UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

October 8, 2019

Sandra L. Ross, Site Manager
Rio Algom Mining LLC
P.O. Box 218
Grants, NM 87020

SUBJECT: RIO ALGOM MINING LLC INSPECTION REPORT 040-08905/2019-001

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on September 17-18, 2019, at the Ambrosia Lake facility in McKinley County, New Mexico. The purpose of the inspection was to determine whether decommissioning activities were being conducted safely and in conformance with NRC requirements and the conditions of your license. The NRC inspectors discussed the results of the inspection with you and members of your staff at the conclusion of the inspection on September 18, 2018. The results of the inspection are documented in the enclosure to this letter.

This inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, and to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. No violations were identified, and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS) accessible from the NRC Web Site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response, if you choose to provide one, should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact Dr. Robert Evans at 817-200-1234, or the undersigned at 817-200-1156.

Sincerely,

/RA/

Heather J. Gepford, PhD, CHP, Chief
Materials Licensing and Decommissioning Branch
Division of Nuclear Materials Safety

Docket No.: 040-08905
License No.: SUA-1473

Enclosure:
Inspection Report 040-08905/2019-001

cc w/enclosure:
M. Hunter, New Mexico Environment Department
S. Rodriquez, New Mexico Environment Department
B. Tsosie, U.S. Department of Energy

U.S. NUCLEAR REGULATORY COMMISSION
Region IV

Docket No.:	040-08905
License No.:	SUA-1473
Report No.:	040-08905/2019-001
Licensee:	Rio Algom Mining LLC
Facility:	Former Ambrosia Lake mill
Location:	McKinley County, New Mexico
Inspection Dates:	September 17-18, 2018
Inspectors:	Robert Evans, PhD, PE, CHP, Senior Health Physicist Materials Licensing and Decommissioning Branch Division of Nuclear Materials Safety Randall Fedors, Senior Hydrogeologist Reactor Decommissioning Branch Division of Decommissioning, Uranium Recovery and Waste Programs Office of Nuclear Material Safety and Safeguards
Approved by:	Heather J. Gepford, PhD, CHP, Chief Materials Licensing and Decommissioning Branch Division of Nuclear Materials Safety
Attachment:	Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

Rio Algom Mining LLC
NRC Inspection Report 040-08905/2019-001

This inspection was a routine, announced inspection of decommissioning activities being conducted at the former Ambrosia Lake mill in McKinley County, New Mexico. In summary, the licensee was conducting activities in accordance with license and regulatory requirements.

Management Organization and Controls/Emergency Preparedness

- The licensee's organizational structure aligned with license requirements, and all positions were staffed with qualified individuals. The licensee conducted routine audits and site inspections in accordance with procedural and regulatory requirements. The licensee established and maintained procedures in compliance with license requirements. The licensee's emergency response program consisted of training and staging of first aid kits in case of an incident at either the site or main office. (Section 1.2)

Radiation Protection/Operator Training

- The licensee implemented radiation protection and training programs in compliance with license and regulatory requirements. Occupational exposures were small fractions of the annual regulatory limits. (Section 2.2)

Radioactive Waste Processing, Handling, Storage, and Transportation

- The licensee was conducting work activities in accordance with license requirements and commitments provided in recent letters to the NRC. Site security was adequate for the status of the site. Independent radiological survey results indicated that the two tailings cover continued to be effective at reducing ambient exposures to the buried tailings material. (Section 3.2)

Effluent Control and Environmental Protection

- The licensee implemented the environmental and groundwater monitoring programs and reported the results to the NRC as required by the license. The licensee conducted public dose assessments to verify compliance with regulatory limits. Public doses were small fractions of the regulatory limit. The licensee conducted land use surveys as required by the license. (Section 4.2)

Report Details

Site Status

The Ambrosia Lake mill processed approximately 33 million tons of uranium ore from 1958-1985. Reclamation of the two tailings cells commenced in 1989, and the mill was demolished in 2003-2004. Reclamation activities were completed in May 2016, with minor exceptions. At the time of the inspection, there were no structures within the restricted area, but several office and laboratory trailers were located adjacent to the licensed property to support site activities.

In 2016-2017, the licensee conducted a final status survey and reviewed the sample results. The radiological survey included surface scans and soil sampling. The survey results indicated that additional remediation and sampling would be necessary in discrete areas. At the time of the inspection, the licensee continued to formulate its plan for conducting future cleanup and resurvey work. The licensee also continued to prepare the construction completion report for future submittal to the U.S. Nuclear Regulatory Commission (NRC) for review and approval.

