APPENDIX A:
PUBLIC INVOLVEMENT

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Public Scoping

In preparing this Environmental Assessment (EA), the U.S. Department of Energy (DOE) Office of Legacy Mangement (LM) initiated public scoping on November 17, 2022. The public scoping period ended December 16, 2022. During the public scoping period, LM sent 30 scoping letters to Federal agencies, state and local governmental entities, American Indian tribes, and members of the public known to be interested in or affected by implementation of the alternatives evaluated in this EA. Table A-1 lists the organizations and individuals to whom LM sent scoping letters.

Public scoping was conducted for this project due to the scale of the project and due to the presence of an Environmental Justice population within the project's region of influence. The scoping process was conducted to solicit agency and community input on the scope and environmental issues to be addressed on a range of possible alternatives regarding the future of the 11-acre evaporation pond including sediment, liner, underlying soil, and associated infrastructure.

The majority of public scoping comments voiced the desire that LM not stop groundwater pumping and were against replacing the evaporation pond.

Table A-1. Shiprock environmental assessment scoping mailing list

Recipient	Contact
Navajo Nation – AML/UMTRA	Karen L. Bedonie, Department Manager
Navajo Nation – AML/UMTRA	Melvin Yazzie, Principal Mining Engineer
Navajo Nation – Council Delegate, Northern Agency	Honorable Eugenia Charles-Newton, Council Delegate
Navajo Nation – Department of Natural Resources	Bidtah Becker, Executive Director
Navajo Nation – Dine' Uranium Remediation Advisory Committee (DURAC)	Nona Bashone, Executive Director
Navajo Nation-Environmental Protection Agency (EPA)	Valinda Shirley, Executive Director
Navajo Nation-Environmental Protection Agency (EPA)	Steve Austin, Senior Hydrologist
Navajo Nation-Environmental Protection Agency (EPA)	Vivian Craig, Environmental Specialist
Navajo Nation – Land Department	W. Mike Halona, Department Manager
Navajo Nation – Police Department (Shiprock Police District)	Rory Atcitty, Police Lieutenant
Navajo Nation-Police Department (Shiprock Police District)	Sgt. Lee, Police Sergeant
Navajo Nation Police Department	Chrissy Largo, Senior Public Information Officer
Navajo Nation – Shiprock Chapter	Nevina D. Kinlahcheeny, Chapter President
Navajo Nation – Shiprock Chapter	Debra A. Yazzie, Chapter Vice President
Navajo Nation-Shiprock Chapter	Michele Peterson, Chapter House Coordinator
Navajo Nation – Shiprock District 12 Grazing Committee	Sarah A. Denetclaw-Begay, Shiprock Grazing Official
U.S. Nuclear Regulatory Commission (NRC)	Brittany Bolz, Senior Project Manager
U.S. Nuclear Regulatory Commission (NRC)	Sandra Talley, Senior Liaison Manager

Recipient	Contact
San Juan County – Communications Authority	Crystal Carellano
Navajo Nation – Engineering & Construction Authority	Jermaine Paul, Equipment Manager
Navajo Nation – Engineering & Construction Authority	Terry Gorsuch
Navajo Nation-Shiprock Farm Board	Beatrice Redfeather-Benally, Farm Board Official
Agency for Toxic Substances and Disease Registry (ASTDR)	Jamie Rayman, Health Educator and Community Involvement Specialist
Northern Navajo Medical Center, Indian Health Services	Denise Bartley
Bureau of Indian Affairs-Navajo Region	George Padilla, Regional Environmental Scientist
Indian Country Grassroots Support	Josie Foo, Executive Director & Co Founder
Southwest Research and Information Center	
Forgotten People CDC	
Dine' C.A.R.E. (Citizens Against Ruining our Environment)	
Haul No!	

	Commenter	Comment ID Number	Comment	Issue/Resource Area	DOE Response
Meeting 1: July 26, 2023					
1	Ms. Bartley	1-1	During the decomissioning of the evaporation pond, what form will the waste take? Will it be liquid or sludge?	Solid Waste and Waste Management	Approximately 20,000 cubic yds of waste, which would include the removal of pond sediments, a 45-mil HDPE liner, repair barriers, bentonite mat, and soil below the bentonite mat. This waste have very little water content so the waste would be a solid. This form is also much easier to transport. The waste would be hauled from the evaporation pond to the waste packaging structure by haul trucks for waste processing and packaging. The waste activities in the waste packaging structure would be inspected at least weekly to ensure the waste is properly contained within the structure and that the waste packaging is in compliant condition. Section 3.8.2.2 describes the waste that would be generated and the ultimate disposal.
1	Ms. Bartley	1-1	The response to the above question mentioned "Super Sack." Ms. Bartley asked a follow-up question regarding what a Super Sack is.	Solid Waste and Waste Management	Super Sacks are soft-sided packages. These bags can hold up to 54,000 pounds (lbs) of material and be made in different configurations and sizes. The preferred bags would likely be the 5 or 9 cubic yds top-loaded bags with a top closure for added protection against spilling. These Super Sacks would be filled and loaded onto haul trucks for shipment to the selected offsite disposal facility. Super Sacks are U. S. Department of Transportation compliant. Section 2.2.2 provides a discussion of Super Sacks, including a picture: Figure 2-2.
2	Mr. Smith	2-1	When people are passing by they've noticed that material is exposed to the surface. Is it contaminated and is it releasing any vapor into the atmosphere?	Air Quality/Human Health Risk Assessment	Since most of the sediment material in the evaporation pond is in the form of a solid monolithic mass, with much of it usually being under water, there are no fumes or vapors being given off from the material. Based on the known source of the material in the pond and the results of laboratory analyses, there are no chemicals present in the pond water or sediment that would volatilize into the air.
3	Ms. Craig	2-1	It was mentioned that there is a "little bit of uranium" in the exposed material. How much is a little bit?	Solid Waste and Waste Management/Human Health Risk Assessment	The highest levels of uranium isotopes found in the pond sediment are less than calculated health-protective levels calculated for a person who infrequently contacts the material in the pond. Realistically, there is no danger of health problems due to radioactivity from the uranium. So for example, the highest level of uranium-238 found in the pond sediment is 17 picocuries per gram, less than the health protective level of 31 picocuries per gram calculated for a trespasser at the pond. Additional calculations performed show that uranium isotopes found in the pond sediment do not pose health risks to people living around the Shiprock Disposal Site, even if the material became dry and was subject to being windblown (as dust). Similarly, the levels of uranium isotopes in the pond water also do not pose a signficant health risk. Besides radioactivity, the chemical effects from exposures to uranium levels found in the pond sediment were also calculated for a trespasser who infrequently comes in contact with the sediment, as well as for residents living around the site. There are no health risks to either a trespasser at the pond or a resident. However, the evaluations do show that a trespasser who infrequently ingests or contacts the pond water during swimming or wading activites could be at risk for adverse health effects, since uranium in its chemical form can impact the kidneys. This potential for health risk is not surprising since the highest level of uranium found in the pond water is 31 milligrams per liter, which is a thousand times greater than the EPA's safe drinking water maximum contaminant level of 0.03 milligram per liter. However, since people living around the Shiprock Site do not swim in the pond or drink the pond water, this health risk becomes insignificant.
3	Ms. Craig	3-1	Why did the Department of Energy allow this liner become so decomposed and unrepairable?	Solid Waste and Waste Management	Results from the 2021 pond liner condition assessment showed that the evaporation pond liner at the Shiprock disposal site has reached the end of its useful life. These liners are not repairable once they have reached the end of useful life. This document evaluates the options for continuing to meet the goals and objectives of protecting the human health and safety and the environment. Additional discussions on the liner condition are discussed in Sections 1.1 and 1.2.

	Commenter	Comment ID Number	Comment	Issue/Resource Area	DOE Response
3	Ms. Craig	4-1	Will the evaporation pond be restored to the point that families can use it as a grazing area?	Land Use and Recreation	As indicated in Section 2.2.3, the proposed evaporation pond decommissioning would be conducted in a three-phased approach. Upon completion of the removal of the evaporation pond and associated waste disposal activities, phase three would include sampling to verify the evaporation pond area could be released in accordance with the requirements of DOE Order 458.1 Change 4, *Radiological Protection of the Public and the Environment* . In addition, temporary support structures and facilities would be removed and clean fill would be brought to the site to backfill and regrade disturbed areas. LM would then consult with the Navajo Nation and other stakeholders to develop the final state of the Shiprock evaporation pond and operations area.
1	Ms. Bartley	5-1	Does the proposed action include the removal of the tailings pile?	Proposed Action/Scoping/Alternatives	No, the proposed action only would include the removal of the evaporation pond liner, the pond sediments and the subsoils directly beneath the pond.
4	Ms. Goodman	6-1	Has DOE taken into account the daughter isotopes of U-238? How will they ensure that there are no decay products left behind?	Solid Waste and Waste Management/Human Health Risk Assessment	The Human Health Risk Assessment (see HHRA Report) evaluated all parent uranium isotopes and used computer models to estimate the formation of daughter isotopes, from decay of the uranium, over the next 1,000 years. As material is removed from the pond, samples would be collected from the excavation that would be sent to a laboratory for analysis to determine that uranium and decay daughter products are not being left behind at levels significant to health.
4	Ms. Goodman	7-1	Ms. Goodman mentions she is hearing lound machine noises at night and points to an area on the map where it's coming from. She wonders if those noises are coming from the Shiprock site and what will be done to keep noise down during the evaporation pond removal.	Noise and Vibration	The activities proposed in Evaporation Pond EA have not begun, thus, they are not the source of the nighttime machinery sounds. As discussed in Section 3.7, Noise and Vibration, the proposed construction activity would occur primarily during normal working hours with activities at other times occurring only on an occasional basis. As a result, the proposed project would not be expected to contribute to nighttime noise. Furthermore, a noise barrier would be installed as part of the first phase of the construction project that would reduce noise levels outside the site during construction. There would not be a direct line of sight between your residence and the proposed construction activity. With the noise barrier in place, noise would remain below impact thresholds at the residence located adjacent to the construction site. At your residence, noise generated during proposed construction activivty would not be expected to be of concern. However, the administrators of the Shiprock disposal site are interested in any input from nearby residents, including any concerns about noise generated during the proposed activities.
5	Mr. Smith	8-1	Is the water that's being pumped into the evaporation ponds coming from beneith the mill? Is it coming from an aquafor and is it contaminated?	Water Resources	The water being pumped into the evaporation pond is coming from wells and drainage trenches on the floodplain northeast of the disposal cell and from wells on the terrace to the south of the disposal cell. There is also a sump in Bob Lee Wash (1087) that removes water from beneath the former mill site. The water is being pumped from the alluvial aquifer and is contaminated from past milling operations and the tailings in the disposal cell. The contaminated water is currently being pumped into the lined evaporation pond.
5	Mr. Smith	8-2	When the uranium mill was in operation there were unlined evaporation ponds. Did the contaminants that could have been in that fluid, which wound up in the old evaporation ponds, seep into the ground water? Is that what causes the groundwater contamination that we see now? If so, what has DOE done about it?	Shiprock Legacy Operations	Yes, the former raffinate ponds were unlined and resulted in contamination of groundwater beneath the former mill site. Milling activities have ultimately led to the ongoing groundwater contamination we see today. Following surface remediation, DOE-LM implemented a groundwater extraction system to eliminate the surface expression of groundwater from the terrace and remove contaminated groundwater from the floodplain.
5	Mr. Smith	8-3	Is it safe to drink from "Well 648" in the Fairgrounds area?	Well safety unrelated to Shiprock EA	Well safety unrelated to Shiprock EA.

	Commenter	Comment ID Number	Comment	Issue/Resource Area	DOE Response
6	Ms. Yazzie	9-1	Will the fenses remain in place after the decomissioning of the ponds?	Land Use and Recreation	See response to Comment ID Number 4-1. LM would consult with the Navajo Nation and other stakeholders to develop the final state of the Shiprock evaporation pond and operations area.
6	Mr. Yazzie	10-1	Mr. Yazzie is with the Navajo Abandoned Mines Program and states that he supports DOE's efforts in restoring the area. DOE has been monitoring the area for over 20 years. If local residents have questions about where the mill site was and how the restoration is progressing, they can use the Geographic Information Database to see a comparison of the old vs. the new site themselves. If the Chapter wants any of this information presented to them, they can put in a request with Joni Tallbull at the NECA Complex.	Shiprock Legacy Operations	Acknowledged
7	Mr. Yazzie	10-2	Mr. Yazzie explain some of the geological concepts. The groundwater issues within Shiprock area are comprised of two different hydrologic unit. He points out the terrace, also known as the "Mancos shale." Water does not move very fast in a shale-type of material. The floodplain contains more gravel and alluvial type of fill. The Mancos shale has higher background uranium as part of the rock.	Geology and Soils	Acknowledged
8	Ms. Smith	11-1	Are community members, who may have been affected by legacy milling operation due to being down wind, eligible for compensation due to potential heath impacts? Re: "Down Winders Program"	Down Winders Program (unrelated to Shiprock EA)	Community members that are interested in seeking compensation through the Down Winders program are provided a resource list with names and contact numbers to the appropriate agency that offer the down winding program. LM invites and encourages representatives of these programs to attend public meetings and participate in door to door outreach events.
9	Ms. Jenkins	12-1	Residents have noticed lots of pipes sticking out of the ground. Are they part of the pond or the mill site? What are their purpose? Will they be taken out if with the rest of the pond infrastructure?	Water Resources	The pipes sticking out of the ground are the protective casings of wells that are used to monitor groundwater. These pipes are expected to remain following pond decommissioning to continue monitoring groundwater.
9	Ms. Jenkins	12-1	Follow-up: Are the results from the ground water monitoring program public?	Water Resources	Yes, the annual site inspection and monitoring reports along with all other site documents can be found at https://lmpublicsearch.lm.doe.gov/SitePages/default.aspx?sitename=Shiprock. We also have a public geospatial database, which can be found at gems.lm.doe.gov.
9	Ms. Jenkins	13-1	Why is the area around south of the mill site so heavily populated? Wouldn't you want the residents to stay clear of the area?	Human Health Risk Assessment	The Human Health Risk Assessment (see HHRA Report) shows that as long as people are not directly contacting the material in the pond, in particular the pond water, there are no health risks to people currently living in close proximity to the pond, in any direction, including people who grow gardens and raise livestock for food.
9	Ms. Jenkins	14-1	Is the whole mill site is lined underneath with a protective liner?	Water Resources/Geology and Soils	No, there is no protective liner beneath the former mill site. The only lined feature at the site is the evaporation pond.

	Commenter	Comment ID Number	Comment	Issue/Resource Area	DOE Response
4	Ms. Goodman	15-1	Ms. Goodman inquires about a structure near the rivier and what its use is.	?	*Note: It was determined this structure is part of the United States Geological Survey River Monitoring station.*
Meeting 2: August 5, 2023					
1	Mr. Johnson	1-1	Who is the contact person if one has any questions about the Shiprock pond decommissioning?	Administrative Record	phone: 505-587-2149 email: joni.tallbull@lm.doe.gov
1	Mr. Johnson	1-2	The evaporation pond and liner should not be removed in open air. Rather it should just be covered up and then removed. If not, there will be lots of dust created which is dangerous for local residents.	Human Health and Safety/Air Quality	Creation of dust would be minimized first by the application of a layer of gunite on top of the liner and sediment, following dewatering and prior to removal. Once applied, the gunite hardens, thereby preventing any dust emissions prior to the removal. Second, during removal, water trucks would be used to spray water over the area(s) being excavated to suppress dust emissions during excavation and dumping into dump trucks. The material would then be loaded into strong, secure containers called super sacks at an indoor processing facility to further reduce dust during transport for offsite disposal. EA section 3.2.2 provides estimations of the amount of fugitive dust that would occur from the project alternatives. The intermittent release of these minor amounts of emissions would disperse to low concentrations once transported downwind to the Shiprock disposal site boundary. As a result, fugitive dust emissions from the project alternatives would not contribute to an exceedance of an ambient air quality standard or a substantial risk to human health. In addition, LM would implement protective measures to minimize the generation of fugitive dust from the project alternatives and to comply with applicable EPA and Navajo Nation EPA regulations. The Human Health Risk Assessment (see HHRA Report) documents the performance of computer air modeling of radioactive and chemical contaminants being released into the air with fugitive dusts. The modeling showed that levels of contaminants in the air are so low that they do not pose any health risks to people on the Shiprock site (workers, trespassers) or to residents living around the Shiprock site.
2	Ms. Yazzie	2-1	Ms. Yazzie lives on the other side of the river and thinks the removal of the pond is a good idea and will have a positive impact of the public's health and safety. (*Note: Much of this comment is inaudible according to the transcript. This paraphrasing is a best guess.*)	Human Health and Safety	Thank you for your comment.
3	Curtis Sue Jay	3-1	The pond removal is a good idea and the commenter approves of the water trucks to keep the dust down and the noise barriers to reduce sound pollution.	Human Health and Safety/Noise and Vibration	Thank you for your comment.
4	Reggie (no last name)	4-1	Is there contamination down in the floodplain area due to the legacy operations of the Shiprock milling site?	Shiprock Legacy Operations	Yes. Section 1.1, Background, outlines the connection of milling operations and contamination in the floodplain area. Section 3.12.1.1.1, Floodplain Groundwater, outlines the current remediation strategy to remove contaminantion from the floodplain and lists the specific contaminants of concern in the floodplain. Table 3-9 states the maximum concentrations of contaminants in the floodplaine from 2000-2003 versus 2019-2022 to demonstrate the impacts of remediation efforts.
4	Reggie (no last name)	4-2	Once the pond is removed, will there be a new pond where the contaminated water gets pumped to?	Shiprock Future Operations	Before the pond is removed, the extracted groundwater would be treated using a water treatment unit, where a substantail proportion of the water would meet environmental release standards and the treated water would be released into the environment, the discharge point is still to be determined. The remaining proportion of brine waste would be pumped to a smaller modular-type pond to be evaporated.

	Commenter	Comment ID Number	Comment	Issue/Resource Area	DOE Response
4	Reggie (no last name)	4-2	Follow up: Will there be a secondary option if the new pond ends up leaking?	Shiprock Future Operations	The new modular-type pond would be segmented into multiple sections, providing the opportunity to isolate sections of the pond for maintenance and repairs as necessary.
5	Ms. Yazzie Yona	4-2	What is the new water treatment system that will be replacing the current system? Is the new system mentioned in the EA or is there a separate EA?	Shiprock Future Operations	The new water treatment system is a combination of technologies which utilize closed-circuit reverse osmosis and electrocoagulation, in addition to filtration and water treatment chemicals.
5	Ms. Yazzie Yona	4-2	What is the life expectancy of the equipment used for the new treatment system, like piping and liners.	Shiprock Future Operations	The life expectancy of the new treatment system would vary depending on the component but the system and infrastructure would be monitored to proactively maintain and conduct repairs as necessary. The water treatment system would be in use at least five years but possibly longer if the treatment technology fits the need of the site.
5	Ms. Yazzie Yona	4-2	How much smaller will the new evaporation pond be?	Shiprock Future Operations	The new modular-type evaporation pond would be between 1 and 4 acres in size.
5	Ms. Yazzie Yona	4-2	How frequent will the leak detection system in the new pond be tested?	Shiprock Future Operations	The leak detection system in the new pond would be tested as recommended by the manufacturer, which is to be determined.
5	Ms. Yazzie Yona	5-1	Based on the amount of trucks that will drive through the Navajo territory, this will cause substantial wear and tear to the roads. Who will be paying to fix the roads once the job is complete?	Traffic and Transportation	The project sponsors would ideally agree in advance to pay such costs to repair the local roads after the project is complete.
5	Ms. Yazzie Yona	5-1	What are the safety measures for any spills that occur along the roads?	Traffic and Transportation	As detailed in Appendix C of the Shiprock EA, the expected very low concentrations of radioactive material in the evaporation pond waste pose very little risk, in general, to human health and the environment, even under accident conditions. Nevertheless, in the event of a radiological release from a shipment along a route, local emergency response personnel would be the first to arrive at the accident scene. It is expected that response actions would be taken in accordance with the guidance in the National Response Framework (DHS, 2019). Based on the initial assessment at the scene, training, and available equipment, first responders would involve Federal and state resources as necessary. First responders and/or Federal and state responders would initiate actions in accordance with the USDOT Emergency Response Guidebook (USDOT, 2016) to isolate the incident and perform the actions necessary to protect human health and the environment (such as evacuations or other means to reduce or prevent impacts to the public). Cleanup actions are the responsibility of the carrier. LM would partner with the carrier, shipper, and applicable state and local jurisdictions to ensure cleanup actions met regulatory requirements.
5	Ms. Yazzie Yona	5-2	Navajo employment is always encouraged. Commenter hopes that local residents will be employed by some of these projects.	Socioeconomics	As stated in Sections 3.5.3, Socieoconomics Environmental Consequences, under each alternative, there would not be any additional workers added to the existing workforce associated with the Proposed Action. However, the direct employment at the Shiprock Disposal Site also creates additional, or indirect, employment in the ROI. Local residents would likely be employed by some of the indirect employment opportunities. No change to text recommended.
6	Mr. Lee	6-1	How much Uranium is in the pond?	Solid Waste and Waste Management	The 11 acre evaporation pound's sediments contain approximately 50 pounds of uranium. As discussed in Section 3.8.2.2, the average uranium concentration is approximately 10 pCi per liter with a maximum value of approximately 19 pCi per liter. The sediment uranium concentrations are below the 30 pCi per liter DOE approved free release limit.

	Commenter	Comment ID Number	Comment	Issue/Resource Area	DOE Response
6	Mr. Lee	6-1	What is the purpose of various wells that can be found in the local area? Is there urainum contamination in these wells?	Water Resources	Most wells on the site are used for monitoring groundwater and a smaller number of wells are used to extract groundwater and pump to the current evaporation pond for treatment. Many wells on the floodplain beneath the terrace indicate that groundwater is contaminated with uranium. Wells on the terrace indicate that uranium in groundwater near the disposal cell and NECA Yard was sourced from activities of the former mill site.
7	Unidentified Male	7-1	Commenter voices concerns about transparency and wants to make sure there is sufficient community engagment. Community members want to see the progress and test results with their own eyes (*Note: Much of this comment is inaudible according to the transcript. This paraphrasing is a best guess.*)	Community Engagment	Pre COVID and now post COVID, LM hosts one to two public meetings per year in Shiprock based on projects. Community members are invited to attend through a variety of methods that include paid advertising and door to door notifications. LM also provides updates at the monthly Shiprock Chapter House public meetings four to six times per year. Navajo AML through the LM cooperative agreement is also charged with holding public meetings to provide updates to community members. All reports are available through the GEMS website and on LM Website through site pages.
8	Ms. Deborah Yazzie	8-1	Inaudible comment regarding Alternative Actions and estimates on dust citing p. 21. Commenter mentions that the wind directions are not what they used to be.	Air Quality	Data are not available that would support or refute the commentor's statement regarding historical changes in wind direction. Regarding the impact of fugitive dust from the project alternatives, Section 3.2.2 provides estimations of the amount of fugitive dust that would occur from the project alternatives. The intermittent release of these minor amounts of emissions would disperse to low concentrations once transported downwind to the Shiprock disposal site boundary. As a result, fugitive dust emissions from the project alternatives would not contribute to an exceedance of an ambient air quality standard or a substantial risk to human health. In addition, LM would implement protective measures to minimize the generation of fugitive dust from the project alternatives and to comply with applicable EPA and Navajo Nation EPA regulations.
8	Ms. Deborah Yazzie	8-2	Inaudible comment regarding protection of children citing p.30, DO-13045	Socioeconomics/Environmental Justice	Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks* , is an EPA policy recommending lead agencies and project proponents pay attention to worksite proximities in places where children live, learn, and play, such as homes, schools, and playgrounds. Section 3.4.1.2 presents existing socioeconomic conditions in the Shiprock area and concludes no disproportionaly high or adverse effects would occur to minority or low-income populations because no minority or low-income populations were identified in the region of influence (ROI) or within the project boundary. In addition, the commenter indicates "that's from page 21"; page 21 presents emissions summaries for year 2 Alternative 3 activities. The inference from the comment is there possibly could be environmental health risks to children as a result of air emissions associated Alternatives 2 or 3 (Table 3-3); however, as discussed in Sections 3.2.2.2 and 3.2.2.3, hazardous air pollutant (HAP) emissions resulting from Alternatives 2 or 3 would not be expected to result in adverse air quality impacts.
8	Ms. Deborah Yazzie	8-2	Inaudible comment referencing the local hospital which has a 60-bed medical center providing primary and special care services, citing line 16 and 17 on page 30.	Socioeconomics/Environmental Justice	Based on what this comment appears to be requesting the following text has been revised to read: "The Northern Navajo Medical Center, located in Shiprock, is a 60-bed medical center providing primary and specialty care services (U.S. Department of Health and Human Services, 2023). The Medical Center's Emergency Department was designated as a Level IV trauma center in 2021 (Indian Health Service, 2023)."
8	Ms. Deborah Yazzie	8-2	Inaudible comment about schools referrencing line 18 on page 30.	Socioeconomics/Environmental Justice	Based on transcripts from "Shiprock Transcripts pt 2" on page 54, lines 13-15 in which the commenter states, "Page 30, line 18, talks about education schools here SASI (inaudible) SASI (inaudible) Schools." Text has been added to the section stating, "The Shiprock Associated Schools, Inc. organization operates two schools (Atsa Biyaazh Community School and Northwest Middle & High School). These schools are associated with the Bureau of Indian Education in Shiprock, New Mexico (Shiprock Associated Schools, Inc., 2023)."

	Commenter	Comment ID Number	Comment	Issue/Resource Area	DOE Response
8	Ms. Deborah Yazzie	8-3	How is "light traffic" defined on page 53, line 4? Commenter claims that minimum daily traffic in the area is 12,000 vehicles and can get up to 20,000 vehicles. She wants to know if the EA is estimating less than 12,000 vehicles per day.	Traffic and Transportation	The proposed construction project would generate only a few new trips per hour, which would contribute minimally to traffic congestion or level of service (LOS).
8	Ms. Deborah Yazzie	8-4	Commenter cites table 3-11 on page 69 and wants to know where the water will be coming from as well as where it will be disposed of.	Water Resources	The source of the water would be from the San Juan River, offsite, or from a newly-installed water treatment unit. If the preferred alternative is to install a new water treatment unit, excess water could be disposed of at an on-site National Pollutant Discharge Elimination System (NPDES)-approved outfall.
8	Ms. Deborah Yazzie	8-5	Commenter cites page 71 line 38 and wants authors to include references on where they get the air standards from, and what level exactly they will not be exceeding. She mentions that the Navajo Nation has different air quality standards than the Federal government and asks which will be followed.	Air Quality	The national ambient air quality standards (NAAQS) are cited in EA Section 3.2.1 and Appendix E - they are codified in Section 109 of the Clean Air Act (see https://www.epa.gov/criteria-air-pollutants/naaqs-table). The Navajo Nation EPA regulations have adopted the NAAQS for purposes of regulating air quality within the Navajo Nation. In addition, LM would implement protective measures to minimize the generation of fugitive dust from the project alternatives that would comply with applicable Navajo Nation EPA regulations.
			Note: Much of comments 8-1 through 8-5 were inaudible according to the transcript. This paraphrasing is a best guess.		

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APPENDIX B:
NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION LETTER TO THE NAVAJO NATION HISTORIC PRESERVATION OFFICER

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Department of Energy
Washington, DC 20585

Mr. Richard Begay
Historic Preservation Officer
The Navajo Nation, Historic Preservation Department
PO Box 4950
Window Rock, AZ 86515

Subject: Consultation Regarding Proposed Removal of Existing Evaporation Pond at the Shiprock, New Mexico, Disposal Site

Dear Mr. Begay:

The U.S. Department of Energy Office of Legacy Management (LM) is the long-term custodian of the Shiprock, New Mexico, Disposal Site and is responsible for long-term treatment of contaminated groundwater and protecting human health and the environment. The current groundwater compliance strategy at the Shiprock site consists of active remediation, combined with natural flushing, to achieve groundwater cleanup standards. The active remediation consists of groundwater extraction and evaporation of contaminated water in an 11-acre evaporation pond. Inspection and repairs of the evaporation pond liner in the summer of 2021 revealed the liner has reached the end of its useful life. Liner material testing and repair work has demonstrated the liner material has degraded and is now beyond repair; therefore, a decision needs to be made by LM about the future of the pond.

