Appendix 1-A
BLM Response to DEIS Public Comment

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
1	U.S. Fish and Wildlife Service	2	2-62		Table 2.4-1	Table 2.4-1 Summary of Applicant Committed Measures and Mitigation Measures, page 2-62, indicates that ponds will be covered with bird balls to deter waterfowl. The FEIS should provide the surface area of the ponds and why the use of bird balls, rather than other exclusion measures such as netting, is proposed for this use. The FEIS should clarify the routine measures for upkeep of the bird balls on the ponds (e.g. when the wind blows will the balls continue to cover the surface of the ponds and will there be routine replacement of balls that are blown off the ponds). It should also be noted in the FEIS that if migratory bird mortality occurs, the U.S. Fish and Wildlife Service's Office of Law Enforcement must be contacted.	Figure 2.3-1 shows the location and approximate size of the raffinate, collection, and holding ponds. Additional information has been added to Section 2.3.3.7.2 to indicate the size of the proposed ponds as follows: Raffinate Pond (approximately 1.01 acres), Collection Pond (approximately 1.48 acres), and Holding Pond (approximately 5.35 acres). The monitoring and efficacy of the use of bird balls is discussed in Table 2.4-1 and Section 4.3.4.4.1. The following language has been added to Section 2.3.3.7.2 Treatment Ponds "The ponds would be covered with bird balls to deter waterfowl. Energy Fuels believes netting the pond is not possible due to the large size." Section 4.3.4.4.1 states "Any migratory bird mortality would be reported to the FWS Office of Law Enforcement".
2	U.S. Fish and Wildlife Service	3	3-44		3.2.5.1	**Section 3.2.5.1 Surface Water,** page 3-44, states "Surface water samples collected from impounded sites (McIntosh Pit and Western Nuclear Pond) within the Project Area demonstrate poor quality as compared to Crooks Creek..." **Section 3.2.5.3 Water Use,** page 3-49, states "Cattle often frequent the Project Area and drink from surface waters within the Western Nuclear Pond..." **Section 3.3.5.3 Migratory Game Birds, page 3-81**, states "Green-winged teal (*Anas carolinensis*) and common mergansers (Mergus merganser) were seen on the Western Nuclear Pond, which is likely utilized by other waterfowl..." **Section 3.3.5.5 Fisheries, page 3-81,** states "WGFD have stocked the Western Nuclear Pond with brook trout (*Salvelineus fontinalis*) and rainbow trout (*Onchorhynchus mykiss*) annually since 1990...Sampling was conducted in June 2013 which yielded brook trout, largemouth bass, rainbow trout, white suckers (*Catostomus commersonii*)..." noting that fish are present in the pond. Since Western Nuclear Pond is described as an enclosed impoundment, evaporation will continue to concentrate elements present in the water and, over time, can lead to adverse effects to wildlife using this pond, particularly migratory birds. It is unclear if the Project will affect the water quality of Western Nuclear Pond. If the Project will affect the water quality, the FEIS should discuss plans for collecting future water samples and steps taken to prevent further water quality degradation. If further degradation of water quality occurs, a discussion on potential effects to aquatic birds, bats, and other wildlife that may drink and feed from the pond, ways to prevent effects to wildlife, and plans to improve water quality, is needed.	No impacts to Western Nuclear Pond are anticipated as a result of the Proposed Action (see Section 4.2.5.1.1). .Improvements to Western Nuclear Pond are being conducted under the WDEQ-AML Project 16-O. The text has been updated to include references to WDEQ-AML Project 16-O.
3	U.S. Fish and Wildlife Service					Additionally, since our original comments on the PDEIS for this Project, a Presidential Memorandum-Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators-was issued by President Barack Obama on June 20, 2014, as a directive to take new steps to reverse pollinator losses. Seed mixes for reseeding should not just focus on forage species but should also include native species that serve pollinators.	The following language was added to Section 4.3.2.2.1 in Chapter 4: "As a directive to take new steps to reverse pollinator losses, on June 20, 2014, President Barack Obama issued a Presidential Memorandum – Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators as a directive to take new steps to reverse pollinator losses. Compliance with this memorandum would help to reverse pollinator losses. The following was added as a BLM Proposed Mitigation Measure: "VEG-8: The Presidential Memorandum-Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators (June 20, 2014) will be complied with (VEG-8 in Table 2.4-1). The measure was added to Table 2.4-1 in Chapter 2 of the FEIS. Also, see Section 2.3.5.9 for a discussion on the proposed seed mix by Energy Fuels (revised by Energy Fuels Comment Letter on the DEIS) which includes Sainfoin, a known native species that serves pollinators.

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4	National Park Service		3-2		Last Paragraph	The Lander RMP identified a National Trail Management Corridor for the protection of trails and their setting where setting is part of the nature and purpose of the Trails. Accordingly, the environmental impacts to the Congressionally designated trails from any of the alternatives will not be analyzed." This statement does not make sense. Why were the trails not analyzed? I imagine this is true because the project is outside of the National Trail Management Corridor, so we simply need to state that.	The text in Chapter 3 Section 3.1 was revised to read as follows: "The Lander RMP (BLM, 2013a) established a National Trail Management Corridor (NTMC) with protections for the viewshed and setting of the NHTs. The boundaries of the NTMC were established based on a viewshed analysis of what can be seen from the NHTs. The proposed project is outside of the NTMC. The RMP also limits projects outside of the NTMC if they are “highly visible” and/or “out of scale” with the surrounding environment (Decision 7008). The BLM determined that no alternative in the RMP would meet the conditions of Decision 7008 so no further analysis of impacts to the NHTs under any alternative was deemed necessary. The BLM performed a viewshed analysis specific to this project. The majority of the project is not visible from the NHTs, and the small portion that is visible is within existing disturbance, resulting in no visual impacts to the NHTs.
5	Representative Lloyd Charles Larsen House District 54					General Letter of Support	Comment Noted.
6	Jim Robinson					We spend and have spent many days camping in the basin south of sheep mountain since the last mining project back in 70s. We were Jeffrey City residents for many years. The attraction is stargazing without light pollution. When the mines were operating the light pollution was enormous. Sad to have it return.	Comment Noted.
7	Sweetwater County		1-4		1.3.2	**Conformance with Local Land Management Plans:** Insert the following text: "The Sweetwater County 2002 Comprehensive Plan calls for industrial development to occur in a manner that balances economic growth with environmental protections. Since the existing Sweetwater Mill is zoned for Mineral Development, the proposed use of the mill for this project is consistent with the Sweetwater County Comprehensive Plan. Sweetwater County encourages consideration of the following conditions: County permits, and county road licenses are obtained; A Sweetwater County Road Use, Improvement and Maintenance Agreement is approved and implemented; Project concerns are addressed with the communities of Bairoil, and Wamsutter and with the Sweetwater County Solid Waste District #2 as well as the High Desert Rural Health Care District.	Text is added to Chapter 1, Section 1.3.2, as suggested.
8	Sweetwater County		1-7		1.3.2	**Permits and Authorizations:** Add the following to Table 1.3-1 under the heading of Local Agencies on page 1-7 of the DEIS: Sweetwater County Land Use, For Sweetwater Mill site expansion, modifications: Zoning, construction and land use permits, Wyoming Statute 18-5-201 et seq; Sweetwater County Public Works Department, For access to and from the Sweetwater Mill Site: Sweetwater County Road Licenses, permits, improvement and maintenance agreements, Wyoming Statute 24-1-104; Sweetwater County Emergency Management, For Sweetwater Mill and related transportation and storage: Reporting of hazardous materials, Right-to-Know Act - EPCRA 42-116-1-01 et seq.	Text is added to Table 1.3-1 in Chapter 1, as suggested.
9	Sweetwater County					**County Road Maintenance Agreements:** Throughout the entire DEIS and Appendices, the term maintenance agreement (or variations thereof) should be changed to the term county road use, improvement and maintenance agreement. This ensures that road use and related road improvements are addressed within the required road agreement.	Text is revised in Chapter 2 Section 2.3.4.5.2, Chapter 4 Sections 4.4.6.1.1 and 4.4.6.1.2, and the

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10	Sweetwater County		7		Appendix 2-A 1.4	**Transportation Plan - Appendix 2-A: Page 7, Section 1.4, paragraph 2, last sentence:** Sweetwater County recommends that the last sentence should read: Energy Fuels will coordinate the maintenance of county roads with Fremont and Sweetwater counties based on county road agreements that will be approved prior to the start of mining.	The text in Appendix 2-A is changed to read as follows: "Energy Fuels will coordinate the maintenance of county roads with Fremont and Sweetwater counties based on county road agreements that will be approved prior to the start of mining."
11	Sweetwater County	4	4-46		4.3.4.2.2	**Speed limits:** Any reduction of speed limits on county roads must be implemented through a statutory process that requires professional engineering studies. Chapter 4, page 4-46, Section 4.3.4.2.2, fifth paragraph states, in reference to protecting sage grouse: "If off-site processing were to occur, vehicular speed limits would be reduced to limit noise produced by trucks traveling on the road during the sage-grouse breeding and nesting season." Because of statutory restrictions, Sweetwater County cautions the BLM that reducing speed limits to reduce impacts on sage grouse may be more problematic than anticipated.	W-1 in Chapter 2 Table 2.4-1 is revised to read as follows: "Energy Fuels would be required to implement procedures to ensure employees adhere to appropriate speed limits within the Project Area and on public roads outside of the Project Area where speed limits are not posted to minimize big game-vehicle collisions." The measure (W-1) has also been revised in Chapter 4 Section 4.3.5.2.1. ESA-7 in Chapter 2 Table 2.4-1 is revised to read as follows: "If off-site processing occurs, Energy Fuels would be required to implement procedures to ensure employees adhere to appropriate speed limits within the Project Area and on public roads outside of the Project Area where speed limits are not posted to limit noise produced by trucks traveling on the road during the greater sage-grouse breeding and nesting season." The measure (ESA-7) has also been revised in Chapter 4 Section 4.3.4.2.1. This clarifies the intent that the proponent would implement procedures or practices for their employees to adhere to appropriate speed limits, but the measure would not require the posting of speed limits on county roads.
12	Sweetwater County					**Weed and Dust Control:** In regard to weed and dust control, especially along county roads that are utilized by the project, Sweetwater County supports the BLM proposed mitigation measures to control weeds and dust and additional measures that may be required through the proposed road use, improvement and maintenance agreement.	Comment Noted.
13	Sweetwater County					**Current Road Conditions and Anticipated Road Improvements:** If the Sheep Mountain Project proposes to use the Sweetwater Mill for offsite processing, the following Sweetwater County roads would be utilized: Wamsutter - Crooks Gap (4-23), Minerals Exploration Road (4-63) and potentially the Bairoil Road (4-22). The following summarizes the current condition of these roads and the upgrades and additional maintenance requirements that would be required to accommodate the projected traffic. See letter for specifics.	The description of current condition of these roads is added to Chapter 3, Section 3.4.6.5 in the FEIS. The summary of upgrades and additional maintenance requirements that would be required to accommodate projected traffic on these roads is added to Chapter 4, Section 4.4.6.1.2 in the FEIS.

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14	Sweetwater County					Sweetwater County is strongly supportive of the Sheep Mountain Uranium Project and strongly believes that it will have positive socioeconomic effects for Sweetwater, Carbon and Fremont Counties. With this in mind, it is important to note that, if the Sweetwater Mill is reopened, the towns of Bairoil and Wamsutter, Sweetwater County Solid Waste District #2 and the High Desert Rural Health Care District could receive impacts that may need to be addressed.	Thank you for your support. The BLM determined that the possible impacts to Bairoil and Wamsutter and the Rural Health Care District are too speculative to analyze without more knowledge about the Sweetwater Mill or the extent staff needs to be increased; however, the socioeconomic analysis does include impact analysis for the larger population areas that could be impacted. The proponent will need to reach an agreement with Solid Waste Disposal in order to use their facilities. No change to the document.
15	Sweetwater County		2-66		Table 2.4-1	To ensure that health, safety and community service needs are addressed, Sweetwater County strongly encourages the project proponent to maintain active and open communication with these governmental entities throughout the life of the project. To integrate this comment into the DEIS, Sweetwater County recommends that, on page 2-66, Table 2.4.1, BLM Proposed Mitigation Measures for the Socioeconomic line item be amended to reflect the above comment.	The following language is added to Chapter 2, Table 2.4-1 and to Chapter 4, Section 4.4.4.2.1 as SE-1: "To ensure that health, safety, and community service needs are addressed, Energy Fuels would maintain active and open communication with governmental entities throughout the life of the Project."
16	EPA		4-25 & 4-26			**Incorporate Water Treatment into Alternatives.** As noted in several places in the DEIS (e.g., pages 4-25 & 26), the proposed mine will need to dispose of surplus water, particularly if the ore is milled off-site. Based on the water quality data from the Lidstone (2013) reports and the water quality standards and regulations for surface water discharge, mine drainage water will need to be treated before it is discharged. Because it is integral to the mine operation and relevant to assessing environmental impacts, we recommend more fully integrating the water treatment plant into the proposed alternatives (Section 2.3.11.3), including identifying likely treatment processes, pollutants of concern, and capacity. The impact analysis should also be revised to include potential impacts from the water treatment plant including chemical use and transportation and disposal of sludge, brine or other waste products.	Sections 2.3.10.3, 2.3.11, and 4.2.5.1.1 have been updated with the information on the treatment plant and associated impacts for the discharge of excess water from the Congo Pit and Sheep Underground Mine dewatering.
17	EPA		2-43		2.3.11	**Treatment Plant Capacity.** The capacity of the proposed wastewater treatment plant should be more closely evaluated. Page 2-43, Section 2.3.11 Water Management Plans notes the following dewatering rates: Congo Pit 260 gpm year , 640 gpm year 4, 330 gpm year 8 Sheep Underground 750-1000 gpm, year 1, 250-400 gpm, steady state Treatment Plant capacity 200 gpm There appears to be disconnection between the anticipated dewatering rates and the water treatment plant capacity. Although we understand that much of the water would be used for dust suppression, the mine facility needs to be also prepared for weather or operating conditions which create substantial surplus water such as during major runoff events, high snowfall years, winter weather or after temporary shutdowns.	Sections 2.3.10.3, 2.3.11, and 4.2.5.1.1 have been updated with the information on the treatment plant and associated impacts for the discharge of excess water from the Congo Pit and Sheep Underground Mine dewatering.

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18	EPA		4-25 & 4-26			**Individual WPDES Permit.** As there is a potential to discharge mine drainage (e.g., water from the mine pits, shafts, ore stockpiles and some waste rock/spoil areas), the final EIS should clarify that an individual WPDES wastewater discharge permit will be needed in addition to the WPDES industrial stormwater permit discussed most frequently in the DEIS. We do note that an individual WPDES permit is alluded to at several places in the draft EIS such as on pages 4-25 and 4-26. However, the discussion does not include enough information to determine if the future WPDES permits will provide sufficient controls to prevent the mine from causing unnecessary or undue degradation to Crooks Creek for designated water uses.	Sections 2.3.10.3, 2.3.11, and 4.2.5.1.1 have been updated with the information on the treatment plant and associated impacts for the discharge of excess water from the Congo Pit and Sheep Underground Mine dewatering.
19	EPA				Table 1.3-1	**WPDES (NPDES) Effluent Guidelines Regulations.** The permit would need to be developed to meet the more stringent of water quality standards and the effluent guidelines for uranium mining and milling at 40 CFR 440.3 developed under the Clean Water Act. The Effluent Guidelines discharge limitations are based on wastewater treatment technologies costs and removal efficiencies for specific industries. For the uranium mining and milling subcategory there are limits for chemical oxygen demand (COD), zinc, radium 226 (both dissolved and total) uranium and pH for mine drainage. No discharges from the mill would be allowed. The requirements of the effluent guidelines would be implemented through the individual WPDES discharge permit and should be factored into evaluating surface water impacts to Crooks Creek. The requirement to obtain an individual NPDES permit and comply with the Effluent Guidelines should also be added to Table 1.3-1 - Major Federal and State Laws, Regulations and Applicable Permits.	Sections 2.3.11 and 4.2.5.1.1 are updated with the information on the treatment plant and associated impacts for the discharge of excess water from the Congo Pit and Sheep Underground Mine dewatering. A reference to the WYPDES Permit for the dewatering treatment discharge has been added to Table 1.3-1.
20	EPA		2-10			**Use of Mine Drainage for Dust Suppression.** The final EIS should clarify whether untreated mine drainage from the facility will be used outside of the mine or mill areas for dust suppression or equipment washing. For example, in the last paragraph of page 2-10, the DEIS states that mine drainage from the Sheep I and Sheep II shafts could be used for dust suppression on roads, fire suppression and washing equipment. This is of concern both for water quality and under the NPDES permit regulations. Water quality data for mine drainage from the historic mine indicates that treatment will be required for several pollutants before it can be used in areas that are required under only the industrial stormwater permit or areas outside the area covered by the stormwater permit.	Energy Fuels has clarified that they would use untreated water for dust suppression where drainage is controlled, but roads or disturbances that might drain off site will use treated water for dust suppression. Language in Chapter 2 Section 2.3.4.2 has been revised to read as follows: The water could then be used for dust suppression on haul and access roads where drainage is controlled. Language in Chapter 2 Section 2.3.11.1 has been revised to read as follows: "Use of this untreated water would be limited to areas where drainage is controlled to avoid the potential for off-site drainage."

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21	EPA		4-33			**Groundwater/Surface Water Connection.** The draft EIS includes a very limited evaluation of the effects of the proposed project to groundwater quality and the subsequent impacts to surface water when the surficial groundwater discharges to Crooks Creek after the water table rebounds post mining. This appears to be one of the more important issues for determining whether the mine project will cause unnecessary or undue degradation. The EIS discussion of impacts to groundwater flow and quantity provides a starting point in identifying potential impacts from groundwater to Crooks Creek. For example, we note on page 4-31, 2nd to last paragraph the statement: "Based on the elevation of the groundwater table and the flow direction, discharge of some water from the Battle Spring Aquifer to the alluvial deposits along Crooks Creek is likely." On page 4-33, the first paragraph summarizes that the Congo Pit and Sheep underground mine would create areas of less consolidated material within the Battle Springs Aquifer increasing permeability that are likely to provide faster recharge to the groundwater system. The second paragraph on page 4-33 discusses the interconnection through permeable pathways within the Battle Spring Aquifer as a result of historic surface and underground mining as well as future mining. The impacts from potentially faster recharge were determined to be minor in the draft EIS test noted on page 4-33.	More information from Appendix D-6 of the WDEQ-LQD Permit to Mine 381C has been incorporated into Section 3.2.5.2 for easier reference, and the text modified accordingly. In particular, the geologic map and two of the hydrogeologic cross-sections from Appendix D-6 of the WDEQ-LQD Permit to Mine 381C (which were also included in the Lidstone Report) were added. The cross-sections illustrate the geologic controls on the groundwater occurrence and movement, in particular the presence of the Cody Shale. This shale is a local and regional aquitard, and as such, limits the amount of groundwater which could contribute to Crooks Creek from the Project Area. In some areas, the Cody Shale is present at the surface between the Project Area and Crooks Creek (e.g., Stephens, 1964, page F22), and in others, the shale is covered by a veneer of Quaternary deposits, which may include alluvial material. Comparison of the available, contemporaneous flow measurements conducted along Crooks Creek (included in Appendix 3-B of the FEIS and as Table D-6-9 of the WDEQ-LQD Permit to Mine 381C) indicates the increases in the flow rates in Crooks Creek from upstream to downstream locations are generally less than 15% of the flow rates, and in some cases there is no change or a reduction in the flow rate. (The one exception appears to be as a result of snowmelt contribution to the creek.) The changes in the flow along the creek can be attributed to measurement difficulties, evaporation, inflow/outflow to groundwater (from both sides of the creek), and contributions from the ephemeral tributaries to Crooks Creek. In addition, the available data does not indicate a significant variation in water quality along the creek adjacent to the Project Area or that the creek water quality adjacent to the Project Area is significantly different than the quality In Crooks Creek a few miles upstream of the Project or in the West Fork of Crooks Creek. The presence of the Cody Shale would also act as a barrier to any preferential flow paths in the Battle Spring Aquifer due to faults or mining-related pathways in the Battle Spring Formation (see Response to Comment 24, below).
21						During mining operations water quality impacts from surfacing groundwater would be a minor issue due to the substantial dewatering of surficial aquifers. However, as the groundwater table recovers post mining or during mine shutdowns, groundwater flow will rebound. The buffer of no surface disturbance within 500 feet from Crooks Creek is a good mitigation measure to protect Crooks Creek but it is not clear what that is based on and whether there may be preferential pathways such a faults that may more directly convey groundwater from the expanded mines to Crooks Creek. We recommend that the final EIS discuss the anticipated flow rates and potential water quality effects from surficial groundwater on Crooks Creek. This may be disclosed as a potential loading to Crooks Creek. The final EIS should also more fully describe the mitigation and/or reclamation measures that will be taken to protect groundwater quality or reduce poor quality groundwater flows from the mining area into Crooks Creek.	For a conservative assessment, the potential for exchange of groundwater and surface water along Crooks Creek should not be discounted entirely. However, considering the limited potential for such exchange due to geologic controls, the lack of significant changes in measured flow rates in Crooks Creek, and the lack of anticipated change to the groundwater quality, impacts to Crooks Creek are anticipated to be negligible. As discussed in Section 4.2.5.2 and 4.2.5.3, water quality monitoring is required throughout reclamation to ensure the anticipated water quality conditions are present.

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21A	EPA		3-25		Section 3.2.3	**Acid Generation/Waste Rock & Overburden Materials Needing Special Handling.** The main premise of the groundwater quality environmental analysis is that since groundwater quality has generally remained the same since the 1970s, it will continue to do so. There are several factors that indicate further analysis should be undertaken or additional mitigation measures should be more formally developed to isolate waste rock/spoils that are potentially acid generating or otherwise release pollutants including radium. First, as noted in the draft EIS in Section 3.2.3 Geologic Hazards on page 3-25, Energy Fuel's analysis determined that the rock associated with the ore zone to be of concern for radium, radon, sodium absorption ratio, boron, acid base potential, selenium and molybdenum. The second factor is existing water quality data for the site found higher metals and lower pHs in several areas. For example, piezometer (PZ-1) and several of the groundwater monitoring wells have pH values that are much lower than surrounding monitoring wells. It is not clear if these lower pH values are due to oxidation of minerals and acid generation. However, the environmental analysis of geologic chemical hazard on page 4-16 in Section 4.2.2 of the draft EIS implies that all of the rock with geologic hazards would be ore and problems could be addressed as they occur. We recommend that the final EIS estimate the potential volume of waste rock, monitoring and mitigation measures that should be developed to identify waste rock that may need special handling prior to disposal. The process for determining special handling and the levels for triggering the need for special handling should also be disclosed. The alternative should also identify waste repository locations and design practices that will be implemented to isolate problematic waste rock from surface and groundwater.	The quantities of waste rock from the Congo Pit and Sheep Underground Mine are listed in Tables 2.3-2 and 2.3-3, respectively. During mining, the temporary waste repositories for out-of-mine spoils from both the Congo Pit and Sheep Underground Mine would be the Hanks Draw Facility and South Spoils Facilities. During reclamation, the ultimate repository for the out-of mine spoils would be the Congo Pit. The exception would be for spoils that cannot be used as in-pit fill material, and that material would be used as grading fill in the existing Paydirt Pit (Sections 2.3.4.2 and 2.3.5.4 of the FEIS). The overburden sampling results for preliminary identification of unsuitable materials are summarized in Section 3.2.2.3 of the FEIS, and the sampling results, including historic and recent sampling events, are described in more detail in Section D-5.5 of Appendix D of the WDEQ-LQD 381C Permit as approved in July 2015. The measures that would be used to identify spoils requiring special handling are summarized in Section 2.3.4.2 of the FEIS and described in more detail in Section 3.8.2 of the Mine Plan in the WDEQ-LQD Permit to Mine 381C as approved by WDEQ-LQD in July 2015. The measures used during reclamation to confirm that the materials handling practices were sufficient are summarized in Section 2.3.12.5 of the FEIS and described in more detail in Section 4.4.3 of the Reclamation Plan in the WDEQ-LQD Permit to Mine 381C Permit as approved in July 2015.
21A Continued	EPA						The following language is added to Section 3.2.5.2: The relatively lower pH values and higher metal concentrations present in some wells are not considered indicative of acid generation and mineral oxidation. No correlations of the parameters generally associated with acid generation and mineral oxidation (e.g., pH, sulfate, iron, manganese, and aluminum) is apparent, and the concentrations of most metals are below laboratory detection limits. With respect to geographic distribution, the pH values in the groundwater samples from the southern portion of the property are generally, but not consistently, lower than those from the northern portion of the property. (The pH values in the northern portion of the site, north of Sheep II, range from 7.7 to 8.7, and in the southern portion of the site range from 7.0 to 8.5 with one lower value of 6.5). However, there does not appear to be any other consistent geographic distribution of other parameters. There also do not appear to be any consistent trends in the pH concentrations. The variations in the parameter concentrations are considered indicative of the complex mineralization in the subsurface materials. The language is revised to read as follows in Section 4.2.5.4.1: "The relatively rapid flooding of the backfilled pit and the underground mine after mining, and the selective handling of overburden would reduce the potential for mineral oxidation. In addition, monitoring required per WDEQ-LQD Permit to Mine 381C would provide confirmation that excessive mineral oxidation is not occurring."

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22	EPA					**Ground Water Analysis.** The groundwater analysis in the draft EIS did not have enough information to understand potential groundwater quantity and quality impacts. Fortunately, the BLM was able to send us the two Lidstone and Associates, Inc. Reports (2013a and 2013b) which filled in many of the gaps in the draft EIS surface and groundwater analysis. Similarly, the State mining permit 381C, Addendum D6-1 - Hydrology Update 2011 was also reviewed along with the draft EIS. We recommend that these documents be available as technical reports for the FEIS. The other main document that is missing is the revised mine permit 381C. We understand that the document is still being reviewed by the State of Wyoming; however, much of the environmental review and mitigation measures are based on documents which are part of the mine permit. We also recommend that the mine permit be included as a technical document for the final EIS.	For easier reference, Sections 3.2.5.1 and 3.2.5.2 have been expanded to include more of the surface and groundwater information from the documents referenced by the FEIS, including the WDEQ-LQD Permit to Mine 381C, as approved by WDEQ-LQD in July 2015 as well as other reports and publications. The documents mentioned by EPA (the Lidstone reports and the WDEQ-LQD Permit to Mine 381C) will be made available in the FEIS through publishing of the WDEQ-LQD Mine Permit.
23	EPA		2-27 & 2-70			**Portal Declines.** The level of mine design in the draft EIS is not sufficient to determine whether the portal declines have the potential to discharge water to the surface when the water table recovers after mining. It appears that ground elevations on the west side of the Congo Pit are in the same range as the 2013 water table elevation (Lidstone 2013). It is not clear if the bulkheads described on pages 2-27 and 2-70 are designed to prevent discharges to surface and groundwater. Also it is not clear if there are seasonal variations in the water table. We recommend clarifying these two issues and that additional design considerations be added to reduce the likelihood of groundwater discharging through the portal declines.	The location of the start (top) of the declines approximately coincides with the location of the Pay Dirt Pit which was reclaimed by WDEQ-AML (Maps 2.2-1 and 2.5-2). As noted on Map 4-2 in the WDEQ-LQD Permit to Mine 381C, the elevation of the start of the declines is 6,835 ft. Groundwater elevation measured in this area in 2013 is on the order of 85 ft. below the elevation of the start of the declines. The 2013 groundwater elevation of about 6,750 ft. in this area (see Map 3.2-14) is similar to the elevation measured in this area in 1979-1980 (Map D-6-4 in Appendix D-6 of the WDEQ-LQD Permit to Mine 381C). As discussed in Section 2.3.5.4 of the FEIS, the bulkheads would be used to restrict surface access and minimize the potential for mine subsidence to reach the surface (see also Map 3-13 of the WDEQ-LQD Permit to Mine 381C). The text in Sections 2.3.5.4 and 2.5 is clarified to indicate the bulkheads are to prevent access into the declines, i.e., they are not necessary to prevent groundwater discharge from the declines because of the depth to groundwater. Figure D-6-2 of Appendix D-6 in the WDEQ/LQD Permit to Mine 381C is a Time Series Plot of water levels from groundwater monitoring wells. There is no evidence of seasonal variations that would impact the water levels to the extent that the elevations in the declines would be above the ground surface. Maps 2.2-1 and 2.5-2 are revised to show the approximate location of the Paydirt Pit.

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24	EPA		3-46		3.2.5.2	**Faults.** On Page 3-46, Section 3.2.5.2, The EIS states that "It is unknown how shallow normal faults or underground mine workings within the Battle Spring Formation on Sheep Mountain may influence the groundwater in the Battle Spring aquifer. Historic mine workings and abandoned drill holes may influence communication between localized aquifers within the Project Area but has not been enumerated due to a lack of data." We recommend that the FEIS examine this unknown issue through groundwater modeling and a proposed monitoring program to begin to fill some of these critical data gaps. If needed, mitigation measures should also be specified.	The groundwater discussion in Chapter 3 Section 3.2.5.2 has been expanded and clarified. As discussed in Section 3.2.4.2, the Battle Spring and Fort Union formations are the water-bearing formations in the vicinity of the Project Area. Because of the heterogeneity of the geologic materials in these formations, the formations are difficult to distinguish and the term Project Area Aquifer is used to collectively refer to the water-bearing strata in the Battle Spring and Fort Union formations. There is also variability in the hydrogeologic properties within the formations due to lithologic variations, e.g., lenses and layers of material rather than homogenous material. The use of the phrase "local aquifers" referred to this variability, not aquifers in formations other than the Battle Spring and Fort Union formations. The synclinal structure of the Cody Shale aquitard provides a significant control on the movement of water out of these formations. The natural heterogeneity of the geologic materials in the Battle Spring and Fort Union formations is augmented by the presence of historic mining-related activities, such as underground workings. The faulting referred to in the subsection is localized, small-scale faults within the Project Area Aquifer, which also contributes to the heterogeneity within the aquifer. However, the heterogeneity does not restrict groundwater movement throughout the Project Area Aquifer, as evidenced by the consistency of the potentiometric surface before and after intervals of dewatering (e.g., Maps D-6-4 and D-6-10 in the WDEQ-LQD Permit to Mine 381C, as approved by WDEQ-LQD in July 2015.) The geohydrologic assessments have taken the effects of the natural and mining-related heterogeneities into account, and interpretation of geologic and hydrologic information continues to help improve the efficiency of dewatering for mining and of monitoring for baseline, operations, and reclamation.
25	EPA		3-43			**Crooks Creek Classification.** Page 3-43 of the draft EIS identifies the Wyoming stream classifications for Crooks Creek and Sheep Creek as Category 3 waters, with a portion of Crooks Creek classified as Category 5. The State's Surface Water Quality standards updated as of July 26, 2013, identify both Crooks Creek and Sheep Creek as Class 2AB waters. As noted in the draft EIS, Crooks Creek continues to be listed as impaired from the confluence with Mason Creek to 1.4 miles downstream due to oil and grease; however, the impaired segment continues to be classified as a 2AB water. The 2AB classification means that water quality is to be protective of additional designated uses such as drinking water, fisheries and fish consumption.	The stream classifications are updated in Section 3.2.5.1. of the FEIS.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
26	EPA		3-49			**Drinking Water and Agricultural Uses of Water.** We note on page 3-49 that there are 2 groundwater wells on-site that are permitted for domestic use, as well as 10 wells in the area of the mine that have been identified for domestic and/or livestock watering uses. We also note in Table 3.2-10 that there are a number of surface water rights in the area that are designated for domestic use, stock watering or irrigation uses; several of the diversion points for the surface rights are immediately downstream of the project area. The groundwater in the project area has also been designated as Zone 3 by the Source Water Assessment Program which identifies watersheds that could be within the capture zone of a public water supply well. The environmental consequences of the proposed action were not analyzed for local water users in the draft EIS. We recommend adding a section to the final EIS analyzing potential impacts to local water users. Depending on the magnitude of potential impacts additional monitoring may be needed. As part of this evaluation of potential impacts to domestic or agricultural water users, we recommend collecting more specific information about the water source such as well information, target aquifer, well screen interval, total depth, and water quality data.	The records of the Wyoming State Engineer's Office (WSEO) are not indicative of current uses, and the existence of a WSEO record is not indicative of whether water: can be obtained (i.e., whether a well drilled at that location would produce water); is of a quality suitable for the reported use; or has been transferred to a different use. There is no requirement that the holder of a water right update the information in the WSEO database, and such updates are generally only done when the water right holder wants to ensure the right continues to be a valid right. In some instances, the infrastructure may have never been completed to use the water. In other instances, the right lapsed for lack of use, e.g., attempts to revive an old, unused right may encounter resistance from holders of newer rights which have been continuously active. In addition, the water may be used for some purpose not specified in the original permit. For example, the two wells on-site that are permitted for domestic use, along with other uses, were originally permitted with the WSEO in the 1960s and 1970s by previous mining companies. Although groundwater may have been used briefly by these operators for water supply, any water supply infrastructure associated with the wells is no longer suitable for modern operations. As another example, a water right associated with the Paydirt Pit was reported as abandoned but subsequently used by WDEQ-AML for dewatering of the pit prior to backfilling. All the water rights and wells within the Project Area were acquired by Energy Fuels, and the water will only be put to the uses specified in the WDEQ-LQD Permit to Mine 381C. as approved by WDEQ-LQD in July 2015. WDEQ/LQD requires operators to provide the WSEO records for all surface and groundwater rights within a specified distance of the proposed operations to help ensure no existing user is overlooked; however, assessments of surface and groundwater impacts are based on the 'on-the-ground' conditions. The analysis in the EIS followed a similar approach. For example, there may be older water wells in use that were not reported to the WSEO. (No such wells are known in the proposed Project Area.) As another example, the location of the closest permanent residence is now 3 miles downstream. Another difficulty with the WSEO records is that well information, such as the well screen interval, may not be available or required to be collected at the time the well was installed. In general, the older the record, less information is available and that information may not be reliable or updated.
26 Continued							Section 3.2.5.3 is revised for clarity and incorporates more information, the associated tables and maps have been updated, the maps are included with the text, and the table are in Appendix 3-C. Section 4.5.2.7 has been updated to include information from the evaluation of Probable Hydrologic Consequences in the WDEQ-LQD Permit to Mine 381C and considers the Zone 3 designation by the Source Water Assessment Program.
27	EPA				Appendix 2-B	**Mine Water Monitoring Plan.** Appendix 2-B of the draft EIS briefly describes Energy Fuels monitoring plan. It would be helpful to attach a more complete water monitoring plan as an appendix or technical report to the final EIS. We also recommend that the monitoring plan identify who will be conducting the monitoring. We assume the agency column denotes the agency(s) that will be reviewing the monitoring data. We note that several monitoring locations are to be monitored only annually which does not seem to be sufficient to identify trends and seasonal variations. We recommend a minimum sampling frequency of quarterly.	Table 1 in Appendix 2-B and the text in Section 2.3.12.3 is updated to reflect the requirements of the WDEQ-LQD Permit to Mine 381C as approved by the WDEQ-LQD in July 2015, which includes quarterly sampling requirements and additional wells.

