

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 byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee

1. Petrotomics Company

2. P.O. Box 2509
Shirley Basin, WY 82615

3. License number

SUA-551, Amendment No. 7

4. Expiration date September 30, 1990

5. Docket or
Reference No. 40-66596. Byproduct, source, and/or
special nuclear material

Uranium

7. Chemical and/or physical
form

Any

8. Maximum amount that licensee
may possess at any one time
under this license

Unlimited

9. Authorized place of use: The licensee's uranium milling facilities located in Carbon County, Wyoming.
10. The licensee is hereby authorized to possess byproduct material in the form of uranium waste tailings generated by the licensee's milling operations authorized by this license.
11. For use in accordance with statements, representations, and conditions contained in Sections 3.4, 3.5, 3.6, Section 4 (excluding Section 4.3 and Appendices), and Section 5 (excluding Section 5.9 and Appendices) of the licensee's application dated April 1, 1981 and revisions submitted by cover letters dated January 27, 1982; March 24, 1982; and September 27, 1983; except where superseded by license conditions below.

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

12. The mill production per calendar year shall not exceed 1500 tons of U_3O_8 .
13. Any changes in the mill circuit, as illustrated and described in Figure 3.1-2 of the licensee's renewal application, shall require approval of the USNRC in the form of a license amendment.
14. The licensee is hereby exempted from the requirements of Section 20.203(e)(2) of 10 CFR 20 for areas within the mill, provided that all entrances to the mill are

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conspicuously posted in accordance with Section 20.203(e)(2) and with the words, "Any area within this mill may contain radioactive material."

15. The results of sampling, analyses, surveys and monitoring; the results of calibration of equipment; reports on audits and inspections; all meetings and trainings courses required by this license; and any subsequent reviews, investigations, and corrective actions, shall be documented. Unless otherwise specified in USNRC regulations, all such documentation shall be maintained for a period of at least five (5) years.
16. The licensee shall maintain effluent control systems as specified in Section 3.4 of the licensee's renewal application with the following additions:
 - A. Operations shall be immediately suspended in the affected area of the mill if any of the emission control equipment for the yellowcake drying or packaging areas is not operating within specifications for design performance.
 - B. The licensee shall, during all periods of yellowcake drying operations, assure that the scrubber is operating within the manufacturer's recommended ranges for water flow and air pressure differential necessary to achieve design performance. This shall be accomplished by either (1) performing and documenting checks of water flow and air pressure differential every four hours during operation or (2) installing instrumentation which will signal an audible alarm if either water flow or air pressure differential fall below the manufacturer's recommended levels. If an audible alarm is used, its operation shall be checked and documented daily.
 - C. Air pressure differential gauges for other emission control equipment shall be read and the readings documented once per shift during operations.
17. All liquid effluents from mill process buildings, with the exception of sanitary wastes, shall be returned to the mill circuit or discharged to the tailings impoundment.
18. Release of equipment or packages from the restricted area shall be in accordance with Attachment No. 1 to SUA-551, "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.
19. Mill tailings other than samples for research or analysis shall not be transferred from the site without specific prior approval of the USNRC in the form of a license amendment. The licensee shall maintain a permanent record of all transfers made under the provisions of this condition.
20. In order to ensure that no disturbance of cultural resources occurs in the future, the licensee shall have an archeological and historical artifact survey of areas of its property, not previously surveyed, performed prior to their disturbance,

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including borrow areas to be used for reclamation cover. These surveys must be submitted to the USNRC and no such disturbance shall occur until the licensee has received authorization from the USNRC to proceed.

In addition, all work in the immediate vicinity of any buried cultural deposits unearthed during the disturbance of land shall cease until approval to proceed has been granted by the USNRC.

21. The licensee shall conduct an annual survey of land use (private residences, grazing areas, private and public potable water and agricultural wells, and non-residential structures and uses) in the area within five miles (8 km) of any portion of the restricted area boundary and submit a report of this survey to the USNRC, Uranium Recovery Field Office. This report shall indicate any differences in land use from that described in the last report.
22. The results of all effluent and environmental monitoring required by this license shall be reported in accordance with 10 CFR 40, Section 40.65 with copies of the report sent to the USNRC, Uranium Recovery Field Office. Monitoring data shall be reported in the format shown in Attachment No. 2 to SUA-551, "Sample Format for Reporting Monitoring Data."
23. The licensee shall have in operation, by April 26, 1985, instrumentation to detect ruptures of the tailings discharge and solution return lines when these lines are being utilized. Indications of a possible rupture of these lines shall result in activation of an alarm in an occupied area of the mill. The instrumentation shall be tested daily, and testing documented, to ensure proper operation.
24. The licensee shall immediately notify the USNRC, Uranium Recovery Field Office, by telephone and telegraph, of any failure to the tailings dam or tailings discharge and solution return system which results in a release of radioactive material and/or of any unusual conditions which if not corrected could lead to such a failure. This requirement is in addition to the requirements of 10 CFR 20.
25. Before engaging in any activity not previously assessed by the USNRC, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity may result in a significant adverse environmental impact that was not assessed or that is greater than that assessed, the licensee shall provide a written evaluation of such activities and obtain prior approval of the USNRC in the form of a license amendment.
26. The licensee shall implement a program to minimize dispersal of dust from the ore stockpile area(s). This program shall include written operating procedures. The effectiveness of the control method used shall be evaluated weekly by means of a documented inspection.