In early August 2018, the licensee and its contractors mobilized to implement two work plans. The first work plan was implemented to obtain supplemental geotechnical testing information needed to complete an internal corporate dam safety review. The second work plan was issued to collect information to support possible changes to the NRC-approved alternate concentration limits (ACLs) for groundwater. At the time of the inspection, the licensee and its contractors had completed the first work plan and was implementing the second work plan. Details about these work plans are provided in Section 3 of this inspection report.

1 Management Organization and Controls/Emergency Preparedness (Inspection Procedures (IP) 88005 and 88050)

1.1 Inspection Scope

The inspectors reviewed the licensee's oversight and control of licensed activities.

1.2 Observations and Findings

a. Site Staffing

The original organizational requirements were provided in the licensee's letter dated January 13, 1998 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML18292A685), which is referenced in License Condition 10. Specifically, the licensee's Radiation Protection and Environmental Program Manual, referenced in the 1998 letter, provides details about the organizational requirements. The licensee updated the Manual in March 2019.

At the time of the inspection, site staffing consisted of a combination of licensee personnel and contractors. The site manager was the highest ranking individual. Other staff assigned to the project included the site principal, site specialist, principal hydrogeologist, and project execution manager. Contractors and consultants were available as needed to provide radiation protection, environmental, groundwater, and site support services. All management level positions were filled, and the licensee had sufficient staff to maintain compliance with license requirements. The inspectors

confirmed that the organization aligned with the requirements provided in the licensee's Radiation Protection and Environmental Program Manual dated March 2019.

By letter dated October 1, 2018 (ADAMS Accession No. ML18282A072), the licensee notified the NRC of a change in site manager. The new site manager was a professional geologist with years of experience in environmental, compliance, and closure work. The previous site manager was reassigned to the position of project manager for all company projects in the State of New Mexico.

b. Routine Site Audits, Inspections, Reports and Procedures

Title 10 to the *Code of Federal Regulations* (10 CFR) 20.1101(c) required licensees to periodically (at least annually) review the radiation protection program content and implementation. In addition, Section 3.3 of the licensee's Radiation Protection and Environmental Program Manual states that the radiation safety officer (RSO) shall prepare an annual report summarizing the results of the radiation protection and environmental monitoring programs for the previous calendar year. The inspectors reviewed the licensee's annual As Low As is Reasonably Achievable (ALARA) audit for 2018 during the inspection.

The annual ALARA audit for 2018 was conducted in July 2019. A courtesy copy was provided to the NRC by letter dated August 5, 2019 (ADAMS Accession Nos. ML19231A145 and ML19231A146). The annual audit summarized occupational doses, public doses, radiation work permits (RWPs), contamination surveys, safety/training activities, and site inspections. The auditor also reviewed the status of recommendations provided in the previous audit. The inspectors concluded that the ALARA report for 2018 provided adequate summaries of the radiation protection and environmental programs as well as applicable trends and corrective actions. The inspectors concluded that the licensee had conducted and documented the annual program review as required by regulations and the Radiation Protection and Environmental Monitoring Program Manual.

Section 3.3 of the Health Physics and Environmental Program Manual specified that the licensee's staff shall conduct routine facility inspections. The licensee's staff and its contractors conducted facility inspections at least quarterly. The inspection frequency was increased to monthly during periods of onsite activity. The licensee's inspections included evaluation of open RWPs and corrective actions, and observation of signs, fences, and gates. The licensee's records indicated that the facility had been inspected in accordance with procedural requirements since the last inspection.

License Conditions 10, 14, and 16 required the licensee to establish certain procedures. The inspectors reviewed the licensee's procedures that were active at the time of the inspection. All procedures had received an annual review, most recently in June 2019. The official procedure manual was located at the site, and copies of procedures were available at the main office. The procedures were found to be acceptable for the work in progress.

c. Emergency Preparedness

The licensee was not required by the license to establish a formal emergency response program based on current site conditions. However, the licensee provided instructions

for responding to emergencies during initial site orientation training, refresher training, and safety meetings. The licensee maintained an emergency contact list at both the site and main office. First aid kits were available at the site and in each company vehicle. If an emergency incident were to occur (security, fire, or injury), the licensee's staff were instructed to immediately call "911" and request help from offsite responders.