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28	EPA		2-46		Map 2.3-3	**Additional Monitoring Locations.** In evaluating the monitoring and sample location Map 2.3-3 on page 2-46; it is unclear if the PZ-7 and MW-7 are located sufficiently downstream to monitor the effects of the Hanks Draw Spoils pile. We recommend adding groundwater and surface water monitoring points down gradient of the spoils pile. We also recommend adding a monitoring point for Sheep Creek, to determine if any faults or other preferential path for groundwater are impacting the Creek.	In response to comments from WDEQ-LQD, Energy Fuels has recently updated the proposed groundwater monitoring locations, including installation of new wells and surface water monitoring locations downgradient of the Hanks Draw Spoils pile. The FEIS is updated for consistency with the WDEQ-LQD Permit to Mine 381C, in particular, Table 1 in Appendix 2-B is updated, Map 3.2-12 is added, and the corresponding text updated. Because of geologic controls, specifically the presence of a thick sequence of Cody Shale to the northeast of the Project Area, the installation of a monitoring point for Sheep Creek to determine if a preferential path for groundwater flow is not considered necessary. As discussed in response to the comment on Groundwater/Surface Water Connection, a map and cross-sections from the WDEQ-LQD Permit to Mine 381C are included in the FEIS for easier reference. These help illustrate the extent of the Cody Shale, which is a local and regional aquitard.
29	EPA					**Fish Pond.** We recommend adding water quality and potentially fish monitoring for the Fish Pond (Western Nuclear Pond) located on the south edge of the project area, southeast of the McIntosh Pit. Although, the groundwater and surface water technical reports prepared by Lidstone indicate that Fish Pond water quality was unlikely to be affected by the proposed mine, the pond is used as a recreational fishery. Because of direct human consumption of the fish, we recommend adding precautionary monitoring.	The drainage which supplies Western Nuclear Pond collects surface water from over 2,000 acres to the southeast of, upgradient of, and outside the Project Area disturbance (see Chapters 3 and 4 and Map 3.2-11). In addition, most of this drainage area was not disturbed by historic mining activities. Therefore, sampling of the pond, or fish in the pond, is not considered necessary as part of the assessment of the Project impacts. Water quality data is available from sampling of the pond (Table 6 in Appendix 3-B); therefore, baseline information is available should some unforeseeable event related to the Project potentially impact the pond. No change to the document.
30	EPA					For projects regulated by multiple agencies and for those with complex environmental impacts, we recommend more fully describing the applicable controls (e.g., permits), mitigation and monitoring measures that will be implemented through: the Wyoming mining and other permits, the BLM Plan of Operations, the BLM Record of Decision, the NRC license and the DOE legacy site management program. We would recommend adding a table or separate section to the final EIS which lists the: Permits, license, plans, Record of Decision, etc. that include controls and mitigation measures for the project (e.g. Storm Water Pollution Prevention Plans, WPDES and mining permits); The types of mitigation and control measures, (e.g., design requirements, monitoring, reporting, inspections, permit limits, performance criteria, management practices); Note whether the controls and/or mitigation measures are mandatory or recommended/voluntary; Monitoring and reporting requirements and the agency receiving the information; Identify the Lead agency for enforcing the measures and/or other follow-up actions.	Table 2.4-1 describes the applicant committed measures and the proposed BLM mitigation measures (under the BLM Mitigation Alternative) and has been updated to include an overview of the permitting requirements and agencies involved; permit numbers, if available; and more specific references to where the requirements can be found in the permit. Table 1.3-1 includes a list of permits/approvals that are required for the Project by agency.

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31	EPA		2-52			**Trigger Levels and Corrective Actions.** The discussion of mitigation measures should also summarize or reference the procedures that would be used if "operational monitoring detects conditions in excess of expected or permitted levels considering background conditions and variability" [Page 2-52, draft EIS]. If the trigger levels and corrective actions have already been defined through the Wyoming mining permit or other mechanisms, then procedures should be included or referenced in the final EIS. Some examples of how to identify important trigger levels and corrective action procedures include: Groundwater - What are the water quality criteria that sample results will be compared against? If those criteria are exceeded what happens: additional sampling, groundwater pumping and treatment, and/or corrective active or operational controls? Storm water - What procedures will be in place when mine site stormwater ponds may need to discharge? A contingency plan might include: Monitoring freeboard, evaluating projected weather conditions and snowpack, Pond maintenance procedures, and Sampling of water quality to determine if treatment is needed prior to discharge.	As mentioned by the commenter, many of the issues of concern have standards for which would be compared to establish appropriate trigger levels by agencies for which these standards were set and enforceable by. The purpose of the EIS standpoint is to disclose impacts, and when those impacts may indicate that unnecessary of undue degradation is inevitable, the BLM would require mitigation measures such as those described under the BLM Mitigation Alternative for those resources that the BLM has jurisdiction to regulate; therefore, the measures described in the BLM Mitigation Alternative are revised or otherwise further clarified (in Chapter 4) to establish thresholds or standards from which to compare as appropriate under the BLM's purview. See Response to Comment 30, above.
32	EPA				2.3.5.11	Evaluation of Reclamation Success. This Section discusses the reclamation conditions of the WDEQ-LQD permit 381C for the existing and proposed mines. We recommend that the Section be clarified in the final EIS to discuss which mining areas are under permit 381C. From the draft EIS we understand that the state Abandoned Mine Lands program will be completing reclamation for the McIntosh Pit but it is unclear if the other mines on Sheep Mountain have been successfully reclaimed.	The mining and reclamation at the site have been conducted under a variety of regulatory programs, ranging from essentially none (pre-law) through the current regulatory requirements (Section 2.2.2.2). The definition of 'successful' reclamation has also changed with the regulatory requirements, ranging from simple reduction of the slopes of spoil piles to current criteria for parameters such as post-mine topography, vegetation, and drainage. In general, an operator is not responsible for disturbance created by previous operators in a given area, unless the operator redisturbs that area. For pre-law sites, the WDEQ-AML may become involved to eliminate safety hazards, repair environmental damage, and mitigate risks associated with a site to the extent funds are available and in accordance with the 'hazard priority' of the site. Therefore, the 'reclamation requirements' at each AML site are tailored to the priority of the work at the site. Section 2.3.5.11 (Reclamation) is applicable to the proposed activities. Even if none of the proposed activities were approved, Energy Fuels would still have reclamation responsibilities under the WDEQ-LQD Permit 381C. These responsibilities are described in Section 2.5 (No Action Alternative). Map 2.5-1 in Section 2.5 delineates the areas of Energy Fuels' reclamation responsibilities under the Permit 381C, and Map 2.5-2 delineates areas that are essentially 'pre-law' (no reclamation requirements) and areas reclaimed by previous operators at the site under older regulatory programs or by WDEQ-AML. (This information is also included in Section 2.5.3 of the WDEQ-LQD Permit to Mine 381C). The text in Sections 2.2.2.2 and 2.3.5.11 is clarified, and a cross-reference to Section 2.5 is added.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
33	EPA				2.3.5.11	Section 2.3.5.11 also mentions that groundwater will need to be returned to pre-mining water quality. We agree that is an excellent goal for aquifers which can be used for drinking water and are tributary streams with aquatic life standards. However, we think that it could be a challenging goal depending on how "pre-mining groundwater quality goals" have been defined. Is the goal to return groundwater quality to current water quality or is the goal to clean up water to estimated conditions prior to any mining, circa 1940? We recommend that the final EIS clarify the groundwater cleanup goals and how the goals were determined. If available, the specific cleanup goals should be included with the final EIS. We note that groundwater in the two uppermost aquifers in the vicinity of the proposed project are considered as potential underground sources of drinking water based up the criterion of 10,000 mg/L TDS.	Per Chapter 8, Section 4 of the WDEQ-WQD Rules and Regulations, groundwaters of the State are classified in order to apply standards to protect water quality. The WQD classification system applicable to most groundwater is based on water quality criteria appropriate to designated uses, including Classes I (Domestic), II (Agricultural), III (Livestock), and IV (Industrial). Based on conditions throughout Wyoming and available water quality data from the Project Area, the presence of mineralized zones, such as those within the Project Area Aquifer, result in considerable variation in the concentrations of some parameters, particularly uranium and radium, within an aquifer. In general, the elevated concentration of uranium and radium result in a Class IV designation of the water in this subbasin. The baseline groundwater quality data presented in the WDEQ/LQD Permit to Mine 381C, as approved by WDEQ-LQD in March 2015, will be submitted to WDEQ-WQD for a determination of the Class of Use, and the criteria associated with this Class of Use will be the basis for evaluation of the water quality during reclamation. The text in Sections 2.3.5.11, 3.2.5.2, and 4.2.5.4 is clarified.
34	EPA				2.3.5.11	We recommend that the final EIS include additional information on the relationship between long term care and reclamation between the BLM and the State LQD mining permit and the NRC license and DOE legacy long-term care [Reclamation Overview Section 2.3.5.1]. We have listed below several questions about the relationship between the agencies' reclamation and post closure activities that we recommend be addressed in the final EIS: Will there be any DOE involvement with post closure maintenance of the mine including the pit, spoils piles and or storage areas? Is it correct that the DOE legacy site program only applies to the NRC regulated portions of the facility such as the ore processing mill or heap leaching facility? Or could additional areas of the historic or proposed mining sites be proposed for the legacy program if certain conditions are present? Are there any legacy areas in the Sheep Mountain/McIntosh Mine areas currently designated for DOE control?	As noted in Sections 2.3 and 2.3.5.12 of the FEIS, the DOE would only become involved in post-closure management of a portion of the site, specifically the NRC License Area, if the Ore Processing Facility were constructed on-site, which would require establishment of the NRC License Area, and the State of Wyoming deferred the post-closure management to DOE. Authorization for DOE involvement at the site is through Title II of The Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 (Public Law 95-604, 42 USC 7901, Title II, §§201-209. The UMTRCA provision which allows for state management of a site is in §202(b). No areas within the Project Area are currently designated for DOE control. The text in Sections 2.3, 2.3.5.11, and 2.3.5.12 is clarified, and the DOE 2012 reference added.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
35	EPA		4-22		4.2.4.3	**Top Soil.** Page 4-22, Section 4.2.4.3 No Action Alternative - This section mentions the activities that would be conducted under Energy Fuels' reclamation plan in the WDEQ-LQD Permit to Mine 381C application revision and the WDEQ-AML reclamation plan that would be implemented to restore previously disturbed areas. We recommend that the final EIS examine whether there is enough available topsoil resource to achieve reclamation performance standards for both the WDEQ-LQD 381C Permit to Mine application revision and the WDEQ-AML reclamation plan.	Four considerations are needed in reference to the phrase "enough topsoil": First, WDEQ-AML is charged with eliminating safety hazards, repairing environmental damage, and mitigating risks associated with a site to the extent funds are available and in accordance with the 'hazard priority' of the site. Therefore, the 'reclamation requirements' at each AML site are tailored to the priority of the work at the site. At the McIntosh Pit, the emphasis is on backfill and stabilization of the pit. However, WDEQ-AML will be using four of the existing topsoil stockpiles from previous mining activities during their work at the McIntosh Pit. The reclamation requirements are those written into the contract for the work. Second, because of the historic site disturbance, the WDEQ-LQD reclamation requirements take into account: - the extent of the historic disturbance; - the regulatory requirements at the time the historic disturbance occurred; - the party(ies) responsible for the historic disturbance; - the availability (if any) of topsoil salvaged prior to that disturbance; and - what historic disturbance will be redisturbed. In general, operators are not responsible for reclamation of historic disturbances they did not create and are not planning to redisturb. As discussed in the response to the previous comment on Evaluation of Reclamation Success, Map 2.5-1 in Section 2.5 of the FEIS delineates the areas of Energy Fuels' reclamation responsibilities under WDEQ-LQD Permit to Mine 381C, and Map 2.5-2 in the FEIS delineates the areas that are essentially 'pre-law' (no reclamation requirements) and the areas reclaimed by previous operators under older regulatory programs. (This information is also included in Section 2.5.3 of the WDEQ-LQD Permit to Mine 381C).
35 Continued							Third, in the event sufficient topsoil is not available due to lack of topsoil salvage during historic operations or due to the presence of rock outcrops in areas to be mined, suitable material (coversoil) can be used as a substitute for topsoil (WDEQ Non Coal Rules and Regulation, Chapter 3, Section 2(c)(iii)). Section 3.6 of the Mine Plan in the WDEQ-LQD Permit to Mine 381C discusses in more detail the available quantities of suitable material (Table 3-12). Fourth, three sources of topsoil or other suitable plant growth material (coversoil) have been identified for salvage and protection within the Project area: existing topsoil stockpiles; topsoil to be salvaged from previously undisturbed portions of the site that will be disturbed for this Project; and coversoil from portions of the site that will be disturbed for this Project. Based on these considerations, Energy Fuels has determined that, exclusive of coversoil, the average topsoil replacement depth would be about 7 inches, and that depth could double depending on the amount of suitable coversoil. The soil studies and calculations used to determine salvage and replacement depths are detailed in the WDEQ-LQD Permit to Mine 381C (Appendix D-7 and Section 3.6 of the Mine Plan, respectively.) The text in Sections 2.3.3.2 and 4.2.4.1.1 of the FEIS is revised to provide additional information and cross-references to the WDEQ-LQD Permit to Mine 381C. If the On-Site Ore Processing Facility were constructed, a similar analysis of topsoil and coversoil quantities would be completed as part of the NRC review process. The topsoil and coversoil replacement would take into account the area of the Heap Leach Pad which would be reclaimed for long-term protection (e.g., radon barrier and erosion protection cap).

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
36	EPA				Appendix 3-B	**Water Quality Data in the Draft EIS.** In Appendix 3-B - Water Quality Monitoring Data, Table 5 (page 3B-5); the monitoring data from the three storm water monitoring locations (SW-1, SW-2 and SW-3) have been averaged together. We recommend that the data be presented separately for each storm water monitoring location so that the reader can determine if different storm drainage areas have different water quality.	Table 5 in the DEIS is separated into Tables 6 and 7 in the FEIS. Table 6 includes the information for McIntosh Pit and Western Nuclear Pond, and in Table 7, the data for Impoundments SW-1 through SW-3 is presented by impoundment. The text in Section 3.2.5.1 is updated to provide additional information about the impoundments and the associated water quality. The ponds are usually dry. Based on available sampling results, the water quality in each impoundment showed considerable variability, which would be expected given the ephemeral nature of the flows to the impoundments. In general, the highest concentrations were detected in SW-1 and the lowest concentrations were detected in SW-3. Most of the land in the drainage above SW-1 is historic disturbance; in contrast, most of the land in the drainages above SW-2 and SW-3 is undisturbed or reclaimed. Impoundment SW-3 would be removed as part of the Project and would not be replaced during reclamation.
37	EPA				Appendix 3-B Table 4	In Appendix 3-B, Table 4, Energy Fuels Crooks Creek Water Quality Summary, on page 3B-4 we recommend adding the water quality standards for Crooks Creek or highlighting potential exceedances of the standards. Similarly, we recommend adding water groundwater quality standards to Table 6 - Groundwater Quality Mean Values.	A new table, Table 4, is added to Appendix 3-B, and this table lists WDEQ-WQD and EPA water quality criteria. The other tables in the appendix are renumbered accordingly, and associated text references updated. In the surface water and groundwater quality tables (Tables 5 through 8), the reported concentrations in excess of the regulatory criteria listed in Table 4 are highlighted.
38	EPA		4-27		4.2.5.1.1	**Sediment.** Page 4-27, Section 4.2.5.1.1, Surface Water Quality discusses mitigation measures for minimizing sediment transport impacts. Although the draft EIS discloses several important commitments related to minimizing sediment transport, it does not provide the information needed to assess the probable hydrologic consequences of the mining and reclamation plans as required by [mining-impacted] Hydrology Guidance 8 (WDEQ/LQD). We recommend a sediment yield evaluation plan be included in the FEIS (or technical reports) as required by Guidance 8, Appendix 2, to establish a pre-mining baseline to evaluate whether attainment of interim reclamation standards is met. We also note in the first bullet on page 4-27, that the Spill Prevention Control and Countermeasure Plan (SPCC) is not associated with sediment transport. Under the Oil Pollution Act, the SPCC is a facility's plan to prevent and contain oil spills. It is likely that this bullet intended to refer to the Storm Water Pollution Prevention Plans that would be required through the storm water WPDES permits.	The information needed to determine the Probable Hydrologic Consequences is included in the WDEQ/LQD Permit to Mine 381C, as approved by WDEQ-LQD in July 2015, and is referenced in the FEIS. More specific cross-references to the WDEQ-LQD permit have been added to Section 2.3.4.2 of the FEIS. The use of the term "interim" in the FEIS is clarified. In some places, the term refers to practices used to reduce impacts on temporary features, such as "interim" seeding of topsoil stockpiles to help reduce erosion. In others, the term refers to "Interim Reclamation" or Interim Mine Stabilization (Section 2.3.5.10), which applies to a specific set of circumstances in which the WDEQ/LQD and the BLM approve temporary closure of a mine, usually for economic reasons (43 CFR 3809.401(5) and LQD Noncoal Rules and Regulations, Chapter 3, §k(ii). In Section, 4.2.5.1.1, the first bullet in the Sediment Transport discussion of Surface Water Quality is corrected.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
39	EPA		2-18		2.3.4.2	**Design Storms.** On page 2-18, Section 2.3.4.2, the draft EIS mentions sediment ponds will be sized to contain the 100-year, 24-hour storm plus the estimated sediment storage volume for one year. As noted in the EIS the more conservative design was selected because of the potential for radium to be present in storm water. We are pleased to see a more conservative design storm than the 10-year, 24-hour storm required by the WDEQ regulations for sediment ponds. We recommend the final EIS discuss whether the more conservative design be required through BLM's approval of the Plan of Operations. We also recommend that this discussion address the factors used to arrive at the 100-year design storm basis. The DEIS states that the 25-year, 24-hour storm was selected as the design storm for sizing of diversions, culverts, and stilling basins. We recommend consideration of a 50- or even 100-year storm event return period based upon a more conservative approach to the expected life of the diversion and the anticipated increased frequency of severe precipitation events during this era of climate change effects. The overall project life is anticipated to be 20 years from initial construction to final reclamation as stated on Page 2-32. We note the WDEQ Guidance 8 for Mining-impacted Hydrology recommends a 50-year, 24-hour design storm basis for temporary diversion channel and culverts.	Appendix D-6, Section 7 of the Mine Plan in the WDEQ-LQD Permit to Mine 381C as approved by WDEQ-LQD in July 2015, discuss the factors used to arrive at the design storm basis. These designs have been accepted by the WDEQ-LQD. Cross-references to these sections of the LQD Permit are added to Section 2.3.4.2 of the FEIS. The more conservative storm recurrence period (100–year versus 10–year) selected for the sediment pond designs, in conjunction with the 24-hour storm duration, was used to help ensure there would be no releases from the ponds because of water quality concerns, as well as ensuring adequate sediment capacity (Section 2.3.4.2 of the FEIS). However, structures such as diversions, culverts, and stilling basins are not intended for water or sediment retention, so the more conservative storm recurrence period was not considered necessary. In addition, the anticipated life of structures such as diversions is generally less than the life of the Project (i.e., less than 20 years). These features are used primarily during mining of the Congo Pit, which is projected to last 8 years, and may be removed during reclamation. In contrast, sediment ponds generally remain in place until reclamation is deemed successful. WDEQ-LQD Guideline 8 recommends different storm recurrence periods depending on the life of the diversion (e.g., a 25–year recurrence period for diversions in place for 3 to 10 years). It is recognized that the use of design storm events may not cover all the storm events encountered during the life of a project, particularly given the variability of precipitation and snow melt in high desert environments. The WDEQ-LQD statutes and regulations provide for measures to address the possibility of unexpected events, including: inspections to ensure the surface water control features were properly constructed and are functioning (e.g., Sections VI and VII of WDEQ-LQD Guideline 15); annual reports with evaluation of the extent to which "expectations and predictions" have been met (W.S. §35-11-411); and designation of operator duties, including protection of soil and water (W.S. §35-11-415).
39 Continued							With respect to climate change and associated precipitation variability, no practical methods exist to evaluate the effect of climate change in a particular place from a single project, especially considering the natural variability in precipitation at the site (Section 3.2.1.1 of the FEIS) and the relatively short duration and small area of the project (see e.g., Intermountain West Climate Summary, 2007).
40	EPA					**Ore Spills.** We recommend the final EIS list required design or mitigation measures to prevent and clean up spills from the ore conveyor. We have found in our reclamation and cleanup activities at other mine sites that storm water drainage or acid generation from spilled ore can be a major contributor to poor water quality. It appears that much of the conveyor system would be outside of the area controlled through the water quality permits and storm water controls for the mine. This issue may be addressed through expanding the area for storm water controls or best management practices to prevent runoff from ore spills.	The ore conveyor would only be constructed if the alternative for an On-Site Ore Processing Facility is chosen. If constructed, the conveyor would be covered to eliminate spills and control fugitive dust (Section 3.5.1 of the Mine Plan in the WDEQ-LQD Permit to Mine 381C). In addition, the length of the conveyor would be included in the Mine Permit Area and the NRC License Area; therefore, all requirements for inspections, spill control, dust control, mitigation, and remediation would be applicable. The text in Section 2.3.4.5.1 is updated to reflect the requirements of the Mine Plan.

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41	EPA		4-32		Figure 4.2-2	**Ground Water Drawdown Model.** We recommend including additional information about the groundwater drawdown model presented in Figure 4.2-2, on page 4-32 of the draft EIS, and the factors used in the model. More specifically the following types of information would clarify the model assumptions, and address concerns with post-mining aquifer recovery: Identify the specific hydrologic model, and the assumptions and inputs used to determine the drawdown contours on Figure 4.2-2 such as aquifer characteristics, boundary conditions and precipitation scenarios. The discussion summarizes the historical quantities dewatered and the subsequent recovery of the aquifer to within 90% of pre-mining water levels. However, it is unclear if predictions have been made to project water table elevation and recovery time after the proposed mine is reclaimed. We recommend that the final EIS include the estimated time of recovery and elevation of the Sheep Mountain groundwater table.	Section 4.8.2.2 of the Reclamation Plan and Exhibit D-6-15 in Appendix D-6 of the WDEQ-LQD Permit to Mine 381C, as approved by the WDEQ-LQD in July 2015, describe, in the requested detail, the methods used to evaluate the drawdown due to groundwater withdrawal from the Congo Pit and the Sheep Underground Mine. Section 4.8.2.3 of the WDEQ-LQD Permit to Mine 381C, as approved by the WDEQ-LQD in July 2015, includes similar information on the groundwater recovery after cessation of pumping from the Congo Pit and the Sheep Underground Mine during reclamation of these facilities. Figure 4.2-2 is replaced with Map 4.2-1 which is the most recent drawdown map from WDEQ-LQD Permit to Mine 381C. The text in Section 4.2.5.4 is also updated.
42	EPA		2-41			**Septic Tank and Leach Field for Processing Plant.** Domestic liquid wastes would be disposed through a permitted septic leach system at the processing facility (Page 2-41). The final EIS should discuss what wastes are included under the term domestic liquid wastes and estimate volumes. In particular, laundry wastewater can be of concern from facilities handling hazardous materials.	The discussion of domestic liquid waste in Section 2.3.10.2 is clarified in the FEIS.
43	EPA		2-43 & 2-44			**Drinking Water Source for the Mine and Mill.** Pages 2-43 & 2-44 - Given the historic impacts in the project area, it will be important to assure that mine workers have a safe supply of drinking water. We recommend the final EIS identify the location(s) of the well and target aquifer for the potable water treatment system during operations.	Based on the anticipated workforce (Section 2.3.7) and anticipated potable water usage rates (Section 2.3.11.3), potable water could be trucked from Jeffrey City throughout the life of the Project. Energy Fuels could decide, in the future, to drill a well for potable supply, which could require treatment. However, installation of a water supply well is considered speculative at this time. No change has been made to the text.
44	EPA				Table 1.3-1	**Radionuclide NESHAPS.** Under 40 CFR Part 61 Subpart W (National Emission Standards for Radon Emissions from Operating Mill Tailings), the EPA regulates radon emissions from uranium recovery facilities. This source is subject to Subpart W and is required to receive a Construction Approval from EPA, prior to construction of the source. EPA recommends that Table 1.3-1 include that Subparts A (General Provisions that any NESHAP facility must meet), B (National Emission Standards for Radon Emissions from Underground Uranium Mines) and W; and explain that regulated sources require construction approvals be granted by EPA prior to construction. Additionally, EPA has proposed changes to the Subpart W rules, which we will take into consideration as appropriate in processing the Construction Approval. We also offer assistance to BLM regarding questions about the NESHAP regulations. The requirements of NESHAPS Subpart W listed in Table 1.3-1 are not correct regarding "... for existing uranium mill tailings.." as the regulated sources at this facility will be considered "new", and EPA recommends revising the Table accordingly.	Additions and deletions are made to Table 1.3-1. The BLM is aware that EPA is revising the Subpart W requirements and Table 1.3-1 reflects how Subpart W applies to the heap leach facility. 40CFR61 Subpart W does not apply to the Sheep Mountain Mine, as there is no processing taking place. Processing will be conducted at the proposed heap leach facility.

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45	EPA					**Compliance with NESHAPS.** The EPA recommends that the dose estimate to the public from the underground mines, Sheep 1 and Sheep 2, be determined using the COMPLY-R computer program or equivalent computer model that has received prior approval from EPA, to show compliance with Subpart B of the radionuclide NESHAPS. We recommend that the final EIS disclose the results of COMPLY-R.	The BLM recognizes that the EPA requires COMPLY-R to show compliance with Subpart B for a construction permit of the underground mine shafts. The BLM believes that COMPLY-R is a black box model which is not well suited to a site such as Sheep Mountain. Further, it is archaic in its formulation and will not run on versions of Windows newer than XP. Nevertheless, it was run on an older machine with the result that the nearest receptor, Claytor Ranch, received a dose of 2.55 mrem from the combination of the Sheep 1 and Sheep 2 adits. This result is added to the FEIS in Section 4.4.7.1.1. However, these results are presented for the purposes of disclosing impacts only.
46	EPA		2-42		2.3.10.3	**Disposal of Radioactive Byproduct Material.** Page 2-42, last paragraph of Section 2.3.10.3 mentions that, "During Construction and Operation, all solid 11e2 byproduct material, other than processed ore in the Heap Leach Pad, would be temporarily held in an interim solid waste management area identified within the Processing Facility." This interim solid waste management area may be subject to the requirements of 40 CFR Part 61 Subpart W, as determine by the EPA. It is recommended that this information be disclosed in the Final EIS.	The following language has been added to Section 2.3.10.3 in Chapter 2: "The interim solid waste management area (within the heap leach area) may be subject to the requirements of 40 CFR Part 61 Subpart W, as determined by the EPA."
47	EPA				3.5 4.1.5 4.3.5 4.4.5	**Disclosure of Radiation Impacts.** We recommend that the final EIS include additional information to improve the disclosure of potential risks from radiation. As the draft EIS is currently written, it is unclear how radiation exposures will change as a result of the proposed mine expansions and on-site mill and the relative magnitude of radiation levels for employees, visitor, local residents, and those that use neighboring land. We recommend that the analysis in Chapter 4 present a summary table of the pre-operational radionuclide monitoring data, as compared to predicted radiation levels expected during construction, operations, reclamation and post reclamation, for at least four classes of receptors: employees, visitors to the facility, recreation/hunting uses, and nearby residents. Also, a table of regulatory dose limits should be included, for comparison to the estimated dose received. It is recommended that BLM model the dose to the public and workers that would be observed during the most conservative operational year (e.g., surface mining, underground mining and processing are all in operation) over a range of anticipated emission rates, and provide a summary of the model results. For an example of a well written summary of radiation impacts, we recommend the Final Uranium Leasing Program Programmatic Environmental Impact Statement (ULP-EIS), dated March 2014 at: http://ulpeis.anl.gov/documents/fpeis/index.cfm. For more specifics, please see Volume 1 of the EIS: Section 3.5 (Specifically Table 3.5-1) on (page 3-84 in the EIS pdf), Section 4.1.5 Human Health for Alternative 1 (very similar to Sheep Mountain no action alternative), Sections 4.3.5 & Section 4.4.5 Evaluates the human health impacts for Alternative 3 & 4 of the ULP-EIS for four scenarios: (1.) worker exposures - uranium miners; (2.) worker exposure - reclamation workers; (3.) general public exposure- residential scenario; and (4.) general public exposure - recreationist scenario. Appendix D.5. Starting on page 224/578 in Volume 2 of the ULP-EIS.	Pre-operational monitoring data are listed and summarized in Appendix 3-A. A paragraph was added to Section 4.4.7.1.1 which estimates a dose to a member of the public located at the "average" air monitoring location and comparing those doses to the MILDOS output. As suggested, Table 4.4-11 addresses the results predicted by MILDOS for four classes of receptors, albeit using slightly different scenarios. All the MILDOS results are for the maximum annual result. The paragraphs above Table 4.4-10 lists the pertinent standards; no table is necessary to do so. However, the BLM believes that the EPA's suggested modelling has been completed to the extent necessary to disclose impacts within the FEIS . "The purpose of analyzing camping near the mine during operations was for a conservative estimate of impacts considering operations would cause the highest rate of exposure from radium 226. As noted in Section 4.4.7.1.1, post closure radium 226 levels in the reclaimed Congo Pit would be lower than current levels. The Heap Leach pad would be permanently removed from public domain upon final closure and land transfer to the DOE. As noted in Section 3.5.1, hunters have been known to use the Project Area even though access is currently blocked by locked gates; however, there is no indication that hunters camp within the project area or will camp within the project area after reclamation especially considering the final reclamation of the project area will leave no access roads. For these reasons, the suggested analysis would not be practical or realistic especially considering the most conservative and realistic scenario has already been analyzed by considering camping near the mine during operations. The following footnote is added to Table 4.4-11 to clarify the conservativeness of the BLM's analysis: "Campers are not anticipated to be present due to limited access during Operations and lack of roads after Reclamation. However, hunters, who might camp, have been known to use the area, so for a conservative assessment, exposure during Operations was assessed. Exposure would be less after Reclamation."