LM is preparing an Environmental Assessment (EA) for this decision in accordance with the National Environmental Policy Act of 1969, at Title 42 *United States Code* Section 4321 et seq. (42 USC 4321 et seq.), the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act" at Title 40 *Code of Federal Regulations* Sections 1500–1508 (40 CFR 1500–1508), the requirements of DOE Policy 451.1, *National Environmental Policy Act Compliance Program*, and the "National Environmental Policy Act Implementing Procedures" at 10 CFR 1021. In this EA, LM is evaluating the environmental consequences associated with the full decommissioning of the existing evaporation pond. This would include complete removal of the pond sediments, liner, and underlying subliner material, which would be transported off tribal lands for disposal. The entire process is expected to take 2 to 5 years to complete.

In accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA) and its operating regulations in 36 CFR 800, it is LM's determination that the proposed removal of the existing evaporation pond comprises an undertaking in accordance with regulations found at 36 CFR 800.16(y). The work proposed is a type of activity that has the potential to have an adverse effect on historic properties should they be present; therefore, LM is initiating the NHPA Section 106 consultation process with your office. The area of potential effect (APE) for the proposed undertaking is depicted on the enclosed figure.

Previous work with your office has allowed LM to develop a comprehensive understanding of the existing cultural resources, mostly archaeological sites, found in the area surrounding the APE. Dinetahdoo Cultural Resources Management LLC summarized these resources in their report *An Expanded Literature Search of Cultural Resources and Site Reassessment of 903 Acres in Shiprock, San Juan County, New Mexico* (DRCM 2018-34); a copy of this report was provided to you by Dinetahdoo in late 2018. This report and its associated map documented the presence of six archeological sites that merit consideration as historic properties and one Traditional Cultural Property in the project area. However, all the properties are outside of the APE that LM has identified for ground-disturbing activity; thus, the proposed work will avoid all these previously identified cultural resources.

Please note that LM is not proposing to conduct any ground-disturbing activity outside of the APE indicated on the map. Should such activity be required outside of the APE in the future, additional consultation with your office would first be completed.

In accordance with 36 CFR 800.4(d)(1), LM has determined that there are no historic properties subject to effect by the proposed undertaking because none are present within the APE at the Shiprock disposal site. Should unidentified archaeological resources be discovered during site work, we would stop work until the resources have been evaluated in accordance with the National Register of Historic Places eligibility criteria found at 36 CFR 60.4. Such an evaluation would be made in consultation with your office in accordance with 36 CFR 800.13. If the scope of the described routine work changes substantially, additional consultation with your office may be required.

Please contact me at (505) 592-2447 or Joni.Tallbull@lm.doe.gov if you have any questions. Please let us know if you lack copies of any of the archaeological reports referenced in this letter, and we will provide them to you. Please address correspondence to:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Sincerely,

Joni R. Tallbull

Digitally signed by Joni R. Tallbull
Date: 2023.03.13 16:17:19 -06'00'

Joni Tallbull
Shiprock Site Manager

Enclosures

cc w/enclosure via email:
Padraic Benson, DOE-LM
Joyce Chavez, DOE-LM
Tracy Ribeiro, DOE-LM
Joni Tallbull, DOE-LM
Kate Whysner, DOE-LM
Jeff Carman, RSI
Jim Denier, RSI
Anthony Farinacci, RSI
John Gabriele, RSI
David Miller, RSI
Joe Trnka, RSI
DOE Read File
ELEM/20/2277

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APPENDIX C:
NAVAJO NATION DEPARTMENT OF FISH & WILDLIFE CONSULTATION

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Carrizo Mountain Environmental & Herbarium
693 CR 233, Suite A, Durango, CO 81301
505.793.1140

May 10th, 2023
Navajo Nation Department of Fish and Wildlife
Natural Heritage Program
PO Box 1480
Window Rock, AZ 86515

Requestor Name:	Carrizo Mountain Environmental & Herbarium, Inc.
Contact Person:	Samantha Hunt
Mailing Address:	693 County Road 233, Ste. A Durango, CO 81301
Phone:	513-562-7460
Email:	carrizo.samh@gmail.com

SUBJECT: We, Carrizo Mountain Environmental & Herbarium, Inc., are requesting data on the occurrence/potential occurrence of species of concern in the project area of the following Shiprock Disposal Site on behalf of RSI EnTech, LLC. RSI EnTech is consulting on this project on behalf of the U.S. Department of Energy (DOE) Office of Legacy Management (LM).

RSI EnTech, LLC Shiprock Disposal Site

Section(s)	Township	Range	County
36	30 North	18 West	San Juan
1	29 North	18 West	San Juan

7.5 Minute Series USGS Quadrangle(s): Shiprock

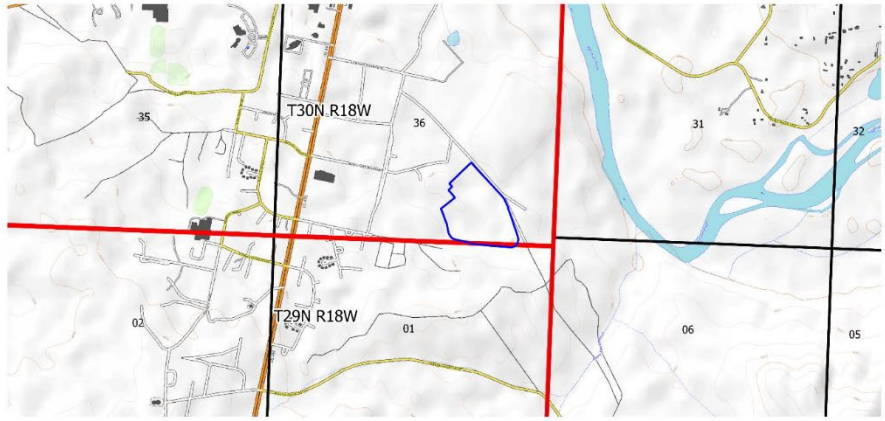
Project Description:
LM proposes to remove an evaporation pond and associated infrastructure at the Shiprock, New Mexico, Disposal Site. The proponent also plans to install new perimeter fencing and three additional gates to the previously disturbed project site. The proposed project would be on Navajo lands subject to Bureau of Indian Affairs and Navajo Tribal oversite. The project area is located approximately one mile south of Shiprock, New Mexico. The project is east of U.S. Hwy 491 and is on Foxtail Trail.

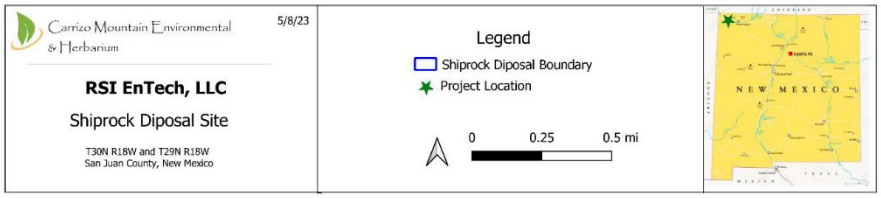
Attached find a topographical map of the proposed location. If you have questions or need additional information, please contact me at the below phone number.

Sincerely,

Samantha Hunt
Biologist
Carrizo Mountain Environmental & Herbarium, Inc.
513-562-7460

Enclosure: Topographical Map of Project Area





Environmental & Archaeological Consultants
New Mexico, Colorado, Arizona, Utah / 505.793.1140
Carrizo.office@gmail.com

BIOLOGICAL RESOURCES COMPLIANCE FORM
NAVAJO NATION DEPARTMENT OF FISH & WILDLIFE
P.O. BOX 1480, WINDOW ROCK, ARIZONA 86515-1480

It is the Department's opinion the project described below, with applicable conditions, is in compliance with Tribal & Federal laws protecting biological resources including the Navajo Endangered Species & Environmental Policy Codes, U.S. Endangered Species, Migratory Bird Treaty, Eagle Protection & National Environmental Policy Acts. This form does not preclude or replace consultation with the U.S. Fish & Wildlife Service if a Federally-listed species is affected.

PROJECT NAME & NO.: Shiprock Disposal Site on behalf of RSI EnTech, LLC

DESCRIPTION: RSI Entech, Shiprock Disposal Site is proposing to remove and replace the liner in the evaporation pond located on Tribal lands managed by the Navajo Nation in northwestern New Mexico (NM). Staging areas with new surface disturbances may be required for the cleanout of the pond.

LOCATION:
SE ¼ of Section 36, Township 30 North, Range 18 West;
N ½ of NE ¼ of Section 1, Township 29 North, Range 18 West;
NW ¼ of NW ¼ of Section 6, Township 29 North, Range 17 West;
W ½ of SW ¼ of Section 31, Township 30, Range 17; and
SE ¼ of SW ¼ of Section 31, Township 30, Range 17, New Mexico Principal Meridian (NMPM), in San Juan County, NM.
Lat.: 36°45'53.26"N, Long.: 108°41'16.14"W

REPRESENTATIVE: Sam Hunt, Carrizo Mountain Environmental and Herbarium, Inc.

ACTION AGENCY: RSI Entech, Shiprock Disposal Site

B.R. REPORT TITLE/ DATE/PREPARER: Request for Biological Review & Compliance/ 5 JUNE 2023/ Carrizo Mountain Environmental and Herbarium, Inc.

SIGNIFICANT BIOLOGICAL RESOURCES FOUND: Area 4, Community Development Area

POTENTIAL IMPACTS

NESL SPECIES POTENTIALLY IMPACTED: NA

FEDERALLY-LISTED SPECIES POTENTIALLY IMPACTED: NA

OTHER SIGNIFICANT IMPACTS TO BIOLOGICAL RESOURCES: NA

AVOIDANCE / MITIGATION MEASURES: NA

CONDITIONS OF COMPLIANCE*: NA

FORM PREPARED BY / DATE: T. Kim Yazzie/10 AUG 2023

COPIES TO: (add categories as necessary)

☐ _____ ☐ _____

2 NTC § 164 Recommendation:

☐ **Approval:**

☐ **Conditional Approval (with memo):**

☐ **Pending (with memo):**

☐ **Disapproval (with memo):**

☒ **Categorical Exclusion (with request letter):**
DR#23cmehi104 - Shiprock Disposal Site on behalf of RSI EnTech, LLC

☐ **None (with memo):**

Gloria M. Tom, Director
Fish & Wildlife

Navajo Nation Department of

Signature:

Date 8/11/23

*I understand and accept the conditions of compliance, & acknowledge that lack of signature may be grounds for the Department not recommending the above-described project for approval to the Tribal Decision-maker.

Representative's signature

Date

BIOLOGICAL RESOURCE CLEARANCE FORM (BRCF) REQUEST

NNHP
Navajo Natural Heritage Program

DR# 23cmehi104
(Required: on the top right corner of data response letter)

Carrizo Mountain Environmental and Herbarium, Inc.
Company/Organization Name

Sam Hunt, sam@adkinsenvironmental.com, 512-562-7460
Contact person, email and phone number

693 County Road 233, Ste. A
Mailing Address

Durango, CO 81301
City/State/Zip

6/5/23
Date

Funding Identifier:
Please mark funding source type for project.

- [ ] ARPA
- [ ] Light Up Navajo
- [ ] CARES ACT
- [ ] OTHER _____

Dear Navajo Natural Heritage Program,

After reviewing the Data Request response letter and Conditional Criteria, Carrizo Mountain Environmental and Herbarium, Inc. (*Organization Name*) is requesting a Biological Resource Clearance Form for DR# 23cmehi104 based upon the selected criteria marked below.

Check applicable box(s) below:

- [ ] **Project Specific Review** – A project that is small enough in scope where surveys and/or a Biological Evaluation may not be required, depending on project location and/or impacts to NESL species. Species-specific surveys and a survey report MAY still be required for projects meeting this criteria, depending on where the project is located and degree of disturbance that the project will entail.
  Qualifying projects include:
  - [ ] a. Linear utilities Projects (water, internet, power, etc.) **directly serving households** on the Navajo Nation where **each line individually is less than 1 mile in length**.
  - [ ] b. Non-linear projects **less than 1 square acre in size.**
  - [ ] c. CARES Act or ARPA Funded Projects
  - [ ] d. Ecological restoration, weed treatment, and revegetation projects where the **goal is to improve native wildlife habitat and forage availability**.

- [x] **Categorical Exclusion (Cat Ex)** – Projects that are exempt from surveys and Biological Evaluations (BE) but are still required to obtain a BRCF issued certifying the applicability of exclusion.
  Exempt projects include:
  - [ ] a. Projects where the entire footprint is within RCP Area 4 (i.e., Development Areas)
  - [x] b. Projects where the entire footprint is within pre-existing development (e.g., radio tower repairs, windmill repairs, water infrastructure repairs, etc.)
  - [ ] c. Agriculture Land Use Permit renewal requests where the entire area is within the previous lease land use area (no expansion).

- [ ] **Biological Evaluation (BE)** –A project not meeting the Project Specific Review and/or Categorical Exclusion criteria above must include a BE for consideration by NNHP before we can determine if a project is in compliance with Navajo Nation and Federal wildlife laws. Submit a finalized BE for further review along with this form to reviews@nndfw.org. Include the DR# on the front page and in the email subject line.

DR. BUU NYGREN PRESIDENT
RICHELLE MONTOYA VICE PRESIDENT

The Navajo Nation | Yideeskąądi Nitsáhákees

MEMORANDUM

TO : Jeffrey Cole, Wildlife Manager
Department of Fish & Wildlife
DIVISION OF NATURAL RESOURCES

FROM : Gloria M. Tom
Gloria M. Tom, Department Manager III
Department of Fish & Wildlife
DIVISION OF NATURAL RESOURCES

DATE : August 11, 2023

SUBJECT : DELEGATION OF AUTHORITY

I'll be out of the office on Friday, August 11, 2023 from 8:00 a.m. to 5:00 p.m. I am hereby delegating you to act in the capacity of the Department Manager III, Department of Fish and Wildlife, effective at 8:00 a.m. on Friday, August 11, 2023. This delegation shall end at 5:00 p.m. on Friday, August 11, 2023.

Your authority will cover the review and signing off on all routine documents pertaining to the Department of Fish and Wildlife, except for issues that you feel should have the attention of the Department Manager III.

ACKNOWLEDGEMENT:

Jeffrey Cole, Wildlife Manager
Department of Fish and Wildlife
DIVISION OF NATURAL RESOURCE

APPENDIX D:
U.S. FISH & WILDLIFE SERVICE CONSULTATION

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Department of Energy
Washington, DC 20585

August 7, 2023

via email: nmesfo@fws.gov

Ms. Raphaela Ware
Fish and Wildlife Biologist
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, NM 87113

Subject: U.S. Department of Energy Office of Legacy Management *Reassessment of Impacts Associated with Proposed Projects at the Shiprock, New Mexico, Disposal Site*, an addendum to *Programmatic Biological Assessment of Threatened and Endangered Species for the U.S. Department of Energy Office of Legacy Management Activities at Sites in the San Juan River Subbasin*

Dear Ms. Ware:

On March 8, 2019, the U.S. Department of Energy Office of Legacy Management (LM) received from the U.S. Fish and Wildlife Service (USFWS) a Biological Opinion (Cons. # 02ENNM00-2019-F-0083) for routine long-term surveillance and maintenance activities at LM sites in the San Juan River Basin. In this opinion, USFWS concurred with LM's determination that routine activities may affect but are not likely to adversely affect the Mesa Verde cactus. Also, USFWS determined that water depletions associated with LM's routine actions (39.98 acre-feet annually) qualify as a minor depletion as addressed in the San Juan River Recovery Implementation Program of 1992. Therefore, USFWS also concurred with LM's determination that routine activities may affect but are not likely to adversely affect the Colorado Pikeminnow, Razorback Sucker, or their critical habitat.

Although several LM sites were addressed in the 2019 Biological Opinion, routine groundwater-related activities at the Shiprock, New Mexico, Disposal Site make up most of the 39.98-acre-foot annual water depletion described in the corresponding Biological Assessment (*Programmatic Biological Assessment of Threatened and Endangered Species for the U.S. Department of Energy Office of Legacy Management Activities at Sites in the San Juan River Subbasin,* LMS/S17239).

As discussed in a phone conversation with USFWS on June 26, 2023, LM has prepared an addendum to the Biological Assessment for the San Juan River Basin, updating information related to two proposed projects at the Shiprock site: 1) decommissioning of the site evaporation pond and 2) installation of a water treatment unit. With the enclosed addendum, LM is requesting to re-consult with USFWS for impacts to threatened or endangered species and critical habitat associated with the proposed projects. LM has determined that the proposed action is not likely to adversely affect threatened or endangered species or critical habitat. Although water will be used differently from the routine activities evaluated in the past, total depletions will not exceed the previously consulted volume of 39.98 acre-feet annually.

Please contact me at (505) 592-2447 or Joni.Tallbull@lm.doe.gov, if you have any questions or need additional information.

Sincerely,

Joni R. Tallbull

Digitally signed by Joni R. Tallbull
Date: 2023.08.07 13:06:10 -06'00'

Joni Tallbull
Shiprock Site Manager

Enclosures

cc w/enclosure via email:
Melissa Mata, USFWS
Raphaela Ware, USFWS
Joyce Chavez, DOE-LM
Nicole Olin, DOE-LM
Tracy Ribeiro, DOE-LM
Stuart Bartlett, RSI
Elizabeth DuQuette, RSI
Linda Sheader, RSI
DOE Read File
File: E/20/2267 F/20/826

Reassessment of Impacts Associated with Proposed Projects at the Shiprock, New Mexico, Disposal Site

Addendum to
***Programmatic Biological Assessment of Threatened and Endangered Species for the U.S. Department of Energy Office of Legacy Management Activities at Sites in the San Juan River Subbasin* (LMS/S17239-Rev 1)**

1.0 Introduction

1.1 Basis for Addendum

This document is an addendum to the 2019 *Programmatic Biological Assessment of Threatened and Endangered Species for the U.S. Department of Energy Office of Legacy Management Activities at Sites in the San Juan River Subbasin* (DOE 2019), hereafter referred to as the 2019 Biological Assessment (BA). The 2019 BA was the basis for a Biological Opinion (BO) issued by the U.S. Fish and Wildlife Service (USFWS) on March 8, 2019 (Consultation No. 02ENNM00-2019-F-0083). The purpose of the addendum is to update information related to U.S. Department of Energy Office of Legacy Management (LM) proposed activities at the Shiprock, New Mexico, Disposal Site to reassess potential impacts to threatened or endangered species or their critical habitat and to reinitiate consultation with USFWS. The proposed activities covered in this addendum include (1) proposed Evaporation Pond decommissioning project and (2) installation of a water treatment unit (WTU).

1.2 Project Descriptions

The Shiprock site is one of several LM sites evaluated in the 2019 BA (DOE 2019). The site is described in that document, so that information is not repeated here. Groundwater remediation activities at the site were included as part of the routine activities addressed by the 2019 BO.

The groundwater compliance strategy at the site requires both groundwater extraction and evaporation. Currently, groundwater is extracted from a system of wells, infiltration galleries, and sumps and pumped to an 11-acre lined Evaporation Pond to facilitate removal of dissolved contaminants in the water. In 2021, LM completed a comprehensive pond liner assessment to evaluate its condition. The assessment determined that the liner continues to degrade over time and LM concluded that the pond and liner are near the end of their useful life. LM is proposing to decommission the existing Evaporation Pond and replace the treatment capability of the pond with a new WTU.

LM has prepared a *Draft Environmental Assessment for the Evaporation Pond at the Shiprock, New Mexico, Disposal Site* (DOE 2023), hereafter referred to as the Draft EA, to evaluate project alternatives to address the degradation of the pond and liner. The Draft EA also considers cumulative impacts associated with past, present, and reasonably foreseeable future actions including the proposed WTU.

1.2.1 Evaporation Pond Project

For the proposed Evaporation Pond project, LM is evaluating three alternatives. Alternative 1 is a No Action Alternative that would include leaving the pond in place and continuing to treat groundwater as part of routine activities, as described in the 2019 BA (DOE 2019). Alternative 2 would involve full decommissioning of the Evaporation Pond and offsite disposal of the generated waste via highway transportation. Alternative 3 would include the same proposed scope as Alternative 2 but would utilize a combination of highway and rail transport to the selected disposal facility.

Figure 1 shows the 140-acre project area boundary (or action area) of which approximately 104 acres have been previously disturbed with minimal vegetation present. Project activities would occur only in areas that were previously disturbed.

Figure 1. Shiprock Evaporation Pond Project Boundary

As described in the Draft EA under Alternatives 2 and 3, it would take 16 months to several years to complete the proposed project which would consist of the following activities:

- Preparing the site for construction, including installing security fencing, wind and noise barriers, stormwater controls, and waste packaging areas. Disturbance would only occur in areas where no habitat for Mesa Verde cactus is present (further described below).
- Removing and disposing an estimated 20,000 cubic yards of generated waste (water, sediment, liners, and subsurface soil). In situ techniques would be used to dry and solidify materials for packaging, transporting, and disposal.
- Using fresh water for dust suppression and other construction activities. With appropriate water rights and agreements in place, water would be obtained from the San Juan River, local offsite water sources, or a proposed onsite WTU that would be installed before the project begins.

Transporting generated waste using haul trucks (Alternative 2) or a combination of haul trucks and rail cars (Alternative 3) to an offsite licensed waste disposal facility in Andrews County, Texas, or Grantsville, Utah. Alternative 3 would use a rail transload station near Mentmore, New Mexico, to transfer waste from haul trucks to rail cars. Onsite haul routes would use established roads in previously disturbed areas, and offsite routes would only use public roads and existing rails. All waste would be characterized to meet disposal facility waste acceptance criteria and shipments would be compliant with applicable U.S. Department of Transportation regulations (i.e., classification, packaging, labeling, placarding).

- Figure 2, Figure 3, and Figure 4 depict haul routes to the potential waste disposal facilities, as well as the haul route to the transload station.
- Verifying soil samples within the removed pond footprint to ensure that the area is suitable for release in accordance with DOE Order 458.1 Chg 4 (LtdChg), *Radiation Protection of the Public and the Environment.*
- Removing temporary structures such as security fences, regrading the project area with clean fill as needed, and reclaiming excavated areas in consultation with the Navajo Nation.

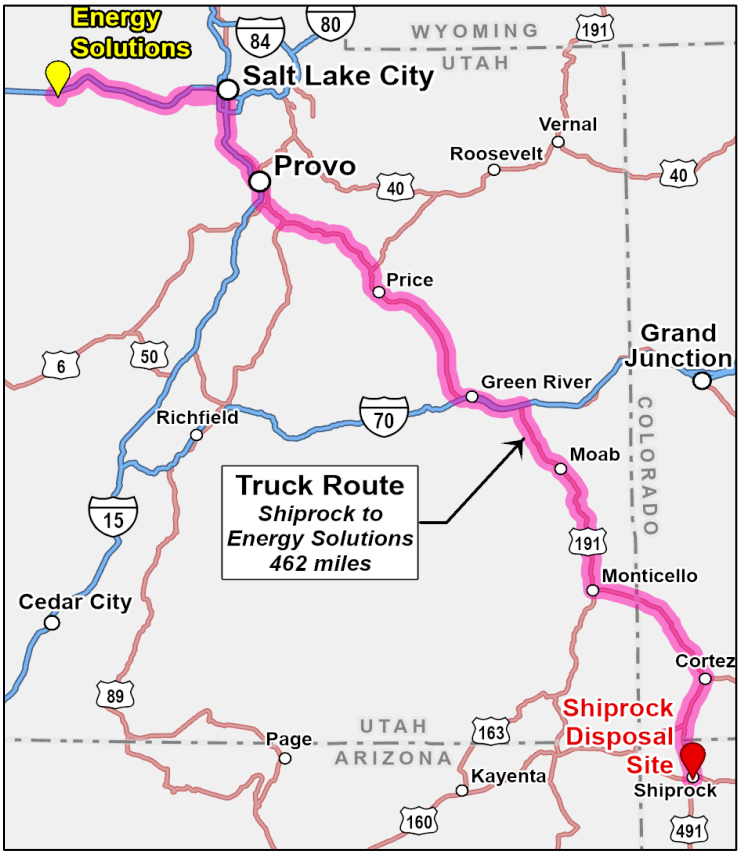


Figure 2. Haul Route to the Energy Solutions Disposal Facility in Grantsville, Utah

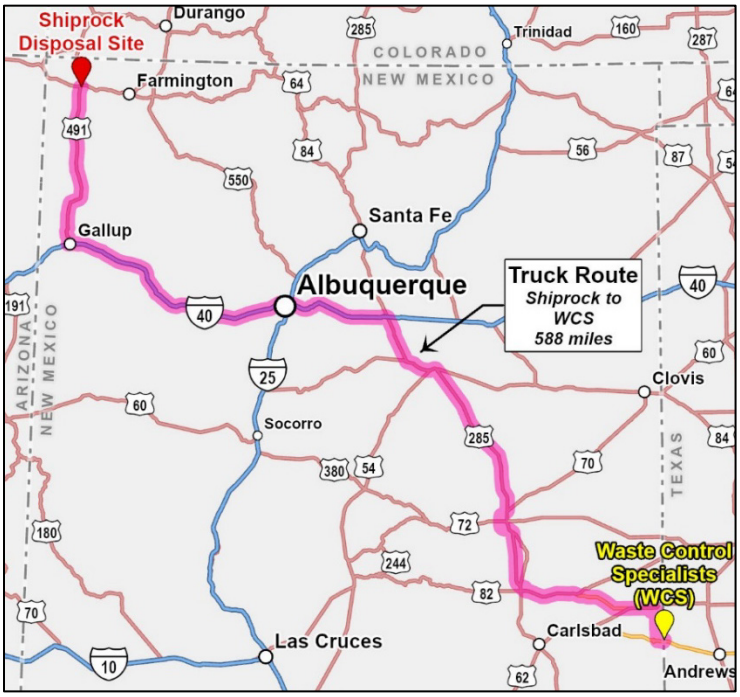


Figure 3. Haul Route to the Waste Control Specialists Disposal Facility in Andrews, Texas

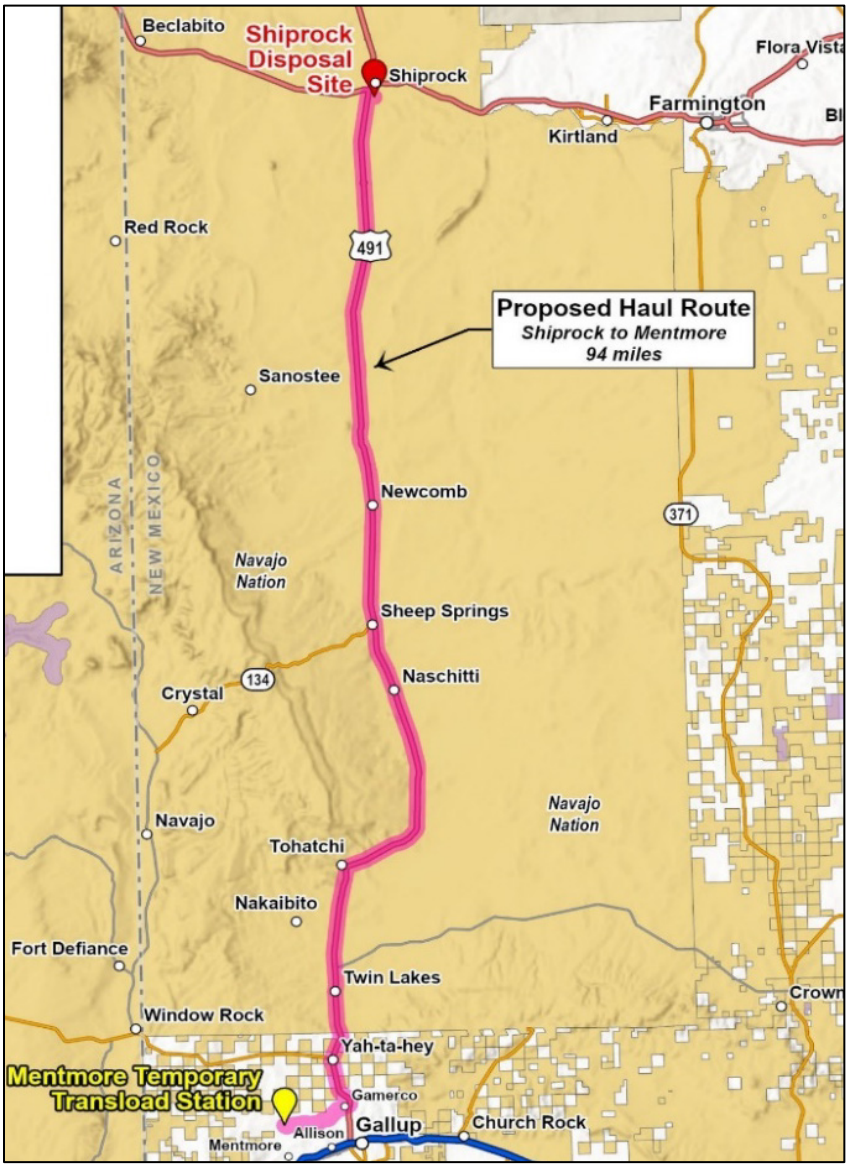


Figure 4. Haul Route to the Transload Station in Mentmore, New Mexico

In 2021, Carrizo Mountain Environmental & Herbarium, Inc., conducted a habitat assessment, the *Mesa Verde Cactus Survey Report in Relation to the Evaporation Pond Decommissioning and Construction Alternatives* (Carrizo 2021), to identify any areas within the potential footprint of the Evaporation Pond project area that could contain Mesa Verde cactus habitat (Figure 5). The Evaporation Pond project was engineered to avoid all areas identified as having potential habitat, including the designations of good habitat and marginal habitat, for the cactus.