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27. The licensee shall maintain a USNRC approved surety arrangement adequate to cover tailings stabilization and reclamation, mill decommissioning and mill site reclamation. The licensee shall submit for USNRC review and approval a proposed revision to the surety arrangement within six (6) months of USNRC approval of a revised reclamation plan. The revised surety shall be in effect within three (3) months of written USNRC approval. Furthermore, the licensee shall submit for USNRC review any proposed revision or annual update to the surety arrangement at least two (2) months prior to the proposed effective date. Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and the cost basis for tailings stabilization and reclamation, mill decommissioning, and mill site reclamation. If the licensee chooses to retain a self-bonding surety arrangement, the licensee shall provide for USNRC review and approval in the form of a license amendment the financial data listed in Items (a) - (d) of Attachment No. 3 to SUA-551, "NRC Self-Bonding Criteria," within three (3) months of the date of this license.
28. Prior to termination of this license, the licensee shall provide for transfer of title to byproduct material and land, including any interests therein (other than land owned by the United States or the State of Wyoming), which is used for the disposal of such byproduct material or is essential to ensure the long term stability of such disposal site to the United States or the State of Wyoming, at the State's option.
29. In addition to the representations contained in the licensee's renewal application, the licensee shall submit a detailed decommissioning plan to the USNRC at least twelve (12) months prior to planned shutdown of mill operations.
30. Internal occupational exposure calculations shall be performed and documented within one week of the end of each regulatory compliance period as specified in 10 CFR 20.103(a)(2) and 10 CFR 20.103(b)(2). Routine airborne ore dust and yellowcake samples shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Non-routine ore dust and yellowcake samples shall be analyzed and the results reviewed by the RSO within two working days after sample collection.
31. The tailings impoundment area shall not be expanded by raising the height of the present dam or constructing a new dam without specific prior approval of the USNRC in the form of a license amendment. In addition, waste other than tailings shall not be disposed of in the tailings impoundment without written approval by the USNRC in the form of a license amendment.
32. The licensee shall implement an interim stabilization program for all tailings not covered by standing water. This program shall include written operating procedures and shall minimize dispersal of blowing tailings. The effectiveness of the control method used shall be evaluated weekly by means of a documented tailings area inspection.

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

All written procedures for both operational and nonoperational activities shall be reviewed and approved in writing by the RSO before implementation and whenever a change in procedure is proposed to ensure that proper radiation protection principles are being applied. In addition, the RSO shall perform a documented review of all existing operating procedures at least annually.

34. The licensee shall submit to the USNRC, Uranium Recovery Field Office, by December 3, 1985, a detailed reclamation plan which includes the following:
- A. A stabilization plan which details methods to prevent blowing, ponding, and recharge of the tailings;
 - B. A plan to dewater and/or consolidate the tailings;
 - C. Plan and cross-sectional views of the final reclaimed area which detail the location and elevations of tailings and cover materials;
 - D. Detailed plans for placement of rock or vegetative cover on the final reclaimed tailings pile;
 - E. A proposed implementation schedule for items A through D above;
 - F. An analysis to show that the proposed type and thickness of soil cover is adequate to provide attenuation of radon in conformance to requirements in 40 CFR 192, Subpart D;
 - G. An erosion analysis to show that the proposed cover materials are sufficient to ensure long-term isolation of tailings in conformance to requirements in 40 CFR 192, Subpart D.
35. In addition to the inspection and monitoring program described in Section 4.2 of the renewal application, the licensee shall maintain in graphical form a continuous permanent record of the piezometer and tailings pond level readings. They shall also conduct an annual technical evaluation of the tailings embankment which will meet the minimum requirements specified in Regulatory Guide 3.11.1. A copy of the technical evaluation as well as the graphed piezometer and tailings pond water level readings shall be submitted to the USNRC, Uranium Recovery Field Office, no later than one (1) month after completion of the evaluation.

