Ennis, David, EMNRD

From: Robert Newcomer <newcomer.b.tmr@gmail.com>
Sent: Tuesday, May 16, 2023 1:09 PM
To: Ennis, David, EMNRD
Cc: Mike Thompson
Subject: [EXTERNAL] Re: Cebolleta Exploration - Agency Comments
Attachments: RTC_051623_complete.pdf

Hi DJ,

On behalf of Cibola Resources, I have attached our responses to the comments to the application received from MMD and the other agencies dated April 12, 2023. As part of this response, we have also included proposed drilling operations and radiation monitoring plans for the project. Once we know we have the details of the permit worked out, we can contract with the drilling contractor, work out the details of the financial assurance, submit the drill hole paperwork to the Office of the State Engineer and schedule the baseline radiation and biological follow-up surveys.

Please let us know if you have any questions, comments or need anything additional at this point.

Best Wishes,

Bob

_____

Bob Newcomer, RG, CPG
Mining and Water Resources Consultant
Toltec Mesa Resources LLC
7823 Quintana Dr. NE
Albuquerque, NM 87109
(505) 238-4770

On Wed, Apr 12, 2023 at 1:24 PM Ennis, David, EMNRD <david.ennis@emnrd.nm.gov> wrote:

> Hi Mike and Bob,
>
> Attached please find MMD and Agency comments on the Cebolleta Exploration project in Cibola County.
>
> If you have any questions, please let me know.

Thanks,

DJ

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David ("D.J.") Ennis, P.G.

Mining and Minerals Division

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david.ennis@emnrd.nm.gov

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May 16, 2023

David J. (DJ) Ennis email: david.ennis@state.nm.us
Program Manager
Mining Act Reclamation Program
Mining and Minerals Division – Energy Minerals and Natural Resources Department
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

RE: RESPONSE TO COMMENTS – AMENDED MIEP APPLICATION FOR CEBOLLETA PROJECT, CIBOLA COUNTY, NEW MEXICO

Dear DJ:

On behalf of Cibola Resources, LLC (Cibola), Toltec Mesa Resources LLC (TMR) has prepared the following responses to the Mining and Minerals Division (MMD) and the other agency's comments and recommendations. Agency comments or recommendations are bolded, followed by Cibola's response.

MMD Comments:

As discussed during the field inspection, drill hole location LJ-4 is approved for this project; however, this location will need to be accessed through construction of a road/ramp. Some additional reclamation or maintenance might be required if this location is accessed. Also as discussed during the field inspection, MMD appreciates Cibola's offer to plug this open hole whether or not it is accessed for exploration. MMD will require in the permit the abandonment of this open hole.

Response: This drill hole location, LJ-4, will not be utilized as part of this permit and the hole will be plugged at the surface with cement. MMD's permit requirement is acceptable.

New Mexico Environment Department (NMED), Mining Environmental Compliance Section (MECS) comments:

1. **Groundwater Protection - Due to the penetration of drillholes into areas with known uranium mineralization, NMED requires all drilling activities to be non-discharging. A discharge may include, but is not limited to, the placement of drilled material and drilling fluids onto the ground surface without primary and secondary containment (i.e. liners, tanks, etc.). To achieve a non-discharging project, all material (drilling fluids, drilling water, drill cuttings, drill core, etc.) generated on site may not remain on site or encounter the ground surface or groundwater. Please provide NMED with a plan for the prevention of potential discharges throughout the project and mechanisms for a closed-loop system.**

Response: There will be no discharges to surface water or groundwater from this project from the drilling fluids. All fluids used with Cibola's drilling operations will be either 'dry'(drilling with air rotary methods) or contained in a closed-loop 'drilling mud' system. Any mineralized cuttings will be contained on plastic and if they pose a risk to surface water or groundwater quality, they will be removed from the

site. A preliminary radiological survey of the site will be conducted prior to any project disturbance to note and avoid any historical materials that are radioactive above background levels (see attached radiation protection plan).

All drill cuttings will be contained on plastic and surveyed for radioactivity during operations and until testing demonstrates they do not contain radiation levels above background levels. The drill core will be boxed and transported offsite for logging and assay. Drill cuttings are expected to be unmineralized. The drilling operations will use above-ground portable mud tanks and a closed loop circulation only if necessary. Drilling water will be sourced from offsite as specified in response 3.

Since the drilling contractor has not been selected, the specific details will be developed following that step. The drilling and operations plan will be provided to the drilling contractor, which will specify that the operation will be non-discharging for the drilling operations, as well as for stormwater from drill location disturbances. Contained fluids will be disposed of based on test results.

The radiation protection (attached) supplement exploration drilling operations (attached) for workers at the site and will be used to ensure the potential spread of radioactive contamination to surface water and groundwater within or beyond the project area is minimized or eliminated.

2. **Site characterization – The location of this project is in an area of multiple historic uranium milling and mining operations. Based on the proximity this site has to surrounding uranium mine and mill sites, NMED is requiring a characterization of radiological background prior to the start of this project. Please submit a workplan detailing how radiological site-specific background levels will be determined levels, background value(s), methods of radiological monitoring during the project and verification of achieving background upon completion. Figure 3: Drilling Locations was provided to NMED during a site visit on April 3, 2023. The figure shows the limits of the biological survey completed by the applicant, which appears with cross into an area of environmental impact from the General Electric/United Nuclear Corporation St Anthony Mine. NMED recommends the applicant avoid drilling south of the southern road where possible.**

Response: Cibola is aware of historic uranium mining and mine waste features in neighboring areas. Cibola expects the baseline survey and working within the limits of the permit area will reduce any potential to encounter the radioactive mine wastes from the St Anthony and other mine/waste areas. Cibola will operate within the constraints of health and safety (to be developed by contractors) and a radiation safety plan (attached) to protect workers. Controls will be put in place to restrict visitors to the site during operations and potential exposure to radioactive cuttings, drilling fluids and core. Any observed historic mine waste will be avoided.

Cibola will conduct a radiological survey of the proposed access routes and drill sites prior to moving equipment and starting any operations to establish baseline conditions. In this process, any radioactive mine waste will be noted and avoided (see attached plan).

Cibola will operate within the constraints of a key provision of OSHA regulations that an annual limit on whole-body dose of 1.25 rem per quarter. On an annualized basis, this overall dose limit is consistent with the NRC occupational dose limit of 5,000 mrem/yr Total Effective Dose Equivalent. This level of exposure is highly unlikely given the small quantities of radioactive material that will be produced (largely the drill core), short duration of the project, and the controls and management of the mineralized drill core. In any event, levels of radioactivity will be monitored in work areas relative to these exposure limits.

3. **Site water – Based on the application, NMED is not aware of an industrial water source for use on the site. Prior to use on the site, the applicant shall provide to NMED for approval, the source for industrial water and associated water quality results that include general chemical analysis (pH, chloride, sulfate, TDS, nitrate) and dissolved metals (uranium, selenium, molybdenum, arsenic). If metals analysis is not provided by the supplier, the applicant shall collect a sample and send for analysis that include the analytes listed above. NMED also notifies the applicant of a well prohibition order (Order) issued by the Office of the State Engineer (OSE) currently in place associated with the St Anthony Mine operated by United Nuclear Corporation/General Electric. The OSE executed the Order based on recommendations from NMED based on water quality impacts at the St Anthony Mine. The Order includes a portion of the area where the applicant's project is planned. Under the Order, the only new wells allowed in the area covered by the prohibition are those for remedial actions at the St Anthony Mine. The Order was effective January 12, 2018 and remains in perpetuity. The Order is attached.**

Response: Cibola will require the drilling contractor to provide the water for drilling operations from an uncontaminated water source and provide data concerning the character and quality of the water supplied. No wells or water supplies that are known to be contaminated or potentially contaminated will be used as a source of drilling water. If available from the provider of the water, data regarding the water quality will be made available to the State. If data is unavailable for an industrial water source, a sample of the water source will be collected and tested. With respect to the OSE's prohibition order, no wells will be completed as part of this permit for the appropriation of groundwater.

4. **In the likely instance groundwater is encountered while advancing the borings to the total depth of 340 feet below ground surface, plugging and abandonment of the borings should comply with New Mexico Office of the State Engineer regulations for wet holes as is indicated in the application. In addition, the applicant must contain any water produced from the exploration holes at the drill sites.**

Response: Cibola and the drilling contractor will plug and abandon the boreholes in accordance with Office of State Engineer requirements, as well as those specified in the permit. Because of uncertainty with respect to the depth of water at each location, each hole will be plugged from the bottom as if saturated conditions extended from near the surface to the full depth of the borehole. Cibola will provide documentation of the plugging of each hole.