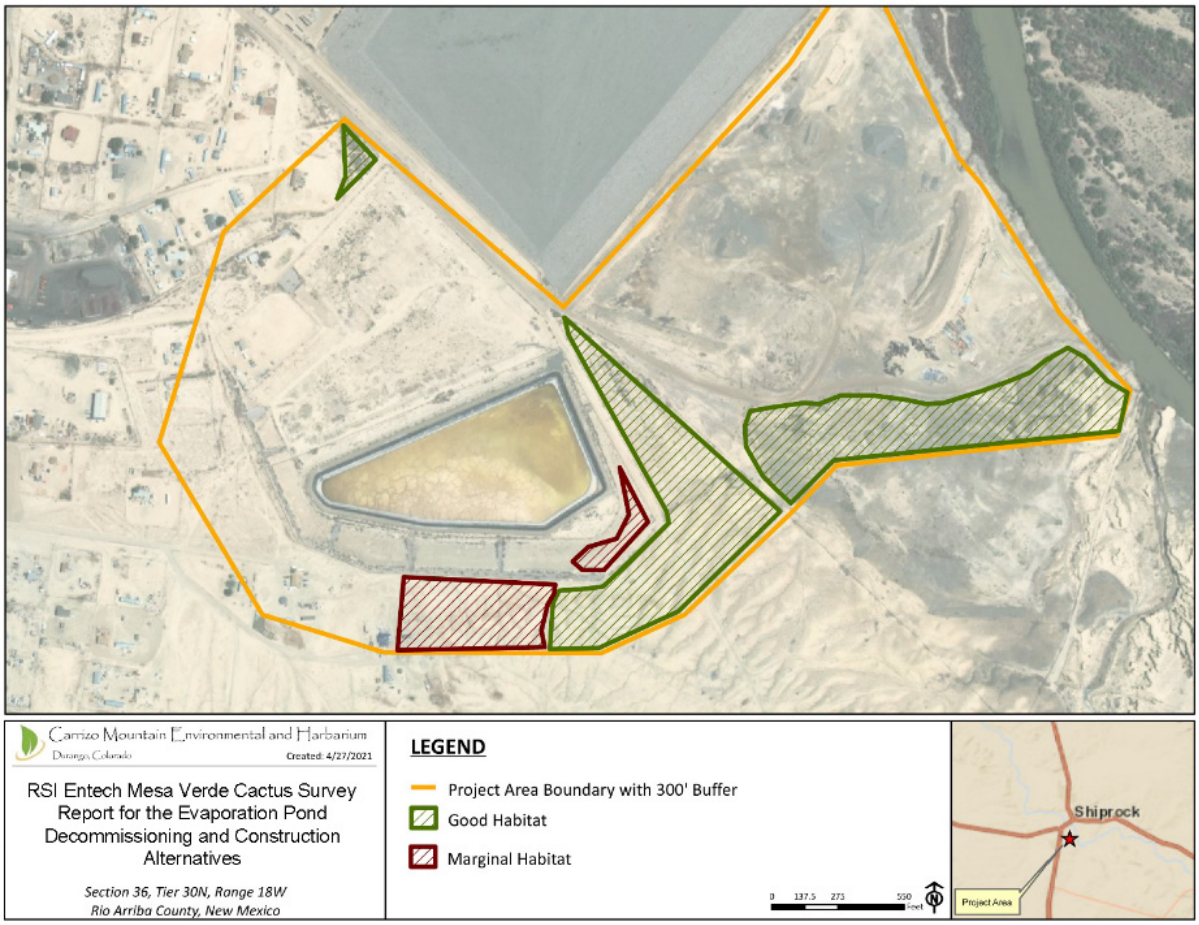


Figure 5. Potential Mesa Verde Cactus Habitat Areas from the Carrizo 2021 Habitat Assessment

LM is simultaneously completing a consultation with the Navajo Nation to ensure protection of tribally listed endangered species; the results of this consultation will be presented in the Draft EA. Note that the "project area boundary" shown in Figure 5 was a draft boundary with a 300-foot buffer used for planning purposes. The current project boundary is smaller than the area shown in this figure and excludes the areas shaded as good or marginal habitat. See Figure 1 for the current project boundary.

An annual minor water depletion of 39.98 acre-feet for routine groundwater activities at five LM sites has been accounted for in the 2019 BA and BO, a majority of which is associated with the extraction of groundwater to the site Evaporation Pond (Table 1). The proposed work described in this addendum would use water differently than the routine groundwater activities described in the 2019 BA (DOE 2019) but would not involve new depletions. When pond decommissioning begins, groundwater would no longer be pumped to the Evaporation Pond. Water would instead be used for dust suppression and other construction activities listed in Table 2. Site water usage is essentially shifting from one set of activities to another set of activities with no new depletions, resulting in no impacts to the endangered fish in the San Juan River. Calculations of maximum water depletions necessary for construction water and for operating a new WTU are conservatively estimated to be below 39.98 acre-feet per year during the decommissioning phase (Table 2). After construction is complete, annual water depletions would remain well below the minor depletion value because construction water would no longer be used at the site.

Table 1. Current Annual Water Depletions at LM Sites Within the San Juan River Subbasin (DOE 2019)

Site	Water Depletion (acre-feet)
Shiprock site: Groundwater pump and evaporate	*38.97
All sites: Groundwater well sampling	0.002
All sites: Potential well redevelopment	0.003
All sites: Surface water sampling	0.0001
Total	**38.98**

Note:
*Once the pond is out of operation, the 38.97 acre-feet depletion would no longer exist.

Table 2. Estimated Annual Water Depletions Associated with Proposed Pond Decommissioning

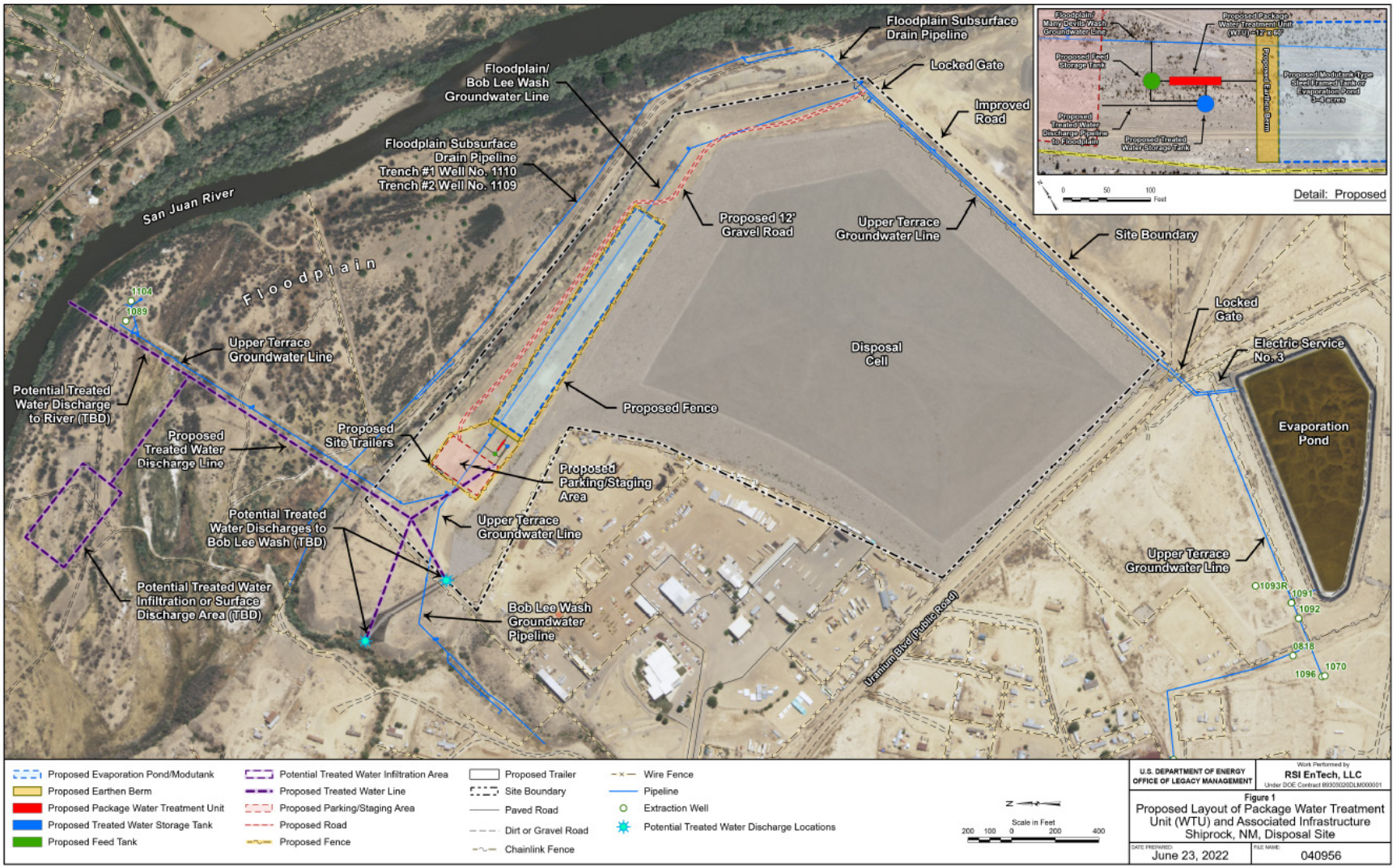
Activity	Description	Estimate of Water Required (acre-feet)
Use of site access roads	Fugitive dust control	13.26
Pond excavation	Fugitive dust control	2.76
Equipment decontamination	Decontamination	0.61
Pond sediment stabilization	Shotcrete application	0.61
Compaction water	Compaction and dust control water	1.53
20% Contingency	A 20% contingency buffer for unexpected situations, etc.	3.76
Total		**22.5**

Note:
Evaporation Pond decommissioning water depletions would only occur for the duration of the project. Upon project completion, water depletions would be far less because water would be returned to the San Juan River via the WTU. See Table 3 for estimated depletions with the WTU in operation.

1.2.2 WTU Project

LM proposes to replace the current Evaporation Pond's capability to treat up to 50 gallons per minute generated from pumping groundwater at and around the site with a new system. The WTU would consist of a package water treatment plant housed in one or more shipping containers. The WTU would generate at least 80% of the pumped groundwater of sufficient quality for infiltration or discharge to surface water. A concentrate or brine reject stream would be generated and is expected to be sent to an up to 4-acre Evaporation Pond or a shallow modular tank for evaporation, both of which would be lined. This proposed project is undergoing a separate National Environmental Policy Act (NEPA) review.

The proposed location and action area for the WTU is identified in Figure 6. The action area includes the west escarpment area adjacent to the northernmost point of the disposal cell, areas in the floodplain, and areas in the San Juan River adjacent to or downstream from the site. Access roads and road improvements would be required along the terrace for construction and WTU operations. Road improvements could include regrading, addition of road base or asphalt, and compacting.



Abbreviation: TBD = to be determined

Figure 6. Proposed Conceptual Layout of the Package WTU and Associated Infrastructure

The existing pipeline system would be entirely reused in the construction. The treated discharge point has not been determined at this stage but could be in any or all of the following: direct discharge to the San Juan River via waterline and outfall, discharge to the outfall drainage channel diversion that leads to the floodplain wetland via Bob Lee Wash, discharge directly to the ground surface in the floodplain and allowed to infiltrate, or discharged to an infiltration system and allowed to infiltrate. The discharge would comply with all applicable permits and water quality standards.

Dust control is anticipated daily throughout the installation of the WTU and associated infrastructure. Table 3 identifies the estimated annual water depletions associated with construction activities and operation of the WTU once installed. Note that construction of the WTU would occur before decommissioning of the Evaporation Pond so construction water usage for the two projects would not overlap. Water depletions associated with the generation of reject brine from the WTU would overlap with pond decommissioning activities and has been accounted for in overall water depletions for the two projects (see Table 4 in the next section).

Table 3. Estimated Annual Water Depletions Associated with the Proposed WTU

Activity	Description	Estimate of Water Required (acre-feet)
Construction	Fugitive dust suppression	3.68
Operation	Brine reject	11.29

Note:
Water depletions associated with construction of the WTU would be temporary. The brine reject water depletion would be ongoing as long as the WTU is in service.

1.2.3 Total Estimated Water Depletions for Both Projects

Although construction- and decommissioning-related water depletions for both projects would not overlap, there would be overlap in the ongoing water depletions associated with the brine reject from the proposed WTU and the water usage from the Evaporation Pond decommissioning project. Total annual water depletions for Evaporation Pond decommissioning were estimated at 22.5 acre-feet per year with a project duration of 16 months to several years. Water depletions associated with the WTU brine reject are estimated to be 11.29 acre-feet per year and would be ongoing as long as the WTU is in service. Total water depletions when accounting for both projects would remain below the 39.98 acre-feet evaluated in the 2019 BO as a minor depletion.

It is important to note that after construction of the WTU and decommissioning of the Evaporation Pond is complete, water depletions at the site would be greatly reduced with overall positive impacts to the San Juan River system because water that was previously evaporated would be returned to the system.

Table 4. Total Annual Water Depletions Associated with the Evaporation Pond and WTU Projects

Evaporation Pond decommissioning	22.5 acre-feet
WTU brine reject	11.29 acre-feet
Total	**33.8 acre-feet**

2.0 Impacts Analysis

2.1 Evaporation Pond Project

USFWS's Information for Planning and Consultation (IPaC) website was consulted on July 25, 2023, for the proposed work. Six listed species, one candidate species, and two critical habitats are identified for the Shiprock site: the southwestern willow flycatcher (*Empidonax traillii extimus*), yellow-billed cuckoo (*Coccyzus americanus*), Mancos milkvetch (*Astragalus humillimus*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), Mesa Verde cactus (*Sclerocactus mesae-verdae*); critical habitats for the Colorado pikeminnow and razorback sucker in the nearby San Juan River; and the candidate species, the monarch butterfly (*Danaus plexippus*). Species accounts were included in the 2019 BA (DOE 2019) and will not be repeated in this addendum.

In the 2019 BA, LM evaluated impacts to all the listed species and critical habitats for routine activities. The defined action area for the Evaporation Pond decommissioning (Figure 1) is included in the action area for routine activities evaluated in the 2019 BA. Evaporation Pond decommissioning activities also include a transportation component, but transportation activities are not expected to have any effect on federally listed species. The expected very low concentrations of radioactive material and other hazardous constituents in the Evaporation Pond waste pose very little risk, in general, to human health and the environment, even under accident conditions. Routine activities and the actions described in this addendum would have no effect on the southwestern willow flycatcher, yellow-billed cuckoo, or Mancos milkvetch because no habitat is present on or near the Shiprock site, or the species could be present only as transient birds. Effects to the Colorado pikeminnow, razorback sucker, and their critical habitats were addressed in the 2019 BO. USFWS's determination in the 2019 BO that the fish and their critical habitats may be affected but are not likely to be adversely affected by LM's actions would continue to apply because no new water depletions would occur. The Evaporation Pond alternatives were designed to avoid all potential habitat for the Mesa Verde cactus, so there would be no effect to this species. Although consultation is not required for candidate species, impacts to the monarch butterfly from the proposed work are unlikely because habitat, mainly in the form of milkweed plants (*Asclepias* spp.), is not present in the project area. Table 5 provides LM's determination of effect for species potentially present or potentially affected by site activities.

Table 5. Federally Listed Species Potentially Present or Potentially Affected by Site Activities

Species/Critical Habitat	Effect Determination	Rationale
Colorado pikeminnow	May affect, is not likely to adversely affect	Direct effects to the Colorado pikeminnow and razorback sucker are not expected because neither species exists at the site.
Razorback sucker	May affect, is not likely to adversely affect	Direct effects to the Colorado pikeminnow and razorback sucker are not expected because neither species exists at the site.
Colorado pikeminnow: Designated critical habitat	May affect, is not likely to adversely affect	Direct effects to designated critical habitat are not expected because the critical habitat is adjacent to, but not on, the site. Indirect effects to the fish species are possible through water depletion. The proposed water depletion meets the criteria for a minor depletion which would not jeopardize the continued existence of the Colorado pikeminnow.
Razorback sucker: Designated critical habitat	May affect, is not likely to adversely affect	Direct effects to designated critical habitat are not expected because the critical habitat is adjacent to, but not on the site. Indirect effects to the fish species are possible through water depletion. The proposed water depletion meets the criteria for a minor depletion which would not jeopardize the continued existence of the razorback sucker.
Mesa Verde cactus	No effect	The Evaporation Pond decommissioning is designed to avoid all suitable habitat.
Mancos milkvetch	No effect	No habitat is present on or near the Shiprock site.
Southwestern willow flycatcher	No effect	No habitat is present on or near the Shiprock site. The species could only be present as transient birds.
Yellow-billed cuckoo	No effect	No habitat is present on or near the Shiprock site. The species could only be present as transient birds.
Monarch butterfly	No effect	Impacts are unlikely because habitat, mainly in the form of milkweed plants (*Asclepias* spp.), is not present in the project area.

2.2 WTU Project

USFWS's IPaC website was consulted on July 25, 2023, for the proposed work. Six listed species, one candidate species, and two critical habitats are identified for the Shiprock site: the southwestern willow flycatcher (*Empidonax traillii extimus*), yellow-billed cuckoo (*Coccyzus americanus*), Mancos milkvetch (*Astragalus humillimus*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), Mesa Verde cactus (*Sclerocactus mesae-verdae*); critical habitats for the Colorado pikeminnow and razorback sucker in the nearby San Juan River; and the candidate species, the monarch butterfly (*Danaus plexippus*). Species accounts were included in the 2019 BA (DOE 2019) and will not be repeated in this addendum.

The defined action area for the proposed WTU (Figure 6) is included in the action area for routine activities evaluated in the 2019 BA.

Mesa Verde cactus is known to be present near the project area; however, the cactus would not be affected because potential habitat has been identified where no work is planned. Marginal foraging habitat for southwestern willow flycatchers has been identified on the floodplain, but there is no nesting habitat. The proposed action, due to its nature and scale, would not significantly affect foraging flycatchers if they are in the area.

The San Juan River contains critical habitats for the Colorado pikeminnow and razorback sucker, which could be affected by water depletions or adverse changes in water quality. Water depletions have been evaluated in the 2019 BA for the San Juan River basin, and a depletion of 3.68 acre-feet for construction of the WTU is unlikely to adversely affect the fish or their habitats. Water depletions associated with the WTU construction would occur at the same time as routine activities, however, water treated at the site is currently tracked and depletions over the 39.98 acre-feet evaluated in the 2019 BA would be avoided. Ongoing water depletions of 11.29 acre-feet resulting from the reject brine from the WTU are also unlikely to adversely affect the fish or their habitats. Water quality impacts would be minimal because water discharged into the river or groundwater in the floodplain would be treated to meet water quality standards.

The monarch butterfly is a candidate species dependent on milkweed. Small amounts of horsetail milkweed have been identified on the floodplain that could contain larval butterflies. Structures installed on the floodplain would be sited to avoid milkweed, or other avoidance or mitigation measures would be implemented to avoid adverse impacts to monarch butterflies. There is no habitat on or near the project area for the remaining species identified on the IPaC website. Table 6 provides LM's determination of effect for species potentially present or potentially affected by site activities.

Table 6. Federally Listed Species Potentially Present or Potentially Affected by Site Activities

Species/Critical Habitat	Effect Determination	Rationale
Southwestern willow flycatchers	No effect	Marginal foraging habitat is within the proposed project area but there is no nesting habitat.
Yellow-billed cuckoo	No effect	No habitat is present on or near the Shiprock site. The species could only be present as transient birds.
Monarch butterfly	No effect	Potential habitat is within the project area, but milkweed plants would be avoided.
Mancos milkvetch	No effect	No habitat is present on or near the Shiprock site.
Colorado pikeminnow	May affect, is not likely to adversely affect	Direct effects to the Colorado pikeminnow and razorback sucker are not expected because neither species exists at the site.
Razorback sucker	May affect, is not likely to adversely affect	Direct effects to the Colorado pikeminnow and razorback sucker are not expected because neither species exists at the site.
Colorado pikeminnow: Designated critical habitat	May affect, is not likely to adversely affect	Direct effects to designated critical habitat are not expected because the critical habitat is adjacent to, but not on, the LM site. Indirect effects to the fish species are possible through water depletion. The proposed water depletion meets the criteria for a minor depletion which would not jeopardize the continued existence of the Colorado pikeminnow.
Razorback sucker: Designated critical habitat	May affect, is not likely to adversely affect	Direct effects to designated critical habitat are not expected because the critical habitat is adjacent to, but not on the site. Indirect effects to the fish species are possible through water depletion. The proposed water depletion meets the criteria for a minor depletion which would not jeopardize the continued existence of the razorback sucker.
Mesa Verde cactus	No effect	The WTU installation is designed to avoid all suitable habitat.

3.0 Conclusions

LM has determined that, in accordance with the 2019 BO, the Colorado pikeminnow, razorback sucker, and their critical habitats may be affected but are not likely to be adversely affected by the proposed actions at the Shiprock site. Water depletions associated with the Evaporation Pond decommissioning activity as well as installation and operation of the WTU are already accounted for in the 2019 BO and qualify as minor depletions. Installation of the WTU would be designed and engineered to avoid any potential impacts to federally or tribally listed threatened or endangered species or their designated critical habitat. Although new actions described in this addendum would have no effect on the Mesa Verde cactus, routine actions would continue. In the 2019 BO, USFWS concurred with LM's determination that the Mesa Verde cactus may be affected but is not likely to be adversely affected by routine actions at the Shiprock site, so the overall determination has not changed.

4.0 References

Carrizo (Carrizo Mountain Environmental & Herbarium, Inc.), 2021. *Mesa Verde Cactus Survey Report in Relation to the Evaporation Pond Decommissioning and Construction Alternatives*, Shiprock, New Mexico, Disposal Site, prepared for RSI EnTech, LLC, May.

DOE (U.S. Department of Energy), 2019. *Programmatic Biological Assessment of Threatened and Endangered Species for the U.S. Department of Energy Office of Legacy Management Activities at Sites in the San Juan River Subbasin,* LMS/S17239, Rev. 1, Office of Legacy Management, October.

DOE (U.S. Department of Energy), 2023. *Environmental Assessment for the Evaporation Pond at the Shiprock, New Mexico, Disposal Site*, DOE/EA-2195, Office of Legacy Management, July.

DOE Order 458.1 Chg 4 (LtdChg), *Radiation Protection of the Public and the Environment*, U.S. Department of Energy, September 15, 2020.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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September 18, 2023

Cons. # 2023-0108702

Joni Tallbull, Shiprock Site Manager
United States Department of Energy
Office of Legacy Management
PO Box 4528
Shiprock, NM 87420

Dear Ms. Tallbull,

Thank you for your August 8, 2023, letter reinitiating consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (ESA), for the U.S. Department of Energy (DOE) Office of Legacy Management (LM) Project for routine long-term surveillance and maintenance activities at LM sites in the San Juan River Basin (Cons.#02ENNM00-2019-F-0083). Your letter included a Biological Assessment (BA) addendum dated July 2023, which analyzed the effect of the proposed actions: 1) decommissioning of the site evaporation pond and 2) installation of a water treatment unit (Project). DOE has determined that the proposed Project "may affect, is not likely to adversely affect" the endangered Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen taxanus*), and their critical habitats, and the threatened Mesa Verde cactus (*Sclerocactus mesae-verdae*). Your BA defined routine activities as groundwater and surface water monitoring, annual site inspections, maintenance, operations related to groundwater treatment, and natural gas well monitoring. These activities occur at six sites in the San Juan River Basin: Durango disposal site (DS), Durango processing site (PS), Gasbuggy site, Shiprock DS, Monument Valley PS and Mexican Hat DS. Shiprock disposal site includes a historic minor depletion of 39.98 acre-feet/year.

Mesa Verde Cactus

DOE made an effects determination for the proposed action of "may affect, is not likely to adversely affect" the Mesa Verde cactus. We concur with your determination as any affects are likely to be insignificant with vehicles staying on existing roads during sampling events and monitoring wells located adjacent to Mesa Verde cactus habitat will only be sampled via limited foot traffic a few times a year. Our conclusion has not changed based on the 2023 addendum.

Colorado Pikeminnow and Razorback Sucker

We concur with the "may affect, not likely to adversely affect" determination to the Colorado pikeminnow and razorback sucker resulting from all routine maintenance activities, pond decommissioning activities, installation of a water treatment unit and associated water depletion described in your 2019 BA and 2023 BA addendum for the reasons described below.

As previously, mentioned in our letter dated March 8, 2019 (Cons.#02ENNM00-2019-F-0083), the depletion amount of 39.98 acre-feet/year of water resulting from routine maintenance activities qualifies as a "minor" depletion under the San Juan River Basin Recovery Implementation Program and is covered under the minor depletion consultation. The change in action of decommissioning the evaporation pond where groundwater would no longer be used for the pond and alternatively used for dust suppression and other listed construction activities depleting up to 22.5 acre-feet/year with an added 11.29 acre-feet/year associated with the water treatment unit brine reject, brings the total depletion amount to 33.8 acre-feet/year. The water depletion associated with decommissioning the evaporation pond would only occur for the duration of 16 months to several years; upon completion, water depletions would only be ongoing for the brine reject water for as long as the water treatment unit is in service. This lower water depletion amount of 33.8 acre-feet/year does not change our assessment in the March 8, 2019 letter. Since the proposed depletion meets the criteria for a "minor" depletion, it is our conclusion that the Project is not likely to jeopardize the continued existence of the Colorado pikeminnow and razorback sucker. Additionally, we conclude that the proposed Project does not result in the destruction or adverse modification of designated critical habitat for the Colorado pikeminnow and razorback sucker in the San Juan River basin.

This concludes section 7 consultation of the ESA for DOE's Legacy Management Project. Please contact our office if: 1) new information reveals changes to the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, 2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not previously considered, or 3) a new species is listed, or critical habitat designated that may be affected by the action.