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36. The licensee shall submit to the USNRC, Uranium Recovery Field Office, within six (6) months of the issuance of this license an updated ground water program which shall include a study and implementation schedule for an enhanced ground water remedial action program as well as a proposal for a representative ground water monitoring system. Furthermore, the licensee shall maintain the existing seepage collection system and return any collected seepage to the tailings impoundment.
37. In addition to the training program specified in Section 5.3-1 of the renewal application, the licensee shall comply with the following:
- A. The radiation protection training program for new employees shall be given by the RSO. At the conclusion of the training program, the new employees shall be given a written or oral examination of the material covered. Each new employee and the RSO shall sign a statement indicating the new employee is familiar with and understands the safety procedures employed in the mill and has successfully completed the examination. This signed statement shall be included in the employee's personnel folder.
 - B. The licensee shall perform and document on-the-job radiation safety training at least annually.
 - C. All employees shall attend a documented mill safety meeting at least once every two months, with at least a portion of the meeting devoted to radiation safety.
38. The licensee shall submit to the USNRC, Uranium Recovery Field Office, for review and approval by June 1, 1985, a general emergency action plan to be implemented in the event of emergencies such as fires or tailings dam failures.
39. The licensee shall maintain a minimum 4 foot freeboard between the crest of the embankment and the maximum operating pond level. In addition the licensee shall maintain a minimum 75 foot tailings beach along the face of the dam.
40. Sample volume and analysis for in-plant sampling shall be adequate to achieve an LLD of 10% of the MPC listed in Table 1 of Appendix B to 10 CFR 20.
41. A. The licensee shall make provisions to assure that urinalysis results are available to the person responsible for conducting the bioassay program within 20 days after specimen collection. Additionally, the lower limit of detection to be utilized shall be based on Figure 4 of Regulatory Guide 8.11, "Applications of Bioassay for Uranium." Additionally, laboratory surfaces used for preparation of bioassay samples shall be decontaminated daily to less than 200 dpm alpha/100 cm² of total surface contamination.
- B. Notwithstanding the frequency for in-vivo measurements specified in Section 5.5-4 of the license application the licensee shall comply with the following:

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1. All mill and maintenance workers routinely assigned to work in the mill shall have in-vivo measurements performed at least once every two years.
 2. Any worker whose internal exposure to radioactive material in any calendar quarter since his last in-vivo measurement, based on time-weighted exposure, exceeds 25 percent of the exposure which would result from inhalation of MPC concentrations listed in Table 1 of Appendix B to 10 CFR 20 over a period of one calendar quarter shall be counted within one year of that calendar quarter.
- C. The licensee shall comply with the following regarding documentation of actions taken in response to exceeding action levels for bioassay:
1. Anytime an action level of 15 ug/l uranium for urinalysis or 9 nCi of natural uranium for an in-vivo measurement is reached or exceeded, the licensee shall provide documentation to the USNRC, Uranium Recovery Field Office, indicating what corrective actions have been performed to satisfy the requirements of Regulatory Guide 8.22. This documentation shall be included and submitted with the semiannual 10 CFR 40.65 report.
 2. Anytime an action level of 30 ug/l uranium for four consecutive specimens or 130 ug/l uranium for one specimen for urinalysis or 16 nCi uranium for an in-vivo measurement is reached or exceeded, the licensee shall provide documentation within 30 days to the USNRC, Uranium Recovery Field Office, indicating what corrective actions have been performed to satisfy the requirements of Regulatory Guide 8.22.
42. If employees do not shower prior to leaving the mill area, they shall monitor themselves with an alpha survey instrument prior to exiting the mill. Should the results of monitoring exceed an action level of 1000 dpm alpha/100 cm² employees shall decontaminate themselves to less than the action level. If decontamination cannot be accomplished, the employee shall report the incident to the radiation safety staff for investigation.
43. Anytime employee exposure calculations are in excess of 25% of the maximum permissible exposure, based upon time weighted studies, a documented investigation shall be performed and the results retained in the employee's exposure history file.
44. The licensee shall control access to all "airborne radioactive areas," as defined in 10 CFR 20.203(d), by the use of caution signs and written operational procedures.
45. The licensee shall implement the environmental and effluent monitoring program as specified in Table 5.5.7-1 of the renewal application.