NMED Summary Comment
NMED is requesting additional information prior to determining if the exploratory project as proposed will have a minimal impact to the environment.

To protect and maintain surface water quality standards, SWQB recommends the following:

• Appropriate spill clean-up materials such as absorbent pads must be available on-site at all times during road construction, site preparations, and drilling activities to address potential spills. Report all 1 https://www.env.nm.gov/surface-water-quality/303d-305b/ Cebolleta Exploration Project SWQB comments Page 2 of 3 2 spills immediately to the NMED as required by the New Mexico Water Quality Control Commission Regulations (20.6.2.1203 NMAC). For non-emergencies during normal business hours, call 505-428- 2500. For non-emergencies after hours, call 866-428-6535. For emergencies only, call 505-827-9329 twenty-four hours a day (New Mexico Department of Public Safety).

Response: Cibola will comply with this requirement and require the drilling contractor to have and maintain a 'spill kit' with the drilling rig and support vehicles. NMED will be immediately notified of any spills or releases not contained within the spill kit controls.

• The applicant must contain any water produced from the exploration holes at the drill site to prevent erosion and gully formation. Drilling cores and drilling mud must be collected and disposed of properly. o Gamma radiation levels at each drill site must be restored to pre-exploration levels.

Response: Cibola will comply with this requirement.

• Pressure wash and/or steam clean all mobile equipment used in the project area before the start of the project and inspect daily for leaks. A written log of inspections and maintenance should be completed.

Response: Cibola will comply with this requirement.

• The use of overland travel and site selection, design, and construction of well pads, reserve pits, and roads should comply with the guidelines described in the Bureau of Land Management "Gold Book" 2 . Suspend construction, maintenance activities, or off-road travel during periods when the soil is too wet to adequately support heavy equipment without causing surface disturbance. The operator should commit to repair any surface disturbance they caused.

Response: Cibola will comply with this requirement and any restoration is subject to MMD inspection and release of held financial assurance.

Additional NMED Surface Water Comments:

• Roads, pads, and other facility structures should be set back a minimum of 100 feet from any watercourses, including springs, wetlands, and arroyos.

• Implement Best Management Practices to prevent direct impacts to watercourses, including springs, wetlands, and arroyos. For temporary surface disturbances during exploration and reclamation activities, the operator should implement erosion control measures that are designed, constructed and maintained using professionally recognized standards (e.g., Natural Resource Conservation Service standards or the Bureau of Land Management "Gold Book").

• The applicant should ensure that stormwater entering the project area ("run-on") is diverted from soil storage piles and should place piles uphill of excavations when possible.

Response to all: Cibola does not anticipate having any discharge with this project, will protect surface water from stormwater runoff from disturbed sites during operations and until the sites are reclaimed.

New Mexico Department of Game and Fish Comments:

To minimize the likelihood of adverse impacts to migratory bird nests, eggs, or nestlings, the Department recommends that ground disturbance, vegetation removal, and drilling activities be conducted outside of the primary breeding season for migratory songbirds and raptors (1 March – 1 September). If ground disturbing and drilling activities must be conducted during the breeding season, the area should be surveyed for active nest sites (with birds or eggs present in the nesting territory) and avoid disturbing active nests until young have fledged. For active nests, establish adequate buffer zones to minimize disturbance to nesting birds. Buffer distances should be ≥100

feet from songbird and raven nests; 0.25 miles from most raptor nests; and 0.5 miles for golden eagle, ferruginous hawk, prairie falcon, and peregrine falcon nests. Active nest sites in trees or shrubs that must be removed should be mitigated by qualified biologists or wildlife rehabilitators. Department biologists are available to consult on nest site mitigation and can facilitate contact with qualified personnel.

Rocky Mountain Ecology, LLC conducted a biological survey of the project area on 17 February 2023. The Biological Evaluation Report documented observation of only two vertebrate wildlife species: dark-eyed junco and mule deer. This low number of observed species is not surprising given the timing of the survey. In order to obtain a more complete inventory of the wildlife species that utilize the habitat near the proposed project area, the Department recommends that Cibola conduct additional wildlife surveys during the migratory bird breeding season to include: one in April, two in May (one early, one late), and one in June (early). The wildlife surveys should include a minimum buffer distance of 0.25 miles around the project area to identify any raptor nests that could be disturbed by drilling activities during the breeding season.

Response: Before initiating drilling operations, Cibola will request an updated inspection of the site by Rocky Mountain Ecology, LLC (RME) to gain the best understanding of actual conditions at the beginning of and during the operations and steps to minimize potential impacts. Cibola will minimize the likelihood of adverse impacts to all wildlife during its operations through vigilance and if necessary, request additional assistance from RME or the State if sensitive species are observed and potentially affected during the operations. Cibola will make every effort and encourage the drilling contractor to expedite the work. The entire drilling program is expected to be completed in approximately 45 days.

Please let me know if you have any questions or need anything else at this point.

Sincerely,
Toltec Mesa Resources LLC

Bob Newcomer
Principal

cc: Mike Thompson, Cibola Resources

Drilling and Operations Plan – Cebolleta Resources LLC (Cebolleta)

All drilling and plugging of boreholes will be completed by a licensed New Mexico Drilling Contractor after only after the necessary forms for each hole have been submitted to the Office of the State Engineer.

Schedule and Communication

Prior to mobilization of equipment, Cibola will develop a schedule of exploration drilling activities, to allow effective communication, inspection and monitoring of drilling and reclamation activities. The schedule will include any exploration drilling activities or phases anticipated and Cibola will notify MMD, by telephone discussion with MMD Staff, within 24 hours, prior to any significant changes or modifications to the drilling schedule. It is anticipated this work will be conducted during daylight hours on a 10 day on and 4 days off schedule. The anticipated scope is expected to take approximately 45 days to complete.

Introduction

The project location is shown in Figure 1. The area encompassed by this permit has been extensively drilled/explored from the 1950's through to the mid 1980's. There has also been mining in adjacent areas to the south. Because of this, there is a network of existing roads, which will be used for primary access. It will be necessary to create short two track trails to access from existing roads to some of the drill pads, but in most cases, this will simply consist of flagging the route to indicate the path to take. No unnecessary clearing of vegetation will take place. Most of these routes are also historical because this exploration effort is twinning the historic hole locations (Figure 2).

Drilling Methods

The anticipated drilling method will be air-rotary with addition of water mist and/or foam to address any unstable hole conditions. If necessary, a bentonite mud-based 'closed loop' drilling system will be added. This is not anticipated based on the small diameter holes (5-inch), geologic conditions (shale/sandstone sequence that appears to hold up in the pit walls of the adjacent St. Anthony open pit) and low-permeability of the formations. The Jackpile sandstone is expected to be the first water-bearing unit encountered. Site observation (no evidence of mud pits) suggests historical drilling did not use excavated mud pits and were likely drilled by air-rotary methods and logged using downhole geophysics. Many holes appear to be left open, and in some instances the original hole opening has been located.

Health and Safety and Environmental Protections During Operations

Health and Safety and Radiological Safety Planning [this would be a separate document]

Baseline Screening for Radiological Conditions [this is a separate work plan, attached to this response to comments]

Material Safety and Spill Protection

No toxic or hazardous materials will be used during the course of the exploration program other than fuels and lubricants used by any motor vehicle. All materials used in the drilling process will be non-toxic and will not contaminate groundwater or aquifers. Chemicals that may be used are listed in the table below:

Name and Use

- Drill Mud (bentonite products) Bit lubrication, hole conditioning
- Foams, Polymers (non-toxic mud additives) Hole conditioning
- LCMs (inert lost circulation materials) Prevent losing drill fluids
- Diesel fuel Drill rig heavy equipment
- Lubricants (oil, grease) Equipment lubrication
- Hydraulic fluid Equipment operation
- Transmission fluids Equipment operation
- Antifreeze Equipment coolant

The exact product list will not be available until the drilling contract is awarded. At that point, the drilling contractor will provide MSDS sheets for the specific products that they use, and these are expected to fit in to the categories above. As soon as the contractor and thus the list of products to be used are finalized, the MSDS will be made available on site.

