

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

|                                |   |                         |
|--------------------------------|---|-------------------------|
| In the Matter of               | ) |                         |
| PLATEAU RESOURCES LIMITED      | ) | Docket No. 40-8698      |
|                                | ) | Source Material License |
| Attn: Fred W. Gerdeman         | ) | No. SUA - 1371          |
| 772 Horizon Drive              | ) |                         |
| Grand Junction, Colorado 81506 | ) | Amendment No. 24        |

ORDER TO MODIFY LICENSE

I

Plateau Resources Limited (Licensee) is the holder of Source Material License No. SUA-1371 issued by the Nuclear Regulatory Commission (Commission). The license authorizes the possession, use and processing of natural uranium and the production of 454 metric tons of  $U_3O_8$  per year. The current license was issued September 21, 1979, and is currently under timely renewal in accordance with 10 CFR 40.43(b).

II

On September 30, 1983, the Administrator of the Environmental Protection Agency (EPA) promulgated, pursuant to Section 275b of the Atomic Energy Act of 1954 (Act), the final health and environmental standards to govern stabilization and control of byproduct materials at licensed commercial uranium and thorium processing sites (40 CFR 192). Under the terms of Section 275d of the Act, the Commission is responsible for the implementation and enforcement of the standards promulgated by EPA.

Section 192.32(a)(2)(iii) of EPA's 40 CFR 192 requires that detection monitoring programs for ground water (required by 40 CFR 264.98) to establish

ground water protection standards for hazardous constituents for each regulated unit (40 CFR 264.92) be in place and operational within one year of the date of promulgation. All NRC licensees subject to the rule, therefore, were required to have an acceptable detection monitoring program in operation no later than September 30, 1984.

By letter dated July 10, 1984, the Commission notified the licensee of the acceptance criteria it would use in evaluating whether the licensee's ground water monitoring program was acceptable to meet these requirements. The Commission also pointed out those specific areas of the licensee's current program which it believed did not meet the acceptance criteria. The licensee was directed to submit its proposed program sufficiently in advance of the September 30, 1984 deadline to permit NRC review and implementation of the program.

The licensee responded to the July 10, 1984 letter on September 27, 1984. The Staff's analysis of the licensee's response and evaluation of its program for conformance to the acceptance criteria is set forth in the attachment to this Order.

The detection monitoring program has been required in order to establish ground water standards for each regulated entity to assure that hazardous constituents entering the ground water from that entity do not exceed established concentration limits in the uppermost aquifer passing under the tailings impoundment. As described above, detection monitoring programs have been required to be in place since September 30, 1984. If contamination exceeds standards pursuant to 40 CFR 192.33, a corrective action program as specified in 40 CFR 264.100 may be required to be in operation no later than 18 months after a finding of exceedance is made. If undetected contamination

of ground water occurs, it may degrade the ground water to the extent that available corrective actions will be ineffective and the contamination will irretrievably pose a substantial present or potential hazard to human health or the environment. Therefore, I have determined pursuant to 10 CFR 2.204 that the public health, safety, and interest requires that the monitoring program to gather the information to establish the appropriate ground water standards for this licensee and to detect their exceedance should be implemented as soon as possible and that the license modification set forth below should be effective immediately.

### III

Accordingly, pursuant to sections 61, 81, 84, 161(b & o) and 275 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR 2.204 and Part 40, IT IS HEREBY ORDERED EFFECTIVE IMMEDIATELY THAT: License No. SUA-1371 is amended by adding the following License Condition No. 50 to read as follows:

50. The licensee shall implement a ground water detection monitoring program to ensure compliance to 40 CFR 192.32(a)(2) which includes the following elements:

A. The licensee shall monitor at the point of compliance and background wells for the following indicator parameters: Arsenic, Selenium and pH. The licensee shall utilize analytical techniques capable of providing lower limits of detection of 0.005 mg/l and 0.001 mg/l for arsenic and

selenium, respectively. Measurements of pH shall be reported to the nearest 1/10 standard unit.

