

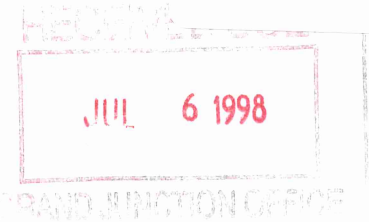


UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-8064

June 30, 1998

LTSM008422



Ms. Stephanie J. Baker, Manager of  
Environmental Services  
Western Nuclear, Inc.  
Union Plaza Suite 300  
200 Union Boulevard  
Lakewood, Colorado 80228

SUBJECT: NRC INSPECTION REPORT 40-1162/98-01

Dear Ms. Baker:

On May 14, 1998, the NRC completed a team inspection at the site of your former Split Rock uranium milling facility. The final results of this inspection were presented to your organization during a telephone call held on June 19, 1998, following NRC analysis of 21 soil samples obtained during the inspection. The inspection disclosed that site activities appeared to be progressing in accordance with NRC regulations and license requirements. The enclosed report presents the results of that inspection.

Based on the results of this inspection, no violations or deviations were identified; therefore, no response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

Should you have any questions concerning this inspection, please contact Mr. Robert Evans at (817) 860-8234 or Mr. Charles L. Cain at (817) 860-8186.

Sincerely,

Charles L. Cain, Chief  
Nuclear Materials Safety Branch - 1  
Division of Nuclear Materials Safety

Docket No. 40-1162  
License No. SUA-56

Enclosure:  
NRC Inspection Report 40-1162/98-01

SPR 535.20

Western Nuclear, Inc.

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cc w/enclosure:

Resident Agent

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**ENCLOSURE**

**U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Docket No. 40-1162

License No. SUA-56

Report No. 40-1162/98-01

Licensee: Western Nuclear, Inc.

Facility: Site of former Split Rock Mill

Location: Jeffrey City, Wyoming

Dates: May 11-14, 1998

Inspectors: Robert J. Evans, P.E., Health Physicist  
Nuclear Materials Safety Branch 1  
Division of Nuclear Materials Safety  
Region IV

Michael C. Layton, Hydrogeologist  
Uranium Recovery Branch  
Division of Waste Management  
Office of Nuclear Material Safety and Safeguards

Accompanied by: Robert D. Carlson, Project Manager  
Uranium Recovery Branch  
Division of Waste Management  
Office of Nuclear Material Safety and Safeguards

Approved By: Charles L. Cain, Chief  
Nuclear Materials Licensing Branch  
Division of Nuclear Materials Safety  
Region IV

Attachments: Supplemental Inspection Information  
Photographs Taken at the Split Rock Facility

## EXECUTIVE SUMMARY

### Site of Former Western Nuclear Split Rock Mill NRC Inspection Report 40-1162/98-01

This inspection included a review of site status; management organization and controls; site operations; and the licensee's radiation protection, waste management and environmental monitoring programs. Special emphasis was placed on the licensee's recent remediation activities, including cleanup of ground water and windblown material. Also reviewed were the licensee's actions taken in response to a recent NRC Information Notice related to the Year 2000 computer issues.

#### Management Organization and Controls

- The licensee's organizational structure and level of security were consistent with previous inspections, and it appeared that adequate oversight had been provided for site activities (Section 2).
- All procedures required by the license had been developed, reviewed by the responsible parties, and were technically adequate for the tasks being performed (Section 2).

#### Operations Review

- Site activities appeared to have been conducted in accordance with the applicable license and regulatory requirements. Site fences were in good condition, and perimeter postings were appropriate (Section 3).

#### Radiation Protection

- The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the license (Section 4).
- Occupational doses appeared consistent with the level of activity in progress at the site, and none exceeded 10 percent of the occupational exposure limits established in 10 CFR Part 20 (Section 4).
- The licensee's implementation of the radiological verification program was reviewed, and the licensee appeared to have performed surface reclamation activities in accordance with the conditions of the license. Soil samples were obtained to ascertain whether the licensee had performed cleanup of potentially contaminated windblown material in accordance with the limitations specified in 10 CFR Part 40, Appendix A. The NRC's laboratory results revealed that the samples were within the radium-226 limitations specified in Appendix A, suggesting that the licensee had adequately cleaned up the windblown material (Section 4).



Radioactive Waste Management/Environmental Protection

- A review of the licensee's environmental and ground water monitoring programs indicated that the licensee was appropriately controlling these activities and was in compliance with license requirements (Section 5).
- A review of the environmental monitoring program revealed that the licensee had collected and reported all samples required by the license. None of the sample results exceeded the regulatory limits specified in 10 CFR Part 20, Appendix B (Section 5).
- The ground water concentration limits established in the license to monitor cleanup for various constituents had been exceeded in samples obtained from three wells. The licensee was aware of this situation and had taken some corrective actions in response to the exceedances (Section 5).

## **Report Details**

### **1 Site Status**

Decommissioning activities began at Western Nuclear's Split Rock facility during 1988. Since that time, the licensee has demolished and buried the former mill structures and has performed extensive reclamation work on the tailings impoundment. Since the last inspection (conducted during May 1997), the licensee has installed the radon cover and erosion protection on tailings impoundment areas 1A, 1B, and portions of 2A. Installation of the final radon cover and erosion barrier has now been completed on the entire tailings impoundment and all diversion ditches. Also completed since the last inspection was the cleanup of contaminated windblown material. According to the licensee, the only onsite surface areas left to be remediated are the two evaporation ponds and the borrow area (the area where clean, uncontaminated soil was borrowed for other onsite uses).