Clean water will be hauled to the site for use primarily as drilling fluid and secondarily as a dust control measure, if required. The source is expected to be a commercial or publicly regulated water source. If a private water source is used, the water quality of the source would be characterized. The specifics will depend on the specific drilling contractor employed. If with a commercial or public source, Cibola will provide information regarding the quality of the source from existing information or testing. Cibola will avoid any water-supply wells in the region that could be influenced by contamination from historical mining and mineral processing or other known environmental impacts. No wells within a 2-mile radius of the project will be used.

Spill Protection - Cibola will require the drilling contractor to have appropriate spill clean-up materials, such as absorbent pads, available on-site always during mobilization, site preparation and drilling activities to address potential spills. Plastic tarps or ground cloths will be placed under drill rig on each location and secured by shoveling small dirt berms around the tarp edges to contain any spills or leakage from the drill rig(s). The drill mud and additives are non-toxic and non-reactive and so do not require special handling. Fuel will be delivered to the drill rig(s) and other heavy equipment via steel tanks mounted in pickups equipped with spill containment kits and tools. All personnel

engaged in re-fueling operations on-site will be required to attend all nozzles or transfers during the entire time fuel transfer is occurring; unattended nozzles will not be allowed. The drilling contractor will exercise appropriate caution during all fueling operations and required to clean-up, remove and properly dispose of any soils or other materials contaminated by fuels or lubricants spilled during operations, in accordance with applicable New Mexico State regulations.

Mobilization

One or more truck - mounted drill rigs, either rubber tired or track mounted and of either conventional rotary or reverse circulation type; water truck(s), pipe trucks, small stake bed truck, probe truck, backhoe for digging mud pits, small dozer or front-end loader for doing road improvements and drainage control work, tractor with disk and harrow for reclamation work. In addition, 4x4 pickups will be used by geologists and other support personnel.

Site Preparation

Cebolleta plans to drill (using a truck-mounted drilling rig) up to twenty-two (22) vertical drill-holes, each approximately 5 inches in diameter, and up to 320 feet deep, utilizing no more than twenty-two drill pad surface disturbance areas, each no greater than sixty feet by one-hundred feet (60' X 100'), to accommodate all support equipment, including the drill rig, pipe truck and any ancillary support vehicles. Cebolleta plans to use a closed-loop drilling fluid manage system with above-ground tanks on skids. Any project-related equipment not used during actual drilling activities shall be staged along the main road.

Cibola anticipates working directly upon existing ground surfaces, where possible, and without mechanically clearing, blading or otherwise constructing each drill pad area. Cibola will minimize any new surface disturbance (e.g., only minor drill pad surface leveling using mechanized earthwork equipment, such as a backhoe or dozer, is permitted) and will utilize any existing two-track trails and existing private roads requiring only minor improvements, wherever possible, for site and drill pad access during all site access, including drilling and reclamation activities. Cibola will avoid removing or damaging standing live or dead trees and woody vegetation during drill pad set-up and construction, as well as during mobilization of equipment into and out of the project area. Some grass and brush clearing will be completed as needed to minimize risk of a grass fire from any sparks or other ignition sources. Fire extinguishers will be kept on the drill rig, support vehicles at the site.

Cibola understands it must limit all disturbances to the approved permit acreage, which is the total cumulative disturbance within the areas shown in Figure 2. These areas have been cleared for cultural resources and assessed for biological impacts. This total disturbance includes the proposed drill pad disturbance areas and any new overland travel access routes leading to the drill site locations.

Erosion Controls and Best Management Practices

Existing two-track roads may be improved, with the emphasis on minimum disturbance of vegetation. Where possible, the only preparation will be delineating the road with stakes and flagging. Traffic will be kept to a minimum and, as mentioned above, the time each pad and access route are heavily used should be short.

Cibola is committed to using a variety of Best Management Practices (BMP's) to improve existing drainage control situations and minimize the potential for erosion during the drilling and reclamation program. Considerable erosional damage has occurred in the 20-30 years since previous exploration and mine development work was discontinued and a significant portion of the proposed permit area has been previously disturbed. However, for the relatively short duration drilling program currently planned, Cibola intends to use primarily operational BMP's and complete limited drainage control work to prevent any further erosion and enhance the stability of existing roads.

BMPS's will include installing upslope diversion barriers (berms and ditches) to divert runoff and down gradient containment structures (berms, straw bale barriers, silt fences, etc.) on drill pads to contain all fluids and potential mud pit overflows on the drill pads. All barriers or containment structures will be properly designed and installed according to site conditions and in keeping with industry standards (Bureau of Land Management "The Gold Book, 4th ed. 2007).

Those BMPS may include:

- Temporary Sediment Traps;
- Silt Fences;
- Straw Bale Barrier Installations; and/or
- Temporary Berm/Diversion Dikes.

None of the proposed drill locations are within 100 feet of the normal high-water line of well-established drainages. In instances where less well-established drainages are noted and affected by the temporary site disturbance, more robust and/or redundant barriers will be used to ensure that potential runoff from the pads does not enter the drainage way.

BMP's will also include reclaiming all drill pads and roads not needed for future use as soon as possible following completion of the drilling work and will include starting reclamation in one area of the project while drilling is still underway in another (i.e. concurrent reclamation).

Other BMP's will include performance criteria and prohibitions in the drilling contract, education of all field personnel on the importance of protecting all natural resources and preventing discharges from the drill pads, and frequent, unannounced compliance audits by Cibola management. Personnel from the MMD, NMED, OSE and NMG&F will be welcome to visit the project at any time.

Cibola will use BMPs to prevent direct impacts to surface water. This will include preventing any discharge of process water (i.e., drilling water) from the drill sites and diverting or containing storm water runoff to prevent contact with disturbed areas.

Mineralized drill cores/cuttings, that show radioactive readings in excess of the immediate background surface readings, will either be removed from the site or buried. Non-mineralized cuttings will be dispersed on the surface. Regardless, a radioactive survey of the surface will be done after these drill cuttings have been managed to ensure that the post reclamation radiation readings are at or below background levels.

No drilling and no storage of fuels or chemicals will take place within any drainage areas that are in the permit area. If necessary, berms or ditches will be built to divert runoff around disturbed areas. If deemed necessary to protect stockpiled material, a berm will be built around the toe of stockpiles. All trash will be collected in appropriate containers and removed for disposal at a proper location or facility.

Since no construction activity is expected, Cibola does not anticipate the need to obtain permit coverage from the Environmental Protection Agency (EPA) to discharge storm water from construction activities under National Pollutant Discharge Elimination System Construction General Permit for storm water. There will be no work in wetlands or waters of the U.S., and no dredge or fill activities with this permit.

Drilling Operations

Cibola anticipates using a slim-hole (5-inch diameter) rotary drilling method to total depth. This method will produce a hole slightly larger than the rod or drill pipe diameter. It is anticipated the holes can be advanced through a surface collar (no surface casing needed) using air-rotary methods. Cuttings would be discharged through a side of the collar onto plastic. The thin-mineralized zones would be cored, core recovered and boxed and removed from the site for logging and analyses. Because Cibola is twinning historic holes and there is a record, these zones will be targeted. The cored sections will include unmineralized material above and below the target zones to address uncertainty with the historical information.

Although saturated conditions are expected in the sandstone intervals at or below the level of the Jackpile Sandstone, the holes are expected to stay open. If hole stability issues are encountered or develop during the drilling operation, mist and foam would be added to stabilize the hole. Only as a last resort would a mud system be used. If used, the mud system would be developed in a portable mud tank system. Cuttings from a mud tank system would be separated from the mud and placed on plastic sheeting. Some of the drilling fluid would be used in developing the hole closure slurry mix and any remaining fluid will be removed from the site.

Recovered cores would be placed in heavy-duty drill core boxes made of wax coated corrugated cardboard. Loaded core boxes would be protected from the weather and

moved to a core logging and storage facility periodically.

Mud Pit Systems [If mud is needed, the following would be used]

If needed to stabilize the drill holes, a closed-loop drilling fluid system would be developed and have a small portable storage tank with baffles and other solids control equipment placed immediately adjacent to the drilling rig (Figure 3). This system would allow for the removal of the coarser drill cuttings from the drilling fluid once it has carried them out of the wellbore during the drilling process. This is a chemical and mechanical process that removes solid cuttings and allows the drilling fluid to be optimized for the drilling operation. Upon exiting the wellbore, the solids-laden drilling fluid would first pass a series of rig-operated shale shakers (not always needed for shallow drill holes) that remove large cuttings. The fluid then moves to a mud or settling tank that allows much of the remaining solids to settle out. The recovered fluid is directed to a steel catch tank where the properties can be tested and adjusted. The cleaned drilling fluid is returned to the rig's active drilling fluid pit system and circulated down the hole. Periodically the liquid and solids in the settling tank can be removed with a front-end loader.