- B. The determination of compliance shall be based upon sampling Wells RM-4, RM-5 and RM-6.
- C. The determination of background levels for the parameters specified in subsection (A) shall be defined by sampling Well RM-1.
- D. The licensee shall sample for those parameters specified in subsection (A) at those wells designated in subsections (B) and (C) three times a quarter for a period of one (1) year and at least twice annually thereafter. The first monthly sample shall be taken within 30 days of the date of this Order. All semiannual samples shall be taken at least four months apart.
- E. The licensee shall, within 60 days of collection of the last of the twelve samples, propose for USNRC approval in the form of a license amendment background levels for indicator parameters and a statistical procedure for identifying significant changes (95% confidence level) between data from the wells specified in subsections (B) and (C).
- F. The licensee shall report the data required by section (D) semiannually along with those data required by License

Condition No. 44 in accordance to the reporting format, Attachment No. 4 to SUA-1371, "Sample Format for Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 34.

- G. The licensee shall report at least annually in accordance to reporting requirements specified in subsection (F) the rate and direction of ground water flow under the tailings impoundment.

#### IV

The licensee or any other person adversely affected by this Order may request a hearing within 25 days after issuance of this Order. Any answer to this Order or any request for hearing shall be submitted to the Director, Uranium Recovery Field Office, U.S. Nuclear Regulatory Commission, P.O. Box 25325, Denver, Colorado, 80225. Copies shall also be sent to the Executive Legal Director, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555 and to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, Parkway Central Plaza Building, 611 Ryan Plaza Drive, Suite 1000, Arlington, Texas, 76011. ANY REQUEST FOR A HEARING SHALL NOT STAY THE IMMEDIATE EFFECTIVENESS OF THIS ORDER.

If a hearing is requested by the licensee, the Commission will issue an order designating the time and place of any hearing. If a hearing is held, the issue to be considered at such hearing shall be:

Whether, on the basis of the matters set forth in this Order, this Order should be sustained.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/

R. Dale Smith, Director  
Uranium Recovery Field Office  
Region IV

Dated at Denver, Colorado  
this 19th day of July 1985

DISTRIBUTION

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Docket File 8698  
LFMB/DCS/PDR  
DBangart, RIV  
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URFO:CCJ  
Docket No. 40-8698  
SUA-1371, Amendment No. 23  
04008698471E

Plateau Resources Limited  
ATTN: Mr. Fred W. Gerrieman  
Director of Regulatory Affairs  
772 Horizon Drive  
Grand Junction, CO 81506-3989

Gentlemen:

Pursuant to Title 10, Code of Federal Regulations, Part 40, and in accordance with the Uranium Recovery Field Office review of Amendment No. 21 dated April 22, 1985, Source Material License No. SUA-1371 is hereby amended by revising License Condition No. 50 to read as follows:

50. The licensee shall implement a ground water detection monitoring program to ensure compliance to 40 CFR 192.32(a)(2) which includes the following elements:
  - a. The licensee shall monitor at the point of compliance and background wells for the following indicator parameters: Arsenic, Selenium and pH. The licensee shall utilize analytical techniques capable of providing lower limits of detection of 0.005 mg/l and 0.001 mg/l for arsenic and selenium, respectively. Measurements of pH shall be reported to the nearest 1/10 standard unit.
  - b. The determination of compliance shall be based upon sampling Wells RM-4, RM-5 and RM-6.
  - c. The determination of background levels for the parameters specified in subsection (a) shall be defined by sampling Well RM-1.

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- d. The licensee shall sample for those parameters specified in subsection (a) at those wells designated in subsections (b) and (c) three times a quarter for a period of one (1) year and at least twice annually thereafter. All semiannual samples shall be taken at least four months apart.
- e. The licensee shall, within 60 days of collection of the last of the twelve samples, propose for USNRC approval in the form of a license amendment background levels for indicator parameters and a statistical procedure for identifying significant changes (95% confidence level) between data from the wells specified in subsections (b) and (c).
- f. The licensee shall report the data required by section (d) semiannually along with those data required by License Condition No. 44 in accordance to the reporting format, Attachment No. 4 to SUA-1371, "Sample Format for Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 34.
- g. The licensee shall report at least annually in accordance to reporting requirements specified in subsection (f) the rate and direction of ground water flow under the tailings impoundment.