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48	EPA				Appendix 3-A	**Background Radiation.** When summarizing the background radiation information mentioned in the comment above, we recommend that additional information be added to the Tables presented in Appendix 3-A. First, we recommend that the data be summarized with an average and range of values over the sampling period. We also recommend adding guidelines, standards and criteria as applicable, so that the reader can understand the magnitude of the background radiation monitoring. The data descriptions/terms should also be defined and explained as needed. For example, in the Air Particulates Monitoring tables on pages 3A-9 through 3A-28, it is not clear how the reporting limit was determined and how the magnitude of the results indicates a low radio particulate concentration in air across the site. Please also explain how the data were handled/processed where "precision" is greater than "reporting limit".	Additional rows are added at the end of Table 1 in Appendix 3-A for radon range and averages. An extension of Table 2 in Appendix 3-A is added for gamma data. Table 15 in Appendix 3-A is added to summarize radioparticulate concentration results. The reporting limit in uCi/ml is a requirement of NRC Regulatory Guide 4.14. The precision is a function of the counting statistics of the radiological sample. There is no operational impact with which to compare until mining and milling are occurring.
49	EPA		3-38 & 3-39		3.2.4.3	Section 3.2.4.3 (pages 3-38 & 3-39) includes some exposure rates in uR/hr. The EPA recommends that these values be related to doses received. We also recommend that the significance of the values be addressed, considering the high standard deviation values of 42.3 uR/hr and 128 uR/hr referenced (this data needs to be made relatable in some way).	These values are typical of a highly mineralized area. No dose, per se, can be calculated without having a receptor. Assuming that an individual was present at the site for 8760 hours per year and by assuming that 1 uR/hr is equivalent to 1 urad/hr, the dose rate to an inhabitant may be estimated. If a person were at the location at which the exposure rate were 40 uR/hr, for example, the potential dose would be 8760 hrs times that rate, or approximately 350 mrem/yr. However, without knowing the length of time that a potential inhabitant is being exposed, it is not possible to estimate an actual dose. No change to the document.
50	EPA					The EPA recommends that the final EIS discuss how the monitored values or background conditions relate to the MILDOS results for dose from particulate radionuclides to the receptors modeled.	Language is added to Section 4.4.7.1.1 to compare doses from inhaled radium-226 at air monitoring sites to the doses calculated by MILDOS.
51	EPA					The EPA recommends that the final EIS provide further explanation as to why radionuclide particulates from the Congo Pit were not included in the estimated radiological dose to the public or workers.	A paragraph has been added to Section 4.4.7.1.1 as follows: No detailed analysis of radio-particulate emissions from the Congo Pit was performed using modelling. Experience with open pit mines in Washington and California has shown there is no appreciable release of radio-particulates from the pit that would be accessible to members of the public (Little, 2015). The Congo Pit is several hundred feet deep. That coupled with the assumption that water spray is going to be used during mining operations, led to the assumption that no particulates would be released from the pit that would impact the public. Additionally, the BLM must assume for this analysis that the requirements of the WDEQ-AQD air permit are met and particulate matter emissions are acceptable or are acceptable with conditions of approval from the Congo Pit as a result of this permit (through dust control and other measures). If particulate emissions are acceptable, then impacts as a result of radio-particulates would also be acceptable because there is no separate standard for radio-particulate emissions.
52	EPA				Appendix 2-B	The EPA recommends that the final EIS provide information on the operational radiological monitoring plan and include how the data collected will be used to ensure protection of workers, public health, livestock and game. It is unclear from Tables 1 and 2 in Appendix 2-B what monitoring is planned during operation and whether Table 1 is for pre-operational monitoring only. The EPA recommends that the final EIS include a more detailed information plan, including what media will be monitored, what standards/limits the results will be compared to, and what actions will be required if standards/limits are exceeded.	As stated in Section 2.3.12.3, most of the monitoring presented in Table 1 of Appendix 2-B is for the life of the Project and is not only preoperational. Additional or detailed radiological monitoring will likely be required by the NRC as part of the NRC licensing process for the on site processing plant., but the BLM does not have the information available to know what this monitoring might consist of.

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53	EPA		4-93		Table 4.4-10	It is unclear from Table 4.4-10 - Modeled TEDE Doses from Mining and Ore Processing (4-93), if the modeled TEDE doses includes dose from radon. Please clarify in the final EIS. Also for Table 4.4-10 please clarify: If the doses modeled were done at the maximum predicted mining/processing conditions. How the "Mill" TEDE" values were determined. There is a math error for the total for "Maximum NRC - processing max (NRC3/NLA-N1)". It should be 102.3 mrem/yr, instead of 26.4, as indicated.	Yes, doses for Mine and Mill both include dose from radon decay products. Doses reported represent the maximum for all years of production. The TEDE values for the mill were calculated using the MILDOS model and include both external and internal doses from all applicable sources . See Appendix 3-A. The math error has been corrected.
54	EPA					Please clarify whether the Claytor Ranch is the nearest resident. We recommend more clearly identifying the nearest resident and whether there was any passive gamma or radioparticulate monitoring conducted at the nearest resident location as well as whether any future monitoring is planned there.	As stated in Section 4.4.7.1.1 and the text accompanying Table 4.4-10, the Claytor Ranch is the location of the nearest resident. Radon monitoring was conducted at the Claytor Ranch. Those results are summarized in Table 1 in Appendix 3-A. The NRC may have requirements for monitoring at the nearest resident as part of the licensing for the on-site processing facility but the BLM does not have the information to know the details of this monitoring effort.
55	EPA					The EPA recommends discussing the anticipated level of radiological impact to livestock and wild game during the operation and post-reclamation phases of the project.	Information regarding radiological impact to livestock and wild game has been added to Chapter 4 in the FEIS.
56	EPA					Radiological Impacts Analysis Technical Document (RIATD). EPA recommends that Appendix B of the Air Quality Technical Support Document (Appendix 4-A of draft EIS) be revised to more clearly model anticipated radiologic impacts and better explain model inputs as follows: a. The emissions inventory indicates that particulate emissions are high from the Congo Pit. Considering this information, the EPA recommends that the final EIS consider radio particulate emissions in the dose estimations. b. The final EIS should disclose if there are any plans to compare modeled particulate dose to those determined through monitoring data? c. The EPA recommends that the important parameters (Table 3, RIATD) be put into the model over a range of anticipated values so that the anticipated range of doses can be predicted. d. Please provide additional information on why the spoils pile concentration of 40 pCi/g of uranium decay chain concentrations is considered conservative. There is a wide range of Ra-226 concentrations in waste rock material. e. Clarify that the modeled doses in Table 4 of the RIATD are from mine activity. Page 15 states that the doses are considered conservative estimates. This is not true considering that the processing facility dose contribution was not taken into account. f. Page 16 of the RIATD: the EPA recommends that the Rn-222 dose from the mine adits should also be presented as results from a model created using COMPLY-R, the program required to show compliance with the 40 CFR 61.22 standards of 10 mrem/yr. g. Page 3 of the RIATD states that, "The purpose of this report is to describe potential doses to members of the public from mining-related activities including the Congo Pit, stockpiling of ore, storage of spoils materials and releases from the underground mine adits." Page 17 provides information on potential doses from the processing facility. Please expand upon how the dose contribution from the processing facility was determined, including what assumptions were made and what inputs were used to arrive at the dose contribution This document should address the potential dose to the public from the connected action of the on-site processing facility and background dose. The total dose would serve as the cumulative impact for radiation dose.	a. See response to comment #51. b: BLM has no plans to compare modeled particulate dose to monitoring; however, the NRC may require such. c. MILDOS is not designed to do stochastic modeling. To do as suggested would require multiple runs of the model with little value. Further, the variation in occupancy at a given location would likely swamp the variation in the calculated dose. d. The average ore grade of 0.122% U represents an average radium-226 concentration of 342 pCi/g. As stated in the comment, there is, indeed, a large range of radium concentrations in waste rock, from background to no higher than ore grade. A 2014 study by Energy Fuels of their Whirlwind Mine found a radium-226 concentration of only 4.2 pCi/g in waste rock having a U-nat content of 0.128% Unat. Given that data, it seems that 40 pCi radium-226/g rock is reasonable. e. The doses presented in Table 4 of the RIATD are for the mining project (locations A-Z). The doses presented in Table 5 are from the milling facility (locations NRC1 - NRC16). f. See Response to Comment #45 g. Dose contribution from the processing facility was calculated using the MILDOS model.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
57	EPA					Air Quality Impacts and Modeling. The air quality modeling conducted for the draft EIS may not capture maximum impacts, as noted in earlier comments during the modeling process. The modeled predicted impacts were not projected to exceed the levels of the National Ambient Air Quality Standards (NAAQS); however, the analysis shows the particulate matter (24-hour PM2.5) and nitrogen oxide (1-hour NO2) impacts are approaching the NAAQS for all modeled scenarios (89% to 93% for the 24-hour PM2.5). The air quality analysis also shows that impacts from operations were projected to be greater than the 24-hour PM10 and 24-hour PM2.5 Class II increments. As the model used may under predict air impacts and air quality impacts are approaching standards, we recommend that additional air mitigation measures be developed in the final EIS to reduce PM and NO2 impacts. The main modeling issues that make it difficult to determine whether air modeling predictions are accurate are: (1) it is not clear whether the methodology used to analyze the near field air quality modeling results for this project used the averaging approach consistent with EPA guidance for the NAAQS comparisons; and (2) it is also not clear whether the data used to support the in-stack ratio assumptions for the near-field modeling were representative because this information is not present in the modeling documents. It appears that the ozone impacts refer back to an older version of the air modeling from the Continental Divide-Creston (CD-C) EIS. A number of important changes were made to improve the CD-C air modeling since the version referenced in the Sheep Mountain draft EIS. We recommend that the final Sheep Mountain EIS be updated to incorporate the air modeling results from the final CD-C EIS.	The air quality analysis performed for the Project is adequate for demonstrating compliance with ambient air quality standards under NEPA. All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern, and do not represent a regulatory PSD Increment Consumption Analysis. The determination of PSD increment consumption is the responsibility of the WDEQ and the analysis will be conducted as part of the New Source Review permitting process. Modeling results presented for 1-hour NO2 concentrations for comparison to the NAAQS and WAAQS are 2-year averages of 98th percentile maximum 1-hour concentrations. For informational purposes, the maximum yearly values will be included in the revised AQTSD. In addition, references for in-stack NO/NO2 concentration ratios have been included in the revised AQTSD available for the FEIS (see Section 3.4). The FEIS and revised AQTSD include references to the CD-C FEIS project for regional ozone impacts and for cumulative AQ and AQRV impacts.
57	EPA					To assure that emissions from the project do not approach or exceed the PM2.5, or NO2 NAAQS, or significantly change air quality, BLM may want to consider additional mitigation for the project in the final EIS.	Thank you for your comment.
58	EPA					The top five project-related sources of PM2.5 are all related to fugitive dust from the mine and roads including: (1) surface mobile sources, mine-wide unpaved road travel [vehicles on dirt roads]; (2) overburden removal; (3) wind erosion of stockpiles; (4) dozing; and (5) wind erosion of open acres. Dust controls would likely offer the most mitigation benefit toward reducing particulate emissions. We also recommend consideration of PM monitoring during construction and operation of the mine with adaptive management to reduce PM impacts for instances when monitored values are approaching or exceeding the NAAQS. It may also be useful to engage WDEQ on the subject of potential WDEQ requirements for PM monitoring or controls so that those considerations can be taken into account by the NEPA process.	The modeling performed for the DEIS is adequate for demonstrating compliance with ambient air quality standards under NEPA. Through the New Source Review permitting process, the WDEQ identified additional mitigation measures and monitoring requirements that could be required as part of permitting conditions (see Section 2.3.12.3, Environmental Monitoring during Operations - Air, in Chapter 2. This includes visual opacity restrictions and the Method 9 observation monitoring. These measures do not include measures for managing fugitive dust from County Roads although County Road Use and Maintenance agreements are required to be obtained by Energy Fuels which will likely require dust suppression components. Air quality monitoring and compliance programs are summarized in Section 2.3.12.3 and 2.3.12.4 and in Tables 1 and 2 in Appendix 2-B. The BLM is not required to develop mitigation measures that would exceed those required by other agencies who manage air resources.
59	EPA					Up to 96% of the project's predicted NOx emissions are expected to come from engine emissions associated with surface mobile/nonroad sources and underground mine mobile sources. Requiring lower emitting engine technology would reduce PM2.5 and NOx emissions as well as having the added benefit of reducing other pollutants such as carbon monoxide and hazardous air pollutants. Diesel particulate filters may also reduce PM2.5 emissions and impacts from diesel equipment.	Thank you for your comment. Please see above comment response.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
60	EPA				Table 4.2-4	**Greenhouse Gas (GHG) and Climate Change.** We appreciate the inclusion of quantitative estimates for GHG emissions for construction and operation of the proposed project and alternatives. We note that the draft EIS estimates both on-site and off-site production alternatives as having exactly the same amount of GHG emissions as shown in Table 4.2-4 of the draft EIS. However, based on the emission inventory of combustion pollutants, summarized in Tables 4.2-2 and 4.2-3, it appears that the alternative considering off-site processing would have more GHG emissions due to surface mobile sources associated with ore haulage to the Sweetwater Mill. We recommend that BLM re-evaluate these calculations and make any necessary revisions to the GHG estimates.	Thank you for your comment. The calculation of total GHG emissions from off-site processing is revised in the FEIS.
61	EPA		4-10			In future environmental reviews, we recommend that Greenhouse Gases discussions such as on page 4-10 of the draft EIS be updated to be consistent with the CEQ Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts at: http://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance. Although we recognize that climate impacts are not attributable to any single action, but are exacerbated by a series of smaller decisions. As such, it is not useful to compare GHG emissions from a proposed action to national or global emissions. As noted in the CEQ revised draft guidance, such an approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make relatively small additions to global atmospheric GHG concentrations that collectively have a huge impacts. With regard to draft EIS statements referencing the infeasibility of assessing the degree of impacts a single project may have on global climate change or the "controversy" around whether changes to natural systems can be quantified, as noted by CEQ, estimated GHG emissions may be used as a reasonable proxy for assessing potential climate change impacts.	The Greenhouse Gases and Climate Change sections have been revised in the FEIS. Please see Sections 3.2.1.5 and 4.2.1.1.
62	NRC	2	2-10			"Access to the site would be controlled by barbed wire fencing and/or gating at all defined points of ingress and egress to the Project Area and internally at the “NRC License Area” … We consider that NRC Restricted Area was probably meant here.	The language has been revised to include the following: "Access to the site would be controlled by barbed wire fencing and/or gating at all defined points of ingress and egress to the Project Area and internally at the “NRC Restricted Area” – an area that contains the uranium processing facility that would be external to the Permit to Mine 381C mine permit boundary but within the Project Area, once NRC licensing is complete."
63	NRC	2	2-14			"The pond would be sized as required by NRC to contain …" NRC has no specific requirement for pond sizing as stated. Therefore, we recommend removing "as required by NRC" from the sentence.	"as required by NRC" has been removed from the sentence.
64	NRC	2	2-14 to 2-15			"The pond would be sized as required by NRC to hold…" NRC has no specific requirement for pond sizing as stated. Therefore, we recommend removing "as required by NRC" from the sentence.	"as required by NRC" has been removed from the sentence.
65	NRC	2	2-15			"and would be sized as required by NRC to hold…" NRC has no specific requirement for pond sizing as stated. Therefore, we recommend removing "as required by NRC" from the sentence.	"as required by NRC" has been removed from the sentence.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
66	NRC	2	2-31			"The NRC would have a similar requirement for interim management of the Ore Processing Facility." We are unaware of such a requirement, and therefore recommend removing this sentence.	The sentence has been removed. The following sentence has been added: "Energy Fuels would similarly manage the facility during periods of temporary closure."
67	NRC	2	2-44			The On-Site Processing Facility, which would be regulated by the NRC, would be required to incorporate surface water management practices which account for the PMP and PMF events. We recommend stating "which account for significant rain events." rather than referring to PMP and PMF events..	Revision has been made as suggested.
68	NRC	2	2-57			with NRC requirements to minimize spoils and leaks. For example, the Heap Leach Pad would be lined with a synthetic triple liner system with dual leak detection." We consider that "to minimize spills and leaks" was intended.	Revision has been made as suggested.
69	NRC	2	2-75			"Energy Fuels is required by the NRC to design the Heap Leach Pad to withstand a major storm event (PMP)." We recommend this sentence be replaced with the following text: "NRC requires that a surface impoundment be designed, constructed, and maintained to prevent overtopping resulting from normal or abnormal operations, overfilling, wind or wave actions, rainfall, run-on, from malfunctions, and from human error. In guidance space, NRC has interpreted this to mean applicants design to consider storm events like a 100-year storm during operations. For the closure period, applicants need to consider significant storm events, like a probable maximum precipitation event, when designing the final cover system.	Revision has been made as suggested.
70	NRC	4	4-25			"Both NRC and DOE review the reclamation plans and as-built topography for stability, including standards for diversion of the 1,000-year storm (NRC, 2008)." We recommend this sentence be replaced with the following text: "Both the NRC and DOE review the reclamation plans and as-built topography for stability, including the ability to resist storm water flows resulting from a PMP event. "	Revision has been made as suggested.
71	NRC		7-12			"Nuclear Regulatory Commission. 2008." No document title is provided for this reference.	The language in this section was revised based on NRC Comment 70, above. The reference was changed to "NRC, 2015" to refer to NRC's comment letter on the DEIS.

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72	Wild Earth Guardians	3	3-39			Most of the project area drains into Crooks Creek, a tributary to the Sweetwater River. DEIS at 3-39. Crooks Creek is designated a Class 3 fishery by WGFD. DEIS at 3-82. This stream has perennial flows near the project site and becomes intermittent downstream where flows disappear into sand alluvial deposits. DEIS at 3-42. Presumably, these flows connect with the Sweetwater River through hyporheic flow. Radiation levels in this stream periodically exceed Class III groundwater standards (suitable for livestock) due to radiation. DEIS at 3-43. This presumably results from past uranium mining activity in the area, which is correlated with unnaturally high levels of radiation, far above background levels for the Battle Springs formation. *See* DEIS at Map 3.2-9. Crooks Creek is also listed as a Category 5 impaired water under the Clean Water Act for oil and grease contamination. DEIS at 3-44. In some cases, groundwater in the project area has been shown to discharge into Crooks Creek, including from the Battle Mountain formation into the wetlands near where Crooks Creek submerges into alluvium. DEIS at 3-46.	The exchange of surface water and groundwater was considered in the development of the EIS, and the potential impacts of the Project on surface and groundwater were considered minimal based on the site conditions and response of the system to previous mining. The proposed Project is similar to previous mining, including cycles of dewatering and recharge, with the exception of more extensive reclamation requirements. Also, to help ensure this evaluation is confirmed, continued surface and groundwater monitoring are part of the Project. The text in Sections 3.2.5.1 and 3.2.5.2 is updated to provide additional information on the surface water and groundwater conditions, and the text in Section 4.2.5.4.1 is updated to provide additional information on treated water discharges to Crooks Creek. The hydrogeologic information for the site indicates the presumption that the flow from Crooks Creek connects with the Sweetwater River through hyporheic flow is not appropriate. Hyporheic flow is generally considered to occur over a relatively small scale and time frame along a stream bed (see, e.g., Boano, F., J. W. Harvey, A. Marion, A. I. Packman, R. Revelli, L. Ridolfi, and A. Wörman (2014), Hyporheic flow and transport processes: Mechanisms, models, and biogeochemical implications, Rev. Geophys., 52, 603–679, doi:10.1002/2012RG000417). As discussed in two of the EIS references (Stephens (1964) and Love (1970)), Crooks Creek disappears before reaching the Sweetwater River, i.e., there is no Crooks Creek stream channel along which hyporheic flow could occur. Although there is exchange between the groundwater of the Arikaree Aquifer, into which Crooks Creek disappears, and the Sweetwater River (Borchert, 1977 and 1987), the identification of any direct contribution from Crooks Creek to the Sweetwater River through hyporheic flow along the Sweetwater River channel would be tenuous, at best.
72 Continued							The presumption that the elevated concentrations of uranium and radionuclides in Crooks Creek are associated with past uranium mining activity and are above background levels in the Battle Spring Formation (or the Arikaree Aquifer) is also not appropriate. The impact of naturally occurring uranium mineralization on surface and groundwater quality has been documented in many areas. With respect to the area of Crooks Gap, Denson et al. (1955), Stephens (1964) and Love (1970) all noted historic, elevated uranium concentrations in surface and groundwater samples collected in the area. Similarly, Mason and Miller (2005) and BLM (2012) report elevated radionuclide concentrations in the Battle Springs Formation in the Great Divide Basin in mineralized areas.
73	Wild Earth Guardians					BLM must analyze the presence of and impacts to federal reserved water rights and withdrawn lands under Public Water Reserve No. 107. The project cannot adversely affect those lands and waters.	The potential for impacts to Public Water Reserves were considered but not analyzed in detail because there are no Public Water Reserves in or near the Project Area that could be directly or indirectly impacted by any of the alternatives. Table 3.1-1 has been updated accordingly.

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74	Wild Earth Guardians	3	3-44			Surface waters in the McIntosh Pit and Western Nuclear Pond already show poor water quality with high turbidity and elevated levels of radionuclides. DEIS at 3-44. These levels are significantly worse than the water quality in Crooks Creek. *Id*. We are concerned that these water could make their way to Crooks Creek and cause contamination and degradation of water quality. We are concerned that during dewatering of mine facilities (DEIS at 4-26), the potential for contamination is elevated. It is troubling that BLM plans to rely on subsequent NEPA to determine environmental impacts from this clearly connected project action, because the agency's choice of alternatives for the project as a whole will then influence the options for minimizing environmental impacts during dewatering. This is why NEPA requires unequivocally that the EIS analyze all cumulative impacts and connected actions at this stage.	As discussed in Section 2.5, the reclamation work on McIntosh Pit, including Energy Fuels previous reclamation responsibility for the part of the pit, and related improvements to Western Nuclear Pond have been consolidated under the WDEQ-AML Project 16-O. As a result, no direct impacts to either the McIntosh Pit or Western Nuclear Pond are anticipated due to Project activities. The text in Sections 2.5, 3.2.5.1, 4.2.5.4.1, and 5.3.1 is updated to provide additional information on McIntosh Pit and Western Nuclear Pond. With respect to McIntosh Pit, the elevated concentrations of uranium and radionuclides are due to the inflow of groundwater from the residual mineralized zones, i.e., not all the mineralized material was removed by prior mining of the pit. WDEQ-AML is in the process of reclaiming the pit, including backfilling the pit above the groundwater level. With respect to Western Nuclear Pond, it receives surface water runoff crossing mineralized areas, so the presence of uranium and radionuclides is not unexpected. The WDEQ-AML project also includes work on Western Nuclear Pond to improve its current function for recreation (fishing and hunting) and livestock/wildlife water source. The proposed Sheep Mountain Project would not impact McIntosh Pit or Western Nuclear Pond and would benefit from the WDEQ-AML work. The text in Section 2.3.1.1 has been updated to provide additional information on treated water discharges to Crooks Creek under the approved WYPDES discharge permit.
75	Wild Earth Guardians	4	4-25			BLM makes the explicit assumption that because surface flows from Crooks Creek do not reach the Sweetwater River, that indirect impacts to the river will not occur. DEIS at 4-25. This is a false assumption based on faulty analysis. Groundwater and surface streams are intimately interconnected from a hydrologic standpoint; groundwater in the upper layers upwells directly into stream and river channels or into floodplain springbrooks (Brunke and Gonser 1997). Benson (1953) found that water inputs to the Pigeon River, Michigan through groundwater upwelling actually controls populations of brook and brown trout by determining the location of spawning habitats. Boulton et al. (1991) recommended that analysis of hyporheic communities should be included in analyses of stream ecosystems.	As noted in the Response to Comment 72, the exchange of surface water and groundwater was considered in the development of the EIS, and the potential impacts of the Project on Crooks Creek and the Sweetwater River are disclosed. To help ensure this evaluation is confirmed, continued surface and groundwater monitoring are part of the Project. The text in Section 2.3.1.1 has been updated to provide additional information on treated water discharges to Crooks Creek under the approved WYPDES discharge permit.
76	Wild Earth Guardians					BLM has done no analysis of hyporheic flows that are likely to directly connect the waters of Crooks Creek with the waters of the Sweetwater River. In fact, BLM's analysis indicates that surface waters sink into sandy alluvial deposits. Where does BLM think these waters then go? If the agency had done water tracking studies with the use of chemical tracers, and found that no chemical tracers ended up in the Sweetwater River, this assumption would be supported by analysis. In the absence of such hard scientific data, and in light of the established scientific principal that groundwaters contribute significantly to river flows through hyporheic flow, the agency must assume that any contamination present in Crooks Creek will in fact reach the Sweetwater River. BLM has failed in its 'hard look' NEPA responsibilities in this regard. Gardner (1999, Attachment 1) provides a useful primer on the interconnected nature of surface water and groundwater that BLM should review as it revisits its analysis of potential impacts to the Sweetwater River.	As noted in the Response to Comment 72, the exchange of surface water and groundwater was considered in the development of the EIS, and the potential impacts of the Project on Crooks Creek and the Sweetwater River are disclosed. To help ensure this evaluation is confirmed, continued surface and groundwater monitoring are part of the Project. The text in Section 2.3.1.1 has been updated to provide additional information on treated water discharges to Crooks Creek under the approved WYPDES discharge permit.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
77	Wild Earth Guardians	4	4-25			BLM further relies on a complicated system of overflow pits and retention facilities to prevent surface water (and contaminants from mining activities) from reaching Crooks Creek. Radiation contamination has a very long active life. What is going to happen to contaminated soil/tailings/waste products once these catchment facilities are no longer maintained? We are concerned that as the intricate series of catchment basins and diversion structures (DEIS at 4-25) fall into disrepair, the contaminants on site will move into the local surface water system and contaminate Crooks Creek and the Sweetwater River. The DEIS does not appear to provide analysis on these long-term project impacts.	The presumption that the proposed system of surface water flow controls at the mine is complicated is not appropriate as the system is not unusual and is in line with the requirements of the WDEQ-LQD for surface water flow controls. The WDEQ-LQD Permit to Mine 381C, as approved by WDEQ-LQD in July 2015, includes requirements for reclamation of the surface disturbance resulting from the proposed Project, including handling of materials unsuitable for surface reclamation. See Section 4.2.5.1.1 for analysis of potential impacts related to on-site water management.
78	Wild Earth Guardians	3	3-21			Crooks Creek is underlain by the Frontier formation, a shale formation. DEIS at Figure 3.2-4. The Quaternary alluvial deposits of Crooks Creek also appear to be underlain by the Battle Springs formation, which is the ore-bearing formation, and the Fort Union formation, another shale. DEIS at Figure 3.2-4. For the project area itself, this is described in cross-section in Figure 3-19. The Battle Springs formation is the deposit that contains the uranium ore targeted for extraction (DEIS at 3-21) and is primarily porous arkosic sandstone (DEIS at 3-25). Existing mine spoils and other previously disturbed areas on the project site (TENORM) already contain elevated levels of radiation. DEIS at 3-38. We are concerned that groundwater flows in this formation could convey additional radioactivity from leaks or spills from heap leaching or other parts of the uranium extraction process, resulting in significant and long-term contamination of groundwaters beyond background levels of radiation.	As discussed in Section 2.3.3.7.1 of the FEIS, the base of the Heap Leach is designed to be impermeable, with a leak detection system to provide rapid detection of any leaks. Continued surface and groundwater monitoring would also be an integral part of the NRC monitoring requirements for the On-Site Ore Processing Facility. See Section 4.2.5.4 for a complete discussion on potential impacts to groundwater as a result of the Proposed Action.
79	Wild Earth Guardians	3	3-44			Groundwaters flow southward into the Great Divide Basin from the project area. DEIS at 3-44. We are concerned that degradation of groundwater quality due to increased radiation will lead, through southward groundwater flows, to contamination of surface springs and surface water bodies fed by the Battle Springs formation, including Battle Springs and the Chain Lakes (see DEIS at 3-45), which have been recognized as important wetland resources for wildlife. Potential direct and indirect impacts of the project on these surface water resources have not been analyzed in the DEIS, in violation of NEPA. We are concerned that surface or groundwater contamination resulting in the loss of function of wetlands in the Chain Lakes area or along Crooks Creek violate Executive Orders 11990 and 11988.	The groundwater discussion in Chapter 3, Section 3.2.5.2 is expanded and clarified. Even though the deeper groundwater at the Project might flow to the south and west into the Great Divide Basin, the groundwater flow rates in the vicinity of the Project are calculated to be less than 100 feet per year. The distances to Battle Spring and Chain Lakes from the Project are over 20 miles. In addition, there are numerous zones of naturally-occurring uranium mineralization in the Battle Spring Formation between the Project and these features, such as the zones being mined at the Lost Creek ISR Project. For these reasons, the Project is not expected to adversely impact surface or groundwater quality in the Great Divide Basin, and to help ensure this evaluation is confirmed, continued surface and groundwater monitoring are part of the Project. As a result, no loss of function of any wetlands are anticipated. See Section 4.2.5.4.1 for additional discussion on potential impacts to groundwater as a result of the Proposed Action.

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80	Wild Earth Guardians					The Bureau of Land Management convened a Greater Sage-Grouse National Technical Team to compile and evaluate the best available science on the potential impacts of BLM-permitted activities and recommend conservation measures that limit the impacts of these activities on sage grouse (NTT 2011, Attachment 2). This document recommended elevated levels of habitat protection within Priority Habitats, subsequently delineated by the U.S. Fish and Wildlife Service as 'Priority Areas for Conservation' (PACs) in 2013 by that agency's Conservation Objectives Team (COT 2013, Attachment 3). This includes lands in close proximity to the proposed uranium project. In addition, in October of 2014 the U.S. Fish and Wildlife Service ('Service') identified 'stronghold' areas recommended for an even more stringent level of protection. These stronghold areas likewise include lands in close proximity to the proposed Sheep Mountain project (*see* Attachment 4). The BLM is currently revising or amending all resource management plans across the range of the greater sage grouse to address the 'inadequacy of regulatory mechanisms' identified by the Service in its 2010 Final Rule designating the greater sage grouse as a Candidate Species under the Endangered Species Act (*see* Attachment 5). The BLM must consult with the Service to identify methods to avoid impacts to this Candidate Species.	No consultation with the Service is required for a candidate species. The Lander RMP is in conformance with the State's Core Area Strategy in protections for greater-sage grouse; this is the regulatory mechanism that the FWS has approved. Since the project area is not in Core Area (nor in the Services' "Highly Important Landscapes" which are the same as Core Area in this part of the Field Office), no additional protections are required. See RMP Decisions 4098 et seq.
81	Wild Earth Guardians					Noise must be limited to a maximum of 10 dBA above the ambient natural noise level after the recommendations of Patricelli et al. (2012); the ambient noise level in central Wyoming was found to be 22 dBA (Patricelli et al. 2012) and in western Wyoming it was found to be 15 dBA (Ambrose and Florian 2014, Attachment 7).	Impacts to greater sage-grouse from noise has been considered in Chapter 4 of the FEIS. The nearest sage grouse lek is over 2 miles away. The WDEQ-LQD and WGFD have not indicated that a measure for the protection of greater sage-grouse based on noise will be required through consultation and permitting efforts. Noise impacts as a result of off-site processing are considered in Chapter 4 and ESA-5, ESA-6, ESA-7, and ESA-8 have been proposed under the BLM Mitigation Alternative in response to this analysis.
82	Wild Earth Guardians	4	4-43			BLM notes that under the Proposed Action, project-related noise could exceed 10 dBA above ambient, resulting in significant impacts to sage grouse using nesting or brood-rearing habitats within 2 to 9 miles of the project area. DEIS at 4-43. In addition, noise from the loudest trucks along the Crooks Gap – Wamsutter Road would reach 34 dBA at the nearest lek sites. DEIS at 4-44. This is louder than the 10 dBA above ambient levels recommended as allowable under the best available science, and thus traffic along this road would have a significant impact not only on nest and brood-rearing habitats in proximity of leks, but also to breeding and loafing sage grouse in and around the active leks themselves. Three leks within 2 miles of this road are expected by BLM to experience adverse impacts (DEIS at 4-45). This could lead to lek abandonment. Id. These impacts to breeding, nesting, and brood-rearing sage grouse constitute unnecessary and undue degradation pursuant to FLPMA, particularly in light of available alternate routes for hauling ore and yellowcake to and from the Sweetwater Mill.	The commenter's suggestion that noise impacts exceeding 10dBa would be significant is noted, but the BLM reminds the commenter that the BLM is not limited to a finding of no significant impacts through the development of this EIS, but to disclose the potential for impacts using the best available information. The Wyoming Game & Fish Department will continue to be consulted on impacts to sage grouse from hauling along the Crooks Gap/Wamsutter Road; however, the BLM does not necessarily agree with the commenter's suggestion that these impacts would result in unnecessary or undue degradation of public lands in accordance with the 43 CFR 3809 regulations because sage grouse are not Threatened or Endangered Species (see 43 CFR Subpart 3809.420(b)(8). The BLM has considered alternate hauling routes as part of the FEIS as suggested (see Section 2.6.2.3-Alternate Access Route to Sweetwater Mill). However, these alternate hauling routes were not carried forward for analysis, because these showed similar impacts and no benefits to the greater sage-grouse and/or its habitat as compared to the Proposed Action alternative. The alternate routes also poses greater health and safety risks because it would require travel on US Highway 287 for upward of approximately 52 miles with a higher possibility for human contact and collisions.
83	Wild Earth Guardians	4	4-46			Surveying potentially affected leks near main haul roads, as proposed under the Mitigation Alternative (DEIS at 4-46), is all well and good but does little to mitigate impacts to sage grouse. It is notable that sage grouse populations show a 2-10 year time lag following the initiation of a disturbance before beginning to register declines. Thus, by the time that population declines begin to be noticed by BLM, impacts will have been underway for years, and declines will have been entrenched so as to be difficult to reverse. The time lag explains why adaptive management approaches for sage grouse are far inferior to science-based standards that hold impacts below the threshold of significance.	The BLM does not anticipate that significant adverse impacts to greater sage-grouse populations would occur because the Core Area Strategy is being applied where applicable. The BLM Mitigation Alternative includes measures to require monitoring the leks in order to be in a position to respond to population declines should they be noticed.