This system and the mud pit systems are designed as 'closed loop systems', which are critical to managing hole stability, remove cuttings from the borehole and minimize drilling fluid loss to the formation. The very small fluid losses from a mud system are closely monitored by the driller, as well as the properties of the drilling mud. As it is critical to managing the drilling program, reducing fluid loss and working cost effectively to advance the drill holes.

The drill cuttings would be managed at the surface to minimize impacts to the environment. Non-mineralized cuttings would be stored on site, their radioactivity documented relative to background. Unmineralized cuttings and drilling mud (if mud is used) would be mixed with any topsoil and spread across the disturbed parts of the site.

Drilling water would be delivered to the site in a water truck. Any unused water would be placed on roadways for dust control. If a mud system is not needed, the volume of water needed would be very small.

Hole Plugging and Abandonment

Drill holes will be plugged to total depth using tremie pipe methods and in accordance with Office of State Engineer regulations and the plans submitted to the OSE in their forms. Thus, with this drilling operation, each drill hole shall be plugged from total depth to within 2 feet of the original ground surface or the collar of the hole, whichever is lower, with a column of cement, high density bentonite clay or other materials specified in the permit. The hole shall be backfilled with topdressing or topsoil from above the cement plug to the original ground surface. The hole shall be plugged as soon as is practical after drilling is complete. All plugging methods must comply with 19.27.4 NMAC of the State Engineer Office's plugging and abandonment requirements.

If there are dry holes, which is not anticipated, or any discovered historic holes that pose a liability, they will be backfilled with clean native fill, then a cement plug will be installed to no more than 11 feet below the ground surface and backfilled with concrete to within 1 foot of ground surface. The remaining hole shall be backfilled with topsoil and re-vegetated. If groundwater is encountered, the entire hole shall be filled from the bottom upwards to land surface using a tremie pipe or drill string. The hole shall be plugged with neat cement slurry, bentonite based plugging material, or other sealing material approved by the state engineer as required pursuant to the State Engineer's Office's Rules and Regulations Governing Well Driller Licensing, Construction, Repair, and Plugging of Wells, 19.27.4 NMAC. Plugging reports to the NMOSE will describe in detail the abandonment method for each drill hole.

After verification by MMD, or another state agency, that 22 holes have been plugged or completed, Cibola request written verification from MMD or, provide MMD with an affidavit signed by the drilling contractor, or the project geologist attesting to the fact that 22 holes have been satisfactorily plugged and abandoned according to the requirements.

Figure 1. Cebolleta Access Map

PART 3 MINIMAL IMPACT EXPLORATION OPERATION PERMIT APPLICATION
Cebolleta Exploration Project
Submitted on: March 14, 2023

Applicant: Cibola Resources, LLC, 18032 Road G, Cortez, CO 81321
Map Prepared by: Mike Thompson, Manager

0 1.25 2.5 5 mi
1 in = 6,700 ft
1 : 80,000

N W E S

LEGEND

- Lease Boundary
- proposed drilling locations

21 miles I-40 to site

Figure 2. Topographic Map of Drilling Locations

PART 3 MINIMAL IMPACT EXPLORATION OPERATION PERMIT APPLICATION
Cebolleta Exploration Project
Submitted on: March 14, 2023

Applicant: Cibola Resources, LLC, 18032 Road G, Cortez, CO 81321
Map Prepared by: Mike Thompson, Manager

0 0.375 0.75 1.5 Miles
1 in = 2,000 ft
1 : 24,000

N W E S

LEGEND

- Lease Boundary
- cultural and biological clearance areas (150 feet from disturbed areas)
- proposed drilling locations

1.5 mi to Seboyeta

PAGUATE PURCHASE GRANT

RESERVATION BOUNDARY

GRANT BOUNDARY

Mesa Gavilan

Río Moquino

Arroyo del Cañada de

St Anthony Mine

Ruins

Figure 3. Drilling Locations

PART 3 MINIMAL IMPACT EXPLORATION OPERATION PERMIT APPLICATION
Cebolleta Exploration Project
Submitted on: March 14, 2023

Applicant: Cibola Resources, LLC, 18032 Road G, Cortez, CO 81321
Map Prepared by: Mike Thompson, Manager

0 250 500 1,000 ft
1 in = 250 ft
1 : 3,000

N W E S

LEGEND

- cultural and biological clearance areas (150 feet from disturbed areas)
- drill pads (100 ft by 60 ft) and overland access routes
- current drilling locations
- historic drilling locations
- preexisting roads

RLB23
RLB18
RLB20
RLB4
RLB1
A3
A7
A8
A12
LJ126
LJ124
A27
LJ121
LJ118
LJ68
LJ111
LJ29
LJ31
RLB83
LJ4
LJ25
LJ5
6.3 miles to Saboyeta
500 ft to St Anthony Mine

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

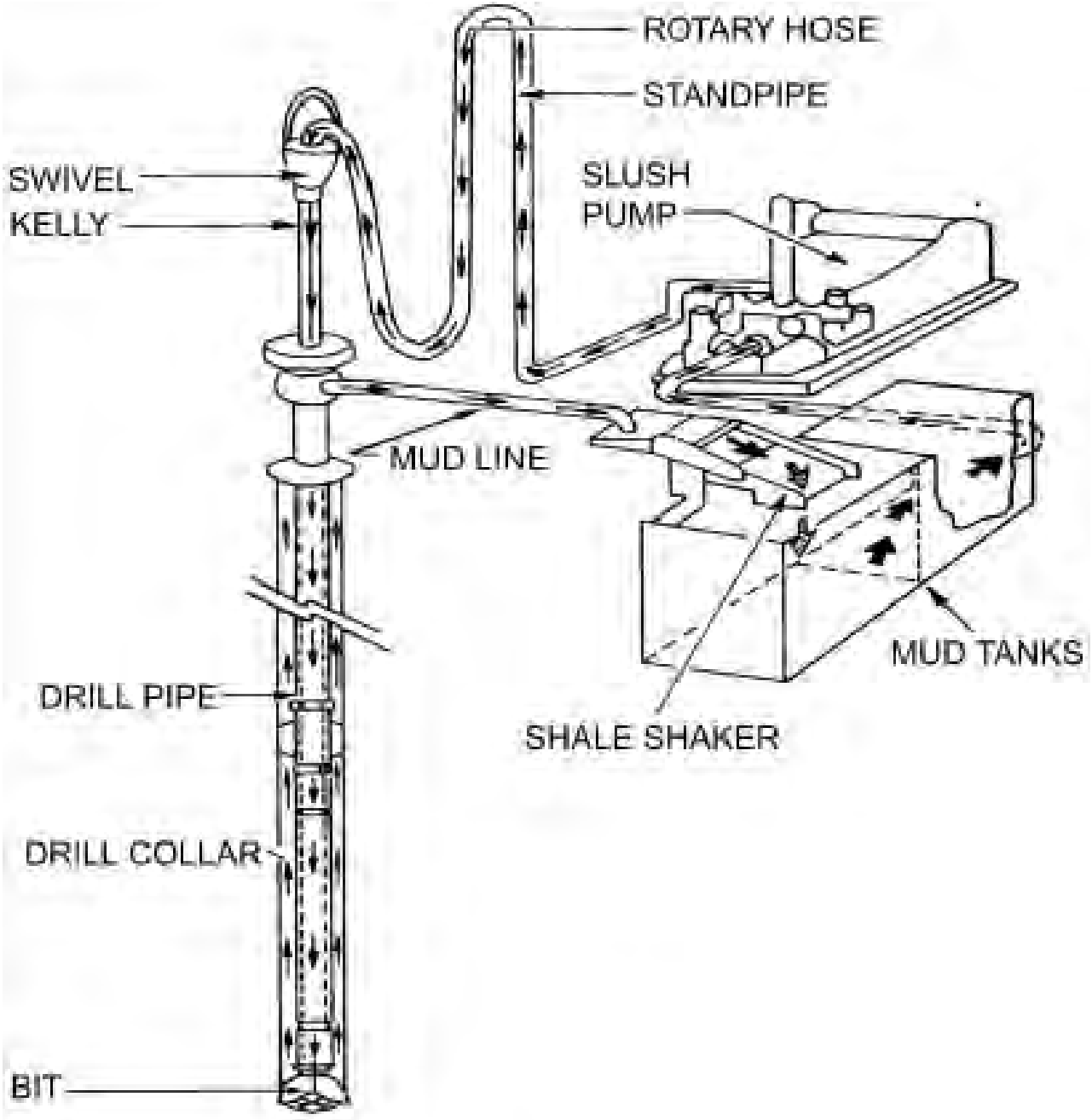

Figure 3. Diagram of Closed-Loop Drilling Fluid System (modified after https://www.sciencedirect.com/topics/engineering/rotary-drilling)

Radiation Protection Plan –
Cebolleta Resources LLC (Cebolleta)

Introduction

Cibola Resources LLC (Cibola) has developed this Radiation Protection Plan (RPP) for proposed exploration drilling at the Cebolleta Project (the Site) in Cibola County, New Mexico under an anticipated Minimal Impact Exploration Permit with the Mining and Minerals Division. The drilling work will be conducted at Site I area on the Cebolleta Land Grant uranium resource (Figure 1). Previous work in the area indicates that gamma exposure rates in the immediate vicinity of the project are low. Cibola does not expect any legacy mining wastes associated with St Anthony mine in the permit area, but there may be relicts of cuttings from historic drilling activities that may be present.