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46. The licensee shall submit to the USNRC, Uranium Recovery Field Office, for review and approval a detailed proposal for the disposal of contaminated material and equipment generated at the mill site prior to any such disposal. The proposal shall include a description of the materials to be disposed of, location(s) of disposal, method(s) of disposal, estimated annual volumes of materials, and an estimate of the impact of the disposal on the tailings management plan.

Notwithstanding the above, the licensee is authorized to dispose of catwalks, pumpstands and other metal material associated with the decommissioning of the 55-foot thickener circuit in accordance with their submittal dated May 23, 1985.

47. The annual ALARA report and recommendations by the Audit Committee to the Mine Manager shall include a determination of the following:
- A. If there are any upward trends developing in personnel exposures for identifiable categories of workers or types of operations or effluent releases;
 - B. If exposures and effluents might be lowered under the concept of as low as reasonably achievable;
 - C. If equipment for effluent and exposure control is being properly used, maintained, and inspected.

In addition, the RSO shall be one of the members of the Audit Committee. A copy of the ALARA report shall be submitted to the USNRC, Uranium Recovery Field Office, no later than one (1) month after completion of the report.

48. The licensee is authorized to use protection factors for respirators not to exceed the values specified in Appendix A of 10 CFR 20 for the purpose of assigning an exposure to airborne radionuclides provided that the respiratory protection program is conducted in accordance with the submittals dated December 6, 1984 and February 6, 1985. Further, the Radiation Safety Officer (RSO) shall perform and document qualitative fit tests using irritant smoke for all employees required to wear respirators prior to the initial use of a respirator and annually thereafter.
49. The licensee shall comply with the following modifications to Section 3.5 of the renewal application:
- A. Fire drills shall be conducted and documented semi-annually.
 - B. The specific volumes and pumping rates discussed in Section 3.5 shall not apply.
50. In accordance with the licensee's submittal of September 19, 1984, the licensee is hereby authorized to receive for disposal in its tailings impoundment uranium byproduct waste materials resulting from operations of USNRC-licensed uranium recovery facilities located in the State of Wyoming.

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In addition, the licensee shall prior to disposal provide for the assay of all byproduct wastes and assure that the wastes do not contain radionuclides or chemical constituents that are in excess of activities or concentrations already present in the tailings impoundment.

The licensee shall document that all solid wastes, other than soil materials, which are received for disposal in the tailings impoundment beach have been dismantled, crushed or perforated to minimize void spaces and placed in the impoundment no closer than 100 feet from the centerline of the dam.

The licensee shall maintain records of receipts and disposals of all byproduct waste which includes a physical description of the waste, its estimated radionuclide and chemical content, the method of disposal and the location of disposal in the impoundment. The licensee shall not accept for disposal wastes that exceed 1% of the annual production of tailings and liquids in any calendar year.

51. 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 temporary 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 5-SC and 42-SC.
 - C. The determination of background levels for the parameters specified in subsection (A) shall be defined by sampling Wells 39-SC and 41-SC.
 - D. The licensee shall sample for those parameters specified in subsection (A) at those wells designated in subsections (B) and (C) on a monthly basis 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 monthly samples, propose for USNRC review and 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 subsection (D) semiannually along with those data required by License Condition No. 22 in accordance to the reporting format, Attachment No. 4 to SUA-551, "Sample Format for

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Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 45.

- 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.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Dated: JUL 19 1985

BY

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

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Docket No. 40-6659
SUA-551, Amendment No. 4
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MEMORANDUM FOR:Docket File No. 40-6659

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

SUBJECT: AMENDMENT NO. 4 TO SOURCE MATERIAL
LICENSE SUA-551 FOR PETROTOMICS COMPANY

By letter dated September 27, 1984, Petrotomics Company 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 Petrotomics 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 Petrotomics' 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.

Petrotomics currently monitors 24 ground water parameters. These parameters include highly mobile ions which are used in the mill circuit

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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 this water quality data indicates that the wells hydrologically downgradient of the tailings impoundment show elevated levels of these very mobile ions above background levels. This situation has occurred for several years and is conclusive evidence that the tailings impoundment is leaking. In response to this, Petrotomics installed a gravel pack/tile drain at the base of the surficial aquifer in the major zone of seepage. This system collects seepage water, drains it to a sump and pumps it to the tailings impoundment.

In their submittal Petrotomics did not propose to monitor any indicator species. As detailed in the previous generic review document, the staff feels that arsenic, selenium and pH represent good indicator species and will require the licensee to monitor for them at the appropriate wells. These constituents are representative of pond seepage which may contain hazardous constituents. Table 1 contains data collected on these parameters to date.

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.