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84	Wild Earth Guardians					Given the BLM's Sensitive Species obligation to prevent activities that contribute to the need to protect the greater sage grouse under the Endangered Species Act, any significant impacts to greater sage grouse populations or habitats necessary to this species would constitute undue degradation, which is not allowable pursuant to FLPMA.	The BLM does not anticipate that significant adverse impacts to greater sage-grouse populations will occur because the Core Area Strategy is being applied to the project and alternatives where applicable. The commenter should be reminded that sage grouse are not listed under the ESA; thus, impacts to sage grouse may or may not constitute undue or unnecessary degradation in accordance with the 43 CFR 3809 regulations dependent upon how the State of Wyoming (lead for sage grouse management for Mining projects) chooses to manage sage grouse in regards to this project.
85	Wild Earth Guardians	2	2-36			The project involves a significant amount of vehicle traffic. DEIS at 2-36 and -37. It also involves the potential for heavy truck traffic between the mine site and the Sweetwater Mill (DEIS at 2-38), a route that runs directly through sage grouse Priority Areas for Conservation that have been recommended for heightened 'stronghold' protections by the Service. Truck traffic routes should be required that avoid these sensitive sage grouse habitats, and such routes are readily available (north to U.S. Highway 287, then east and south along U.S. Highway 287, then west along Mineral Exploration Road, a paved and gravel route built to access the Sweetwater Uranium Mill). Such routes would avoid the generation of noise, dust, and behavioral disturbance of sage grouse using habitats surrounding the more direct proposed haul route. Holloran (2005, Attachment 8) documented that main haul roads located within 1.9 miles of an active lek were correlated with declines of sage grouse lek populations, that increased traffic led to increased population declines, and that whether or not the road was actually visible from the lek was immaterial in determining the levels of population decline for which the proximity of roads and traffic were responsible. We are concerned that the use of the Crooks Gap – Wamsutter Road south of the project area for hauling ore and/or yellowcake would result in unnecessary and undue impacts to sage grouse populations in the surrounding Core Area/stronghold habitats.	The Crooks Gap/Wamsutter Road has been utilized in previous decades to haul material to the Sweetwater Mill. The road has also been a well-travelled county road for many years. The RMP limit on distance to leks applies only to new roads (Decision 4104.) The commenter should be reminded that this road is a County Road for which members of the public including Energy Fuels are allowed to drive within use requirements as stipulated by the county (weight, vehicle size...). Energy Fuels would be required to obtain an agreement with the counties in order to haul material along this road. Therefore, the BLM has not identified how undue or unnecessary degradation could result from hauling along this County Road. The BLM has considered alternate hauling routes as part of the FEIS as suggested (see Section 2.6.2.3-Alternate Access Route to Sweetwater Mill). However, these alternate hauling routes were not carried forward for analysis, because these routes showed similar impacts and no benefits to greater sage-grouse and/or its habitat as compared to the Proposed Action Alternative. The alternate routes also pose greater health and safety risks because they would require travel on US Highway 287 for upward of approximately 52 miles with a higher possibility for human contact and collisions.
86	Wild Earth Guardians	3			Table 3.4-18	BLM presents estimated highway traffic surrounding the project area (DEIS at Table 3.4-18), but some of the most important traffic impact associated with the project will occur along gravel access roads leading to the project area from the north and south and passing through sage grouse Core Areas. The BLM has an obligation to determine baseline traffic levels on these roads as part of its NEPA analysis, and in order to successfully estimate the cumulative level of traffic (and therefore impacts to sage grouse) associated with this project. Failure to provide this baseline information on traffic levels on the Crooks Gap - Wamsutter Road is a violation of NEPA's baseline information requirements. The agency also fails to present detailed information on the timing, frequency, and magnitude of truck traffic along this route and what impact that would have, individually and cumulatively, on sage grouse populations.	The BLM's responsibilities are to disclose impacts associated with use of the Crooks Gap/Wamsutter Road, and the FEIS has been updated to ensure that the affected environment adequately describes the existing conditions and use of the road using the best available baseline information so that impacts can be adequately disclosed.
87	Wild Earth Guardians	5	5-25			The project area is located within the Mountain Allotment, which was formerly a part of the Green Mountain Common Allotment at the time of the last rangeland health evaluation. Given the poor range condition of surrounding lands in the Green Mountain Common Allotment (*see* Attachment 10), and BLM's pervasive inability to provide the 7 inches of residual grass cover in uplands and riparian areas for sage grouse to hide during nesting and brood-rearing in this allotment, we are concerned that the additional impacts related to the Sheep Mountain project, including increases in corvids, noise, dust, and vehicle traffic, will serve as the 'straw that broke the camel's back' for sage grouse populations in Core Areas surrounding the project area boundary. BLM has failed to factor in the cumulative impacts of poor range management on sage grouse in the cumulative impact analysis area (see DEIS at 5-25), and in doing so has failed NEPA's cumulative impact analysis requirements.	There are no data indicating that the upland vegetation are not meeting rangeland health standards. Data for the former Green Mountain Allotment and the Mountain Allotment indicate rangeland health problems in riparian areas on public lands. A new management system had been adopted for the Mountain Allotment which the court has found adequately addresses rangeland health. Section 5.4.10 adequately discloses potential cumulative impacts to wildlife including sage grouse and addresses impacts from livestock grazing.

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88	Wild Earth Guardians	3	3-67			We are concerned about the potentially significant impacts of the project to sagebrush obligate passerines and other birds, particularly sage sparrow, Brewer's sparrow, mountain plover, and sage thrasher, which are BLM Sensitive Species and may occur in the project area. DEIS at 3-67. Ingelfinger (2001, *and see* Ingelfinger and Anderson 2004, Attachment 9) conducted a study of sagebrush birds in a western Wyoming gas field and found a significant decline in nesting songbirds within 100m of roads, and also found that as gravel roads increased, densities of sagebrush obligate birds, Brewer's sparrows, and sage sparrows declined, while horned larks (a grassland species) increased. According to his findings, "roads associated with natural gas development negatively impact sagebrush obligate passerines. Impacts are greatest along access roads where traffic volume is high" (p. 69), but "bird densities are reduced along roadways regardless of traffic volume" (p.71). Gilbert and Chalfoun (2011) documented significant declines in sage sparrow and Brewer's sparrow populations with increasing industrialization of their habitats due to oil and gas development. We are concerned that the levels of habitat destruction and fragmentation, project-related disturbance and displacement of birds from otherwise suitable habitats surrounding the project site, and exposure of birds to contaminated grit or caustic chemicals from the heap-leach process or other mining operations potentially constitute unnecessary or undue degradation to these BLM Sensitive Species and their habitats. The screening or capping of open pipes to prevent small birds from being trapped and killed would be necessary under any action alternative that might be adopted.	The BLM believes that the DEIS adequately discloses the impacts to sage obligate birds would be similar impacts to sage grouse. No change was made to the text.
89	Wild Earth Guardians					Using the existing uranium processing mill (Sweetwater Mill) is more environmentally responsible than using heap-leach methods, which open up a whole can of worms of additional opportunities for radioactive contamination of soils, surface waters, and groundwater. However, the existing proposal is to have heavy truck hauling of ore directly south from the Sheep Mountain project area to the Sweetwater Uranium Mill via the Crooks Gap – Wamsutter Road, which traverses 23 miles of sage grouse Core Area established by the State of Wyoming and targeted for elevated protections in the BLM's sage grouse RMP amendment that applies to this area, which also has been recommended for even higher 'stronghold' protections by the Service, and which takes the heavy truck traffic within 2 miles of numerous active sage grouse leks. This will result in significant negative impacts to sage grouse populations breeding at these leks and using nesting habitat within 5.3 miles of active leks. This results in unnecessary and undue degradation to sage grouse habitat and populations due to traffic noise, dust, and disturbance and displacement from vehicle activity. If the project is approved (which we do not recommend) and ore is trucked to the Sweetwater Mill, it should be trucked north to Jeffrey City and then east and south by federal highway, then west on the paved and gravel access roads built (and upgraded) specifically for the Sweetwater Uranium Mill, to avoid traversing the 23 miles of important sage grouse habitats in close proximity to leks that lie south of the project area. BLM needs to evaluate this alternative in detail to meet its NEPA range of alternatives requirements.	Comment Noted.
90	Wyoming Outdoor Council					The BLM Mitigation Alternative should be adopted as the preferred alternative in the final environmental impact statement (FEIS) and should be implemented pursuant to the Record of Decision (ROD) for this project.	Thank you for your comment.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
91	Wyoming Outdoor Council		2-6 4-12			First, two distinct alternatives are identified for processing the uranium ore into yellowcake: on-site heap leach and off-site conventional milling at the inactive Sweetwater Mill. DEIS at 2-6. However, the DEIS does not compare the direct impacts of these distinct processing methods in separate NEPA alternatives, deferring instead to the Nuclear Regulatory Commission ("NRC") analysis at some later date. DEIS 4-12. Such deferral to other agencies is not allowed by NEPA where 40 CFR 1502.14(c) specifically requires inclusion of reasonable alternatives not within the jurisdiction of the lead agency.	The BLM does not agree that these two milling processes require separate alternatives, but the BLM does agree that a comparative analysis between the two options be made; thus, the inclusion of the two processing options under the Proposed Action Alternative. The BLM does not have jurisdiction over uranium milling activities beyond surface management of public lands nor the authority to determine which processing option Energy Fuels should implement as long as the 43 CFR Subpart 3809 requirements are adhered to. Information about the milling process (whether on-site or at the Sweetwater Mill) is provided as context for surface management over which the BLM does have jurisdiction; however, only portions of each of the two processing facilities occur on public lands. Regardless, the BLM has analyzed these options under the Proposed Action Alternative for the purposes of disclosing the difference in potential impacts between the two options because processing is a connected action to the mining operations. For these reasons, the BLM believes that the decision of how to process ore is Energy Fuels' decision.
92	Wyoming Outdoor Council		6-1			Moreover, the failure to invite and include the NRC and other cooperating agencies in this NEPA process violates NEPA. *Colo. Envtl. Coalition v. Office of Legacy Mgmt.*, 819 F.Supp.2d1193, 1215-16 (D. Colo. 2011)(showing that a draft for comment fails to satisfy lead agency duties). Here, cooperating agencies were identified and numerous federal and state agencies "requested to participate as cooperators or consulting agencies and will receive a copy of the document." DEIS at 6-1. The FEIS would be legally infirm if BLM - the lead agency - completes the NEPA process without the involvement of the other federal agencies that wield federal authority and control over the project, including the NRC. Whether the lead agency fails to invite agencies or the "other Federal agency" refuses to participate as a cooperating agency, the absence of cooperating agencies violates the "one EIS" requirement and serves to unlawfully segment the NEPA analysis. 40 CFR 1501.6, 1508.5.	The NRC was invited to be a cooperating agency. There is no requirement that the NRC participate as a cooperating agency. The BLM disagrees that the cited references require that there be only one NEPA analysis for two separate permitting processes: the BLM Surface Management requirements, and the NRC's permitting requirements for the milling process. It is worth noting that the NRC has participated as a reviewer on the BLM's DEIS, and the DEIS has been completed to analyze and disclose impacts for the entire project including both the mining and milling even though the BLM does not have jurisdiction beyond surface management of the milling options.
93	Wyoming Outdoor Council					Further, by conflating these technologies into a single alternative, the direct impacts and comparative effectiveness of mitigation measures of each technology are not subjected to the NEPA "hard look" requirement. The requirement that agencies consider alternatives to the action under review is "the heart of the environmental impact statement." *Fuel Safe Washington v. Fed. Energy Regulatory Commission,* 389 F3d 1313, 1323 (10th Cir.2004)(quoting 40 CFR 1502.14). By failing to compare on-site heap leach and off-site conventional milling with the BLM Mitigation and the no action alternative, the FEIS does not [r]rigorously explore and objectively evaluate all reasonable alternatives." 40 CFR 1502.14(a). Whereas heap leach processing would be carried out using massive quantities of toxic liquids in a 40-acre open air raffinate pond, conventional processing would take place largely in an enclosed industrial facility. The differences between these processing options are stark, and must be presented as separate alternatives to meet NEPA mandates. Also, no distinction is made between the perpetual storage and care of the tailings created by these two processes. This fundamental deficiency of not presenting the processing alternatives for comment as separate DEIS alternatives can be repaired by presenting a new DEIS for public comment that includes the necessary alternatives, mitigation measures, and corresponding alternatives analysis that forms "the heart of the NEPA process." *Id.*	The BLM does not agree that the different approaches to milling require separate analyses. The adequacy of NEPA analysis is not dependent on whether alternatives are separately presented but whether reasonable alternatives are analyzed. The DEIS meets this requirement for a hard look.

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94	Wyoming Outdoor Council					Second, the Lander Resource Management Plan (RMP) ROD makes a number of provisions for environmental protection that do not seem to be incorporated into the current BLM Mitigation Alternative. These provisions should be explicitly incorporated into the BLM Mitigation Alternative and adopted in the preferred alternative. Environmental protection measures specified in the Lander RMP ROD that are not currently explicitly reflected in the BLM Mitigation Alternative include: (see below).	The BLM has completed a detailed analysis comparing the measures described below to the Alternatives and added Measures that apply to the BLM Mitigation Alternative in the DEIS. All RMP resource protections are part of all alternatives whether or not explicitly stated as mitigation or design features. Further., the BLM's responsibility in dealing with surface management of mining operations is described in the 43 CFR 3809 regulations and describes the requirements to prevent unnecessary and undue degradation. Compliance with the RMP does not determine whether unnecessary or undue degradation is prevented, but compliance with the 3809 regulations determines such.
95	Wyoming Outdoor Council					**Soil Reclamation** - Decision No. 1017 - "Require that surface-disturbing activities minimize the surface disturbance footprint to the maximum extent possible to limit the areas requiring reclamation."	See Response to Comment 94
96	Wyoming Outdoor Council					**Soil Reclamation** - Decision No. 1024 - "Utilize management practices, including phased development and BMPs, to achieve reclamation success."	See Response to Comment 94
97	Wyoming Outdoor Council					**Water** - Decision No. 1027 - "Require the use of BMPs and mitigation applied as Conditions of Approval to reduce point and nonpoint source pollution and to prevent groundwater contamination."	See Response to Comment 94
98	Wyoming Outdoor Council					**Water** - Decision No. 1034 - "Avoid the authorization of activities likely to cause accelerated channel erosion and adverse adjustments in channel geometry (dimension, pattern, or profile)."	See Response to Comment 94
99	Wyoming Outdoor Council					**Water** - Decision No. 1035 - "Take actions to improve the biological, chemical, and geomorphic conditions of streams and riparian-wetland areas adversely impacted by BLM-authorized activities or by activities upstream of BLM-administered lands."	See Response to Comment 94
100	Wyoming Outdoor Council					**Water** - Decision No. 1042 - "Require measures to limit degradation of water quality, such as avoiding disturbance of soils with high erosion potential, implementing zero-runoff programs on large-scale surface disturbing activities, and requiring full bonding for site reclamation, and reclaiming abandoned surface disturbances."	See Response to Comment 94
101	Wyoming Outdoor Council					**Minerals** - Decision No. 2002 - "Incorporate proponent committed or BLM Required Design Features or mitigation such as BMPs as Conditions of Approval for any authorized mineral activity for federal minerals, regardless of surface ownership."	See Response to Comment 94
102	Wyoming Outdoor Council					**Minerals** - Decision No. 2003 - "In project level EISs and EAs, require, on a case-by-case basis, the development of a wildlife resource monitoring and mitigation plan to address potential impacts from minerals development on wildlife populations and/or habitat.	See Response to Comment 94
103	Wyoming Outdoor Council					**Grassland and Shrubland Communities** - Decision No. 4015 - "Identify unique plant communities and manage to protect, preserve, or enhance the communities."	See Response to Comment 94
104	Wyoming Outdoor Council					**Invasive Species** - Decision No. 4020 - "Manage weed treatments to maintain and improve greater sage-grouse habitat. Apply Required Design Features and BMPs as Conditions of Approval, such as those in Appendix E."	See Response to Comment 94
105	Wyoming Outdoor Council					**Invasive Species** - Decision No. 4023 - "Require that equipment and vehicles used for BLM-authorized activities be cleaned for seeds of noxious weeds and invasive nonnative species before moving onto BLM-administered lands."	See Response to Comment 94

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106	Wyoming Outdoor Council					**Invasive Species** - Decision No. 4025 - "If the Authorized Officer determines that BLM-authorized activities are contributing to the spread of noxious or invasive species, adjust the terms of the authorized activity to aid in the control of the species."	See Response to Comment 94
107	Wyoming Outdoor Council					**Fish and Wildlife** - Decision No. 4033 - "Choose and implement appropriate mitigation and BMPs/Required Design Features to minimize decreases in habitat function. Mitigate impacts as near to the impact… as soon as possible. Offsite mitigation can be considered."	See Response to Comment 94
108	Wyoming Outdoor Council					**Fish and Wildlife** - Decision No. 4034 - "Minimize adverse impacts to fish and wildlife during the life of projects through project placement and maintenance of connectivity between large contiguous blocks of undisturbed habitat…"	See Response to Comment 94
109	Wyoming Outdoor Council					**Fish and Wildlife** - Decision No. 4036 - "Remove or modify identified wildlife hazard fences that are adversely affecting wildlife where opportunities exist."	See Response to Comment 94
110	Wyoming Outdoor Council					**Fish and Wildlife** - Decision 4041 - "All greater sage-grouse core areas "are priorities for management of fish and wildlife and their habitat." While the Sheep Mountain Project Area may lie just outside of core areas it is clear the area is an important use area for sage-grouse and likely other sagebrush obligate species, so priority should be given to their management.	See Response to Comment 94
111	Wyoming Outdoor Council					**Fish and Wildlife** - Decision 4043 - "To protect wildlife and their habitats, reduce the footprint of surface-disturbing activities and facilities to the smallest size necessary to achieve the purpose for the disturbance without raising safety issues."	See Response to Comment 94
112	Wyoming Outdoor Council					**Fish and Wildlife** - Decision 4056 - Outside of DDAs, wildlife seasonal protections for surface disturbing and disruptive activities apply to maintenance and operations actions where the activity is determined to be detrimental to wildlife (see Appendix F).	See Response to Comment 94
113	Wyoming Outdoor Council					**Big Game** - Decision No. 4066 - "Manage BLM-authorized activities so that the forage requirements of all grazing/browsing animals are met."	See Response to Comment 94
114	Wyoming Outdoor Council					**Raptors** - Provision on page 62 of the Lander RMP ROD.	See Response to Comment 94
115	Wyoming Outdoor Council					**Special Status Species** - Decision No. 4076 - "Develop site-specific measures for BLM-authorized activities to protect… sensitive species. Reduce the footprint of development and facilities to the smallest practical to protect special status species and their habitat. Incorporate Required Design Features and BMPs such as those identified in Appendix E... as Conditions of Approval as appropriate for authorized activities to address adverse impacts to special status species."	See Response to Comment 94
116	Wyoming Outdoor Council					**Special Status Species** - Decision No. 4077 - "Require seasonal restrictions or other identified mitigation as needed to minimize impacts to migratory birds and their habitats protected by the Migratory Bird Treaty Act."	See Response to Comment 94
117	Wyoming Outdoor Council					**Special Status Species** - Decision No. 4098 - "Maintain sagebrush and understory diversity… in seasonal greater sage-grouse and other sagebrush obligate species habitats…" This provision applies to all seasonal habitats, not just core areas.	See Response to Comment 94

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118	Wyoming Outdoor Council					**Special Status Species** - Decision No. 4099 - "BLM is to use the recommendations specified in several listed publications, including its National Technical Team Report, to "minimize adverse impacts to greater sage-grouse from allowable uses" This provision also does not apply just in core areas.	See Response to Comment 94. .
119	Wyoming Outdoor Council					**Green Mtn. ERMA** - Decision No. 6088 - Extensive Recreation Management Areas are to be managed to "address local recreation issues and provide for wildlife dependent recreation activities (Map 39)."	See Response to Comment 94. The ERMA does not preclude industrial use and manages use to protect visitor safety (Decision 6130).
120	Wyoming Outdoor Council					**Green Mtn. ERMA** - As shown on Map 28 of the Lander RMP ROD, the Sheep Mountain Project Area is located on or very near to regional historic trails or intact early highway segments. These should be protected.	The project is near to the Rawlins to Ft. Washakie Road. The BLM evaluated impacts to the Trail from the Proposed Action and found no adverse impacts. Refer to other response on trails.
121	Wyoming Outdoor Council					Incorporating these additional provisions from the Lander RMP ROD into the BLM Mitigation Alternatives for each processing technology will help ensure that BLM meets its obligation to prevent unnecessary or undue degradation of the public lands. Under BLM's hardrock mining regulations, performance standards are required to be met so as to not cause unnecessary or undue degradation. These performance standards include complying with applicable BLM land use plans and taking mitigation actions "specified by BLM to protect public lands." 43 CFR 3809.420(a)(3) and (4). Additionally, minimizing impacts means reducing adverse impacts "to the lowest practical level" and "BLM may determine that it is practical to avoid or eliminate particular impacts." *Id. 3809.5*. Therefore, there is no doubt that BLM can require the additional measures we have identified as mitigation measures specified in the BLM Mitigation Alternative.	The BLM has completed a detailed analysis comparing the measures described above to the Alternatives and added Measures that are applicable to the BLM Mitigation Alternative in the FEIS. Compliance with the RMP does not determine whether unnecessary or undue degradation is prevented, but compliance with the 43 CFR 3809 regulations determines such.
122	Wyoming Outdoor Council					Third, of particular concern are the cumulative impacts of this project. This mine would not be built on a clean slate - on an untouched landscape. Uranium mining has occurred on this site in the past and has left a considerable legacy of unreclaimed lands. The Sheep Mountain Uranium Project would add to this unfortunate legacy. The project area is 3,611 acres and BLM anticipates there could be 929 acres of disturbance. Of this, 356.5 acres would be new disturbance and 572.5 acres would be previous disturbance. There are said to be 419.6 acres of currently disturbed land and 891.7 acres of previous disturbance has been reclaimed. As much as 189.9 acres is under no obligation to be reclaimed. Given these extensive previous impacts which have not been mitigated, the BLM should more fully consider the cumulative impacts of the Sheep Mountain Project and make plans to fully mitigate - specifically, to reclaim - this area. New, additional mining should not be permitted if previous disturbance remains unreclaimed, or is on some indefinite timeline for reclamation. As noted above, under both the Lander RMP and the BLM's hardrock mining regulations there is no doubt BLM can - and must - decline to approve new, additional disturbance while prior, severe environmental impacts remain unresolved.	Energy Fuels is under no obligation and the BLM has no authority to require that the existing disturbances that have no reclamation obligations be reclaimed. By authorizing the Plan of Operations, the BLM will require the proponent to reclaim any existing disturbance that will be further disturbed. At the conclusion of the Project, these areas will be reclaimed. However, Measures in the BLM Mitigation Alternative consider the option of having poorly reclaimed or unreclaimed sites reclaimed by the proponent to offset the amount of disturbance that might be taken out of public domain through transfer to the DOE or the State of Wyoming for long term care and maintenance.

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123	Wyoming Outdoor Council					Fourth, the plan for on-site heap leach recovery of uranium at the ore processing facility is not fully developed, disclosed, or analyzed in the Sheep Mountain DEIS. Heap leach recovery facilities would apparently cover 40 acres of the project area, including in addition to the heap leach pad treatment ponds, an extraction plant, and a processing and packaging plant. The potential for water pollution resulting from heap leach operations is high. Site stabilization and groundwater remediation of uranium mill tailings has cost the U.S. taxpayer billions of dollars over the past three decades. The BLM must ensure that this does not occur and that there is adequate mitigation in place to ensure there is no contamination of local waters, either surface or groundwater. An adequate bond must be established based on the known and ongoing expense of cleaning up other heap leach sites, such as the Durita heap leach project in Western Colorado. Although Hecla Mining Company's Durita project provides a real-world example of the difficulties in safely operating and remediating a heap leach project, the experiences at Durita are not mentioned in the Sheep Mountain DEIS.	The Uranium Mill Tailings Radiation Control Act of 1978 and subsequent efforts by the NRC, DOE, EPA, and state agencies to prevent legacy sites, because of the difficulties created by historic mining and milling practices, has resulted in a more stringent regulatory environment than when the earlier sites were active. Improvements in milling and monitoring technology have also occurred. For example, construction of an unlined tailings pond, which created many of the water contamination issues associated with uranium milling, is no longer an option. A history of heap leach projects which have occurred over time and around the world is outside the scope of this EIS. (For example, the Durita Project involved reworking of residuals, from previous milling efforts, which had been moved to the Durita site and processed in the mid-1990s.) However, the BLM's analysis assumes that all applicable regulations are adhered to and permits obtained, which includes the assumption that the proponent will not abandon the project with an inadequate bond. WDEQ-LQD, BLM, and NRC require and review reclamation bonds annually or as required per regulation for the mining and milling activities, and the DOE (or State of Wyoming) would require funds for the management of any areas requiring long-term maintenance and the proponent will be required to provide funds to allow the DOE(or State of Wyoming) to provide for such long term maintenance as described in Section 2.3.
124	Wyoming Outdoor Council					Last, the DEIS was not prepared by a disinterested third party. Edge Environmental, Inc. which was a preparer and reviewer of the DEIS, has been under contract to Energy Fuels, the project proponent, on a regular basis since at least 2009 to prepare environmental documents and testify on the company's behalf in various regulatory proceedings. In particular, Edge Environmental, Inc. is one of the contractors that helped design and license the Pinon Ridge facility near Paradox, Colorado. Energy Fuels asserted attorney/client privilege for Edge Environmental documents prepared for this project due to their close relationship. The Pinon Ridge license was twice remanded for failure to meet Colorado laws, and a pending order currently holds that license in abeyance while the matter is on remand to an Administrative Law Judge. *Sheep Mountain Alliance v. Colorado Dept. of Public Health and Env't.* 2013CV03239 (Denver District Court, Colorado) (Sept. 3, 2014 Remand Order). Energy Fuels remains a party to the ongoing litigation involving disputed testimony and work product of Edge Environmental. Given its non-disinterested status the BLM should ensure that Edge Environmental does not have an undue influence on this process and should ensure full disclosure of its interest and allegiances. See 40 CFR 1506.5(a) and (c) (outlining agency responsibilities when third parties are involved in the preparation of an EIS, including requiring disclosure of interests and requiring the lead agency to select contractors).	The BLM has complied with 40 CFR 1506.5. Edge operates under the supervision of the BLM which is solely responsible for information and analysis. Additionally, in August 2011, Edge Environmental, Inc. was selected by BLM and hired by Titan Uranium USA Inc. to prepare the EIS for the Sheep Mountain Uranium Project as a third-party contractor. As required, Edge completed the disclosure statement and provided it to the BLM. In Feb/Mar 2012, Titan merged with Energy Fuels Wyoming Inc. As an aside, Edge received the final payment for support work associated with the Energy Fuels Resources' Pinon Ridge Environmental Report in December 2010.
125	Wyoming OSLI					At this time, OSLI has no specific comment on the DEIS document. We appreciate this opportunity to comment and look forward to our continued participation in this process. If we may be of further assistance, please do not hesitate to contact this office.	Comment Noted.
126	Wyoming Game and Fish Department					**Terrestrial Considerations:** We provided comments in July of 2014. We have no additional terrestrial wildlife concerns at this time.	Comment Noted.
127	Wyoming Game and Fish Department					**Aquatic Considerations:** We have provided aquatic comments in previous letters. We have no additional aquatic concerns.	Comment Noted.

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128	INFORM					None of the three alternatives presented in the Draft Environmental Impact Statement appear to satisfy the National Environmental Policy Act's requirement to provide a robust analysis of the proposed action in order to facilitate improved decision-making. The BLM Mitigation Alternative could be significantly strengthened, the No Action alternative is flawed, and additional alternatives that should have carefully analyzed the impacts of various processing methods were not included. Considering the unlikelihood of timely development of mining activities at the project site, BLM should reopen scoping, develop additional alternatives for analysis and develop a new Draft EIS.	The BLM disagrees with INFORM's assertion that the DEIS does not satisfy the NEPA. The alternatives were developed within the BLM's decision making authority and are analyzed appropriately to satisfy the NEPA.
129	INFORM					A fundamental flaw both with the proposed Plan of Operations submitted by the proponent Energy Fuels Inc. and the DEIS prepared by BLM is the failure to definitively characterize how, where and when uranium ore extracted at the Sheep Mountain Project will be processed. The DEIS's two main alternatives, the Proposed Action and the BLM Mitigation Alternative, identify both on-site heap leach processing and off-site conventional processing as part of the project. Or perhaps it's one then the other. Or perhaps neither, depending on the whims of the market. Energy Fuels does not commit to making the significant and hugely important choice of a processing method for a very large uranium project and BLM does not require the proponent to make the necessary choice. Rather, the two main alternatives presented in the DEIS allow the proponent to choose at will in the future what processing method will be selected.	The BLM is under no obligation nor is statutorily required to require the proponent to choose a processing method at this juncture. The two methods of potential processing described as options in the Proposed Action are analyzed separately as the identified options by the proponent under the Proposed Action Alternative because the decision to implement one or the other is entirely Energy Fuels'. The FEIS has been reviewed and revised as appropriate to ensure that assumptions regarding the analysis of these two options are adequately described.
130	INFORM					Naturally, this prevents the serious and significant impacts of uranium processing from being fully disclosed to the public. The impacts from processing the Sheep Mountain ore on site would be drastically different from processing offsite, yet the two options are lumped together and considered to be roughly equivalent in the DEIS as though it's really no big deal which method is chosen. From one perspective, on-site processing would result in the permanent creation of a long-term storage facility for the burial of radioactive byproduct material and other toxic wastes at the Sheep Mountain site at a repository that will be perpetually monitored by the government; off-site processing means that dumping will occur somewhere else. The difference between the two in terms of permanent, site-specific impacts could hardly be more stark, yet the DEIS casually describes the impacts of processing the Sheep Mountain ore under either scenario to be roughly the same. This conclusion is not supported by the robust, hard look at the processing question that NEPA requires, with a detailed disclosure of the differences between impacts and how they would occur with the two methods. The ambiguity of which processing method will be implemented must be eliminated from this analysis and BLM shouldn’t proceed with further NEPA analysis until the proponent decides what it wants to propose.	The BLM agrees that the two processing methods are entirely different and require separate analysis of impacts, thus the creation of two separate options under the Proposed Action Alternative, but are also options that could occur at the same time so they are analyzed as such, using the best available information, in Chapter 4. The use of a heap leach and long term care and maintenance by the DOE (or the State of Wyoming) are described in the FEIS. The impacts of utilizing an off-site processing facility, such as the Sweetwater Mill, are also described because it is not within BLM's regulatory authority to require the proponent to choose one processing option over another. However, the differences between these two options and the analysis presented in the FEIS have been revised to ensure the analysis is clear.

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131	INFORM					In developing alternatives, it is not BLM's obligation to determine what processing method is economical nor is it appropriate to make decisions about environmental impacts based on economic assumptions. Uranium processing is a dirty business; when undertaken on public lands, BLM is obligated to analyze all the possible alternatives for processing, regardless of economics, in order to determine which method and location are the most protective of the environment, public health and wildlife with the goal of preventing the unnecessary and undue degradation of public lands. It is impossible from the DEIS -- with its lack of information and specificity on the processing question -- to determine which path is best in moving forward. In revising the DEIS in order to fully analyze the impacts of processing, BLM should develop additional alternatives that address the question of multiple processing options. This could include an alternative for on-site processing with mitigations, an alternative for off-site processing with mitigations, and an alternative for phased or sequential processing for both types. Although the proponent has rejected the development of an on-site conventional processing mill as too costly, that does not preclude the analysis of such a facility in an alternative in order to inform the comparison of impacts between multiple processing options. The specific impacts of all reasonable alternatives -- regardless of whether they will be implemented -- must be disclosed in order to provide a valid means of comparison and enable good decision-making, but the DEIS has failed to do so.	The NEPA does not require that the BLM analyze all of the possible alternatives for processing, but that the BLM rigorously explore and objectively evaluate all reasonable alternatives. Therefore, reasonable alternatives were determined to be those with the potential to be implemented by the proponent that are not speculative which includes on-site heap leach processing and off-site conventional processing with the Sweetwater Mill as the most appropriate location. The Proponent has clarified this approach. The FEIS has been reviewed and revised appropriately to ensure this is clear.
132	INFORM					Heap-leach processing is an outdated technology that has outlived its usefulness, particularly in the production of uranium, and has not been utilized domestically for processing this mineral for several decades. Throughout the history of uranium mining in the United States, heap-leach processing has never been deployed responsibly without causing contamination. Regulations for heap-leach processing have not been seriously analyzed since the NRC's Final Generic Environmental Impact Statement (GEIS) on Uranium Milling in 1980. NRC is currently reviewing its guidance for the procedural review of heap leach facilities, but the process is not complete. The Environmental Protection Agency is currently involved in a multi-year rulemaking of its NESHAPS Subpart W regulations. The proposed rule does not establish new standards for heap leach facilities to monitor radon emissions. Because the framework for regulating heap-leach processing and conventional uranium mining is so outdated, the public can have little confidence that its interests will be protected if projects are approved without taking the time to substantially update and approve the relevant standards. In the face of outdated regulations and the lack of a modern EIS that could satisfy NEPA's tiering requirements, there is no question that a full EIS with a very broad scope is needed for this particular project.	The proponent has identified heap leaching as a viable processing option for which the BLM has analyzed in the FEIS to ensure unnecessary and undue degradation will not occur to public lands. This analysis is based off the best available information. The BLM does not agree that heap leaching is an outdated and poorly regulated processing option for uranium. Approval of the Heap Leach and processing facility would be required by the Nuclear Regulatory Commission. The NRC's Draft Standard Review Plan for Conventional Uranium Mill and Heap Leach Facilities (NUREG-2126) is currently in the public review/comment process. NRC's guidance for addressing NEPA requirements for the licensing of uranium recovery operations (NUREG-1748) was updated in 2003.