Work in progress included ground water remediation. The licensee was operating two extraction wells which pumped ground water into two evaporation ponds. The pumps operated at a combined flowrate of 116 gallons per minute. To assist in the disposal of ground water, enhanced evaporation systems were in service in each of the two 8-acre evaporation ponds. The operation of the enhanced evaporation system was seasonal. The licensee secured the system during October 1997 but restarted the system during April 1998.

Activities planned for the near future included radon flux testing of the final 58 acres of the tailings impoundment, including portions of areas 1A, 1B, 2A, and the diversion ditches. The licensee also planned to reseed and recontour the topsoil in off-tailings areas such as the borrow area and to reclaim the "Cody Shale" pit, the offsite location where tailings impoundment radon barrier material was obtained.

### **2 Management Organization and Controls (88005)**

#### **2.1 Inspection Scope**

The organizational structure was reviewed to ensure that the licensee had established an organization with defined responsibilities and functions. The inspectors also reviewed the licensee's implementation of procedures and analyses related to site reclamation as specified in the license to evaluate the effectiveness of the licensee's control of site activities.

#### **2.2 Observations and Findings**

The onsite staff consisted of five individuals, the resident agent/environmental specialist, the safety director/radiation safety officer, a mechanic, an electrician, and a receptionist. Contractors were used on an as-needed basis, including construction workers and site

surveyors. In summary, the licensee's onsite organizational structure was the same as the structure that was in place during the previous inspection.

As specified in License Condition 44, the licensee is required to establish written procedures for site reclamation activities, including personnel and environmental monitoring and survey instrument calibrations. The NRC inspectors noted that procedures had been developed and were technically adequate for the work being performed. License Condition 44 also states that the site radiation safety officer shall perform a documented review of all existing site procedures at least annually. A review of the licensee's procedure manual revealed that site procedures had been reviewed by the radiation safety officer during April 1997 and January 1998.

In accordance with the licensee's procedures, an inspection of the winter storage ponds was required to be performed on a routine basis. (The frequency of the inspection depended on the work in progress.) A review of the licensee's "Routine Evaporation Pond Inspection Log" and discussions with the licensee revealed that the licensee continued to perform the pond inspections on a routine basis.

### 2.3 Conclusions

The licensee's organizational structure was consistent with structures in place during previous inspections, and it appeared that adequate oversight had been provided for site activities. In general, the procedures that were required by the license had been developed and were technically adequate.

## 3 **Operations Review (88020)**

### 3.1 Inspection Scope

The NRC inspectors performed a site tour to verify that site activities were being conducted in accordance with applicable regulations and the conditions of the license, and to ensure that operational controls were adequate to protect the health and safety of the workers and members of the general public.

### 3.2 Observations and Findings

The inspectors observed offsite buildings, fences, gates, and operating equipment. Site fences were noted to be in good condition and were properly posted. Employee postings, required by 10 CFR 19, were identified in the licensee's main office. The inspectors noted that the tailings impoundment areas appeared to be adequately covered with erosion protection. No construction activities were in progress during the inspection.

Security was provided by locked access gates, and a fence was installed around the site property to keep intruders out. No permanent structures remained onsite, although several contractor trailers were stationed just outside of the restricted area. (The site

offices were moved to an offsite location prior to the May 1997 inspection.) In summary, the inspectors identified no health or safety hazard during the site tour.

### 3.3 Conclusions

Site activities generally appeared to have been conducted in accordance with applicable license and regulatory requirements. No health or safety concern was identified during the site tours.

## 4 **Radiation Protection (83822)**

### 4.1 Radiation Safety Program

#### a. Inspection Scope

The purpose of this portion of the inspection effort was to determine if the licensee's radiation safety program was in compliance with requirements established in the license and 10 CFR Part 20 regulations.

#### b. Observations and Findings

During 1997, the licensee monitored two site workers for exposure to radioactive materials. These two individuals were the workers most likely to receive an occupational dose during construction activities. The workers were the operators of a tailings impoundment compaction machine and a dirt scraper. According to the licensee's data, the two workers were assigned doses of 31 and 29 millirems for the year, primarily from internal exposures to radioactive materials. These assigned doses were down significantly from 1996, but were comparable with 1995 dose assessments.

All site workers were assigned an occupational dose of 30 millirems, the average dose of the two monitored workers. The exposures assigned to site workers for 1997 were well below the annual limit of 5000 millirems established in 10 CFR 20.1201. The licensee did not report these doses to site workers because the doses were well below 10 percent of the total effective dose equivalent limit established in the NRC regulations. Reporting is not required unless the doses exceed 10 percent of either the external or internal regulatory limits.

A review of the licensee's air sampling records was performed. The records indicated that during 1997 the licensee measured one airborne concentration of 4.30 E-13 microcuries per milliliter, which was 7 percent of the thorium-230 derived air concentration specified in Appendix B of 10 CFR Part 20. (The licensee used the derived air concentration value for thorium-230 instead of natural uranium because it was viewed as a more conservative value.) All other 1997 sample results were less than 7 percent of the thorium-230 limit.