1.3 Conclusions

The licensee's organizational structure aligned with license requirements, and all positions were staffed with qualified individuals. The licensee conducted routine audits and site inspections in accordance with procedural and regulatory requirements. The licensee established and maintained procedures in compliance with license requirements. The licensee's emergency response program consisted of training and staging of first aid kits in case of an incident at either the site or main office.

2 Radiation Protection/Training (IP 83822 and IP 88010)

2.1 Inspection Scope

The inspectors reviewed the licensee's radiation protection and training programs to verify compliance with 10 CFR Part 20 and license requirements.

2.2 Observations and Findings

License Condition 10 required, in part, that the licensee maintain a health physics program. Details about the program were provided in the licensee's Radiation Protection and Environmental Program Manual. The inspectors reviewed the licensee's implementation of its occupational exposure, RWP, contamination control, training, and instrument calibration programs. The licensee eliminated the bioassay and respiratory protection programs in 2016 due to a reduction in onsite activities.

The NRC inspectors reviewed personnel dosimetry records for 2018-2019. The licensee measured occupational radiation exposures for deep dose equivalent, lens dose equivalent, and shallow dose equivalent using optically stimulated dosimeters. All results were less than or equal to 2 millirem per year. These results were well below the regulatory limit of 5,000 millirem per year for total effective dose equivalent exposures.

As stipulated by RWPs, the licensee conducted air sampling during non-routine work to ensure that no worker received an internal exposure greater than 10 percent of the regulatory limits specified in 10 CFR 20.1201. Since the results of air sampling were well below the 10 percent of the limit for the most restrictive radionuclide, the licensee did not assign internal doses to any worker in 2018 as allowed by 10 CFR 20.1202. The inspectors reviewed the licensee's records and confirmed that the air sample results were well below the regulatory limit for reporting.

The licensee implemented a contamination control program. Personnel monitoring records for 2019 indicated that no individual left the site with contamination above the licensee's action level. Equipment release records for 2019 indicated that no component was released with contamination above the respective action level specified in License Condition 25. The equipment release records included construction vehicles and

various equipment used during implementation of the two work plans (described in Section 3 of this inspection report).

License Condition 15 provided the RWP requirements. Details of this program were provided in Section 3.7 of the licensee's Radiation Protection and Environmental Program Manual. The licensee recently issued an RWP involving transfer of potential radioactive wastes from a staging area to a roll-off container for eventual disposal. The RWP provided comprehensive information about radiological conditions, dosimetry and air sampling requirements, and job-specific hazards.

In September 2018, the licensee issued an RWP to support off-tailings drilling operations at the site. The drilling was conducted to support a future license application for supplemental alternate concentration limits (ACLs) to those specified in the license. The work was suspended in 2018, and the RWP was closed in October 2019. However, the work recommenced in 2019. The RSO decided that a new RWP was unnecessary for the work being conducted in 2019, since the work did not meet the criteria established in License Condition 15. Specifically, the work did not have the potential for significant exposure to radioactive material based on the results of radiological sampling that was conducted to support work in 2018. As noted earlier, the inspectors reviewed the licensee's occupational whole body and air sample results collected in 2018 for this RWP and agreed that the work being conducted in 2019 most likely did not have the potential for significant exposure of workers to radioactive material.

The Radiation Protection and Environmental Monitoring Manual does not require routine external radiation surveys since the reclamation work has been completed and the tailings material had been covered. However, the licensee's staff conducted surveys of the waste storage area when conditions changed. The waste material in storage included tailing collected during implementation of the dam safety work plan in 2018.

License Condition 10 provided the training requirements. Details about training were provided in Section 3.1 of the licensee's Radiation Protection and Environmental Program Manual. The licensee conducted training for visitor orientation, initial site training, on-the-job training, safety training, and daily job safety training. The inspectors reviewed the licensee's training records for visitor orientation and radiation protection training for site workers. The training program covered the topics as provided in Regulatory Guide 8.30, "Health Physics Surveys in Uranium Recovery Facilities," and Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Recovery Facilities Will be As Low As Is Reasonably Achievable." The inspectors confirmed that a test was administered after completion of radiation protection training for both routine and project-based site workers.