The effect of this amendment is to correct the license number in subpart f of Condition No. 50 which was incorrectly specified as SUA-1338 in Amendment No. 21 to SUA-1371.

All other conditions of this license shall remain the same. The license is being reissued in its entirety to incorporate the corrected license condition specified above.

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The issuance of this amendment was discussed via telephone conversation between Mr. Gerdeman of Plateau Resources Limited and Ms. Jierree of my staff on April 29, 1985.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/  
R. Dale Smith, Director  
Uranium Recovery Field Office  
Region IV

Enclosure: Source Material License SUA-1371

Case Closed: 04008698471E

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| OFC             | URFO     | URFO        | URFO    |  |  |  |  |
| NAME :          | CJierree | HPettengill | RDSmith |  |  |  |  |
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Docket File 8698  
LFMB/DCS/PDR  
DBangart, RIV  
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State Health Office  
URFO r/f

URFO:GRK  
Docket No. 40-8698  
SUA-1338, Amendment No. 21  
04008698351E

MEMORANDUM FOR:Docket File No. 40-8698

FROM: Gary R. Konwinski, Project Manager  
Licensing Branch 2  
Uranium Recovery Field Office, RIV

SUBJECT: AMENDMENT NO. 21 TO SOURCE MATERIAL  
LICENSE SUA-1338 FOR PLATEAU RESOURCES  
LIMITED, SHOOTARING CANYON URANIUM  
PROCESSING FACILITY

By letter dated September 27, 1984, Plateau Resources Limited, Shootaring Canyon Uranium Processing Facility (PRL), submitted the details of their proposed detection monitoring program in response to URFO's July 10, 1984 letter outlining the staff's criteria for an acceptable detection monitoring program as detailed in 40 CFR 192. The July 10 letter informed PRL that their existing groundwater monitoring program at that time did not appear to meet Criteria 6 and 7. The purpose of this memorandum is to review PRL's proposed detection monitoring program against the staff-developed acceptance criteria and make recommendations for licensing action to implement this program.

Criterion 1

The program must be reliable in indicating the presence of hazardous constituents in the uppermost aquifer under the impoundment. Reliable indication shall be based on the analyses of ground water samples for specified chemical-physical parameters, waste constituents, or reaction products that are reliable indicators of the leakage of hazardous constituents disposed in the impoundment.

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PRL currently monitors 5 ground water parameters semiannually and 2 quarterly. These parameters include highly mobile ions which are used in the mill circuit for the extraction of uranium, are very concentrated in the tailings pond liquor and are therefore reliable indicators of the presence of seepage. A review of the water quality data (Table 1) indicates that the downgradient wells (Wells RM-4, RM-5 and RM-6) have a higher pH than the upgradient well (Well RM-1). All of the wells show considerable scatter in most other monitored parameters. Because the data has a consistent amount of scatter from 1979 to the present, it probably represents a combination of normal groundwater fluctuations and less than ideal sampling techniques.

In their submittal, PRL proposed to monitor the following indicator species: sulfate, chloride, conductance, pH, uranium and lead 210. Sulfate, chloride and conductance represent mobile constituents which may signal the presence of tailings impoundment seepage; however, they do not necessarily indicate the presence of hazardous constituents. Similar problems, as more completely discussed in the generic review document, are associated with uranium and lead. The uranium may be mobilized from a local and unknown source whereas lead is immobile when compared to other hazardous constituents. Due to these considerations, the staff recommends that PRL use arsenic, selenium and pH as indicator species. These parameters overcome the problems noted above and are good indicators of the presence of hazardous constituents in the ground water. A list of existing data for these parameters is shown in Table 1.

