

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
AMERICAN NUCLEAR CORPORATION)	Docket No. 40-4492
)	Source Material License
Gas Hills Project)	No. SUA - 667
314 W. Midwest Ave.)	
Casper, Wyoming 82601)	Amendment No. 22

ORDER TO MODIFY LICENSE

I

American Nuclear Corporation (Licensee) is the holder of Source Material License No. SUA-667 issued by the Nuclear Regulatory Commission (Commission). The license authorizes the possession of natural uranium and byproduct material. The current license was issued February 2, 1971, and is currently under review for termination.

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 October 12, 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-667 is amended by adding the following License Condition No. 28 to read as follows:

28. The licensee shall implement a groundwater 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 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 Well R-6 for Tailings Pond No. 1 and Well TP2-2 for Tailings Pond No. 2.
- C. The determination of background levels for the parameters specified in subsection (A) shall be defined by sampling Well TP2-3.
- 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 12 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) above semiannually along with those data required by License Condition No. 18 in accordance to the reporting format, Attachment No. 3 to SUA-667, "Sample Format for Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 18.
- 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 impoundments.

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

40-4492/GRK/85/03/07/0

APR 22 1985

Docket File 4492
LFMB/DCS/PDR
DBangart, RIV
GKonwinski
PGarcia
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State Health Office
URFO r/f

URFO:GRK
Docket No. 40-4492
SUA-667, Amendment No. 21
04004492291E

MEMORANDUM FOR:Docket File No. 40-4492

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

SUBJECT: AMENDMENT NO. 21 TO SOURCE MATERIAL
LICENSE SUA-667 FOR AMERICAN NUCLEAR
CORPORATION

By letter dated October 12, 1984, American Nuclear Corporation (ANC) 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 ANC that their existing groundwater monitoring program at that time did not appear to meet Criteria 2, 3, 4, 6 and 7. The purpose of this memorandum is to review ANC'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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ANC currently monitors 37 ground water parameters. 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 above background level in the ground water and are therefore represent reliable indicators of the presence of tailings impoundment seepage. A review of this water quality data indicates that wells hydrologically downgradient of the tailings impoundments show elevated levels of the mobile ions. This situation has occurred for several years and is conclusive evidence that the tailings impoundments are leaking. In response to this, ANC has installed a seepage collection system downgradient of tailings pond No. 1. It consists of six pumping wells which return the collected water to the tailings impoundment. The system has been marginal in performance as well as in collection of seepage water. Tailings Pond No. 2 has no mitigative system associated with it.

The staff has determined in its previous generic review document that arsenic, selenium, and pH be monitored as indicator species at all mills. In their submittal, ANC proposed to monitor arsenic and selenium as indicator species. The staff agrees that these species would be indicative of pond seepage that has a high probability of containing hazardous constituents. Additionally, the staff recommends that pH also be sampled as an indicator species. Although natural variations occur in the ground water, pH is considered a reliable indicator species that generally lags behind the very mobile ions, but precedes most hazardous constituents. A list of data that exist 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.

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TABLE 1, AMERICAN NUCLEAR INCORPORATED WATER QUALITY DATA

Well R-6 - Point of Compliance Tailings Pond No. 1				Well TP2-2 - Point of Compliance Tailings Pond No. 2				Well TP2-3 Background 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)
1084	#	#	2.9	1084	#	#	7.5	NO DATA AVAILABLE		
0784	#	#	2.8	0784	#	#	7.4			
0484	#	#	2.9	0484	#	#	6.8			
0184	.006	.003	2.8	0184	.003	#	8.0			
1083	.010	#	3.0	1083	#	#	6.4			
0783	.010	.003	2.6	0783	#	#	6.4			
0483	#	#	3.4	0483	#	#	6.8			
0183	.009	.003	3.4	0183	#	#	6.9			
0782	.015	.003	3.0	1082	#	#	7.8			
0482	.003	#	3.0	0782	.006	#	7.1			
0182	.012	#	3.1	0482	#	#	7.5			
1081	.011	#	3.3	0182	.003	.004	7.2			
0781	*	*	*	1081	#	.004	7.4			
1080	*	*	*	0781	#	*	#			
0780	*	*	*	0481	#	*	7.3			
0480	*	*	*	0181	#	*	7.8			
				1080	#	*	7.0			
				0780	#	*	7.7			
				0480	#	*	7.5			