FIGURE 1: PROPOSED DRILL HOLE LOCATIONS FROM PERMIT APPLICATION (FOLLOW TEXT).

FIGURE 2: PRE-DRILLING GAMMA SCAN DATA FOR DRILLING LOCATIONS (TO BE DEVELOPED FOLLOWING PERMIT APPROVAL).

Regulatory Framework

The proposed project site is on private property and is just north of the former St. Anthony Mine and associated workings and mine waste piles. The project is being permitted under a Minimal Impact Exploration Permit in accordance with the New Mexico Mining Act and rules. The applicable regulations for radiation protection for this project are expected to be those that fall under the Occupational Safety and Health Administration (OSHA). OSHA radiation protection requirements for construction activities (29 CFR 1910.1096) are similar in many respects to NRC requirements for licensed facilities (10 CFR 20).

A key provision of OSHA regulations is an annual limit on whole-body dose of 1.25 rem (1,250 mrem) per quarter [1910.1096(b)(1)]. On an annualized basis, this overall dose limit is consistent with the NRC occupational dose limit of 5,000 mrem/yr Total Effective Dose Equivalent (TEDE). In addition, the following OSHA regulations are believed to apply and will be observed for this proposed drilling project:

1. Each drill site will be considered a temporary "*Restricted Area*" to limit access for "…*protection of individuals from exposure to radiation or radioactive materials*" as described in 1910.1096(a)(3).
2. 1910.1096(d)(1) – radiological surveys will be conducted for evaluation "…*of the*

radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions. When appropriate, such evaluation includes a physical survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive material present."

Due to the short duration of this project, the anticipated extremely low levels of exposure and on-site environmental monitoring during the project, individual site worker monitoring will not be included as part of this project.

Potential Radiological Hazards

Drill cuttings from subsurface ore bodies may contain small volumes of significantly elevated levels of mineralized uranium and associated radioactive decay products. Field personnel working near such drill cuttings could potentially receive external radiation doses more than current baseline levels at the drilling sites. Additional doses from mineralized drill cuttings brought to the surface, would depend on the levels of radionuclides found in the mineralized fraction of the cuttings, the volume of mineralized cuttings exposed at the ground surface, and the duration of worker occupancy near this material.

Drilling workers are expected to occupy temporary Restricted Areas at the drilling locations up to 10 hours per day, 7 days per week, for 3 to 4 weeks, or approximately 280 hours of exposure to existing baseline gamma radiation (To be developed with permit approval). Assuming the fraction of drill cuttings from mineralized ore zones is very small relative to unmineralized cuttings from overlying geologic formations, a measurable dose from the cuttings more than the dose from baseline radiological conditions at each drill site is unlikely.

Drill cuttings from the targeted mineralized zone are expected to be moist or saturated and the use of drilling fluids, generation of fugitive dusts from this material is unlikely, and internal dose via the inhalation pathway is expected to be negligible. Accidental ingestion of small amounts of material from mineralized drill cuttings could occur if workers hands or clothing become contaminated with trace amounts of this material and the radiation safety work rules required by this RPP are not followed.

Because the potential for internal intakes of uranium is very low and easily prevented by following RPP radiation protection measures (see next Section), urine bioassay sampling for uranium is not warranted and will not be conducted. Similarly, due to the relatively short duration of the drilling campaign, the outdoor work environment, and the fact that any radon gas released from mineralized drill cuttings will be relatively "fresh" in terms of radioactive decay, significant ingrowth of radon decay products (progeny) in outdoor air within the Restricted Area is not expected, and since nearly all of the inhalation dose from radon is due to the progeny rather than the gas, monitoring of

radon gas or progeny is not warranted.

Although the potential for significant radiation doses due to drilling activities at the project is very low, Cibola requires all workers to adhere to the "as low as reasonably achievable" (ALARA) principle. This means that all workers must take all ***reasonable*** measures to minimize potential exposures to radioactive materials associated with drill cuttings, as well as existing radiological impacts form historic mining at the Site. This RPP and the requirements and measures outlined herein are expected to keep doses to workers ALARA.

RADIATION PROTECTION MEASURES

All personnel performing drilling work at the Site must read and understand the provisions of this RPP and follow the ALARA principle as noted above.

Radiation Safety Work Rules:

1. All workers that will enter and work in the Restricted Area must read this RPP and receive radiation protection training for the project.
2. No food or use of tobacco products will be allowed in Restricted Areas. Drinking bottled water from plastic screw-cap type bottles is allowed to ensure that workers stay hydrated, but personnel must wash hands and face when leaving the Restricted Area and before eating, smoking, etc.
3. Workers shall don appropriate personal protective equipment (PPE) when working in Restricted Areas, including gloves, safety vests and glasses, steel-toed boots, and hard hats. If conditions are muddy, accumulations of mud on boots and work clothes shall be scraped and/or brushed off at the drill site prior to leaving the Restricted Area, followed by personnel exit contamination surveys as described in the next Section of this RPP.
4. Direct physical/personal contact with drill cuttings in the Restricted Area shall be minimized to the extent compatible with achieving the objectives of the drilling project.

REFERENCES

Nuclear Regulatory Commission (NRC). 2002. Health Physics Surveys in Uranium Recovery Facilities. NRC

ATTACHMENT A – Standard Operating Procedures

SOP-1 *Instrument Testing and Calibration*

1. PURPOSE

This Standard Operating Procedure (SOP) describes the procedures for calibration, operational function checks and measurement efficiency determinations for radiation detectors/meters prior to performing radiological contamination surveys at the Cibola Resources LLC (Cibola) project site (Site) as described in the Radiation Protection Plan (RPP)

2. DISCUSSION

This SOP covers specific instruments that will be used to survey personnel and equipment prior to leaving Restricted Areas at the Site as described in the RPP.

3. RESPONSIBILITY

- Radiation Safety Technician – responsible for training Site Workers on the use of radiation detection instruments for personnel contamination surveys, including daily instrument QC checks, personnel exit surveys, and documentation. Also responsible for performing final equipment release surveys at the end of the drilling project.
- Drilling Workers – responsible for receiving hands-on instruction in the operation and use of instruments for personnel contamination surveys as directed by the RST.

4. PROCEDURE

4.1. Equipment and Materials

- Ludlum Model 2360 scaler calibrated with a Ludlum Model 43-93 alpha/beta detector, or equivalent. In addition, a spare 2360/43-93 instrument pairing and extra mylar films.
- Forms: Form SOP-1A (*Instrument Function Check Form*) (attached).
- Instrument calibration certificate(s) with measured alpha counting efficiency value.
- Thoriated lantern mantle in cardboard holder.
- Calibration Jig.

4.2. Instrument Calibration

All radiation measurement instruments must be calibrated by a qualified vendor within 1 year prior to use at the Site. Calibration metrics shall be documented on the calibration certificate to be retained with other RPP records. The calibration certificate shall include the measured 2π counting efficiency (number of counts detected per radioactive decay) in response to a certified, NIST-traceable Th-230 alpha check source (or other suitable alpha check source).

