State and Federal agencies if necessary to review site-specific chemical toxicity evaluations, and to verify that any necessary permits for this purpose are secured as warranted by the applicable regulations.

In the absence of compliance monitoring wells in the uppermost aquifer in the area used for effluent disposal or for installation of land application

systems including temporary surface storage facilities, proposals must demonstrate that contaminants will not be returned to the ground water and cause exceedence of any site-specific ground-water protection standards that are established pursuant to Appendix A of 10 CFR Part 40.

Licensees and applicants disposing effluent by on-site land applications are further required to comply with NRC's regulatory provisions for decommissioning, prior to facility closure and license termination (decommissioning requirements have already been discussed under Applicable Regulations and Standards).

Deep-Well Injection

Proposals for disposal of liquid waste by injection in deep wells must meet the regulatory provisions in §20.2002. Specifically, proposals must in this case include a description of the waste, including its physical and chemical properties that are important to risk evaluation; the proposed manner and conditions of waste disposal; an analysis and evaluation of pertinent information on the nature of the environment; information on the nature and location of other potentially affected facilities; and analyses and procedures to ensure that doses are ALARA, and within the dose limits in Part 20 (i.e., §20.1301).

Proposals must also demonstrate that the injection zone is confined, that it is not a drinking water source, and that the injected contaminants will not cause exceedence of any established site-specific ground-water protection standards in the uppermost aquifer or result in any cross contamination that would adversely impact another zone that is a source of drinking water. If necessary and warranted by site conditions, proposals may include provisions for periodic ground-water monitoring in the vicinity of the injection well to verify that drinking water zones are free from cross contamination, and a remediation plan that can be implemented in the event that unacceptable levels of contamination are detected.

In addition, pursuant to the provisions of §20.2007, proposals for disposal by injection in deep wells must also meet any other applicable Federal, State, and local government regulations pertaining to deep well injection, and obtain any necessary permits for this purpose. In particular, proposals must satisfy the EPA's regulatory provisions in 40 CFR Part 146: Underground Injection Control (UIC) Program: Criteria and Standards, and obtain necessary permits from the EPA and/or States authorized by EPA to enforce these provisions. In general, proposals that satisfy the EPA regulations under the UIC program will be approved by NRC staff.

Licensees and applicants disposing effluent by injection in deep wells are further required to comply with NRC's regulatory provisions for decommissioning, prior to facility closure and license termination (decommissioning requirements have already been discussed under Applicable Regulations and Standards).

Appendix

Summary
Effluent Limitations and Standards Applicable to NRC Licensed Facilities in 40 CFR Part 440: "Ore Mining and Dressing Point Source Category, Subpart C, Uranium, Radium and Vanadium Ores Subcategory"

Since the NRC does not regulate conventional mining, the effluent limitations in 40 CFR Part 440 pertaining exclusively to conventional mines are not applicable to NRC licensed facilities and will not be provided or discussed in this summary.

There is a distinction in 40 CFR Part 440 Subpart C between "process wastewater" and "mine wastewater" with respect to in situ leach (ISL) facilities (see 40 CFR Part 440, Subpart L, and 47 FR 54604). "Process wastewater" is wastewater and liquid waste generated from uranium recovery operations; it includes production bleed or ground water extracted from the aquifer during the uranium recovery operation, and liquid waste generated at the main uranium recovery plant. "Mine wastewater" is wastewater from post-operation ground water sweep, or ground water extracted to restore water quality in the recovery zone after a uranium recovery operation is stopped.

Effluent limitations in 40 CFR 440 that are applicable to NRC licensed facilities are provided in Tables A1 and A2. The effluent limitations in Table A1 are applicable to mills, including "process wastewater" from ISL facilities. Effluents from existing mills, including "process wastewater" from existing ISL facilities, applying the best practicable control technology currently available (BPT) shall not exceed the attainable effluent limitations provided in Table A1.

The effluent limitations in Table A2 are applicable to mines, including "mine wastewater" from ISL facilities. Existing mines, including "mine wastewater" from ISL facilities, applying the best available technology economically achievable (BAT) shall not exceed the attainable effluent limitations provided in Table A2.

In addition to the above, the new source[1] performance standards (40 CFR Part §440.34(b)) stipulate that for new sources there shall be no discharge of process wastewater to navigable waters from mills using the acid leach, alkaline leach or combined acid and alkaline leach process for the extraction of uranium or from mines and mills using ISL methods. These regulations further stipulate that in the event that the annual precipitation falling on

[1] Pursuant to the definition of "new sources" in 40 CFR 122.2, "new" uranium recovery facilities as they pertain to the regulations in 40 CFR Part 440 are those the construction of which commenced after December 3,1982, which is the date when the effluent standards relevant to uranium recovery were first issued. "Existing" facilities are those the construction of which commenced before December 3, 1982.

the treatment facility and the drainage area contributing surface runoff to the treatment facility exceeds the annual evaporation, a volume of water equivalent to the difference between these two values may be discharged subject to the limitations set forth above.

In that the effluent limitations and standards in 40 CFR Part 440 are based on technology-based treatment requirements, effluent limitations and standards at specific sites will be imposed based on approved treatment technology on a site-specific basis by the EPA. Treatment technology would be approved for specific sites based on the regulatory provisions in 40 CFR Part 125: Criteria and Standards for the National Pollutant Discharge Elimination System; Subpart A: Criteria and Standards for Imposing Technology Based Treatment Requirements Under Sections 301 (b) and 402 of the Act (i.e. Clean Water Act) (40 CFR Part 125, §125.1 through §125.3).

Table A1
Effluent Limitations Representing the Degree of Effluent Reduction Attainable by the Application of BPT Technology

(Applicable to existing mills, including "process wastewater" from in situ leach facilities)

(Source: 40 CFR Part 440, §440.32(b))

| Effluent Characteristic | Effluent Limitations | |
|---|---|---|
| | Maximum for any One Day | Average of Daily Values for 30 Consecutive Days |
| TSS (mg/l) | 30 | 20 |
| COD (mg/l) | --- | 500 |
| As (mg/l) | 1.0 | 0.5 |
| Zn (mg/l) | 1.0 | 0.5 |
| Ra226 (dissolved); pCi/l | 10 | 3 |
| Ra226 (total); pCi/l | 30 | 10 |
| $NH^3$ (mg/l) | --- | 100 |
| pH | 6.0-9.0 | 6.0-9.0 |

Table A2
Effluent Limitations Representing the Degree of Effluent Reduction Attainable by the Application of BAT Technology

(Applicable to existing mines, including "mine wastewater" from in situ leach facilities)

(Source: 40 CFR Part 440, §440.33(a))

| Effluent Characteristic | Effluent Limitations | |
|---|---|---|
| | Maximum for any One Day | Average of Daily Values for 30 Consecutive Days |
| COD (mg/l) | 200 | 100 |
| Zn (mg/l) | 1.0 | 0.5 |
| Ra226 (dissolved); pCi/l | 10 | 3 |
| Ra226 (total); pCi/l | 30 | 10 |
| U (mg/l) | 4 | 2 |

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# MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

| Licensee | |
|---|---|
| 1. COGEMA Mining, Inc. [Applicable Amendments: 2, 17, 34] | 3. License Number: SUA-1341, Amendment No. 45 |
| 2. P.O. Box 730 Mills, Wyoming 82644 [Applicable Amendments: 2, 14, 18, 34] | 4. Expiration Date: ~~March 31, 1995~~ [Applicable Amendments: 10] |
| | 5. Docket or Reference No.: 40-8502 |

| 6. Byproduct, Source, and/or Special Nuclear Material | 7. Chemical and/or Physical Form | 8. Maximum Amount that Licensee May Possess at Any One Time Under This License |
|---|---|---|
| Uranium | Unspecified | Unlimited |

9. The authorized place of use shall be the licensee's Irigaray and Christensen Ranch Satellite facilities in Johnson and Campbell Counties, Wyoming. [Applicable Amendments: 10]

10.1 The licensee shall conduct operations in accordance with the commitments, representations, and statements contained in Sections 3.0 and 4.0 of the Irigaray application dated October 31, 1985, as revised by letters dated July 28, 1987, September 12, 1989, and December 10, 1993 as revised by submittal dated October 30, 1995. Also for use in accordance with statements, representations, and conditions contained in the October 15, 1986, "Restoration and Decommissioning Plan for Malapai Resources Company Christensen Ranch R & D, Willow Creek Project," and in Section 5.0 of the January 5, 1988, Christensen Ranch amendment application revised by the September 12, 1989 submittal, and the December 10, 1993 submittal as revised by the October 30, 1995 submittal. Also for use in accordance with statements, representations, and conditions contained in letters dated November 10, 1994, December 21, 1994, January 12, 1995, and November 3, 1995. Also for use in accordance with portions of the original January 5, 1996, license renewal application submittal as referenced in the final performance based license condition submittal dated December 13, 1996. The above are hereby incorprated by reference except where superseded by license conditions below.

Whenever the word "will" is used in the above referenced sections, it shall denote a requirement.

10.2.

A. The licensee, without prior NRC approval, and subject tc the conditions specified in Part B of this condition, may:



Exhibit 2

(1) Evaluate and commence the operation of new well fields that are within the NRC licensed area using the processes and procedures (including Standard Operating Procedures) presented or referenced in the December 13, 1996, submittal (which revised the November 7, 1996, submittal which revised the original August 30, 1996 request for a performance based license condition amendment.)

(2) Conduct tests or experiments relating to the wellfield development and approval for operation that were not presented in the performance based license condition application dated December 13, 1996.

B. The licensee shall file an application for an amendment to the license, unless the following conditions are satisfied.

(1) The change, test, or experiment, relating to the development, evaluation, or operation of a new wellfield do not conflict with any requirement specifically stated in this license or impair the licensee's ability to meet all applicable NRC regulations.

(2) There is no degradation in the essential safety or environmental commitments made in the license application, or provided by the approved reclamation plan.