Thank you for your concern for endangered species and New Mexico's wildlife habitats. In future correspondence about this project, please refer to Consultation Number (2023-0108702). If we can be of further assistance, please contact Raphaela Ware of my staff at raphaela_ware@fws.gov or (505)761-4753.

Sincerely,

SHAWN SARTORIUS

Digitally signed by SHAWN SARTORIUS
Date: 2023.09.18 13:58:00 -06'00'

Shawn Sartorius
Field Supervisor

ecc:
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division, Santa Fe, New Mexico
National Species Lead Biologist (Colorado pikeminnow), Upper Colorado River Endangered Fish Recovery Program, Lakewood, Colorado
National Species Lead Biologist (Razorback sucker), Upper Colorado River Endangered Fish Recovery Program, Lakewood, Colorado
Regional Species Lead Biologist (Mesa Verde Cactus), U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, New Mexico
Program Coordinator, U.S. Fish and Wildlife Service, San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico
Program Biologist, U.S. Fish and Wildlife Service, San Juan River Basin Recovery Implementation Program, Albuquerque, New Mexico

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APPENDIX E:
SAMPLING AND ANALYSIS RESULTS FOR THE SHIPROCK EVAPORATION POND DECOMMISSIONING PROJECT NOVEMBER 2022

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SYS_LOC_CODE	SYS_SAMPLE_CODE	SAMPLE_DATE	SAMPLE_TYPE_CODE	MATRIX_CODE	PARENT_SAMPLE_CODE	ANALYTIC_METHOD	ANALYSIS_DATE	FRACTION	DILUTION_FACTOR	CAS_RN	CHEMICAL_NAME	REPORT_RESULT_VALUE	REPORT_METHOD_DETECTION_LIMIT	REPORT_REPORTING_LIMIT	REPORT_QUANTITATION_LIMIT	REPORTABLE_RESULT	DETECT_FLAG	INTERPRETED_QUALIFIERS	LAB_QUALIFIERS	RESULT_UNIT	VALIDATED_YN
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	11.9				Yes	Y			pCi/g	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	329000	18300	55200		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	EPA 9056	12/6/2022	N	10000	16887-00-6	Chloride	33800	9930	27600		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	EPA 9056	12/6/2022	N	10000	NITRATE AS N	Nitrate as Nitrogen	17800	4550	13800		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	22.8	22.8	69.0		Yes	N	J	U	mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	32000	10.8	38.2		Yes	Y			mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	29.2	0.255	1.27		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	4490	8.15	31.9		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	164	0.127	0.637		Yes	Y	J	N	mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	2.17	0.51	2.55		Yes	Y	J	B	mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	123000	89.2	319		Yes	Y			mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	6950	204	637		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N	J	UN	mg/L	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.044	0.01	0.0500		Yes	Y	J	BN	mg/L	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.0115	0.01	0.100		Yes	Y		B	mg/L	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	1.17	0.06	0.300		Yes	Y			mg/L	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.128	0.128	0.511		Yes	N		U	mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.432	0.432	1.28		Yes	N		U	mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	1.63	0.128	1.02		Yes	Y			mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0256	0.0256	0.256		Yes	N		U	mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	24.7	0.0169	0.0511		Yes	Y	J	N	mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	19.2	0.46	1.28		Yes	Y			mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.00991	0.00991	0.0296		Yes	N		U	mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW-846 9045	12/15/2022	N	1	PH	pH	7.36	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	4.48		1.00		Yes	Y	J		pCi/g	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	4.42		1.00		Yes	Y			pCi/g	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	0.302		1.00		Yes	Y	J		pCi/g	Y
7006	SHP02-02.2301003-001	11/29/2022	D	SEDIMENT	SHP02-02.2301003-008	EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	7.32		4.00		Yes	Y	J		pCi/g	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	18.7		4.00		Yes	Y			pCi/g	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	19.1		10.0		Yes	Y			pCi/g	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	579000	32400	97400		Yes	Y	J		mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	16887-00-6	Chloride	18100	877	2430		Yes	Y	J		mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	NITRATE AS N	Nitrate as Nitrogen	12000	402	1220		Yes	Y	J		mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	40.2	40.2	122		Yes	N	J	U	mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0119	0.01	0.0500		Yes	Y		B	mg/L	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0281	0.01	0.0500		Yes	Y		BN	mg/L	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.013	0.01	0.100		Yes	Y		B	mg/L	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	0.894	0.06	0.300		Yes	Y			mg/L	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	37700	18.7	66.0		Yes	Y			mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	31.3	0.44	2.20		Yes	Y			mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	4940	14.1	55.0		Yes	Y			mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	135	0.22	1.10		Yes	Y		N	mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	2.68	0.88	4.40		Yes	Y		B	mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	244000	154	550		Yes	Y			mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	5770	352	1100		Yes	Y			mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.212	0.212	0.847		Yes	N		U	mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.715	0.715	2.12		Yes	N		U	mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	1.83	0.212	1.69		Yes	Y			mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0423	0.0423	0.423		Yes	N		U	mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	37.1	0.0279	0.0847		Yes	Y		N	mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	34.7	0.762	2.12		Yes	Y			mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0191	0.0191	0.0571		Yes	N		U	mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW-846 9045	12/12/2022	N	1	PH	pH	7.61	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	12.6		1.00		Yes	Y			pCi/g	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	10.3		1.00		Yes	Y			pCi/g	Y
7000	SHP02-02.2301003-002	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	0.666		1.00		Yes	Y			pCi/g	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	23.7		4.00		Yes	Y			pCi/g	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	29.2		10.0		Yes	Y			pCi/g	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	520000	30600	91900		Yes	Y	J		mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	16887-00-6	Chloride	20100	827	2300		Yes	Y	J		mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	NITRATE AS N	Nitrate as Nitrogen	13300	379	1150		Yes	Y	J		mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	37.9	37.9	115		Yes	N	J	U	mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0141	0.01	0.0500		Yes	Y		B	mg/L	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0683	0.01	0.0500		Yes	Y		N	mg/L	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.01	0.01	0.100		Yes	N		U	mg/L	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	1.28	0.06	0.300		Yes	Y			mg/L	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	40400	17.4	61.4		Yes	Y			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	78.7	0.41	2.05		Yes	Y			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	5870	13.1	51.2		Yes	Y			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	208	0.205	1.02		Yes	Y		N	mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	5.05	0.819	4.10		Yes	Y			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	200000	143	512		Yes	Y			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	10100	328	1020		Yes	Y			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.22	0.219	0.877		Yes	Y		B	mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.741	0.741	2.19		Yes	N		U	mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	4.42	0.219	1.75		Yes	Y			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0439	0.0439	0.439		Yes	N		U	mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	29.5	0.0289	0.0877		Yes	Y		N	mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	32.3	0.789	2.19		Yes	Y			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0188	0.0188	0.0561		Yes	N		U	mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW-846 9045	12/12/2022	N	1	PH	pH	7.62	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	19.2		1.00		Yes	Y			pCi/g	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	17.1		1.00		Yes	Y			pCi/g	Y
7001	SHP02-02.2301003-003	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	1.04		1.00		Yes	Y			pCi/g	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	42		4.00		Yes	Y			pCi/g	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	51.7		10.0		Yes	Y			pCi/g	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	230000	21600	64900		Yes	Y	J		mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	16887-00-6	Chloride	33800	11700	32500		Yes	Y	J		mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	NITRATE AS N	Nitrate as Nitrogen	16300	5360	16200		Yes	Y	J		mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	26.8	26.8	81.2		Yes	N	J	U	mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0202	0.01	0.0500		Yes	Y		B	mg/L	Y

7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0767	0.01	0.0500		Yes	Y		N	mg/L	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.0149	0.01	0.100		Yes	Y		B	mg/L	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	0.704	0.06	0.300		Yes	Y			mg/L	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	17600	11.8	41.6		Yes	Y			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	261	0.278	1.39		Yes	Y			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	14.1	0.555	2.78		Yes	Y			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	148000	97.1	347		Yes	Y			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-09-7	Potassium	2320	178	694		Yes	Y			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-24-6	Strontium	1280	2.78	13.9		Yes	Y		N	mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	84100	222	694		Yes	Y			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.281	0.153	0.612		Yes	Y		B	mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.517	0.517	1.53		Yes	N		U	mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	6.88	0.153	1.22		Yes	Y			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0306	0.0306	0.306		Yes	N		U	mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	32.7	0.0202	0.0612		Yes	Y		N	mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	26.8	0.551	1.53		Yes	Y			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0118	0.0118	0.0351		Yes	N		U	mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW-846 9045	12/12/2022	N	1	PH	pH	8.41	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/14/2022	T	1	11-08-5	URANIUM-233,-234	18.7		1.00		Yes	Y			pCi/g	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/14/2022	T	1	7440-61-1	Uranium	16.4		1.00		Yes	Y			pCi/g	Y
7002	SHP02-02.2301003-004	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/14/2022	T	1	U-235+236	Uranium-235/236	0.948		1.00		Yes	Y			pCi/g	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	5.92		4.00		Yes	Y	J		pCi/g	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	5.85		10.0		Yes	Y			pCi/g	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	378000	20800	62500		Yes	Y	J		mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	16887-00-6	Chloride	32200	11200	31200		Yes	Y	J		mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	NITRATE AS N	Nitrate as Nitrogen	10100	258	781		Yes	Y	J		mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	25.8	25.8	78.1		Yes	N	J	U	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0126	0.01	0.0500		Yes	Y		B	mg/L	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0276	0.01	0.0500		Yes	Y		BN	mg/L	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.01	0.01	0.100		Yes	N		U	mg/L	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	0.995	0.06	0.300		Yes	Y			mg/L	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	27000	11.3	39.8		Yes	Y			mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	15.6	0.265	1.33		Yes	Y			mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	2790	8.5	33.2		Yes	Y			mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	92.7	0.133	0.664		Yes	Y		N	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	1.1	0.531	2.65		Yes	Y		B	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	156000	92.9	332		Yes	Y			mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	4480	212	664		Yes	Y			mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.151	0.151	0.606		Yes	N		U	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.512	0.512	1.51		Yes	N		U	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	0.741	0.151	1.21		Yes	Y		B	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0303	0.0303	0.303		Yes	N		U	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	17.3	0.02	0.0606		Yes	Y		N	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	22.4	0.545	1.51		Yes	Y			mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0122	0.0122	0.0363		Yes	N		U	mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW-846 9045	12/12/2022	N	1	PH	pH	7.48	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	4.74		1.00		Yes	Y			pCi/g	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	4.33		1.00		Yes	Y			pCi/g	Y
7003	SHP02-02.2301003-005	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	0.269		1.00		Yes	N		U	pCi/g	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	12.1		4.00		Yes	Y			pCi/g	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	16.3		10.0		Yes	Y			pCi/g	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	495000	21600	64800		Yes	Y	J		mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	16887-00-6	Chloride	14600	583	1620		Yes	Y	J		mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	NITRATE AS N	Nitrate as Nitrogen	10200	267	810		Yes	Y	J		mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	100	14797-65-0	Nitrite	53.5	53.5	162		Yes	N	J	U	mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0124	0.01	0.0500		Yes	Y		B	mg/L	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0302	0.01	0.0500		Yes	Y		BN	mg/L	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.01	0.01	0.100		Yes	N		U	mg/L	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	0.733	0.06	0.300		Yes	Y			mg/L	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	43200	13.4	47.4		Yes	Y			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	206	0.316	1.58		Yes	Y			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	3940	10.1	39.5		Yes	Y			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	912	0.158	0.790		Yes	Y		N	mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	11.8	0.632	3.16		Yes	Y			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	165000	111	395		Yes	Y			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	40300	253	790		Yes	Y			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.245	0.163	0.651		Yes	Y		B	mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.55	0.55	1.63		Yes	N		U	mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	4.38	0.163	1.30		Yes	Y			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-43-9	Cadmium	0.0326	0.0326	0.326		Yes	N		U	mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	24.6	0.0215	0.0651		Yes	Y		N	mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	23.5	0.586	1.63		Yes	Y			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0134	0.0134	0.0400		Yes	N		U	mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW-846 9045	12/12/2022	N	1	PH	pH	8.26	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	9.49		1.00		Yes	Y			pCi/g	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	8.74		1.00		Yes	Y			pCi/g	Y
7004	SHP02-02.2301003-006	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	0.546		1.00		Yes	Y			pCi/g	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	7.72		4.00		Yes	Y	J		pCi/g	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	9.25		10.0		Yes	Y			pCi/g	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	553000	29200	87700		Yes	Y	J		mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	16887-00-6	Chloride	51400	15800	43900		Yes	Y	J		mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	NITRATE AS N	Nitrate as Nitrogen	26400	7240	21900		Yes	Y	J		mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	36.2	36.2	110		Yes	N	J	U	mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0234	0.01	0.0500		Yes	Y		BN	mg/L	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.01	0.01	0.100		Yes	N		U	mg/L	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	0.964	0.06	0.300		Yes	Y	J		mg/L	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	43600	18.1	63.9		Yes	Y			mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	16.3	0.426	2.13		Yes	Y			mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	4840	13.6	53.2		Yes	Y			mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	126	0.213	1.06		Yes	Y		N	mg/kg	Y

7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	1.06	0.852	4.26		Yes	Y		B	mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	225000	149	532		Yes	Y			mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	4960	341	1060		Yes	Y			mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.225	0.225	0.900		Yes	N		U	mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.761	0.761	2.25		Yes	N		U	mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	0.886	0.225	1.80		Yes	Y		B	mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.045	0.045	0.450		Yes	N		U	mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	21.5	0.0297	0.0900		Yes	Y		N	mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	28.8	0.81	2.25		Yes	Y			mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0169	0.0169	0.0504		Yes	N		U	mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW-846 9045	12/15/2022	N	1	PH	pH	7.91	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	5.58		1.00		Yes	Y			pCi/g	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	4.44		1.00		Yes	Y			pCi/g	Y
7005	SHP02-02.2301003-007	11/30/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	0.379		1.00		Yes	Y	J		pCi/g	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	10.9		4.00		Yes	Y			pCi/g	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	8.34		10.0		Yes	Y			pCi/g	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	387000	20700	62100		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	16887-00-6	Chloride	11200	559	1550		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	NITRATE AS N	Nitrate as Nitrogen	7410	256	777		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	25.6	25.6	77.7		Yes	N	J	U	mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0122	0.01	0.0500		Yes	Y		B	mg/L	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0385	0.01	0.0500		Yes	Y		BN	mg/L	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.01	0.01	0.100		Yes	N		U	mg/L	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	0.948	0.06	0.300		Yes	Y			mg/L	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	43100	12.2	43.0		Yes	Y			mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	40.8	0.287	1.43		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	3160	9.17	35.8		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	335	0.143	0.717		Yes	Y	J	N	mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	3.05	0.573	2.87		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	143000	100	358		Yes	Y			mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	1900	229	717		Yes	Y	J		mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.149	0.149	0.594		Yes	N		U	mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.502	0.502	1.49		Yes	N		U	mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	1.25	0.149	1.19		Yes	Y			mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0297	0.0297	0.297		Yes	N		U	mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	28.6	0.0196	0.0594		Yes	Y		N	mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	21.4	0.535	1.49		Yes	Y			mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0121	0.0121	0.0361		Yes	N		U	mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW-846 9045	12/15/2022	N	1	PH	pH	7.26	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	6.17		1.00		Yes	Y	J		pCi/g	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	5.18		1.00		Yes	Y			pCi/g	Y
7006	SHP02-02.2301003-008	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	0.46		1.00		Yes	Y			pCi/g	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	20.8		4.00		Yes	Y			pCi/g	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	48.3		10.0		Yes	Y			pCi/g	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	450000	27100	81600		Yes	Y	J		mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	33.6	33.6	102		Yes	N	J	U	mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	16887-00-6	Chloride	24300	734	2040		Yes	Y	J		mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	NITRATE AS N	Nitrate as Nitrogen	16100	336	1020		Yes	Y	J		mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0138	0.01	0.0500		Yes	Y		B	mg/L	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0545	0.01	0.0500		Yes	Y		N	mg/L	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.013	0.01	0.100		Yes	Y		B	mg/L	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	0.712	0.06	0.300		Yes	Y			mg/L	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	33100	15.1	53.2		Yes	Y			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	96.8	0.355	1.77		Yes	Y			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	7.88	0.71	3.55		Yes	Y			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	124000	124	444		Yes	Y			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-09-7	Potassium	3990	227	887		Yes	Y			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-24-6	Strontium	1030	3.55	17.7		Yes	Y		N	mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	88700	284	887		Yes	Y			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.296	0.184	0.736		Yes	Y		B	mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.622	0.622	1.84		Yes	N		U	mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	5.05	0.184	1.47		Yes	Y			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0368	0.0368	0.368		Yes	N		U	mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	37.3	0.0243	0.0736		Yes	Y		N	mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	22	0.663	1.84		Yes	Y			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.014	0.014	0.0418		Yes	N		U	mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW-846 9045	12/15/2022	N	1	PH	pH	7.48	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	13.2		1.00		Yes	Y			pCi/g	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	11.8		1.00		Yes	Y			pCi/g	Y
7007	SHP02-02.2301003-009	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	1.09		1.00		Yes	Y			pCi/g	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	14.1		4.00		Yes	Y			pCi/g	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	15.6		10.0		Yes	Y			pCi/g	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	429000	22900	69000		Yes	Y	J		mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	16887-00-6	Chloride	36200	12400	34500		Yes	Y	J		mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	NITRATE AS N	Nitrate as Nitrogen	17800	5690	17300		Yes	Y	J		mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	28.5	28.5	86.3		Yes	N	J	U	mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0131	0.01	0.0500		Yes	Y		B	mg/L	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0489	0.01	0.0500		Yes	Y		BN	mg/L	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.01	0.01	0.100		Yes	N		U	mg/L	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	1.75	0.06	0.300		Yes	Y			mg/L	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	27200	13.6	48.1		Yes	Y			mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	49.3	0.321	1.60		Yes	Y			mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	3340	10.3	40.1		Yes	Y			mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	445	0.16	0.802		Yes	Y		N	mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	3.32	0.642	3.21		Yes	Y			mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	179000	112	401		Yes	Y			mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	21500	257	802		Yes	Y			mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.167	0.167	0.670		Yes	N		U	mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.566	0.566	1.67		Yes	N		U	mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	2.03	0.167	1.34		Yes	Y			mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0335	0.0335	0.335		Yes	N		U	mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	35.9	0.0221	0.0670		Yes	Y		N	mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	23.4	0.603	1.67		Yes	Y			mg/kg	Y

7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0138	0.0138	0.0413		Yes	N		U	mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW-846 9045	12/15/2022	N	1	PH	pH	7.29	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	10.2		1.00		Yes	Y			pCi/g	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	8.65		1.00		Yes	Y			pCi/g	Y
7008	SHP02-02.2301003-010	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	0.921		1.00		Yes	Y			pCi/g	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	18.1		4.00		Yes	Y			pCi/g	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	21.3		10.0		Yes	Y			pCi/g	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	590000	29100	87600		Yes	Y	J		mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	16887-00-6	Chloride	21100	789	2190		Yes	Y	J		mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	500	NITRATE AS N	Nitrate as Nitrogen	1410	361	1100		Yes	Y	J		mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	100	14797-65-0	Nitrite	72.3	72.3	219		Yes	N	J	U	mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0146	0.01	0.0500		Yes	Y		B	mg/L	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0514	0.01	0.0500		Yes	Y		N	mg/L	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.01	0.01	0.0500		Yes	N		U	mg/L	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.01	0.01	0.100		Yes	N		U	mg/L	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	1.61	0.06	0.300		Yes	Y			mg/L	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	42100	17.4	61.5		Yes	Y			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	112	0.41	2.05		Yes	Y			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	5440	13.1	51.3		Yes	Y			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	537	0.205	1.03		Yes	Y		N	mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	7.73	0.821	4.10		Yes	Y			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	200000	144	513		Yes	Y			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	22700	328	1030		Yes	Y			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	0.185	0.185	0.741		Yes	N		U	mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.626	0.626	1.85		Yes	N		U	mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	3.67	0.185	1.48		Yes	Y			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.037	0.037	0.370		Yes	N		U	mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	50.6	0.0244	0.0741		Yes	Y		N	mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	31.5	0.667	1.85		Yes	Y			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0156	0.0156	0.0465		Yes	N		U	mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW-846 9045	12/15/2022	N	1	PH	pH	7.16	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	15.2		1.00		Yes	Y			pCi/g	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	13.5		1.00		Yes	Y			pCi/g	Y
7009	SHP02-02.2301003-011	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	1.12		1.00		Yes	Y			pCi/g	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-46-1	Gross Alpha	17.9		4.00		Yes	Y			pCi/g	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		EPA 900.0/EPA 9310	12/14/2022	T	1	12587-47-2	Gross Beta	26		10.0		Yes	Y			pCi/g	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	14808-79-8	Sulfate	517000	27400	82400		Yes	Y	J		mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	16887-00-6	Chloride	43400	14800	41200		Yes	Y	J		mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		EPA 9056	12/6/2022	N	10000	NITRATE AS N	Nitrate as Nitrogen	20900	6800	20600		Yes	Y	J		mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		EPA 9056	12/7/2022	N	50	14797-65-0	Nitrite	34	34.0	103		Yes	N	J	U	mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7439-92-1	Lead	0.033	0.033	0.200		Yes	N		UN	mg/L	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-22-4	Silver	0.0176	0.01	0.0500		Yes	Y		B	mg/L	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-38-2	Arsenic	0.05	0.05	0.300		Yes	N		U	mg/L	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-39-3	Barium	0.0722	0.01	0.0500		Yes	Y		N	mg/L	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-43-9	Cadmium	0.0123	0.01	0.0500		Yes	Y		B	mg/L	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7440-47-3	Chromium	0.01	0.01	0.100		Yes	N		U	mg/L	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW846 6010	12/14/2022	T	1	7782-49-2	Selenium	0.682	0.06	0.300		Yes	Y			mg/L	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-95-4	Magnesium	53400	17.1	60.4		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7439-96-5	Manganese	288	0.402	2.01		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-09-7	Potassium	6800	12.9	50.3		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-24-6	Strontium	586	0.201	1.01		Yes	Y		N	mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	1	7440-66-6	Zinc	21.5	0.805	4.02		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6010	12/13/2022	T	10	7440-23-5	Sodium	122000	141	503		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6010	12/14/2022	T	20	7440-70-2	Calcium	29200	322	1010		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7439-92-1	Lead	1.03	0.186	0.744		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-38-2	Arsenic	0.688	0.629	1.86		Yes	Y		B	mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-39-3	Barium	19.7	0.186	1.49		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6020	12/7/2022	T	2	7440-43-9	Cadmium	0.0633	0.0372	0.372		Yes	Y		B	mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7440-61-1	Uranium	49.9	0.0246	0.0744		Yes	Y		N	mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 6020	12/8/2022	T	2	7782-49-2	Selenium	26.6	0.67	1.86		Yes	Y			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 7470A	12/8/2022	T	1	7439-97-6	Mercury	0.00067	0.00067	0.00200		Yes	N		U	mg/L	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 7471	12/12/2022	T	1	7439-97-6	Mercury	0.0164	0.0164	0.0489		Yes	N		U	mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 9012	12/14/2022	N	1	CNRCT	Reactive Cyanide	25000				Yes	N			mg/kg	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW-846 9045	12/15/2022	N	1	PH	pH	7.38	0.0100	0.100		Yes	Y	J	H	s.u.	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		SW8461020A	12/16/2022	N	1	FLASH-140	Flashpoint-140		75.0	75.0		Yes	Y	J		F	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	11-08-5	URANIUM-233,-234	17		1.00		Yes	Y			pCi/g	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	7440-61-1	Uranium	15.2		1.00		Yes	Y			pCi/g	Y
7010	SHP02-02.2301003-012	11/29/2022	F	SEDIMENT		U-02-RC MODIFIED	12/13/2022	T	1	U-235+236	Uranium-235/236	1.12		1.00		Yes	Y			pCi/g	Y

APPENDIX F:
AIR EMISSION CALCULATIONS

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Nonradiological Air Emissions and Standards

Under the Clean Air Act of 1970 (42 USC 7401), the U.S. Environmental Protection Agency (EPA) establishes National Ambient Air Quality Standards (NAAQS) for common air pollutants known as criteria pollutants. NAAQS exist for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter less than or equal to 10 microns in diameter (PM_{10}), particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead. NAAQS represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare and include a reasonable margin of safety to protect the more sensitive individuals in the population. Units of concentration for the NAAQS are generally expressed in parts per million or micrograms per cubic meter.

The Clean Air Act establishes air quality planning processes and requires states to develop a State Implementation Plan that details how they will maintain the NAAQS or attain a standard in a nonattainment area within mandated time frames. In New Mexico, EPA has delegated authority to the New Mexico Environment Department Air Quality Bureau to enforce air quality regulations, excluding Tribal lands. The Air Quality Bureau enforces the NAAQS and state ambient air quality standards by monitoring air quality, developing rules to regulate and to permit stationary sources of air emissions, and contributing to air quality attainment planning processes statewide. Within the Navajo Nation, the Navajo Nation Environmental Protection Agency manages air quality, although EPA is the permitting authority for stationary sources of emissions.

In addition to criteria pollutants, EPA also regulates hazardous air pollutants (HAPs) that are known or are suspected to cause serious health effects or adverse environmental effects. HAPs are emitted from a range of industrial facilities and vehicles. Examples of HAPs include hydrocarbons such as benzene, certain metals including lead and mercury, and mineral fibers such as asbestos. EPA sets Federal regulations to reduce HAP emissions from stationary sources in the National Emission Standards for Hazardous Air Pollutants (NESHAP) (EPA, 2021). A "major" source of HAPs is defined as any stationary facility or source that directly emits, or has the potential to emit, 10 tons per year or more of any HAP, or 25 tons per year or more of combined HAPs.

Ozone is formed in the atmosphere by photochemical reactions of previously emitted pollutants called precursors. Ozone precursors are mainly nitrogen oxides and photochemically reactive volatile organic compounds (VOCs). In the presence of solar radiation, the maximum effect of precursor emissions on ozone levels usually occurs several hours after they are emitted and many miles from their source. Ozone concentrations are highest during the warmer months of the year and coincide with the period of maximum insolation. Inert pollutants tend to have the highest concentrations during the colder months of the year, when light winds and nighttime or early morning surface-based temperature inversions inhibit atmospheric dispersion.

Greenhouse Gases (GHGs) and Climate Change

It is well documented that the Earth's climate has fluctuated throughout its history. Recent scientific evidence indicates a correlation between increasing global temperatures over the past century and the worldwide proliferation of greenhouse gas (GHG) emissions by mankind. Climate change associated with this global warming is predicted to produce negative environmental, economic, and social consequences across the globe (Intergovernmental Panel on Climate Change, 2021; USGCRP, 2018).

Observed changes due to global warming include rising temperatures, shrinking glaciers and sea

ice, thawing permafrost, sea level rise, a lengthened growing season, and shifts in plant and animal ranges. In the Southwest region (e.g., Arizona, California, Colorado, Nevada, New Mexico, and Utah), observed changes include an increase in drought and wildfire conditions, a reduction in winter snowpack, and lower stream flows in major drainage basins (USGCRP, 2017). Recent assessments of climate change conclude that global warming will continue into the foreseeable future and will intensify as a function of anthropogenic greenhouse gas emissions and changes in land uses.

The most common GHGs emitted from natural processes and human activities include carbon dioxide, methane, and nitrous oxide. Each GHG is assigned a global warming potential (GWP) that equates to the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is normalized to carbon dioxide, which has a value of one. To simplify GHG analyses, total GHG emissions from a source are often expressed as a carbon dioxide equivalent, which is calculated by multiplying the emissions of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. While methane and nitrous oxide have much higher GWPs than carbon dioxide, it is emitted in such greater quantities that it is the overwhelming contributor to global carbon dioxide equivalent emissions from both natural processes and human activities.