The inspectors also evaluated the process the RSO followed that ensured annual training was maintained for all site workers. The RSO tracked training of routine site workers using a spreadsheet to ensure that annual training was maintained. For project-based site workers, the project manager must go through the RSO prior to onsite access for all project team members. All training records were found to be complete, and the system for ensuring annual completion of required training for all onsite workers was adequate.

The licensee maintained radiation detection instrumentation for routine and non-routine activities being conducted at the site. The licensee established a program to ensure that

survey instruments were calibration-checked at the intervals specified in site procedures. Portable radiological survey instruments and equipment were functionally examined to verify operability, response, and proper settings. The inspectors confirmed that the licensee's instrument calibration program followed license requirements and site procedures.

2.3 Conclusions

The licensee implemented radiation protection and training programs in compliance with license and regulatory requirements. Occupational exposures were small fractions of the annual regulatory limits.

3 Radioactive Waste Processing, Handling, Storage, and Transportation (IP 88035)

3.1 Inspection Scope

The inspectors interviewed licensee representatives, toured the site, and reviewed applicable records to determine if the licensee had established and maintained an effective program for managing radioactive waste.

3.2 Observations and Findings

By letter dated February 9, 2018 (ADAMS Accession Nos. ML18044A111 and ML18044A112), the licensee notified the NRC that it intended to implement a work plan involving dam safety and tailings characterization on the two tailings material disposal cells. In addition, by letter dated November 27, 2017 (ADAMS Accession Nos. ML17340A824 and ML17340A826), the licensee notified the NRC that it planned to implement a second work plan to gather more information to support a future license amendment request for supplemental ACLs. The NRC accepted the two work plans by email dated July 11, 2018 (ADAMS Accession No. ML18197A087).

At the time of the onsite inspection, the licensee's contractors had completed the first work plan and were implementing the second work plan. As part of the first work plan, the licensee's contractors drilled a number of core borings. The contractor replaced some of the bore holes with lysimeters or piezometers for future use. The inspectors reviewed a limited sampling of the work during the previous inspection (ADAMS Accession No. ML18271A159). The licensee implemented the first work plan in response to a request for additional information by the licensee's parent company.

During the inspection, the licensee was implementing the second work plan. As part of this work plan, the licensee planned to drill bore holes and install wells to support a future request to change the NRC-approved ACLs. The work was started in September 2018, but was suspended in October 2018. The work recommenced in June 2019 and was ongoing at the time of the inspection.

The completed work included construction of three core holes for mineralogical characterization and stratigraphic profiling and completion of two alluvial exploration borings to locate the depth of the water table. In addition, the licensee's contractor installed two of seven bedrock monitor wells. The field work will continue for several more weeks. After the installation of the monitoring wells has been completed, the licensee plans to monitor the wells for 1-2 years, to gather information about the

groundwater quality at these locations. Based on the current work and sampling schedule, the licensee anticipates that it will submit the proposed application to the NRC in 2023.

The inspectors reviewed the status of the licensee's construction completion report. The NRC suspended the review of the licensee's construction records in 2016, to give the licensee time to organize the records and to assemble the associated completion report. During the inspection, the licensee informed the inspectors that the review was being conducted in phases. The phases included a review of license requirements over time, review of data previously collected, resolution of deficiencies in the records, and preparation of the final report. At the time of the inspection, the licensee estimated that the construction completion report would be completed and presented to the NRC for review and approval by 2021.

The inspectors reviewed the status of the licensee's plans to remediate and resurvey some areas that were previously identified with elevated levels of radioactivity. After completion of the reclamation work, the licensee conducted extensive field investigations in 2016-2018 to identify and quantify areas above the NRC-approved acceptance criteria. The licensee's investigations identified areas that needed additional remediation. These areas were located in both the alternate release criteria area and the wind-blown tailings area. The licensee presented the preliminary information to the NRC in a public meeting on January 23, 2019 (ADAMS Accession No. ML19050A423).

The licensee subsequently submitted a work plan for the wind-blown tailings areas to the NRC by letter dated April 1, 2019 (ADAMS Accession No. ML19099A196). The NRC acknowledged receipt of the work plan by email dated April 9, 2019 (ADAMS Accession No. ML19099A194). The licensee's staff conducted a pilot study in May-June 2019. At the time of the inspection, the licensee had not decided where to dispose of contaminated material that would be collected during future reclamation work. The licensee plans to start the field work in 2021.

The inspectors reviewed site security. The NRC staff noted that the licensee's site security measures were effective. The property was enclosed by a fence, and gates were locked and posted as required by License Condition 28.