(3) The change, test, or experiment relating to the development, evaluation or operation of a new wellfield are consistent with the conclusions of actions analyzed and selected in the Environmental Assessments (EAs) dated September, 1978, and May, 1988.)

C. The licensee's determinations concerning Part B of this condition, shall be made by a "Safety and Environmental Review Panel (SERP)." The SERP shall consist of a minimum of three individuals. One member of the SERP shall have expertise in management and shall be responsible for managerial and financial approval changes; one member shall have expertise in operations and/or construction and shall have responsibility for implementing any operational changes; and, one member shall be the corporate radiation safety officer (CRSO) or equivalent, with the responsibility of assuring changes conform to radiation safety and environmental requirements. Additional members may be included in the SERP as appropriate, to address technical aspects such as health physics, groundwater hydrology, surface-water hydrology, specific earth sciences, and other technical disciplines. Temporary members or permanent members, other than the three above-specified individuals, may be consultants.

D. The licensee shall maintain records of any changes made pursuant to this condition until license termination. These records shall include written safety and environmental evaluations, made by the SERP, that provide the basis for determining changes are in compliance with the requirements referred to in Part B of this condition. The licensee shall furnish, in an annual report to NRC, a description of such changes, tests, or experiments, including a summary of the safety and environmental evaluation of each. In addition, the licensee

shall annually submit to the NRC changed pages to the Operations Plan and Reclamation Plan of the approved license application to reflect changes made under this condition.

[Applicable Amendments: 3, 4, 10, 12, 15, 17, 18, 20, 22, 27, 33, 34, 36, 37, 41, 43, 45]

11. The annual plant throughput shall not exceed 2,500,000 pounds of $U_3O_8$. [Applicable Amendments: 7, 9, 10, 44]

12. Any significant changes in the process circuits as shown in Figure 3.14 of the November 3, 1995, submittal and Figure 3.16 of the September 12, 1989 amendment application, and by letters dated January 12, 1995 and November 3, 1995, shall require U. S. Nuclear Regulatory Commission approval in the form of a license amendment. [Applicable Amendments: 3, 10, 11, 15, 36, 41]

13. Release of equipment or packages from the restricted area shall be in accordance with the attachment to this license entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials," dated September 1984. [Applicable Amendments: 10]

14. The results of effluent and environmental monitoring described in Section 5.7.7 of the Irigaray application as revised by letter dated January 28, 1988, as well as Tables 5.1 and 5.2 of the January 5, 1988, Christensen Ranch amendment application, shall be reported in accordance with 10 CFR 40, Section 40.65, to the NRC. The report shall also include injection rates, recovery rates and injection manifold pressures. [Applicable Amendments: 3, 6, 8, 10]

15. Before engaging in any activity not previously assessed by the NRC, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity may result in a significant adverse environmental impact that was not previously assessed or that is greater than that previously assessed, the licensee shall provide a written evaluation of such activities and obtain prior approval of the NRC in the form of a license amendment.

16. The licensee is hereby exempted from the requirements of Section 20.1902(e) of 10 CFR 20 for areas within the facility, provided that all entrances to the facility are conspicuously posted in accordance with Section 20.1902(e) and with the words, "Any area within this facility may contain radioactive material." [Applicable Amendments: 36]

17. The results of sampling, analyses, surveys and monitoring, the results of calibration of equipment, reports on audits and inspections, all meetings and training courses required by this license and any subsequent reviews, investigations and corrective actions, shall be documented. Unless otherwise specified in the NRC regulations, all such documentation shall be maintained for a period of at least 5 years.

18. Standard operating procedures (SOPs) shall be established for all operational process activities involving radioactive materials that are handled, processed or stored. Standard operating procedures for operational activities shall enumerate pertinent radiation safety practices to be followed. Additionally, written procedures shall be established for nonoperational activities to include in-plant and environmental monitoring, bioassay analyses and instrument calibrations. An up-to-date copy of each written procedure shall be kept in the process area to which it applies.

19. All written procedures for both operational and nonoperational activities shall be reviewed and approved in writing by the RSO (Radiation Safety Officer) before implementation and whenever a change in a procedure is proposed to ensure that proper radiation protection principles are being applied. Additionally, the RSO shall perform an annual documented review of all operating procedures. [Applicable Amendments: 10]

20. The licensee shall use a Radiation Work Permit (RWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written operating procedure exists. All RWPs shall be accompanied by a breathing zone air sample or applicable area air sample. The RWP shall be issued by the RSO or his designee, qualified by way of specialized radiation protection training, and shall at least describe the following:

    A. The scope of the work to be performed.

    B. Any precautions necessary to reduce exposure to uranium and its daughters.

    C. The supplemental radiological monitoring and sampling necessary, prior to, during and following completion of the work.

    [Applicable Amendments: 4, 10]

21. The licensee shall maintain effluent control systems as specified in Section 4.1.2.1 of the Irigaray application with the following additions:

    A. Operations shall be immediately suspended in the dry/pack area of the mill if any of the emission control equipment for the yellowcake drying or packaging areas is not operating within specifications for design performance.

    B. The licensee shall, during all periods of yellowcake drying operations, assure that the scrubber is operating within the manufacturer's recommended ranges for water flow and air pressure differential necessary to achieve design performance. This shall be accomplished by either (1) performing and documenting checks of water flow and air pressure differential approximately every four (4) hours during operation, or (2) installing instrumentation which will signal an audible alarm if either water flow or air pressure differential fall below the manufacturer's recommended levels. If an audible alarm is used, its operation shall be checked and documented daily.

C. Air pressure differential gauges for other emission control equipment shall be read and the readings documented once per shift during operations.

[Applicable Amendments: 10]

22. Occupational exposure calculations shall be performed and documented within one (1) week of the end of each regulatory compliance period as specified in 10 CFR 20.2106(a). Routine radon daughter and particulate samples shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Nonroutine samples shall be analyzed and the results reviewed by the RSO within 2 working days after sample collection.
[Applicable Amendments: 36]

23. The licensee shall complete the decommissioning of the two evaporation ponds at the Willow Creek R & D facility as specified in the "Restoration and Decommissioning Plan for Malapai Resources Company's Christensen Ranch R & D, Willow Creek Project" dated October 15, 1986, prior to beginning mining within the pond area. The licensee will use applicable current NRC guidance for decommissioning such facilities in conducting the radiological surveys addressed in the plan.

The licensee shall submit a detailed decommissioning plan for the Irigary, Christensen Satellite, and any remaining Willow Creek facilities to the NRC at least 12 months prior to planned shutdown of mining operations.

[Applicable Amendments: 14, 37]

24. All liquid effluents from process buildings and other process waste streams, with the exception of sanitary wastes, shall be returned to the process circuit, discharged to the solution evaporation ponds, or disposed of by appropriate NPDES permit.

Additionally, the licensee is authorized to dispose of process solutions, injection bleed, and restoration brine in the following wells:

COGEMA DW No. 1
Christensen 18-3
DW-1
DW-2

The licensee shall maintain a record of the volumes of solution disposed in these wells and submit it in the semiannual monitoring report. [Applicable Amendments: 3, 13, 24, 40]

25. The licensee shall establish baseline water quality data for all production units. Baseline water quality sampling shall provide representative premining groundwater quality data and restoration criteria as described in the approved license application. The data shall be from wells established in the mining zone, the mining zone perimeter, the upper aquifer and the lower aquifer. The data shall, at

a minimum, consist of the sample analyses shown in Table 5.25 of Section 5.8.2.2 of the January 5, 1996, license renewal application.

[Applicable Amendments: 4, 6, 8, 9, 10, 35, 42, 45]

26. The wells used for obtaining baseline groundwater quality in current and future production areas shall be established at the following minimal density:

| Monitored Unit | Density of Wells per Monitored Unit |
|---|---|
| Irigaray Unit 1 Sandstone | 2 |
| Irigaray deep monitor zone | 2 |
| Irigaray perimeter and trend monitor wells (Units 1-9) | 70 percent of installed wells |
| Irigaray and Christensen Ranch ore zone baseline (restoraion) | 1 per acre of pattern area |
| Christensen ore zone monitors | All except MW-33 and MW-34 |
| Christensen shallow zone monitors | 1 well per 3.5 acres of pattern area |
| Christensen deep zone monitors | 1 well per 3.5 acres of pattern area |

Baseline groundwater quality in previously approved production areas shall be the mean data values (wellfield average) from the following submittals:

Irigaray

| | |
|---|---|
| Units 1-5 | April 16, 1990 (refers to WDEQ permit 478) |
| Unit 6 | April 4, 1988 |
| Unit 7 | November 2, 1987 (Table 4) |
| Units 8 and 9 | January 28, 1988 |

Christensen Ranch

| | |
|---|---|
| Unit 3 and Module 2 expansion | December 1, 1988 (Table 2) |
| Unit 3 expansion and Module 4A expansion | August 8, 1991 (Table 6) |
| Unit 2 south portion | November 27, 1992 (Table 2) |
| Unit 2 north portion | April 16, 1992 (Table 2) |
| Unit 4 | April 1, 1994 (Table 6) |
| Unit 5 | February 28, 1995 (Table 7) |

[Applicable Amendments: 6, 8, 10, 11, 12, 21, 22, 29, 31, 34, 35, 38, 45]

27. DELETED by Amendment 6.

28. The licensee shall establish Upper Control Limits (UCL) for each mining unit, prior to operation, in accordance with Section 5.8.2.3 of the January 5, 1996, license renewal application. UCLs shall be applied to all monitor wells in cor ormance with

the original January 5, 1996, license renewal application and appropriate SOPs. The UCL parameters shall be chloride, conductivity, and total alkalinity.

If two UCL values are exceeded in a well, the licensee shall take a confirmation water sample within 48 hours and analyze it for chloride, conductivity, and total alkalinity. If the second sample does not indicate exceedance of two UCLs, a third sample shall be taken within 48 hours. If neither the second or third indicate exceedance of the two UCLs, the first sample shall be considered in error.