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133	INFORM					Heap leach processing at the Sheep Mountain Project poses significant risks for future groundwater contamination that have not been adequately reviewed in the DEIS. Where Energy Fuels initially proposed a double liner system for this project and eventually revised it to include a triple liner system, the long-term integrity and viability of such systems still remains unproven. The project will include a significant number of impoundments and stormwater management structures over a large acreage, but the DEIS fails to include a definitive groundwater analysis that delineates how the contamination of ground waters will be prevented should leaks, spills or other failures occur. There is also a lack of evidence and analysis to support the DEIS's conclusion that discharges into Crook Creek will not result in the contamination of connected ground and surface waters. BLM should carefully consider the likelihood that the Sheep Mountain Project will stand idle for extended periods due to economic conditions, increasing the likelihood that contamination events and the release of radionuclides or heavy metals will occur due to reduced oversight at the mine. BLM should conduct a detailed hydrological analysis that determines the relationship between surface and ground water flows at the site in order to determine how to reduce impacts and develop the best mitigation methods. Especially in this context and due to the high degree of concern for scarce water supplies, a "hard look" at this issue in the DEIS is required under NEPA.	As discussed in Section 2.3.3.7 of the EIS, the NRC has the primary responsibility to authorize the On-Site Ore Processing Facility due to the presence of 11(e)(2) byproduct material, and the NRC licensing process would require separate and additional environmental review under NEPA. The presumption that groundwater contamination would occur should a spill, leak, or other failure occur omits the measures that would be required by the NRC to reduce the potential for, and mitigate the impact of, leaks, spills, or other failures, and omits the response measures that would be required by the NRC in the event of a leak, spill, or other failure. Groundwater monitoring would be an integral part of the NRC monitoring requirements for the On-Site Ore Processing Facility. As noted in the Response to Comment 72, the exchange of surface water and groundwater was considered in the development of the FEIS, and the potential impacts of the Project on surface and groundwater were considered minimal based on the site history, current conditions, and the proposed work. To help ensure this evaluation is confirmed, continued surface and groundwater monitoring are part of the Project. Interim mine stabilization is only allowed under specific circumstances (Section 2.3.5.10 of the FEIS) and will be implemented during periods of non-operation to ensure unnecessary or undue degradation does not occur. WDEQ-LQD requires public notice if an operator requests interim mine stabilization (LQD NonCoal Rules, Chapter 3, §3(k)(ii)(E)(I)). It is speculative for BLM to assume that these periods of non-operation would increase the likelihood of contamination because the interim management plan would fail as suggested.
134	INFORM					The Sweetwater Mill has not processed ore since the early 1980s, has been on standby status for the past 20 years, and has just recently initiated a license renewal process with the Nuclear Regulatory Commission. It is unlikely that it can simply turn itself back on. The DEIS has not considered the full implications of what a reopening of the Sweetwater Mill would mean, not only to site-specific impacts related to the Sheep Mountain Project, but to the cumulative impacts of uranium production in the broader region. Reopening the Sweetwater Mill to process Sheep Mountain ore would likely anticipate the need to process additional ore streams from other mines or alternate-waste feeds in order to make processing economically feasible. The DEIS fails to analyze the socioeconomic and environmental impacts of this on a regional scale.	The EIS has been reviewed in detail and revised as appropriate to ensure that the impacts of utilizing the Sweetwater Mill are adequately disclosed; however, the BLM cannot speculate all unanticipated impacts as a result of re-opening the mill and can only disclose impacts using the best available information which includes the assumption that all applicable rules and regulations are adhered to. This would include updating necessary licenses with the NRC which may or may not require additional NEPA analysis. Additionally, the BLM has no evidence to speculate that reopening the mill would encourage other similar operations to spring-up in the nearby area. The BLM feels that the socioeconomic impact analysis in the FEIS adequately describes the impacts as a result of processing at the mill.
135	INFORM					In August 2013 Energy Fuels Inc. acquired the Lower Gas Hills Project in Fremont County, Wyoming, for which BLM is conducting a NEPA analysis as well. Following this acquisition, Energy Fuels publicly announced that it was considering the development of a joint processing facility that would serve both the Sheep Mountain and Lower Gas Hills projects in an off-site location and informed NRC of the change in its planning. A joint processing facility is a reasonable alternative for the development of these projects. The possibility of this scenario occurring in the future should have been analyzed in the DEIS.	The Lower Gas Hills Project has been withdrawn by Energy Fuels, and no development at this location is currently proposed. Further, Energy Fuels has clarified with the BLM that the processing options described in the FEIS are consistent with their plans, and any other options such as joint processing from the Lower Gas Hills Project are speculative. Therefore, this scenario was not considered in this EIS.
136	INFORM					In February 2014, Energy Fuels informed the NRC that it intended to delay submittal of a license application for the Sheep Mountain Project indefinitely because it was evaluating other processing options. Thus, the NRC license application and its concurrent environmental and safety analyses are not proceeding. This presents troubles for the BLM's DEIS, which inappropriately defers to the NRC analysis to address significant areas of the proposal and fails to compare the direct impacts of both these processing options, as required by NEPA. BLM cannot simply shrug off this responsibility, particularly since the NRC may never actually complete the analysis if the proponent does not reinitiate it. Consultations with other agencies, such as NRC or the U.S. Fish & Wildlife Service, must be complete in order to fully analyze and disclose the impacts of the proposed action.	The FEIS has been revised to ensure that it is clear that the intent of the document is not to defer environmental analysis to the NRC regarding the processing facilities, but that the BLM must assume that Energy Fuels will obtain approval from the NRC prior to beginning operations because they cannot construct the processing facility without NRC approval. Thus, the analysis is not deferred, but it is based off of the best available information. The BLM disagrees that Energy Fuels has to complete all consultations with applicable agencies for BLM to analyze the Proposed Action. The analysis assumes all applicable consultations and permits will be obtained.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
137	INFORM					After closure, the on-site processing facility will be reclaimed and turned over to the Department of Energy or the State of Wyoming for permanent management and oversight. Part of the permanent closure area is BLM surface land, which will be withdrawn from public ownership. This is an inappropriate use of public lands. BLM cannot approve operations on public lands that cause their “undue or unnecessary degradation”. By definition, creating a radioactive impoundment that must be perpetually monitored is an act of debilitation that permanently degrades the public’s asset. In the DEIS, BLM should consider altering the location of the on-site processing facility; since it is already partly located on the disturbed McIntosh Pit and partly on private lands, it may be feasible to move the footprint southward so that it is located entirely on private acreage. Certainly, where the opportunity to locate the facility entirely on private lands exists, a request from a private corporation to dispose of public lands in such a fashion should not be entertained at all. If a thorough analysis determines that the facility cannot be located entirely on private lands and a withdrawal of BLM surface lands cannot be avoided, at minimum the proponent should be required to offset the loss of this acreage by acquiring lands elsewhere, suitable for wildlife habitat, that can be donated back to the public.	The BLM does not agree that transfer of a processing facility to the DOE (or the State of Wyoming) for long term care and maintenance constitutes unnecessary or undue degradation as suggested. Additionally, the BLM does not agree that the BLM can require an operator to move operations off public lands to private lands. A description of other possible locations for the facility is provided in the alternatives considered but eliminated from detailed analysis (Section 2.6). Further, the BLM has considered in the BLM Mitigation Alternative the possibility of requiring reclamation of areas previously disturbed within the Permit Area to offset the area to be transferred to the DOE (or the State of Wyoming).
138	INFORM					The stormwater management controls appear to be subject to a number of different standards, none of which appear suitable to fully protect contaminated waters from flowing offsite during major storm events. BLM is required to consider the impacts of climate change in the DEIS, including the potential change in intensity of storm events. As discussed in Chapter 2, BLM is allowing the minimal standard required by the State of Wyoming to engineer the stormwater sediment ponds around the pit mine areas to withstand a 10-year flood event. For a project that will last many decades longer than just the first, this standard is obviously inadequate to protect the environment. Likewise, it makes little sense for BLM to implement a 100-year storm event standard on other collection ponds. In the light of changing climate conditions, it is unlikely that this standard is sufficient to protect the environment over the long term. BLM must fully analyze and disclose the potential for these impacts in the next draft of the EIS. Engineering standards for stormwater management structures should be overzealous in their effort to prevent offsite releases of contaminated waters and their actual capacity should be disclosed.	See Response to Comment 39 with respect to the design of surface water control features and with respect to climate change.
139	INFORM					Weekly inspections during operating and intermittent periods should be required. Monthly inspections during temporary shutdown periods are not frequent enough to prevent the excessive release of contaminants if spills or leaks go undetected.	Energy Fuels will monitor in accordance with their monitoring plans, and BLM and WDEQ will review completed monitoring to ensure unnecessary or undue degradation is prevented.
140	INFORM					Solid waste materials generated in the sediment, raffinate, holding and evaporative ponds should have a specific management plan for disposal if they cannot be reprocessed at the on-site facility. The DEIS does not identify how or where all of the various evaporates and sludges generated onsite would be disposed.	Waste considered 11e2 byproduct material would be disposed of in the heap pad as described in Section 2.3.5.5 of the FEIS.
141	INFORM					Geochemical testing of waste rock should be required in order to determine whether it can be safely used in combination with cement and fly ash for backfilling the underground workings of the mine. A hydrological study should be required and its recommendations implemented in order to prevent the leaching of mineralized waste rock into groundwater supplies from backfilling the pits or underground workings.	Section 2.3.4.3 of the FEIS has been corrected to remove the reference to use of fly ash as part of the stabilization material. Per WDEQ-LQD Permit to Mine 381C, as approved by WDEQ-LQD in July 2015, fly ash will not be used as part of the stabilization material. The historic mining activities at the site, including pit backfilling and cycles of mine dewatering and recovery, have provided information on the response of the groundwater system to the activities similar to the proposed project. Groundwater quality has generally remained stable.

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142	INFORM					Regular water quality testing of the mine pool should be undertaken before the water is recycled for dust suppression or other land applications on the surface. Water that does not meet agricultural standards at a minimum should not be used for dust control on roads, underutilized or undisturbed sections of the project area, or on spots that are adjacent to wildlife habitat or grazing allotments.	See Response to Comment 20 with respect to the water that would be used for dust control.
143	INFORM					Reclamation standards should require surface radiation levels to be returned to the established pre-mining baseline. For areas that are to be used post-mining specifically for recreation, such as trails and hunting stations, surface radiation should be returned to background in order to achieve the highest possible protection for members of the public that will use the areas in the future. Care should be taken to examine the condition of access roads in and out of the project area post-closure to ensure that any residual radioactivity present in roadways is fully mitigated to background radiation levels. A standard for radiological contamination at the site should be established to initiate cleanup action when standards are exceeded.	The Proponent's reclamation plan requires radioactive materials be handled and segregated separately so as to minimize potential hazards. This would similarly be true for roadways during reclamation; however, setting standards establishing background, pre-mine standards would be unattainable considering the previous mining activities that have occurred on site.
144	INFORM					A specific management plan for the ore pad and ore stockpile areas should be developed and implemented. The DEIS does not address the impacts of the long-term storage of ore onsite during periods of closure and inactivity. The analysis should include the impacts of radon releases and fugitive dust emissions from ore piles that remain on site for extended periods of time because processing has ceased.	The MILDOS Model completed for the Project included analysis of large amounts of ore stored at the ore pad for extended periods of time as suggested. The FEIS has been reviewed and revised as appropriate to ensure this information is described adequately. Further, the interim management plan filed for the Project includes a requirement that mining of ore cease and exposed ore be transferred to the processing facility during periods of non-operation.
145	INFORM					Locate facilities in order to reduce their impacts to wildlife habitat and migration	A discussion on alternate facility locations is provided in the Alternatives Considered but Eliminated from detailed analysis Section of the FEIS.
146	INFORM					The impact to birds from the Sheep Mountain Project is of particular concern, both to the federally threatened greater sage-grouse and to other resident and migratory species that use the area. Special mitigation measures to protect raptors and other species protected under the Migratory Bird Treaty Act should be identified. Seasonal closures should be required when mining activities cause disturbances to nesting or breeding species. The presence of multiple processing ponds at the project poses particular risks to birds that are attracted to water. Vegetation around ponds and catch basins should be carefully controlled in order to deter nesting species. Wherever the size of the pond permits, netting should be used to prevent birds from accessing the water; this method is far preferable to the use of lights or sounds, which can create even greater impacts. In addition, considering that much of the adjacent area and parts of the permitted area are historically disturbed sites in various states of reclamation, BLM should take into consideration the construction of a new freshwater pond and wetlands area as part of a reclamation project. By attracting wildlife to a nearby decoy pond suitable for their use, the impacts to birds and other wildlife could be significantly reduced at the mine's contaminated watering holes.	The commenter is mistaken that the greater sage-grouse is a federally threatened species (Threatened or Endangered Species under the Endangered Species Act). Greater sage-grouse is a candidate species. The BLM Mitigation Alternative as well as Energy Fuels' Plan of Operations includes measures to protect birds from ponds and during sensitive time frames. It should be noted that due to the size of some of the ponds, netting is not a viable option.

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147	INFORM					Because sage-grouse are of special concern in Wyoming and elsewhere, the proponent should be required to enhance the sage cover during the reclamation phase of the project and improve habitat for this particular species. During operations, additional measures can be taken to protect the grouse. Buffer zones as wide as possible should be created in the project area to protect lekking sites, of which the DEIS documents at lease 13 in current use. Recent research has shown that the presence of evaporative ponds at industrial sites is a strong attractant to the sage grouse and contributes to a decrease in nest survival rates.5 Because evaporative ponds have been identified as the primary method to dispose of waste water at the Sheep Mountain Project, the greater impact to sage-grouse in particular should be taken into consideration. Instead of relying on evaporative ponds, all waste water to be disposed of at the Sheep Mountain Project should instead be diverted to a water treatment facility before discharge.	Seed mixes will be required to be BLM approved and will include sage brush species. The nearest greater sage-grouse lek is over 2 miles away. Impacts to greater sage-grouse and potential mitigation measures have been adequately disclosed and the FEIS reviewed and revised accordingly. The Project will indeed include discharge of excess water which will need to be treated as described in Section 2.3.11..
148	INFORM					Finally, the Mitigation Alternative, if it is to be developed as the preferred alternative in the next draft of the EIS, should be specific in identifying a chosen method of processing and developing a management plan that is the most protective of the environment possible.	Thank you for the support of the BLM Mitigation Alternative. See previous comment responses on processing options.
150	INFORM					BLM has failed to develop a reasonable No Action Alternative for this proposal but instead has created an alternative that would more accurately be called the “Permanent Closure Alternative.” This is, in fact, a reasonable alternative to include in the DEIS in order to provide a comparison point between alternatives for their impacts, but it doesn’t meet the mandate to develop and analyze a real no-action alternative. Whether or not BLM has authority to deny this proposal under the 1872 Mining Law does not allow the agency to sidestep its obligation to review a no action alternative. Even if the current proposed action were to be denied, it does not preclude the proponent from submitting and gaining approval of another proposal for the site down the road, allowing conditions to remain at the site as they are indefinitely. In this case, that means the continuing and long-term disturbance of lands, contaminated pit waters, degraded wildlife habitat, and other environmental impacts that remain unaddressed at the Sheep Mountain Project site. These impacts currently exist and are very likely to keep existing into the foreseeable future without being addressed.	The No Action alternative is described in the FEIS and is analyzed similarly to the other alternatives. The BLM has not sidestepped it's obligation to complete a No Action alternative, but has clearly disclosed that the No Action is for purposes of analysis only. The BLM has no obligation to speculate under the No Action Alternative that another proposal could be submitted if the Plan of Operations was denied, or to require that the proponent complete reclamation of sites within the permit area for which they have no reclamation responsibilities.
151	INFORM					Instead of analyzing the actual conditions of the site and what will happen if no new activities are authorized there, BLM has instead developed a No Action Alternative in the DEIS to include the hypothetical closure and full reclamation of the site under the existing permit requirements. This is not the same as “no action” and, in fact, proposes quite a number of smaller actions that could occur at the site in the future in the unlikely event that the proponent decides to fully reclaim and close the property. Again, this scenario for full reclamation is a reasonable alternative to include in the DEIS for the purposes of better understanding and comparing impacts, but it isn’t the No Action Alternative that NEPA requires.	The BLM disagrees that the No Action constitutes something beyond disapproving the Plan of Operations and requiring reclamation of features required to be reclaimed under the WDEQ-LQD Mine Permit. Some reclamation would indeed be required under the No Action Alternative, as required by the WDEQ-LQD Mine Permit and the FEIS analyzes the impacts of this scenario. The DEIS includes a measure in the BLM Mitigation Alternative that considers reclamation of areas within the Project to offset the amount of public land proposed for removal from the public domain through the long term care and maintenance of the onsite processing facility. However, the BLM does not have the authority to require that all lands within the Project Area for which there are no reclamation responsibilities be reclaimed by Energy Fuels. For these reasons an alternative that considers the complete reclamation of all disturbances on site is not reasonable.

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152	INFORM					We also take issue with the assumption in the development of the No Action Alternative that BLM has no ability to deny a mining proposal because of the proponent□s valid existing rights. We disagree with this assumption. Building this assumption into the analysis lends a certain inevitability that conclusions will be drawn and decisions made in advance that are inappropriate and do not serve the public. What BLM is obligated to do is to require that any proposal for this area meet the standards of the law, whether dated to 1872 or not, and to make the best decision possible over use of the land in partnership with the public. If an action on public lands is proposed that causes the undue or unnecessary degradation of public lands then BLM is actually obligated to deny it, regardless of valid existing rights. Only a proposal that balances the proponent's rights with the public interest and sensible and protective management of public resources is one that BLM may approve. In the case of the Sheep Mountain Project, that proposal hasn't come forth yet and hasn't been analyzed in the DEIS.	Mining activities conducted under the 1872 Mining Law (as amended) are non-discretionary actions. The BLM cannot deny a proponent the statutory right to develop mining claims when a discovery has been proven. The commenter is correct, however, in stating that the BLM's decision making authority is limited to ensuring that undue or unnecessary degradation does not occur. The criteria that must be met to prevent undue or unnecessary degradation is described in the 43 CFR 3809 regulations, which includes the requirement that the proponent obtain all necessary permits and authorizations, but does not require that the proponent's rights be balanced with public interest and protective management of public resources.
153	INFORM					Overall, we find the DEIS to be inadequate in its analysis and disclosure of the impacts as well as in the scope of alternatives presented. The lack of a definitive course for processing in the document is particularly troubling. None of the alternatives in the DEIS are satisfactory. The proposed action would create significant impacts to public lands and is not beneficial to the public in its current form. BLM should reinitiate scoping on this project, redevelop the alternatives, finish the required "hard look" analysis and release another draft of this EIS for public review.	The FEIS has been reviewed and revised as appropriate to ensure that all potential impacts are disclosed using the best available information. However, the BLM disagrees that the alternatives and impacts analysis warrant additional scoping and re-issuance of a Draft EIS at this time.
General - 1	Energy Fuels					**Plan of Operations.** As the BLM is aware, Energy Fuels currently holds Permit to Mine No. 381C with the Wyoming Department of Environmental Quality (WDEQ) Land Quality Division (LQD), and a Major Revision to the Permit ("Permit Revision") was issued to LQD in January 2014. This document is referenced in several locations within the DEIS as an update to the Plan of Operations (e.g., Section 1.1 [Project Location and Background]). However, LQD issued comments on the Permit Revision in April 2014, for which Energy Fuels has responded. In late November 2014, LQD issued additional comments on the Permit Revision, for which our response is nearing completion. Through the process of addressing LQD's comments on the Permit Revision, the "Proposed Action Alternative" continues to evolve and become more protective of the environment. As discussed with the BLM on 9 February 2015, the Permit Revision should not be considered an update to the Plan of Operations, but instead supplemental information that provides additional details and clarifications for purposes of the National Environmental Policy Act (NEPA) analysis. Further, Energy Fuels will provide a document to the BLM with specific updates to the Plan of Operations once LQD approves of the Permit Revision, which is anticipated in the near future.	Because the Plan of Operations is the basis for the Proposed Action and refers to the Mine Permit, and the Proposed Action has been updated per Energy Fuels' revisions to the Mine Permit, the Plan of Operations is inherently updated with each revision to the Mine Permit. However, the EIS has been revised to clarify that the Mine Permit submittal provided additional detail and clarifications to the Plan of Operations. The BLM agrees that Energy Fuels should submit an update to the Plan of Operations pending the completion of the Mine Permit to ensure consistency between the two.
General-2	Energy Fuels					**Water Treatment and Discharge.** Based on the site-wide water balance, which is included in the Permit Revision to the LQD, Energy Fuels anticipates that management of excess water will be required commencing in Year 1 of Congo Pit mining, whether or not an on-site processing facility is constructed. As such, treatment and discharge of water to Crooks Creek via a Wyoming Pollutant Discharge Elimination System (WYPDES) permit is anticipated. The 2013 Plan of Operations update stated "should water discharge become necessary, an application to discharge would be submitted to the [WYPDES] program." In several places throughout the DEIS (e.g., Section 2.3.11.3 [Surface Water]), the BLM indicates that additional NEPA analysis may be required for off-site discharge of excess water; however, management of excess water via a WYPDES discharge permit is considered part of the Proposed Action, analysis of which should be included in the FEIS.	The FEIS addresses the WYPDES application submitted to WDEQ-WQD in July 2015. Energy Fuels' consideration of a UIC Permit is addressed in Section 2.6.4 of the FEIS.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
General - 2 Continued	Energy Fuels					The DEIS, as written, appears to include evaluation of WYPDES discharge to Crooks Creek. For instance, Section 4.2.5.1 (Surface Water – Proposed Action Alternative) of the DEIS indicates that, if treated water were discharged to Crooks Creek, a treatment rate of 200 gpm would only be about 20 percent of the lowest measured flow rate in the creek (i.e., 2 cfs). Also, treated water would likely be discharged into an existing ephemeral drainage within the Project Area near the proposed Ore Pad. As such, much of the discharge is likely to infiltrate prior to reaching Crooks Creek, and have an even smaller impact to the flow rates within the creek. Either as an alternative or additional means for managing excess water, if mining of the underground resource is deferred, Energy Fuels is considering discharging untreated (or treated, if required) water from Congo Pit dewatering into the Sheep Underground workings via an Underground Injection Control (UIC) permit. Both the WYPDES and UIC permitting options have been presented to the Water Quality Division (WQD) of WDEQ, and appear to be viable alternatives. As such, Energy Fuels plans to apply for both a WYPDES discharge permit and a UIC permit in the near future to provide operational flexibility. This approach has been discussed with the LQD, and the LQD anticipates including this permit (WYPDES and/or UIC) as a condition of approval to the Permit Revision. Similarly, we believe that analysis of excess water management via a UIC should be included in the FEIS.	See Response above. The EIS has been reviewed and revised where appropriate to ensure impacts to Crooks Creek as a result of the WYPDES discharge have been disclosed.
General-3	Energy Fuels					The August 2013 update to the Plan of Operations provided a map (Figure 1.2-1B) showing the location of the Sweetwater Mill in relation to the Sheep Mountain Project merely for the purposes of analyzing the off-site processing option, with no other reference to the Sweetwater Mill made in the Plan. Section 2.3.4.5.2 (Off-Site Processing) of the DEIS states that “the most likely facility for off-site processing is the existing Sweetwater Mill in Sweetwater County,” while the remainder of the DEIS appears to indicate that off-site processing, if performed, would definitively occur at the Sweetwater Mill. Energy Fuels is exploring various options for off-site processing, including the potential to process loaded resin from an on-site heap leach facility at another licensed facility, such as Uranerz’s Nichols Ranch. Also, if uranium prices justify such, ore could be shipped to Energy Fuels’ White Mesa Mill in Utah. As such, we request that the BLM provide reference to the Sweetwater Mill as a potential off-site processing location for purposes of NEPA analysis only, and remove all other references to the Sweetwater Mill within the document (e.g., Section 2.3 [Proposed Action Alternative], Section 2.3.4.1 [Overview], etc.).	The BLM cannot be expected to accommodate all potential unexpected scenarios in one NEPA document, and the NEPA is not structured to accommodate an analysis of all possible scenarios and options even those that are speculative. The BLM and Energy Fuels have discussed and Energy Fuels has clarified what processing scenarios are reasonable and what are speculative (not reasonable options).
General - 4	Energy Fuels					**BLM Mitigation Alternative.** The BLM Mitigation Alternative focuses on revisions to the Reclamation Plan (Section 2.4.1) and development of a Travel Management Plan (Section 2.4.2). In both instances, the BLM appears to be proposing that Energy Fuels adopt a reclamation plan that includes reclamation and potentially re-reclamation of significant portions of the Project Area that are either outside of the proposed disturbance boundary (i.e., Proposed Action), or not currently bonded for reclamation. We believe that it is not within the BLM’s jurisdiction to require Energy Fuels to reclaim disturbed areas outside of the proposed disturbance limit, nor is it within BLM’s jurisdiction to require Energy Fuels to re-reclaim previously-reclaimed site areas outside of the proposed disturbance limit to current (and potentially every-changing) reclamation standards.	The BLM has reviewed and revised as appropriate the BLM Mitigation Alternative to ensure the intent and purpose of the alternative is clear in particular the potential for requiring reclamation of previously unreclaimed areas within the permit to offset the amount of disturbance associated with the on-site mill that would be transferred out of the public domain. The decision to implement the BLM Mitigation Alternative or not will be made by the BLM in the Record of Decision

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General-4 Continued	Energy Fuels					Section 2.4.1 of the DEIS states that “the reclamation plan would require that Energy Fuels evaluate reclamation success of previously disturbed areas within the Project Area that have not achieved adequate revegetation and reclaim those areas in order to offset the amount of disturbance of public lands around the processing facility that might be permanently removed from the public domain and transferred to DOE.” The maximum acreage that would potentially be removed from the public domain for Department of Energy (DOE) long-term care only equates to about 158 acres (within the proposed NRC License Area), and only applies to the on-site processing option. The proposed maximum project disturbance is 929 acres, and a reclamation plan would be in place to reclaim these areas. As one alternative to removing BLM land from the public domain if an on-site processing facility is constructed, Energy Fuels has proposed a potential land swap with the BLM to offset this acreage.	The BLM reviewed and revised the BLM Mitigation Alternative as appropriate to clarify the amount of disturbance that could be reclaimed to offset the amount taken out of public domain through transfer to the DOE (or the State of Wyoming). The BLM has considered and discussed Energy Fuels proposed land swap options and determined that on-site mitigation through the reclamation of previously poorly reclaimed sites would be the preferred method of mitigation rather than relying on a much more complicated and potentially less advantageous land swap option. Regardless, the BLM has included this potential land swap in the LFO RMP, but will not evaluate it in detail in this EIS because of the uncertainty for on-site processing and other more amenable options available.
General - 4 Continued	Energy Fuels					Section 2.4.1 of the DEIS goes on to say that “some of the unreclaimed areas for which Energy Fuels has no reclamation obligation…would probably meet the reclamation standards…However, other disturbances have shown limited success, particularly some of the AML work according to the standards.” It is important to note that, as the land owner, the BLM approved of the Abandoned Mine Land’s (AML’s) reclamation plans for the Paydirt Pit area and other AML projects on site, and therefore cannot now require that Energy Fuels re-reclaim these areas because they do not meet current BLM standards.	The BLM and AML have refined their reclamation goals and objectives since the beginning of AML's work in this area (1991), and what was once considered an acceptable reclamation practice at the time would no longer be acceptable; therefore, habitat restoration in some of these areas does not currently meet BLM's acceptable standards. The decision to implement the BLM Mitigation Alternative or not will be made by the BLM in the Record of Decision.
General - 4 Continued	Energy Fuels					Of the 3,611 acre permit boundary, approximately 892 acres have been disturbed and reclaimed (68%), while an estimated 497 acres (14%) of this reclaimed area is outside of the proposed disturbance area. However, the current delineations of existing disturbance, as shown on Map 2-5.1 of the DEIS, “exclude” the majority of historic drill roads, which intersect the site extensively. The BLM’s enforcement of these and similar proposed mitigation alternatives outside of the proposed disturbance area would add significant costs to Energy Fuels, and, in some case, may be significant enough to threaten the Project’s economic viability. As such, these mitigation alternatives are considered to counter to the BLM’s obligation to “allow and encourage” the development of mining claims.	The BLM has considered in the Mitigation Alternative a requirement to reclaim some lands which do not currently meet standards as an exchange for land permanently taken out of public domain, and the decision to require this is the BLM's upon the signing of the Record of Decision. However, the viability of requiring reclamation of non-bonded areas to offset the land to be taken out of public domain and the potential financial impacts to Energy Fuels will be considered before submitting the FEIS
EF-1	Energy Fuels	1	1-1		1	Please correct the second sentence to read: “On February 29, 2012, Energy Fuels Inc. acquired the Project through its acquisition of Titan Uranium USA, Inc., and is redeveloping the Project under management of its wholly-owned subsidiary, Energy Fuels Resources (USA) Inc. (Energy Fuels).” The statement currently misstates that Titan and Energy Fuels merged, and that Energy Fuels Resources (USA) Inc. is the parent company, not Energy Fuels Inc.	The sentence has been revised to read as follows: "On February 29, 2012, Energy Fuels Inc. acquired the Project through its acquisition of Titan Uranium USA, Inc. (Titan) and is redeveloping the Project under management of its wholly-owned subsidiary, Energy Fuels Resources (USA) Inc. (Energy Fuels)."
ER-2	Energy Fuels	1	1-1		1	We recommend revising the last statement in this paragraph to read: “Energy Fuels’ Permit to Mine 381C permit revision (Energy Fuels, 2014a) submitted to the Wyoming Department of Environmental Quality – Land Quality Division (WDEQ-LQD) in January 2014 was made available to the BLM to provide additional details and clarifications to the August 2013 Plan of Operations.” The statement currently indicates that the document was provided as an “update to the Plan of Operation;” however, that document excludes discussion of the proposed on-site processing facility and is therefore not an updated Plan (refer to Section 1.1 of this letter).	The sentence has been revised to read as follows: “In January 2014, Energy Fuels submitted a revision to the WDEQ-LQD Permit to Mine 381C and the revision was made available to the BLM to provide additional details and clarifications to the August 2013 Plan of Operations.”