During site tours, the NRC inspectors conducted independent radiological surveys using a Ludlum Model 2401-S survey meter (Serial No. 182780, calibration due date November 5, 2019). With a background of 7-8 microroentgen per hour (μR/hr), as measured at the office trailers adjacent to the site, the exposure rates on top of the two tailings cells were observed to be at background levels (8-10 μR/hr), indicating that the cell covers were effective. The area of the drill rig, located in the northern area, measured 25-35 μR/hr. The mine impacted areas measured around 70 μR/hr. Finally, the Section 4 area, located southeast of the tailing cells, measured about 45 μR/hr per hour. All areas of the site were well below the regulatory limit for posting as a radiation area (5,000 μR/hr).

3.3 Conclusions

The licensee conducted work activities in accordance with license requirements and commitments provided in recent letters to the NRC. Site security was adequate for the status of the site. Independent radiological survey results indicated that the two tailings

covers continued to be effective at reducing ambient exposures to the buried tailings material.

4 Effluent Control and Environmental Protection (IP 88045)

4.1 Inspection Scope

The inspectors reviewed the licensee's effluent and environmental protection programs to ensure compliance with license and regulatory requirements.

4.2 Observations and Findings

a. Effluent and Environmental Monitoring

The effluent and environmental monitoring program requirements were specified in License Conditions 10 and 29. Section 4.0 of the Radiation Protection and Environmental Program Manual provided detailed instructions for the program. In December 2016, the NRC authorized the licensee to discontinue environmental gamma, surface soil, vegetation, and sediment sampling (ADAMS Accession No. ML16344A027). In December 2017, the NRC agreed with the license's request to terminate the environmental air particulate sampling program (ADAMS Accession No. ML17293A342). Beginning January 1, 2018, the licensee monitored only for gaseous radon-222, in addition to groundwater sampling.

The inspectors reviewed the licensee's environmental and effluent monitoring results for 2018 and the first half of 2019 (ADAMS Accession Nos. ML18242A081, ML19058A439, and ML19246A104). The licensee collected samples at seven stations. The licensee also collected duplicate samples at several locations for quality control reasons. The inspectors concluded that the radon-222 samples were collected and reported to the NRC in accordance with License Condition 19 requirements. No sample result exceeded the effluent concentration limit provided in Appendix B to 10 CFR Part 20.

The license did not clearly specify which environmental sample stations were the background and nearest resident stations. In response to previous NRC questions about sampling stations, the licensee submitted a clarification letter to the NRC dated January 20, 2019 (ADAMS Accession No. ML19028A155). The licensee clarified which stations were the background and nearest resident stations. The licensee's letter included a map of station locations. The inspectors noted that the information provided in the licensee's letter was consistent with the information presented in semi-annual reports that had been previously submitted to the NRC.

The licensee conducted public dose assessments as part of its annual ALARA program reviews. The inspectors reviewed the licensee's dose assessment for calendar year 2018. The licensee's assessment concluded that annual doses to the nearest resident, delivery person, and visitor from licensed operations were less than 2 millirem. The calculated doses were well below the regulatory limit of 100 millirem per year as specified in 10 CFR 20.1301(a).

b. Groundwater Monitoring

License Condition 34 stated that the licensee shall implement a groundwater compliance monitoring program. The program included semi-annual sampling of 23 wells in four geological layers: Dakota Formation (KD), Tres Hermanos A (TRA) and Tres Hermanos B (TRB) in the Mancos Formation, and Alluvium. Four of those 23 wells were designated as background wells. License Condition 34.A required that the samples be analyzed for gross alpha, lead-210, radium-226 plus radium-228, thorium-230, natural uranium, several non-radiological chemical constituents, and as-found water conditions (water level, pH, and electrical conductivity). The license also required the licensee to submit semi-annual groundwater monitoring reports to the NRC. For wells requiring monthly measurements under License Condition 34.F that exceed the Groundwater Protection Standards (GPS), the licensee submitted first and third quarter monthly results in first and third quarter groundwater reports. Monthly results from the second and fourth quarters were submitted in the semi-annual submissions to the NRC.