Approximately 100 urine bioassay samples were collected during 1997. The number of bioassay samples collected during 1997 was down significantly from the previous year because of a reduction in onsite reclamation activities. (About 200 samples were collected during 1996.) One sample result exceeded the lowest action level of 15 micrograms per liter. This sample (19 micrograms of natural uranium per liter of urine) was an initial bioassay sample for a truck driver who previously worked for another NRC licensee prior to working at this site. Followup sampling revealed measurable amounts of uranium below the lowest action level. The initial sample result was inconclusive because the elevated sample may have been the result of an intake that occurred at another site or the result of medications being taken by that particular individual at the time of testing.

The release of equipment from the restricted area is governed by License Condition 41. The licensee's equipment release records were reviewed to ensure that no material had been inappropriately released from the site with residual radioactive contamination above the release limits. Construction equipment was released during July-August 1997. The licensee's records revealed that all equipment was released with removable contamination levels well below the action level of 1000 disintegrations per minute per 100 square centimeters. The licensee also maintained records of alpha radiation contamination checks of site employees. The licensee's records indicated that no individual was identified with contamination above the site action level.

License Condition 43 specifies various documents relating to the radiation protection program which must be maintained. The inspectors reviewed records relating to instrument calibrations, radiation work permits, personnel training, employee exposures, and equipment releases, and no oversights in documentation were noted. For example, License Condition 46 requires the licensee to develop quarterly reports of radiation protection-related activities. The quarterly reports for 1997 and 1998 were found to be satisfactory.

License Condition 42 states that a copy of the As Low As Reasonably Achievable (ALARA) report containing the results of the annual audit and recommendations by the ALARA committee shall be submitted to the NRC. The inspectors reviewed the licensee's annual ALARA report dated August 28, 1997. The report provided clear and concise discussions of the licensee's compliance with all license conditions.

License Condition 53 states that radiation detection instruments shall be calibrated after repair and as recommended by the manufacturer or at intervals not to exceed 6 months, whichever is sooner. A review of the licensee's calibration records revealed that equipment with up-to-date calibrations was available at the time of the inspection.

In summary, the licensee's radiation protection program was in compliance with the conditions of the license, and occupation exposures were small fractions of the total effective dose equivalent limit specified in the 10 CFR Part 20.



## 4.2 Radiological Verification Program

### a. Inspection Scope

The purpose of this portion of the inspection effort was to review the licensee's implementation of the verification survey program associated with site remediation.

### b. Observations and Findings

License Condition 33.A states that the cleanup of soil contamination will be verified in accordance with the Radiological Verification Program, a plan that was previously submitted to and approved by the NRC. The inspectors performed confirmatory sampling to ascertain whether the licensee had performed adequate remediation of the areas containing windblown radioactive materials. The confirmatory sampling included ambient gamma surveys and soil sampling. The gamma surveys were performed outside of the restricted area to locate "hot spots," areas with elevated ambient gamma readings. Soil samples were obtained from the areas identified with elevated gamma readings.

During the inspection, soil samples were obtained by the licensee at the request of the NRC from three different locations: 10 samples were obtained from inside of the area previously remediated or radiologically surveyed by the licensee for windblown materials, 5 samples were obtained from the areas surrounding the windblown cleanup area, and 4 samples were obtained from the licensee's sample archives. The samples were sent to the NRC Region III laboratory for analysis. At the request of the NRC laboratory, a background sample was obtained and submitted with the remainder of the soil samples.

The licensee utilized a slightly different approach for quality control of the soil sample results. Instead of using a third-party laboratory to perform confirmatory analyses on a certain number of samples (such as 5 percent of the samples), the licensee typically included a spiked blind sample with every 19 soil samples being sent to their contract laboratory. If the blind sample's results were within a predetermined range, then the licensee assumed that the results for the remaining 19 samples were acceptable. As a quality control check of the NRC's laboratory, a portion of the performance evaluation standard was randomly submitted with the 20 soil samples. The NRC's analysis result for this sample was within the predetermined range for the standard; therefore, the NRC inspectors concluded that the NRC's sample results were reliable.

Appendix A to 10 CFR Part 40, Criterion 6, lists the acceptance criteria for cleanup of windblown material. According to Criterion 6, the allowable concentration of radium-226 in land, averaged over 100 square meters, which, as a result of byproduct material, does not exceed the background level by more than 5 picocuries per gram (pCi/g) of radium-226 averaged over the first 15 centimeters (roughly 6 inches) below the surface and 15 pCi/g of radium-226 averaged over 15-centimeter thick layers more than 15 centimeters below the surface. The samples that were collected were samples obtained from the first 15 centimeters of soil, averaged over a 100 square meter grid.

With an NRC-approved background level of 1 pCi/g, the acceptance criteria for all soil samples obtained from the site was 6 pCi/g.