If the second or third sample indicates an exceedance of two UCLs, the well in question shall be placed on excursion status and the NRC Operations Center shall be notified at (301) 951-0550 by telephone within 24 hours and within 7 days in writing from the time the confirmation sample was taken. Upon confirmation of an excursion, the licensee shall implement a corrective action and increase the sampling frequency for the excursion indicators to once every 7 days. An excursion is considered concluded when the concentrations of excursion indicators are below the concentration levels defining an excursion for three consecutive 1-week samples.

UCL's for monitor wells established prior to the issuance of this performance-based license condition are provided in Table 5.26 for the Irigaray site, and Table 5.27 for the Christensen Ranch site, in Section 5.8.2.3 of the January 5, 1996 license renewal application.

[Applicable Amendments: 3, 7, 8, 9, 10, 11, 12, 22, 29, 31, 32, 33, 34, 35, 36, 38, 45]

29. In the event that a monitor well is verified to be on excursion status, the NRC Project Manager shall be notified, by telephone within 24 hours and within 7 days in writing from the time the confirmation sample was taken. The report shall describe the excursion event, corrective actions taken and results obtained to date.

    Written progress reports describing the status of the excursion shall on a quarterly basis until the situation has been mitigated.

    [Applicable Amendments: 3, 7, 8, 9, 10, 11, 12, 22, 29, 31, 32, 33, 34, 35, 36, 45]

30. DELETED by Amendment No. 4.

31. The licensee shall perform well integrity tests on each injection and production well before the wells are utilized and on wells that have been serviced. Integrity tests shall be performed in accordance with the January 5, 1996, license renewal application. Any failed well casing that cannot be repaired to pass the integrity test shall be appropriately plugged and abandoned.

    Additionally, injection manifold pressures and flow rates shall be measured and recorded daily. During well-field operations, injection pressures shall not exceed 120 psi, and 140 psi at the Irigaray and Christensen Ranch sites respectively.

Also, during maintenance tasks injection pressures shall not exceed the integrity test pressures.

[Applicable Amendments: 3, 7, 10, 45]

32. The licensee shall utilize a sodium bicarbonate and/or $CO_2$ gas as the lixiviant with an oxygen or hydrogen peroxide oxidant. Any variation from this combination shall require a license amendment. [Applicable Amendments: 7]

33. The licensee shall incorporate the 5I7 and USMT sites into Production Unit 10 as described in Attachment 3 to the October 31, 1988, amendment application. [Applicable Amendments: 5, 7, 9, 11, 13, 26, 34]

34. Solution evaporation ponds A, B, C, D and E shall have a 2 foot freeboard requirement. Ponds RA and RB shall have an 8 foot freeboard requirement. The Christensen Ranch permeate storage ponds, brine ponds and filter backwash pond shall have a 2 foot freeboard. The Willow Creek R&D ponds shall have a 4 foot freeboard.

Additionally, the licensee shall, at all times, maintain sufficient reserve capacity in the evaporation pond system to enable the transfer of the contents of a pond to other ponds. In the event of a leak and subsequent transfer of liquid, the freeboard requirements shall be suspended during the repair period. [Applicable Amendments: 10, 11, 14]

35. The licensee shall perform and document weekly visual inspections of the Irigaray and Christensen Ranch Satellite evaporation pond embankments, fences and liners, as well as measurements of pond freeboard and checks of the leak detection system. Anytime 6 vertical inches or more of fluid is in the leak detection system standpipes, it shall be analyzed for chloride, conductivity, pH and uranium. Should analyses indicate that the pond is leaking, the NRC Operations Center at (301) 951-0550 shall be notified by telephone within 48 hours of verification and the pond level lowered by transferring its contents into an alternate cell. Standpipe water quality samples shall be analyzed for the above parameters once every 7 days during the leak period and once every 7 days for at least 2 weeks following repairs.

A written report shall be filed with the NRC, within 30 days of first notifying the NRC that a leak exists. This report shall include analytical data and describe the mitigative action and the results of that action.

Additionally, the licensee shall perform monthly checks of the Willow Creek R&D ponds. Anytime 12 inches or more of fluid is in the sumps, it shall be analyzed and reported as discussed above. [Applicable Amendments: 4, 10, 14, 36]

36. The licensee shall maintain a log of all significant solution spills and notify the the NRC Operations Center at (301) 951-0550 by telephone within 48 hours of any failure which may have a radiological impact on the environment. Such notification shall be followed, within 7 days, by submittal of a written report detailing the conditions leading to the failure or potential failure, corrective actions taken and

results achieved. This requirement is in addition to the reporting requirements in 10 CFR part 40 and 10 CFR Part 20. [Applicable Amendments: 10, 36, 45]

37. The licensee is authorized to dispose of byproduct material from the Irigaray and Christensen Ranch Satellite facilities at a site licensed by the NRC to receive byproduct material. The licensee shall identify the disposal facility to the NRC in writing. The licensee's approved waste disposal agreement must be maintained onsite. In the event the agreement expires or is terminated, the licensee shall notify the NRC, with 7 working days after the expiration date and identify a new facility. [Applicable Amendments: 19, 34]

38. A. At least 2 months prior to ground-water restoration in a mining unit, the licensee shall submit to the NRC in the form of a license amendment, a plan for ground-water restoration and post restoration monitoring. The goal of restoration shall be to return the ground-water quality, on a production unit average, to baseline concentrations.

B. The licensee shall implement the restoration and well-field decommissioning plan dated April 16, as revised by the figure dated July 9, 1990, and as revised by the October 22, 1993, submittal, subject to the following:

- operate the hydrogen sulfide safety program submitted by cover letter dated April 1, 1991, at all times reductants are onsite.
- conduct the metal precipitant field-scale test described in the December 19, 1991, submittal, with the exception that the precipitant will be utilized in the southern half of mining unit 1. Prior to full-scale utilization of the precipitant, a report describing the test and results shall be submitted to the Chief, Uranium Recovery Branch, Division of Waste Management, NMSS (T-7-J-9), Nuclear Regulatory Commission, 11545 Rockville Pike, Rockville, MD 20850, for review and approval.
- extend the stability monitoring period to a minimum of 9 months.
- exclude Well T-6 from monitoring.

C. The licensee shall implement the restoration and well-field decommissioning plan for Irigaray Units 4-9 dated March 6, 1995, as revised by the submittal dated November 15, 1995.

[Applicable Amendments: 7, 15, 16, 17, 19, 23, 25, 28, 34, 36, 43]

39. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criterion 9, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination, offsite disposal of radioactive solid process or evaporation pond residues, and ground-water restoration as warranted. The surety shall also include the costs associated with all soil and water sampling analyses necessary to confirm the accomplishment of

decontamination. Within 3 months of NRC approval of a revised decommissioning plan, the licensee shall submit for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly approved decommissioning plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within 3 months of written NRC approval. Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criterion 9, shall be provided to the NRC by August 18 in each successive year. Financial surety coverage for the full amount of the NRC-approved decommissioning cost estimate shall not lapse for any time period prior to license termination.

Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a minimum 15 percent contingency, changes in engineering plans, activities performed, and any other conditions affecting estimated costs for site closure. The licensee shall also provide the NRC with copies of surety-related correspondence submitted to the State, a copy of the State's surety review, and the final approved surety arrangement. The licensee must also ensure that the surety, where authorized to be held by the State, expressly identifies the NRC-related portion of the surety and covers the cost of decommissioning and decontamination, offsite disposal, soil and water sample analyses, and ground-water restoration associated with the site. The basis for the cost estimate is the NRC-approved site closure plan or the NRC-approved revisions to the plan. Reclamation/decommissioning plan, cost estimates, and annual updates should follow the outline in the attachment to SUA-1341 entitled, "Recommended Outline for Site Specific Reclamation and Stabilization Cost Estimates."

The licensee's currently approved surety, irrevocable standby letter of credit number 93/832 issued by the Credit Commercial de France of New York in favor of the State of Wyoming, shall be continuously maintained in an amount no less than $11,384,319 for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, until a replacement is authorized by both the State and the NRC.

[Applicable Amendments: 14, 17, 33, 34, 39, 42]

40. The licensee shall maintain a restricted area boundary as shown on Figure 5.5 of the September 12, 1989, amendment application as modified by Figures 1 and 2 dated July 29, 1992. Additionally, the Christensen Ranch Satellite plant buildings shall represent restricted areas. The Irigaray and Christensen Ranch well-field buildings shall be restricted if radiological surveys indicate appropriateradiological levels. [Applicable Amendments: 3, 7, 9, 10, 11, 15, 28]

41. The RSO shall have the health physics' authorities, responsibilities, and technical qualifications identified in Regulatory Guide 8.31. [Applicable Amendments: 3, 10, 34]

42. The RSO or his designee shall document a daily walkthrough of the Irigaray and Christensen Ranch Satellite facilities to determine if radiation control practices are being implemented. This is in addition to the inspection and audit programs

described in Section 5.3 of the Irigaray application and Christensen Ranch amendment application. [Applicable Amendments: 10]

43. The licensee shall submit to the NRC a copy of the annual ALARA report as specified in Section 5.3 of the Christensen Ranch amendment application within two (2) months of the end of the reporting period. The report shall discuss the Irigaray and Christensen Ranch Satellite facilities and include a summary of the daily walkthrough inspections. [Applicable Amendments: 3, 10]

44. The licensee shall sample particulates and radon daughters on a monthly frequency at the Irigaray and Christensen Ranch Satellite locations shown on Figures 5.2 and 5.3 of the September 12, 1989 amendment application. [Applicable Amendments: 3, 10, 11, 15,]

45. If any worker reaches or exceeds 25 percent of the maximum permissible exposure limits as specified in 10 CFR Part 20, based upon a calculated TWE for the week or the calendar quarter, dependent on the solubility of the material, the RSO shall initiate an investigation of the employee's work record and exposure history to identify the source of the exposure.