4.3. Determination of QC Tolerance Limits for Daily Function Checks

Prior to initiation of drilling work at the Site, the designated RST will establish quantitative quality control (QC) tolerance limits for the response of the survey instrument to a dedicated alpha check source (a thoriated lantern mantle) at a designated location and measurement geometry. An exempt thoriated lantern mantle will be used to determine tolerance limits for daily QC function check measurements. These daily QC measurements will be used to ensure acceptable instrument performance throughout the duration of the drilling project. The steps for initial

determination of instrument QC tolerance limits are as follows:

4.3.1. Create a separate Instrument Function Check Form (Form SOP-1A) for determining the initial QC tolerance limits for the survey instrument. Record detector/meter serial numbers, calibration date for the instrument pairing, and check source information in the appropriate fields. Under comments, record source to detector distance, Site name, and designated onsite location where function check will be performed each day the instrument is to be used.

4.3.2. Replace the batteries in the meter if the meter battery level is low. *Note: For a Model 2360 the meter needle should deflect to the BAT TEST or BAT OK range.*

4.3.3. With the meter in the rate meter position and a meter scale selected so that the meter is not pegged (other than the log scale), move both ends of the detector cable to determine if the cable is functioning properly. A faulty cable will introduce spurious counts. To test a cable, move both ends of the cable watching the meter. If excessive counts occur the cable may be faulty. Replace it with a new cable of identical size and repeat the test. Document faulty cable and dispose of cable.

4.3.4. Select a designated (fixed) location to perform the initial QC measurements and all subsequent daily function checks. Describe the location and measurement geometry where indicated on the Function Check Form. The daily function check location should be selected with the following conditions in mind:

- The location should represent reasonably low background conditions for the Site.
- The radiological conditions surrounding the location should be expected to remain consistent throughout the duration of the project.
- This will be the location that all instrument function checks will be performed at the beginning of the workday for the duration of the drilling project.

4.3.5. With the detector placed in the fixed geometry position with no radioactive check source present in the calibration jig, perform 1-minute scaler count and record the background count rate on the Function Check Form. Repeat until ten background readings are recorded and determine the average background count rate.

4.3.6. Repeat the 1-minute scaler counts with the radioactive check source in the fixed position on the calibration jig until ten source readings are recorded. Subtract the average background reading (from the previous step) from each check source reading to determine the net (above background) reading, then calculate the average net (above background) source reading.

4.3.7. Acceptable QC limits for each instrument are represented by the upper and lower bounds on the average net (above background) reading for the initial ten counts ± 20%.

4.4. Daily Instrument Function Checks

One or more designated members of the drilling crew will be trained to perform and document daily instrument function checks to verify that the instrument is responding with the QC tolerance limits established by the RST as indicated in Section 4.3. These daily QC measurements will be used to ensure acceptable instrument performance throughout the duration of the drilling project. The steps for daily instrument QC function checks are as follows:

4.4.1. The daily function check shall be performed each morning before use in the field. If outside QC tolerance limits the instrument will be taken out of service for repair and recalibration.

4.4.2. Create a new Function Check form (Form SOP-1A) for daily testing of the survey instrument pairing as described in the previous Section of this SOP. In the comments field note that the form is being used as a daily function check form.

4.4.3. Follow steps 4.3.1 – 4.3.4 as detailed in the previous Section.

4.4.4. Measure the background count for one minute at the designated function check location (see Section 4.3.5 above). Record the count rate result (cpm) on the Instrument Function Check Form (Form SOP-1A).

4.4.5. Repeat step 4.4.4 with the alpha check source in place and record the result of the daily check source readings on the Instrument Function Check Form (Form SOP-1A).

4.4.6. Subtract the background reading from the source reading to determine the net (above background) instrument response to the source.

4.4.7. If the net check source reading does not fall within the QC tolerance limits as defined above (step 4.3.7), remove the instrument from service and replace it with a spare instrument that has been verified to function properly.

4.5. Measurement Efficiency Determination

The counting efficiency for contamination survey instruments must be determined. The total detection efficiency of the survey method (fixed/static measurement of total activity on the surface of interest) shall be used in calculation of surface activity for comparison against the applicable limits given in SOP-2 (*Radiological Contamination Surveys*). The method for calculation of surface activity based on measured alpha emissions is defined below.

4.5.1. Guidance from the International Organization for Standardization (ISO) in ISO 7503-1 (Evaluation of Surface Contamination) calls for use of 2π surface emission rate when determining instrument counting efficiency (ISO, 1988). Consistent with ISO guidance, NUREG-1575 (NRC, 2000) also defines instrument efficiency as "the ratio of the net count rate of the instrument and the surface emission rate of a source for a specified geometry". Based on this information, the formula for instrument efficiency calculations is as follows (Equation 1-1):

$$\varepsilon\varepsilon_{ii} = \frac{RR_{SS+BB} - RR_{BB}}{qq_{2\pi\pi}} \qquad \textbf{Equation 1-1}$$

Where:

$\varepsilon\varepsilon_{ii}$ = 2π instrument counting efficiency.

RR_{SS+BB} = detector count rate of the source plus background (CPM).

RR_{BB} = detector background count rate (CPM).

$qq_{2\pi\pi}$ = certified 2π surface emission rate of the source (EPM).

4.5.2. The 2π surface emission rate for alpha and beta particles is listed on the source calibration certificates.[1] ISO 7503-1 gives a generic source efficiency value (ε_s) for alpha emissions of 0.25. Calculate the total (effective) detection efficiency for alpha emissions from equipment surfaces as follows (Equation 1-2):

$$\varepsilon_t = \varepsilon_i \times \varepsilon_s \qquad \textbf{Equation 1-2}$$

Where,

ε_t = Total detection efficiency (counts/emission).

ε_i = 2π instrument counting efficiency, calculated as defined above.

ε_s = Source efficiency factor = 0.25 for alpha emissions.

4.5.3. Once the total detection efficiency is determined, the surface activity (DPM/100 cm^2) is given by Equation 1-3:

$$CC = \frac{RR_{SS} - RR_{BB}}{\varepsilon\varepsilon_{tt}} \qquad \textbf{Equation 1-3}$$

Where:

C = surface activity concentration (DPM/cm^2) or air concentration (µCi/mL).

RR_{SS} = detector count rate for the surface or sampling media (CPM).

RR_{BB} = background count rate for "clean" surface or unused sampling media (CPM).

$\varepsilon\varepsilon_{tt}$ = total detection efficiency (counts/decay).

Note: A correction for the sensitive area of the probe window is unnecessary for the specified alpha detector.

4.6. Documentation and Records Retention

The RST and designated survey technician(s) will retain all instrument QC function check forms and contamination survey results in the project records.

5. REFERENCES

International Organization for Standardization (ISO). 1988. Evaluation of Surface Contamination – Part 1: Beta-emitters (maximum beta energy greater than 0.15 MeV) and Alpha-emitters.

U.S. Nuclear Regulatory Commission (NRC). 2000. Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), Revision 1. NUREG-1575 (amended in 2002). Washington, D.C.

[1] The surface emission rate (EPM) is assumed equivalent to the measured count rate (CPM) specified for 2π source emission geometry based on verification of absolute counting as indicated in the Measurement Method section of the certificate of calibration.

6. ATTACHMENTS

- Form SOP-1A: Instrument Function Check Form

Form SOP-1A **Instrument Function Check Form**

METER	
Manufacturer:	
Model:	
Serial No.:	
Cal. Due Date:	

DETECTOR	
Manufacturer:	
Model:	
Serial No.:	
Cal. Due Date:	

Location:
Geometry:
Comments:

Instrument Counting and Detection Efficiency Information (from calibration certificate)

Alpha Source: _____ SN: _____ 2π Emission Rate: _____ EPM* Source Calibration Date:_____

*Alpha Source emissions per minute (EPM) = 2π Emission Rate stated on calibration certificate (in CPM).

2π Instrument Counting Efficiency (from Calibration Certificate): _____ Total Alpha Detection Efficiency (multiply 2π Counting Efficiency by 0.25): _____

Daily Function Check Source: Thoriated lantern mantle in cardboard holder

Instrument Tolerance Limits: **Low** _____ **High**_____ **CPM** (net, above background)

Date	Battery OK?	Alpha (CPM)			Net within Tolerance Limits?	Technician Name (print)	Technician Signature
		Source	BKG	Net			

Reviewed by: **Review Date:**

SOP-2 *Radiological Contamination Surveys*

1. PURPOSE

This Standard Operating Procedure (SOP) describes the procedures for conducting radiological contamination surveys for personnel and equipment at the Site as described in the Radiation Protection Plan (RPP) and quality control testing as specified in the companion procedure SOP-1 (*Instrument Testing and Calibration*).