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EF-3	Energy Fuels	1	1-1		2	The last sentence states that Energy Fuels is currently in the process of preparing an application to the NRC for an on-site processing facility; however, this effort has been delayed. We recommend revising the sentence to read: “Energy Fuels will submit an application to the U.S. Nuclear Regulatory Commission (NRC) for a Source and Byproduct Materials License for the proposed Heap Leach and Ore Processing Facility if this path is selected for project advancement.”	The sentence has been revised to read as follows: “Energy Fuels will submit an application to the United States Nuclear Regulatory Commission (NRC) for a Source and Byproduct Materials License for the proposed Heap Leach and Ore Processing Facility if this path is selected for project advancement.”
EF-4	Energy Fuels	1	1-5		Table 1.3-1	With regard to applicable permits, please also include WYPDES discharge permitting and potential for a UIC permit with the other permits listed for WDEQ-WQD. Based on the site-wide water balance, we expect that management of excess water will be required (refer to Section 1.2 of this letter).	Table 1.3-1 has been revised to include a WYPDES Permit and a UIC Permit.
EF-5	Energy Fuels	2	2-4		1	This paragraph indicates that the AML has plans to reclaim the McIntosh Pit in the future. However, the AML commenced reclamation of the McIntosh Pit in mid-2014, and plans to commence Phase 2 reclamation activities in the near future (mid-2015).	The sentence has been revised to read as follows: "Since the early 1980s, the WDEQ Abandoned Mine Lands Division (WDEQ-AML) has conducted reclamation projects on mined areas for which there was no reclamation obligation (i.e., the mining predated the 1969 Act) or limited reclamation obligation, but which pose a safety hazard per WDEQ-AML criteria and for which funding is available."
EF-6	Energy Fuels	2	2-5		Map 2.3-1	Though the proposed disturbance boundary remains the same, we have made some minor modifications to the facility layout with regard to stormwater controls as part of the permitting process with LQD. Specifically, this map shows ponds in locations that differ somewhat from the latest Mine Plan; however, Figure 2.3-3 in the DEIS shows the ponds in the correct locations. Also, this map refers to the proposed processing area as the “NRC License Boundary.” Because a License Application has not yet been submitted to the NRC, we recommend referring to this boundary as the “Proposed NRC License Boundary.”	Map 2.3-1 has been revised as suggested.
EF-7	Energy Fuels	2.3	2-8		Map 2.3-2	This map refers to the proposed processing area as the “NRC License Boundary” and the proposed radiation control boundary as the “Radiation Control Boundary.” Because a License Application has not yet been submitted to the NRC, we recommend referring to these boundaries as the “Proposed NRC License Boundary” and the “Proposed Radiation Control Boundary.”	Map 2.3-2 has been revised as suggested. In addition, "Proposed Radiation Control Boundary" has been changed to "NRC Restricted Area" to be consistent with Map 2.3-1.
EF-8	Energy Fuels	2	2-9		2.3.3.1	A conveyor system would only be constructed if ore is processed on-site, conveying ore from the Ore Pad to the processing facility. This paragraph seems to indicate that a conveyor would be constructed regardless of whether on-site or off-site processing is performed. Also, this paragraph refers to the “Ore Pad” as the “Ore Stockpile,” though the pad area is proposed to contain considerably more than just ore stockpiles (e.g., warehouse, shop, fuel station).	The sentence in Section 2.3.3.1 has been revised to read as follows: 'The Ore Pad and conveyor system (if ore is processed on-site) would be constructed near the entry point to the new proposed double entry decline to the Sheep Underground Mine (see Map 2.3-1). " "Ore Stockpile" has been changed to "Ore Pad" on Map 2.3-1 and throughout the document.
EF-9	Energy Fuels	2	2-9		2.3.3.2	This paragraph indicates that “existing topsoil stockpiles…would be preserved for future reclamation needs.” However, AML plans to use existing topsoil stockpiles TSP-E7, TSP-E10, TSP-E11, and TSP-E12 for reclamation of the McIntosh Pit (refer to Energy Fuels, 2014). As such, the total topsoil volume available from existing stockpiles for use in reclamation of the Project is estimated at approximately 150,255 cubic yards, though approximately 222,200 cubic yards of topsoil are in stockpile within the Project Area.	Please see response to EPA Comment 35, above.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-10	Energy Fuels	2	2-10		2.3.3.4	The water line that extended from the Sheep II Shaft to the McIntosh Pit has been removed to facilitate AML's reclamation efforts.	The following text has been removed from Section 2.3.3.4: " An existing 8-inch water line extends from the Sheep I Shaft to the vicinity of the McIntosh Pit. The pipeline follows the power line from the Sheep I Shaft to the Sheep II Shaft where the pipeline then follows the road and discharges into the existing McIntosh Pit (see Map 2.3-1). This line would be extended to the proposed Ore Processing Facility."
EF-11	Energy Fuels	2	2-11		2.3.3.4	Based on the Congo Pit dewatering model and site-wide water balance completed as part of the permitting efforts with the LQD, we have determined that a water treatment system will be necessary for dewatering of the Congo Pit and Sheep Underground Mine (refer to Section 1.2 of this letter). This facility would be constructed within the limits of the Ore Pad.	The FEIS addresses the WYPDES application submitted to WDEQ-WQD in July 2015.
EF-12	Energy Fuels	2	2-11		2.3.3.6	The last sentence in this paragraph states that "current plans are to utilize the warehouse at the main administration building…" However, the shop and warehouse are proposed to be located on the Ore Pad, separate from the administration office (refer to Map 3-3 in Energy Fuels, 2014).	The sentence has been revised to read as follows: "Current plans are to utilize the warehouse on the Ore Pad to support both the surface and underground operations."
EF-13	Energy Fuels	2	2-12		2.3.3.7.1	The first sentence indicates that the heap leach pad would be constructed in accordance with NUREG-1620; however, this NRC Regulatory Guide pertains to "reclamation" of a uranium tailings storage facility. It may be appropriate to instead state that design of the heap leach pad would be in accordance with 10 CFR 40, including Appendix A to 10 CFR 40. Also, NRC recently issued a draft (for comment) Standard Review Plan (SRP) for Conventional Uranium Mills and Heap Leach Facilities (NUREG-2126) that may be more applicable than NUREG-1620 for design, once it has been adopted.	The sentence has been revised to read as follows: "The Heap Leach Pad would be constructed by excavating the 40-acre pad to design grades in accordance 10 CFR 40, including Appendix A to 10 CFR 40, because the majority of the pad would be below the ground surface. "
EF-14	Energy Fuels	2	2-12		2.3.3.7.1	This paragraph discusses proposed piping and berms for the heap leach pad, but the discussion is not correct as written. The discussion of piping within the heap leach pad itself comes later on p. 2-14 (e.g., collection system). However, this paragraph could be revised to discuss only the application of leach solution to the heap, as follows: "Leach solution would be pumped to the active leach area of the Heap Leach Pad from the Raffinate Pond via a pump and a main pipeline. The main line would be equipped with lateral lines to allow for distribution of the solution over the levelled pad area. A drip emitter system would be used to apply the barren solution to the top of the heap at an established solution application rate."	The paragraph has been revised as suggested.
EF-15	Energy Fuels	2	2-14		2.3.3.7.2	The discussion on sizing of the Raffinate Pond is not correct as currently written (refer to the August 2013 Plan of Operations update). The pond is sized to contain three days of make-up solution, plus three days of leach solution to wet fresh ore, plus the volume of water from a storm event. The DEIS indicates that this pond is sized to contain at least one day worth of lixiviant and leach solution make-up plus a storm event.	The sentence has been revised to read as follows: "The pond would be sized to contain 3 days of make-up solution, plus 3 days of leach solution to wet fresh ore, plus the volume of water from a storm event (e.g., a 100-year, 24-hour event) over the Raffinate Pond."
EF-16	Energy Fuels	2	2-15		2.3.3.7.2	The discussion on sizing of the Collection Pond is not correct as currently written (refer to the August 2013 Plan of Operations update). The pond is sized to contain one day of pregnant leach solution (PLS) from the active leach area plus the volume of a storm event over the Collection Pond and Heap Leach Facility (HLF) areas. The DEIS indicates that the pond is sized to contain more than one day of PLS, plus all solution contained within the HLF, plus the volume of a storm event over the Collection Pond and HLF areas.	The sentence has been revised to read as follows: "The pond would be sized to contain 1 day-worth of PLS from the active leach area, plus the volume of a storm event over the Collection Pond and Heap Leach Pad areas."

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-17	Energy Fuels	2	2-15		2.3.3.7.2	The second to last statement in this paragraph indicates that solids that precipitate out of the liquid waste would be placed within the interim solid “water” management area within the HLF. This should read solid “waste” management area.	The sentence has been revised to read as follows: "Solids that precipitate out of the liquid waste would be periodically removed from the Pond and placed in the interim solid water waste management area within the facility."
EF-18	Energy Fuels	2	2-15		2.3.3.7.2	The last statement in this paragraph indicates that U.S. Environmental Protection Agency (EPA) would have jurisdiction over the ponds associated with the HLF as part of 40 CFR Part 61 Subpart W. Though the EPA has proposed new rulemaking for the National Emission Standards for Hazardous Air Pollutants (NESHAPs) Subpart W that would include heap leach facilities and impoundments (e.g., evaporation ponds and solution ponds) at uranium processing facilities, it is important to note that the proposed Subpart W rulemaking has not yet been finalized. As such, we recommend that the BLM remove reference to the Subpart W rules in this instance, or provide reference that the ponds may be subject to EPA jurisdiction.	The text has been revised to read as follows: "The facility may be subject to EPA requirements (40 CFR Part 61 Subpart W) pending current rulemaking efforts, because the ponds would contain uranium byproduct material (i.e., 11(e)(2) material)."
EF-19	Energy Fuels	2	2-19		2.3.4.2	The first paragraph indicates that excavation of the Congo Pit would intercept groundwater in the 2nd or 3rd year of mining. However, based on dewatering models developed subsequent to the 2013 Plan of Operations (included as part of the LQD Permit Revision and subsequent updates), Energy Fuels anticipates that groundwater will be encountered during year 1 of mining.	The text has been revised to read as follows: "Under the proposed schedule, excavation of the Congo Pit would intercept groundwater in the first year of mining at which point the lower portion of the pit would require dewatering. "
EF-20	Energy Fuels	2	2-30		Section 2.3.5.9 Table 2.3-5	During the permitting process through LQD, the proposed broadcast seed mixture has been revised. Specifically, the rates for Wyoming big sagebrush are increased significantly, and one additional shrub and two additional forbs are included to assist in replacement of the previous Sagebrush-Grass community. The revised broadcast seed mix is as follows (see Energy Fuels' Comment Letter for Seed Mix).	Tables 2.3-5 and 2.3-6 in Chapter 2 (seed mixes) have been revised based on Energy Fuels' Comment Letter.
EF-21	Energy Fuels	2	2-30		Section 2.3.5.9 Table 2.3-6	The proposed drill seed mixture has been modified in the same manner as the broadcast seed mixture (refer to Comment EF-20), as follows (see Energy Fuels' Comment Letter for Seed Mix).	See response to EF-20, above.
EF-22	Energy Fuels	2	2-42		2.3.10.2	In the discussion pertaining to “Groundwater”, the DEIS currently indicates that excess water would not be encountered until “after the first couple of years of operation.” However, based on the groundwater models and site-wide water balance, Energy Fuels (2014) anticipates encountering excess water during the first year of operations. As discussed in Section 1.2 of this letter, Energy Fuels is in the process of preparing applications to the WDEQ-WQD to manage the excess water, with the following two scenarios being considered: Treatment and discharge of excess water to Crooks Creek via a WYPDES discharge permit; and If underground mining operations are deferred, Energy Fuels is exploring the possibility of discharging excess water from dewatering of the Congo Pit into the Sheep Underground via a UIC permit.	The FEIS addresses the WYPDES application submitted to WDEQ-WQD in July 2015. Energy Fuels' consideration of a UIC Permit is addressed in Section 2.6.4 of the FEIS.
EF-23	Energy Fuels	2	2-42		2.3.10.2	In the paragraph on “Ore Processing Waste (11(e)(2) Byproduct Material)”, we recommend removing the reference to the bleed stream flow rates (i.e., 40 gpm and 10 gpm). The process design is still in the early stages, and though these flow rates are our best estimates at this time, they may change.	The text has been revised to indicate that the bleed stream flow rates (i.e., 40 gpm and 10 gpm) are estimates.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-24	Energy Fuels	2	2-43		2.3.11.1	The estimated Congo Pit dewatering rates provided in this paragraph have not been adjusted for water-bearing strata. The Congo Pit dewatering report (included as Exhibit D-6.15 to Appendix D-6 of the Permit Revision; Energy Fuels, 2014) estimates that approximately 60 percent of the Battle Spring formation is comprised of water-bearing sandstone. Based on this adjustment, the total pumping rates are estimated to range from 156 gpm (Year 1) to 377 gpm (Year 4), with an average of 263 gpm, which is less than currently reported in the DEIS.	The discussion of the dewatering rates in the FEIS corresponds with the WDEQ-LQD Permit to Mine 381C as approved July 2015.
EF-25	Energy Fuels	2	2-43		2.3.11.1	Refer to Comment EF-22 regarding the site-wide water balance and excess water management. With off-site processing, Congo Pit dewatering will require excess water management (via a WYPDES discharge permit or a UIC permit); however, if ore is processed on-site, the amount of excess water will decrease significantly, and may be negligible. Regardless of on-site or off-site processing, dewatering of the Sheep Underground is anticipated to require treatment and discharge.	The language has been revised to indicate that dewatering would require treatment and discharge.
EF-26	Energy Fuels	2	2-43		2.3.11.1	See Comment EF-5. The Wyoming AML program commenced reclamation of the McIntosh Pit in 2014.	All references to the WDEQ-AML program in the text have been revised to note that they began reclamation of the McIntosh Pit in mid-2014."
EF-27	Energy Fuels	2	2-44		2.3.11.3	This paragraph states that “in addition to obtaining a WYPDES permit for discharge to Crooks Creek, BLM approval and possibly additional NEPA analysis would be needed.” Refer to the discussion provided in Section 1.2 of this letter.	The FEIS addresses the WYPDES application submitted to WDEQ-WQD in July 2015.
EF-28	Energy Fuels	2	2-47		2.3.12.2	We have the following comments on the “Air” section: - The text indicates that Map 2.3-3 shows the locations of the current air monitors, but station AM-1 (located at the nearest residence) is missing from this map. - All 10 of the air monitors collected a minimum of one year of continuous air samples (text indicates 8 of the 9).	Map 2.3-3 has been revised to show AM-1. The text has been revised to read as follows: "All ten air monitors (AM-1, AM-2, and AM-4 through AM-9) have been collecting continuous air samples for a minimum of 1 year."
EF-29	Energy Fuels	2	2-47		2.3.12.2	Regarding recent vegetation surveys of the site, BKS performed additional vegetation (including wetlands) surveys in 2014. The latest information is available in the LQD Permit Revision (Energy Fuels, 2014).	Chapters 3 and 4 have been updated with the latest information available in the WDEQ-LQD Permit Revision (WDEQ, 2015) and supporting documents (BKS 2013 Vegetation Survey) .
EF-30	Energy Fuels	2	2-49		2.3.12.3	This paragraph indicates that quarterly water levels and annual water quality sampling will occur during operations. However, in accordance with the Permit Revision to LQD, Energy Fuels will be required to perform quarterly groundwater sampling (including water levels) once operations re-commence.	The text has been revised to read as follows: "Groundwater monitoring would be conducted throughout the life cycle of the Project according to the NRC approved license and the WDEQ-LQD Permit to Mine 381C. Groundwater monitoring would be conducted on a quarterly basis for water levels and water quality, including both WDEQ-LQD and NRC water quality parameters. Additional sampling would be conducted as appropriate should a spill or excursion be detected."
EF-31	Energy Fuels	2	2-49		2.3.12.3	This paragraph indicates that “air monitoring would be conducted on a continuous basis” during operations. However, Section 2.3.12.2 (Air) correctly indicates that, pending the outcome of WDEQ-AQD permitting, “the existing [air] monitoring locations…may or may not be needed.” Please revise accordingly.	The text has been revised as follows: "To ensure compliance with 10 CFR 20.1301, 20.1302, and 20.1501, air monitoring would be conducted in accordance with the WDEQ-AQD permit. "
EF-32	Energy Fuels	2	2-52		2.4	The second sentence in this paragraph should be revised to include off-site processing as an option.	The text has been revised to read as follows: This alternative is similar to the Proposed Action Alternative, in that conventional mining techniques would be utilized and uranium would be produced using heap leach and solvent extraction/ion exchange procedures on-site or uranium would be processed off-site."

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-33	Energy Fuels	2	2-53		2.4.1	The BLM indicates that their proposed reclamation plan, which includes evaluation of reclamation success (and potential re-reclamation) of previously reclaimed lands and reclamation of other non-bonded site disturbances, is provided “in order to offset the amount of disturbance of public lands around the processing facility that might be permanently removed from the public domain and transferred to DOE.” Refer to Section 1.4 of this letter, as Energy Fuels does not believe it is within the BLM’s jurisdiction to require Energy Fuels to reclaim disturbed areas outside of the proposed disturbance limit.	The BLM has considered in the Mitigation Alternative a requirement to reclaim some lands which do not currently meet standards as an exchange for land permanently taken out of public domain associated with the On-Site Processing Facility, and the decision to require this is the BLM's upon the signing of the ROD. However, the viability of requiring reclamation of non-bonded areas to offset the land to be taken out of public domain and the potential financial impacts to Energy Fuels will be considered before making this decision in the ROD. The FEIS has been revised to remove specific mention of the Travel Management Plan and consolidate requirements into Mitigation Measures in order to clarify the intent of this measure.
EF-34	Energy Fuels	2	2-54 & 2-55		2.4.1 Table 2.4-1	BLM’s proposed mitigation measures for soils, S-1 through S-3, are all included as part of the current mine and reclamation plans, as discussed in the LQD Permit Revision (Energy Fuels, 2014).	The measures in the WDEQ-LQD Permit to Mine 381C are slightly different than the intent of the Soils measures in the BLM Mitigation Alternative. These measures have been revised to clarify the differences.
EF-35	Energy Fuels	2	2-55		2.4.1 Table 2.4-1	BLM’s proposed mitigation measure SW-1 indicates that any water discharged on-site under a WYPDES “would require consultation and approval by the BLM regardless of where the discharge point is located.” It is Energy Fuels’ understanding that WYPDES discharge permits are issued under the authorization of WQD and there are no additional consultations or approvals needed through the BLM.	Mitigation Measure SW-1 has been removed in the FEIS.
EF-36	Energy Fuels	2	2-60		2.4.1 Table 2.4-1	Regarding “Wetlands and Riparian Zones,” and specifically BLM’s proposed mitigation measure WT-1, Energy Fuels has completed the process with the U.S. Army Corps of Engineers (USACE), and they determined that no additional permitting is required for the project (correspondence from the USACE is included in Attachment 1).	The BLM has reviewed the USACE's response and determined that the USACE is not as clear in stating that no additional permitting requirements are necessary as Energy Fuels suggests. Therefore, the BLM has revised this measure accordingly.
EF-37	Energy Fuels	2	2-60 & 2-61		2.4.1 Table 2.4-1	BLM’s proposed mitigation measures ESA-1 and ESA-10 pertain to sage grouse surveys within the project area prior to site disturbances, and annually within four miles of the Project disturbance, respectively. The Project is outside of the designated sage grouse core area, and sage grouse surveys performed for the Project found no leks on the Project area, or within a two mile buffer (nearest lek 5.25 miles southwest of Project). Though the Project contains some suitable sage grouse habitat (i.e., sagebrush), the habitat is limited to the outer boundaries of the mine permit area. However, since the site is more than two miles from any documented sage-grouse lek, and is outside the core area, we understand that attendance surveys for leks are not required. However, if the BLM maintains these mitigation measures, we request that ESA-10 be revised to include surveys for leks within 2 miles of project disturbance (instead of 4 miles).	ESA-10 has been removed from Table 2.4-1 and Section 4.3.4.2.1 in Chapter 4.
EF-38	Energy Fuels	2	Feb-63		2.4.1 Table 2.4-1	BLM’s proposed mitigation measure W-1 indicates that “speed limits of 35 miles per hour from Jeffrey City to the Project Area would be enforced by Energy Fuels.” Crooks Gap Road is a county road for which Energy Fuels does not have the jurisdiction to establish speed limits. It is important to note that a number of other developments exist along this road, including other mining and oil and gas projects, and is therefore heavily used by others. The speed limits are set by the county transportation department.	Measures W-1 and ESA-7 (now ESA-6) have been revised to clarify that the measure would require Energy Fuels to implement measures to ensure employees maintain safe speed limits to limit collisions with wildlife. Measure W-1 would not require Energy Fuels to post speed limits on public roads.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-39	Energy Fuels	2	2-65 & 2-66		2.4.1	BLM's proposed mitigation measure CR-3 relates to protection of an identified "cultural resource" (48FR7357) within the reclamation limits of the proposed processing facility. The Wyoming State Historic Preservation Office (SHPO) submitted a letter to the BLM in January 2014 indicating that they did not concur with the BLM's finding that this site is eligible for listing in the National Register of Historic Places (NRHP), and further indicated that the proposed plan would have no effect on historic properties. As such, we request that the BLM remove this mitigation measure from further consideration.	Additional language has been added to CR-3 in response to Comment EF-76 as follows: "If physical avoidance is not possible, interpretive signage would be developed and installed along public roads by Energy Fuels in coordination with the BLM." Although SHPO determined that the site does not retain enough integrity to be considered eligible, it remains historically important as one of only a few early mining camps in the area, and the foundations are intact. Both BLM and SHPO have requested physical avoidance of the site, but are no longer considering visual impacts.
EF-40	Energy Fuels	2	2-66 & 2-67		2.4.1	Based on other statements made throughout the DEIS, BLM's proposed mitigation measure TRA-1 appears to include an inventory all roads within the Project Area, including historic drill roads outside of Energy Fuels' proposed disturbance boundary. Then, BLM's proposed mitigation measure TRA-3 indicates that any roads identified in the inventory without adequate reclamation success would be reclaimed. Refer to Section 1.4 of this letter, as Energy Fuels does not believe that the BLM has jurisdictional authority to require Energy Fuels to reclaim historic disturbances that are neither within the proposed disturbance boundary, nor otherwise not bonded for reclamation with the LQD.	The mentioned TRA-1 and TRA-3 have been replaced (now only TRA-1 and TRA-2) in the BLM Mitigation Alternative, and Measure REC-1 has been updated to clarify the intent of the mentioned measures. However, additional clarifications have been made to the BLM Mitigation Alternative that clarifies the purpose of reclamation of on-site disturbances that do not meet BLM standards to offset lands to be taken out of public domain (this could include abandoned roads that do not meet BLM standards).
EF-41	Energy Fuels	2	2-68		2.4.1 Table 2.4-1	Regarding BLM's proposed mitigation measure REC-1, access to the site during operations will be controlled by Energy Fuels. As such, and for the safety of the public, the site will generally not be accessible to hunters (or for other recreational purposes) during active mining operations. However, abandoned roads which access hazardous areas of the mine would be blocked off, as feasible, during operations for the safety of mine personnel.	Thank you for agreeing with the principles of Measure REC-1 which has been revised for clarification.
EF-42	Energy Fuels	2	2-69		2.4.2	This section indicates that the proposed "Travel Management Plan" would include an inventory of all roads within the Project Area, "including old drill roads", and potentially reclamation thereof. Refer to Section 1.4 of this letter.	The BLM has considered in the Mitigation Alternative a requirement to reclaim some lands which do not currently meet standards as an exchange for land permanently taken out of public domain associated with the On-Site Processing Facility, and the decision to require this is the BLM's upon the signing of the ROD. However, the viability of requiring reclamation of non-bonded areas to offset the land to be taken out of public domain and the potential financial impacts to Energy Fuels will be considered before making this decision in the ROD. The FEIS has been revised to remove specific mention of the Travel Management Plan and consolidate requirements into Mitigation Measures in order to clarify the intent of this measure.
EF-43	Energy Fuels	2	2-79		2.7 Table 2.7-1	With regard to "Wetlands and Riparian Zones", the Proposed Action would have little impact. This is demonstrated by the results of the Aquatic Resources Inventory (ARI) completed in 2014, with concurrence by the USACE (refer to Attachment 1).	The BLM agrees that impacts to Wetlands and Riparian zones are minimal, but disagrees that the USACE letter is as clear as suggested. See comment response to EF-36 above.
EF-44	Energy Fuels	3	3-9		3.2.1.3	This paragraph indicates that the on-site air monitoring stations are "in operation." However, Energy Fuels has placed air monitoring on standby, as sufficient baseline data has been completed for the permitting efforts.	The text has been revised to read as follows: "Nine on-site air particulate monitoring stations were installed, with five stations installed in August 2010 and four in June 2011. All stations are currently on standby."
EF-45	Energy Fuels	3	3-18		3.2.2.2 Map 3.2-4	The Regional Geologic map shows the Fort Union formation outcropping within the Congo Pit area; however, the Battle Spring formation, which overlies the Fort Union formation, is the mineralized zone within the Congo Pit area. For consistency with Energy Fuels' geologic interpretation of the site, including Energy Fuels' geologic cross-sections (included as Figures 3.2-3 and 3.2-4 in the DEIS), we recommend that the BLM adopt use of the amended Stephens (1964) geologic map, included in the Permit Revision (Energy Fuels, 2014).	Map 3.2-4 has been updated to be consistent with the most recent interpretation (Map D-5-2 from WDEQ-LQD Permit to Mine 381C, as approved by WDEQ-LQD in July 2015).

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-46	Energy Fuels	3	3-26		3.2.2.3	The paragraph on “Seismology” references Engineering Analytics (2011). That study was updated and finalized in 2013, and made available to the BLM. Engineering Analytics (2013) indicates that the mean PGA for the 2500-year return period event is estimated as 0.16g at the site, while the mean PGA for the 10,000-year return period event is estimated as 0.58g. These PGA values differ from the values presented in this section.	The text in the Seismology paragraphs has been updated with the 2013 information, and the reference list has been updated.
EF-47	Energy Fuels	3	3-31		3.2.4.1	This section refers to the soil mapping survey completed by BKS in 2010. BKS performed additional soil mapping surveys at the site in 2013 and 2014 to encompass the entire proposed disturbance area. The results of the revised report (BKS, 2014) have been made available to the BLM as part of the Permit Revision (Energy Fuels, 2014).	Chapters 3 and 4 have been revised to include the most recent available data for soils based on the Permit to Mine 381C (WDEQ, 2015) and supporting documents (BKS 2013 Soil Survey).
EF-48	Energy Fuels	3	3-31		3.2.4.1	Refer to Comment EF-47. The salvage depths have been revised somewhat from those presented in this paragraph.	See response to Comment EF-47, above.
EF-49	Energy Fuels	3	3-34		3.2.3.1 Table 3.2-8	The BKS study area was revised somewhat as part of the 2013 and 2014 soil mapping surveys. Refer to Comments EF-47 and EF-48.	See response to Comment EF-47, above.
EF-50	Energy Fuels	3	3-42		3.2.5.1	The first paragraph in the section titled “Crooks Creek Characteristics” discussed flow measurements in Crooks Creek and references Table 2 in Appendix 3-B. The discussion indicates that the measured flows range from 3.3 to 6.8 cfs, while the table shows both lower and higher flow rates. Further, Energy Fuels has collected additional flow measurements at the weir location since 2013 that could be made available to the BLM, upon request.	The text has been revised to read as follows: "In 2010, Energy Fuels placed three gaging sites on Crooks Creek, including locations upstream (XSCCMU), adjacent to (XSCCUS), and downstream (XSCCDS) of the Project Area. The locations of the gaging sites are shown on Map 3.2-11, and Photos 3.2-2 through 3.2-4 show Crooks Creek near the each of the gaging sites (Lidstone, 2013). Energy Fuels has also installed a weir near the location of XSCCUS. Crooks Creek drains approximately 90 square miles above the gaging site XSCCDS. Recorded flows have ranged from 1.8 cfs in August 2012 to 13.5 cfs in November 2013 (see Table 1 in Appendix 3-B)." The tables in Appendix 3-B have been updated.
EF-51	Energy Fuels	3	3-42		3.2.5.1	The discussion on “Surface Water Quality” indicates that surface water quality samples have been collected at two sites on Crooks Creek; however, Energy Fuels has been collecting water quality samples at three sites (shown on Map 2.3-3), which include one downstream site (CC-DS), one upstream site (CC-MU), and one adjacent site (CC-US).	See Response to EF-50, above.
EF-52	Energy Fuels	3	3-46		3.2.5.2	The paragraph on “Project Area Aquifers” indicates that Energy Fuels collected groundwater data in 2010, 2011 and 2013. However, Energy Fuels has been collecting groundwater data since 2010, including data collection in 2012 and 2014. Data pre-2014 is included in the Permit Revision (Energy Fuels, 2014), while data subsequent to that time is provided in the Annual Reports to LQD. Also, this paragraph and elsewhere in this section references Lidstone (2013b) as the baseline groundwater report; however, this should refer to the Lidstone and Wright Environmental Services (2013) report.	The text was revised to read as follows: "Groundwater has been studied at the Project Area since the 1970’s, as part of previous mining activities. To establish the current conditions prior to the proposed Project, Energy Fuels began collecting additional data in 2010, which is included in the WDEQ-LQD Permit to Mine 381C (WDEQ, 2015)." References have been updated to include "Lidstone and Wright Environmental Services, 2013"
EF-53	Energy Fuels	3	3-47		3.2.5.2 Map 3.2-11	The contour corresponding to elevation 6800 feet is mis-labeled as 6000 feet on the potentiometric map.	Map 3.2-11 has been revised as suggested.
EF-54	Energy Fuels	3	3-57		3.3.2	The second complete paragraph on this page refers to field vegetation field surveys completed in the 1980s, as discussed in BKS (2011a). However, BKS performed additional vegetation mapping in 2014, and an updated report is available for use (i.e., BKS, 2014).	Chapters 3 and 4 have been updated with the latest information available in the WDEQ-LQD Permit Revision (WDEQ, 2015) and supporting documents (BKS 2013 Vegetation Survey) .

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-55	Energy Fuels	3	3-58		3.3.2 Map 3-3-1	Additional vegetation mapping was completed by BKS in 2014, which may not currently be reflected on this map, which references BKS (2013).	See Response to Comment 54, above.
EF-56	Energy Fuels	3	3-61		3.3.3	These paragraphs indicate that the USACE will make a determination on the permitting requirements for the Project with regard to aquatic resources. However, the USACE completed their review and found that no permitting with the USACE will be required for the Project (refer to Attachment 1).	The paragraph has been revised to read as follows: "The USACE has determined that no waters of the U.S. occur within the disturbance area, but an extensive evaluation in accordance with administrative procedures implemented by the USACE on June 5, 2007, would be required to determine jurisdiction over streams and wetlands within the Permit Area beyond that area of disturbance (WT-1 in Table 2.4-1)."
EF-57	Energy Fuels	4	4-20		4.2.4.1.1 Table 4.2-12	Refer to Comments EF-47 through EF-49, regarding additional soil mapping performed by BKS (2014), which may affect the acreages reflected in this table.	See Response to Comment 47, above.
EF-58	Energy Fuels	4	4-20		4.2.4.1.1	In response to comments from the LQD on the Permit Revision, BKS (2014) revised recommendations for topsoil salvage to include salvage of any available overburden materials that may be used during site reclamation as available plant growth medium.	The following text has been added: "The presence of suitable plant growth medium or coversoil, in addition to topsoil, was also evaluated, and potential salvage thicknesses ranged from about 1.54 to 2.86 feet. Based on these depths, up to 2,000,000 cubic yards of potential salvageable plant growth medium (coversoil) could be salvaged and stockpiled, depending on accessibility and percentage of large rocks and boulders in the material."
EF-59	Energy Fuels	4	4-20		4.2.4.1.1	This paragraph indicates that all of the currently stockpiled topsoil would be available for reclamation; however, as part of the McIntosh Pit reclamation project, the AML plans to utilize the topsoil stockpiled within that area.	The sentence has been revised to read as follows: "In addition to topsoil, Energy Fuels has identified up to 2,000,000 cubic yards of potential salvageable plant growth medium (coversoil) that would be salvaged and stockpiled, depending on accessibility and percentage of large rocks and boulders in the material."
EF-60	Energy Fuels	4	4-20		4.2.4.1.1	This paragraph mentions that topsoil would be inspected prior to placement. As part of the site work performed by BKS in 2014, the viability of the existing topsoil stockpiles were assessed via sampling and testing, at the request of the BLM.	The language regarding "topsoil would be inspected prior to placement" has been removed from Chapter 4. The following language has been added to Chapter 3: "Additionally, 11 of the 18 topsoil stockpiles, generally the largest of the stockpiles currently on site from previous disturbances, were sampled in June 2014 to verify viability for use as replacement topsoil."
EF-61	Energy Fuels	4	4-22		4.2.4.2.1	The BLM mitigation alternative refers to “stockpile stabilization” measures, indicating that these are not part of the Proposed Action. However, the Proposed Action includes seeding of topsoil stockpiles to minimize loss, construction of a perimeter ditch/berm, and soil amendments, if needed (refer to Energy Fuels, 2014).	The BLM notices differences between measures proposed by Energy Fuels and the intent of the Measures presented in Table 2.4-1 of DEIS. Therefore, these measures have been revised in the FEIS to ensure these differences are noted. H228
EF-62	Energy Fuels	4	4-26		4.2.5.1.1	This paragraph indicates correctly that Energy Fuels anticipates that discharge of water to Crooks Creek would be required, with the rate of discharge dependent on whether or not an on-site processing facility is constructed. However, this paragraph indicates that “BLM approval and possibly additional NEPA analysis would be needed” to discharge treated water. As this is part of the Proposed Action, the current NEPA analysis needs to include any additional assessment of this proposal. Refer to Section 1.2 of this letter.	The Proposed Action description has been revised to ensure that it is clear that a WYPDES permit will be obtained. Analysis of discharge under a WYPDES permit has been completed to the best extent practicable using the available information; however, if additional information becomes available post -EIS completion that negates or is outside the scope of the analysis in the EIS, additional NEPA analysis will be required.
EF-63	Energy Fuels	4	4-26		4.2.5.1.1	The paragraph on the McIntosh Pit indicates that reclamation will occur beginning in 2015; however, reclamation of the pit commenced in mid-2014.	The text has been revised to refer to both McIntosh Pit and Western Nuclear Pond and reads as follows in Section 4.2.5.1.1 : "As discussed in Section 2.5, the reclamation work on McIntosh Pit, including Energy Fuels’ previous reclamation responsibility for the part of the pit, and related improvements to Western Nuclear Pond have been consolidated under the WDEQ-AML Project 16-O."

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-64	Energy Fuels	4	4-28		4.2.5.1.1	The first paragraph in the section titled “Dewatering Discharge” indicates that “during the first couple of years of operation, water discharged from the dewatering system would be entirely consumed on-site.” However, the water balance shows that dewatering is likely to exceed consumption, particularly if an on-site processing facility is not constructed. Refer to Section 1.2 of this letter.	The document has been revised accordingly for consistency based off of the most up to date water balance.
EF-65	Energy Fuels	4	4-28		4.2.5.1.1	The second paragraph in the section titled “Dewatering Discharge” indicates that, for discharge of treated water to Crooks Creek, “BLM approval and possibly additional NEPA analysis would be needed, along with revision of the current WDEQ-LQD 381C Mine Plan and Plan of Operations to include reference to the WYPDES permit.” The Permit Revision has been revised to indicate that a WYPDES permit will be obtained for the Project, which is anticipated to be a condition to LQD approval of the Permit Revision. Regarding BLM approval and additional NEPA analysis, refer to Section 1.2 of this letter.	The description of the Proposed Action has been revised to ensure that it is clear that Energy Fuels submitted an application under the WYPDES program. Analysis of discharge under the WYPDES permit has been completed to the best extent practicable using the available information; however, if additional information becomes available post-EIS completion that negates or is outside the scope of the analysis in the EIS, additional NEPA analysis will be required.
EF-66	Energy Fuels	4	4-28		4.2.5.2.1	This paragraph indicates that “any water discharged on-site under a WYPDES permit would require consultation and approval by the BLM regardless of where the discharge point is located.” Refer to Comment EF-35.	This language has been removed from the FEIS.
EF-67	Energy Fuels	4	4-31		4.2.5.4.1	This paragraph references the drawdown modeling performed by Lidstone; however, Lytle Water Solutions (LWS) has completed recent drawdown and recovery modeling for the Project as part of the Permit Revision, which will soon be made available to the BLM for reference. The results are similar, in that limited drawdown is anticipated beyond the limits of the Project Area.	The text and figures in Section 4.2.5.4.1 have been updated to correspond with WDEQ-LQD Permit to Mine 381C as approved July 2015.
EF-68	Energy Fuels	4	4-32		4.2.5.4.1 Figure 4.2-2	This figure, prepared by Lidstone, could be replaced by the updated modeling completed by LWS. Refer to Comment EF-67.	See Response to Comment EF-67, above.
EF-69	Energy Fuels	4	4-40		4.3.2.2.1	This paragraph indicates that “sites that had previously been disturbed, with or without reclamation, would be subject to the revised Reclamation Plan” outlined herein. However, refer to Section 1.4 of this letter.	The BLM has revised as appropriate the BLM Mitigation Alternative to ensure the intent and purpose of the alternative is clear in particular the potential for requiring reclamation of previously unreclaimed areas within the permit to offset the amount of disturbance associated with the on-site mill that would be transferred out of the public domain. The decision to implement the BLM Mitigation Alternative or not will be made by the BLM in the Record of Decision.
EF-70	Energy Fuels	4	4-41		4.3.2.3	With regard to the No Action Alternative, it should be noted that only the bonded disturbance area would be reclaimed under this alternative (i.e., 241 acres). However, large portions of existing disturbance (i.e., 179 acres) that are within the proposed disturbance limits would not have the benefit of reclamation.	The following sentence has been added to Section 4.3.2.3: "The bonded disturbance (144 acres) would be reclaimed by energy Fuels under the No Action Alternative, and about 302 acres would be reclaimed by WDEQ-AML under Project 16-O. About 190 acres of existing disturbance that are within the proposed disturbance limits would not be reclaimed. "
EF-71	Energy Fuels	4	4-41		4.3.3.1.1	The first paragraph in this section indicates that “jurisdictional status of all wetlands within the Project Area has not been confirmed.” However, as noted above, the USACE has determined that no permitting is required for the Project with regard to aquatic resources (refer to Attachment 1).	The first paragraph has been revised to read as follows: "Jurisdictional wetlands would not be affected by the Proposed Action (see Section 3.3.3)."
EF-72	Energy Fuels	4	4-46		4.3.4.2.1	This paragraph indicates that lek surveys should be performed within 4 miles of the Project disturbance (ESA-10). Refer to Comment EF-37.	See Response to Comment EF-37, above.