Necessary corrective measures shall be taken to ensure that future exposures are as low as is reasonably achievable. Records shall be maintained of these investigations and results furnished to Chief, Uranium Recovery Branch, Division of Waste Management, NMSS (T-7-J-9), Nuclear Regulatory Commission, 11545 Rockville Pike, Rockville, MD 20850, in the semiannual 10 CFR 40.65 report. [Applicable Amendments: 36, 42]

46. The licensee shall issue thermoluminescent dosimeters (TLDs) to each process employee. All TLDs shall be exchanged and read on a quarterly frequency. [Applicable Amendments: 3]

47. The licensee shall implement the respiratory protection program as described in Attachment 6 to the October 31, 1988 amendment application. Additionally, the licensee shall perform and document random irritant smoke fit tests on at least 10 percent of the respirator issuances. [Applicable Amendments: 3, 11]

48. The licensee shall implement the bioassay program discussed in Section 5.7.5 of the Christensen Ranch amendment application. Additionally, the licensee shall comply with the following:

    A. Perform in-vivo counting of any worker whose internal exposure to radioactive material in any calendar quarter, based on time-weighted exposure, exceeds 25 percent of the exposure which would result from inhalation of MPC concentrations listed in Table 1 of Appendix B to 10 CFR 20 over a period of 1 calendar quarter. Counting shall be performed within 1 year of the calendar quarter.

B. Prior to assignment at the facility, all new employees shall submit a baseline urine sample. On a monthly frequency, all employees routinely assigned to work in the process areas shall submit urine samples.

C. Any time an action level of 15 ug/l uranium for urinalysis or 9 nCi of natural uranium for an in-vivo measurement is exceeded, the licensee shall provide documentation to the NRC indicating what corrective actions have been performed to satisfy the requirements of Regulatory Guide 8.22. This documentation shall be included and submitted with the semiannual 10 CFR 40.65 report.

D. Any time an action level of 30 ug/l uranium for four consecutive specimens or 130 ug/l uranium for one specimen for urinalysis or 16 nCi uranium for an in-vivo measurement is reached or exceeded, the licensee shall provide documentation within 30 days to the NRC, indicating what corrective actions have been performed to satisfy the requirements of Regulatory Guide 8.22.

[Applicable Amendments: 10]

49. If employees do not shower prior to leaving the restricted area, they shall monitor themselves with an alpha survey instrument prior to exiting. Should the results of monitoring exceed an action level of 1000 dpm/100 $cm^2$, employees shall decontaminate themselves to less than the action level. If decontamination cannot be accomplished, the employee shall report the incident to the RSO or his designee for investigation. Additionally, the RSO or his designee shall perform and document quarterly spot checks of employees leaving the restricted area.
[Applicable Amendments: 10]

50. All radiation monitoring, sampling and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer or at least semiannually. In addition, all radiation survey instruments shall be operationally checked with a radiation source before each use.

51. The licensee shall implement a ground-water monitoring program as follows:

A. DELETED by Amendment No. 4.

B. Annual sampling and analysis for chloride and conductivity from 517 and USMT Wells M-1, MM-3, M-4, SM-1, M-219, M-220, and M-221.

C. DELETED by Amendment No. 34.

D. DELETED by Amendment No. 34.

[Applicable Amendments: 4, 7, 34]

52. The licensee is hereby authorized to receive contaminated process equipment from licensed uranium recovery operators. Records of all receipts shall be maintained.

53. The licensee is hereby authorized to transfer source material to any facility licensed by the Commission or an Agreement State to receive source material for purposes of drying and storage. The licensee shall follow Standard Operation Procedure No. E-11 in the event of a transportation or storage accident. [Applicable Amendments: 30]

54. The licensee will not commence mining in the northern zone of Mine Unit 5 north of an imaginary line connecting wells 5MW65 and 5MW66, until two additional trend wells are constructed in that zone and their baseline water quality has been established.

One well will be constructed at a distance not greater than 300 feet south of the pinch out where the K Sand (production zone) merges with the Deep Sand #1 (deep monitoring zone). The purpose of this well will be to detect potential lixiviant migration from the K Sand into the Deep Sand #1. Action levels for this well will be set using the UCLs established for the other monitoring wells that are completed in Deep Sand #1.

The second well will be constructed to monitor the lower part of the K Sand north of where the K Sand is split horizontally by a clay layer. This well should be located approximately on an imaginary line that connects wells 5MW12 and 5MW5. Action levels for this well will be set using the UCLs established for the perimeter ore zone monitoring wells.

These two trending wells will be monitored at the same two week frequency used for the larger network of monitoring wells.

[Applicable Amendments: 38]

55. The licensee will not commence mining in the lower part of the K Sand in Mine Unit 5 north of an imaginary line that connects wells 5MW10 and 5MW3 until additional hydrogeologic data verifying the vertical isolation of the Deep Sand #2 from the lower part of the K Sand is provided and approved by NRC.

[Applicable Amendments: 38]

FOR THE NUCLEAR REGULATORY COMMISSION

Dated: Dec 24, 1996

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

# MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

| Licensee | | |
|---|---|---|
| 1. Power Resources Inc.<br>P.O. Box 1210<br>2. Glenrock, Wyoming 82637 | 3. License Number | SUA-1511 |
| | 4. Expiration Date | August 17, 2000 |
| | 5. Docket or Reference No. | 40-8857 |

| 6. Byproduct, Source, and/or Special Nuclear Material | 7. Chemical and/or Physical Form | 8. Maximum Amount that Licensee May Possess at Any One Time Under This License |
|---|---|---|
| Uranium | Unspecified | Unlimited |

## SECTION 9: Administrative Conditions

9.1 The authorized place of use shall be the licensee's Highland Uranium Project uranium recovery and processing facilities in Converse County, Wyoming.

9.2 All written notices and reports to NRC required under this license shall be addressed to the Chief, High-Level Waste and Uranium Recovery Projects Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, Mail Stop T 7-J-9, Nuclear Regulatory Commission, 11545 Rockville Pike, Rockville, MD 20850. Incidents and events that require telephone notification shall be made to the NRC Operations Center at (301) 816-5100.

9.3 The licensee shall conduct operations in accordance with the conditions, representations, and statements referenced in the Operations Plan and Reclamation Plan submitted by cover letter dated July 28, 1995, and the license application dated May 14, 1993, which are hereby incorporated by reference, except where superseded by license conditions below.

Whenever the word "will" is used in the above referenced document, it shall denote a requirement.

9.4 A. The licensee may, without prior NRC approval, and subject to the conditions specified in Part B of this condition:

(1) Make changes in the facility or process, as presented in the application.
(2) Make changes in the procedures presented in the application.

Exhibit 3

(3) Conduct tests or experiments not presented in the application.

B. The licensee shall file an application for an amendment to the license, unless the following conditions are satisfied.

(1) The change, test, or experiment does not conflict with any requirement specifically stated in this license (excluding material referenced in License Condition 9.3), or impair the licensee's ability to meet all applicable NRC regulations.

(2) There is no degradation in the essential safety or environmental commitments in the license application, or provided by the approved reclamation plan.

(3) The change, test, or experiment are consistent with the conclusions of actions analyzed and selected in the Environmental Assessment (EA) dated August 18, 1995).

C. The licensee's determinations concerning Part B of this condition, shall be made by a "Safety and Environmental Review Panel (SERP)." The SERP shall consist of a minimum of three individuals. One member of the SERP shall have expertise in management and shall be responsible for managerial and financial approval changes; one member shall have expertise in operations and/or construction and shall have responsibility for implementing any operational changes; and, one member shall be the corporate radiation safety officer (CRSO) or equivalent, with the responsibility of assuring changes conform to radiation safety and environmental requirements. Additional members may be included in the SERP as appropriate, to address technical aspects such as health physics, groundwater hydrology, surface-water hydrology, specific earth sciences, and other technical disciplines. Temporary members or permanent members, other than the three above-specified individuals, may be consultants.

D. The licensee shall maintain records of any changes made pursuant to this condition until license termination. These records shall include written safety and environmental evaluations, made by the SERP, that provide the basis for determining changes are in compliance with the requirements referred to in Part B of this condition. The licensee shall furnish, in an annual report to NRC, a description of such changes, tests, or experiments, including a summary of the safety and environmental evaluation of each. In addition, the licensee shall annually submit to the NRC changed pages to the Operations Plan and Reclamation Plan of the approved license application to reflect changes made under this condition.

9.5 The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criterion 9, adequate to cover the estimated reclamation and closure costs, if accomplished by a third party, for all existing operations and any planned expansions or operational changes for the upcoming year. Reclamation includes all cited activities and groundwater restoration, as well as, off site disposal of byproduct

material which may include evaporation pond wastes.

Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criterion 9, shall be provided to the NRC at least 3 months prior to June 30 of each year. If the NRC has not approved a proposed revision 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the existing arrangement, prior to expiration, for 1 year. Along with each proposed revision or annual update of the surety, the licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a minimum 15 percent contingency, changes in engineering plans, activities performed, and any other conditions affecting estimated costs for site closure.

The licensee shall provide an updated surety for NRC approval for any planned expansion or operational change which has not been included in the annual surety update. This surety update shall be provided to the NRC at least 30 days prior to the commencement of the planned expansion or operational change.

The licensee shall also provide the NRC with copies of surety-related correspondence submitted to the State, a copy of the State's surety review, and the final approved surety arrangement. The licensee must also ensure that the surety, where authorized to be held by the State, identifies the NRC-related portion of the surety and covers the above-ground decommissioning and decontamination, the cost of offsite disposal, soil and water sample analyses, and groundwater restoration associated with the site. The basis for the cost estimate is the NRC-approved site closure plan or the NRC-approved revisions to the plan. Reclamation/decommissioning plan, cost estimates, and annual updates should follow the outline in the attachment to SUA-1511 entitled, "Recommended Outline for Site Specific Reclamation and Stabilization Cost Estimates."

Power Resources Incorporated's currently approved surety instruments, Irrevocable Letter of Credit No. SFO 870IM issued by National Westminster Bank PLC and confirmed by National Westminster Bank USA Reference No. S050925, and Irrevocable Letter of Credit No. S-865154 issued by Morgan Guaranty Trust Company, both in favor of the State of Wyoming, shall be continuously maintained in the sum total amount of no less than $6,191,400 for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, until a replacement is authorized by both the State of Wyoming and the NRC.