### Criterion 2

The program must provide samples representative of the ground water passing under the impoundment at the point of compliance. Representative samples shall be determined by the sufficiency in number of sampling wells and the adequacy of their locations, including depths, with respect to the uppermost aquifer and its direction(s) of flow. Point of compliance is specified to provide prompt indication of leakage from the impoundment should it occur.

In their submittal PRL proposed to use wells RM-4, RM-5 and RM-6 as point of compliance wells. These wells are located in a line which parallels the face of the tailings impoundment dam. The wells are all located in a downgradient direction and sample the aquifer which

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TABLE 1, PLATEAU RESOURCES LIMITED, SHOOTARING CANYON WATER QUALITY DATA

| RM-1 - Background Well |                   |          |           | RM-4 - Point of Compliance Well |                               |          |           | RM-5 - Point of Compliance Well |                   |          |           |
|------------------------|-------------------|----------|-----------|---------------------------------|-------------------------------|----------|-----------|---------------------------------|-------------------|----------|-----------|
| Date                   | Indicator Species |          |           | Date                            | Indicator Species             |          |           | Date                            | Indicator Species |          |           |
|                        | As(mg/l)          | Se(mg/l) | pH(units) |                                 | As(mg/l)                      | Se(mg/l) | pH(units) |                                 | As(mg/l)          | Se(mg/l) | pH(units) |
| 0284                   | #                 | #        | 8.4       | 0284                            | *                             | *        | *         | 0284                            | #                 | #        | 11.7      |
| 1283                   | 0.7               | #        | 10.1      | 1283                            | #                             | #        | 9.4       | 1283                            | #                 | #        | 9.8       |
| 0983                   | #                 | .002     | 7.8       | 0983                            | .001                          | .002     | 11.3      | 0983                            | #                 | .001     | 10.9      |
| 1282                   | .004              | -.01     | 7.7       | 1282                            | .008                          | #        | 11.5      | 1282                            | .008              | #        | 10.6      |
| 1182                   | .0028             | -.01     | 6.2       | 1182                            | .002                          | #        | 12.5      | 1182                            | #                 | #        | 12.0      |
| 1082                   | .003              | .005     | #         | 1082                            | .002                          | .001     | *         | 1082                            | #                 | #        | *         |
| 0982                   | -.01              | 0.1      | #         | 0982                            | No sample - equipment failure |          | *         | 0982                            | .002              | 0.1      | *         |
| 0882                   | *                 | *        | *         | 0882                            | #                             | 1.4      | 10.9      | 0882                            | #                 | 1.1      | 10.2      |
| 0782                   | -.01              | 1.2      | 8.2       | 0782                            | #                             | 1.2      | 11.1      | 0782                            | #                 | 1.1      | 10.7      |
| 0682                   | *                 | *        | *         | 0682                            | #                             | 1.5      | 11.1      | 0682                            | #                 | 1.0      | 10.9      |
| 0582                   | 0.13              | .04      | 8.4       | 0582                            | .07                           | 0.1      | 11.0      | 0582                            | .04               | 0.1      | 11.0      |
| 1080                   | -.01              | -.001    | 8.5       | 1080                            | -.01                          | -.01     | 12.0      | 1080                            | -.01              | -.01     | 11.0      |
| 0780                   | -.01              | -.005    | 8.5       | 0780                            | -.01                          | -.005    | 11.0      | 0780                            | -.01              | -.005    | 11.0      |
| 0480                   | -.005             | -.005    | 8.4       | 0480                            | -.005                         | -.005    | 11.0      | 0480                            | -.005             | -.005    | 11.0      |
| 0180                   | -.005             | -.01     | 4.3       | 0180                            | .012                          | -.005    | 11.6      | 0180                            | .011              | -.005    | 10.1      |
| 1279                   | -.01              | -.02     | 8.6       | 1279                            | -.01                          | .02      | 11.3      | 1279                            | -.01              | .02      | 9.6       |
| 0979                   | -.01              | -.01     | 8.5       | 0979                            | -.005                         | -.001    | 11.5      | 0979                            | -.005             | -.01     | 10.0      |

\* Indicates that no sample was taken for this indicator species on the date specified.