Comment No.	Comments From	Chapter	Page No.	Lines	Section	Comment	BLM Response
EF-73	Energy Fuels	4	4-48		4.3.4.4.1	This paragraph discusses occurrence of raptor nests within the Project Area. As part of the existing Permit to Mine, Energy Fuels is performing annual raptor surveys, which are included in the Annual Reports to the LQD (with copy to the BLM). As such, Real West completed a raptor survey in 2014.	The text has been updated to include discussion of annual surveys.
EF-74	Energy Fuels	4	4-53		4.3.4.8.1	As part of the referenced BLM mitigation measures for limber pine, this paragraph indicates that “BLM may determine that transplanting some of the healthy limber pine trees to previously disturbed areas within the Project Area would be effective reclamation.” (BWSS-1) As a note, the AML is currently maintaining an on-site limber pine nursery as part of the McIntosh Pit reclamation project, and plans to transplant these trees. We recommend that AML’s success with this effort be monitored to assess whether or not this is a viable approach for future reclamation at the Project.	Depending on the success of the WDEQ-AML effort, BLM will consider its applicability to the proposed Project.
EF-75	Energy Fuels	4	4-58		4.3.5.2.1	Under the BLM Mitigation Alternative, the BLM indicates that “speed limits of 35 miles per hour from Jeffrey City to the Project Area would be enforced by Energy Fuels.” However, the speed limit on this county road is not within Energy Fuels’ jurisdiction. Refer to Comment EF-38.	Measures W-1 and ESA-7 (now ESA-6) have been revised to clarify that the measure would require Energy Fuels to implement measures to ensure employees maintain safe speed limits to limit collisions with wildlife. The W-1 and ESA-7 (now ESA-6) Measure would not require Energy Fuels to post speed limits on public roads.
EF-76	Energy Fuels	4	4-62		4.4.1.1.1	Regarding cultural site 48FR7357, it is noted that SHPO determined that the site is not eligible for listing in the NRHP. Prior to the SHPO’s non-concurrence with the BLM’s recommendation to list the site, Energy Fuels “offered to install signage along Big Eagle Road or Crooks Gap adjacent to the Project Area during construction of the ore processing facility” in lieu of physical avoidance of the feature. Further, this paragraph indicates that the “BLM and SHPO are requesting physical avoidance of the site.” This is considered feasible for the off-site processing alternative, but not the on-site processing alternative.	The following language was added to CR-3: "If physical avoidance is not possible, interpretive signage would be developed and installed along public roads by Energy Fuels in coordination with the BLM."
EF-77	Energy Fuels	4	4-76		4.4.4.1.1	This paragraph provides the estimated annual production rates for uranium (388 to 1,736 pound); however, the values reported should be multiplied by 1000.	The sentence has been revised to read as follows: "Under the Proposed Action, estimated annual production would range from a low of 388,000 pounds of uranium in the early years of Operations to a high of 1,736,000 pounds during peak production years (BRS Engineering, 2012)."
EF-78	Energy Fuels	4	4-91		4.4.6.2.1	This section refers to the proposed “Travel Management Plan.” Refer to Section 1.4 of this letter.	Reference to the "Travel Management Plan" has been removed in the FEIS.
EF-79	Energy Fuels	5	5-11		5.3.1	This paragraph indicates that AML plans to commence reclamation of the McIntosh Pit in 2015; however, reclamation work commenced in mid-2014.	The sentence has been revised to read as follows: "The WDEQ-AML program commenced Project 16-O in mid-2014."
	Wyoming Game and Fish Department					The WGFD recommends that proposed on-site processing be used to reduce impacts to Greater Sage-grouse in the project area. On-site processing will greatly reduce truck traffic proposed on the existing county roads. On-site processing is proposed in DEIS at the southwest (SW) corner of the project area. The proponent should be aware of the Greater South Pass core area boundary which overlaps the SW corner of the project area. Any disturbance in core area will need to have a DDCT analysis performed.	The FEIS is clear in stating that the decision as to whether on site or offsite processing be completed is that of Energy Fuels' not BLM's. For this reason, the Proposed Action Alternative has two options analyzed separately, on-site processing and off-site processing. The BLM's records and maps of the Greater South Pass core area boundary do not indicate overlap with the Project Area as suggested; rather, the core area boundary is just south and north of the Project Area. However, transportation to the Sweetwater Mill is indeed proposed to occur within core area and is analyzed in the FEIS. There is currently no new disturbance associated with this hauling in core area so a DDCT would not apply.
	Wyoming Game and Fish Department					Due to the proximity of the project site to core area, any on-site processing should include mosquito abatement, to reduce the spread of West Nile Virus to sage-grouse.	The BLM Mitigation Alternative in the FEIS includes measure ESA-4 (formerly ESA-5) to limit potential impacts to sage grouse as a result of mosquitos as suggested.
	Wyoming Game and Fish Department					Fencing should be kept to the minimum needed for safety and marked to reduce grouse mortality.	The BLM Mitigation Alternative in the FEIS includes measure ESA-3 (formerly ESA-4) to limit potential impacts to sage grouse as a result of fences as suggested.
	Wyoming Game and Fish Department					Predators perching and nesting sites should be discouraged to prevent predation on nesting grouse.	BLM Mitigation Alternative in the DEIS includes Measure ESA-2 (formerly ESA-3) to limit impacts to grouse from perched birds as suggested.

Appendix 2-A
Transportation Plan

Transportation Plan

Sheep Mountain Project

Energy Fuels Resources (USA), Inc.
225 Union Blvd., Suite 600
Lakewood, CO 80228

Presented to:

Bureau of Land Management
Lander Field Office
Lander, WY

March 2016

TRANSPORTATION PLAN
SHEEP MOUNTAIN PROJECT

1.1 INTRODUCTION

This Transportation Plan addresses traffic and road use associated with the Energy Fuels Resources (USA) Inc. (Energy Fuels) Sheep Mountain Project (Project). The Project Area is located in Fremont County, Wyoming, approximately 8 miles south of Jeffrey City, 57 miles southeast of Lander, 62 miles southeast of Riverton, 67 miles north of Rawlins, and 105 miles southwest of Casper.

Open pit and underground mining methods will be used to extract uranium ore from the Project Area. For analysis purposes, it is assumed that an on-site processing facility will be constructed and that ore will be processed on-site. It also considers the possibility that an on-site processing facility would not be constructed and ore would be processed off-site (Sweetwater Mill). Based on currently identified resources, the open-pit mine is expected to have an 8 year mine life. Development of the underground mine will be deferred for up to 5 years and is expected to have an 11 year mine life. The overall project life is anticipated to be 20 years from initial construction to completion of final reclamation activities.

The Sheep Mountain Project Area will be accessed using existing federal and state highways and county roads. Access routes and rights-of-way are pre-existing. Within the Project Area, existing roads will require upgrades and new roads will be constructed.

This Transportation Plan addresses roads that may be used to access the Project Area and roads within the Project Area. The plan describes existing roads and roads identified for upgrade/construction; identifies the parties responsible for road maintenance; and estimates traffic levels associated with construction and operation of the Project.

1.2 ACCESS ROUTES

1.2.1 Primary Access Routes in the Vicinity of the Project Area

Road types, or functional classifications, describe the functions that roads serve in facilitating traffic flows within a transportation network. Arterial roads, such as interstates and state highways, connect population centers, accommodate high traffic volumes and have limited access. Collector roads include federal, state, county, and municipal roads that provide primary access through towns or to large blocks of land, and are generally two lanes wide. Table 1 lists the arterial and collector roads in the Project Area's transportation network that could be used for project access. The table also indicates road surfacing and identifies the parties responsible for road maintenance.

Table 1
Potential Access Routes

Road Name	Road Type	Surface Type	Maintenance Responsibility
US Highway 287	Arterial	Paved	WYDOT[1]
Wyoming State Highway (WY) 135 (Sand Draw Road)	Arterial	Paved	WYDOT[1]
WY 136 (Gas Hills Road)	Arterial	Paved	WYDOT[1]
WY 220	Arterial	Paved	WYDOT[1]
WY 789	Arterial	Paved	WYDOT[1]
Crooks Gap Road (Fremont County Road –CR 318)	Collector	Unpaved[2]	Fremont County
Wamsutter Road (Sweetwater CR 23	Collector	Unpaved[2]	Sweetwater County
Minerals Exploration Road (Sweetwater CR 63)	Collector	Unpaved between Sweetwater CR 23 and Sweetwater Mill, Paved between Sweetwater Mill and Carbon County line	Sweetwater County, Sweetwater Mill[3]
BLM Road 3206	Collector	Paved	BLM, Sweetwater Mill[4]

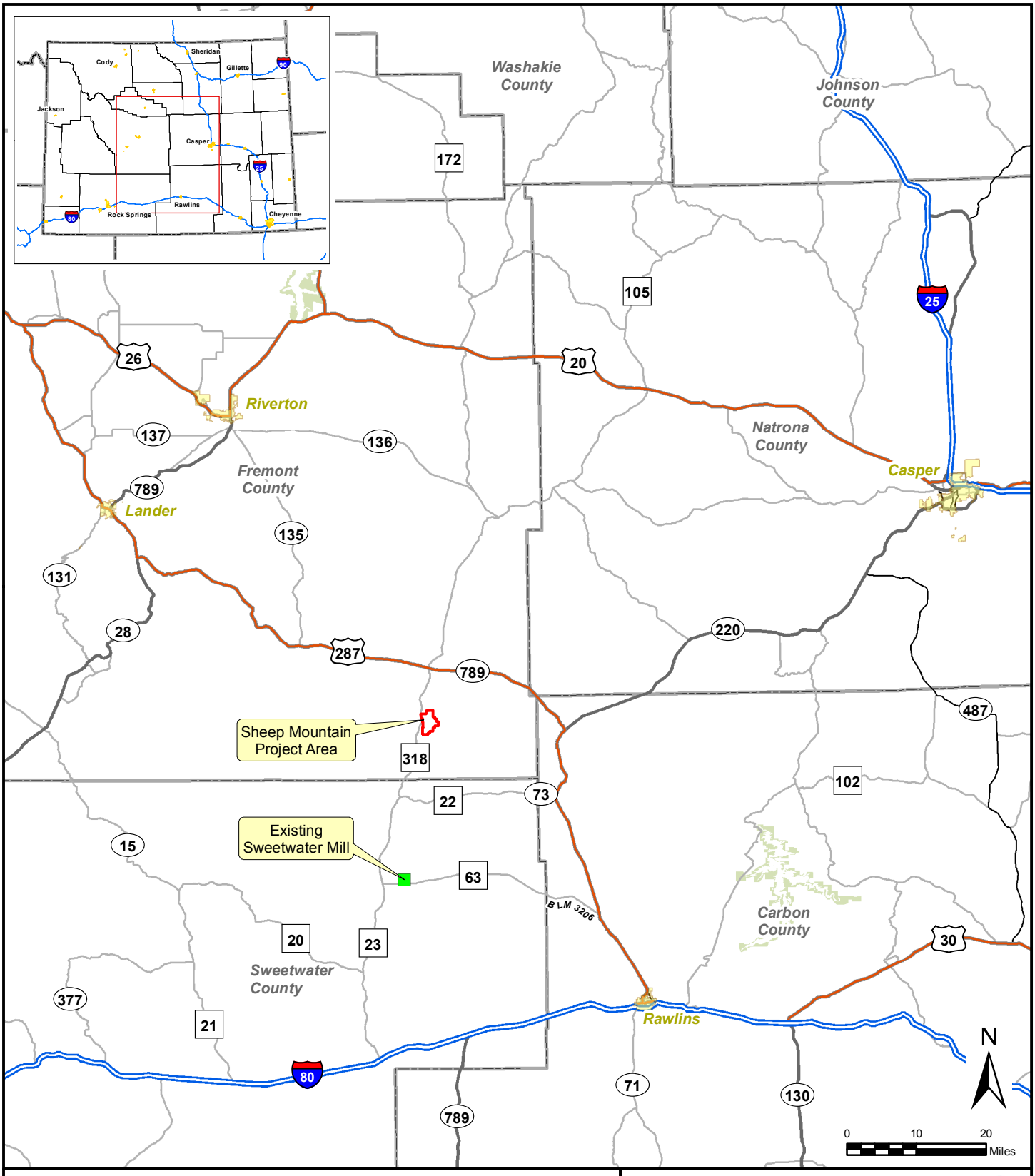
[1] WYDOT = Wyoming Department of Transportation.
[2] Improved gravel surface treated with magnesium chloride.
[3] The Sweetwater Mill conducts road maintenance on county roads 23 and 63 under county road use, improvement, and maintenance agreements with Sweetwater County.
[4] The BLM provides minimal maintenance along BLM Road 3206. The Sweetwater Mill conducts periodic road maintenance under its right-of-way agreement with the BLM.

Local and resource roads include BLM, county, municipal, and private roads that link areas with low traffic volumes to higher classification roads. Local roads connect to collector roads and serve a smaller area than collector roads, and may be one or two lanes with lower traffic volumes. Resource roads provide point access, connecting to local or collector roads, and are single lanes to individual facilities. Primary access routes to the Sheep Mountain Project Area include arterial and collector roads.

1.2.2 Access Routes

1.2.2.1 Access Roads to the Project Area

Travel routes for most workers and supplies travelling to the Project Area are expected to originate in Riverton, Lander, and Rawlins. Some supply routes may also originate in Casper. For off-site processing, trucks will haul ore extracted from the Sheep Mountain Mine to the Sweetwater Mill, which is located 33 miles south of the Project Area (see Map 1).



Map 1

Transportation Plan

Sheep Mountain Project Area Access Routes

Fremont County, WY

From Riverton, Project-related traffic will access the Project Area by heading south on South Federal Boulevard (Wyoming State Highway 789) and turning left onto Wyoming State Highway 136 (WY 136). The access route follows WY 136 for approximately 1.2 miles and merges into WY 135. Traffic will proceed 35 miles south on WY 135 to its junction with US Highway 287 (US 287) at Sweetwater Station and then travel east for 19 miles on US 287 (also WY 789) to Jeffrey City. From there, traffic will turn right onto Fremont County Road (CR) 318 (Crooks Gap Road) and proceed 9 miles south to turn left on Project Access Road, which is the Project Area's primary point of ingress and egress. A secondary access road into the Project Area, Hanks Draw Road, is located approximately 1 mile north of the Project Access Road.

From Lander, Project traffic will travel 57 miles southeast on US 287 to Jeffrey City, and from Rawlins, project traffic will travel 67 miles northwest on US 287 to Jeffrey City. From Casper, project traffic will travel 74 miles southwest on US 220 to its junction with US 287 at Muddy Gap, and continue 23 miles west on US 287 to Jeffrey City. From Jeffrey City, all traffic will use Crooks Gap Road to access the Project Area as described above.

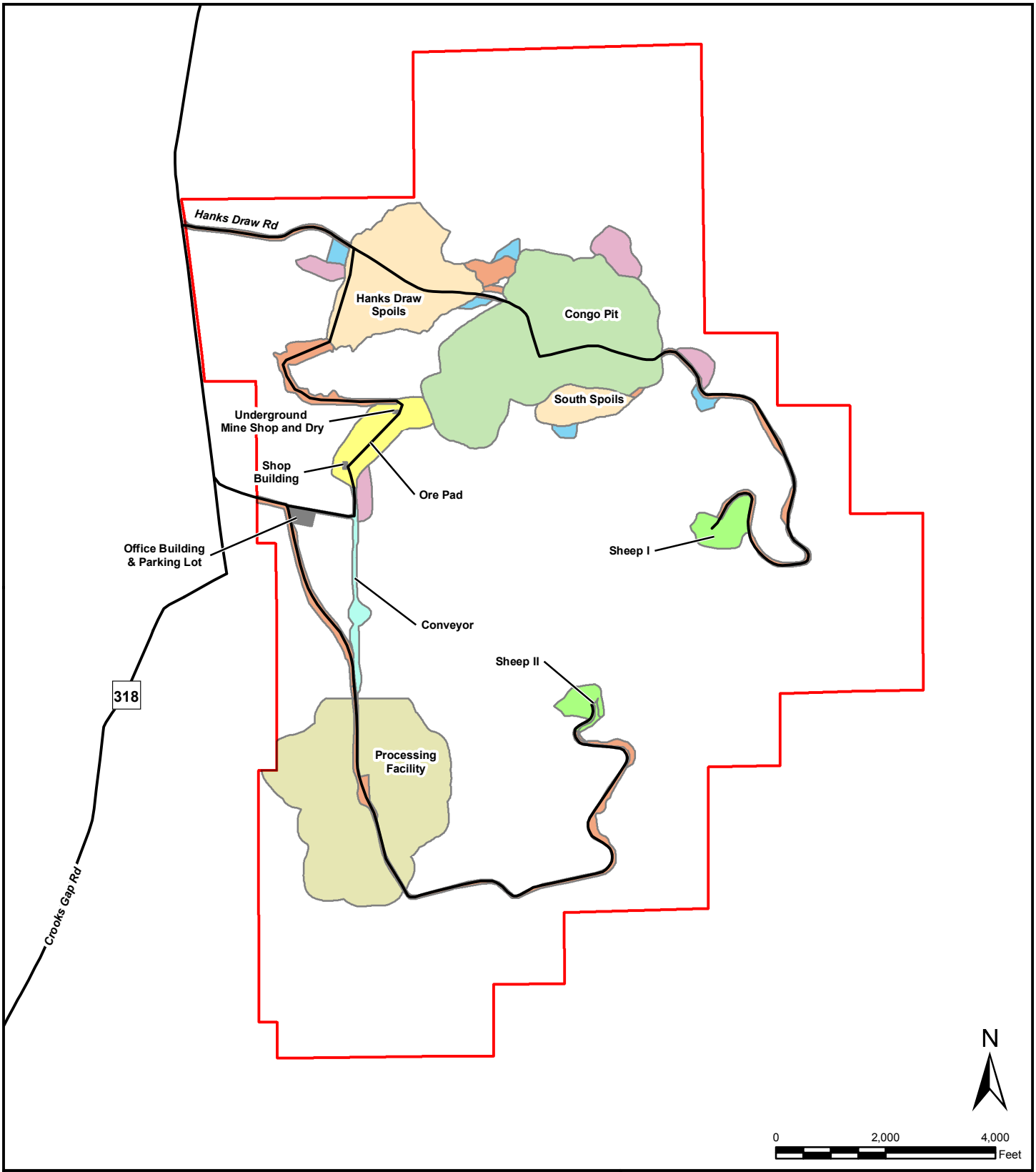
If ore is processed off-site, trucks will haul ore from the Project Area to the Sweetwater Mill by travelling approximately 10 miles south on Crooks Gap Road to enter Sweetwater County, where the road becomes Sweetwater CR 23 (Wamsutter Road), and continuing 16 miles to CR 63 (Minerals Exploration Road). Vehicles will turn left (east) onto Minerals Exploration Road and travel approximately 4 miles to the Sweetwater Mill entry road.

Processed ore from the Project Area will be trucked from the processing facility to a conversion plant in Metropolis, Illinois via Interstate-80. For on-site processing, the processed product will be transported on US 287 to access Interstate-80 at Rawlins. For processing at the Sweetwater Mill, the processed product will travel approximately 20 miles east on Minerals Exploration Road (Sweetwater CR 63) to the Carbon County line. From there, traffic will continue 10 miles east on BLM Road 3206 to access US 287 north of Rawlins. Weather permitting, haul trucks leaving the Sweetwater Mill could also travel 22 miles south on Wamsutter Road to access Interstate-80 at Wamsutter.

1.2.2.2. Access Roads within the Project Area

The Project Area is accessed from Crooks Gap Road by Hanks Draw Road and the Project Access Road (see Map 2). Within the Project Area, existing roads will require upgrades and new road construction will be used to access the project facilities.

Hanks Draw Road will provide access to the Hanks Draw Spoils Facility. The road will be extended along the south side of the spoils pile to access the open pit mine (Congo Pit). During pit operations, a road will be extended along the southern side of the Congo Pit and eastern side of the Project Area to provide continuous access to the Sheep I Shaft to the underground mine.



Legend

- Sheep Mountain Project Area
- Access Roads

Proposed Action Disturbance Footprint

- Congo Pit
- Processing Facility
- Ore Pad
- Pad
- Topsoil Stockpile
- Spoils
- Ponds
- Conveyor
- Roads
- Buildings and Parking

Map 2

Transportation Plan
Roads in the Vicinity of the
Sheep Mountain Project Area

Fremont County, WY

From the site's entry along the Project Access Road, vehicles will proceed east to access the site office. The route forks near the office. To the left, a new road will extend north for approximately 1.7 mile through the ore pad area and Hanks Draw Spoils Facility. Just beyond the main gate, an existing 1.1 mile road will also access the On-Site Ore Processing Facility. An existing 2.0 mile road through the processing facility will provide on-site access to the Sheep II Shaft. The road will be extended around the processing facility to provide continuous access to the Sheep II Shaft.

Use of roads within the Project Area will be restricted to authorized personnel only. Access to the Project Area will be controlled by barbed-wire fencing and/or gates at all defined points of ingress and egress. Public access to the mine and processing facility will be controlled through a single entrance at the Project Access Road with a guard house manned during operating hours and gated at all other times. Hanks Draw Road will be gated and opened for deliveries, maintenance, and inspections on an as-needed basis.

1.3 ROAD CONSTRUCTION AND IMPROVEMENTS

On-site haul roads will be crowned and ditched to quickly shed any direct precipitation, and culverts will be installed to convey runoff from first and second order drainages that are crossed by the haul roads. Berms reaching the midpoint of the wheel of the largest equipment on site will be installed in any area where the potential for equipment tipping exists in accordance with Mine Safety and Health Administration (MSHA) regulations. Berms may be utilized to divide opposing lanes of travel to provide further protection against collision. Haul roads will be surfaced with site-produced sandy gravel passing a 3/8-inch screen, to provide a surface which minimizes tire wear, is easily maintained, reduces fugitive dust emissions, and does not become slick when wet. A motor grader will maintain haul roads on a full-time basis. Off-road water trucks will apply water to roadway surfaces to control dust and promote surface compaction on an as-needed basis. For the use of county roads, as off-site haul roads, road maintenance and improvements will be coordinated with Fremont and Sweetwater counties through road use, maintenance and improvement agreements. These agreements will be finalized prior to road use.

1.4 ROAD MAINTENANCE

Energy Fuels will coordinate with the Wyoming Department of Transportation (WYDOT) and Fremont County, and in the event of off-site processing, Sweetwater County and the BLM so that use of state highways and county and BLM roads is consistent with issued use permits, rights-of-ways, and other state and county requirements. Energy Fuels anticipates that any county road improvement or maintenance, prior to or during construction, will be coordinated through an agreement with the appropriate county. WYDOT maintains paved access roads leading to the Project Area. Fremont County maintains Crooks Gap Road and Sweetwater County maintains the Crooks Gap/Wamsutter Road (4-23) and the Minerals Exploration roads (4-63) (see Table 1). Both counties provide limited winter maintenance on the roads within their jurisdiction. Sweetwater County provides year-round maintenance on the northern portion of the Crooks Gap/Wamsutter Road through an agreement with Lost Creek Uranium. Energy Fuels will coordinate the maintenance of county roads with Fremont and Sweetwater counties based on county road use, improvement, and maintenance agreements that will be implemented prior to road use.

The BLM provides minimal maintenance on BLM Road 3206. It should be noted that this road has a posted 20 ton weight limit. The Sweetwater Mill has a BLM right-of-way on this route and conducts periodic roadway maintenance as part of its right-of-way agreement. In the event of additional commercial use of BLM Road 3206, the BLM would require commercial users to enter maintenance cost-sharing agreements with one another and the BLM.

Energy Fuels will maintain on-site roads in accordance with BLM 9113 Manual specifications (BLM, 2011). Most roads in the Project Area will be wider with greater vertical clearance than those specified in the manual to accommodate large mine equipment. Energy Fuels will be responsible for all maintenance actions necessary to provide all-weather access to the Project Area. In addition, Energy Fuels will provide timely maintenance and cleanup of access roads to pre-existing conditions. Energy Fuels' county road use, improvement, and maintenance agreements with Fremont and Sweetwater counties will include provisions addressing the repair of existing roads due to damages caused by construction and/or operational traffic.

Maintenance will include, but not be limited to: dust abatement; reconstruction of the crown, slope, and/or water bars; blading or resurfacing; material application; clean-out of ditches, culverts, catchments; snow plowing, and other best management practices (BMPs).

Roads will not be bladed directly up drainages and will be designed at right angles to the drainage, as feasible. Roads bladed in drainages will be located a sufficient height above the channel so that fill material does not enter the drainage channel.

Saturated soil conditions may exist when water is flowing on the ground surface. Examples of saturated conditions include: water comes to the ground surface from walking or driving across the soil; the ground surface is spongy when walked upon; ruts 3 inches or deeper result from driving across the ground surface; vehicles get stuck in the mud; or a bulldozer is needed to pull vehicles through the mud. When saturated soil is present, construction travel will be halted until the road dries out or is frozen sufficiently for use to proceed without undue damage and erosion to soils and roads. Road maintenance or upgrades will be conducted when rutting of the travel-way reaches a depth of 3 inches.

Dust suppression will be implemented by spraying water on unpaved roads on an as-needed basis. Magnesium chloride and other surfactants, binding agents, or other dust-suppression chemicals will not be used for dust control without prior approval from the BLM.

1.5 ROADWAY SAFETY

All ore shipments will be conducted in accordance with applicable U.S. Department of Transportation (USDOT) and MSHA regulations. The required documents will be prepared for each shipment and will accompany the shipment to its destination. Federal regulations also mandate that ore shipments be tarped to reduce the potential for accidental spillage or fugitive dust. WYDOT requires commercial carriers to comply with federal regulations covering the transportation of hazardous materials, and has not issued separate regulations. There are no hazardous material route designations in Wyoming.

If ore is processed off-site, ore haulage to the Sweetwater Mill will be contracted to one or more trucking companies who will be responsible for developing and implementing an Emergency Response Plan in the event of an accident, obtaining required road use permits, and obeying all traffic rules. Emergency response and remediation services in the event of an accident may be supported by the Sheep Mountain Mine, provided that the ore haulage contractor requests this service as part of the contractual arrangement. Materials transported to the mine and processing facility will primarily include diesel fuel, chemical reagents for mineral processing, underground mine materials, and explosives. Items transported from the processing facility will primarily consist of concentrated uranium ore (yellowcake), which is a solid product packaged in USDOT-approved 55 gallon drums for shipment. The USDOT requires trucking companies that transport these materials to have emergency response plans in place to respond to accidents and cargo spills. As part of its contracting program, Energy Fuels will verify that its trucking contractors have such plans in place.

1.6 TRAFFIC LEVELS

1.6.1 Construction Traffic

Development Schedule

The Sheep Mountain Project will be constructed under a staggered development schedule. The Congo Pit will be developed sequentially to accommodate the desired mine production and allow for internal backfilling. Because the Congo Pit does not require large pre-stripping, mining personnel will also develop the mine during the project's first year (Year 1). Development of the underground mine will be deferred for up to 5 years after surface mining commences. Construction of the On-Site Ore Processing Facility is expected to begin 6 months prior to development of the Congo Pit.

On-Site Processing

Under the schedule outlined above, traffic related to construction of the On-Site Ore Processing Facility is estimated to include between 40 and 61 vehicle round-trips per day during the first 6 months of project development. Construction of the processing facility will overlap with development of the open pit mine for approximately three months in Year 1, when construction traffic is expected to include between 48 and 71 vehicle round trips per day (see Table 2). Construction of the underground mine is estimated to include between 18 and 25 vehicles a day for approximately 18 months sometime after Year 1. This traffic will overlap with operational traffic at the open pit mine and processing facility.

Off-Site Processing

For transportation to the Sweetwater Mill (if ore is processed off-site), construction traffic will include between 8 and 10 vehicles per day for the open pit mine, and between 18 and 25 vehicles per day for the underground mine. Construction traffic for the underground mine will overlap with operational traffic for the open pit mine.

Table 2
Estimated Range of Vehicle Round-Trips per Day During Construction

Project Component	Project Schedule	Light Vehicles	Heavy Vehicles	Total Vehicles
Open Pit Mine	12 months in Year 1	8 -10[1]	0[2]	8 – 10
Underground Mine[3]	18 Months after Year 1	20 - 25[4]	0[2]	18 – 25
Processing Facility				
On-Site Processing	9 Months in Years 0 - 1[5]	35 - 55[6]	5 - 6[2, 7]	40 – 61
Off-Site Processing	--	0	0	0

Assumptions:
[1] Assumes that between 15 and 20 workers are required to develop the open pit mine. Vehicle estimates include workers' personal vehicles, assuming two workers per vehicle.
[2] Assumes that heavy equipment remains on-site during construction.
[3] Development of the underground mine will be deferred for up to 5 years depending on financing and market conditions.
[4] Development of the underground mine will include between 20 and 30 workers to drive the double-entry decline and 20 workers to conduct rehabilitation in the mine. Vehicle estimates include workers' personal vehicles, assuming two workers per vehicle.
[5] Construction of the processing facility is expected to begin 6 months prior to Year 1.
[6] Includes personal vehicles for 70 to 110 processing facility construction workers, assuming two workers per vehicle.
[7] Includes 302 truckloads of materials delivered between 135 and 270 days. Also assumes that durable rock material is obtained off-site.

1.6.2 Operational Traffic

On-Site Processing

Traffic related to operation of the Sheep Mountain Project is expected to include between 55 and 107 vehicle round trips per day. The lower-bound estimate assumes that the project is operating at less than full capacity with partial workforce levels and the upper-bound estimate assumes that the project is operating at full capacity with peak workforce levels. Operational traffic will be highest when the underground mine will be producing ore. Prior to that time, operations-only traffic is estimated to include between 32 and 43 vehicle round-trips per day (see Table 3).

Off-Site Processing

For processing at the Sweetwater Mill (if ore is processed off-site), operational traffic is estimated to include between 89 and 180 vehicle round trips per day. Approximately half of this traffic will consist of trucks hauling ore from the Project Area to the Sweetwater Mill. During the project's early years, when only the Congo Pit will be producing ore, operational traffic is estimated to include between 57 and 116 vehicle round-trips per day.

Table 3
Estimated Range of Vehicle Round-Trips per Day During Operations

Project Component	Light Vehicles	Heavy Vehicles	Total Vehicles
Open Pit Mine	10 - 21[1]	0[2]	10 – 21
Underground Mine	32 - 64[3]	0[2]	32 – 64
Processing Facility			
On-Site Processing	10 - 18[4]	3 - 4[5]	13 – 22
Off-Site Processing	7 - 15[6]	40 - 80[7]	47 – 95

Assumptions:

[1] Includes personal vehicles for between 20 and 41 open pit mine workers, assuming two workers per vehicle.

[2] Assumes that mine support vehicles, water trucks and mechanical service trucks remain on-site.

[3] At full production, the underground mine is expected to employ 128 workers over two shifts. Lower production levels may require only one daily work shift. The estimated vehicle range includes personal for between 64 and 128 underground mine workers, assuming two workers per vehicle.

[4] Includes personal vehicles for 20 to 35 processing plant workers, assuming two workers per vehicle.

[5] Includes approximately one yellow cake shipment per week, one delivery of sodium chlorate per week, nine shipments of sulfuric acid per week, two shipments of miscellaneous chemicals (sodium carbonate, hydrogen peroxide, sodium hydroxide, hydrated lime) per week, one fuel delivery per day, and two shipments per week of domestic solid wastes to the Jeffrey City Transfer Station.

[6] Includes personal vehicles for between 7 and 15 haul truck drivers, assuming one worker per vehicle.

[7] Assumes between 7 and 15 haul trucks make up to 5.3 round trips per day between the Project Area and Sweetwater Mill (assumed cycle time of two hours). Assumes that haul trucks remain on-site when not in use.