2. DISCUSSION

This SOP details the radiological contamination surveys that will be conducted under the RPP for a supplemental exploration drilling project, to measure fixed and removable contamination involving surface alpha activity on personnel or equipment.

3. RESPONSIBILITY

- Radiation Safety Technician (RST) – responsible for training Site Workers on the use of radiation detection instruments for personnel contamination surveys, including daily instrument QC checks, personnel exit surveys, and documentation. Also responsible for performing and documenting all equipment contamination and release surveys.
- Drilling Workers – responsible for receiving hands-on instruction in the operation and use of instruments for personnel contamination surveys as required by the RST.

4. PROCEDURE

4.1. Equipment and Materials

- Ludlum Model 2360 scaler calibrated with a Ludlum Model 43-93 alpha/beta detector, or equivalent. In addition, a spare 2360/43-93 instrument pairing and extra mylar films.
- Materials and equipment as needed for daily instrument quality control (QC) function checks (per SOP-1).
- Radiological Survey Forms SOP-2A and SOP-2B (attached) to document survey results.
- Camera (e.g., cell phone camera) to document equipment being released and identify the locations surveyed on a photo diagram as indicated on Form SOP-2A (attached).

4.2. Preliminary Measurements

Before a contamination survey is conducted, preliminary measurements are required to verify and document proper instrument response performance (function checks) on a daily basis. In accordance with SOP-1 (*Instrument Testing and Calibration*), at the beginning of the drilling project, the designated RST will establish quantitative QC tolerance limits for the response of the survey instrument to an alpha check source under a designated (fixed) location and measurement geometry to be used throughout the project. The instrument's measured alpha counting efficiency (number of counts detected per radioactive decay) shall be obtained from the documentation provided on the instrument calibration certificate. These measurements and parameter determinations shall be in accordance with the specifications of SOP-1.

4.3. Release Criteria for Unrestricted Use

The criteria for unrestricted release of personnel and equipment from uranium recovery facilities are specified in regulatory guidance from the U.S. Nuclear Regulatory Commission (NRC) in Regulatory Guide 8.30 (NRC, 2002). Under the Site's "as low as reasonably achievable" (ALARA) policy, an administrative limit of 10% of the regulatory release limit will serve as the primary goal for release of equipment and personnel from the Site. The regulatory and administrative contamination release limits for the drilling project are specified in Table 2-1. If the initial contamination survey indicates that the ALARA administrative limit is not met, decontamination will be attempted to try and meet the administrative limit. If the administrative limit cannot be achieved with reasonable efforts to decontaminate (e.g., with pressure washing of equipment), the regulatory limit will still apply for release for unrestricted use.

Table 2-1: Regulatory and Administrative Contamination limits.

CATEGORY	PARAMETER	REGULATORY LIMIT (1)	ADMINISTRATIVE LIMIT (1)
Contamination Limits	Personnel	1,000 dpm/100 cm^2 (4)	Background
	Equipment Release	5,000 dpm/100 cm^2 (2) 15,000 dpm/100 cm^2 (3) 1,000 dpm/100 cm^2 (4)	500 dpm/100 cm^2

(1) Note that all limits are net (above background) values.

(2) Average total (fixed plus removable) alpha activity across any 1 m^2 area (NRC Reg Guide 8.30).

(3) Maximum total alpha activity across any 100-cm^2 area (NRC Reg Guide 8.30).

(4) Removable gross alpha surface activity above background (NRC Reg Guide 8.30).

4.4. Calculation of Surface Activity for Alpha Emissions

Once measurements of the count rate (CPM) for total (fixed + removable) contamination or removable contamination (swipe samples) have been taken as prescribed in the following sections of this SOP, the measured count rate must be converted to units of surface activity for comparison against the limits given in Table 2-1. The formula for calculation of surface activity is given by Equation 2-1.

$$CC = \frac{R_{SS} - RR_{BB}}{\varepsilon\varepsilon_{tt}} \qquad \textbf{Equation 2-1}$$

Where:

C = surface alpha activity concentration (DPM/100 cm^2).

RR_{SS} = detector count rate for the surface measurement (CPM).

RR_{BB} = background count rate for ambient air away from contaminated areas (CPM).

$\varepsilon\varepsilon_{tt}$ = total detection efficiency (counts/decay) as determined in SOP-2 (Equation 2-2).

Note: a correction for active probe area is not required in the above formula as the 43-93 alpha/beta detector has an active surface area of 100 cm^2.

4.5. Equipment Release Surveys

During the drilling project, equipment release surveys are not required for moving drilling equipment from one drill site to another, but drilling equipment shall first be pressure washed

to remove visible mud/soil accumulations on the equipment. This will largely prevent transport and the spread of any contamination between onsite locations. For release from the Site for unrestricted future use, a formal contamination survey will be required, and only a qualified, experienced RST shall perform equipment contamination surveys for release from the Site (e.g., at the end of the drilling project). Equipment release surveys consist of scans and static measurements to identify and quantify radiological surface contamination from alpha radiation for comparison against the criteria for unrestricted release as specified in Table 2-1.

4.5.1. Alpha Surveys for Total Surface Activity

All equipment or materials that could potentially become radiologically contaminated due to drilling activities will be surveyed for radioactive surface contamination prior to removal from the Site as described in the Radiation Protection Plan (RPP). If the initial contamination survey indicates that the ALARA administrative limit in Table 2-1 is not met, decontamination with pressure washing will be attempted to try and meet the administrative limit. If the administrative limit cannot be achieved with reasonable efforts to decontaminate (e.g., with pressure washing), the regulatory limit given in Table 2-1 will still apply for release for unrestricted use. Consistent with specifications found in NRC Regulatory Guide 8.30 (NRC, 2002), surveys for alpha activity alone are generally sufficient to demonstrate compliance with release limits at uranium recovery facilities.

1. General Considerations for Equipment Release Surveys:

    a) If drilling equipment has been pressure washed or is otherwise wet prior to surveying, the equipment must be dried to perform an alpha contamination survey. Alpha particles cannot penetrate even a thin film of water on the surfaces of equipment.

    b) Using Form SOP-2A (attached), document the location where the equipment was last used, description of the equipment, name of the surveyor, release survey date, and the specific components of the equipment and/or location(s) surveyed (a photo diagram on the second page of the form with annotated location ID numbers corresponding to the locations listed on page 1 is requested but not mandatory). In addition, document the information regarding the radiological survey instrument used including the serial number, calibration date, instrument background (at the survey location), and the total detection efficiency (ε_t) as determined under SOP-1 (*Instrument Testing and Calibration*).

2. Total (Fixed + Removable) Surface Contamination Survey:

    a) Scan for total alpha activity on accessible surfaces of potentially contaminated items by placing the detector approximately 0.5 cm from the surface, moving the detector over the surface at about 2 cm per second.

    b) If elevated counts are detected while scanning (relative to background levels), take a static 1-minute scaler count where highest elevated counts were observed. If no elevated counts observed while scanning, then select location(s) based on potential likelihood for contamination and make a 1-minute scaler count at each location.

    c) The number of static measurement locations must be sufficient to adequately represent the entire piece of equipment being surveyed. For each measurement, record the location and resulting scaler count rate (CPM) on Form SOP-2A.

d) For each static measurement location, convert the measured net (above background) survey count rate (in CPM) to units of total surface activity (DPM/100 cm^2) using Equation 2-1 (Section 4.3.2). Record the result on Form SOP-2A in the column labeled Total Alpha Activity.

e) Compare results for total surface activity against the removable activity limits given in Table 2-1. If the total measured surface activity exceeds the ALARA administrative limit anywhere on the equipment being surveyed, attempt to decontaminate per Section 5.3.

4.6. Personnel Exit Surveys

Personnel working under this RPP are required to scan their clothing, exposed skin, and shoes upon leaving the Restricted Area (each drill site) as specified in the RPP. Basic steps for personnel exit surveys are as follows:

- While holding an alpha detector approximately 0. 5 cm from the surface to be scanned, survey at a rate of approximately 2 inches per second, paying attention to the audible output (clicks) and/or analog dial response or digital display readings.
- If audibly or visually elevated counts (relative to background) are observed while scanning, pause at that location to confirm whether the counts are at background levels or above.
- If count rate is at background levels, continue with the survey.
- If count rate exceeds the background level (the ALARA administrative limit for personnel exit surveys), carefully scan around the location to determine the extent of the elevated readings. Note the area for subsequent decontamination and continue scanning until the survey is completed.
- If above-background contamination is identified, the decontamination procedures in Section 5 of this SOP shall be followed as applicable.
- If radioactivity above background persists after decontamination, the applicable regulatory limit for release of personnel in Table 2-1 is acceptable for release. If the regulatory limit cannot be met with standard decontamination procedures (Section 5), contact the Cibola Project Manager to consult with a certified health physicist (CHP) for further advising.

