



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

URANIUM RECOVERY FIELD OFFICE
BOX 26325
DENVER, COLORADO 80225

JUN 10 1994

Docket No. 40-8857
SUA-1511, Amendment No. 53

Power Resources, Inc.
ATTN: William F. Kearney
Environmental Director
P.O. Box 1210
Glenrock, Wyoming 82637

Dear Mr. Kearney:

We have completed our review of your request to amend Source Material License SUA-1511, submitted by letter dated October 5, 1993, and the supplemental information submitted by letters referenced in the enclosed Technical Evaluation Report. Issuance of this amendment will authorize Power Resources, Inc. to operate a second effluent storage and irrigation facility at the Highland Uranium Project, Satellite 2 facility.

We conclude that implementation of the effluent storage and irrigation facility will not result in a significant impact to the public health and safety or to the environment, and have therefore revised License Conditions Nos. 10.11, 11.4, 11.13, and 12.2 to authorize the requested effluent storage and irrigation system.

The revised versions of License Condition Nos. 10.11, 11.4, 11.13, and 12.2, and a summary of the staff review, are included in the enclosed Technical Evaluation Report. The license is being reissued to incorporate the changes discussed above.

An environmental assessment for this action is not required because this action is categorically excluded under 10 CFR 51.22(c)(11), and an environmental report from the licensee is not required by 10 CFR 51.60(b)(2).

The issuance of this amendment was discussed during a telephone conversation between you and Cynthia Corbett of my staff on May 26, 1994.

Sincerely,

Ramon E. Hall
Director

Enclosures:
Technical Evaluation Report
Source Material License SUA-1511

NRC FILE

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TECHNICAL EVALUATION REPORT

DOCKET NO. 40-8857

LICENSE NO. SUA-1511

LICENSE: POWER RESOURCES, INC.
FACILITY: HIGHLAND URANIUM PROJECT
PROJECT MANAGER: Cynthia D. Miller-Corbett
TECHNICAL REVIEWS: Cynthia D. Miller-Corbett, Project Manager
Christopher A. McKenney, Nuclear Engineer

SUMMARY AND CONCLUSIONS:

By letter dated October 5, 1993, Power Resources, Inc. (PRI) submitted a request to amend Source Material License SUA-1511, to allow use of both a second purge storage reservoir and a second irrigation system at the Highland Uranium Project (HUP). The effect of the requested amendment would be to increase the licensee's capacity for disposal of processing and restoration waste water (effluent) at the HUP. The document entitled "Satellite 2 Wastewater Land Application Facility" (dated September 30, 1993), accompanied the amendment request and provides the technical information required to evaluate the proposed effluent disposal system.

The NRC staffs' evaluation of the requested amendment to allow installation of the Satellite 2 wastewater storage reservoir and land application facility indicated the change in site operations and effluent disposal is acceptable.

Authorization to implement the second waste disposal system would cause changes to the HUP operations plan described in Volume 6 of the license application. Revisions to Sections 1.4, 2.10, and 4.4.2 are included as part of this amendment request.

LICENSEE AMENDMENT REQUEST:

Since the initial submittal, PRI has forwarded additional information to revise and support the amendment request as follows:

January 7, 1994: Revision to all of original submittal including Plate 1, excepting Appendices 1 and 2, addition of Plate 2.
February 4, 1994: Additional information for use of ground water.
April 13, 1994: Assessment of radiation doses to the public from irrigation with treated waste water (for uranium).
April 21, 1994: Assessment of radiation doses to public from radium-226.
April 22, 1994: Additional information to assess final soil uranium and radium-226 concentrations.

- May 9, 1994: Revision to Section 2.6 of Satellite 2 Wastewater Land Application Facility
- May 23, 1994: Revision to Sections 1.4, 2.10, and 4.4.2, and Plate 1 of license application.
- June 2, 1994: Dose assessment for reservoir embankment failure.

Purge Storage Reservoir

The proposed Satellite 2 purge storage reservoir would occupy approximately 42 acres in the SE1/4 SE1/4, Section 11, and the SW1/4 SW1/4 Section 12, 136N, R73W. For the land in Section 11, PRI currently holds a lease with an option to buy; the purchase pends approval of this amendment. The land in Section 12 is owned by the State of Wyoming.

The reservoir would utilize an existing reservoir that was constructed in 1979, and permitted by the State of Wyoming for holding irrigation and stock water. By letter dated December 30, 1993, the licensee submitted their response to the NRC's request that PRI verify that the proposed reservoir meets criteria for Regulatory Guide 3.11 ("Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills"). Within their response, the licensee justified their position that the proposed reservoir, as well as the existing reservoir, is not subject to the criteria of Regulatory Guide 3.11. The primary reason is because the purpose of the purge storage reservoir is to hold treated water (that will meet requirements for unrestricted release) prior to land application. Regulatory Guide 3.11 is specific to mill tailings retention ponds.

As for the existing wastewater disposal system at Satellite 1, the effluent to be disposed at Satellite 2 comprises (1) wellfield production purge and (2) restoration effluent from well field ground-water sweep and reverse osmosis processes. Based on the estimated production and restoration schedule, the volume of effluent to be piped to the reservoir between the years 1995 and 2004 is approximately 2186 acre-feet (AF) (SWLA, Table 2).

The reservoir would have an active capacity of about 321 AF. The design of the reservoir is detailed in the State permit (Satellite 2 Wastewater Land Application Facility (SWLA), Appendix 1). Profiles of wellbore electric logs, also detailed in the State permit, verify the reservoir is immediately underlain by a minimum of 2 to 8 feet of clay. Based on the electric logs, this uppermost clay bed is underlain by a minimum of 125 feet of silty clay and clayey sandstone.