9.6 The licensee shall have an agreement for the disposal of 11(e)2 byproduct material with a facility licensed to accept such materials. The licensee shall maintain the waste disposal agreement onsite. In the event the agreement expires or is terminated, the licensee shall attain a new agreement within 90 days after expiration, or the licensee will be prohibited from further lixiviant injection.

9.7 The licensee shall have a training program for all site employees as described in Regulatory Guide 8.31 and as detailed in the Operations Plan of the approved license application. The Radiation Safety Officer (RSO), or his designee, shall have the education, training and experience as specified in Regulatory Guide 8.31. The RSO shall also receive 40 hours of related health and safety refresher training every 2 years.

Individuals designated as the Radiation Safety Technician (RST) shall report directly to the RSO on matters dealing with radiological safety. In addition, the RSO shall be accessible to the RST at all times. The RST shall have the qualifications specified in Regulatory Guide 8.31, or equivalent. Any person newly hired as an RST shall have all work reviewed and approved by the Site RSO as part of a comprehensive training program until appropriate course training is completed, and at least for 6 months from the date of appointment.

9.8 Written standard operating procedures (SOPs) shall be established for all operational activities involving radioactive materials that are handled, processed, stored, or transported by employees. The SOPs shall include appropriate radiation safety practices to be followed in accordance with 10 CFR Part 20. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed.

Written SOPs shall be established for non-operational activities described in the Operations Plan and Reclamation Plan of the approved license application dated July 28, 1995, including in-plant and environmental monitoring, bioassay analysis, and instrument calibration. An up-to-date copy of each SOP shall be kept in each area where it is used.

All SOPs for activities described in the Operations and Reclamation Plan of the approved license application shall be reviewed and approved in writing by the RSO, Safety Director, Environmental Manager, or Operations Manager, as appropriate, before being implemented and whenever a change in a procedure is proposed. All existing facility SOPs related to activities involving the handling, processing, storing, or transporting of radioactive materials shall be reviewed by the CRSO on an annual basis.

9.9 Release of equipment, materials, or packages from the restricted area shall be in accordance with, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials," dated May 1987, or suitable alternative procedures approved by the NRC prior to any such release.

9.10 Any corporate organization changes affecting the assignments or reporting responsibilities of the radiation safety staff as described in the Operations Plan of the approved license application and as shown in the submittal dated July 28, 1995, shall conform to Regulatory Guide 8.31.

9.11 The licensee is hereby exempted from the requirements of Section 20.1902(e) of 10 CFR 20 for areas within the facility, provided that all entrances to

the facility are conspicuously posted in accordance with Section 20.1902(e) and with the words, "**ANY AREA WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL.**"

9.12 Before engaging in any developmental activity not previously assessed by the NRC, the licensee shall administer a cultural resource inventory. All disturbances associated with the proposed development will be completed in compliance with the National Historic Preservation Act (as amended) and its implementing regulations (36 CFR 800), and the Archaeological Resources Protection Act (as amended) and its implementing regulations (43 CFR 7).

In order to ensure that no unapproved disturbance of cultural resources occurs, any work resulting in the discovery of previously unknown cultural artifacts shall cease. The artifacts shall be inventoried and evaluated in accordance with 36 CFR Part 800, and no disturbance shall occur until the licensee has received authorization from the NRC to proceed.

## SECTION 10: Operations, Controls, Limits, and Restrictions

10.1 The licensee shall use a lixiviant composed of native groundwater, carbon dioxide gas, and oxygen gas or hydrogen peroxide, as described in the Operations Plan of the approved license application. Any variation from this combination shall require a license amendment.

10.2 The licensee shall perform mechanical well integrity tests on each injection and production well before the wells are utilized and on wells that have been serviced. Integrity tests shall be performed using techniques approved in the Underground Injection Control program administered by the State of Wyoming and the Operations Plan of the approved license application. Any failed well casing that cannot be repaired to pass the integrity test shall be plugged and abandoned.

10.3 Baseline groundwater quality sampling shall provide representative pre-mining groundwater quality data and restoration criteria as described in the Operations Plan of the approved license application. The data shall, at a minimum, consist of the following sampling and analyses:

A. Two separate samples shall be collected at least 14 days apart from monitoring wells completed within the mineralized zone production patterns (MP-Wells). Samples shall be analyzed for alkalinity, ammonium, arsenic, barium, bicarbonate, boron, cadmium, calcium, carbonate, chloride, chromium, copper, electrical conductivity, fluoride, iron, magnesium, manganese, mercury, molybdenum, nickel, nitrate, pH, potassium, radium-226, selenium, sulfate, total dissolved solids, uranium, vanadium.

B. After completing the above described sampling, two separate samples shall be collected at least 14 days apart in the MP-Wells and analyzed for bicarbonate, chloride, electrical conductivity, sulfate, total dissolved solids, iron, pH, selenium, uranium, and radium. Arsenic

and/or fluoride shall also be analyzed if either constituent is measured above the detection limit from the sampling performed under Part A of this condition.

C. At monitoring wells completed in the ore zone and surrounding the perimeter of the pattern areas (M- and T-Wells), one sample shall be collected and analyzed for the parameters described in Part A of this condition, and three additional samples collected and analyzed for chloride, bicarbonate, and electrical conductivity. All samples shall be collected at least 14 days apart.

D. At monitoring wells completed in the overlying and underlying zones (MO- and MU-Wells), two samples shall be collected and analyzed for the parameters described in Part A of this condition, and two additional samples collected and analyzed for chloride, bicarbonate, and electrical conductivity. All samples shall be collected at least two weeks apart.

10.4 The wells for establishing baseline groundwater quality in each mining unit shall consist of the following, in accordance with the Operations Plan of the approved license application and appropriate SOPs: (1) all mining unit perimeter monitor wells, (2) an adequate number of upper and lower aquifer monitoring wells to provide representative coverage for detecting vertical excursions of all production pattern areas within a wellfield, and (3) at least one production zone monitor well per 3 acres of production pattern area. A minimum of five of these wells shall be installed per mine unit.

10.5 To ensure the total satellite capacity is not exceeded, the annual throughput shall not exceed an average flow rate of 7500 gallons per minute, exclusive of restoration flow. Yellowcake production shall not exceed 1.897 million pounds annually.

10.6 Radium settling ponds shall have at least 3 feet of freeboard. The Satellite 1 and Satellite 2 purge storage reservoirs shall have at least 4 feet of freeboard. The licensee shall at all times maintain sufficient capacity in the Satellite 1 purge storage reservoirs to enable transferring the contents of any one radium settling pond to the reservoir. In the event of a radium settling pond leak and subsequent transfer of liquid, the freeboard requirements for the purge storage reservoir may be suspended during the repair period.

10.7 All liquid effluents from process buildings and other process waste streams, with the exception of sanitary wastes, shall be disposed of as described in the Operations Plan of the approved license application.

10.8 The licensee shall maintain effluent control systems as specified in Sections 9.1.3 and 9.1.4 of the Operations Plan of the approved license application with the following additions:

A. Operations shall be immediately suspended in the dry/pack area of the

facility if any of the emission control equipment for the yellowcake drying or packaging areas is not operating within specifications for design performance.

B. The licensee shall, during all periods of yellowcake drying operations, assure that the scrubber is operating within the manufacturer's recommended ranges for water flow and air pressure differential necessary to achieve design performance. This shall be accomplished by either (1) performing and documenting checks of water flow and air pressure differential approximately every four (4) hours during operation, or (2) installing instrumentation which will signal an audible alarm if either water flow or air pressure differential fall below the manufacturer's recommended levels. If an audible alarm is used, its operation shall be checked and documented daily.

C. Air pressure differential gauges for other emission control equipment shall be read and the readings documented once per shift during operations.

10.9 The licensee shall be required to use a Radiation Work Permit (RWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written operating procedure exists. All RWPs which describe activities that could expose workers to airborne uranium or its daughters shall be accompanied by a breathing zone air sample or an applicable area air sample. The RWP shall be issued by the RSO, or his designate qualified by way of specialized radiation protection training, and shall at least describe the following:

A. The scope of the work to be performed,

B. Any precautions necessary to reduce exposure to uranium and its daughters,

C. The supplemental radiological monitoring and sampling necessary prior to, during, and following completion of the work, and

D. A review and documentation by the RSO of all nonroutine activities.

10.10 Any visitor, including contractors, shall be required to register at the main office and shall be appropriately instructed in security, safety, and radiation protection prior to entering process areas. Visitors, including contractors, shall be required to register at a designated sign-in station and shall be instructed in security, safety, and radiation protection, when appropriate, prior to entering a wellfield.

10.11 The licensee shall require that all process and maintenance workers who work in uranium recovery areas; or work on equipment contaminated with radioactive materials, wear the proper protective clothing and personal protective equipment, as appropriate, to provide adequate worker protection in accordance with 10 CFR 20.

10.12 Within restricted areas, eating shall be allowed only in designated eating areas.

10.13 Before leaving any restricted area, all process workers shall shower or monitor themselves in conformance with Regulatory Guide 8.30. In addition, all radiation survey instruments shall be operationally checked in conformance with Regulatory Guide 8.30.

10.14 All radiation monitoring, sampling, and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer, or at least annually, whichever is more frequent. In addition, all radiation survey instruments shall be operationally checked with a radiation source each day when in use.

10.15 The licensee shall maintain an area within the restricted area boundary for temporary storage of contaminated materials. All contaminated wastes and evaporation pond residues shall be disposed at a licensed radioactive waste disposal site licensed to accept 11(e)2 byproduct material.

## SECTION 11: Monitoring, Recording, and Bookkeeping Requirements

11.1 Flow rates for production wells shall be measured and recorded on a daily basis. Injection flow rates shall be measured and recorded at least every 3 days.

11.2 Wellfield monitoring wells at operating areas, excluding groundwater restoration, shall be monitored at no more than 14 days apart, in accordance with the Operations Plan of the approved license application.