The inspectors reviewed the semi-annual reports for the second half of 2018 and the first half of 2019 (ADAMS Accession Nos. ML19037A407 and ML19214A107). The inspectors also reviewed the quarterly reports for the third quarter of 2018 and first quarter of 2019 (ADAMS Accession Nos. ML18333A039 and ML19158A090). Tabular and graphical analytical results for alternate concentration limit (ACL) constituents were provided in the semi-annual reports, but GPS constituents were not provided, which was consistent with the requirements specified in License Condition 34.D. The inspectors concluded that the licensee collected all required samples and reported the sample results in the quarterly and semi-annual reports as specified in License Condition 34.

The most notable observation in the data was the decline in the potentiometric surface in the alluvium unit. The licensee monitored the water levels in 40 wells in the alluvium in and surrounding the site. The licensee had observed that water levels continued to slowly decline in the past year, which is consistent with the long-term trend. Eight of the 40 wells installed in the alluvium unit continued to be dry. The decline in water levels was attributed to the discontinuance of the alluvium corrective action program in 2006 that previously maintained an artificial water mound in the vicinity of the site. Of the nine wells designated for chemical analysis of groundwater in the alluvium in License Condition 34, two wells could not be sampled due to insufficient volumes of water. License Condition 34.F states, in part, that if any exceedance continue for three consecutive months, the licensee shall submit to the NRC a groundwater corrective action designed to regain compliance with groundwater protection standards. The inspectors reviewed the quarterly and semi-annual reports for the second half of 2018 through the first half of 2019 and confirmed that the licensee discussed the exceedance for three wells in the reports. Samples from wells 36-06 KD, 32-45 KD-R, and 31-02 TRB-R exceeded certain GPS for three consecutive months in prior years, and in some cases, continued to exceed GPS in the past year. Recent sample results for beryllium and cadmium at Well 36-06 KD and molybdenum at Well 32-45 KD-R exceeded the GPS specified in the license. The semi-annual reports provided dates of corrective action program submittal and NRC approval for exceedance of the non-radiological metals for these three wells. Gross alpha activity levels also exceeded levels specified in the license at all three wells. The semi-annual groundwater monitoring reports discussed the problems of uncertainty and lower limits of detections for gross alpha measurements. While the gross alpha activities levels exceed standards, the licensee noted in both semi-annual reports that the significant alpha-

producing radionuclides at these three wells met the groundwater protection standards as specified in the license. The Dakota Formation and Tres Hermanos B groundwater layers associated with wells 36-06 KD, 32-45 KD-R, and 31-02 TRB-R were both included the proposed corrective action program associated with a supplemental ACL work plan (ADAMS Accession No. ML17340A826) discussed below.

The inspectors noted that the third quarter monthly sampling report (ADAMS Accession No. ML18333A039) identified an exceedance for gross alpha at one well (31-67 TRB) under the semi-annual sampling program, that was not shifted to the monthly sampling program as dictated by License Condition 34.F. The August 2018 gross alpha result of 35 picocuries per liter (pCi/L) exceeded the GPS of 21 pCi/L for the Tres Hermanos B sandstone layer. The licensee noted that the uncertainty in the laboratory result was 33 pCi/L and the lower limit of detection was 110 pCi/L. Considering the high relative uncertainty and that the lower limit of detection was much higher than the GPS, the licensee suggested that the gross alpha result may not reflect a true exceedance of the GPS at this well. As with exceedances of gross alpha at other wells, the licensee had included gross alpha in the supplemental ACL work plan for the bedrock units, and in addition, has indicated an exemption may be requested due to limitations of analytical methods when the groundwater samples contain high total dissolved solids (TDS) that cause interference.

Two work plans for field studies were implemented since the last inspection in September 2018. During a public meeting held in April 2016 (ADAMS Accession No. ML16141B267), the licensee indicated that it was considering a proposed license amendment to supplement the ACLs specified in License Condition 34.B due to consecutive exceedances of the GPSs since 2007. Subsequently, a work plan to support preparation of a request for supplemental ACLs was provided to the NRC in 2017 (ADAMS Accession No. ML17340A826). The second work plan described work on the tailings impoundments to support a directive by the licensee's parent company to perform dam failure analyses at all of the company's tailings impoundments worldwide; but, this work activity was not considered to be a license-required activity by the licensee. However, the analyses of water balances and of chemical constituents in the impoundments could be relevant to source term and release of contaminants for a dose assessment for the site. Licensee representatives stated that any relevant data will be reported to the NRC if needed to support licensed activities. The tailings work plan was provided to NRC in 2018 (ADAMS Accession No. ML18044A096).