As for the waste treatment facility at Satellite 1, recovered effluent would be treated prior to storage at the reservoir. Uranium would be removed in ion exchange columns. Subsequently, radium-226 would be removed by treatment of effluent with barium chloride and passage through a radium filter press. At Satellite 1, the treated effluent is discharged to radium settling ponds for settling of radium-barium sulfate, and then piped to the storage reservoir.

At the Satellite 2 facility, the licensee would use a bag filter installed downstream of the filter press. The bag filter would eliminate the need for radium settling ponds.

Land Application (Irrigation) Facility

The proposed land application facility would be constructed to irrigate approximately 116 acres in the W1/2 of Section 12, T36N, R73W. The land would be owned by PRI pending completion of land acquisition. Details for the facility are included in Section 2.5 of the SWIA. The irrigation site would be encircled by a 6- to 12-inch berm to prevent runoff of irrigation fluids. A 32-inch high fence will be installed around the perimeter of the site to keep out livestock.

Of the total volume of process effluent, the licensee estimates 663 AF would evaporate during storage, and 1570 AF would be irrigated over the life of the facility. The average rate of land application would be about 112 AF/qtr, with irrigation occurring primarily during the spring and summer quarters of each year. According to the licensee, irrigation would be used until 2002, after which evaporation would empty the reservoir.

Justification for Amendment

PRI elected to meet compliance with 10 CFR Part 20.1301 and 20.1302 by demonstrating the total effective dose equivalent (TEDE) to an individual from treated effluent piped to the proposed waste land application facility would be less than the 0.1 rem per year limit. To this end, PRI's proposal for storage and irrigation of treated processing effluent requires evaluation of potential impacts from release of radium-226 and uranium. The licensee's TEDE assessment considered (a) the dose due to a reservoir embankment failure that would cause all effluent above land surface elevation to instantaneously spill, and (b) the dose due to soil loading at the irrigation (application) rate. The exposure pathways comprised soil, vegetation, livestock feeding, and meat consumption. Initial conditions included the quality and quantity of effluent to be released (a) instantaneously, and (b) over the lifetime of the wastewater land application facility.

Based on the licensee's submittal dated June 2, 1994, the TEDE to the public as a consequence of an instantaneous effluent release due to reservoir embankment failure, would be 0.48 mrem per year. Of this, 0.44 mrem would be from uranium, and 0.04 mrem would be from radium-226. The TEDE performed for estimating the dose to the public due to the proposed schedule of effluent irrigation (submittals dated April 13 and 21, 1994) indicated the public could receive 3.70 mrem per year; uranium would account for 3.53 mrem and radium-226 would account for 0.18 mrem.

In the submittal dated February 4, 1994, the licensee presented the results of their water rights search to verify that domestic and stock wells within 6 miles of the Satellite 2 facility would not be susceptible to ground-water contamination if the proposed land application facility is installed. This information reveals the most shallow well is 100 feet deep; all other wells

are at least 145 feet deep. Furthermore, the relatively thick sequence of clay and sandy clay immediately underlying the reservoir would impede vertical migration of applied effluent and would protect the uppermost aquifer from contamination. There are no known faults or fracture systems to serve as pathways for effluent migration.

TECHNICAL EVALUATION

Chemical Composition

Based on the quality of water irrigated at the Satellite 1 facility, the licensee estimates the chemical composition of effluent to be disposed at the Satellite 2 facility as shown in Table 1. The concentration of radium-226 in the treated effluent is estimated at 3.3 pCi/l. This is below the standard of 30 pCi/l established in Appendix B of 10 CFR Part 20 for release of water to unrestricted areas. The average concentration of uranium in the effluent, estimated at 2 mg/l, exceeds the newly established Appendix B standard of 0.44 mg/l.

Total Effective Dose Equivalent

Because the uranium concentration exceeds the limit in Appendix B, the licensee chose to demonstrate compliance with 10 CFR Part(s) 20.1301, 20.1302, and 20.2002. Consequently, the licensee submitted an assessment for the TEDE to the public, from radionuclides found in the effluent. This alternative for showing compliance with 10 CFR Part 20 obligated the licensee to demonstrate the dose to the public from effluent disposed by pond storage and irrigation would not exceed the 20 CFR Part 20 exposure limit of 0.1 rem per year and that doses are maintained as low as reasonably achievable (ALARA).

TEDE Analysis for Irrigation Facility

The proposed disposal procedure is the application of wastewater in a 116-acre irrigation circle. The wastewater concentration levels will average 2 mg/l (1.4×10^{-6} μ Ci/ml) natural uranium and 3 pCi/l (3.0×10^{-9} μ Ci/ml) ^{226}Ra . PRI conservatively assumed that the total application of wastewater on to the irrigation circle would result in soil concentrations of 24 pCi/g natural uranium and 0.38 pCi/g ^{226}Ra . Concentrations in the initial staff analysis were the same as PRI estimates, and staff assumed the 24 pCi/g natural uranium consisted of 11.7 pCi/g ^{234}U , 11.7 pCi/g ^{238}U , and 0.6 pCi/g ^{235}U . The staff, also, analyzed the same scenario with "best estimate" soil concentrations for the radionuclides i. 14.4 pCi/g natural uranium and 0.04 pCi/g ^{226}Ra .