Federal agencies address emissions of GHGs by reporting and meeting reductions mandated in Federal laws, executive orders, and agency policies. On January 9, 2023, the Council on Environmental Quality released interim guidance that describes how Federal agencies should consider the effects of GHGs and climate change in their National Environmental Policy Act reviews (CEQ, 2023). The interim guidance explains that agencies should (1) consider the potential effects of project alternatives on climate change, as indicated by its estimated GHG emissions, (2) determine the social cost of project GHGs, (3) determine project consistency with GHG plans and goals, (4) consider mitigations that will reduce project GHGs, (6) consider impacts to environmental justice communities, and (7) consider adaptation measures that would make the actions and affected communities more resilient to the effects of climate change. The Council on Environmental Quality intends to revise the guidance in response to public comments or to finalize the interim guidance in the near future. Section 3.14 presents the cumulative impact analysis of project GHGs.

Table Index

Table A-1. On-Road Vehicle Activity Data for the Shiprock Project Onsite Work

Construction Activity/Vehicle Type	Trips per Day	Total Work Days	Total Trips	Miles/Round Trip		Total Miles	
				On-site	Off-site	On-site	Off-site
Evaporation Pond Early Work							
Pick-up Truck		110		80		8,800	
Water Truck - 4,000 Gallon		110		40		4,400	
Concrete Truck			75	2	62	150	4,650
Delivery Truck - Misc.	3	60	196	1.5	62	294	12,152
Delivery Truck - Fuel	1	110	110	1.5	62	165	6,820
Mechanic Truck		110		20		2,200	
Delivery Truck - Equipment			20	1.5	100	30	2,000
Honey Wagon			9	1.5	30	14	270
Trash truck			11	1.5	100	17	1,100
Worker Commuter Vehicles	20	110	2,200	1.5	100	3,300	220,000
Excavation at the Pond							
Pick-up Truck		220		80		17,600	
Delivery Truck - Fuel	2	220	440	1.5	62	660	27,280
Worker Commuter Vehicles	15	220	3,300	1.5	100	4,950	330,000
Pond Waste Processing Bldg. &							
Water Truck - 4,000 Gallon		110		20		2,200	
Delivery Truck - Fuel	1	220	220	1.5	62	330	13,640
Delivery Truck - Misc.			16	1.5	100	24	1,600
Delivery Truck - Super Sacks			116	1.5	1,000	174	116,000
Honey Wagon			10	1.5	30	15	300
Trash truck			10	1.5	100	15	1,000
Worker Commuter Vehicles	15	220	3,300	1.5	100	4,950	330,000
Remove Temporary Structures/Final Site							
Delivery Truck - Misc.	3	60	180	1.5	62	270	11,160
Pick-up Truck		120		80		9,600	
Delivery Truck - Fuel	1	120	180	1.5	62	270	11,160
Delivery Truck - Equipment			20	1.5	100	30	2,000
Water Truck - 4,000 Gallon		60		20		1,200	
Honey Wagon			10	1.5	30	15	300
Trash truck			11	1.5	100	17	1,100
Worker Commuter Vehicles	20	120	2,400	1.5	100	3,600	240,000

Notes: Data from Shiprock EA Data Call_V0_RVSD_gm comments 021323.docx. All trucks are diesel-powered.

Table A-2. Waste Haul Truck Activity Data for the Shiprock Project Alternatives

Alternative/Trip Type	Trips per Day	Total Trips	Miles/Round Trip		Total Miles	
			On-site	Off-site	On-site	Off-site
Alternative 2						
Waste Haul Truck to Waste Complex Specialists, TX	4	1,324	1.5	1,176	1,986	1,557,024
Waste Haul Truck to EnergySolutions in Clive, UT	4	1,324	1.5	916	1,986	1,212,784
Alternative 3						
Waste Haul Trucks to GELP Transload Facility.	8	1,324	1.5	181	1,986	239,697

Notes: Data from Evaporation Pond Waste Transportation Plan - Draft 081522 gm.docx. All trucks are diesel-powered.

Table A-3. Worker Truck Trips to GELP Transload Facility - Shiprock Project Alternative 3

Vehicle Type	Trips per Day	Total Work Days	Total Trips	Miles/Round Trip		Total Miles	
				On-site	Off-site	On-site	Off-site
Pick-up Truck	2	110	220	0.5	100	110	22,000

Table A-4. Emission Factors for On-road Vehicles - Shiprock EA Project Alternatives

Source Type	Fuel Type	Emission Factors (Grams/Mile) (1)							References
		VOC	CO	NOx	SO2	PM10	PM2.5	CO2e	
Passenger Car	G	0.15	1.47	0.04	0.00	0.04	0.01	330	(2)
Light Duty Truck (LDT2)	G	0.17	1.45	0.05	0.00	0.04	0.01	451	(3)
Composite Commuter Vehicle	G	0.16	1.47	0.04	0.00	0.04	0.01	360	(4)
Pick-ups and Water Truck (4,000	D	0.08	1.43	0.43	0.01	0.04	0.01	864	(5)
Heavy Duty Vehicle	D	0.10	2.90	1.82	0.01	0.10	0.02	1,429	(6)

Notes: (1) Data are from the EPA MOVES3 model, as simulated by the GREET 2022 model (Argonne National Lab [ANL] 2021). Data emission factors for model year 2020 vehicles and based on the entire life of the vehicle. VOC factor includes both exhaust and PM10/PM2.5 factors include both running emissions and tire and brake wear. CO2e data from Greet 2022 model file

(2) Data from Table 2, passenger cars, except CO2e data from the Vehicles sheet

(3) Data from Table 6, light-duty trucks 2 (LDT2), except CO2e data from the HDV_TS sheet

(4) Equal to a fleet of 75/25% car/LDT2

(5) Data from Table 8, diesel heavy-duty pick-up trucks and vans, except CO2e from sheet HDV_TS, cell

(6) Data from Table 19, diesel combination long-haul trucks, except CO2e from sheet HDV_TS, cell B2104. Pertains to all heavy except pick-ups and water

Table A-5. Total On-road Vehicle Emissions for the Shiprock Project Onsite Work								
Construction Activity/Vehicle Type	Tons							CO2e (MT)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e	
Evaporation Pond Early Work								
Pick-up Truck - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	8.33	7.57
Water Truck - 4,000 Gallon - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	4.16	3.78
Concrete Truck - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.21
Concrete Truck - Offsite	0.00	0.01	0.01	0.00	0.00	0.00	7.32	6.66
Delivery Truck - Misc. - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.42
Delivery Truck - Misc. - Offsite	0.00	0.04	0.02	0.00	0.00	0.00	19.14	17.40
Delivery Truck - Fuel - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.24
Delivery Truck - Fuel - Offsite	0.00	0.02	0.01	0.00	0.00	0.00	10.74	9.77
Mechanic Truck - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	3.47	3.15
Delivery Truck - Equipment - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.04
Delivery Truck - Equipment - Offsite	0.00	0.01	0.00	0.00	0.00	0.00	3.15	2.86
Honey Wagon - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
Honey Wagon - Offsite	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.39
Trash Truck - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02
Trash Truck - Offsite	0.00	0.00	0.00	0.00	0.00	0.00	1.73	1.58
Worker Commuter Vehicles - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	1.31	1.19
Worker Commuter Vehicles - Offsite	0.04	0.36	0.01	0.00	0.01	0.00	87.36	79.42
Subtotal - Onsite	**0.00**	**0.04**	**0.01**	**0.00**	**0.00**	**0.00**	**18.32**	**16.65**
Subtotal - Offsite	**0.04**	**0.44**	**0.06**	**0.00**	**0.01**	**0.00**	**129.88**	**118.07**
Total	**0.04**	**0.12**	**0.07**	**0.00**	**0.00**	**0.00**	**60.84**	**55.31**
Excavation at the Pond								
Pick-up Truck - Onsite	0.00	0.03	0.01	0.00	0.00	0.00	16.65	15.14
Delivery Truck - Fuel - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.95
Delivery Truck - Fuel - Offsite	0.00	0.09	0.05	0.00	0.00	0.00	42.97	39.06
Worker Commuter Vehicles - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	1.97	1.79
Worker Commuter Vehicles - Offsite	0.06	0.53	0.02	0.00	0.01	0.00	131.04	119.13
Subtotal - Onsite	**0.00**	**0.04**	**0.01**	**0.00**	**0.00**	**0.00**	**19.66**	**17.87**
Subtotal - Offsite	**0.06**	**0.62**	**0.07**	**0.00**	**0.02**	**0.00**	**174.01**	**158.19**
Total	**0.06**	**0.66**	**0.08**	**0.00**	**0.02**	**0.00**	**193.67**	**176.06**
Pond Waste Processing Bldg. & Storage/Loading								
Water Truck - 4,000 Gallon - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	2.08	1.89
Delivery Truck - Fuel - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.47
Delivery Truck - Fuel - Offsite	0.00	0.04	0.03	0.00	0.00	0.00	21.49	19.53
Delivery Truck - Super Sacks - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03
Delivery Truck - Super Sacks - Offsite	0.00	0.01	0.00	0.00	0.00	0.00	2.52	2.29
Honey Wagon - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.25
Honey Wagon - Offsite	0.01	0.37	0.23	0.00	0.01	0.00	182.72	166.11
Trash Truck - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
Trash Truck - Offsite	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.43
Worker Commuter Vehicles - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Worker Commuter Vehicles - Offsite	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.36
Subtotal - Onsite	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**2.94**	**2.68**
Subtotal - Offsite	**0.01**	**0.42**	**0.26**	**0.00**	**0.01**	**0.00**	**207.60**	**188.72**
Total	**0.01**	**0.43**	**0.27**	**0.00**	**0.01**	**0.00**	**210.54**	**191.40**
Remove Temporary Structures/Final Site								
Delivery Truck - Misc. - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.39
Delivery Truck - Misc. - Offsite	0.00	0.04	0.02	0.00	0.00	0.00	17.58	15.98
Pick-up Truck - Onsite	0.00	0.02	0.00	0.00	0.00	0.00	9.08	8.26
Delivery Truck - Fuel - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.39
Delivery Truck - Fuel - Offsite	0.00	0.04	0.02	0.00	0.00	0.00	17.58	15.98
Delivery Truck - Equipment - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.04
Delivery Truck - Equipment - Offsite	0.00	0.01	0.00	0.00	0.00	0.00	3.15	2.86
Water Truck - 4,000 Gallon - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	1.14	1.03
Honey Wagon - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
Honey Wagon - Offsite	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.43
Trash Truck - Onsite	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02
Trash Truck - Offsite	0.00	0.00	0.00	0.00	0.00	0.00	1.73	1.58
Worker Commuter Vehicles - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	1.43	1.30
Worker Commuter Vehicles - Offsite	0.04	0.39	0.01	0.00	0.01	0.00	95.30	86.64
Subtotal - Onsite	**0.00**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**	**12.60**	**11.45**
Subtotal - Offsite	**0.04**	**0.47**	**0.06**	**0.00**	**0.01**	**0.00**	**135.82**	**123.47**
Total	**0.05**	**0.49**	**0.07**	**0.00**	**0.01**	**0.00**	**148.41**	**134.92**

Table A-6. Total Emissions for Waste Haul Truck Activity Data for the Shiprock Project Alternatives								
Alternative/Vehicle Type	Tons							CO2e (MT)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e	
Alternative 2								
Waste Haul Truck to Waste Complex Specialists, TX	0.00	0.01	0.00	0.00	0.00	0.00	3.13	2.84
Waste Haul Truck to Waste Complex Specialists, TX	0.17	4.98	3.12	0.02	0.17	0.03	2,452.59	2,229.62
Waste Haul Truck to EnergySolutions in Clive, UT -	0.00	0.01	0.00	0.00	0.00	0.00	3.13	2.84
Waste Haul Truck to EnergySolutions in Clive, UT -	0.13	3.88	2.43	0.01	0.13	0.03	1,910.35	1,736.68
Alternative 3								
Waste Haul Trucks to GELP Transload Facility -	0.00	0.01	0.00	0.00	0.00	0.00	3.13	2.84
Waste Haul Trucks to GELP Transload Facility -	0.03	0.77	0.48	0.00	0.03	0.01	377.56	343.24

Table A-7. Total Emissions for Worker Truck Trips to GELP Transload Facility - Shiprock Project Alternative 3								
Vehicle Type	Tons							CO2e (MT)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e	
Pick-up Truck - Offsite	0.00	0.04	0.00	0.00	0.00	0.00	10.99	9.99

Table A-8. Nonroad Equipment Activity Data for the Shiprock Project Onsite Work								
Construction Activity/Equipment Type	Hp Rating	Fuel Type	Ave. Daily Load	Number Active	Hours/ Day	Daily Hp-Hrs	Work Days	Total Hp-Hrs
Evaporation Pond Early Work								
Scraper - 627K	555	D	0.60	2	9	5,994	44	263,736
Dozer - D9	468	D	0.40	1	9	1,685	66	111,197
Grader - Cat 140	179	D	0.30	1	9	483	66	31,898
Light Tower	13	D	0.20	4	9	94	110	10,296
Soil Compactor - Cat 825 Sheeps Foot	174	D	0.60	1	9	940	66	62,014
Excavator - Cat 320	172	D	0.50	2	9	1,548	110	170,280
Soil Compactor - Cat CS56 Smooth Drum Vibratory	157	D	0.30	1	9	424	66	27,977
Skid Steer - Bobcat	110	D	0.60	4	9	2,376	110	261,360
Gator - John Deere XUV835M	54	G	0.30	2	9	292	110	32,076
Telehandler	125	D	0.40	2	9	900	66	59,400
Crane - Rough Terrain Terex RT 1045	178	D	0.25	1	9	401	44	17,622
Water Tanker - Cat 725C2	320	D	0.40	1	9	1,152	66	76,032
Dump Truck - Western Star Tri	505	D	0.30	3	9	4,091	40	163,620
Compressor - Doosan 825 CFM	266	D	0.90	4	9	8,618	22	189,605
Volumetric Mixer - Strong Indus VM-14	400	D	0.90	4	9	12,960	22	285,120
Excavation at the Pond								
Excavator - Cat 320	172	D	0.50	4	9	3,096	220	681,120
Skid Steer - Bobcat	110	D	0.60	4	9	2,376	220	522,720
Telehandler	125	D	0.30	2	9	675	220	148,500
Pumps - 2" Trash	10	G	0.50	2	9	90	220	19,800
Dozer - D6	215	D	0.30	1	9	581	220	127,710
Light Tower	13	D	0.20	4	9	94	220	20,592
Gator - John Deere XUV835M	54	G	0.30	2	9	292	220	64,152
Haul Truck - Cat 725 Articulated	338	D	0.60	3	9	5,476	220	1,204,632
Pond Waste Processing Bldg. & Storage/Loading Area								
Skid Steer - Bobcat	110	D	0.60	4	9	2,376	220	522,720
Telehandler	125	D	0.50	1	9	563	220	123,750
Forklift - 22,000 lb	125	D	0.50	1	9	563	220	123,750
Loader - Cat 910 Compact	110	D	0.60	3	9	1,782	110	196,020
Forklift - Taylor XB-250M 25,000 lb	173	D	0.80	2	9	2,491	220	548,064
Remove Temporary Structures/Final Site Recontouring								
Crane - Rough Terrain Terex RT 1045	175	D	0.50	1	9	788	15	11,813
Telehandler	125	D	0.50	1	9	563	60	33,750
Gator - John Deere XUV835M	54	G	0.30	2	9	292	120	34,992
Loader - Cat 950GC	225	D	0.60	1	9	1,215	100	121,500
Dump Truck - Western Star 4900 Tri	505	D	0.30	3	9	4,091	30	122,715
Grader - Cat 140	179	D	0.30	1	9	483	90	43,497
Excavator - Cat 320	172	D	0.50	2	9	1,548	30	46,440
Skid Steer - Cat	110	D	0.60	2	9	1,188	30	35,640
Dozer - D6	215	D	0.30	1	9	581	30	17,415
Scraper - Cat 627K	555	D	0.60	2	9	5,994	60	359,640
Dozer - D9	468	D	0.60	1	9	2,527	60	151,632
Soil Compactor - Cat 825 Sheeps Foot	174	D	0.60	1	9	940	60	56,376
Truck - Hydroseeder	250	D	0.38	1	9	855	5	4,275
Notes: Data from Shiprock EA Data Call_V0_RVSD_gm comments								

Table A-9. Nonroad Equipment Activity Data for the Shiprock Project Alternative 3 - GELP Transload Facility Onsite Work

Construction Activity/Equipment Type	Hp Rating	Fuel Type	Avg. Daily Load	Number Active	Hours/ Day	Daily Hp-Hrs	Work Days	Total Hp-Hrs
Crane - Rough Terrain Terex RT 1045	178	D	0.25	1	9	401	110	44,055
Light Tower	13	D	0.20	2	9	47	110	5,148
Telehandler	125	D	0.50	1	9	563	110	61,875
Skid Steer - Cat	110	D	0.60	1	9	594	110	65,340

Table A-10. Emission Factors for Nonroad Equipment - Shiprock Project Alternatives

Construction Activity/Equipment Type	Fuel Type	Emission Factors (Grams/Horsepower-Hour)						
		VOC	CO	NOx	SO2	PM10	PM2.5	CO2
Evaporation Pond Early Work								
Scraper - 627K	D	0.06	0.21	0.52	0.00	0.03	0.03	507
Dozer - D9	D	0.06	0.19	0.46	0.00	0.03	0.03	507
Grader - Cat 140	D	0.09	0.31	1.15	0.00	0.04	0.04	495
Light Tower	D	0.05	0.10	1.05	0.00	0.02	0.01	566
Soil Compactor - Cat 825 Sheeps Foot	D	0.10	0.33	0.90	0.00	0.06	0.06	491
Excavator - Cat 320	D	0.06	0.14	0.36	0.00	0.02	0.02	508
Soil Compactor - Cat CS56 Smooth Drum Vibratory	D	0.10	0.33	0.90	0.00	0.06	0.06	491
Skid Steer - Bobcat	D	0.09	0.40	1.23	0.00	0.05	0.04	493
Gator - John Deere XUV835M	G	0.21	3.38	0.39	0.00	0.02	0.02	1,068
Telehandler	D	0.10	0.33	0.90	0.00	0.06	0.06	491
Crane - Rough Terrain Terex RT 1045	D	0.10	0.33	0.90	0.00	0.06	0.06	491
Water Tanker - Cat 725C2	D	0.06	0.07	0.19	0.00	0.01	0.01	509
Dump Truck - Western Star Tri	D	0.06	0.07	0.19	0.00	0.01	0.01	509
Compressor - Doosan 825 CFM	D	0.07	0.11	0.49	0.00	0.02	0.02	505
Volumetric Mixer - Strong Indus VM-14	D	0.10	0.50	1.10	0.00	0.08	0.08	488
Excavation at the Pond								
Excavator - Cat 320	D	0.06	0.14	0.36	0.00	0.02	0.02	508
Skid Steer - Bobcat	D	0.09	0.40	1.23	0.00	0.05	0.04	493
Telehandler	D	0.10	0.33	0.90	0.00	0.06	0.06	491
Pumps - 2" Trash	G	0.21	3.38	0.39	0.00	0.02	0.02	1,068
Dozer - D6	D	0.06	0.08	0.25	0.00	0.01	0.01	508
Light Tower	D	0.05	0.10	1.05	0.00	0.02	0.01	566
Gator - John Deere XUV835M	G	0.21	3.38	0.39	0.00	0.02	0.02	1,068
Haul Truck - Cat 725 Articulated	D	0.06	0.07	0.19	0.00	0.01	0.01	509
Pond Waste Processing Bldg. & Storage/Loading								
Skid Steer - Bobcat	D	0.09	0.40	1.23	0.00	0.05	0.04	493
Telehandler	D	0.10	0.33	0.90	0.00	0.06	0.06	491
Forklift - 22,000 lb	D	0.10	0.33	0.90	0.00	0.06	0.06	491
Loader - Cat 910 Compact	D	0.09	0.34	1.23	0.00	0.04	0.04	493
Forklift - Taylor XB-250M 25,000 lb	D	0.10	0.33	0.90	0.00	0.06	0.06	491
Remove Temporary Structures/Final Site								
Crane - Rough Terrain Terex RT 1045	D	0.10	0.33	0.90	0.00	0.06	0.06	1.25
Telehandler	D	0.10	0.33	0.90	0.00	0.06	0.06	1.25
Gator - John Deere XUV835M	G	0.21	3.38	0.39	0.00	0.02	0.02	2.72
Loader - Cat 950GC	D	0.09	0.34	1.23	0.00	0.04	0.04	1.25
Dump Truck - Western Star 4900 Tri	D	0.06	0.07	0.19	0.00	0.01	0.01	1.30
Grader - Cat 140	D	0.09	0.31	1.15	0.00	0.04	0.04	1.26
Excavator - Cat 320	D	0.06	0.14	0.36	0.00	0.02	0.02	1.29
Skid Steer - Cat	D	0.09	0.40	1.23	0.00	0.05	0.04	1.25
Dozer - D6	D	0.06	0.08	0.25	0.00	0.01	0.01	1.29
Scraper - Cat 627K	D	0.06	0.21	0.52	0.00	0.03	0.03	1.29
Dozer - D9	D	0.06	0.19	0.46	0.00	0.03	0.03	1.29
Soil Compactor - Cat 825 Sheeps Foot	D	0.10	0.33	0.90	0.00	0.06	0.06	1.25
Truck - Hydroseeder	D	0.07	0.17	0.90	0.00	0.02	0.02	1.28

Notes: (1) Data are from the EPA MOVES3 model, as simulated by the GREET 2022 model (Argonne National Lab [ANL] 2023). Data equate to national average emission factors for model year 2020 and based on the entire life of the equipment.

Table A-11. Total Emissions for Off-Road Equipment - Shiprock Project Onsite Work								
Construction Activity/Equipment Type	Tons							CO2e (MT)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	
Evaporation Pond Early Work								
Scraper - 627K	0.02	0.06	0.15	0.00	0.01	0.01	147.41	134.01
Dozer - D9	0.01	0.02	0.06	0.00	0.00	0.00	62.15	56.50
Grader - Cat 140	0.00	0.01	0.04	0.00	0.00	0.00	17.41	15.83
Light Tower	0.00	0.00	0.01	0.00	0.00	0.00	6.42	5.84
Soil Compactor - Cat 825 Sheeps Foot	0.01	0.02	0.06	0.00	0.00	0.00	33.53	30.48
Excavator - Cat 320	0.01	0.03	0.07	0.00	0.00	0.00	95.40	86.72
Soil Compactor - Cat CS56 Smooth Drum Vibratory	0.00	0.01	0.03	0.00	0.00	0.00	15.13	13.75
Skid Steer - Bobcat	0.03	0.11	0.36	0.00	0.01	0.01	142.00	129.09
Gator - John Deere XUV835M	0.01	0.12	0.01	0.00	0.00	0.00	37.78	34.34
Telehandler	0.01	0.02	0.06	0.00	0.00	0.00	32.12	29.20
Crane - Rough Terrain Terex RT 1045	0.00	0.01	0.02	0.00	0.00	0.00	9.53	8.66
Water Tanker - Cat 725C2	0.00	0.01	0.02	0.00	0.00	0.00	42.69	38.81
Dump Truck - Western Star Tri	0.01	0.01	0.03	0.00	0.00	0.00	91.88	83.52
Compressor - Doosan 825 CFM	0.01	0.02	0.10	0.00	0.00	0.00	105.48	95.89
Volumetric Mixer - Strong Indus VM-14	0.03	0.16	0.35	0.00	0.02	0.02	153.43	139.48
Subtotal	**0.15**	**0.61**	**1.36**	**0.00**	**0.07**	**0.07**	**992.35**	**902.14**
Excavation at the Pond								
Excavator - Cat 320	0.04	0.10	0.27	0.00	0.01	0.01	381.58	346.89
Skid Steer - Bobcat	0.05	0.23	0.71	0.00	0.03	0.03	284.00	258.18
Telehandler	0.02	0.05	0.15	0.00	0.01	0.01	80.30	73.00
Pumps - 2" Trash	0.00	0.07	0.01	0.00	0.00	0.00	23.32	21.20
Dozer - D6	0.01	0.01	0.03	0.00	0.00	0.00	71.55	65.04
Light Tower	0.00	0.00	0.02	0.00	0.00	0.00	12.84	11.68
Gator - John Deere XUV835M	0.01	0.24	0.03	0.00	0.00	0.00	75.55	68.68
Haul Truck - Cat 725 Articulated	0.07	0.09	0.25	0.00	0.01	0.01	676.43	614.94
Subtotal	**0.22**	**0.81**	**1.48**	**0.00**	**0.07**	**0.06**	**1,605.57**	**1,459.61**
Pond Waste Processing Bldg. & Storage/Loading								
Skid Steer - Bobcat	0.05	0.23	0.71	0.00	0.03	0.03	284.00	258.18
Telehandler	0.01	0.04	0.12	0.00	0.01	0.01	66.91	60.83
Forklift - 22,000 lb	0.01	0.04	0.12	0.00	0.01	0.01	66.91	60.83
Loader - Cat 910 Compact	0.02	0.07	0.27	0.00	0.01	0.01	106.50	96.82
Forklift - Taylor XB-250M 25,000 lb	0.06	0.20	0.54	0.00	0.04	0.04	296.34	269.40
Subtotal	**0.16**	**0.59**	**1.77**	**0.00**	**0.09**	**0.09**	**820.67**	**746.06**
Remove Temporary Structures/Final Site								
Crane - Rough Terrain Terex RT 1045	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01
Telehandler	0.00	0.01	0.03	0.00	0.00	0.00	0.05	0.04
Gator - John Deere XUV835M	0.01	0.13	0.01	0.00	0.00	0.00	0.10	0.10
Loader - Cat 950GC	0.01	0.05	0.17	0.00	0.01	0.01	0.17	0.15
Dump Truck - Western Star 4900 Tri	0.01	0.01	0.03	0.00	0.00	0.00	0.18	0.16
Grader - Cat 140	0.00	0.01	0.06	0.00	0.00	0.00	0.06	0.05
Excavator - Cat 320	0.00	0.01	0.02	0.00	0.00	0.00	0.07	0.06
Skid Steer - Cat	0.00	0.02	0.05	0.00	0.00	0.00	0.05	0.04
Dozer - D6	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
Scraper - Cat 627K	0.02	0.08	0.20	0.00	0.01	0.01	0.51	0.47
Dozer - D9	0.01	0.03	0.08	0.00	0.00	0.00	0.22	0.20
Soil Compactor - Cat 825 Sheeps Foot	0.01	0.02	0.06	0.00	0.00	0.00	0.08	0.07
Truck - Hydroseeder	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Subtotal	**0.09**	**0.38**	**0.72**	**0.00**	**0.04**	**0.04**	**1.52**	**1.38**

Table A-12. Total Emissions for Off-Road Equipment - Shiprock Project Alternative 3 - GELP Transload Facility Onsite Work								
Activity/Equipment Type	Tons							CO2e (MT)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	
Crane - Rough Terrain Terex RT 1045	0.00	0.02	0.04	0.00	0.00	0.00	23.82	21.66
Light Tower	0.00	0.00	0.01	0.00	0.00	0.00	3.21	2.92
Telehandler	0.01	0.02	0.06	0.00	0.00	0.00	33.46	30.41
Skid Steer - Cat	0.01	0.03	0.09	0.00	0.00	0.00	35.50	32.27
Subtotal	**0.02**	**0.07**	**0.20**	**0.00**	**0.01**	**0.01**	**95.99**	**88.65**

Table A-13. Fugitive Dust Activity Data for the Shiprock Project Onsite Work

Construction Activity/Source Type	Throughput (Tons)	On-site Paved Road Round Trip Distance (Mi)	Total Truck Trips	Disburbed Acres	Work Days	Total Activity (1)
Stormwater Retention Basin Reconfiguration						
Actively Disturbed Ground				7	66	462
Paved Road Dust - Fuel Trucks		1.5	66			99
Waste Processing Area Installation						
Actively Disturbed Ground				4	44	176
Paved Road Dust - Misc. Delivery, Concrete, and Fuel Trucks		1.5	315			473
Inactive Disturbed Area				4		
Excavation of the Pond						
Actively Disturbed Ground				1	220	220
Truck Loading - Soil	39,700					
Unpaved Road Dust - Soil Haul Truck		0.5	1,500			750
Paved Road Dust - Fuel Trucks		2	440			880
Pond Waste Processing Bldg. & Storage/Loading Area						
Paved Road Dust - Fuel Trucks		1.5	220			330
Remove Temporary Structures						
Actively Disturbed Ground				2.5	120	300
Paved Road Dust - Misc. Delivery and Fuel Trucks		1.5	300			450
Inactive Disturbed Area				9		
Final Site Recontouring						
Actively Disturbed Ground				6.5	60	390
Paved Road Dust - Fuel Trucks		2	60			120
Inactive Disturbed Area				11		

Note: (1) = total acre-days for disturbed ground and total mlies for unpaved road dust.
(3) Throughput in tons.