The soil sample results listed in the table below include the results of all samples except the four obtained from the licensee's archives. All samples results listed are for radium-226 in units of pCi/g:

SAMPLE ID	DESCRIPTION	LICENSEE'S SAMPLE RESULTS	NRC SAMPLE RESULTS
S6073123	Performance Evaluation Standard	4.75 - 9.30	5.85 ± 0.39
W3507617	Background sample		1.33 ± 0.16
C2217281	Inside windblown cleanup area		3.32 ± 0.26
C3106121	Inside windblown cleanup area	<b>NOT</b>	1.89 ± 0.22
E5310416	Inside windblown cleanup area	<b>AVAILABLE</b>	2.91 ± 0.24
E6672707	Inside windblown cleanup area	<b>AT</b>	2.06 ± 0.27
N1468497	Inside windblown cleanup area	<b>TIME</b>	4.75 ± 0.31
N1858898	Inside windblown cleanup area	<b>OF</b>	1.47 ± 0.33
S1260278	Inside windblown cleanup area	<b>INSPECTION</b>	1.61 ± 0.16
S3105111	Inside windblown cleanup area		5.29 ± 0.46
W1116127	Inside windblown cleanup area		3.93 ± 0.36
W3501611	Inside windblown cleanup area		3.25 ± 0.22
R1001004	Outside of windblown cleanup area		1.70 ± 0.17
R1005008	Outside of windblown cleanup area		2.39 ± 0.22
R1013016	Outside of windblown cleanup area		2.36 ± 0.29
R1009012	Outside of windblown cleanup area		2.33 ± 0.24
R1017020	Outside of windblown cleanup area		2.09 ± 0.31

The NRC's sample results indicate that no sample exceeded the acceptance criteria limit of 6 pCi/g, suggesting that the licensee has adequately remediated the site of all loose, windblown material.

The soil sample results were split with the licensee. The licensee's sample results were not available at the end of the inspection period; therefore, this subject area will be reviewed during a future NRC inspection (Inspection Followup Item 40-1162/9801-01).

As a quality control check of the licensee's previous laboratory results, the NRC inspectors obtained four randomly selected samples from the licensee's soil archives. (The licensee had roughly 3000 samples in storage.) The samples were analyzed by the NRC for their radium-226 content and were compared to the licensee's sample results previously published in their December 1997 completion report. The results are as follows:

SAMPLE ID	NRC's SAMPLE RESULTS	LICENSEE's SAMPLE RESULTS
W1662715	3.85 ± 0.99 pCi/g	1.96 ± 0.113 pCi/g
C3402426	1.82 ± 0.26 pCi/g	2.03 ± 0.131 pCi/g
S2284309	1.25 ± 0.18 pCi/g	1.055 ± 0.099 pCi/g
E4747827	1.07 ± 0.20 pCi/g	1.097 ± 0.095 pCi/g

The NRC inspectors concluded that the sample results were acceptable because all sample results contained background, or near background, levels of radium-226, and none of the sample results exceeded the acceptance criteria limit of 6 pCi/g.

In summary, the sample results suggest that the licensee had adequately performed cleanup of the windblown material because none of the sample results exceeded the acceptance criteria limit specified in 10 CFR Part 40, Appendix A.

#### 4.3 Conclusions

The licensee had implemented a radiation protection program that met requirements established in 10 CFR Part 20 and the conditions of the license. Occupational doses for site personnel during calendar year 1997 appeared consistent with the scope of work ongoing at the site, and occupational doses were only a small fraction of the dose limits established in 10 CFR Part 20.

The licensee's implementation of the radiological verification program was reviewed. The licensee appeared to have performed cleanup of the windblown material in such a manner as to be in compliance with the criteria specified in 10 CFR Part 40, Appendix A.

An Inspection Followup Item was issued to perform a correlation comparison of the licensee's soil sample results to the NRC's sample results. The licensee's soil sample results were not available at the end of the inspection period and will be reviewed during a future inspection.



**5 Radioactive Waste Management (88035)  
Environmental Protection (88045)**

5.1 Environmental Protection

a. Inspection Scope

The environmental monitoring program at the site was reviewed to assess the effectiveness of the licensee's program and to evaluate the effects, if any, of site reclamation activities on the local environment.

b. Observations and Findings

Environmental monitoring program requirements are identified in License Condition 24. At the time of the inspection, the environmental monitoring program in place at the site consisted of air particulate, radon, direct radiation, and surface water sampling. The licensee utilized two sample stations. One sample station was located at the northeastern corner of the site, while the second station was located offsite at the Graham Ranch. Continuous air samplers, radon canisters, and environmental thermoluminescent dosimeters were deployed at each of the two sample stations.

During the inspection, the inspectors reviewed the two semi-annual effluent reports and supporting data for 1997. Overall, the licensee's semi-annual reports were noted to be thorough and complete. All environmental monitoring samples required by the license had been obtained and were documented in the semi-annual effluent reports, with two exceptions. Surface water samples were no longer being taken from the tailings and acid plant cooling ponds because these two ponds no longer existed at the site.

Surface water samples were obtained on a quarterly basis at three locations from a local stream. The water samples were analyzed for a number of chemical constituents as well as radium-226, radium-228, thorium-230, and natural uranium. The radionuclide concentrations in the surface water samples were under 3 percent of the respective effluent concentration release limits established in 10 CFR Part 20, Appendix B.

Air samples were continuously collected at the two sample stations and analyzed for lead-210, radium-226, thorium-230, and natural uranium concentrations on a quarterly basis. The concentrations for all radionuclides were under 4 percent of the respective effluent concentration limits specified in Appendix B.

Radon samples were also continuously collected at the two sample stations. The samples were analyzed quarterly. The highest measured value (1.3 picocuries per liter) was obtained at the northeastern corner station during the fourth quarter of 1997. This value was 13 percent of the effluent concentration limit listed in 10 CFR Part 20, Appendix B, for radon-222 with daughters removed. All other sample results were less than 4 percent of the limit.