The staff analysis was based on the rural farmer scenario (Scenario C) in the draft Policy and Guidance Directive on Scenarios for Assessing Potential Doses

Table 1. Estimated Wastewater Quality for Satellite No. 2 Facility.
(from Satellite 2 Wastewater Land Application Facility)

Parameter	Estimated Concentration (mg/l unless noted)
pH (units)	7.4
SAR (dimensionless)	1.4
Conductivity ($\mu\text{mhos/cm}$)	2046
TDS	1850
Na	160
Ca	233
Mg	83
K	84
Cl	508
SO ₄	598
HCO ₃	229
As	<0.001
Ba	<0.10
B	0.1
Cr	<0.05
Ni	<0.05
Se	1.1
Zn	1.1
U ₃ O ₈	2.4
U-Nat	2.0
Ra-226 (pCi/l)	3.3

Associated with Residual Radioactivity (LD-93-01, November 1993). The staff used the RESRAD Version 5.05 computer code to analyze the scenario. A qualitative description of the scenario follows:

"The resident spends 50% of the time indoors onsite, 33% outdoors onsite (8 hours per day for 365 days) and 17% of the time away from the site. The gardening is assumed to occur in the contaminated area. Approximately 50% of the resident's vegetable, grain, and fruit diet is assumed to be produced from the garden. This scenario assumes that all the resident's milk and 50% of the meat diet are also produced onsite. Dust levels in outdoor air in the vicinity of the garden are representative for earth moving areas because of tilling, planting, harvesting, and other activities that may increase suspension of soil particles in the air.

Vegetables, fruits, and grains are irrigated with water drawn from a well immediately downgradient of the contaminated area. Well water is also used to water the livestock onsite. All of the resident's drinking water is produced from the well onsite. No surface water is assumed to occur onsite. Consequently, the resident does not consume fish or other aquatic food from the site.

The walls, foundation, and floor of the resident's house reduce external exposure by 30%. Indoor dust levels in air are assumed to be 40% of the outdoor dust level. The scenario includes doses from indoor and outdoor radon exposure using conventional assumptions about the construction and air-exchange characteristics of the residence."

The scenario parameter values and assumptions used in creating the scenario is described in more detail in the draft Policy and Guidance Directive.

PRI's evaluation analyzed the potential dose through the meat pathway and the direct exposure pathway. The evaluation resulted in 35.2 $\mu\text{Sv}/\text{yr}$ (3.52 mrem/yr) TEDE. This evaluation consisted of simplified conservative calculations for the pathways under consideration.

The staff evaluation of PRI's analysis assumed concentrations result in a potential annual dose of 94.4 μSv (9.44 mrem) TEDE. The evaluation was carried out for one thousand years and the peak dose occurred at year 0. The evaluation using the "best estimate" source term resulted in a peak dose at year 0 of 34.8 $\mu\text{Sv}/\text{yr}$ (3.48 mrem/yr) TEDE. The results of the RESRAD computer modeling simulations are attached as Appendix 1.

TEDE Analysis for Reservoir Embankment Failure Release

In a letter dated June 2, 1994, PRI submitted an analysis of the exposure due to a potential embankment failure. This analysis was performed using the same post-application scenario and pathways as the previous submittals for the land application study and estimated the potential dose through the direct gamma pathway and the grass/dirt-to-cow-to-man pathway.

The licensee assumed an area of 36 acres would be inundated by the accidental release of 120 acre-feet of wastewater containing 2 mg/l natural uranium and 30 pCi/l Ra-226. The contaminants were assumed to be deposited in the top 6 inches of soil throughout the 36 acres. Assuming homogenous conditions, the resulting soil concentrations would be 6.2 pCi/g natural uranium and

0.14 pCi/g Ra-226. PRI's analysis resulted in a dose equivalent of 4.8 μ Sv/yr (0.48 mrem/yr) TEDE. The soil concentrations are lower than was analyzed by the staff in the dose assessment for the land application area, and the land surface affected is smaller. The resulting exposure from the resident farmer scenario would result in a TEDE of less than 94 μ Sv/yr (9.4 mrem/yr). Based on the NRC staff's review of the licensee's TEDE, the staff concludes the licensee has demonstrated that if the Satellite No. 2 Purge storage Reservoir Dam fails, the potential dose equivalent to the public is below the dose limit of 500 mrem established in 10 CFR 20.103(c).

Ground Water

To quantify the potential migration of effluent, the NRC staff used the RESRAD subroutine for determining travel time of hazardous constituents through saturated and unsaturated strata, and assess the potential impact to the well water (uppermost aquifer) at the land application facility (Appendix 2). The program run was based on geologic information from wellbore electric logs and the licensee's water rights search (February 4, 1994) which indicates (a) the unsaturated strata interbedded between the land application facility and the uppermost aquifer comprises units of sandy clay and silty sand and (b) the depth to ground-water well screens is commonly greater than 120 feet. To account for the spatial variation in geology, the strata was modeled as two equally thick layers (60-feet each), with the upper layer being the sandy clay unit and the lower layer being the silty sand unit. Hydrogeologic characteristics of the units were based on standard values for these types of strata (Driscoll, 1989; Freeze and Cherry, 1979). The initial concentrations of the radionuclides was the concentration at the time of application.

The results of the RESRAD analysis reveal the average transport time through the uppermost strata for radium-226 and uranium 234 and -238 would be approximately 2400 years and 1750 years, respectively. The transport time through the second, stratigraphically lower medium is approximately 2700 and 1900 years for radium-226 and uranium isotopes, respectively. These calculations are considered worst case scenarios because they incorporated the distribution coefficient and retardation factor for the radionuclides, but did not consider the effects of chemical dispersion and attenuation. A more rigorous analysis would result in even greater travel times for reaching the uppermost aquifer and the concentration of the radionuclides would be less. Program runs for 0-, 1000-, 3000-, and 5000-year elapsed times show the concentration radium-226 and uranium isotopes would be zero (Appendix 2). Therefore, the NRC staff conclude there would be no contamination to ground water as a result of instantaneous effluent release or scheduled land application.