Table A-14. Fugitive Dust Activity Data for the Shiprock Project Alternative 3 - GELP Transload Facility Onsite Work

Construction Activity/Source Type	Throughput (Tons)	On-site Paved Road Round Trip Distance (Mi)	Total Truck Trips	Disburbed Acres	Work Days	Total Activity (1)
Actively Disturbed Ground				1	110	110

Table A-15. Fugitive Dust Emission Factors for the Shiprock Project Alternatives

Source Type	Emission Factors						References
					PM10	PM2.5	
Actively Disturbed Ground					9.93	0.99	(1)
Paved Road Dust - On-site Non-Waste Trucks					0.18	0.05	(3)
Paved Road Dust - On-site Waste Trucks					0.23	0.06	(3)
Truck Loading - Soil					0.0005	0.00008	(4)
Unpaved Road Dust - Haul Trucks					4.19	0.42	(5)
Inactive Disturbed Ground Wind Erosion					10.28	0.77	(6)

Notes: (1) From Table 3-2 for active large-scale earth moving operations (Countess Environmental 2006). Emissions reduced by 74% from uncontrolled levels to simulate water application every 2.1 hours and use of best management practices for fugitive dust control (Table 3-7 Countess Environmental 2006). Converted to units of lbs/acre-day of disturbance assuming 22 work days/month.

(3) From Section 13.2.1 of AP-42 (USEPA 2011). Units in Lb/VMT. Emissions reduced by 50% from uncontrolled levels due to the use of a PM10-efficient street sweeping vacuum unit 2 times per day.

(4) Estimated with the methods identified in AP-42 Section 13.2.4 (USEPA 2006b). Units in lbs/ton of soil loaded.

(5) Developed for methods in AP-42 Section 13.2.5. See Table Pile Efs for details. Emissions reduced by 0% to simulate use of soil stabilization measures.
Units in grams/meter2 of pile area.

(6) From Section 13.2.2 of AP-42 (USEPA 2006). Units in Lb/VMT.

Table A-16. Emission Factor Estimates for Windblown Dust from Inactive Disturbed Areas - Shiprock Project Alternatives

Year	Activity (1)	Annual Disturbed Area	U_{10} (m/s) (2)	Threshold Friction	ction Veloc * (m/s) (4)	Uncontrolled Gm/m ^{2}) (5)
1	All Soils		24.1	1.02	1.278	10.28
2	All Soils		24.1	1.02	1.278	10.28
3	All Soils		24.1	1.02	1.278	10.28
Total - Soil Remediation						

Notes: (1) Assumes area is inactive for one year after prior year of active disturbance.

(2) Wind speeds at 10 meter level (U_{10}). Equates to equation #5 presented in AP-42 Section 13.2.5 (EPA 2006).

(3) Threshold friction velocity value for scoria from AP-42 Section Table 13.2.5-2.

(4) Equates to equation #4 presented in AP-42 Section 13.2.5.

(5) Equates to equation #3 presented in AP-42 Section 13.2.5.

Table A-17. Total Fugitive Dust Emissions for Shiprock Project Onsite Work

Construction Activity/Source Type	Tons						
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Stormwater Retention Basin Reconfiguration							
Actively Disturbed Ground					2.29	0.23	
Paved Road Dust - Fuel Trucks					0.01	0.00	
Subtotal					**2.30**	**0.23**	
Waste Processing Area Installation							
Actively Disturbed Ground					0.87	0.09	
Paved Road Dust - Misc. Delivery, Concrete, and Fuel Trucks					0.04	0.01	
Inactive Disturbed Area					0.18	0.01	
Subtotal					**1.10**	**0.11**	
Excavation of the Pond							
Actively Disturbed Ground					1.09	0.11	
Truck Loading - Soil					0.01	0.00	
Unpaved Road Dust - Soil Haul Truck					1.57	0.16	
Paved Road Dust - Fuel Trucks					0.08	0.02	
Subtotal					**2.75**	**0.29**	
Pond Waste Processing Bldg. & Storage/Loading Area							
Paved Road Dust - Fuel Trucks					0.03	0.01	
Subtotal					**0.03**	**0.01**	
Remove Temporary Structures							
Actively Disturbed Ground					1.49	0.15	
Paved Road Dust - Misc. Delivery and Fuel Trucks					0.04	0.01	
Inactive Disturbed Area					0.41	0.03	
Subtotal					**1.94**	**0.19**	
Final Site Recontouring							
Actively Disturbed Ground					1.94	0.19	
Paved Road Dust - Fuel Trucks					0.01	0.00	
Inactive Disturbed Area					0.51	0.04	
Subtotal					**2.45**	**0.23**	

Table A-18. Total Fugitive Dust Emissions for the Shiprock Project Alternative 3 - GELP Transload Facility Onsite Work

Construction Activity-Soil Type/Equipment Type	Tons						
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Actively Disturbed Ground					0.55	0.05	
Subtotal					**0.55**	**0.05**	

Table A-19. Locomotive Activity Data for the Shiprock Project - Onsite GELP

Equipment Type	Hp	Load Factor	Number Active	Hourly Hp-Hr	Hours/ Round Trip	Annual Round Trips	Total Hp-Hrs
Switch Yard Locomotive	2,028	0.10	1	203	2.0	9	3,650
Line Haul Locomotive	4,000	0.10	2	800	1.0	9	7,200

Notes: Estimates

Table A-20. Line Haul Locomotive Usages between GELP Transload Facility and Disposal Site Destinations - Shiprock Project Alternative 3

Disposal Site	Hp	Load Factor	Number Active	Hourly Hp-Hr	Round Trip Miles	Hours/Round Trip (1)	Annual Round Trips	Total Hp-Hrs
EnergySolutions - Clive, UT	4,000	0.47	2	3,760	2,500	55.6	9	1,880,000
Waste Complex Specialists, TX	4,000	0.47	2	3,760	2,892	64.3	9	2,174,784

Notes: (1) Assumes 45 mph average speed.

Table A-21. Emission Factors for Locomotives - Shiprock Project Alternative 3

Project Scenario/Equipment	Emission Factors (Gm/Hp-Hr)							
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	References
Year 2025								
Switch Yard Locomotive	0.55	1.83	9.87	0.01	0.21	0.20	672	(1)
Line Haul Locomotive	0.13	1.28	3.56	0.01	0.08	0.07	491	(1)

Notes: (1) Data from "Emission Factors for Locomotives" (EPA Office of Transportation and Air Quality, 2009) and equate to national locomotive fleet average emission factors for year 2025.

Table A-22. Total Locomotive Emissions - Shiprock Project Alternative 3

Scenario/Source Activity	Total Tons							CO2e (MT)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	
GELP Transload Facility								
Switch Yard Locomotive	0.00	0.01	0.04	0.00	0.00	0.00	2.70	2.46
Line Haul Locomotive	0.00	0.01	0.03	0.00	0.00	0.00	3.90	3.54
Line Haul to Disposal Sites								
EnergySolutions - Clive, UT	0.27	2.65	7.37	0.01	0.16	0.15	1,018	925
Waste Complex Specialists, TX	0.31	3.07	8.53	0.01	0.18	0.18	1,178	1,070
Total - EnergySolutions Option	**0.28**	**2.67**	**7.44**	**0.01**	**0.16**	**0.16**	**1,025**	**931**
Total - Waste Complex Specialists Option	**0.32**	**3.09**	**8.60**	**0.01**	**0.19**	**0.18**	**1,184**	**1,076**

Table A-23. Emissions Summary for Activities from Shiprock Project Alternative 2								
Construction Activity/Source	Tons							CO2 (mt)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	
Evaporation Pond at the Shiprock, New Mexico, Disposal Site - Year 1								
On-Road Vehicles - Onsite	0.00	0.04	0.01	0.00	0.00	0.00	18	17
On-Road Vehicles - Offsite	0.04	0.44	0.06	0.00	0.01	0.00	130	118
Nonroad Equpment	0.15	0.61	1.36	0.00	0.07	0.07	992	902
Fugitive Dust					3.40	0.34		
Excavation at the Pond - Year 2								
On-Road Vehicles - Onsite	0.00	0.04	0.01	0.00	0.00	0.00	20	18
On-Road Vehicles - Offsite	0.06	0.62	0.07	0.00	0.02	0.00	174	158
Nonroad Equpment	0.22	0.81	1.48	0.00	0.07	0.06	1,606	1,460
Fugitive Dust					2.75	0.29		
Pond Waste Processing Bldg. & Storage/Loading Area - Year 2								
On-Road Vehicles - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	3	3
On-Road Vehicles - Offsite	0.01	0.42	0.26	0.00	0.01	0.00	208	189
Nonroad Equpment	0.16	0.59	1.77	0.00	0.09	0.09	821	746
Fugitive Dust					0.03	0.01		
Waste Haul Truck - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	3.13	2.84
Waste Haul Truck to Waste Complex Specialists, TX - Offsite	0.17	4.98	3.12	0.02	0.17	0.03	2,453	2,230
Waste Haul Truck to EnergySolutions in Clive, UT - Offsite	0.13	3.88	2.43	0.01	0.13	0.03	1,910	1,737
Remove Temporary Structures/Final Site Recontouring - Year 3								
On-Road Vehicles - Onsite	0.00	0.02	0.01	0.00	0.00	0.00	13	11
On-Road Vehicles - Offsite	0.04	0.47	0.06	0.00	0.01	0.00	136	123
Nonroad Equpment	0.09	0.38	0.72	0.00	0.04	0.04	2	1
Fugitive Dust					4.40	0.42		

Table A-24. Annual Emissions for Activities from Shiprock Project Alternative 2								
Construction Component/Activity	Tons per Year							CO2 (mt)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	
Year 1								
Onsite	0.15	0.65	1.37	0.00	3.48	0.42	1,011	919
Offsite - Vehicles	0.04	0.44	0.06	0.00	0.01	0.00	130	118
Total Year 1	**0.19**	**1.09**	**1.44**	**0.00**	**3.49**	**0.42**	**1,141**	**1,037**
Year 2								
Onsite	0.38	1.44	3.26	0.01	2.94	0.45	2,452	2,229
Offsite - Waste Complex Specialists Option	0.25	6.02	3.46	0.02	0.20	0.04	2,834	2,577
Offsite - EnergySolutions Option	0.21	4.92	2.77	0.02	0.17	0.03	2,292	2,084
Total Year 2 - Waste Complex Specialists Option	**0.62**	**7.46**	**6.72**	**0.02**	**3.15**	**0.49**	**5,286**	**4,806**
Total Year 2 - EnergySolutions Option	**0.58**	**6.36**	**6.03**	**0.02**	**3.11**	**0.48**	**4,744**	**4,313**
Year 3								
Onsite	0.09	0.40	0.73	0.00	4.43	0.46	14	13
Offsite - Vehicles	0.04	0.47	0.06	0.00	0.01	0.00	136	123
Total Year 3	**0.13**	**0.87**	**0.79**	**0.00**	**4.45**	**0.46**	**150**	**136**
Total Emissions - Waste Complex Specialists Option	**0.95**	**9.43**	**8.95**	**0.03**	**11.09**	**1.37**	**6,577**	**5,979**
Total Emissions - EnergySolutions Option	**0.91**	**8.33**	**8.26**	**0.03**	**11.05**	**1.37**	**6,034**	**5,486**
Notes: All onsite emissions would occur within the Shiprock site and include on-road vehicles, waste haul trucks, nonroad equipment, and fugitive dust.								

Table A-25. Emissions Summary for Activities from Shiprock Project Alternative 3

Construction Activity	Tons							CO2 (mt)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	
Evaporation Pond at the Shiprock, New Mexico, Disposal Site - Year 1								
On-Road Vehicles - Onsite	0.00	0.04	0.01	0.00	0.00	0.00	18	17
On-Road Vehicles - Offsite	0.04	0.44	0.06	0.00	0.01	0.00	130	118
Nonroad Equpment	0.15	0.61	1.36	0.00	0.07	0.07	992	902
Fugitive Dust					3.40	0.34		
Excavation at the Pond - Year 2								
On-Road Vehicles - Onsite	0.00	0.04	0.01	0.00	0.00	0.00	20	18
On-Road Vehicles - Offsite	0.06	0.62	0.07	0.00	0.02	0.00	174	158
Nonroad Equpment	0.22	0.81	1.48	0.00	0.07	0.06	1,606	1,460
Fugitive Dust					2.75	0.29		
Pond Waste Processing Bldg. & Storage/Loading Area - Year 2								
On-Road Vehicles - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	3	3
On-Road Vehicles - Offsite	0.01	0.42	0.26	0.00	0.01	0.00	208	189
Waste Haul Truck - Onsite	0.00	0.01	0.00	0.00	0.00	0.00	3	3
Waste Haul Trucks to GELP - Offsite	0.03	0.77	0.48	0.00	0.03	0.01	381	346
Worker Truck Trips to GELP - Offsite	0.00	0.04	0.00	0.00	0.00	0.00	11	10
Train Transport of Waste - GELP to Waste Complex Specialists Option	0.32	3.09	8.60	0.01	0.19	0.18	1,184	1,076
Train Transport of Waste - GELP to EnergySolutions Option	0.28	2.67	7.44	0.01	0.16	0.16	1,025	931
Nonroad Equpment	0.16	0.59	1.77	0.00	0.09	0.09	821	746
Fugitive Dust					0.03	0.01		
Load Trains at GELP Transload Facility - Year 2								
Nonroad Equpment	0.02	0.07	0.20	0.00	0.01	0.01	96	89
Fugitive Dust					0.55	0.05		
Remove Temporary Structures/Final Site Recontouring - Year 3								
On-Road Vehicles - Onsite	0.00	0.02	0.01	0.00	0.00	0.00	13	11
On-Road Vehicles - Offsite	0.04	0.47	0.06	0.00	0.01	0.00	136	123
Nonroad Equpment	0.09	0.38	0.72	0.00	0.04	0.04	2	1
Fugitive Dust					4.40	0.42		

Table A-26. Annual Emissions for Activities from Shiprock Project Alternative 3

Construction Component/Activity	Tons per Year							CO2 (mt)
	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	
Year 1								
Onsite	0.15	0.65	1.37	0.00	3.48	0.42	1,011	919
Offsite - Vehicles	0.04	0.44	0.06	0.00	0.01	0.00	130	118
Total Year 1	**0.19**	**1.09**	**1.44**	**0.00**	**3.49**	**0.42**	**1,141**	**1,037**
Year 2								
Onsite	0.38	1.44	3.26	0.01	2.94	0.45	2,452	2,229
Offsite - GELP Transload Facility Activities	0.02	0.07	0.20	0.00	0.56	0.07	96	89
Offsite - Waste Complex Specialists Option	0.42	4.94	9.42	0.02	0.25	0.19	1,957	1,779
Offsite - EnergySolutions Option	0.38	4.52	8.26	0.02	0.22	0.17	1,798	1,634
Total Year 2 - Waste Complex Specialists Option	**0.82**	**6.45**	**12.88**	**0.02**	**3.75**	**0.71**	**4,505**	**4,097**
Total Year 2 - EnergySolutions Option	**0.77**	**6.03**	**11.72**	**0.02**	**3.72**	**0.68**	**4,346**	**3,952**
Year 3								
Onsite	0.09	0.40	0.73	0.00	4.43	0.46	14	13
Offsite - Vehicles	0.04	0.47	0.06	0.00	0.01	0.00	136	123
Total Year 3	**0.13**	**0.87**	**0.79**	**0.00**	**4.45**	**0.46**	**150**	**136**
Total Emissions - Waste Complex Specialists Option	**1.14**	**8.41**	**15.11**	**0.03**	**11.69**	**1.59**	**5,796**	**5,270**
Total Emissions - EnergySolutions Option	**1.10**	**7.99**	**13.95**	**0.03**	**11.66**	**1.57**	**5,636**	**5,125**

Notes: All onsite emissions would occur within the Shiprock site and include on-road vehicles, waste haul trucks, nonroad equipment, and fugitive dust.

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APPENDIX G:
BIOLOGICAL AND NATURAL RESOURCES

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Table G-1. Special-status species potentially present on or near the Shiprock disposal site project area

Name (*Scientific Name*)	Listing Status	Notes
Bald eagle (*Haliaeetus leucocephalus*)	Navajo Nation endangered BGEPA	Foraging habitat along the San Juan River, but no nesting habitat
Burrowing owl (*Athene cunicularia*)	Navajo Nation endangered BCC	Habitat on the terrace in association with prairie dog burrows; not observed in the area since 2020
Colorado pikeminnow (*Ptychocheilus lucius*)	ESA and Navajo Nation endangered	Designated critical habitat in the San Juan River
Golden eagle (*Aquila chrysaetos*)	Navajo Nation endangered BGEPA	Foraging habitat on or near the project area, but no nesting habitat; historically observed on/near site
Mesa Verde cactus (*Sclerocactus mesae-verdae*)	ESA and Navajo Nation endangered	Known populations in terrace areas; might also occur within terrace areas identified as potential habitat and outside the project area
Monarch butterfly (*Danaus plexippus*)	ESA candidate species	Monarchs depend on milkweed to complete life cycle; horsetail milkweed (*Asclepias subverticillata*) has been observed on the floodplain
Mountain plover (*Charadrius montanus*)	Navajo Nation endangered BCC	Marginal habitat identified in terrace areas; not historically or recently observed in the area
Peregrine falcon (*Falco peregrinus*)	Navajo Nation sensitive	Could forage on or near the project area; no nesting habitat; not historically observed in the area
Razorback sucker (*Xyrauchen texanus*)	ESA and Navajo Nation endangered	Designated critical habitat in the San Juan River
Southwestern willow flycatcher (*Empidonax traillii extimus*)	ESA and Navajo Nation endangered	Marginal foraging habitat in floodplain, but no nesting habitat; not historically observed in the area
Yellow warbler (*Dendroica petechia*)	Navajo Nation endangered	Marginal habitat in the floodplain, but no nesting habitat; not historically observed in the area

Key: BCC = Bird of Conservation Concern; BGEPA = Bald and Golden Eagle Protection Act; ESA = Endangered Species Act

Table G-2. Plants without special status commonly observed on or near the Shiprock disposal site project area

Species Name (*Scientific Name*)	Category	Notes
Annual wheatgrass (*Eremopyrum triticeum*)	Invasive grass	Floodplain, terrace, and washes
Broadleaf pepperweed (*Lepidium latifolium*)	Invasive perennial	Floodplain
Broom snakeweed (*Gutierrezia sarothrae*)	Native subshrub	Predominantly in terrace areas, undisturbed and disturbed
Bulrush (*Schoenoplectus* spp.)	Grass-like	Several species identified in wetlands
Burningbush (*Bassia scoparia*)	Invasive annual	Floodplain, terrace, and wash areas, primarily in disturbed places
Cattail (*Typha* spp.)	Grass-like	*T. latifolia* (introduced) and *T. domingensis* (native) identified in wetlands

Species Name (*Scientific Name*)	Category	Notes
Cheatgrass (*Bromus tectorum*)	Invasive grass	Floodplain, terrace, wash
Common reed (*Phragmites australis*)	Introduced grass	Wetlands within the floodplain
Common stork's bill (*Erodium cicutarium*)	Introduced annual	Floodplain, terrace
Desert prince's plume (*Stanleya pinnata*)	Native perennial	Terrace
Fourwing saltbush (*Atriplex canescens*)	Native shrub	Floodplain, terrace, washes
Foxtail barley (*Hordeum jubatum*)	Introduced grass	Floodplain
Fremont cottonwood (*Populus fremontii*)	Native tree	Floodplain
Greasewood (*Sarcobatus vermiculatus*)	Native shrub	Floodplain, terrace, and wash areas with available groundwater
Hardheads (Russian knapweed) (*Acroptilon repens*)	Invasive perennial	Floodplain, washes
Herb sophia (*Descurainia sophia*)	Introduced annual	Floodplain, terrace
Horsetail milkweed (*Asclepias subverticillata*)	Native perennial	Floodplain
Indian ricegrass (*Achnatherum hymenoides*)	Native grass	Floodplain, disturbed and undisturbed terrace areas, and infrequently in washes
Inland saltgrass (*Distichlis spicata*)	Native grass	Found on the floodplain and wetlands within the floodplain
James' galleta (*Pleuraphis jamesii*)	Native grass	Terrace
Prickly pear cactus (*Opuntia* spp.)	Native cactus	*O. polyacantha* and *O. phaeacantha* have been identified in terrace areas
Rubber rabbitbrush (*Ericameria nauseosa*)	Native shrub	Floodplain, terrace, and wash, early successional
Russian olive (*Elaeagnus angustifolia*)	Invasive tree	Floodplain
Russian thistle (*Salsola tragus*)	Invasive annual	Floodplain, terrace, and wash, especially in disturbed areas
Saltcedar (*Tamarix* sp.)	Invasive shrub	Floodplain
Saltlover (*Halogeton glomeratus*)	Invasive annual	Terrace, floodplain, and wash
Sand dropseed (*Sporobolus cryptandrus*)	Native grass	Terrace, wash
Shadscale saltbush (*Atriplex confertifolia*)	Native subshrub	Floodplain, terrace, washes
Threadleaf ragwort (*Senecio flaccidus*)	Native shrub	Terrace
Valley saltbush (*Atriplex cuneata*)	Native shrub	Predominantly in undisturbed terrace areas

APPENDIX H:
EVALUATION OF HUMAN HEALTH EFFECTS FROM TRANSPORTATION

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Introduction

This appendix summarizes human health considerations associated with transporting waste materials resulting from the proposed decommissioning and disposal of evaporation pond. Both radiological and nonradiological transportation impacts would result from shipment of materials and pond wastes. Radiological impacts are those associated with the effects from low levels of radiation emitted during incident-free transportation and from the accidental release of radioactive materials. Nonradiological impacts are independent of the nature of the cargo being transported and are expressed as traffic accident fatalities resulting only from the physical forces that accidents could impart to humans. This appendix contains the detailed transportation analysis, including methodology and assumptions.

Transportation packages containing radioactive materials emit low levels of radiation; the amount of radiation depends on the characteristics of the transported materials and the amount of shielding provided by the package. For incident-free transportation, the potential human health impacts from the radiation field surrounding the radioactive packages were estimated for transportation workers and populations along the route (termed off-traffic or off-link), people sharing the route (termed in-traffic or on-link), and people at rest areas and stops along the route.

The system for analyzing the Radiological Impact of the Transportation of Radioactive Materials (RADTRAN) 6.02.1 computer program (Weiner et al., 2013) was used to estimate impacts on transportation workers and populations, as well as the impact to a maximally exposed individual (MEI), who may be a worker or a member of the public (for example, a resident along the route, a person struck in traffic, a gasoline station attendee, or an inspector). Incident-free radiological health impacts are expressed in terms of additional latent cancer fatalities (LCFs). Radiological health impacts from accidents are also expressed as additional LCFs[1], and nonradiological accident risk as additional immediate (traffic) fatalities.

Transportation accidents involving radioactive materials present both nonradiological and radiological risks to workers and the public. Nonradiological impacts of transportation accidents include traffic accident fatalities. The radiological impact of a specific accident is expressed in terms of probabilistic risk (i.e., dose risk), which is defined as the accident probability (i.e., accident frequency) multiplied by the accident consequences (i.e., dose). The overall radiological risk is obtained by summing the individual radiological risks for a range of accidents. The analysis of accident risks considers a spectrum of accident severities ranging from high probability accidents of low severity (e.g., a fender bender) to hypothetical high-severity accidents having low probabilities of occurrence. Because it is impossible to predict the specific location of an off-site transportation accident, generic atmospheric conditions (the United States averaged atmospheric data) as included in RADTRAN computer program were selected for the risk and consequence assessments.

Transportation packaging for radioactive materials must be designed, constructed, and maintained to contain the package contents and provide radiation shielding. The type of packaging used is determined by the total radioactive hazard presented by the material within the packaging. For the waste generated in this Environmental Assessment (EA), which is a low specific activity waste, as indicated in the U.S. Department of Transportation (USDOT)

[1] LCFs associated with radiological exposure were estimated by multiplying the occupational (worker) and public dose by a dose conversion factor of 0.0006 LCFs per rem or person-rem of exposure (DOE, 2003).

regulation 49 Code of Federal Regulations (CFR) Part 173, it may be shipped in a shipping container such as Industrial or Type A Packaging (49 CFR 173.427). In this EA, the selected packaging is a 4 x 4 x 8 ft Super Sack, with a maximum capacity of 15,000 lbs (6,804 kg).

Transportation of the waste materials would occur on exclusive and dedicated use vehicles (e.g., trucks or rails). Offsite transportation of the radioactive material has a defined regulatory limit of 10 millirem (mrem) per hour at approximately 6.6 feet (ft) from the outer lateral surfaces of the vehicle (10 CFR 71.47; 49 CFR 173.441). The external dose rate of package is driven by their radiological characteristics of its content. Given the composition of waste consists of a very low concentration of uranium, a naturally occurring radioactive material, with a maximum uranium content of 0.005 percent, a dose rate of 0.01 mrem per hour at 3.3 ft from the transporter (truck or railcar) was assigned.

Potential human health impacts from transportation accidents were evaluated. The impact of a specific radiological accident is expressed in terms of probabilistic risk, which is defined as the accident probability (accident frequency) multiplied by the accident consequence. The overall risk was obtained by summing individual risks from all reasonably conceivable accidents. The analysis of accident risks accounts for a spectrum of accidents ranging from high-probability accidents of low severity (e.g., a fender-bender) to hypothetical high-severity accidents that have a corresponding low probability of occurrence.

The expected very low concentrations of radioactive material in the evaporation pond waste pose very little risk, in general, to human health and the environment, even under accident conditions, as summarized hereafter. Nevertheless, in the event of a radiological release from a shipment along a route, local emergency response personnel would be the first to arrive at the accident scene. It is expected that response actions would be taken in accordance with the guidance in the *National Response Framework* (DHS, 2019). Based on the initial assessment at the scene, training, and available equipment, first responders would involve Federal and state resources as necessary. First responders and/or Federal and state responders would initiate actions in accordance with the USDOT *Emergency Response Guidebook* (USDOT, 2016) to isolate the incident and perform the actions necessary to protect human health and the environment (such as evacuations or other means to reduce or prevent impacts to the public). Cleanup actions are the responsibility of the carrier. LM would partner with the carrier, shipper, and applicable state and local jurisdictions to ensure cleanup actions met regulatory requirements.

Incident-free radiological health impacts are expressed as additional LCFs. Radiological accident health impacts are also expressed as additional LCFs, and nonradiological accident risks are expressed in terms of additional immediate (traffic) fatalities. LCFs associated with radiological exposure were estimated by multiplying the occupational (transport crew) and public dose by a risk factor of 0.0006 (6.0×10^{-4}) LCFs per roentgen equivalent man (rem) or person-rem of exposure (DOE, 2003). Impacts from transporting wastes were calculated assuming that the wastes are shipped by truck or a combination of truck and rail[2].

In determining transportation risks, per-shipment risk factors were calculated for incident-free and accident conditions using the RADTRAN 6.02 computer program (Weiner et al., 2013) in conjunction with the Web-Transportation Routing Analysis Geographic Information System

[2] Because Shiprock does not have rail connections, waste shipments would have to be transported via truck to an intermodal location, considered to be the Mentmore Transload Station at the Gallup Energy Logistics Park just northwest of Gallup, New Mexico.