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

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

In the original review of ANC's detection monitoring program, Criterion 2 was not adequately addressed. In response to this, ANC proposed to use wells TP2-1 and TP2-2 as point of compliance wells for Tailings Pond No. 2. The staff recommends that well TP2-2 be used as a point of compliance well for Tailings Pond No. 2 because it has the greatest data base and samples the formation in contact with the tailings impoundment. Well TP2-1 was deleted as a point of compliance because it would add little if any information to that obtained from TP2-2. The staff further recommends that Well R-6 be used as a point of compliance for Tailings Pond No. 1 for the same reasons noted above.

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.

In the original review of ANC's detection monitoring program, Criterion 3 was not adequately addressed. In response to this, ANC proposed to drill a background well upgradient of Tailings Pond No. 2. In a subsequent meeting with the NRC, ANC, and their consultant, the siting of the proposed well was discussed. The approximate location, coordinates 777,700N and 799,700E, was agreed upon. The well, designated TP2-3, was installed in early 1985. It was drilled through the surficial aquifer to the underlying mudstone, which is the aquifer in contact with the tailings impoundments. The staff agrees with the siting of this well.

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.

In the original review of ANC's detection monitoring program, Criterion 4 was not adequately addressed. Sufficient background data was not available because a suitable background well had not been installed.

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However, with the installation of the background well as discussed in Criterion 3, and subsequent collection and analysis of water samples, a data base will be established to compare background data with data at the point of compliance wells. Although ANC currently monitors their wells on a quarterly frequency, the staff recommends that for the initial year of sampling, indicator species be sampled on a monthly frequency. This will allow for a more complete data base to be developed.

The staff further concludes that sampling include sampling 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 made 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.

ANC currently monitors their wells on a quarterly frequency. The staff recommends that this frequency be upgraded to monthly for the initial year of sampling of the indicators (as discussed in Criterion 4) and twice annually thereafter for the existing wells and, that this frequency be implemented for the background well. 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.

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

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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 ANC's detection monitoring program, Criterion 7 was not adequately addressed. In their October 12, 1984 submittal, ANC proposed to use a t-test to determine if a statistically significant change has taken place. The staff has reviewed their proposal and recommends that a specific t-test be used which considers variance. A further review of the proposed action levels, indicates that the proposed selection of these values "at or above the maximum EPA concentration" may allow drinking water standards to be exceeded prior to determining that a statistically significant increase has occurred. The staff therefore finds that ANC should collect appropriate data on the indicator parameters for all wells in the detection monitoring network. Based upon a review of this data, ANC should propose background levels for the indicator parameters and a statistical procedure for identifying significant changes between data from the point of compliance wells and the data from the background well at a 95% confidence level.

The staff will also require that ground water samples be analyzed for indicator species required by this action within thirty days of sampling once adequate background data has been established. Further, any sampling results demonstrating a statistically significant change shall be reported to the NRC within 30 days of receipt of those results.

The staff has determined in its previous generic review document that 30 days will give the operator ample time to statistically analyze the sample results.

Based upon the above discussion, the staff recommends that SUA-667 be amended by adding a new License Condition No. 28 to read as follows:

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

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- 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 Well R-6 for Tailings Pond No. 1 and Well TP2-2 for Tailings Pond No. 2.
- c. The determination of background levels for the parameters specified in subsection (a) shall be defined by sampling Well TP2-3.
- d. The licensee shall sample for those parameters specified in subsection (a) above 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 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) above semiannually along with those data required by License Condition No. 18 in accordance to the reporting format, Attachment No. 3 to SUA-667, "Sample Format for Reporting Detection Monitoring Data." These monitoring requirements are in addition to the requirements specified in License Condition No. 18.
- 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 impoundments.

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

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Approved by:

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

Case Closed: 04004492291E

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