Ambient gamma radiation levels were measured using environmental thermoluminescent dosimeters. A total of 124 millirems was measured at the northeast perimeter sample station during 1997, while 84.8 millirems was measured at the background station (Graham Ranch) during the same time frame. The northeastern corner boundary location was therefore 39.2 millirems per year above the background location during 1997. The difference in ambient exposure rates between the two sample stations decreased during 1997 when compared to the 1995 (70 millirems) and 1996 (56 millirems) sample results.

An NRC inspector compared the 1997 results with the 1995 and 1996 sample results. The sample results for 1997 were either comparable to, or lower than, the 1995-1996 environmental monitoring sample results.

In response to the NRC's new constraint rule listed in 10 CFR 20.1101(d), the licensee performed a dose assessment for air particulate releases using the sum of fractions method. The licensee concluded that the airborne releases could have resulted in 3.4 millirems of exposure to an offsite individual. (The NRC inspectors noted that the nearest resident lived over one mile from the site.) Since the result was less than 10 millirems, the licensee was not required to formally report this assessment, or report any proposed corrective actions to reduce the releases, to the NRC. An NRC inspector reviewed the licensee's report and determined that the licensee's assessment was technically acceptable.

## 5.2 Ground water Monitoring Program

Ground water compliance monitoring program requirements are specified in License Condition 74.A, and the corrective action program monitoring requirements are specified in License Condition 74.C. Details of the sampling frequency and concentration limits are specified in the licensee's amendment request submittal dated April 18, 1997. During the inspection, an NRC inspector visually examined the physical condition of the majority of the monitoring wells in the licensee's monitoring network, examined the surface impoundments, reviewed the monitoring well sampling standard operating procedure, and reviewed the laboratory reports for the corrective action monitoring program.

### a. Monitoring Well and Evaporation Impoundment Conditions

The inspector visually examined the physical condition of all monitoring wells listed in the license, with two exceptions. Each observed well was completed with a steel protective casing set in a concrete pad, labeled, and secured with a locking cover. Each of the well casings were fitted with a dedicated submersible pump for well purging and sampling, and an electrical connection for a portable generator was provided to supply pumping power. The inspector noted that the soil surrounding two monitoring wells within the site boundary had been removed during windblown cleanup to the degree that the concrete casings were fully exposed. However, the inspector determined that this condition did not adversely impact the performance of the monitoring wells.



Well WN-23 also exhibited complete exposure of the concrete well pad. The licensee stated that this condition was the result of frost heaving moving the concrete pad over a period of several years. The inspector visually verified that movement of the concrete pad and the protective casing had not caused a separation in the well casing. The inspector concluded that all wells examined were in good condition, with no irregularities that would adversely impact the monitoring well's performance.

The two evaporation pond impoundments used to dispose of water collected from the corrective action program were inspected. The inspector visually examined the berms of each impoundment and the access ports of the leak detection systems. No irregularities were noted. A system of spray misters situated along the sides of the impoundments were operating during the inspection.

Each impoundment is reported to be approximately eight acres in surface area, totaling sixteen acres of aerial coverage. The licensee indicated that the operating depth for each impoundment could potentially produce a capacity of 50 acre-feet for each impoundment. The inspector inquired whether all of the 50 acre-feet capacity was retained behind the berm or if a portion of the capacity was retained below grade. The licensee indicated that some capacity was below grade and that a calculation was being performed to assess this situation and determine whether the impoundments should be included in NRC's Dam Safety Program. The licensee stated that the results of this calculation would be forwarded to NRC Headquarters at a later date.

b. Standard Operating Procedure and Ground-Water Sampling

Ground-water sampling was not being performed during this inspection, but the inspector reviewed the written procedure for ground-water sampling and compared the information from the field sampling log sheets with the sampling procedure. The procedure was currently being revised to incorporate field filtration of the collected samples. (Samples are currently filtered by the laboratory before analysis.) The inspector reviewed the procedure and determined that it adequately addressed all aspects of water-level measurement, well purging, sample collection, sample handling, and chain-of-custody protocols. The inspector also reviewed field sampling records for the period covering the previous year and found no discrepancies in the records. The records showed the licensee was performing ground-water sampling in accordance with the established procedure.

c. Corrective Action Program

An inspector reviewed the results of laboratory analyses for the wells listed in License Condition 74 and the wells used to monitor the performance of the corrective action program, as required by License Condition 74.C and described in the licensee's submittal dated April 18, 1997. The records showed that for the second quarterly (June) sampling of 1997, monitoring Well WN-3 exceeded the established concentration limits for total dissolved solids (TDS) and sulfate ( $\text{SO}_4$ ), while monitoring Well WN-24 exceeded the concentration limit for nitrate ( $\text{NO}_3$ ) established in the April 18, 1997, submittal.

These wells continued to exceed the established limits for these and other indicator constituents in the subsequent quarterly samplings. Monitoring well WN-18 exceeded the established concentration limits for chloride (Cl) in the third quarterly (August) sampling of 1997, and this well exceeded TDS, SO<sub>4</sub>, NO<sub>3</sub>, and Cl limits in the subsequent quarterly samplings.