(Web-TRAGIS) computer program (Peterson, 2018) to choose transportation routes in accordance with USDOT regulations, as specified in 49 CFR Part 397. The Web-TRAGIS program provides population density estimates for rural, suburban, and urban areas along the routes based on the 2012 United States census. The population density estimates were escalated to 2025 population density estimates using state-level 2010 and 2020 census data and assuming population growth between 2010 and 2020 would continue through 2025. The region of influence (ROI) of this analysis is the affected population, including individuals living within 0.5 miles (804 meters [m]) of each side of the road or rail line for incident-free operations and, for accident conditions, individuals living within 50 miles (80 kilometer [km]) of the accident. The MEI was assumed to be a receptor located 330 ft directly downwind from the accident.

All Motor Carriers selected for transport of the wastes will be thoroughly vetted through a formalized selection process and must have USDOT Satisfactory Safety Ratings and DOE Motor Carrier Evaluation Program approvals. To mitigate the possibility of an accident, DOE-issued Manual 460.2-1A (DOE, 2008), *Radioactive Material Transportation Practices Manual for Use with DOE O 460.2B*[3]. As specified in this manual, carriers are expected to exercise due caution and care in dispatching shipments. According to the manual, the carrier determines the acceptability of weather and road conditions, whether a shipment should be held before departure, and when actions should be taken while enroute. The manual emphasizes that shipments should not be dispatched if severe weather or bad road conditions make travel hazardous. Current weather conditions, the weather forecast, and road conditions would be considered before dispatching a shipment. Conditions at the point of origin and along the entire route would be considered The Shiprock disposal site operations contractor will inspect all trucks with the driver before the load is released. Daylight driving will be emphasized.

Route-specific accident and fatality rates for commercial truck transports and rail shipments were used to determine the risk of traffic accident fatalities. For offsite transport of radioactive waste, a weighted average accident and fatality rate was calculated based on the state-level distances travelled and their associated accident and fatality rates. The accident and fatality values selected were the state-level total accident and fatality rates provided in the Saricks and Tompkins report (Saricks and Tompkins, 1999); adjusted for underreporting (UMTRI, 2003). The rates in the Saricks and Tompkins report are cited in terms of accident and fatality per car- and railcar-km traveled.

Affected Environment

Route characteristics that are important to the radiological risk assessment include the total shipment distance and population distribution along the route. The specific route selected determines both the total potentially exposed population and the expected frequency of transportation-related accidents. Route characteristics for routes analyzed in this EA are summarized in Table H-1. Rural, suburban, and urban areas were characterized according to the following breakdown (Peterson, 2018):

- Rural population densities range from 0 to 140 persons per square mile (0 to 54 persons per square km)

[3] DOE M 460.2-1A was published in 2008 for the action in DOE O 460.2A, which is now revised as DOE O 460.2B.

- Suburban population densities range from 140 to 3,326 persons per square mile (55 to 1,284 persons per square km)
- Urban population densities include all population densities greater than 3,326 persons per square mile (1,284 person per square km)

The affected population for route characterization and incident-free dose calculation includes all persons living within 0.5 miles (805 m) of each side of the transportation route.

Table H-1. Off-site transport truck and rail route characteristics

Origin	Destination	Nominal Distance (km)	Distance Traveled in Zones (km)			Population Density in Zone [a] (number per square km)			Number of Affected Persons [b]
			Rural	Suburban	Urban	Rural	Suburban	Urban	
Truck									
Shiprock	Energy*Solutions*	995	843	121	31	9	583	2,020	226,674
	WCS	965	849	97	20	9	343	1,840	124,403
	GELP [c]	146	124	23	0	40	278	0	18,227
Rail									
Mentmore	Energy*Solutions*	1,877	1691	175	21	6	532	2415	244,696
	WCS	1,377	928	402	47	9	299	3682	484,694

Key: GELP = Gallup Energy Logistics Park; km = kilometer; WCS = Waste Control Specialists

[a] Population densities were projected to 2025 using state-level data from the 2020 census and assuming state population growth rates from 2010 to 2020 continue to 2025.

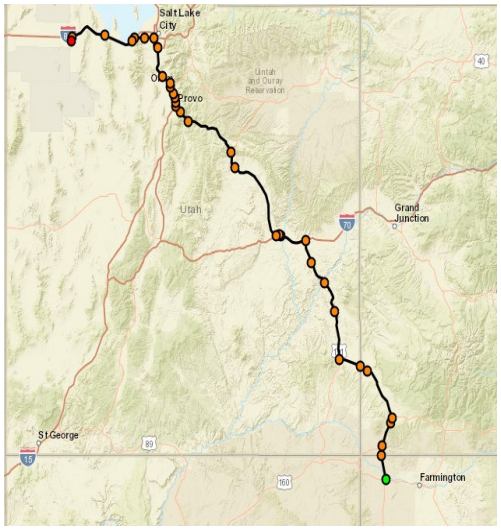
[b] For offsite shipments, the estimated number of persons residing within 0.5 miles along the transportation route, projected to 2025.

[c] Because Shiprock does not have a rail yard, truck transport from a nearby rail yard (Mentmore Transload Station at the GELP was used) would be required.

Note: Because all numbers are rounded to nearest digit, total distance may be different from some of individual segments.

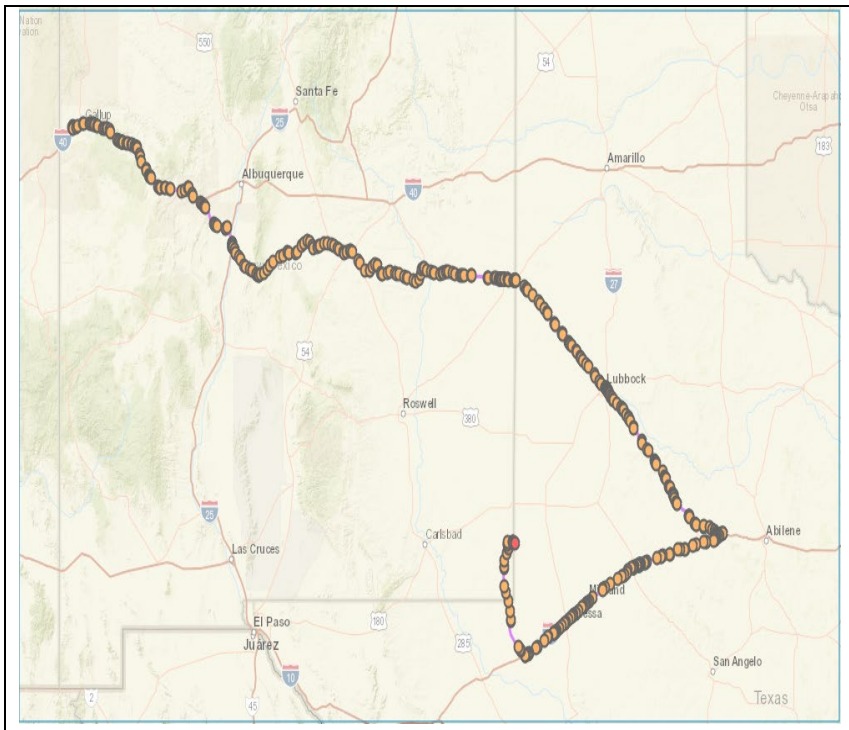
Figure H-1 and Figure H-2 show the specific routes for the truck and rails transports generated using Web-TRAGIS computer program (Peterson, 2018). Truck transports use the U.S. Highway 491 South (for transports to WCS in Andrews County, Texas) and U.S. Highway 491 North (for transports to Energy*Solutions* in Clive, Utah). Rail transports will use Mentmore transload station at the Gallup Energy Logistics Park (GELP) as an intermodal facility.

Truck Transport Route to WCS in Andrews County, Texas

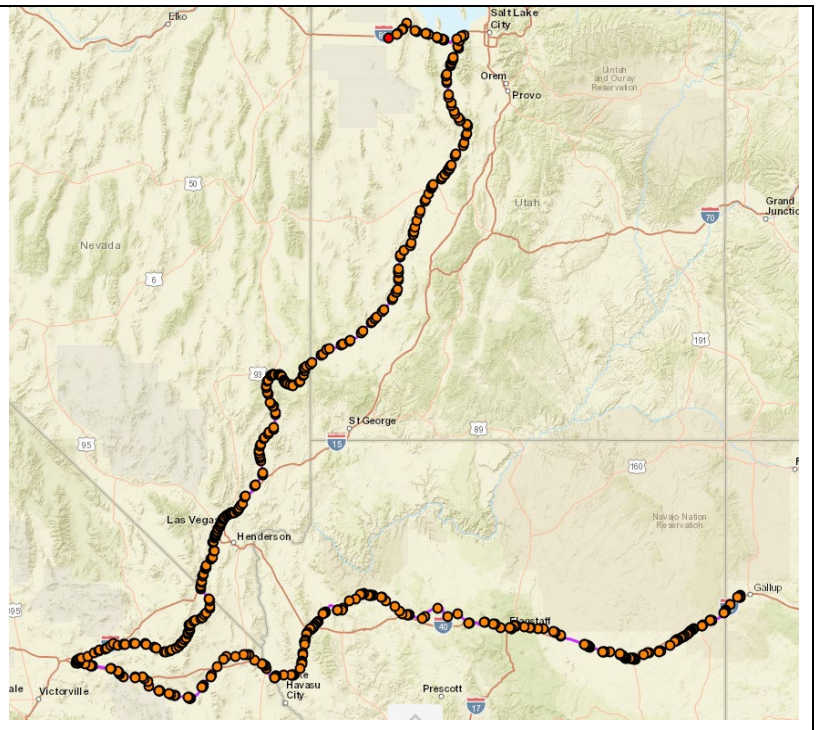


Truck Transport Route to EnergySolutions in Clive, Utah

Figure H-1. Truck transportation routes to Waste Control Specialists (WCS) and EnergySolutions



Rail Transport Route to WCS in Andrews County, Texas



Rail Transport Route to EnergySolutions in Clive, Utah

Figure H-2. Rail transport routes to Waste Control Specialists (WCS) and EnergySolutions

Environmental Consequences

Incident-Free Transportation Risks

During incident-free transportation of the Shiprock pond waste materials, a radiological dose results from exposure to the external radiation field that surrounds the shipping containers. The population dose is a function of the number of people exposed, their proximity to the containers, their length of time of exposure, and the intensity of the radiation field surrounding the containers.

Radiological impacts were determined for crew members (truck and train drivers) and the general population during incident-free transportation. The general population is composed of the persons residing within 0.5 miles on either side of the truck route (off-link), persons sharing the road (on-link), and persons at stops. Exposures to workers who would load and unload the shipments are not included in this analysis but are included in the occupational estimates for plant workers. Exposures to inspectors are evaluated and presented separately in this section.

Collective doses for the crew and general population were calculated by using the RADTRAN 6.02.1 computer code (Weiner et al., 2013; Weiner et al., 2014). Offsite transportation of the radioactive material has a defined regulatory limit of 10 mrem per hour at 6.6 ft from the outer lateral surfaces of the vehicle (10 CFR 71.47; 49 CFR 173.441). The external dose rate of a package is driven by the radiological characteristics of its content. Given the very low concentration of the natural uranium content of the pond waste, the radioactive material shipments were assigned an external dose rate 0.01 mrem per hour at 3.3 ft (1 m) from the transporter (truck or a rail car).

To calculate the collective dose, a unit risk factor for a single shipment (a per-shipment risk factor) between a given origin and destination was developed to estimate the impact of transporting one shipment of radioactive material over the shipment distances in various population density zones. The unit dose is a function of the distance and exposure time for both the driver and the exposed public. To include the potential of traffic congestion, the analysis assumed that for 10 percent of the time, travel through suburban and urban zones would encounter rush hour conditions, leading to a lower average speed and higher traffic density.

For truck shipments, the following hypothetical scenarios were evaluated to determine the dose to the MEI in the general population (DOE, 2002c):

- A person caught in traffic and located 4 ft (1.2 m) from the surface of the shipping container for 30 minutes
- A resident living 98 ft (30 m) from the highway used to transport the shipping container
- A service station worker at a distance of 52 ft (16 m) from the shipping container for 50 minutes

The following hypothetical scenarios were also evaluated for railcar shipments (DOE, 2002c):

- A rail yard worker working at a distance of 33 ft (10 m) from the shipping container for 2 hours
- A resident living 98 ft (30 m) from the rail line on which the shipping container is being transported
- A resident living 656 ft (200 m) from a rail stop during classification and inspection for 20 hours

The maximally exposed transportation worker (excluding drivers) for both truck and rail shipments would be an individual inspecting the cargo at a distance of 1 m from the shipping container for 1 hour.

The hypothetical MEI, a resident living near the road or rail, doses were accumulated over the total transportation shipments, but for the scenario involving an individual caught in traffic next to a shipping container, the radiological exposures were calculated for only one event, because it was considered unlikely that the same individual would be caught in traffic next to all containers for all shipments.

The radiological risks from transporting the radioactive materials are estimated in terms of the number of LCFs among the crew and the exposed population. A health risk conversion factor of 0.0006 LCF per rem or person-rem of exposure is used for both the public and workers (DOE, 2003).

Transportation Risk Results

The transportation risk assessment considers the probabilities and consequences of a spectrum of potential accident severities using a methodology developed by NRC (NRC, 1977). For the spectrum of accidents considered in the analysis, accident consequences in terms of collective "dose risk" to the population within 50 miles were determined using the RADTRAN 6.02 computer program (Weiner et al., 2013; Weiner et al., 2014).

The accident consequence assessment considers the potential impacts of severe transportation accidents. In terms of risk, the severity of an accident must be viewed in terms of potential radiological consequences, which are directly proportional to the fraction of the radioactive material within a transport package that is released to the environment during the accident. Although accident severity regions span the entire range of mechanical and thermal accident loads, they are grouped into accident categories that can be characterized by a single set of release fractions and are, therefore, considered together in the accident consequence assessment (NRC, 1977). The accident category severity fraction is the sum of all conditional probabilities in that accident category. For this EA, the severity categories in the *Radioactive Material Transportation Study* (NRC, 1977) were used.

For off-site transportation of radioactive materials and wastes, route-specific accident rates and accident fatality risks were determined. The values selected were the total state-level accident and fatality rates provided in ANL/ESD/TM-150 (Saricks & Tompkins, 1999). For the truck transports, the state-level rates were then adjusted based on the distance traveled in each state to derive a route-specific accident and fatality rate per truck-km. Because of the potential underreported data that were used in Saricks and Tompkins report, state-level truck accident and fatality rates in the Saricks and Tompkins report were increased by factors of 1.64 and 1.57, respectively, to account for the underreporting (Saricks & Tompkins, 1999; UMTRI, 2003).

Radiological consequences were calculated by assigning radionuclide release fractions on the basis of the type and form of radioactive material, the type of shipping container, and the accident severity category. For this analysis, release fractions for the pond wastes were selected based on pond sample test results providing the details on the potential fractions of fine particles and the related assumptions in the *Radioactive Material Transportation Study* (NRC, 1977).

Table H-2 presents the per-shipment risk factors (unit risk factor for a single shipment) that have been calculated for the collective populations of exposed persons and for the crew for the anticipated routes and shipment configurations. Radiological risks are presented in terms of doses and LCFs per shipment for each unique route, material, and container combination. The

radiological risks would result from potential exposure of people to external radiation emanating from the packaged waste. The exposed population includes the off-link public (people living along the route), on-link public (pedestrian and car occupants along the route), and public at rest and fuel stops. LCF risk factors were calculated by multiplying the accident dose risks by a health risk conversion factor of 0.0006 LCF per rem or person-rem of exposure (DOE, 2003).

For transportation accidents, the risk factors are given for both radiological impacts, in terms of potential LCFs in the exposed population, and nonradiological impacts, in terms of nonoccupational number of traffic fatalities. LCFs represent the number of additional LCFs among the exposed population. Under accident conditions, the population would be exposed to radiation from released radioactivity (if the package were damaged) and would receive a direct dose (even if the package is unbreeched). For accidents that had no release, the analysis conservatively assumed that it would take approximately 12 hours to remove the package or commercial vehicle from the accident area (DOE, 2002a).

Table H-2. Risk factors per shipment of waste

Transport Modes	Origin	Transport Destination	Incident-Free				Accident	
			Crew Dose (person-rem)	Crew Risk (LCF) [a]	Population Dose (person-rem) [b]	Population Risk (LCF) [a]	Radiological Risk (LCF) [a]	Non-radiological Risk (Traffic Fatalities)
Truck	Shiprock	Energy*Solutions*	3×10^{-6}	2×10^{-9}	8×10^{-6}	5×10^{-9}	3×10^{-9}	0.00004
		WCS	3×10^{-6}	2×10^{-9}	7×10^{-6}	4×10^{-9}	5×10^{-10}	0.00003
		GELP [c]	5×10^{-7}	3×10^{-10}	5×10^{-7}	3×10^{-10}	1×10^{-10}	0.000005
Rail	Mentmore[c]	Energy*Solutions*	2×10^{-3}	9×10^{-7}	2×10^{-3}	1×10^{-6}	6×10^{-9}	0.002
		WCS	1×10^{-3}	7×10^{-7}	2×10^{-3}	1×10^{-6}	1×10^{-9}	0.001

Key: GELP = Gallup Energy Logistics Park; LCF = latent cancer fatality; WCS = Waste Control Specialists

[a] Risk is expressed in terms of LCFs. Radiological risk is calculated for one-way travel while nonradiological risk is calculated for two-way travel. Accident dose risk can be calculated by dividing the risk values by 0.0006 (DOE, 2003). LCF risks are rounded to one non-zero digit.

[b] Person-rem is the exposure of a population to radiation and is the average dose per individual (in rem) multiplied by the number of people exposed. Rem is a unit of effective absorbed dose of ionizing radiation in human tissue.

[c] Because Shiprock does not have a rail yard, truck transport to a nearby rail yard (Mentmore Transload Station at the Gallup Energy Logistics Park was used) would be required. The analysis considers dedicated train transports with 22 Shiprock pond wastes railcars.

Table H-3 shows the risks of transporting pond wastes to various disposal locations. The table summarizes the risk results for Alternative 1 and Alternative 2 transports. Under the No Action Alternative, the pond wastes would remain at the site, and therefore, no offsite transportation is evaluated.

The risks are calculated by multiplying the previously given per-shipment factors by the number of shipments over the duration of the program. The Shiprock pond wastes consists of pond sediments, liner, and subsoil, all of which are conservatively assumed to have the same natural uranium concentration. It is estimated that the different wastes would have a total volume of 20,0000 cubic yds. Based on the Federal gross vehicle weight limits (23 CFR 658.17) and the expected mass of the wastes, there would be approximately 1,324 truck shipments and nine train (or rail) shipments to various disposal locations. Each train would consist of 22 railcars, each of which would contain seven Super Sacks. Each truck would transport three Super Sacks.

Table H-3. Risks of transporting Shiprock evaporation pond radioactive waste

Alternatives	Number of Shipments	One-way km Traveled	Incident-Free				Accident	
			Crew		Population		Radiological Risk	Non-radiological Risk
			Dose (person-rem) [a]	LCFs [a]	Dose (person-rem) [b]	LCFs		
Alternative 2: All Truck Transports								
Shiprock disposal site to Energy*Solutions*	1,324	1,317,380	0.004	3×10^{-6}	0.01	6×10^{-6}	4×10^{-6}	0.06
Shiprock disposal site to WCS	1,324	1,278,980	0.004	2×10^{-6}	0.009	6×10^{-6}	7×10^{-7}	0.04
Alternative 3: Truck and Rail Transport								
Truck: Shiprock disposal site to GELP	1,324	194,630	0.0006	4×10^{-7}	0.0006	4×10^{-7}	1×10^{-7}	0.007
Rail: GELP to Energy*Solutions*	9	16,990	0.01	8×10^{-6}	0.02	1×10^{-5}	6×10^{-8}	0.013
Rail: GELP to WCS	9	12,402	0.01	7×10^{-6}	0.02	1×10^{-5}	1×10^{-7}	0.009
Truck/Rail to *EnergySolutions*	1,333	211,620	0.01	8×10^{-6}	0.02	1×10^{-5}	2×10^{-7}	0.02
Truck/Rail to WCS	1,333	207,030	0.01	7×10^{-6}	0.02	1×10^{-5}	2×10^{-7}	0.02

Key: GELP = Gallup Energy Logistics Park; LCF = latent cancer fatality; WCS = Waste Control Specialists

[a] Risk is expressed in terms of LCFs. Radiological risk is calculated for one-way travel while nonradiological risk is calculated for two-way travel. Accident dose risk can be calculated by dividing the risk values by 0.0006 (DOE, 2003). LCF risks are rounded to one non-zero digit.

[b] Person-rem is the exposure of a population to radiation and is the average dose per individual (in rem) multiplied by the number of people exposed. Rem is a unit of effective absorbed dose of ionizing radiation in human tissue.

As indicated in Table H-3, all shipment risk factors are less than one. This means that no LCFs or traffic fatalities are expected to occur during these transports.

The maximum estimated doses to workers and the public MEIs are presented in Table H-4, considering all shipment types. Doses are presented on a per-event basis (rem per event, per exposure, or per shipment), because it is generally unlikely that the same person would be exposed to multiple events. A member of the public living along the route would likely receive multiple exposures from passing shipments during the period analyzed. The cumulative dose to this resident is calculated by assuming all the shipments pass his or her home. The cumulative dose is calculated assuming that the resident is present for every shipment and is unshielded at a distance of approximately 98 ft from the route. Therefore, the cumulative dose depends on the number of shipments passing a particular point and is independent of the actual route being considered.

If one considers the maximum resident dose provided in Table H-4, then the maximum dose to this resident (if all the materials were shipped via this route [a total of 1,324 truck shipments or nine train shipments]) would be approximately 0.00077 mrem for truck with a risk of developing an LCF of approximately 5×10^{-7} (0.0000005), and 0.0003 mrem for rail with a risk of developing an LCF of 2×10^{-7} (0.0000002).

Table H-4. Estimated dose to the maximally exposed individual under incident-free transportation conditions.

Receptor	Dose to Maximally Exposed Individual
Workers	
Crew member (truck driver)	2 rem per year [a]
Inspector	0.000039 rem per event per hour of inspection
Rail yard workers	0.00027 rem per event
Public	
Resident (along the truck route)	0.00000000058 rem per event
Resident (along the rail route)	0.000000032 rem per event
Person in traffic congestion	0.000032 rem per event per half an hour stop
Person at a rest stop/gas station	0.0002 rem per event per hour of stop
Gas station attendant	0.0000005 rem per event

Key: DOE = U.S. Department of Energy; rem = roentgen equivalent man

[a] In addition to complying with DOT requirements, a DOE-LM employee would also need to comply with 10 CFR 835, which limits worker radiation doses to 5 rem per year. DOE's goal is to maintain radiological exposure as low as reasonably achievable. DOE has, therefore, established the administrative control level of 2 rem per year (DOE, 2017). Based on the number of commercial shipments and the total crew dose to two drivers, a commercial driver dose would not exceed this administrative control limit. Therefore, the administrative control limit is reflected in this table for the maximally exposed truck crew member.

Based on the results presented, the following conclusions have been reached (see Table H-4):

- The transportation of radioactive pond waste materials would likely result in no additional fatalities as a result of radiation, either from incident-free operation or postulated transportation accidents.
- The nonradiological accident risks (the potential for fatalities as a direct result of traffic accidents) are greater than the radiological accident risks.
- It is estimated that no potential traffic fatalities would be expected over the duration of the activities. Considering that the transportation activities analyzed in this EA would occur over approximately 7 to 8 months and that the average number of traffic fatalities in the United States is approximately 34,030 per year for the 10-year period 2010 through 2019 (USDOT, 2021b), the incremental increase in risk to the general population from shipments associated with the Shiprock evaporation pond decommissioning would, therefore, be very small and would not contribute to cumulative impacts.