11.3 The licensee shall establish Upper Control Limits (UCLs) for each mining unit, prior to operation, in conformance with the Operations Plan of the approved license application and appropriate SOPs. The UCL parameters shall be chloride, bicarbonate, and electrical conductivity. UCL criteria shall be calculated as described in the Operations Plan of the approved license application. UCLs shall be applied to all monitor wells in conformance with the Operations Plan and the Reclamation Plan of the license application. Lixiviant excursions shall be verified and monitored in conformance with the Operations Plan and appropriate SOPs. Corrective actions for confirmed excursions may be, but are not limited to, those described in the Operations Plan.

11.4 The licensee shall establish an effluent and environmental monitoring program in accordance with the Operations Plan of the approved license application and the WDEQ-Water Quality Division Wastewater Land Application Permit No. 92-077 dated April 16, 1992, and Table 7 of the "WDEQ-Water Quality Division Application for Satellite No. 2 Wastewater Land Application-Facility," dated September 30, 1993. Prior to release for unrestricted use, the licensee shall demonstrate that radionuclide levels meet applicable criteria.

11.5 The results of the following activities, operations, or actions shall be documented: sampling; analyses; surveys or monitoring; survey/monitoring equipment calibrations; reports on audits and inspections; all meetings and training courses required by this license; and any subsequent reviews, investigations, or corrective actions. Unless otherwise specified in the NRC regulations, all such documentation shall be maintained for a period of at least five (5) years.

11.6 During production, the RSO, RST, or a trained designee shall perform and document a daily walk-through inspection of all operating areas to ensure all radiation protection and monitoring requirements are being followed.

11.7 The licensee shall perform alpha contamination surveys of the change rooms, eating areas, and offices in conformance with Regulatory Guide 8.30. If bioassay samples are analyzed in house, the licensee shall survey laboratory work surfaces as specified in Regulatory Guide 8.31.

11.8 Occupational exposure calculations shall be performed and documented within 1 week of the end of each regulatory compliance period as specified in 10 CFR 20.1201 and 10 CFR 20.1204(d). Routine radon daughter and particulate samples shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Nonroutine samples shall be analyzed and the results reviewed by the RSO within two (2) working days after sample collection.

11.9 The pipeline that transports waste water from the Satellite 2 to Satellite 1 treatment facility shall be monitored as follows:

A. Standpipes shall be utilized at 1000-foot intervals along the pipeline route for leak detection. Standpipes shall be monitored for leak detection and integrity on a monthly basis. All observations and maintenance checks shall be recorded.

B. Logs for pump rates and volumes shall be maintained on a daily frequency.

11.10 The licensee shall implement a urinalysis program as outlined in Regulatory Guide 8.22 and the Operations Plan of the approved license application.

11.11 The licensee shall perform and document a daily visual inspection of the waste solution disposal system. The NRC shall be notified by telephone within 48 hours, in accordance with License Condition 9.2, if an inspection indicates that a non-routine, unanticipated discharge has taken place.

A written report shall be filed with the NRC, in accordance with License Condition 9.2, within 30 days of first notifying the NRC that a non-routine, unanticipated discharge incident occurred. This report shall include analytical data and describe the mitigative actions and the results of that action.

SECTION 12.0: **Reporting Requirements**

12.1 In conjunction with baseline water quality data, hydrologic test results depicting hydrologic properties shall be conducted in conformance with the Operations Plan of the approved license application and appropriate SOPs. The data, results, and findings of the hydrologic testing shall be documented in a report and maintained until wellfield restoration is completed and approved by NRC.

12.2 The results of effluent and environmental monitoring shall be reported to the NRC in accordance with 10 CFR 40.65. This report shall also include the following:

A. Results from employee urinalyses if an exposure exceeds action levels described in the Operations Plan of the approved license application.

B. Injection rates, recovery rates, and injection trunk-line pressures for each satellite facility.

C. Water quality analyses and monitoring results, as required by WDEQ permit, for the operating irrigation sprinkler systems.

Monitoring data shall be reported in the format shown in the NRC guidance entitled, "Sample Format for Reporting Monitoring Data."

12.3 In the event a lixiviant excursion is confirmed by groundwater monitoring, NRC shall be notified by telephone within 24 hours and by letter within 7 days from the time the excursion is confirmed, in accordance with License Condition 9.2. In addition, a written report shall be submitted to the NRC within 60 days of excursion confirmation. The report shall describe the excursion event, corrective actions taken, and results obtained. If the excursion is not controlled at the time the report is submitted, the licensee shall suspend injection of lixiviant within the mining unit including and adjacent to the well on excursion until such time as the excursion is considered controlled or has been terminated. If, at the time of reporting, the licensee can demonstrate that the excursion is controlled, the licensee may inject lixiviant at a rate which does not change or hinder the trend in groundwater quality improvement.

Control of an excursion shall be demonstrated by groundwater quality and water level data, which show that the degraded water plume has not increased in extent, and show that the groundwater quality of the impacted area is improving.

12.4 In the event radium settling pond analyses indicate that an impoundment is leaking, the NRC shall be notified by telephone within 48 hours of verification, in accordance with License Condition 9.2. Standpipe water quality samples shall be analyzed for chloride and conductivity once every 7 days during the leak period and once every 7 days for at least 2 weeks following repairs. Additionally, water samples collected at the pond

standpipe shall be analyzed for the full suite of parameters as defined in the WDEQ, Land Quality Division, Guideline 8, Appendix I, at least once per month during the leak period.

A written report shall be filed with the NRC within 60 days of first notifying the NRC that a leak exists. This report shall include analytical data, describe mitigative action, and discuss the results of that action.

12.5 The licensee shall report incidents in accordance with 10 CFR 20.2202. Additionally, 1 month subsequent to a reportable incident, a written report shall be submitted to the NRC detailing the conditions leading to the incident, corrective actions taken, and results achieved.

12.6 The licensee shall conduct restoration activities in accordance with the groundwater restoration plan included in the Reclamation Plan of the approved license application. The primary goal of restoration shall be to return the groundwater quality, on a production unit average, to baseline conditions. A secondary goal is to return the groundwater to a quality consistent with the premining use or uses, in accordance with the Reclamation Plan of the approved license application.

12.7 The licensee shall submit a detailed decommissioning plan to the NRC for review and approval at least 12 months prior to final shutdown of mining operations.

12.8 An audit team comprising licensee management shall perform an annual ALARA audit of the radiation safety program in accordance with Regulatory Guide 8.31. The RSO shall accompany the audit team. A report of this audit shall be retained on site for NRC inspection. The report shall also summarize the results of the daily walk-through inspections.

FOR THE NUCLEAR REGULATORY COMMISSION

Date: Aug 23, 1995

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

NRC FORM 374 (7-89) U.S. NUCLEAR REGULATORY COMMISSION 

# MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

| Licensee | |
|---|---|
| 1. Crow Butte Resources, Inc. | 3. License Number SUA-1534, Amendment No,. 1 |
| 2. 216 Sixteenth Street Mall, Suite 810 Denver, Colorado 80202 | 4. Expiration Date February 28, 2008 |
| | 5. Docket or Reference No. 40-8943 |

| 6. Byproduct, Source, and/or Special Nuclear Material | 7. Chemical and/or Physical Form | 8. Maximum Amount that Licensee May Possess at Any One Time Under This License |
|---|---|---|
| a. Natural Uranium | Any | a. Unlimited |
| b. Byproduct material as defined in 10 CFR 40.4 | Unspecified | b. Quantity generated under operations authorized by this license |

SECTION 9: ***Administrative Conditions***

9.1 Authorized place of use shall be the licensee's Crow Butte uranium recovery and processing facilities in Dawes County, Nebraska.

9.2 All written notices and reports to the NRC required under this license, with the exception of reports submitted in accordance with 10 CFR 40.65, shall be addressed to the Chief, Uranium Recovery Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, Mail Stop T 7-J-8, Nuclear Regulatory Commission, 11545 Rockville Pike, Rockville, MD 20850. Semiannual effluent monitoring reports required under 10 CFR 40.65 shall be addressed to Director, Division of Nuclear Material Safety, Region IV, Nuclear Regulatory Commission, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas, 76011.

Incident and event notifications that require telephone notification shall be made to the NRC Operations Center at (301) 816-5100.

9.3 The licensee shall conduct operations in accordance with the commitments, representations, and statements contained in the license application dated December 1995, as amended by submittals dated April 1, June 25, July 28, and October 31, 1997, which are hereby incorporated by reference, except where superseded by license conditions below. Whenever the word "will" or "shall" is used in the above referenced documents, it shall denote a requirement.

9.4 A. The licensee may, without prior NRC approval, and subject to the conditions specified in Part B of this condition:

(1) Make changes in the facility or process, as presented in the approved application.

(2) Make changes in the procedures presented in the approved application.

Exhibit 4

(3) Conduct tests or experiments not presented in the approved application.

B. The licensee shall file an application for an amendment to the license, unless the following conditions are satisfied:

(1) The change, test, or experiment does not conflict with any requirement specifically stated in this license (excluding information referenced in the approved license application), or impair the licensee's ability to meet all applicable NRC regulations.

(2) There is no degradation in the essential safety or environmental commitments in the license application, or provided by the approved reclamation plan.

(3) The change, test, or experiment is consistent with the conclusions of actions analyzed and selected in the Environmental Assessment dated February 1998.

C. The licensee's determinations concerning Part B of this condition shall be made by a "Safety and Environmental Review Panel" (SERP). The SERP shall consist of a minimum of three individuals employed by the licensee, and one of these shall be designated as the SERP chairman. One member of the SERP shall have expertise in management and shall be responsible for approval of managerial and financial changes; one member shall have expertise in operations and/or construction and shall have responsibility for implementing any operational changes; and one member shall be the site Corporate Radiation Safety Officer or equivalent, with the responsibility for assuring changes conform to radiation safety and environmental requirements. Additional members may be included in the SERP as appropriate, to address technical aspects such as health physics, groundwater hydrology, surface-water hydrology, specific earth sciences, and other technical disciplines. Temporary members or permanent members, other than the three above-specified individuals, may be consultants.