- When a concentration is preceded by a -, this indicates that the indicator species was undetectable at this lower limit of detection.

# Indicator species sampled but no value recorded or a zero value recorded.

TABLE 1, PLATEAU RESOURCES LIMITED, SHOOTARING CANYON WATER QUALITY DATA (Cont)

RM-6 - Point of Compliance Well

| <u>Date</u> | <u>Indicator Species</u> |                 |                  |
|-------------|--------------------------|-----------------|------------------|
|             | <u>As(mg/l)</u>          | <u>Se(mg/l)</u> | <u>pH(units)</u> |
| 0284        | *                        | *               | *                |
| 1283        | 0.2                      | #               | 9.8              |
| 0983        | #                        | .004            | 11.2             |
| 1282        | .007                     | #               | 11.5             |
| 1182        | #                        | #               | 12.5             |
| 1082        | #                        | #               | *                |
| 0982        | #                        | #               | *                |
| 0882        | #                        | 1.15            | 10.9             |
| 0782        | #                        | 1.1             | 11.1             |
| 0682        | #                        | 1.1             | 11.1             |
| 0582        | .013                     | 0.2             | 11.0             |
| 1080        | -.01                     | -.01            | 9.4              |
| 0780        | -.01                     | -.005           | 9.9              |
| 0480        | -.005                    | -.005           | 10.0             |
| 0180        | 0.12                     | .006            | 11.0             |
| 1279        | -0.01                    | .02             | 10.6             |
| 0979        | -.005                    | -0.01           | 11.1             |

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\* Indicates that no sample was taken for this indicator species on the date specified.

- When a concentration is preceded by a -, this indicates that the indicator species was undetectable at this lower limit of detection.

# Indicator species sampled but no value recorded or a zero value recorded.

underlies the tailings impoundment. Because tailings have been disposed in only a portion of the tailings impoundment (behind a cross-valley berm) the initial staff reaction was to require an additional well to be drilled at the base of the disposal area. However, after reviewing the rate of ground water movement and the depth to the saturated portion of the formation, the staff concluded that there would be no advantage to establishing a point of compliance well within the tailings impoundment at the cross-valley berm. The staff therefore agrees with PRL and recommends that wells RM-4, RM-5 and RM-6 define the point of compliance.

### Criterion 3

The program must include sampling locations suitable to determine background levels of monitored parameters and constituents and to detect leakage of hazardous constituents from the impoundment should it occur. Suitability of sampling locations shall be determined by the placement of sampling wells upgradient (background) and downgradient (leakage) of the surface impoundment.

PRL proposed well RM-1 to be representative of background conditions. The well is located upgradient from the tailings management system. Pre-operation data indicate that well RM-1 has similar water quality as the wells located at the point of compliance with the exception of pH. The variation in pH between the background well and the point of compliance is unexplainable as are the large variations in the other indicator species. It appears that sample gathering, as well as analytical techniques, may be somewhat less than ideal. The staff however agrees with the siting of this well and recommends that it be used to represent background levels of indicator parameters.

### Criterion 4

The program, to be fully operational, must have available reliable data on background levels of monitored parameters and constituents, or a procedure implemented for determining background levels of monitored parameters and constituents.

As previously discussed, considerable scatter exists in the water quality data. Most of this scatter is due to lack of sampling or due to reporting a zero value when the species tests are less than the lower limit of

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detection (LLD). To further complicate matters, the LLD for many samples is not specified. Due to these reasons an adequate statistical base cannot be developed for indicator species at this time. Although PRL currently monitors their wells on a quarterly frequency, the staff recommends that sampling for arsenic, selenium and pH be done on a monthly frequency for the initial year of sampling in order to establish baseline levels of the indicators in a reasonably short time. This will allow for a more complete data base to be developed. Subsequent discussions with PRL indicate that the manpower requirements to set pumps in the monitoring wells on a monthly basis would be extreme. This is due to the depth of the wells, small casings, and sampling pumps which yield 0.5 gpm. Given these constraints the staff concurs with PRL's recommendation that three consecutive samples be taken over a period of several days during each quarter and that the total number of samples, for the initial year of sampling, not be less than 12.