The April 18, 1997, submittal requires resampling of a well that exceeds the indicator concentration limits within 10 days of receipt of the laboratory results. Resampling of Wells WN-3 and WN-24 were not initiated until after the third quarterly sampling results were received. Resampling of Well WN-18 was performed after the third quarterly sampling results were received. If the results of the resampling confirm the exceedance, then the sampling frequency for those wells would increase from quarterly to monthly. Monthly sampling of Wells WN-3, WN-18, and WN-24 was initiated after the exceedances were confirmed by the resampling during the third quarterly sampling period.

The licensee's records show that the licensee was not timely in initiating the confirmatory resampling and the monthly sampling schedule for Wells WN-3 and WN-24. The licensee was therefore cited with a Notice of Violation from NRC Headquarters by letter dated April 14, 1998, after an in-office review of sampling reports submitted by the licensee covering the period of the above described exceedances. The records show that the licensee was timely in resampling Well WN-18, which indicates that some internal corrective action measures had been initiated.

The April 18, 1997, submittal specifies that the licensee is to notify the NRC within 30 days if a monitoring well continues to exceed concentration limits for three consecutive monthly samplings and to provide a description of the appropriate contingency action. Monitoring Wells WN-3, WN-18, and WN-24 continued to exceed the established concentration limits for monthly samples taken in February, March, and April of 1998. The laboratory results for the April 1998 sampling episode had not been received by the licensee at the time of this inspection. The licensee received the results shortly after the inspection and submitted a written notification and contingency proposal to NRC Headquarters by letter dated May 20, 1998. This submittal fulfilled the requirement of License Condition 74.C, as detailed in the April 18, 1997, submittal.

### 5.3 Conclusions

A review of the licensee's environmental monitoring program indicated that the licensee was in compliance with the license requirements of the license and 10 CFR Part 20 and 10 CFR Part 40. The licensee had collected and reported all samples required by the license. None of the sample results exceeded the regulatory limits, and the 1997 sample results were comparable to or were below the 1995-1996 sample results.

A review of the ground water monitoring program was performed and areas found acceptable included the physical condition of the wells and evaporation pond integrity. The ground water concentration limits established in the license to monitor cleanup for

various constituents had been exceeded in samples obtained from three wells. The licensee was aware of this situation and had taken some corrective actions.

## **6 Followup (92701)**

### **6.1 NRC Information Notice 96-70: Year 2000 Effect on Computer System Software**

This Notice was issued to alert licensees of the potential problems that may occur with their computer systems and associated software as a result of the upcoming change to the new century. During this inspection, the licensee's actions taken in response to this issue were reviewed.

The NRC inspector noted that the licensee had a copy of the Notice and were aware of the potential problem. The licensee stated that their corporate office was aware of the problem and was taking actions on a corporate-wide level. The licensee also stated that there were no critical computer programs or computer uses at the site that are expected to still be in service at year 2000. In summary, no short term changes are planned because of the year 2000 issue, and the licensee expects there will be no critical computer uses at the site when the year 2000 occurs.

## **7 Exit Meeting Summary**

The inspector presented the inspection results to the representatives of the licensee at the conclusion of the inspection on May 14, 1998. Licensee representatives acknowledged the findings as presented. A telephonic exit briefing was held with the licensee on June 19, 1998, to provide the licensee with a summary of the NRC's soil sample results. The licensee did not identify any material reviewed by the NRC inspectors as proprietary.

ATTACHMENT 1

**SUPPLEMENTAL INSPECTION INFORMATION**

**PARTIAL LIST OF PERSONS CONTACTED**

Licensee

S. Baker, Manager of Environmental Services  
L. Fiske, Civil Engineer/Radiation Specialist, Shepherd Miller, Inc.  
J. Gearhart, Resident Agent/Environmental Engineer  
T. Herrera, Safety Director/Radiation Safety Officer  
L. Miller, Vice President, Shepherd Miller, Inc.

**ITEMS OPENED, CLOSED AND DISCUSSED**

Opened

40-1162/9801-01	IFI	Comparison of licensee's soil sample results to NRC's sample results. The licensee's results were not available at end of inspection period.
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Closed

None

Discussed

None

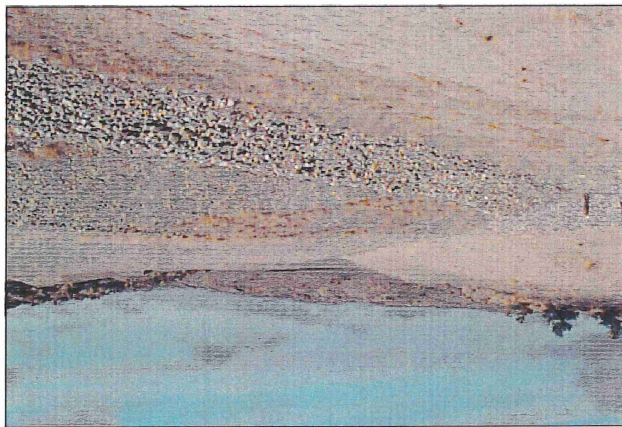
**LIST OF ACRONYMS**

ALARA	as low as reasonably achievable
IFI	inspection followup item
pCi/g	picocuries per gram
TDS	total dissolved solids