RECOMMENDED LICENSE CHANGE

The NRC staff recommend amendment to License Condition No. 10.11 of SUA-1511 to reflect operation of a second purge storage reservoir at the HUP. Issuance of the proposed amendment would also require License Condition No.(s) 11.4 and 12.2 to be revised, to incorporate the cited monitoring program and ensure the licensee would meet reporting requirements. (The proposed operational monitoring program for the reservoir and irrigation area is described in

Section 4.0 of the SWLA, and included as Appendix 2 to this IER.) The licensee's commitment to perform post-operations surveys of soil (and vegetation) for uranium and radium-226 is discussed in Section 2.6 of the SWLA and will be required by revision to License Condition No. 11.4. This radionuclide data would be required to verify soil concentration levels are not above the levels used as the source term in the application. If the radionuclide levels were found to exceed the source term levels or pose a risk to public health, the licensee would be required to (a) reevaluate dose assessments to demonstrate that TEDE to public is still below the 10 CFR Part 20 dose limit, or (2) propose remediation to soil and vegetation to eliminate any potential health or environmental risk. Inspection of the reservoir would be required by revision to License Condition No. 11.13.

Issuance of the requested amendment to SUA-1511 would further require a revision to Section(s) 1.4, 2.10, and 4.4.2, and Plate 1 of the license application. Section 1.4 and Plate 1 of the current application, reviewed under the NRC environmental assessment dated October 3, 1991, refer to anticipated construction of a purge storage reservoir and irrigation facility at a proposed Satellite 3. A revision to this section and plate are required to correctly refer to Satellite 2. The NRC staff recommend approval of this revision because the previously and currently proposed facilities are comparable in function, and it appears there would be no additional potential impacts to the environment if the location of the reservoir and irrigation site is transferred from the area of the proposed Satellite 3 facility to the existing Satellite 2 area. A future request for a third effluent storage and irrigation system would require evaluation to determine the need for a new environmental assessment. Section 2 describes the HUP surface facilities. Section 4.4.2 discusses the use of purge storage reservoir for storing wellfield purge.

ENVIRONMENTAL IMPACT EVALUATION

The potential impacts to human health through ingestion are adequately addressed in the TEDE's. There are no projected impacts to public livelihood because (a) the use of the reservoir site is the same, and (b) the short term impact to land use for the irrigation land would not cause changes in the public's livelihood or standard of living.

A dose assessment which considers the potential radiological exposure of livestock is included in Appendix 2. In Section 5.4, the licensee commits to fencing the proposed reservoir and irrigation area to deter wildlife access to these facilities. (It should be noted this will not act to prevent waterfowl access.) The most notable impact to wildlife is the decrease in available natural feed. However, this is considered a short term impact. Furthermore, the total available rangeland is not significantly diminished. Therefore, the NRC staff conclude there would be no long term, significant impacts to wildlife.

Land use would be the same for the proposed reservoir. However, the land for irrigation currently supports natural vegetation that provides feed for wildlife. Because of the need to fence the irrigation facility, the land use would be altered for the life of the project (approximately 8 years). The

radionuclide loading of soil and vegetation by irrigation with effluent is discussed in the NRC's staff's technical evaluation of the amendment request under review. Based on the staff's TEDE assessment, contamination to soil and vegetation does not pose a long term impact. Notwithstanding, the licensee commits to post-operations soil and vegetation surveys to assess site contamination. The licensee indicated (SWLA) the greatest impact to vegetation would be inundation by water, and committed to discing and reseeding the land to be used for irrigation. Therefore, the change in land use is temporary, and is considered a short term impact.

Based on available information, the strata lying between the land application facility and the uppermost aquifer is characterized by a sequence of low permeability, sandy clay, and silty sand that is at least 120 feet thick. This information and the results of the RESRAD program indicate there will be no significant impact to ground water.

The proposed revision to SUA-1511, originally submitted October 5, 1993, and supplemented by information dated January 7, 1994, February 4, April 13, 21, and 22, and May 9 and 23, 1994, is consistent with NRC guidance. Therefore, it is recommended that SUA-1511 be amended by revising License Condition Nos. 10.11, 11.4, 11.13, and 12.2 of SUA-1511 to read as follows:

- 10.11 Radium settling ponds shall have at least 3 feet of freeboard. The Satellite 1 and Satellite 2 purge storage reservoirs shall have a 2 foot freeboard requirement until July 5, 1994, and a 4-foot requirement thereafter. 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. [Applicable Amendments: 45, 52, 53]
- 11.4 The licensee shall establish an effluent and environmental monitoring program in accordance with Section 9.7 and 9.8 of the Operations Plan of the approved license application and Attachment 2 of 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. [Applicable Amendments: 36, 45, 53]
- 11.13 The licensee shall perform and document a weekly visual inspection of the Satellite No. 1 radium settling ponds and liners, and the Satellite No. 1 and No. 2 storage reservoir embankments and fences, as well as measurements of pond and reservoir freeboard. Weekly checks of the Satellite No. 1 radium settling pond leak detection system shall also be documented. Should analyses indicate that a pond is leaking, the pond contents shall be transferred into an alternate impoundment and repairs undertaken. [Applicable Amendments: 5, 45, 53]

- 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 Section 9 of the Operations Plan of the approved license application.
 - B. Injection rates, recovery rates, and injection trunkline pressures for each satellite facility.
 - C. Monthly water quality analyses for the irrigation sprinkler discharge consisting of: pH, conductivity, IDS, Ba, Ca, Mg, K, Cl, SO₄, HCO₃, As, B, Se, U₃O₈, and Ra 226.
 - D. Results from the Satellite No. 2 Wastewater Land Application Facility monitoring program described in Table 7 of the amendment application dated October 5, 1993.