The staff further concludes that sampling include sampling and analysis for arsenic, selenium and pH on the above frequency with a lower limit of detection for arsenic of 0.005 mg/l and 0.001 mg/l for selenium. Measurements of pH shall be to the nearest 1/10 standard unit.

#### Criterion 5

The program must provide for analyses of ground water samples from all monitoring wells at a frequency of at least twice each twelve month period, where the first and last samples at any wells are spaced at least four months apart in that twelve month period. All monitoring wells means all background (upgradient) and all leakage detection (downgradient) sampling locations.

PRL has proposed to monitor the background well on a quarterly basis for a period of one year. The staff recommends that this frequency be upgraded to include 12 samples, as discussed above, for the initial year and twice annually thereafter. This will not result in any increases in ground water sampling frequency beyond the initial one year period.

#### Criterion 6

The program must include determination of the rate and direction of ground water flow in the uppermost aquifer under the impoundment at a frequency of a least once each twelve month period.

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In the original review of PRL's detection monitoring program, Criterion 6 was not adequately addressed. The staff therefore finds that PRL should comply with Criterion 6 by determining rate and direction of ground water flow at least annually.

#### Criterion 7

The program must provide for the identification and reporting of statistically significant increases above background levels of monitored parameters and constituents in ground water samples. Statistically significant increases shall be based on factors such as: variability and values of background levels of monitored constituents and parameters, accuracy of analytical methods, limits of detection of analytical methods, and the number of samples.

In the original review of PRL's detection monitoring program, Criterion 7 was not adequately addressed. In their September 27, 1984 submittal they proposed to use Cochran's Approximation to the Behrens-Fisher Students' t-test. The staff finds that this method is not applicable to all data bases. The staff therefore recommends that PRL review the data collected from the detection monitoring wells for the initial year of sampling and propose background levels of indicator parameters. The staff further concludes that based upon this data review, PRL should propose a statistical procedure for identifying significant changes between data from the background and point of compliance wells at a 95% confidence level.

Based upon the above discussion, the staff recommends that SUA-1338 be amended by adding a new License Condition No. 50 to read as follows:

50. The licensee shall implement a ground water detection monitoring program to ensure compliance to 40 CFR 192.32(a)(2) which includes the following elements:
  - a. The licensee shall monitor at the point of compliance and background wells for the following indicator parameters: Arsenic, Selenium and pH. The licensee shall utilize analytical techniques capable of providing lower limits of detection of 0.005 mg/l and 0.001 mg/l for arsenic and selenium, respectively. Measurements of pH shall be reported to the nearest 1/10 standard unit.

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- b. The determination of compliance shall be based upon sampling Wells RM-4, RM-5 and RM-6.
- c. The determination of background levels for the parameters specified in subsection (a) shall be defined by sampling Well RM-1.
- d. The licensee shall sample for those parameters specified in subsection (a) at those wells designated in subsections (b) and (c) three times a quarter for a period of one (1) year and at least twice annually thereafter. All semiannual samples shall be taken at least four months apart.
- e. The licensee shall, within 60 days of collection of the last of the twelve monthly samples, propose for USNRC approval in the form of a license amendment background levels for indicator parameters and a statistical procedure for identifying significant changes (95% confidence level) between data from the wells specified in subsections (b) and (c).
- f. The licensee shall report the data required by section (d) semiannually along with those data required by License Condition No. 44 in accordance to the reporting format, Attachment No. 4 to SUA-1338, "Sample Format for Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 34.
- g. The licensee shall report at least annually in accordance to reporting requirements specified in subsection (f) the rate and direction of ground water flow under the tailings impoundment.

/S/

Gary R. Konwinski, Project Manager  
Licensing Branch 2  
Uranium Recovery Field Office, RIV

Approved by: /S/

Harry J. Pettengill, Chief  
Licensing Branch 2  
Uranium Recovery Field Office, RIV

Case Closed: 04008698351E

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