The ALARA administrative release limit (i.e., background) will be determined each day by the designated, trained survey technician(s) from the drilling crew. The ALARA administrative limit for the survey instrument to be used that day will be based on the maximum ambient "background" count rate observed at the personnel exit survey station. This release limit will be labeled at the top of the Personnel Exit Survey Form provided for the day (Form SOP-2B; attached). Personnel must acknowledge and document that they have performed a personnel exit survey by providing the name, company, any special notes regarding the survey, and to confirm that the release limit was met by initialing the Personnel Exit Survey Form (Form SOP-2B) in the indicated column.

4.7. Documentation and Records Retention

The designated survey technician(s) from the drilling crew will retain all completed QC function check forms (Form SOP-1A) and Personnel Exit Survey Forms (Form SOP-2B). The designated RST

for equipment release surveys will retain all QC function check forms (Form SOP-1A) and equipment release survey forms (Form SOP-2A) associated with equipment release surveys.

5. DECONTAMINATION

5.1. Overview

While unlikely at the Site, the surfaces of equipment, personnel protective equipment (PPE), and clothing or skin could potentially become contaminated in excess of administrative action levels or regulatory release limits. In such cases, decontamination is required before releasing the person from the Restricted Area, and/or equipment from the Site. The following procedures describe the methods for decontamination.

5.2. Decontamination Facilities and Equipment

There is not a designated area for decontamination of equipment or personnel at the Site. In the unlikely event that contamination above release limits occurs, the quantity of liquid/solid residues generated from the decontamination process is unlikely to be sufficient to affect ambient gamma exposure rates at the decontamination location.

A source of clean (uncontaminated) water and common tools for washing or other means of removing contaminated residues from the surfaces of equipment or personnel will be provided as needed to attain compliance with applicable release limits. The following decontamination equipment and materials apply:

- Personal protective equipment (PPE), including Level D work clothing, nitrile gloves, etc. as required.
- Decontamination equipment and materials, as required (e.g., pressure washer, clean water supply, biodegradable detergent, brushes, paper towels, etc.).

5.3. Decontamination Methods:

- Scrapers or brushes can be effective for removing gross accumulations of dirt or mud on equipment, and PPE. Stiff-bristled brushes or other abrasive removal methods should not be used for skin to avoid breaking the skin and creating a potential pathway for dermal absorption.
- Decontamination with water (e.g., washing skin) is effective for most contamination likely to be present at the Site. Mild, biodegradable soap or detergent can increase the effectiveness of water as a decontamination agent.

5.4. Personnel Decontamination

If surface contamination exceeding the administrative limit (above background) is identified on skin, clothing or PPE for personnel working in a Restricted Area, the affected area(s) must be decontaminated. Brushing off visible accumulations of dirt or mud may be sufficient for clothing or PPE, but skin should be gently washed with mild soap and water. Radiological surveys will be repeated (after drying) to verify that Table 2-1 limits have been met.

5.5. Decontamination of Personal Clothing or Articles

Personal clothing or items may be released when surveys indicate that surface activity meets the administrative limit provided at the top of the Personnel Exit Survey Form (Form SOP-2B).

Note: Short-lived airborne decay products of radon gas (progeny) can readily adhere to clothing, particularly fleece and polyester materials. Radon progeny may produce false positive readings on personnel exit surveys. Radon progeny on surfaces are not considered contamination nor a health concern as within several hours, associated radioactivity will decay away. Washing skin can help to remove radon progeny and reduce false positive survey readings for long-lived radionuclides (the primary concern). If these measures do not reduce survey readings to acceptable levels, the individual may resurvey after 20-30 minutes and resurvey. If readings have measurably decreased, this is an indication of radon progeny, and the person may leave the Site without need for further decontamination.

5.6. Decontamination of Equipment

- Gross accumulations of dirt or mud on equipment shall be removed with a flat bladed scraper, brushes or by pressure washing.
- After cleaning and sufficient drying of equipment, perform appropriate radiological surveys as indicated in this SOP to ensure that the equipment meets applicable criteria for release for unrestricted use as specified in Table 2-1.
- Perform additional decontamination as necessary until applicable limits are met.

6. REFERENCES

U.S. Nuclear Regulatory Commission (NRC). 2002. Health Physics Surveys in Uranium Recovery Facilities. NRC Regulatory Guide 8.30 (Revision 1). Washington, D.C.

7. ATTACHMENTS

- Form SOP-2A: Example Equipment Release Survey Form.
- Form SOP-2B: Example Personnel Exit Survey Form.

Form SOP-2A

Equipment Release Survey Form

Site: Old Church Rock Mine	Equipment Use/Location:		Page 1 of 2
Survey description:		RWP #	DATE:

Meter / Detector (radiation survey type):	Detector Area (cm^2)	Serial Number:		Cal. Due Date:		Background (CPM)		Total Efficiency (counts/decay)	
		Meter	Detector	Meter	Detector	Alpha (α)	Beta (β)	Alpha (α)**	Beta (β)**
Model 2360 / 43-93 (α/β)	100								
Model 12 / 43-5 (α)	76								
Model 3030 Swipe Counter (α/β)	100								

Contamination Limits: (dpm/100cm^2) *	Removable α 1,000 (100)			Removable β 1,000 (100)			Total α 5,000 (500)			Total β 5,000 (500)			20 µR/hr
Sample No.	Description/ Location	Gross CPM α Removable	Net CPM α Removable	dpm/100cm^2 α Removable	Gross CPM β Removable	Net CPM β Removable	dpm/100cm^2 β Removable	Gross CPM α Total	Net CPM α Total	dpm/100cm^2 α Total	Gross CPM β Total	Net CPM β Total	dpm/100cm^2 β Total	Net Gamma (µR/hr)
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

REMARKS:

TECHNICIAN SIGNATURE/DATE:

REVIEWER SIGNATURE/DATE:

***Administrative limit given in parentheses**

****Per Equation 1-2 in SOP-1**

Form SOP-2A **Equipment Release Survey Form (continued)**

Site: Old Church Rock Mine	**Survey Locations Diagram**	Page 2 of 2

Insert Photo Diagram or Sketch of Locations Here

Form SOP-2B **Personnel Exit Survey Form**

Date_____ Controlled Area Location/No. _____

Instrument Model Numbers: Detector_____ Meter_____

Maximum background alpha surface activity prior to first daily entry into Controlled Area _____cpm[1]

ACTION LEVEL = max background_____ (cpm) × 1.5 = _____cpm[2]

(*NOTE*: if background is ≤ 2 cpm, a value of 4 cpm should be used as the release limit)

Initialing this Exit Survey Form indicates that you have performed and passed the Personal Exit Survey.

Name (please print)	Company	Survey Result below Action Level (Yes or no)	Initials

[1] The survey technician will determine the maximum background alpha count rate on his/her clothing/skin first thing in the morning each day, prior to entry of any personnel into the Restricted Area.

[2] To account for temporal variability in background levels of short-lived radon progeny on clothing/skin, the daily background alpha activity value is multiplied by a factor of 1.5 to determine the daily personal exit survey limit.

Figure 3. Drilling Locations

PART 3 MINIMAL IMPACT EXPLORATION OPERATION PERMIT APPLICATION
Cebolleta Exploration Project
Submitted on: March 14, 2023

Applicant: Cibola Resources, LLC, 18032 Road G, Cortez, CO 81321
Map Prepared by: Mike Thompson, Manager

0 250 500 1,000 ft
1 in = 250 ft
1 : 3,000

N W E S

LEGEND

- cultural and biological clearance areas (150 feet from disturbed areas)
- drill pads (100 ft by 60 ft) and overland access routes
- current drilling locations
- historic drilling locations
- preexisting roads

RLB23
RLB18
RLB20
RLB4
RLB1
A3
A7
A8
A12
LJ126
LJ124
A27
LJ121
LJ118
LJ68
LJ111
LJ29
LJ31
RLB83
LJ4
LJ25
LJ5
6.3 miles to Saboyeta
500 ft to St Anthony Mine

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community