Monitoring data shall be reported in the format shown in the attachment to this license entitled, "Sample format for Reporting Monitoring Data."

[Applicable Amendments: 36, 45, 53]

In accordance with the categorical exclusion contained in paragraph (c)(11) of 10 CFR 51.22, an environmental assessment is not required for this licensing action. That paragraph states that the categorical exclusion applies to the issuance of amendments to licenses for uranium mills provided that (1) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite, (2) there is no significant increase in individual or cumulative occupational radiation exposure, (3) there is no significant construction impact, and (4) there is no significant increase in the potential for or consequences from radiological accidents.

The licensing action discussed in this memorandum meets these criteria as the proposed amendment involves effluent storage and land application within the Highland Uranium Project area authorized for operations. Staff analyses conservatively demonstrated that no effluents would be released from the site and that there would be no harm to human health or the environment as a consequence of the proposed activity. Therefore, an environmental assessment is not required. Accordingly, an environmental report is not required from the licensee because the amendment does not meet the criteria of 10 CFR 51.60(b)(2).

MONITORING PLAN: SATELLITE NO.2 WASTEWATER LAND APPLICATION FACILITY
(From SWLA, 1994)

Sample Type	Location	Frequency	Analyses
Irrigation Fluid	At irrigation pivot during irrigation	Composited daily Analyzed at least every 30 days of operation	Na, Ca, Mg, Cl, SO ₄ , As, Se, U, Ra226, HCO ₃ , TDS, K, Ba, B, SAR, pH
Irrigation Fluid	At discharge from radium treatment system	Monthly; grab	Ra226
Soil Water	At two 4 ft lysimeters	June	pH, Electrical Cond., Cl, SO ₄ , HCO ₃ , Se, B, U, Ra226
Soil Water	At shallow wells 1 and 2 adjacent to reservoir	Water level quarterly, semi-annual grab water quality	pH, Electrical Cond., Cl, SO ₄ , HCO ₃ , Se, B, U, Ra226
Irrigated Soil	4 sample sites per quarter of irrigated area, obtained at depths of 0-6 inches, 6-12 inches	August	Na, Ca, Mg, K, As, Se, B, Ba, Ra226, U, Electrical Cond., SAR, pH
Irrigated Vegetation	One sample at each soil sample location, composited by quarter	August	As, Se, B, Ra226, U, Ba
Visual Inspection	Irrigation Perimeter	Daily during irrigation	Check for runoff

NOTE: a. Heavy metal analyses in soils will be performed on plant available or "DPTA extractable" fraction

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, 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 by product 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 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

Power Resources Inc.

[Applicable Amendments: 18, 19]

P.O. Box 1210

Glenrock, Wyoming 82637

3. License number

SUA-1511, Amendment No. 53

4. Expiration date July 1, 1993

5. Docket or Reference No. 40-8857

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

9.0 Administrative Conditions

9.1 All notices to NRC required under this license shall be addressed to the Director, Uranium Recovery Field Office.

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

9.3 Authorized use is for uranium recovery from pregnant lixiviant in accordance with statements, descriptions, and representations contained in Volume 6 of the licensee's application submitted by cover letter dated March 20, 1991, as revised by page changes submitted on May 26, 1992; July 8, 1992; and July 16, 1992; and Section 9 as submitted on March 4, 1994. In addition, the licensee shall conduct its activities in accordance with the provisions in the following submittals:

October 20, 1988:	Research and Development Pilot
November 16, 1992:	Respiratory Protection Program
February 4, 1993:	Slurry Toll Processing
December 20, 1993,	Modification to the F-Wellfield
and January 26, 1994:	ground-water monitoring program

Regardless of the above submittals, the following license conditions shall override any conflicting statements contained in the licensee's application and supplements.

[Applicable Amendments: 2, 7, 17, 18, 36, 41, 44, 45, 46, 50, 51]

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MATERIALS LICENSE
SUPPLEMENTARY SHEET

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License number.

Docket or Reference Number: SUA-1511, Amendment No. 57

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- 9.4 Any significant changes to the licensed mining area or the restricted area shown in Plate 1 of the Operations Plan of the approved license application shall require approval by the NRC in the form of a license amendment. [Applicable Amendments: 45]
- 9.5 The licensee is authorized to dispose of byproduct material from the Highland Uranium Project 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, Uranium Recovery Field Office, within 7 working days after the expiration date. A new agreement shall be submitted for NRC approval within 90 days after expiration, or the licensee will be prohibited from further lixiviant injection. [Applicable Amendments: 17, 27, 45]
- 9.6 Before engaging in any 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). [Applicable Amendments: 36, 45]
- 9.7 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. [Applicable Amendments: 36, 45]
- 9.8 Release of equipment, materials, 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, or suitable alternative procedures approved by the NRC prior to any such release. [Applicable Amendments: 45]
- 9.9 Standard operating procedures (SOPs) shall be established for all operational activities involving radioactive materials that are handled, processed, stored, or transported by employees. SOPs shall include appropriate radiation safety practices to be followed in accordance with 10 CFR Part 20. The Radiation Safety Program also shall conform to 10 CFR Part 20. Written procedures shall be established for nonoperational activities to include inplant and environmental monitoring, bioassay analysis, and instrument calibration. The licensee shall establish standard operating procedures (SOPs) for the deployment of chemical reducing agents

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SUPPLEMENTARY SHEET**

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in the processing plant or in well fields for aquifer restoration in accordance with ground-water restoration methods described in the license application. An up-to-date copy of each SOP shall be kept in each area where it is used.