The licensee's contractors began implementing the supplemental ACL work plan in 2018. To date, three exploratory boreholes have been completed and two of seven monitoring wells have been constructed in the bedrock; exploratory wells are drilled first at a location to identify well construction specifications needed for the monitoring wells that are then drilled in close proximity to the exploratory boreholes. Two alluvial exploratory borings have been completed and one alluvial well was constructed, at which no saturated horizon was found. The work was expected to be completed in November 2019. Aquifer testing had not yet begun at the monitoring wells. The inspectors observed the drill rig but did not observe any drilling in progress. The drill rig was inactive during the inspection due to weather and other reasons.

The licensee indicated that field work identified in the tailings work plan (ADAMS Accession No. ML18044A096) began in 2018 and was nearly complete. The only continuing activity is monitoring of water levels and conditions at wells constructed in

the tailings. The inspectors examined the process for retention of information and analyses traced from field work to databases containing results to ensure that License Condition 20 was satisfied. The inspectors reviewed Standard Operating Procedure ESP-014, "Ambrosia Lake Tailings Porewater Sampling," dated March 2019. This procedure included instructions for monitoring open-pipe and vibrating wire piezometers for water level measurements and lysimeters for water sampling in the unsaturated zone. The inspectors traced data collection from field sheets and data loggers to the results stored in the offsite project data base. The information reviewed included borehole logs and data collection of groundwater conditions for three boreholes (GBH-2Z, TBH-4Y, and GBH-6) that represent each of the three groundwater techniques mentioned above. The inspectors concluded that the description of the procedures in the procedure were followed and the data records were accessible and maintained as consistent with License Condition 20 requirements.

c. Annual Land Use Survey

License Condition 39 required, in part, that the licensee conduct an annual survey of land use. This license condition also required the licensee to submit the results of the annual land use survey to the NRC by the first of July of each year. The licensee submitted the most recent land use survey to the NRC by letter dated June 26, 2019 (ADAMS Accession No. ML19183A193). During the inspection, the inspectors noted an error in the original report that was submitted to the NRC. The licensee issued an addendum to the report to correct this error. The addendum was submitted to the NRC by letter dated September 18, 2019 (ADAMS Accession No. ML19267A045).

The land use within two miles of the mill site included livestock grazing and utility distribution. The report noted that the nearest resident was located approximately three miles north-northeast of the mill site. This residence was occupied at the time of the inspection. There were no new land features or structures in 2019. In summary, the licensee conducted and submitted a land use land survey for 2019 in accordance with the requirements specified in License Condition 39.

4.3 Conclusions

The licensee implemented the environmental and groundwater monitoring programs and reported the results to the NRC as required by the license. The licensee conducted public dose assessments to verify compliance with regulatory limits. Public doses were small fractions of the regulatory limit. The licensee conducted a land use survey as required by the license.

5 Exit Meeting Summary

The inspectors presented the inspection results to the licensee's representatives at the conclusion of the onsite inspection on September 18, 2019. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

K. Applegate, Site Principle
C. Ardito, Hydrogeologist, INTERA
T. Ballaine, New Mexico Project Manager
J. Bauman, Hydrogeologist
L. Coons, Principle Engineer, INTERA
M. Gorospe, Site Specialist
A. Marek, Site Specialist
S. Ross, Site Manager
E. Ruedig, Health Physicist, Environmental Restoration Group, Inc.
M. Schierman, Radiation Safety Officer, Environmental Restoration Group, Inc.
R. Schietinger, Engineer

U.S. Department of Energy, Office of Land Management

A. Kuhlman, Site Lead, Navarro
B. Tsosie, Site Manager

INSPECTION PROCEDURES (IPs) USED

IP 83822	Radiation Protection
IP 88005	Management Organization and Controls
IP 88010	Training
IP 88035	Radioactive Waste Processing, Handling, Storage, and Transportation
IP 88045	Effluent Control and Environmental Protection
IP 88050	Emergency Preparedness

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

ACL	alternate concentration limits
ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
CFR	Code of Federal Regulations
GPS	Groundwater Protection Standards
IP	Inspection Procedure
KD	Dakota Formation
μR/hr	microroentgen per hour
NRC	U.S. Nuclear Regulatory Commission
pCi/L	picocurie per liter
RSO	radiation safety officer
RWP	radiation work permit
TDS	total dissolved solids
TRA	Tres Hermanos A
TRB	Tres Hermanos B