9.5 The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criterion 9, adequate to cover the estimated reclamation and closure costs, if accomplished by a third party, for all existing operations and any planned expansions or operational changes for the upcoming year. Reclamation includes all cited activities and groundwater restoration, as well as off-site disposal of all 11e.(') byproduct material.

Within three months of NRC approval of a revised closure plan and cost estimate, the licensee shall submit for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly approved site closure plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within three months of written NRC approval.

Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criterion 9, shall be provided to NRC by October 1 of each year. If NRC has not approved a proposed revision 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the existing arrangement, prior to expiration, for one year. Along with each proposed revision or annual update of the surety, the licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a minimum 15 percent contingency, changes in engineering plans, activities performed, and any other conditions affecting estimated costs for site closure.

At least 90 days prior to beginning construction associated with any planned expansion or operational change which was not included in the annual surety update, the licensee shall provide for NRC approval an updated surety to cover the expansion or change.

The licensee shall also provide NRC with copies of surety-related correspondence submitted to the State of Nebraska, a copy of the State's surety review, and the final approved surety arrangement. The licensee also must ensure that the surety, where authorized to be held by the State, identifies the NRC-related portion of the surety and covers the above-ground decommissioning and decontamination, the cost of offsite disposal, soil and water sample analyses, and groundwater restoration associated with the site. The basis for the cost estimate is the NRC-approved site closure plan or the NRC-approved revisions to the plan. Reclamation/decommissioning plan, cost estimates, and annual updates should follow the outline in Appendix E to NUREG-1569 (NRC, 1997), entitled "Recommended Outline for Site-Specific *In Situ* Leach Facility Reclamation and Stabilization Cost Estimates."

Crow Butte Resources, Inc.'s currently approved surety instrument, an Irrevocable Standby Letter of Credit issued by the Royal Bank Of Canada (New York Branch), in favor of the State of Nebraska, shall be continuously maintained in the sum total amount of no less than $8,950,827 for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, until a replacement is authorized by both the State of Nebraska and NRC.

9.6 Written standard operating procedures (SOPs) shall be established and followed for all operational process activities involving radioactive materials that are handled, processed, or stored. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed. Additionally, written procedures shall be established for non-operational activities to include in-plant and environmental monitoring, bioassay analyses, and instrument calibrations. An approved, up-to-date copy of each written procedure shall be kept in the process area to which it applies.

All written procedures for both operational and non-operational activities shall be reviewed and approved in writing by the site Corporate Radiation Safety Officer (CRSO) before implementation and whenever a change in procedure is proposed to ensure that proper radiation protection principles are being applied. In addition, the CRSO shall perform a documented review of all existing SOPs at least annually.

9.7 The licensee shall dispose of 11e.(2) byproduct material from the Crow Butte facility at a site licensed by NRC or an NRC Agreement State to receive 11e.(2) byproduct material. The licensee shall identify the disposal facility to NRC in writing. The licensee's approved waste disposal agreement must be maintained on-site. In the event the agreement expires or is terminated, the licensee shall notify NRC in writing, in accordance with License Condition 9.2, within 7 days after the date of expiration or termination. A new agreement shall be submitted for NRC approval within 90 days after expiration or termination, or the licensee will be prohibited from further lixiviant injection.

9.8 Release of equipment, materials, or packages from the restricted area shall be in accordance with the NRC guidance document entitled "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated May 1987, or suitable alternative procedures approved by NRC prior to any such release.

9.9 Before engaging in any construction activity not previously assessed by NRC, the licensee shall complete a cultural resource inventory. All construction associated with the proposed development will be completed in compliance with the National Historic Preservation Act of 1966 (as amended)

and its implementing regulations (36 CFR Part 800), and the Archaeological Resources Protection Act of 1979 (as amended) and its implementing regulations (43 CFR Part 7).

In order to ensure that no unapproved disturbance of cultural resources occurs, any work resulting in the discovery of previously unknown cultural artifacts shall cease. The artifacts shall be inventoried and evaluated in accordance with 36 CFR Part 800, and no disturbance shall occur until the licensee has received authorization from NRC to proceed.

Prior to any developmental activity in the immediate vicinity of the six "potentially eligible" sites identified in Section 2.4 of the approved license application, the licensee shall provide documentation of its coordination with the Nebraska State Historical Society to NRC.

9.10 The licensee shall conduct operations within the permit area boundaries shown in Figure 1.3-1 of the approved license application, as amended by the submittal dated July 28, 1997.

9.11 The licensee is hereby exempted from the requirements of Section 20.1902(e) of 10 CFR Part 20 for areas within the facility, provided that all entrances to the facility are conspicuously posted in accordance with Section 20.1902(e) and with the words, "ANY AREA WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL."

9.12 Any corporate organization changes affecting the assignments or reporting responsibilities of the radiation safety staff as described in Section 5 of the approved license application shall conform to Regulatory Guide 8.31.

9.13 The licensee shall have a training program for all site employees as described in Regulatory Guide 8.31 and as detailed in the approved license application. The training program shall cover the topics identified in Section 2.5 of Regulatory Guide 8.31.

The CRSO, or their designee, shall have the education, training and experience as specified in Regulatory Guide 8.31. The CRSO shall also receive 40 hours of related health and safety refresher training every two (2) years.

Individuals designated as the Health Physics Technician (HPT) shall report directly to the CRSO on matters dealing with radiological safety. In addition, the CRSO shall be accessible to the HPT at all times. The HPT shall have the qualifications specified in Regulatory Guide 8.31, or equivalent. Any person newly hired as an HPT shall have all work reviewed and approved by the CRSO as part of a comprehensive training program until appropriate course training is completed, and at least for 6 months from the date of appointment.

9.14 The boundaries of the licensee's restricted area shall be those identified in the submittal dated April 22, 1998.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number: SUA-1534, Amend. No. 11

Docket or Reference Number: 40-8943

## SECTION 10: *Operations, Controls, Limits, and Restrictions*

10.1 The licensee shall use a lixiviant composed of native groundwater, with added sodium carbonate/bicarbonate and oxygen or hydrogen peroxide, as described in the approved license application.

10.2 The licensee shall construct all wells in accordance with methods described in Section 3.1.2 of the approved license application.

Mechanical integrity tests shall be performed on each injection and production well before the wells are utilized and on wells that have been serviced with equipment or procedures that could damage the well casing. Additionally, each well shall be retested at least once each five (5) years it is in use. The integrity test shall pressurize the well to 125 percent of the maximum operating pressure and shall maintain 90 percent of this pressure for 20 minutes to pass the test. A single point resistance test may be used only in conjunction with another approved well integrity testing method. If any well casing failing the integrity test cannot be repaired, the well shall be plugged and abandoned.

10.3 The licensee shall establish pre-operational baseline groundwater quality data for all mine units. Baseline water quality sampling shall provide representative pre-mining groundwater quality data and restoration criteria as described in the approved license application.

The data shall consist, at a minimum, of the following sampling and analyses:

A. Three samples shall be collected from production and injection wells at a minimum density of one production or injection well per 4 acres. These samples shall be collected at least 14 days apart.

B. The samples shall be analyzed for alkalinity, ammonia, arsenic, barium, bicarbonate, boron, cadmium, calcium, carbonate, chloride, chromium, copper, fluoride, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, nitrate, nitrite, pH, potassium, radium-226, selenium, silica, sodium, specific conductivity, sulfate, temperature, total dissolved solids, uranium, vanadium, and zinc.

C. Groundwater restoration goals shall be established on a parameter-by-parameter basis, and the primary goal of restoration shall be to return the groundwater quality, on a mine unit average, to baseline conditions. The licensee shall conduct ground-water restoration activities in accordance with the groundwater restoration plan submitted by letter dated November 26, 1996.

10.4 Prior to mining in each mine unit, the licensee shall collect groundwater samples from and establish Upper Control Limits (UCLs) for designated upper aquifer and perimeter monitor wells. The data shall consist, at a minimum, of the following sampling and analyses:

A. Three samples shall be collected from the monitor wells at a minimum density of (1) one upper aquifer monitor well per 5 acres, and (2) all perimeter monitor wells. These samples shall be collected at least 14 days apart.

B. The samples shall be analyzed for the following indicator parameters: chloride, sodium, sulfate, conductivity, and total alkalinity.

C. For each monitor well, UCLs shall be calculated for each indicator parameter as equal to 20 percent above the maximum concentration measured for that parameter among the three samples.

10.5 The plant throughput shall not exceed a maximum flow rate of 5000 gallons per minute, excluding restoration flow. Annual yellowcake production shall not exceed 2 million pounds.

10.6 Each of the R&D evaporation ponds shall have at least 0.9 meters (3 feet) of freeboard. Each of the commercial evaporation ponds shall have at least 1.5 meters (5 feet) of freeboard.

Additionally, the licensee shall maintain, at all times, sufficient reserve capacity in the evaporation pond system to enable transferring the contents of a pond to the other ponds. In the event of a leak and subsequent transfer of liquid, freeboard requirements shall be suspended during the repair period.

10.7 All liquid effluents from process buildings and other process waste streams, with the exception of sanitary wastes, shall be returned to the process circuit; discharged to the solar evaporation ponds; disposed by land irrigation in accordance with the licensee's proposal submitted on August 3, 1988, as modified by its submittal on June 7, 1993; or deep well injected in accordance with the licensee's report submitted on August 24, 1993, as modified by submittals dated December 7, 1995, and April 3, 1996.

10.8 The licensee shall maintain effluent control systems as specified in Sections 4.1 and 5.7.1.1 of the approved license application, with the following exceptions:

A. If any of the yellowcake emission control equipment fails to operate within specifications set forth in the standard operating procedures, the drying and packaging room shall immediately be closed-in as an airborne radiation area and heating operations shall be switched to cooldown, or packaging operations shall be temporarily suspended. Packaging operations shall not be resumed until the vacuum system is operational to draw air into the system.