All SOPs shall be reviewed and approved in writing by the Operations Manager and the Safety Director before being implemented and whenever a change in a procedure is proposed. SOPs for activities involving radioactive materials shall also be reviewed and approved by the Corporate Radiation Safety Officer (CRSO) prior to implementation. 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.

[Applicable Amendments: 45]

10

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 completion of the NRC-approved site closure plan including; above-ground decommissioning and decontamination, the cost of offsite disposal of radioactive solid process or evaporation pond residues, and ground water restoration, as warranted. Within 3 months of NRC approval of a revised site closure plan, the licensee shall submit for NRC review and approval, a proposed revision to the financial surety arrangement if the estimated costs in the newly approved site closure plan exceed the amount covered in the existing financial surety. A 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 at least 3 months prior to August 31 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 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 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.

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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.

[Applicable Amendments: 18, 25, 27, 36, 39, 45, 47]

9.11 The licensee shall assign an RSO to the site on a permanent full-time basis. [Applicable Amendments: 45]

9.12 Any corporate organization changes affecting the assignments or reporting responsibilities of the radiation safety staff as described in Section 9 of the Operations Plan of the approved license application and as shown in the submittal dated November 5, 1992, shall require approval by the NRC in the form of a license amendment. [Applicable Amendments: 18, 27, 29, 36, 37, 40, 45]

9.13 The RSO shall be qualified as specified in Sections 1.2 and 2.4.1 of Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills will be As Low As Reasonably Achievable," dated May 1983, or equivalent. 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 Section 2.4.2 of 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.

[Applicable Amendments: 28, 35, 36, 45]

9.14 The licensee shall have a training program for all site employees as described in Section 2.5 of Regulatory Guide 8.31 and as detailed in Section 9 of the Operations Plan of the approved license application. [Applicable Amendments: 45]

9.15 The licensee is exempted from the requirements of Section 20.1902(e) of 10 CFR 20 which addresses requirements for areas within the facility in

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which use or storage of uranium or thorium exceeds a designated level, 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."

Additionally, the licensee shall maintain the well-field area postings to notify people of the onsite radiological hazards. Well fields where decommissioning activities or other activities which could potentially result in personnel exposure to radioactive materials and for which no SOP exists shall require restricted area control and RWPs.

[Applicable Amendments: 36, 45, 50]

9.16 The licensee shall implement the Emergency Action Plan for Accidents as detailed in Section 9.13 of the Operations Plan of the approved license application. [Applicable Amendments: 45]

9.17 The licensee shall update the Highland Uranium Project schedule as described in Section 1.4 of the approved license application on an annual basis. [Applicable Amendments: 17, 36, 45]

10. Operations, Controls, Limits, and Restrictions

10.1 The licensee shall conduct aquifer hydrologic tests in accordance with Section 7.3 of the Operations Plan of the approved license application, as revised by the submittal dated October 15, 1992. Any substitution of the Neumann-Witherspoon analytical method shall require prior NRC approval.

The licensee shall perform additional hydrologic tests of the aquitard underlying the mine unit aquifer at monitor wells FMU-3, FMU-4, and FMU-5, prior to commencement of production activities in the portion of the F-Wellfield monitored by these wells.

[Applicable Amendments: 2, 44, 45, 51]

10.2 The licensee shall conduct injection and recovery well installation in conformance with Section 6.3 of the Operations Plan of the approved license application. [Applicable Amendments: 45]

10.3 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 using techniques approved in the Underground Injection Control program administered by the State of Wyoming and Section 6.6 of 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. [Applicable Amendments: 45]

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10.4

Baseline ground-water quality sampling shall provide representative premining ground-water quality data and restoration criteria as described in Section 7.5 and 7.6 of the Operations Plan of the approved license application. Baseline ground water quality for all new mining units shall be submitted 2 months prior to lixiviant injection. The data shall, at a minimum, consist of analyses for ground-water constituents as described below and in conjunction with Section 7.5.2, Table 1 (short list), Section 7.5.3, Table 2 (long list), and 7.6.2 (upper control limits) of the approved license application:

- Production pattern (MP) wells: Two long lists and two short lists
- Monitor ring (M) and trend (T) wells: One long list; three UCI suites
- Overlying (MO) and underlying (MU) wells: Two long lists; two UCI suites

[Applicable Amendments: 4, 6, 9, 12, 16, 17, 22, 30, 36, 43, 45, 48]

10.5

The wells for establishing baseline ground-water quality shall be placed in each mining unit at the following points: (1) all mining unit perimeter monitor wells, (2) at least one upper and lower aquifer monitor well per 3-acre area of production pattern area, 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. [Applicable Amendments: 2, 24, 38, 45]

10.6

For the following mining units, UCIs are approved as delineated in the licensee's referenced submittals:

Mining UnitSubmittal Date

Section 21:20-Sand
(A-Wellfield)

November 30, 1987, and
November 2, 1988

Section 21:30-Sand
(B-Wellfield)

November 2, 1988

Section 14:50-Sand (North)
(C-Wellfield)

February 13, 1989 and
July 20, 1992

Section 14:50-Sand (South)
(C-Wellfield)

April 2, 1990

Section 22/23:40-Sand
(D-Wellfield)

March 12, 1991

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Section 15/22/23:50-Sand
(E Wellfield)

September 5, 1991 and
September 13, 1992

Section 14/23:50-Sand and
40-Sand
(C and D Wellfield)

February 19, 1992

Section 21:30-Sand
(B Wellfield, Well M-63)

November 5, 1993

Sections 20/21/22/27/28/29:
40, 50-, and 60-Sand
(I Wellfield)

November 10, 1993

[Applicable Amendments: 4, 6, 9, 12, 16, 17, 22, 30, 36, 43, 45, 49, 51]