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APPENDIX I:
SUMMARY OF ENVIRONMENTAL IMPACTS

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Table I-1. Summary of environmental impacts and best management practices (BMPs) to avoid or minimize impacts

Affected Environment	Alternative 1 – No Action Alternative	Alternative 2 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway Transport	Alternative 3 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway/Rail Transport
Air Quality	Short-Term: Maintenance activities would continue to generate very small amounts of nonradiological air emissions due to maintenance activities. Long-Term: Same as short-term	Short-Term: Minor amounts of (1) combustive emissions due to the use of fossil-fuel-powered equipment, trucks, and worker commuter vehicles and (2) fugitive dust emissions from bare soils and the operation of vehicles and equipment on exposed soils would not result in adverse air quality impacts Long-Term: GHG emissions would result in a negligible contribution to climate change. BMPs: Dust suppression techniques applied during construction activities.	Short-Term: Similar to Alternative 2. Train transport of waste would result in higher emissions of most criteria pollutants but lower GHG emissions versus transport by truck. Long-Term: Similar to Alternative 2 BMPs: Similar to Alternative 2
Biological and Natural Resources	Short-Term: No impact to wildlife and/or domestic animals because no construction activities would occur, the evaporation pond would remain in its current location, and the existing chain-link fence would prohibit terrestrial wildlife and/or domestic animals from entering the pond area. Long-Term: Negligible impacts to wildlife because no decommissioning activities would occur. No impacts to special-status species because there are no special-status species known to occupy the area within the evaporation pond fence. The vegetation community would continue to slowly develop within the fence, but exclusion	Short-Term: Avoidance and mitigation measures developed in consultation with Navajo Nation Department of Fish and Wildlife and the USFWS, as applicable, would be implemented during construction activities to avoid areas of potential special-status species and their habitat (i.e., Mesa Verde cactus, Colorado pikeminnow, razorback sucker). Long-Term: Some wildlife species could be temporarily displaced during construction activities; however, full access to the formerly fenced area would be available upon completion of full decommissioning and disposal of the evaporation pond. Additionally, revegetated areas could persist for decades afterward until later-successional plants became established.	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2 BMPs: Similar to Alternative 2

Affected Environment	Alternative 1 – No Action Alternative	Alternative 2 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway Transport	Alternative 3 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway/Rail Transport
	of wildlife would negate any indirect beneficial impact to wildlife from improved vegetation. BMPs: Institutional controls maintained for the site that include fencing and gates that prohibit wildlife entry and noxious weed control	BMPs: Project controls to minimize and eradicate the establishment and spread of invasive (vegetative) species.	
Cultural Resources and Native American Tribal Resources	Short-Term: No impact Long-Term: No impact	Short-Term: No impact because there are no historic properties or other cultural resources identified within the APE. Long-Term: Same as short-term	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2
Socioeconomics and Environmental Justice	Short-Term: No effect on socioeconomics or environmental justice because workforce requirements would not change socioeconomic resources in the region. Long-Term: Same as short-term	*Socioeconomics* Short-Term: Negligible socioeconomic impacts compared to No Action Alternative. The number of full-time personnel under this alternative would be the same as under Alternative 1. Long-Term: There would be potential for long-term benefits to Shiprock CDP residents from excavation and off-site waste disposal, which would eliminate any potential for human exposure from contaminated sediments. There would also be potential for positive impacts if the land is reverted to the community for use. *Environmental Justice* Short-term: No disproportionately high or adverse effects would occur to minority or low-income populations as a result of Alternative 2 because no minority or low-income populations were identified within the ROI/project boundary Long-Term: Same as short-term.	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2

Affected Environment	Alternative 1 – No Action Alternative	Alternative 2 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway Transport	Alternative 3 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway/Rail Transport
Geology and Soils	Short-Term: Under the No Action Alternative, the evaporation pond would remain in its current location and contaminated groundwater from the floodplain would continue to be pumped into the pond. The liner would continue to degrade, ultimately leading to dissolved contaminants coming into direct contact with the land surface and underlying soils. Long-Term: A secondary source of uranium and other hazardous constituents would be expected as a result of the No Action Alternative because chemical partitioning of dissolved compounds between the infiltrating water and soils underlying the evaporation pond would be created.	Short-Term: Adverse impacts to site soils would be expected from construction activities such as removal of vegetation, site excavation/grading, hauling and placement of fill material. Negligible soil contamination would be expected from trucks and mechanical equipment. Long-Term: No impact BMPs: Sedimentation and erosion controls (i.e., silt fencing, straw bales) to reduce runoff and soil erosion during construction activities.	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2 BMPs: Similar to Alternative 2
Human Health and Safety	Short-Term: There would be health impacts to potential onsite trespassers frequently exposed to uranium-234, uranium-238 and arsenic due to ingestion of pond surface water. Continued leakage from the pond to the subsurface would not impact human health onsite since terrace groundwater is not used as a potable source. Long-Term: Same as short-term impacts plus no offsite human health impacts via atmospheric transport of dusts (assuming loss of surface water if pumping were to cease) or groundwater migration of nitrate (the only migration contaminant of concern in groundwater) from pond leakage to the subsurface due to institutional controls that prohibit drinking water well the installation. Nitrate in groundwater is not expected to impact the San Juan River. BMPs: Occupational hazards minimized by adherence to health and safety regulations and	Short-Term: During remediation of the pond, no short-term onsite human health impacts are likely for a pond remediation worker due to health and safety BMPs and the use of PPE. No short-term impacts are estimated for offsite individuals during remediation via atmospheric transport of pond sediment dusts generated during remediation. Remediation is not expected to impact human health via groundwater exposures because institutional controls prevent groundwater usage at onsite and offsite locations. Long-Term: Following completion of the removal of pond media and liner, there are no human health impacts expected for onsite or offsite individuals. No offsite groundwater impacts are expected for locations directly downgradient of the pond area following remediation, including the San Juan River,	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2 BMPs: Similar to Alternative 2

Affected Environment	Alternative 1 – No Action Alternative	Alternative 2 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway Transport	Alternative 3 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway/Rail Transport
	standards; engineering controls; and PPE used for work with hazardous materials.	because all primary source media and contaminants will have been removed. BMPs: Occupational hazards minimized by adherence to health and safety regulations and standards; engineering controls; and PPE used for work with hazardous materials.	
Land Use and Recreation	Short-Term: No impact because there would be no changes to land use or recreation. Long-Term: Same as short-term	Short-Term: Beneficial impact because the future use of the decommissioned evaporation pond land area would be determined with the Navajo Nation through a NEPA evaluation. Additionally, no impacts to recreational resources would be expected as a result of Alternative 2 in the nearby town of Shiprock. Long-Term: Same as short-term	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2
Noise and Vibration	Short-Term: No impact because there would be no construction/demolition activity and noise levels would not change. Long-Term: Same as short term	Short-Term: Temporary impact to noise-sensitive receptors within the vicinity of the construction site; however, BMPs would be implemented to reduce noise levels and noise and vibration impacts would cease upon construction completion. Long-Term: No impact. BMPs: Implementation and adherence to hearing conservation program.	Short-Term: Identical to Alternative 2. No sensitive locations are near the GELP transload facility, and temporary noise increases associated with transload activities would have minimal impacts. Long-Term: No impact. Noise would be temporary lasting only for the duration of the Project. BMPs: Similar to Alternative 2
Solid Waste and Waste Management	Short-Term: No impact because no waste would be generated over baseline conditions. Long-Term: Same as short-term	Short-Term: Potential environmental consequences associated with receipt, management, and disposal of wastes up to the quantities or limits licensed, permitted, or approved were considered in the NEPA evaluations for the disposal facilities and are not included in this EA. The quantity of waste generated under this alternative is negligible compared to the facilities' licensed/permitted/approved capacities and	Short-Term: Similar to Alternative 2 Long-Term: Same as short-term

Affected Environment	Alternative 1 – No Action Alternative	Alternative 2 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway Transport	Alternative 3 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway/Rail Transport
		therefore the potential solid waste and waste management impacts would also be negligible. Long-Term: Same as short-term	
Traffic and Transportation	Short-Term: No impact Long-Term: No impact	*Traffic* Short Term: Traffic impacts from implementation of Alternative 2 would be negligible. The expected small work force, minor equipment and delivery requirements, and availability of existing highway infrastructure do not indicate that transportation would be an issue of concern. Truck shipments under would not be expected to impact highway capacity or existing use patterns. The impact of project traffic on traffic patterns is also expected to be minimal and would mostly occur within immediate vicinity of project area where construction equipment and haul trucks would be concentrated. Long-Term: No Impact. *Transportation* Short-Term: No fatalities would be expected as a result of transportation of decommissioning and disposal of the evaporation pond. Additionally, no potential traffic fatalities would be expected as a result of Alternative 2. Long-Term: No impact BMPs: Adherence to traffic laws, signage, school zones, bus stops, speed limits, and pedestrian crossings. Implementation of safety options in conjunction with appropriate Federal, state, and local recommendations.	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2 BMPs: Similar to Alternative 2

Affected Environment	Alternative 1 – No Action Alternative	Alternative 2 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway Transport	Alternative 3 – Full Decommissioning and Disposal of Existing Evaporation Pond at Off-Site Licensed Waste Facilities by Highway/Rail Transport
		Implementation and adherence to day-to-day health and safety programs.	
Visual Resources	Short-Term: Impacts to the surrounding area from the low-quality visual resource resulting from existing pond. Impacts would be mitigated by creating visual barriers between the pond and residential neighbors to the west and north. Long-Term: Same as short-term BMPs: Implementation of visual barriers.	Short-Term: Positive impact on the visual quality of the surrounding area as a result of removal of the evaporation pond because many nearby residents have a strong negative opinion regarding the visual quality of their neighborhood due to the evaporation pond. Long-Term: Same as short-term	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2
Water Resources	Short-Term: Impacts from contaminated groundwater from the floodplain and terrace would continue to be pumped into the pond. Long-Term: Impacts to the liner and eventual failure would be expected as a result of continued or increased infiltration of pond water into the subsurface as a result of the No Action Alternative. Additionally, high uranium concentrations and other environmental constituents would be expected in pond water as a of Alternative 1.	Short-Term: Increases in soil erosion and runoff by exposing unconsolidated materials, clearing vegetation, and compacting soils would be minimized by BMPs. Long-Term: No impact BMPs: Sedimentation and erosion controls (i.e., silt fencing, straw bales) to reduce runoff and soil erosion during construction activities. Redirecting runoff from problem areas, backfilling excavations with clean soil, soil compaction, and other methods to control infiltration of precipitation to groundwater.	Short-Term: Similar to Alternative 2 Long-Term: Similar to Alternative 2 BMPs: Similar to Alternative 2

Key: APE = area of potential effect; BMPs = best management practices; COC = contaminant of concern; dB = decibel; dBA = “A” weighted decibel; GELP = Gallup Energy Logistics Park; GHG = greenhouse gas; NEPA = National Environmental Protection Agency; PPE = personal protective equipment

APPENDIX J:
COMPLIANCE WITH LAWS, REGULATIONS, PERMITS, AND ORDERS

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The decommissioning and disposal of the 11-acre evaporation pond at the Shiprock disposal site would be regulated by numerous Federal and state legal requirements addressing environmental compliance. For some activities, LM has sole authority to act, such as under the Atomic Energy Act of 1954.

The USDOT regulates commercial transportation of hazardous and radioactive materials. USEPA would regulate many aspects of the proposed activities. In many cases, USEPA has delegated all or part of its environmental protection authorities to the states but retains oversight authority. In this delegated role, the New Mexico Environment Department regulates most air emissions; discharges to surface water and groundwater; drinking water quality; and hazardous and nonhazardous waste treatment, storage, and disposal. Under DOE O 436.1A, *Departmental Sustainability* (2023), it is DOE's policy to carry out its mission in a sustainable manner by maximizing energy and water efficiency; minimizing chemical toxicity and harmful environmental releases; promoting renewable and other clean energy development; and conserving natural resources while sustaining assigned mission activities. The major Federal laws, regulations, Executive Orders (Presidential directives that apply only to Federal agencies), DOE Os; state laws and regulations; and other requirements that could apply to the alternatives analyzed in this EA for decommissioning and disposal of the evaporation pond are identified in Table J-1.

Table J-1. Applicable laws, regulations, and other requirements

Law, Regulation, Order, or Other Requirements	Description
General Requirements	
NEPA of 1969, as amended, 42 USC § 4321 et seq.	Establishes a national policy for environmental protection and directs all Federal agencies to use a systematic, interdisciplinary approach to incorporating environmental values into decision- making
Council on Environmental Quality, Regulations for Implementing NEPA, 40 CFR Parts 1500– 1508	Defines actions that Federal agencies must take to comply with NEPA.
DOE National Environmental Policy Act Implementing Procedures, 10 CFR 1021	Establishes DOE's program implementing the procedural provisions of NEPA.
Executive Order 11514, *Protection and Enhancement of Environmental Quality*, as amended by Executive Order 11991	Requires Federal agencies to direct their policies, plans, and programs so as to meet national environmental goals established by NEPA.
Executive Order 12088, *Federal Compliance with Pollution Control Standards*	Directs Federal agencies to comply with applicable administrative and procedural pollution control standards established by, but not limited to, the CAA, Noise Control Act, CWA, Safe Drinking Water Act, Toxic Substances Control Act, and RCRA.
Executive Order 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*	Among other requirements, directs Federal agencies to ensure access to clean air and water; limit exposure to dangerous chemicals and pesticides; reduce greenhouse gas emissions; bolster resilience to the impacts of climate change; and prioritize both environmental justice and employment.

DOE Policy 451.1, *National Environmental Policy Act Compliance Program*	Establishes DOE's expectations for implementing NEPA; the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508); and the DOE NEPA Implementing Procedures (10 CFR Part 1021).
DOE P 450.4A Chg 1 (MinChg), *Integrated Safety Management Policy*	Establishes the DOE's expectation for safety, including integrated safety management that will enable the Department's mission goals to be accomplished efficiently while ensuring safe operations at all departmental facilities and activities.
DOE O 436.1A, *Departmental Sustainability*	Establishes an agency-wide integrated, performance-based approach to implement sustainability in DOE operations and ensures the DOE conducts its missions in a sustainable manner that addresses national energy security and global environmental challenges; advances sustainable, efficient, reliable, and resilient energy for the future; promotes the conservation of natural resources; and ensures DOE achieves sustainability goals pursuant to applicable laws, regulations, and Executive Orders.
Environmental Improvement Act, Chapter 74, Article 1 New Mexico Statutes Annotated (NMSA) 1978	The basic authority for environmental management and consumer protection in New Mexico. This law establishes the Environmental Improvement Board and specifies its duties and powers.
Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), as amended, 42 USC 791 et seq. (Public Law 95-604)	Provides for the safe and environmentally sound disposal, long-term stabilization, and control of uranium mill tailings in a manner that minimizes or eliminates health hazards to the public.
Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings 40 CFR 192	Establishes standards for protection of public health, safety, and environment from radiological and non-radiological hazards associated with uranium and thorium ore processing, and their associated wastes.
Atomic Energy Act of 1954, as amended, 42 USC 2011	Provides fundamental jurisdictional authority to DOE and NRC over governmental and commercial use, respectively, of nuclear materials; authorizes DOE to establish standards to protect health or minimize dangers to life or property for activities under DOE jurisdiction; allows DOE to issue a series of orders to establish a system of standards and requirements that ensure safe operation of DOE facilities.
Farmland Protection Policy Act of 1981 7 CFR Part 658	Establishes criteria Federal agencies use (1) to identify and consider the adverse effects of their programs on the preservation of farmland, (2) to consider alternative actions, as appropriate, that could lessen adverse effects, and (3) to ensure that their programs, to the extent practicable, are compatible with State and units of local government and private programs and policies to protect farmland.

Air Quality	
Clean Air Act of 1970, as amended, 42 USC 7401 et seq.	Requires Federal agencies to comply with air quality regulations; includes four major programs: (1) NAAQS; (2) state implementation plans; (3) new source performance standards; and (4) NESHAP. Allows USEPA to delegate authority for most CAA provisions to New Mexico, who would issue or modify permits, as needed, for stationary sources associated with the proposed activities.
Ambient Air Quality Standards/State Implementation Plans, 40 CFR Parts 51 and 58	Establishes the NAAQS, which are divided into primary and secondary categories for carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and PM.
New Source Performance Standards, 40 CFR Part 60	Creates industry- and process-specific standards applicable to any new, modified, or reconstructed sources of air pollution.
National Emission Standards for Hazardous Air Pollutants (HAPs) and for Source Categories, 40 CFR Parts 61 and 63	Defines HAPs (such as radionuclides, mercury, and asbestos) and maximum achievable control technologies by industry or process. (Proposed activities would add to site HAPs emissions).
Council on Environmental Quality, National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change, 1/9/23	The CEQ released interim guidance that describes how Federal agencies should consider the effects of GHGs and climate change in their NEPA reviews. The interim guidance explains that agencies should (1) consider the potential effects of project alternatives on climate change, as indicated by its estimated GHG emissions, (2) determine the context of project GHGs, (3) consider mitigations that will reduce project GHGs, (4) consider impacts to Environmental Justice communities, and (5) consider adaptation measures that would make the actions and affected communities more resilient to the effects of climate change.
National Emission Standards for Emissions of Radionuclides other than Radon from DOE Facilities, 40 CFR Part 61, Subpart H	Establishes requirements for monitoring radionuclide emissions from facility operations and analyzing and reporting radionuclide doses; limits, in Subpart H, the radionuclide dose to a member of the public to 10 mrem per year.
Air Quality Control Act, Chapter 74, Article 2 New Mexico Statues Annotated (NMSA) Air Quality (Statewide): 20.2.1-20.2.350 New Mexico Administrative Code (NMAC)	New Mexico's Environmental Improvement Act and Air Quality Control Act authorize the NMED to regulate air quality and implement air quality control regulations. The New Mexico Air Quality Control Act delegates authority to the Environmental Improvement Board to adopt, promulgate, publish, amend, and repeal regulations consistent with the State's Air Quality Control Act to attain and maintain NAAQS and prevent or abate air pollution. The Air Quality Control Act also designates the NMED as the State's air pollution control agency, and the Environmental Improvement Act provides the NMED with enforcement authority.

Biological and Natural Resources	
Migratory Bird Treaty Act of 1918, 16 USC 703 et seq. Migratory Bird Permits, 50 CFR Part 21	Implements several international treaties related to the protection of migratory birds and makes it illegal to take, capture, or kill any migratory bird, or to take any part, nest, or egg of any such birds; applies to purposeful actions, not to incidental take.
Endangered Species Act of 1973, 16 USC 1531 et seq. Interagency Cooperation – Endangered Species Act of 1973, as amended, 50 CFR Part 402	Requires Federal agencies to assess whether actions could adversely affect threatened or endangered species or their habitat.
Bald and Golden Eagle Protection Act 16 U.S.C. 668-668d	Prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald or golden eagles, including their parts (including feathers), nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part (including feathers), nest, or egg thereof."
Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (January 10, 2001)	This Executive Order directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act.
Executive Order 13112, *Invasive Species*, Amended by E.O. 13286 and E.O. 13751	Directs Federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
Cultural and Native American Tribal Resources	
American Antiquities Act of 1906, 16 USC 431 et seq Preservation of American Antiquities, 43 CFR Part 3	Protects prehistoric American Indian ruins and artifacts on Federal lands; authorizes the President to designate historic areas as national monuments.
Historic Sites Act of 1935, 16 USC 461 National Historic Landmarks Program, 36 CFR Part 65	Provides for the preservation of historic American sites, buildings, objects, and antiquities of national significance, and serves other purposes.
16 USC 470: National Historic Preservation Act of 1966 36 CFR Part 60: National Register of Historic Places; 36 CFR 61: Procedures for State, Tribal, and Local Government Historic Preservation Programs 36 CFR Part 800: Protection of Historic Properties	Sets forth the procedural requirements for listing properties on the NRHP; identifies the process for evaluating the eligibility of properties for inclusion in the NRHP; establishes the qualifications and defines minimum education and experience required to perform identification, evaluation, registration, and treatment activities related to historic properties; requires consultation with the SHPO and Native American tribes prior to any action that could affect historic resources (this consultation will be accomplished for the proposed activities, as needed).
Archaeological and Historic Preservation Act of 1974, as amended, 16 USC 469 et seq.	Requires the preservation of historical and archaeological data (including relics and specimens) that might otherwise be irreparably lost or destroyed as the result of Federal construction projects.

American Indian Religious Freedom Act of 1978, 42 USC 1996	Protects and preserves, for Native Americans, their inherent right of freedom to believe, express, and exercise their traditional religions, including access to sites.
Archaeological Resources Protection Act of 1979, 16 USC 470aa-mm Protection of Archaeological Resources, 43 CFR Part 7	Protects archaeological resources and sites on Federal and American Indian lands and establishes the uniform definitions, standards, and procedures to be followed by all Federal land managers in providing protection for archaeological resources located on public lands and American Indian lands of the United States, including collections of prehistoric and historic material remains, and associated records, recovered under the authority of the American Antiquities Act (16 USC 431-433), the Reservoir Salvage Act (16 USC 469–469c), Section 110 of the National Historic Preservation Act (16 USC 470h-2), or the Archaeological Resources Protection Act (16 USC 470aamm).
Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*	Requires consultation and coordination with American Indian Tribes prior to taking actions that affect federally recognized tribal governments.
DOE O 144.1 Admin Chg 1, *Department of Energy American Indian Tribal Government Interactions and Policy*	Establishes a policy committing DOE to consultation with American Indian tribal governments to solicit input on DOE issues.
DOE Policy 141.1, *Department of Energy Management of Cultural Resources*	Ensures that DOE programs and field elements integrate cultural resources management into their mission and activities.
Navajo Nation Cultural Resources Protection Act (NN Code Title 19, Section 1001 [Chapter 8]) Navajo Nation Cultural Resources Inventory Permit Number B18532	Establishes policies, procedures, and requirements for protecting and managing cultural resources in a manner that reflects the unique preservation concerns of the Navajo Nation. The Navajo Nation Historic Preservation Department is responsible for reviewing applications and issuing permits for all archaeological and ethnographic investigations within the exterior boundaries of the Navajo Nation.
Navajo Nation Policy for the Protection of Jishcháá’	This policy outlines procedures based on Diné cultural beliefs for protecting all gravesites, human remains, and funerary items under jurisdiction of the Navajo Nation.
Native American Graves Protection and Repatriation Act	Provides a process for Federal agencies to repatriate or transfer from their collections certain Native American cultural items—human remains, funerary objects, sacred objects, and objects of cultural patrimony—to lineal descendants, and to Indian tribes, Alaska Native Corporations, and Native Hawaiian organizations. It also provides a process for Federal agencies to address new discoveries of Native American human remains, funerary objects, sacred objects and objects of cultural property intentionally excavated or inadvertently discovered on Federal or Tribal lands.

Socioeconomics and Environmental Justice	
Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, as amended by Executive Order 12948	Requires each Federal agency to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.
Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, as amended by Executive Order 13296	Requires each Federal agency to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and to ensure that its policies, programs, activities, and standards address disproportionate environmental health or safety risks to children.
Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*	Requires each Federal agency to develop programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related, and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.
Human Health and Safety	
Occupational Safety and Health Act of 1970, 29 USC 651 et seq. Occupational Safety and Health Standards, 29 CFR Part 1910, 29 CFR Part 1926.	Ensures worker and workplace safety, including a workplace free from recognized hazards, such as exposure to toxic chemicals, excessive noise levels, and mechanical dangers. Establishes standards to protect workers from hazards encountered in the workplace (Part 1910) and construction site (Part 1926).
Worker Safety and Health Program, 10 CFR Part 851	Creates DOE's health and safety program to control and monitor hazardous materials to ensure that workers are not being exposed to health hazards, such as toxic chemicals, excessive noise, and ergonomic stressors
Occupational Radiation Protection, 10 CFR Part 835	Establishes radiation protection standards, limits, and program requirements for protecting workers from ionizing radiation resulting from DOE activities.
Chemical Accident Prevention Provisions, 40 CFR Part 68	Provides the list of regulated substances and thresholds, and the requirements for owners or operators of stationary sources concerning the prevention of accidental releases, and the state accidental release prevention programs approved under CAA Section 112(r).
DOE O 440.1B Chg 4 (AdminChg), *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*	Describes the DOE program to protect workers and reduce accidents and losses; adopts occupational safety and health standards.
DOE O 458.1 Chg 4 (LtdChg), *Radiation Protection of the Public and the Environmen*t	Establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE, pursuant to the Atomic Energy Act of 1954, as amended.
National Oil and Hazardous Substances Pollution Contingency Plan 40 CFR 300	The NCP is the Federal Government's blueprint for responding to both oil spills and hazardous substance releases.

40 CFR Part 141: National Primary Drinking Water Regulations	Establishes primary drinking water regulations pursuant to section 1412 of the Public Health Service Act, as amended by the Safe Drinking Water Act (Pub. L. 93–523); and related regulations applicable to public water systems.
40 CFR Part 192, Subpart B: Standards for the Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites.	Establishes requirements that provide reasonable assurance of human health protection as a result of remedial actions.
Solid Waste and Waste Management	
Low-Level Radioactive Waste Policy Act of 1980, 42 USC 2021 et seq. Criteria and Procedures for Emergency Access to Non-Federal and Regional Low-Level Waste Disposal Facilities, 10 CFR Part 62	Specifies that the Federal government is responsible for the disposal of certain LLW, including LLW owned or generated by the DOE; and specifies States are responsible for the disposal of commercially generated LLW; pertains to waste that could be generated by the proposed activities.
Solid Waste Disposal Act of 1965 as amended by RCRA of 1976 and the Hazardous and Solid Waste Amendments of 1984, 42 USC 6901 et seq. RCRA Regulations for Non-hazardous Waste, 40 CFR Parts 239-259 RCRA Regulations for Hazardous Waste, 40 CFR Parts 260-273	Establishes comprehensive management system for hazardous wastes, addressing generation, transportation, storage, treatment, and disposal; allows, per Section 3006 of RCRA (42 USC 6926), States to establish and administer permit programs with USEPA approval; allows USEPA to delegate primary enforcement authority to New Mexico.
Pollution Prevention Act of 1990, 42 USC 13101 et seq. Comprehensive Procurement Guidelines for Products Containing Recovered Materials, 40 CFR Part 247	Establishes requirement to prevent pollution by emphasizing source reduction and recycling. EPA is charged with developing measures for source reduction and evaluating regulations to promote source reduction.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 42 USC 9601	Regulates construction of hazardous waste storage, including for radioactive materials.
DOE Order 435.1, *Radioactive Waste Management*	Ensures that all DOE radioactive waste is managed in a manner that is protective of worker and public health and safety and the environment.
Radiation Protection Act, NMSA 1978, Sections-3-1 to 16	Establishes Radiation Protection Rules and licensing requirements for Radioactive Waste Disposal in New Mexico.
Hazardous Waste Act, NMSA 1978, Section 74-4-1 to -14	Requires proper controls for the management of solid and hazardous waste. Establishes requirements applicable to all hazardous waste management facilities in New Mexico.
Emergency Management Act, NMSA 1978, Section 74-4B-1 to -14	Establishes procedures for responding to hazardous waste spills and releases and incidents.

Solid Waste Act, NMSA 1978, §74-9-1 to -43	Establishes a comprehensive solid waste management program; plans for and regulates the reduction, storage, collection, transportation, separation, processing, recycling, and disposal of solid waste; and requires issuance of permits for the construction, operation and, if applicable, closure and post closure maintenance of solid waste facilities.
Hazardous Chemicals Information Act, NMSA 1978, Section 74-4E-1 to -9	Ensures that current information on the nature and location of hazardous chemicals is available to local emergency planning committees, emergency responders and the public.
Traffic and Transportation	
Hazardous Materials Transportation Act of 1975, 49 USC 5101 et seq. Transportation, Subchapter C, Hazardous Materials Regulations, 49 CFR Parts 171–180	Provides the USDOT with authority to protect against the risks associated with transportation of hazardous materials, including radioactive materials, in commerce. Establishes USDOT requirements for classification, packaging, hazard communication, incident reporting, handling, and transportation of hazardous materials
Packaging and Transportation of Radioactive Material 10 CFR Part 71	Establishes requirements for persons who transport radioactive material or deliver radioactive material to a carrier for transport. The regulations in 10 CFR Part 71 apply to any licensee authorized by specific or general license to receive, possess, use, or transfer licensed material, if the licensee delivers that material to a carrier for transport, transports the material outside the site of usage, or transports that material on public highways.
Truck Size and Weight, Route Designations—Length, Width, and Weight Limitations 23 CFR 658.17	Governs truck and bus size and weight on the national highway network
Transportation of Hazardous Materials; Driving and Parking Rules 49 CFR Part 397	Establishes regulations regarding the transportation of hazardous materials and includes the attendance and surveillance of motor vehicles, routing, parking, and vehicle safety and maintenance.
DOE O 460.1D Chg1 (LtdChg)**,** *Hazardous Materials Packaging and Transportation Safety*	Describes DOE safety requirements for the proper packaging and transportation of offsite shipments and onsite transfers of radioactive and other hazardous materials.
DOE O 460.2B, Departmental Materials Transportation Management	Establishes requirements and responsibilities for management of DOE, including NNSA, materials transportation to ensure the safe, secure, and efficient transportation of materials, both hazardous and nonhazardous, for offsite shipments. Supersedes DOE O 460.2A, dated 12-22-2004 and DOE M 460.2-1a, dated 6-4-2008.
Radioactive and Hazardous Materials Act, NMSA 1978, Section74-4A-1 to -16	Prescribes the conditions for transport of radioactive material on the highways in New Mexico.
Water Resources	

Clean Water Act, as amended, 33 USC 1251	Establishes a national program to restore and maintain the chemical, physical, and biological integrity of navigable waters by prohibiting the discharge of toxic pollutants in significant amounts without a permit; requires Federal agencies to comply with Federal, state, and local water quality requirements; Section 404 of the CWA regulates development activities in jurisdictional surface waters and wetlands, and delegates USEPA and the USACE to share Section 404 enforcement authority regarding the discharge of dredged or fill material into waters of the United States; allows USEPA to delegate primary enforcement authority for NPDES permits (Section 402) to Idaho. As of 2016, Idaho DEQ received permitting authority to address water pollution by regulating point sources that discharge pollutants to Idaho's surface water.
Safe Drinking Water Act of 1974, as amended, 42 USC 300f et seq.	Establishes a national program to ensure the quality of drinking water in public water systems; allows EPA to delegate primary enforcement authority to New Mexico.
National Primary Drinking Water Regulations, 40 CFR Part 141	Creates standards for maximum contaminant levels for pollutants in drinking water; used as groundwater protection standards.
Procedures for Decision-making (Permitting), 40 CFR Part 124	Contains USEPA procedures for issuing, modifying, revoking, and reissuing, or terminating all RCRA, PSD, and NPDES permits.
New Mexico Water Quality Act, NMSA 1978, Section 74-6-1 to -17	The Act provides authority for water quality management in New Mexico. This law establishes the WQCC and defines its authority to adopt water quality standards and to direct programs consistent with the Federal Clean Water Act.

Key: CAA = Clean Air Act; CFR = Code of Federal Regulations; CWA = Clean Water Act; DEQ = Department of Environmental Quality; GHG = greenhouse gas; LLW = low-level waste; NAAQS = National Ambient Air Quality Standards; NCP = National Oil and Hazardous Substances Pollution Contingency Plan; NESHAP = National Emission Standards for Hazardous Air Pollutants; NMED = New Mexico Environmental Department; NPDES = National Pollutant Discharge Elimination System; NRHP = National Register of Historic Places; NRC = Nuclear Regulatory Commission; DOE O = DOE Order; RCRA = Resource Conservation and Recovery Act; SHPO = State Historic Preservation Officer; USACE = U.S. Army Corps of Engineers; USEPA = Environmental Protection Agency; USC = U.S. Code; WQCC = Water Quality Control Commission

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APPENDIX L:
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