ATTACHMENT 2

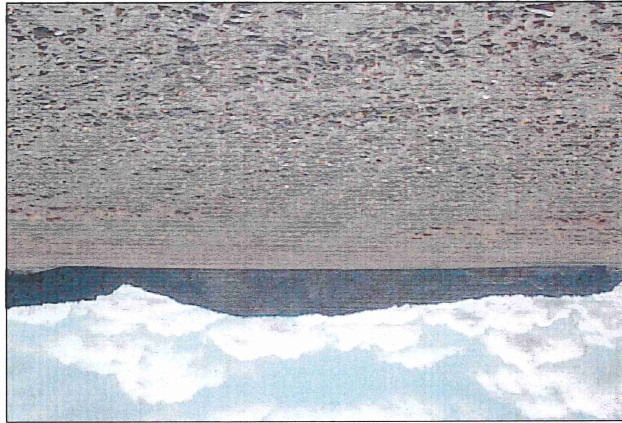
WESTERN NUCLEAR, INC.'S SPLIT ROCK MILL SITE



Northwest section of tailings impoundment and north-central diversion ditch.



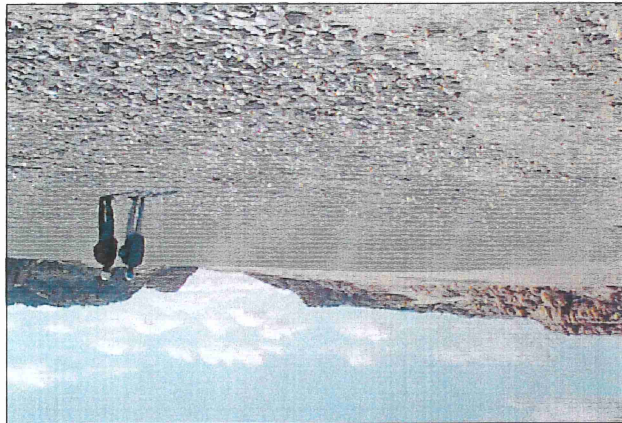
North-central diversion ditch with rip-rap.



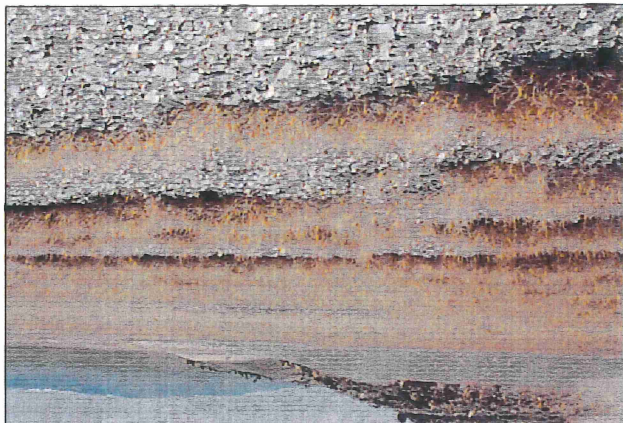
Top of tailings impoundment area reclaimed during 1994-1996.



Rock stockpile area exempted from radiological cleanup.



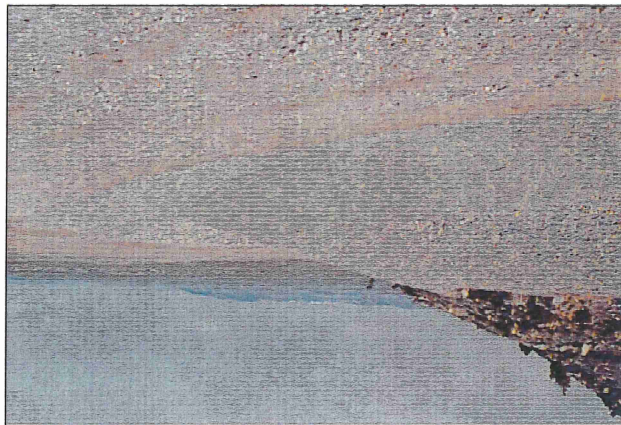
Top of tailings impoundment area reclaimed during 1997.



Vegetation on top of tailings impoundment area reclaimed during 1996.



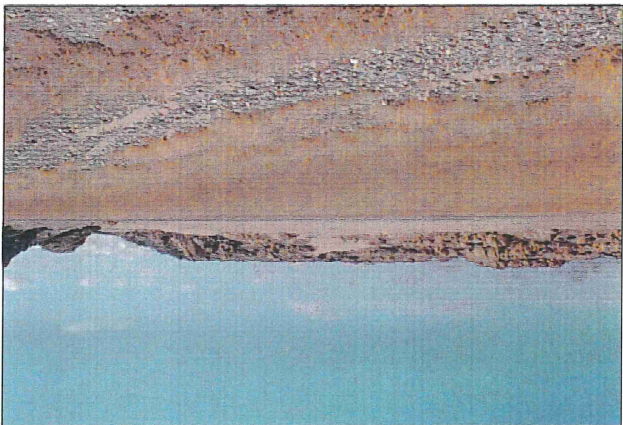
**WESTERN NUCLEAR, INC.'S SPLIT ROCK MILL SITE**