10.7

The licensee shall utilize a carbon dioxide solution as the lixiviant with an oxygen or hydrogen peroxide oxidant. Any variation from this combination shall require a license amendment. [Applicable Amendments: 12, 36, 45]

10.8

Injection well pressures shall be maintained in accordance with commitments in Section 3.2 of the Operations Plan of the approved license application. [Applicable Amendments: 45]

10.9

Any significant changes which alter a production zone injection/recovery balance or processing plant circuit as illustrated in Figure 2 of the Operations Plan of the approved license application shall be reviewed by the CRSO and shall require prior approval by the NRC in the form of a license amendment. [Applicable Amendments: 36, 45]

10.10

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. [Applicable Amendments: 17, 36, 45]

10.11

Radium settling ponds shall have at least 3 feet of freeboard. The Satellite 1 and Satellite 2 purge storage reservoirs shall have a 2-foot freeboard requirement until July 5, 1994, and a 4-foot requirement thereafter. 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. [Applicable Amendments: 45, 52, 53]

10.12

All liquid effluents (solutions) from process buildings and other process waste streams, with the exception of sanitary wastes, shall be returned to the process circuit, or discharged to the waste solution well in accordance

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with Section 4.4 of the Operations Plan of the approved license application. All changes to disposal methods described in Section 4 of the Operations Plan shall be approved by license amendment. [Applicable Amendments: 45]

10.13

The licensee shall maintain effluent control systems as specified in Section 9.14 of the license application, with the following additions:

- A. Yellowcake drying and packaging operations shall be immediately suspended if any of the emission control equipment for 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 manufacturer's recommended pressure is maintained for the package and dryer scrubbers. This shall be accomplished by either (1) performing and documenting checks of air pressure approximately every 4 hours during operation, or (2) installing instrumentation which will signal an audible alarm if the air pressure does not meet the manufacturer's recommended levels. If an audible alarm is used, its operation shall be checked and documented daily.

[Applicable Amendments: 36, 45]

10.14

For work in restricted areas or areas as defined in 10 CFR 20.203 where the potential for exposure to radioactive materials exists and for which no SOP exists, a radiation work permit (RWP) shall be required. Such permits shall describe the following:

- A. The scope of the work to be performed.
- B. Any precautions (such as supplemental radiological monitoring and sampling) necessary to reduce exposure to radioactive materials to levels as low as reasonably achievable (ALARA).

Nonroutine maintenance activities which expose workers to airborne uranium or its daughters shall require use of continuous breathing-zone monitors.

The RSO, RST, or their designees shall indicate by signature that each RWP has been reviewed prior to initiating the work. Exposure calculations shall be performed in accordance with Section 9.4 of the license application.

[Applicable Amendments: 45]

10.15

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 well field. [Applicable Amendments: 45]

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- 10.16 DELETED by Amendment No. 50.
- 10.17 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 protective clothing including coveralls, rubber gloves, and boots or shoe covers. [Applicable Amendments: 45]
- 10.18 Within restricted areas, eating shall be allowed only in designated eating areas. [Applicable Amendments: 45]
- 10.19 Before leaving any restricted area, all process workers shall shower or monitor themselves using a calibrated alpha survey instrument. Surveys meeting or exceeding the radiation action level of 1000 dpm/100 cm² shall require personnel to decontaminate and resurvey themselves until contamination is less than the action level. The Site RSO or designee shall perform and document spot surveys for alpha contamination at least quarterly on workers leaving the restricted area. [Applicable Amendments: 45]
- 10.20 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. [Applicable Amendments: 45]
- 10.21 The licensee shall maintain an area within the restricted area boundary and at each satellite facility for temporary storage of contaminated materials. All contaminated wastes shall be disposed at a licensed radioactive waste disposal site authorized to accept 11(e)2 byproduct material. [Applicable Amendments: 20, 45]
- 10.22 Three months prior to construction of Satellite No. 3 and ancillary facilities, the licensee shall submit a request for a revision to operations for NRC approval in the form of a license amendment. The submittal shall include a diagram and description for all major facility process components. The submittal shall also include a facility radiological monitoring program. [Applicable Amendments: 36, 45]
- 11.0 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. [Applicable Amendments: 45]
- 11.2 Well-field monitoring wells shall be monitored once every 2 weeks in accordance with Section 8.2 of the Operations Plan of the approved license application. In addition, the following monitoring program revisions are approved:

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May 19, 1988	A- and B-Well-Field monitor well modification
May 2, 1990	C-Well-Field monitor well identification
July 23, 1991	C- and D-Well-Field monitoring for only water levels in some wells
August 19, 1991	B-Well-Field excursion well monitoring
May 13, 1992	C-, D-, E-Well-field monitor well modification
October 8, 1992	B-Well-Field excursion well monitoring

[Applicable Amendments: [8, 23, 33, 34, 42, 45]]

- 11.3 Upper control limit (UCL) criteria shall be applied to all monitor wells to determine when action must be taken to control excursions during production and restoration activities. During production activities, each monitor well shall be sampled and analyzed for chloride, bicarbonate, and conductivity (excursion indicators) once every 2 weeks in accordance with Section 8.2 of the Operations Plan of the approved license application. During restoration, monitor wells shall be sampled and analyzed in accordance with Section 4.5 of the Reclamation Plan of the approved license application.

If two UCLs are exceeded in a well, the licensee shall take a confirmatory water sample within 24 hours and analyze it for the excursion indicators. If the first confirmatory sample does not indicate exceedance of UCLs, a third sample shall be taken within 48 hours of receiving data for the first sample. If neither the second or third sample indicate exceedance, the first sample shall be considered in error.