Petrotomics does not currently have in place true point of compliance wells. As seepage has already been detected at the site and mitigative measures are underway, the staff has concluded that true point of compliance wells are not necessary at this time. Temporary point of compliance wells will therefore be designated.

Petrotomics did not propose a well for point of compliance purposes. A review of the monitor wells and associated completion data indicate that Wells 5-SC and 42-SC would be adequate temporary point of compliance wells. These wells are considered to be adequate because they are located outside the influence of the seepage collection system, monitor the aquifer in contact with the tailings impoundment and are perpendicular to the direction of ground water flow. Due to these reasons the staff recommends that Wells 5-SC and 42-SC define the temporary point of compliance.

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TABLE 1, PETROTOMICS COMPANY WATER QUALITY DATA

<u>41-SC Background Well</u>				<u>5-SC - Temporary Point of Compliance Well</u>				<u>42-SC Temporary Point of Compliance Well</u>			
<u>Date</u>	<u>Indicator Species</u>			<u>Date</u>	<u>Indicator Species</u>			<u>Date</u>	<u>Indicator Species</u>		
	<u>As(mg/l)</u>	<u>Se(mg/l)</u>	<u>pH(units)</u>		<u>As(mg/l)</u>	<u>Se(mg/l)</u>	<u>pH(units)</u>		<u>As (mg/l)</u>	<u>Se(mg/l)</u>	<u>pH(units)</u>
0884	*	*	6.7	NO DATA AVAILABLE				NO DATA AVAILABLE			
0584	*	*	6.7								
0284	*	*	7.0								
1083	*	*	6.8								
0883	*	*	7.0								
0583	*	*	6.8								
0283	*	*	6.8								
1082	-0.002	-.0.002	6.6								
0882	*	*	6.6								
0682	*	*	6.5								
0282	*	*	7.2								
1281	*	*	6.7								
1081	*	*	6.8								

* 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.

TABLE 1, PETROTOMICS COMPANY WATER QUALITY DATA (Cont)

39-SC Background Well			
Date	Indicator Species		pH(units)
	As(mg/l)	Se(mg/l)	
1280	*	*	6.2

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

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.

Petrotoomics Company did not propose a background monitoring well. The well that they currently use for background ground water monitoring, Well RTH-5, is completed in a formation which is not in contact with the tailings impoundment and therefore not representative of the formation sampled by the temporary point of compliance wells. Because of the extent of contamination in the surficial aquifer, the limited areal extent of the aquifer and the lack of historical data, no ideal background site exists. However, the staff finds that Wells 39-SC and 41-SC are located in such a manner that they are reasonably representative of background water quality and will recommend their utilization for this purpose.

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.

Due to the problems associated with selecting a background well site, as discussed in Criterion 3, establishing a sufficient background data base may be difficult. Wells 39-SC and 41-SC are rather close to the tailings impoundment; however, data from these wells indicate that the ground water has been unaffected by tailings impoundment seepage. Because there is little data for these wells, a statistical base does not exist at this time. Although Petrotoomics currently monitors 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.

The staff further concludes that sampling and analysis for arsenic, selenium and pH on the above frequency be conducted with a lower limit

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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.

Petrotomics currently monitors their wells on a quarterly frequency. The staff recommends that this frequency be upgraded to monthly for the initial year of sampling and twice annually thereafter for all wells in the detection monitoring system.

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.

In the original review of Petrotomics' detection monitoring program, Criterion 6 was not adequately addressed. The staff therefore finds that Petrotomics 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 Petrotomics' detection monitoring program, Criterion 7 was not adequately addressed. The staff therefore concludes

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that Petrotomics should collect data from the wells in the detection monitoring program on a monthly frequency. Upon the conclusion of the initial year of data collection Petrotomics should propose background levels for indicator parameters. The staff further concludes that based upon a review of this data, Petrotomics should propose a statistical procedure for identifying significant changes between data from the point of compliance wells and the data from the background wells at a 95% confidence level.

Based upon the above discussion, the staff recommends that SUA-551 be amended by adding a new License Condition No. 51 to read as follows:

51. 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 temporary 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 5-SC and 42-SC.
 - C. The determination of background levels for the parameters specified in subsection (A) shall be defined by sampling Wells 39-SC and 41-SC.
 - D. The licensee shall sample for those parameters specified in subsection (A) at those wells designated in subsections (B) and (C) on a monthly basis 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 review and approval in the form of a license amendment background levels for indicator parameters and a

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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 subsection (D) semiannually along with those data required by License Condition No. 22 in accordance to the reporting format, Attachment No. 4 to SUA-551, "Sample Format for Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 45.
- 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: 04006659211E

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