B. The licensee shall, during all periods of yellowcake drying operations, assure that the negative pressure specified in the standard operating procedures for the dryer heating chamber is maintained. This shall be accomplished by either (1) performing and documenting checks of air pressure differential approximately every four hours during operation, or (2) installing instrumentation which will signal an audible alarm if the water flow or air pressure differential falls below the recommended levels. If an audible alarm is used, its operation shall be checked and documented at the beginning and end of each drying cycle when the differential pressure is lowered.

10.9 The licensee shall be required to use a Radiation Work Permit (RWP) for all work or non-routine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written operating procedure exists. All RWPs shall be accompanied by a breathing zone air sample or an applicable area air sample. The RWP shall be issued by the CRSO, or designee qualified by way of specialized radiation protection training, and RWPs shall include, as a minimum, the information described in Section 2.2 of Regulatory Guide 8.31.

10.10 In-plant radiological monitoring for airborne uranium and radon daughters shall be conducted at the locations shown in Figure 5.7-1 in the approved license application.

10.11 Employees shall monitor themselves with an alpha survey instrument prior to exiting the restricted area. Should the results of monitoring exceed an action level of 1000 dpm/100 cm$^2$, employees shall decontaminate themselves to less than the action level. If decontamination cannot be accomplished, the employee shall report the incident to the CRSO for investigation.

10.12 In addition to the bioassay program discussed in Section 5.7.5 of the approved license application, the licensee also shall perform *in vivo* measurements in accordance with the recommendations contained in Revision 1 of Regulatory Guide 8.22.

10.13 All radiation monitoring, sampling, and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer, or at least annually, whichever is more frequent. In addition, all radiation survey instruments shall be operationally checked with a radiation source each day when in use.

10.14 The licensee shall maintain an area within the restricted area boundary for temporary storage of contaminated materials. All contaminated wastes and evaporation pond residues shall be disposed at a radioactive waste disposal site licensed to accept 11e.(2) byproduct material.

10.15 The licensee shall construct evaporation ponds 2 and 5 in accordance with the engineering design report dated April 27, 1988, as modified by the submittals dated May 11, and July 16, 1992. In addition, the ponds shall be constructed as follows:

A. Fill material shall be classified as a silty sand material in accordance with the Unified Soil Classification System.

B. Quality control of the fill shall be performed in accordance with the guidance provided for radon barrier materials in the NRC "Staff Technical Position on Testing and Inspection Plans during Construction of DOE's Remedial Action at Inactive Uranium Mill Tailing Sites" (January 1989).

C. As-built drawings of the constructed ponds shall be submitted to NRC within 3 months of the completion of construction of each pond.

## SECTION 11: *Monitoring, Recording, and Bookkeeping Requirements*

11.1 Flow rates on each injection and recovery well, and manifold pressures on the entire system, shall be measured and recorded daily. During well-field operations, injection pressures shall not exceed the integrity test pressure at the injection well heads.

11.2 All designated perimeter and upper aquifer monitor wells shall be sampled and tested no more than 14 days apart, except in the event of the situations identified in the licensee's submittal dated March 19, 1998. If a designated monitor well is not sampled within 14 days of a previous sampling event, the reasons for the postponement of sampling shall be documented. Sampling shall not be postponed for greater than five days.

If two UCLSs are exceeded in a well or if a single UCL is exceeded by 20 percent, the licensee shall take a confirming water sample within 48 hours after the results of the first analyses are received and analyze the sample for the indicator parameters. If the second sample does not indicate an exceedance, a third sample shall be taken and analyzed in a similar manner with 48 hours after the

second set of samples was acquired. If neither the second nor the third sample indicate an exceedance, the first sample shall be considered in error.
If either the second or third sample confirms that a UCL(s) has been exceeded, the well in question shall be placed on excursion status. Upon confirmation of an excursion, the licensee shall notify NRC in accordance with License Condition 12.2, implement corrective action, and increase the sampling frequency for the indicator parameters at the excursion well to once every seven (7) days. Corrective actions for confirmed excursions may be, but are not limited to, those described in Section 5.7.8.1 of the approved license application. An excursion is considered concluded when the concentrations of the indicator parameters are below the concentration levels defining an excursion for three (3) consecutive weekly samples.

11.3 The licensee shall establish and conduct an effluent and environmental monitoring program in accordance with the program submitted by letter dated July 28, 1997.

11.4 The licensee shall perform and document inspections in accordance with the February 5, 1996, revision to its Evaporation Pond Onsite Inspection Program.

Any time 6 inches or more of fluid is detected in a commercial pond standpipe, it shall be analyzed for specific conductance. If the water quality is degraded beyond the action level, the water shall be further sampled and analyzed for chloride, alkalinity, sodium, and sulfate. Any time 6 inches or more of fluid is detected an R&D pond standpipe, it shall be analyzed for specific conductance, chloride, alkalinity, sodium, and sulfate.

Upon verification of a liner leak, the licensee shall notify NRC in accordance with License Condition 12.3, lower the fluid level by transferring the pond's contents to an alternate cell, and undertake repairs, as needed. Water quality in the affected standpipe shall be analyzed for the five parameters listed above once every 7 days during the leak period and once every 7 days for at least 14 days following repairs.

11.5 The licensee shall conduct the in-plant radiological inspection program described in Section 5.3 of the license renewal application, with the following modifications:

A. The licensee shall document problems observed during the daily visual walk-through inspections in writing; and

B. The CRSO and plant manager, or qualified designees, shall perform weekly inspections to observe general radiation control practices and to review required changes in procedures and equipment.

11.6 The results of the following activities, operations, or actions shall be documented: sampling; analyses; surveys and monitoring; survey/monitoring equipment calibration results; reports on audits and inspections; all meetings and training courses required by this license; and any subsequent reviews, investigations, or corrective actions. Unless otherwise specified in the NRC regulations, all such documentation shall be maintained for a period of at least five (5) years.

11.7 The licensee shall maintain records of any changes made pursuant to License Condition 9.4 until license termination. These records shall include written safety and environmental evaluations, made by the Safety and Environmental Review Panel, that provide the basis for determining that changes are in compliance with the requirements referred to in Part B of License Condition 9.4.

## SECTION 12.0: *Reporting Requirements*

12.1 Effluent and environmental monitoring program results submitted in accordance with 10 CFR 40.65 shall be reported in the format shown in Table 3 of Regulatory Guide 4.14, (Rev. 1) entitled, "Sample Format for Reporting Monitoring Data." These reports also shall include injection rates, recovery rates, and injection manifold pressures.

12.2 In the event a lixiviant excursion is confirmed by groundwater monitoring, NRC shall be notified by telephone within 24 hours and by letter within seven (7) days from the time the excursion is confirmed, in accordance with License Condition 9.2. In addition, a written report shall be submitted to NRC within 60 days of excursion confirmation. The report shall describe the excursion event, corrective actions taken, and results obtained. If the well(s) are still on excursion when the report is submitted, the report also must contain a schedule for the submittal of future reports to NRC which will provide an update of corrective actions taken and the results obtained. In addition, if the well(s) are still on excursion at the time the 60-day report is submitted, the licensee shall terminate injection of lixiviant into the wellfield on excursion until such time that aquifer cleanup is complete.

12.3 In the event evaporation pond standpipe water analyses indicate that a pond is leaking, NRC shall be notified by telephone within 48 hours of verification, in accordance with License Condition 9.2. In addition, a written report shall be submitted to NRC within 30 days of first notifying NRC that a leak exists. This report shall include analytical data, describe the mitigative action, and discuss the results of that action.

12.4 Until license termination, the licensee shall maintain documentation on all spills of source or 11e.(2) byproduct materials, and all spills of process chemicals. Documented information shall include: date, spill volume, total activity of each radionuclide released, radiological survey results, corrective actions, results of remediation surveys, and a map showing the spill location and impacted area.

The licensee shall notify NRC by telephone within 48 hours of any spill of source or 11e.(2) byproduct materials and all spills of process chemicals, that may have a radiological impact on the environment. This notification shall be followed, within seven (7) days, by submittal of a written report detailing the conditions leading to the spill, corrective actions taken, and results achieved. This requirement is in addition to the reporting requirements of 10 CFR Part 20 and 10 CFR 40.60.

12.5 The licensee shall submit a detailed decommissioning plan to NRC for review and approval at least 12 months prior to the planned final shutdown of mining operations.

12.6 An annual ALARA audit of the radiation safety program shall be performed in accordance with Regulatory Guide 8.31 and Section 5.3 of the approved license application. The CRSO shall accompany the audit team. A report of this audit shall be retained on-site for NRC inspection. The report also shall summarize the results of the daily walk-through inspections.

NRC FORM 374A (9-91) U.S. NUCLEAR REGULATORY COMMISSION



MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number: SUA-1534, Amend. No. 1

Docket or Reference Number: 40-8943

12.7 The licensee shall furnish, in an annual report to NRC, a description of changes, tests, or experiments made under License Condition 9.4, including a summary of the safety and environmental evaluation of each. In addition, the licensee shall annually submit to NRC page changes to the approved license application to reflect changes made under License Condition 9.4.

FOR THE NUCLEAR REGULATORY COMMISSION

Dated: May 8, 1998

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

November 9, 1998

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Administrative Judge Peter B. Bloch, Presiding Officer

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|---|---|---|
| In the Matter of | ) | |
| | ) | |
| HYDRO RESOURCES, INC. | ) | Docket No. 40-8968-ML |
| 2929 Coors Road | ) | |
| Suite 101 | ) | ASLBP No. 95-706-01-ML |
| Albuquerque, NM 87120 | ) | |
| | ) | |

**CERTIFICATE OF SERVICE**

I hereby certify that

On November 9, 1998, I caused to be served copies of the following:

**INITIAL WRITTEN PRESENTATION OF GRACE SAM AND MARILYN MORRIS**

upon the following persons by U.S. mail, first class, and in accordance with the requirements of 10 C.F.R. § 2.712. The parties marked by an asterisk (*) were also served by fax . The envelopes were addressed as follows:

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Dated this 9th day of November, 1998

Roderick Ventura