If the second or third sample indicates an exceedance, the well in question shall be placed on excursion status. Upon confirmation of an excursion, the licensee shall implement corrective action. During excursion status, sampling and testing frequency shall be increased to weekly for all monitor wells on excursion. An excursion is considered concluded when the concentrations of all excursion indicators are below the levels that define an excursion, for 3 consecutive weekly samples.

[Applicable Amendments: 12, 28, 45]

- 11.4 The licensee shall establish an effluent and environmental monitoring program in accordance with Section 9.7 and 9.8 of the Operations Plan of the approved license application and Attachment 2 of 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. [Applicable Amendments: 36, 45, 53]

- 11.5 The results of sampling, analyses, surveys, monitoring, equipment calibration, reports on audits and inspections, all meetings and training courses required by this license, and any subsequent reviews,

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investigations, and corrective actions, shall be documented. Unless otherwise specified in the NRC regulations, all such documentation shall be maintained for at least 5 years. [Applicable Amendments: 45]

- 1.6 During production, the RSO, RST, or a trained designee shall perform and document a daily walkthrough inspection of all operating areas to ensure all radiation protection and monitoring requirements are being followed. [Applicable Amendments: 36, 45]
- 1.7 DELETED by Amendment No. 50.
- 1.8 DELETED by Amendment No. 50.
- 1.9 The licensee shall perform alpha contamination surveys of the change rooms, eating areas, and offices in conformance with Section 1.5 and Table 1 of Regulatory Guide 8.30. If bioassay samples are analyzed in house, the licensee shall survey laboratory work surfaces as specified in Section 3.5 of Regulatory Guide 8.31. [Applicable Amendments: 45]
- 1.10 The calculation of occupational exposures to soluble uranium shall be performed and documented within 1 week of the end of the regulatory compliance period as specified in 10 CFR 20.1201(e). Routine air 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 or designee within 2 working days after sample collection. [Applicable Amendments: 45, 50]
- 1.11 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.
- [Applicable Amendments: 17, 36, 45]
- 1.12 The licensee shall implement a urinalysis program as outlined in Revision 1 to Regulatory Guide 8.22 and Section 9.5 of the Operations Plan of the approved license application. [Applicable Amendments: 36, 45]
- 1.13 The licensee shall perform and document a weekly visual inspection of the Satellite No. 1 radium settling ponds and liners, and the Satellite No. 1 and No. 2 storage reservoir embankments and fences, as well as measurements of pond and reservoir freeboard. Weekly checks of the Satellite No. 1

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radium setting pond leak detection system shall also be documented. Should analyses indicate that a pond is leaking, the pond contents shall be transferred into an alternate impoundment and repairs undertaken.
[Applicable Amendments: 5, 45, 53]

Reporting Requirements

At least 2 months prior to lixiviant injection in each mining unit, the mine unit hydrologic test results depicting hydrologic properties controlling ground-water flow, and the baseline water quality data, shall be submitted to the NRC. The submittal shall propose UCLs for chloride, bicarbonate, and conductivity in all monitoring wells for each mining unit in accordance with Section 7 of the Operations Plan of the approved license application. Authorization to begin lixiviant injection and associated activities shall be in the form of a license amendment to approve the proposed UCLs.
[Applicable Amendments: 9, 12, 24, 30, 45]

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 Section 9 of the Operations Plan of the approved license application.
- B. Injection rates, recovery rates, and injection trunkline pressures for each satellite facility.
- C. Monthly water quality analyses for the irrigation sprinkler discharge consisting of: pH, conductivity, TDS, Na, Ca, Mg, K, Cl, SO₄, HCO₃, As, B, Se, U₂O₈, and Ra-226.
- D. Results from the Satellite No. 2 Wastewater Land Application Facility monitoring program described in Table 7 of the amendment application dated October 5, 1993.

Monitoring data shall be reported in the format shown in the attachment to this license entitled, "Sample Format for Reporting Monitoring Data."

[Applicable Amendments: 36, 45, 53]

In the event a lixiviant excursion is confirmed by ground-water monitoring, NRC shall be notified by telephone within 24 hours and by letter within 7 days from the time the excursion is confirmed. In addition, a written report shall be submitted to the NRC within 2 months 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

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excursion until such time as the excursion is considered controlled or has 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 ground-water quality improvement. Control of an excursion shall be indicated by ground-water quality data that reveal the plume of degraded water quality has not increased in extent and that show the ground-water quality of the impacted area is improving. [Applicable Amendments: 12, 45]

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. 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 1, at least once per month during the leak period.

A written report shall be filed with the NRC within 2 months 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.

[Applicable Amendments: 5, 45]

12.5 The licensee shall report incidences 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. [Applicable Amendments: 45, 50]

6 The licensee shall conduct restoration activities in accordance with the ground-water restoration plan included in Section 4 of the Reclamation Plan of the approved license application. The primary goal of restoration shall be to return the ground-water quality, on a production unit average, to baseline conditions. A secondary goal of returning the ground water to a quality consistent with the use or uses for which the water was suitable prior to in situ leach mining may be approved in accordance with Section 4.1 of the Reclamation Plan of the approved license application. [Applicable Amendments: 32, 45]

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. [Applicable Amendments: 45]

12.8 An audit team comprising licensee management shall perform an annual ALARA audit of the radiation safety program in accordance with Section 2.3.3 of Regulatory Guide 8.31. The RSO shall accompany the audit team. A report of

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this audit shall be submitted to the NRC within 60 days after conducting the audit. The report shall also summarize the results of the daily walkthrough inspections. [Applicable Amendments: 36, 45]

FOR THE NUCLEAR REGULATORY COMMISSION



Ramon E. Hall, Director
Uranium Recovery Field Office
Region IV

Date:

JUN 10 1994