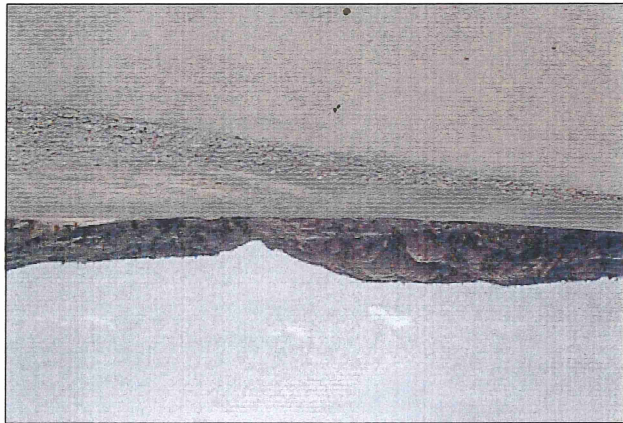
South diversion ditch with varying rip-rap gradations.



Southwest section of tailings impoundment and south diversion ditch with 18-inch rip-rap.



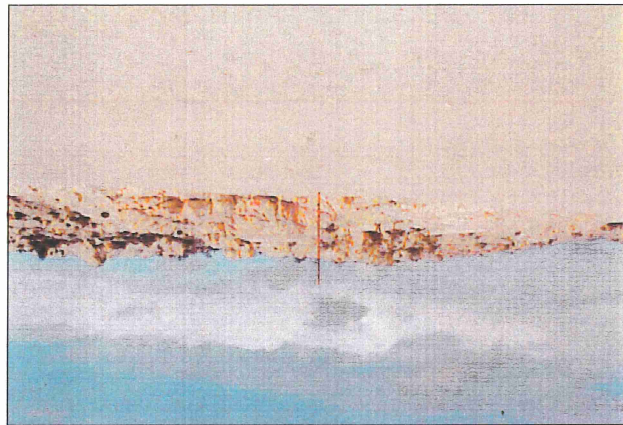
Northeast section of tailings impoundment.



Confluence of north diversion ditch and drainage swale on top of tailings impoundment.



Area of windblown cleanup (foreground) and rock exempted from cleanup (background).



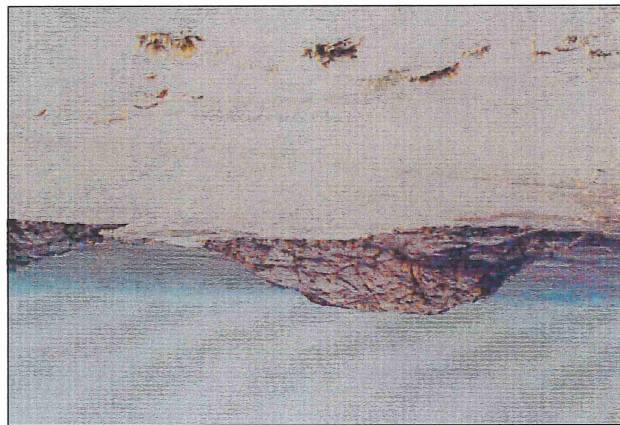
Area of windblown cleanup near northeast environmental monitoring station.



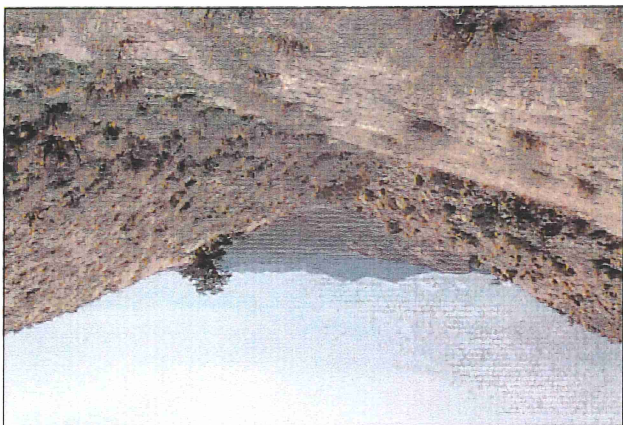
**WESTERN NUCLEAR, INC.'s SPLIT ROCK MILL SITE**



Tailings impoundment areas reclaimed during 1997 (foreground) and 1996 (background).



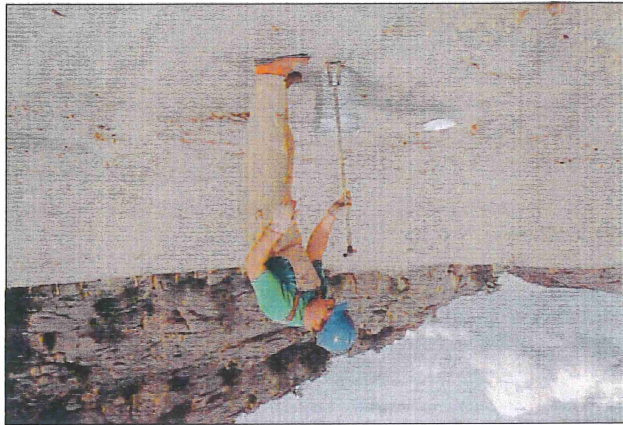
Windblown cleanup performed in Northeast Valley area.



Front side of North Dune area exempted from radiological cleanup.



Licensee personnel performing gamma survey and soil sampling in NRC-selected grid.



Soil sampling in progress by licensee personnel.



Gamma scanning and soil sampling by licensee personnel.