Project traffic is expected to peak at 107 vehicle round-trips per day with an on-site processing facility and at 180 vehicle round-trips per day with off-site processing. Peak traffic would occur with both the open pit and underground mines in operations. Development of the underground mine may be deferred up to 5 years, depending on financing and market conditions.

1.6.3 Final Reclamation Traffic

Final reclamation of the Project Area will be conducted for approximately 2 years after mining is complete. Traffic during final reclamation is estimated to include between 32 and 39 vehicle round-trips per day. If ore is processed off-site, final reclamation traffic is estimated to include between 12 and 15 vehicle round-trips per day (see Table 4).

Table 4
Estimated Vehicle Round-Trips per Day During Final Reclamation

Project Component	Light Vehicles	Heavy Vehicles	Total Vehicles
Open Pit Mine	10 - 12[1]	0[2]	10 - 12
Underground Mine	2 - 3[3]	0[2]	2 - 3
Processing Facility			
On-Site Processing	10 - 12[4]	10 - 12[5]	20 - 24
Off-Site Processing	0	0	0

Assumptions:
[1] Includes personal vehicles for between 20 and 24 reclamation workers, assuming 2 workers per vehicle.
[2] Assumes that heavy vehicles required for mine reclamation remain on-site.
[3] Includes personal vehicles for 4 to 6 reclamation workers, assuming two workers per vehicle.
[4] Includes personal vehicles for between 20 and 24 reclamation workers, assuming two workers per vehicle.
[5] Assumes that reclamation will occur over a two year period, and that materials for the radon barrier (i.e. clay), riprap and other durable rock layers will be sourced off-site.

1.7 REFERENCES

Bureau of Land Management, 2011. Manual 9113 – Roads. Manual Transmittal Sheet Release 9-390. October 21.

Bureau of Land Management and Forest Service (BLM and Forest Service). 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. Gold Book. Fourth Edition.

Appendix 2-B
Monitoring Summary

Table 1
Summary of Site Environmental Monitoring Program

MEDIA	LOCATIONS	FREQUENCY	PARAMETERS	AGENCY REQUIRING SAMPLING
Surface Water	Crooks Creek: XSCCMU, XSCCUS, & XSCCDS Sediment Ponds As specified in WDEQ-LQD Permit to Mine 381C. Ephemeral Impoundments: SW-2 & SW-3 On-Site Mill (if constructed): New impoundment locations to be determined by NRC.	Quarterly As water is available after rainfall	Field Measurements: Conductivity, DO, pH, Temperature, TSS, Turbidity, & Flow Rate (in creek). Lab Analyses: General Water Quality: Alk,Cond, F, NH4, NO2+NO, pH, SiO2, & TDS Major Cations & Anions: Ca, Cl, CO3, HCO3 K, Mg, Na, K, & SO4 Metals: Al, As, Ba, Be, Bo, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, V, & Zn Radionuclides: Gross Alpha, Gross Beta, Pb–210, Po–210, Ra–226, Ra–228, Th–230, & Unat	WDEQ/LQD & NRC (NRC may require additional sampling as part of license.)
Treated Dewatering Discharge	Outfall	Daily Weekly Monthly Quarterly	# of days of discharge & Oil & Grease Flow & TSS Ra-266, Ra-226+228, Se, U, & Zn COD, pH, & Zn	WDEQ/WQD (per WYPDES permit)
Groundwater	Mine: Existing Wells: MW–6NEW, MW–10~~,~~ PZ–1, PZ–3, P–4, PZ–8, PZ–9, & PZ-10 New Wells: MW–11, MW–12, MW–13, & MW–14 On-Site Mill (if constructed): G–3, G–4, G-5, G–6, G–7, G–8, & Point of Compliance Wells (new wells, locations to be determined by NRC)	Quarterly	Same parameters as for Surface Water but omit Turbidity & TSS and, in place of Flow Rate add Water Level.	WDEQ/LQD & NRC (NRC may require additional sampling as part of license.)

MEDIA	LOCATIONS	FREQUENCY	PARAMETERS	AGENCY REQUIRING SAMPLING
Air	**Mine: (TBD)** **Mill:** AM-4, -5, -6, -7, -8, -9, -10	As required by WDEQ/AQD Permit (TBD) Continuous measurement, Quarterly sampling	TBD Unat, Ra-226, Th-230, Pb-210 and Radon	WDEQ NRC
Noise	Permit Boundary, Mine Areas (TBD)	Quarterly	dB	MSHA/NIOSH
Soil	Downwind of Mill Area (TBD)	Annual	Unat, Ra-226, Th-230, Pb-210	NRC
Vegetation	Downwind of Mill Area (TBD)	Annual	Unat, Ra-226, Th-230, Pb-210	NRC
Wildlife	Raptors Large Game Sage Grouse	Seasonal, annually Seasonal, annually Seasonal, annually	Visual Observations	WDEQ WDEQ WDEQ

Table 2
Operational Monitoring

MEDIA	LOCATIONS	FREQUENCY	PARAMETER TABLE	AGENCY
Stability/SWPPP	**Mine:** (as per SWPPP) **Mill:** (as per SWPPP)	Monthly, opportunistically after rainfall Monthly, opportunistically after rainfall	Visual observation of landform stability, sediment control, storm water discharge	WDEQ
Early Detection Monitoring	Heap Leach Pad Collection Pond Raffinate Pond Holding Pond Plant Buildings	Daily, Weekly, Monthly Annual	Unat, Ra-226, Th-230, Pb-210, Po-210, SO_4 as per license (TBD)	NRC
Personnel & Workplace	Radiation Control Areas	Personnel: Continuous, quarterly sampling Bioassay Workplace: throughout buildings	Radon-222, direct gamma Unat Radioparticulates, Radon-222 & daughters, Beta/gamma radiation	NRC

Appendix 3-A
Air Quality Monitoring Data

Table 1
Quarterly Passive Air Quality Radon Results[1]

Passive Monitoring Station ID	Start Date	End (seal) Date	Result (pCi-days/L)	Precision (pCi-days/L)	Avg. Radon Concentration (pCi/L)	Precision (pCi/L)
	2010 Q3					
AM-1	6/29/2010	9/30/2010	54.6	5.61	0.6	0.06
AM-2	6/29/2010	10/5/2010	48.7	5.16	0.5	0.05
AM-3	6/29/2010	10/5/2010	86.4	7.67	0.9	0.08
AM-4	6/29/2010	9/30/2010	108.3	8.9	1.2	0.10
AM-5	6/29/2010	9/30/2010	72.5	6.82	0.8	0.07
	2010 Q3					
AM-1	10/5/2010	1/4/2011	<30.0		<0.3	0.03
AM-2	10/5/2010	1/4/2011	36.8	3.85	0.4	0.04
AM-3	10/5/2010	1/4/2011	58.6	5.51	0.6	0.06
AM-4	9/30/2010	1/4/2011	88.4	7.39	0.9	0.08
AM-5	9/30/2010	1/4/2011	57.6	5.44	0.6	0.06
	2011 Q1					
AM-1	1/4/2011	4/3/2011	<30.0		<0.3	0.03
AM-2	1/4/2011	4/3/2011	<30.0		<0.3	0.03
AM-3	1/4/2011	4/3/2011	37.0	3.84	0.4	0.04
AM-4	1/4/2011	4/3/2011	<30.0		<0.3	0.03
AM-5	1/4/2011	4/3/2011	32.5	3.46	0.4	0.04
	2011 Q2					
AM-1	4/3/2011	7/5/2011	<30.0		<3.0	0.03
AM-2	4/3/2011	7/5/2011	51.6	5.19	0.6	0.06
AM-3	4/3/2011	7/5/2011	82.5	7.13	0.9	0.08
AM-4	4/3/2011	7/5/2011	88.7	7.47	1.0	0.08
AM-5	4/3/2011	7/5/2011	70.1	6.4	0.8	0.07
	2011 Q3					
AM-1	7/5/2011	9/27/2011	142.1	9.5	1.7	0.11
AM-2	7/5/2011	9/27/2011	<30.0		<0.3	0.03
AM-3	7/5/2011	9/27/2011	36.9	3.55	0.4	0.04
AM-4	7/5/2011	9/27/2011	63.7	5.44	0.8	0.06
AM-5	7/5/2011	9/27/2011	<30.0		<0.3	0.03
Claytor Ranch	6/20/2011	9/27/2011	120.4	8.5	1.2	0.09
AM-6	6/17/2011	9/27/2011	65.0	5.53	0.6	0.05

Passive Monitoring Station ID	Start Date	End (seal) Date	Result (pCi-days/L)	Precision (pCi-days/L)	Avg. Radon Concentration (pCi/L)	Precision (pCi/L)
AM-7	6/17/2011	9/27/2011	62.3	5.37	0.6	0.05
AM-8	6/17/2011	9/27/2011	148.3	9.7	1.5	0.10
AM-9	6/17/2011	9/27/2011	44.7	4.17	0.4	0.04
	2011 Q4					
AM-1	9/27/2011	1/5/2012	37.2	3.40	0.4	0.03
AM-2	9/27/2011	1/5/2012	31.9	2.99	0.3	0.03
AM-3	9/27/2011	1/5/2012	<30.0		<0.3	0.03
AM-4	9/27/2011	1/5/2012	<30.0		<0.3	0.03
AM-5	9/27/2011	1/5/2012	42.0	3.73	0.4	0.04
AM-6	9/27/2011	1/5/2012	<30.0		<0.3	0.03
AM-7	9/27/2011	1/5/2012	66.9	5.39	0.7	0.05
AM-8	9/27/2011	1/5/2012	75.3	5.89	0.8	0.06
AM-9	9/27/2011	1/5/2012	50.3	4.31	0.5	0.04
	2012 Q1					
AM-1	1/5/2012	3/28/2012	66.4	5.71	0.8	0.07
AM-2	1/5/2012	3/28/2012	51.7	4.74	0.6	0.06
AM-3	1/5/2012	3/28/2012	80.2	6.54	1.0	0.08
AM-4	1/5/2012	3/28/2012	58.1	5.18	0.7	0.06
AM-5	1/5/2012	3/28/2012	67.3	5.77	0.8	0.07
Claytor Ranch	1/5/2012	3/28/2012	251.8	13.5	2.9	0.15
AM-6	1/5/2012	3/28/2012	93.0	7.26	1.1	0.09
AM-7	1/5/2012	3/28/2012	51.0	4.54	0.6	0.05
AM-8	1/5/2012	3/28/2012	37.6	3.57	0.5	0.04
AM-9	1/5/2012	3/28/2012	68.0	5.64	0.8	0.07
	2012 Q2					
AM-1	3/28/2012	6/27/2012	53.3	4.57	0.6	0.05
AM-2	3/28/2012	6/27/2012	<30.0		<0.3	0.03
AM-3	3/28/2012	6/27/2012	59.6	4.98	0.7	0.05
AM-4	3/28/2012	6/27/2012	51.5	4.45	0.6	0.05
AM-5	3/28/2012	6/27/2012	45.3	4.02	0.5	0.04
Claytor Ranch	3/28/2012	6/27/2012	185.7	11.4	2.0	0.13
AM-6	3/28/2012	6/27/2012	31.0	2.94	0.3	0.03
AM-7	3/28/2012	6/27/2012	50.6	4.39	0.6	0.05
AM-8	3/28/2012	6/27/2012	115.1	8.0	1.3	0.09
AM-9	3/28/2012	6/27/2012	41.7	3.76	0.5	0.04

Passive Monitoring Station ID	Start Date	End (seal) Date	Result (pCi-days/L)	Precision (pCi-days/L)	Avg. Radon Concentration (pCi/L)	Precision (pCi/L)
	2012 Q3					
AM-1	6/27/2012	10/2/2012	43.2	3.96	0.4	0.04
AM-2	6/27/2012	10/2/2012	62.4	5.27	0.6	0.05
AM-3	6/27/2012	10/2/2012	131.3	9.0	1.4	0.09
AM-4	6/27/2012	10/2/2012	97.3	7.29	1.0	0.08
AM-5	6/27/2012	10/2/2012	72.5	5.90	0.7	0.06
Claytor Ranch	6/27/2012	10/2/2012	125.3	9.4	1.3	0.10
AM-6	6/27/2012	10/2/2012	112.9	8.1	1.2	0.08
AM-7	6/27/2012	10/2/2012	125.8	8.7	1.3	0.09
AM-8	6/27/2012	10/2/2012	263.7	13.9	2.7	0.14
AM-9	6/27/2012	10/2/2012	126.7	8.7	1.3	0.09
	2012 Q4					
AM-1	10/2/2012	1/3/2013	67.1	6.68	0.7	0.07
AM-2	10/2/2012	1/3/2013	59.4	6.16	0.6	0.07
AM-3	10/2/2012	1/3/2013	61.3	6.29	0.7	0.07
AM-4	10/2/2012	1/3/2013	93.4	8.26	1.0	0.09
AM-5	10/2/2012	1/3/2013	95.3	8.36	1.0	0.09
Claytor Ranch	10/2/2012	1/3/2013	255.5	14.5	2.7	0.16
AM-6	10/2/2012	1/3/2013	96.3	8.42	1.0	0.09
AM-7	10/2/2012	1/3/2013	89.4	8.03	1.0	0.09
AM-8	10/2/2012	1/3/2013	126.7	10.0	1.4	0.11
AM-9	10/2/2012	1/3/2013	100.2	8.6	1.1	0.09
AM-10	10/2/2012	1/3/2013	<30.0		<0.3	0.03
	2013 Q1					
AM-1	1/3/2013	3/28/2013	79.2	7.12	0.9	0.08
AM-2	1/3/2013	3/28/2013	78.3	7.06	0.9	78.3
AM-3	1/3/2013	3/28/2013	95.6	8.05	1.1	8.05
AM-4	1/3/2013	3/28/2013	62.9	6.08	0.7	0.07
AM-5	1/3/2013	3/28/2013	116.8	9.2	1.4	.11
Claytor Ranch	1/3/2013	4/3/2013	214.7	13.2	2.4	0.15
AM-6	1/3/2013	3/28/2013	76.3	6.94	0.9	0.08
AM-7	1/3/2013	3/28/2013	97.5	8.16	1.2	0.10
AM-8	1/3/2013	3/28/2013	118.8	9.2	1.4	0.11
AM-9	1/3/2013	3/28/2013	66.5	6.31	0.8	0.08
AM-10	1/3/2013	3/28/2013	56.8	5.65	0.7	0.07

Passive Monitoring Station ID	Start Date	End (seal) Date	Result (pCi-days/L)	Precision (pCi-days/L)	Avg. Radon Concentration (pCi/L)	Precision (pCi/L)
	2013 Q2					
AM-1	3/28/2013	6/26/2013	48.3	4.72	0.5	0.05
AM-2	3/28/2013	6/26/2013	<30.0		<0.3	0.03
AM-3	3/28/2013	6/26/2013	141.4	10.0	1.6	0.11
AM-4	3/28/2013	6/26/2013	<30.0		<0.3	0.03
AM-5	3/28/2013	6/26/2013	<30.0		<0.3	0.03
Claytor Ranch	4/2/2013	6/26/2013	197.9	12.5	2.3	0.15
AM-6	3/28/2013	6/26/2013	<30.0		<0.3	0.03
AM-7	3/28/2013	6/26/2013	<30.0		<0.3	0.03
AM-8	3/28/2013	6/26/2013	188.7	12.0	2.1	0.13
AM-9	3/28/2013	6/26/2013	114.9	8.7	1.3	0.10
AM-10	3/28/2013	6/26/2013	<30.0		<0.3	0.03

Table 2
Summary of Quarterly Passive Air Quality Radon Concentrations[1]

Passive Monitoring Station ID	Radon Concentrations (pCi/L)		
	Minimum	Maximum	Average
AM-1	<0.30	1.70	0.66
AM-2	<0.30	0.90	0.56
AM-3	0.40	1.60	0.88
AM-4	<0.30	1.20	0.79
AM-5	<0.30	1.40	0.67
Claytor Ranch	1.20	2.90	2.11
AM-6	<0.30	1.20	0.85
AM-7	0.60	1.30	0.86
AM-8	0.50	2.70	1.46
AM-9	0.40	1.30	0.84
AM-10	0.70	0.70	0.70

Table 3
Passive Air Monitoring Station Gamma Results

Passive Monitoring Station ID	OSL Issue Date	Field Installation Date	Monitoring End Date	Processed Date	Landauer's GROSS Result (mrems)	Estimated Dose During Monitoring Period (mrem)	Estimated Daily Field Dose (mrem)	Estimated Field Dose Rate (mrem/hour)
3rd Quarter 2010								
AM-1	6/17/2010	7/1/2010	10/5/2010	10/26/2010	44.2	34.6	0.360	0.015
AM-2	6/17/2010	7/1/2010	10/5/2010	10/26/2010	86.5	76.9	0.801	0.033
AM-3	6/17/2010	7/1/2010	10/5/2010	10/26/2010	214.2	204.6	2.131	0.089
AM-4	6/17/2010	7/1/2010	9/30/2010	10/26/2010	76.7	65.7	0.722	0.030
AM-5	6/17/2010	7/1/2010	9/30/2010	10/26/2010	60.2	49.2	0.540	0.023
Deploy Control	6/17/2010			10/26/2010	66.2			
Transit control	6/17/2010			10/26/2010	36.1			
4th Quarter 2010								
AM-1	9/7/2010	10/1/2010	1/4/2011	1/26/2011	45.9	34.3	0.361	0.015
AM-2	9/7/2010	10/1/2010	1/4/2011	1/26/2011	85.9	74.3	0.782	0.033
AM-3	9/7/2010	10/1/2010	1/4/2011	1/26/2011	184.8	173.2	1.823	0.076
AM-4	9/7/2010	10/1/2010	1/4/2011	1/26/2011	60.1	48.5	0.510	0.021
AM-5	9/7/2010	10/1/2010	1/4/2011	1/26/2011	58.6	47.0	0.494	0.021
Deploy Control	9/7/2010			1/26/2011	56.8			
Transit control	9/7/2010			1/26/2011	35.7			
1st Quarter 2011								
AM-1	12/06/2010	1/4/2011	4/3/2011	4/14/2011	35.6	24.6	0.276	0.011
AM-2	12/06/2010	1/4/2011	4/3/2011	4/14/2011	64.8	53.8	0.604	0.025
AM-3	12/06/2010	1/4/2011	4/3/2011	4/14/2011	178.4	167.4	1.880	0.078
AM-4	12/06/2010	1/4/2011	4/3/2011	4/14/2011	64.7	53.7	0.603	0.025
AM-5	12/06/2010	1/4/2011	4/3/2011	4/14/2011	50.0	39.0	0.438	0.018
Deploy Control	12/06/2010			4/14/2011	59.2			
Transit control	12/06/2010			4/14/2011	35.6			
2nd Quarter 2011								
AM-1	3/07/2011	4/3/2011	7/5/2011	10/19/2011	45.9	NC		
AM-2	3/07/2011	4/3/2011	7/5/2011	10/19/2011	81.8	NC		

Passive Monitoring Station ID	OSL Issue Date	Field Installation Date	Monitoring End Date	Processed Date	Landauer's GROSS Result (mrems)	Estimated Dose During Monitoring Period (mrem)	Estimated Daily Field Dose (mrem)	Estimated Field Dose Rate (mrem/hour)
AM-3	3/07/2011	4/3/2011	7/5/2011	10/19/2011	203.5	NC		
AM-4	3/07/2011	4/3/2011	7/5/2011	10/19/2011	83.7	NC		
AM-5	3/07/2011	4/3/2011	7/5/2011	10/19/2011	60.0	NC		
3rd Quarter 2011								
AM-1	06/06/2011	7/5/2011	9/27/2011	10/19/2011	41.9	29.1	0.346	0.014
AM-2	06/06/2011	7/5/2011	9/27/2011	10/19/2011	81.9	69.1	0.823	0.034
AM-3	06/06/2011	7/5/2011	9/27/2011	10/19/2011	217.1	204.3	2.432	0.101
AM-4	06/06/2011	7/5/2011	9/27/2011	10/19/2011	77.1	64.3	0.765	0.032
AM-5	06/06/2011	7/5/2011	9/27/2011	10/19/2011	59.0	46.2	0.550	0.023
Deploy Control	06/06/2011			10/19/2011	32.6			
Transit control	06/06/2011			10/19/2011	33.9			
4th Quarter 2011								
AM-1	9/6/2011	9/27/2011	1/1/2012	2/2/2012	46.6	33.0	0.344	0.014
AM-2	9/6/2011	9/27/2011	1/1/2012	2/2/2012	80.7	67.1	0.699	0.029
AM-3	9/6/2011	9/27/2011	1/1/2012	2/2/2012	228.8	215.2	2.242	0.093
AM-4	9/6/2011	9/27/2011	1/1/2012	2/2/2012	77.7	64.1	0.668	0.028
AM-5	9/6/2011	9/27/2011	1/1/2012	2/2/2012	62.2	48.6	0.507	0.021
Deploy Control	9/6/2011			2/2/2012	36.5			
Transit control	9/6/2011			2/2/2012	38.1			
1st Quarter 2012								
AM-1	12/29/2011	1/1/2012	3/28/2012	4/18/2012	30.6	24.5	0.282	0.012
AM-2	12/29/2011							
AM-3	12/29/2011	1/1/2012	3/28/2012	4/18/2012	184.6	178.5	2.052	0.086
AM-4	12/29/2011	1/1/2012	3/28/2012	4/18/2012	58.4	52.3	0.602	0.025
AM-5	12/29/2011	1/1/2012	3/28/2012	4/18/2012	43.7	37.6	0.433	0.018
AM-6	12/29/2011	1/1/2012	3/28/2012	4/18/2012	47.8	41.7	0.480	0.020
AM-7	12/29/2011	1/1/2012	3/28/2012	4/18/2012	48.6	42.5	0.489	0.020
AM-8	12/29/2011							
AM-9	12/29/2011	1/1/2012	3/28/2012	4/18/2012	46.1	40.0	0.460	0.019
AM-10	12/29/2011	1/1/2012	3/28/2012	4/18/2012	64.4	58.3	0.671	0.028
Deploy	12/29/2011			4/18/2012	29.2			

Passive Monitoring Station ID	OSL Issue Date	Field Installation Date	Monitoring End Date	Processed Date	Landauer's GROSS Result (mrems)	Estimated Dose During Monitoring Period (mrem)	Estimated Daily Field Dose (mrem)	Estimated Field Dose Rate (mrem/hour)
Control								
Transit control	12/29/2011			4/18/2012	28			
2nd Quarter 2012								
AM-1	03/05/2012	3/28/2012	6/27/2012	7/26/2012	44.6	30.3	0.333	0.014
AM-2	03/05/2012	3/28/2012	6/27/2012	7/26/2012	81.8	67.5	0.741	0.031
AM-3	03/05/2012	3/28/2012	6/27/2012	7/26/2012	258.2	243.9	2.680	0.112
AM-4	03/05/2012	3/28/2012	6/27/2012	7/26/2012	80.9	66.6	0.732	0.030
AM-5	03/05/2012	3/28/2012	6/27/2012	7/26/2012	61.9	47.6	0.523	0.022
AM-6	03/05/2012	3/28/2012	6/27/2012	7/26/2012	66.3	52.0	0.571	0.024
AM-7	03/05/2012	3/28/2012	6/27/2012	7/26/2012	85.8	71.5	0.785	0.033
AM-8	03/05/2012	3/28/2012	6/27/2012	7/26/2012	271.3	257.0	2.824	0.118
AM-9	03/05/2012	3/28/2012	6/27/2012	7/26/2012	64	49.7	0.546	0.023
AM-10	03/05/2012	3/28/2012	6/27/2012	7/26/2012	45.7	31.4	0.345	0.014
Deploy Control	03/05/2012			7/26/2012	39.4			
3rd Quarter 2012								
AM-1	06/06/2012	6/27/2012	10/3/2012	10/09/2012	41.2	34.4	0.351	0.015
AM-2	06/06/2012	6/27/2012	10/3/2012	10/09/2012	84.6	77.8	0.794	0.033
AM-3	06/06/2012	6/27/2012	10/3/2012	10/09/2012	245.8	239.0	2.439	0.102
AM-4	06/06/2012	6/27/2012	10/3/2012	10/09/2012	83.6	76.8	0.784	0.033
AM-5	06/06/2012	6/27/2012	10/3/2012	10/09/2012	60.1	53.3	0.544	0.023
AM-6	06/06/2012	6/27/2012	10/3/2012	10/09/2012	60.9	54.1	0.552	0.023
AM-7	06/06/2012	6/27/2012	10/3/2012	10/09/2012	83.6	76.8	0.784	0.033
AM-8	06/06/2012	6/27/2012	10/3/2012	10/09/2012	306.2	299.4	3.055	0.127
AM-9	06/06/2012	6/27/2012	10/3/2012	10/09/2012	61.9	55.1	0.562	0.023
AM-10	06/06/2012	6/27/2012	10/3/2012	10/09/2012	34.9	28.1	0.287	0.012
Control Dose	06/06/2012			10/09/2012	31.5			
4th Quarter 2012								
AM-1	9/7/2014	10/3/2012	1/3/2013	1/09/2013	43.3	34.6	0.376	0.016
AM-2	9/7/2014	10/3/2012	1/3/2013	1/09/2013	79.6	70.9	0.770	0.032
AM-3	9/7/2014	10/3/2012	1/3/2013	1/09/2013	216.9	208.2	2.263	0.094
AM-4	9/7/2014	10/3/2012	1/3/2013	1/09/2013	79.6	70.9	0.770	0.032
AM-5	9/7/2014	10/3/2012	1/3/2013	1/09/2013	58.8	50.1	0.544	0.023

Passive Monitoring Station ID	OSL Issue Date	Field Installation Date	Monitoring End Date	Processed Date	Landauer's GROSS Result (mrems)	Estimated Dose During Monitoring Period (mrem)	Estimated Daily Field Dose (mrem)	Estimated Field Dose Rate (mrem/hour)
AM-6	9/7/2014	10/3/2012	1/3/2013	1/09/2013	78.7	70.0	0.760	0.032
AM-7	9/7/2014	10/3/2012	1/3/2013	1/09/2013	78.7	70.0	0.760	0.032
AM-8	9/7/2014	10/3/2012	1/3/2013	1/09/2013	279.8	271.1	2.946	0.123
AM-9	9/7/2014	10/3/2012	1/3/2013	1/09/2013	61	52.3	0.568	0.024
AM-10	9/7/2014	10/3/2012	1/3/2013	1/09/2013	67.6	58.9	0.640	0.027
Control Dose	9/7/2014			1/09/2013	33.9			
1st Quarter 2013								
AM-1	12/17/2012	1/3/2013	3/28/2013	04/09/2013	38	28.7	0.341	0.014
AM-2	12/17/2012	1/3/2013	3/28/2013	04/09/2013	76.4	67.1	0.798	0.033
AM-3	12/17/2012	1/3/2013	3/28/2013	04/09/2013	213.6	204.3	2.432	0.101
AM-4	12/17/2012	1/3/2013	3/28/2013	04/09/2013	73.7	64.4	0.766	0.032
AM-5	12/17/2012	1/3/2013	3/28/2013	04/09/2013	51.5	42.2	0.502	0.021
AM-6	12/17/2012	1/3/2013	3/28/2013	04/09/2013	51.6	42.3	0.503	0.021
AM-7	12/17/2012	1/3/2013	3/28/2013	04/09/2013	71.6	62.3	0.741	0.031
AM-8	12/17/2012	1/3/2013	3/28/2013	04/09/2013	285.7	276.4	3.290	0.137
AM-9	12/17/2012	1/3/2013	3/28/2013	04/09/2013	57.9	48.6	0.578	0.024
AM-10	12/17/2012	1/3/2013	3/28/2013	04/09/2013	65.1	55.8	0.664	0.028
Control Dose	12/17/2012			04/09/2013	36.4			
2nd Quarter 2013								
AM-1	3/13/2013	4/1/2013	6/30/2013	7/2/2013	37.9	31.5	0.350	0.015
AM-2	3/13/2013	4/1/2013	6/30/2013	7/2/2013	77.3	70.9	0.788	0.033
AM-3	3/13/2013	4/1/2013	6/30/2013	7/2/2013	206.2	199.8	2.220	0.093
AM-4	3/13/2013	4/1/2013	6/30/2013	7/2/2013	74.7	68.3	0.759	0.032
AM-5	3/13/2013	4/1/2013	6/30/2013	7/2/2013	55.2	48.8	0.542	0.023
AM-6	3/13/2013	4/1/2013	6/30/2013	7/2/2013	58.6	52.2	0.580	0.024
AM-7	3/13/2013	4/1/2013	6/30/2013	7/2/2013	75.5	69.1	0.768	0.032
AM-8	3/13/2013	4/1/2013	6/30/2013	7/2/2013	281.1	274.7	3.052	0.127
AM-9	3/13/2013	4/1/2013	6/30/2013	7/2/2013	56.9	50.5	0.561	0.023
AM-10	3/13/2013	4/1/2013	6/30/2013	7/2/2013	67.7	61.3	0.681	0.028
Control Dose	3/13/2013			7/2/2013	33.8			

NC – arrived without control values not calculated

Table 4
Summary of Gamma Data

Station ID	Field Dose Rate (mrem/hr)			Average Dose Rate (mrem/yr)
	Minimum	Maximum	Average	
AM-1	0.011	0.016	0.014	123.44
AM-2	0.025	0.034	0.032	276.82
AM-3	0.076	0.112	0.093	816.27
AM-4	0.021	0.033	0.029	254.84
AM-5	0.000	0.023	0.020	172.28
AM-6	0.020	0.032	0.024	210.24
AM-7	0.020	0.033	0.030	264.26
AM-8	0.118	0.137	0.126	1107.26
AM-9	0.019	0.024	0.023	198.56
AM-10	0.012	0.028	0.023	200.02

Table 5
Air Particulate Monitoring: Third Quarter 2010

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM-1	9/1/2010	2,602,044	Pb-210	25.4	3.7	2	9.8E-15	1.4E-15	2.0E-15
		2,602,044	Ra-226	3.25	1.5	0.1	1.2E-15	5.8E-16	1.0E-16
		2,602,044	Th-230	0.92	1.2	0.1	3.5E-16	4.6E-16	1.0E-16
		2,602,044	U-Nat	0.4	n/a	0.1	1.5E-16	n/a	1.0E-16
AM-2	9/1/2010	4,930,533	Pb-210	26.7	3.7	2	5.4E-15	7.5E-16	2.0E-15
		4,930,533	Ra-226	7.03	2.0	0.1	1.4E-15	4.1E-16	1.0E-16
		4,930,533	Th-230	3.44	2.4	0.1	7.0E-16	4.9E-16	1.0E-16
		4,930,533	U-Nat	2.0	n/a	0.1	4.1E-16	n/a	1.0E-16
AM-3	9/1/2010	3,891,630	Pb-210	17.8	3.2	2	4.6E-15	8.2E-16	2.0E-15
		3,891,630	Ra-226	3.32	1.5	0.1	8.5E-16	3.9E-16	1.0E-16
		3,891,630	Th-230	2.95	2.4	0.1	7.6E-16	6.2E-16	1.0E-16
		3,891,630	U-Nat	0.2	n/a	0.1	<1.0E-16	n/a	1.0E-16
AM-4	10/7/2010	2,241,652	Pb-210	37.6	0.9	1	1.7E-14	4.0E-16	2.0E-15
		2,241,652	Ra-226	0.4	0.2	0.2	1.8E-16	8.9E-17	1.0E-16
		2,241,652	Th-230	0.6	0.4	0.2	2.7E-16	1.8E-16	1.0E-16
		2,241,652	U-Nat	0.98	n/a	0.01	4.4E-16	n/a	1.0E-16
AM-5	9/1/2010	3,900,782	Pb-210	26.1	3.7	2	6.7E-15	9.5E-16	2.0E-15
		3,900,782	Ra-226	9.71	4.5	0.1	2.5E-15	1.2E-15	1.0E-16
		3,900,782	Th-230	2.04	1.8	0.1	5.2E-16	4.6E-16	1.0E-16
		3,900,782	U-Nat	0.2	n/a	0.1	<1.0E-16	n/a	1.0E-16

[1] Concentration is from lab calculated value.

Table 6
Air Particulate Monitoring: Fourth Quarter 2010

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	1/4/2011	3,687,000	Pb-210	63.0	5.0	2	1.7E-14	1.4E-15	2.0E-15
		3,687,000	Ra-226	<0.3		0.3	<1.0E-16		1.0E-16
		3,687,000	Th-230	<0.3		0.3	<1.0E-16		1.0E-16
		3,687,000	U-Nat	0.4		0.1	1.1E-16		1.0E-16
AM2	1/4/2011	3,965,000	Pb-210	76.6	5.3	2	1.9E-14	1.3E-15	2.0E-15
		3,965,000	Ra-226	0.8	0.4	0.3	2.0E-16	1.0E-16	1.0E-16
		3,965,000	Th-230	0.6	0.4	0.3	1.5E-16	1.0E-16	1.0E-16
		3,965,000	U-Nat	1.0		0.1	2.5E-16		1.0E-16
AM3	1/4/2011	3,797,000	Pb-210	69.7	5.1	2	1.8E-14	1.3E-15	2.0E-15
		3,797,000	Ra-226	<0.3		0.3	<1.0E-16		1.0E-16
		3,797,000	Th-230	<0.3		0.3	<1.0E-16		1.0E-16
		3,797,000	U-Nat	1.0		0.1	2.6E-16		1.0E-16
AM4	1/4/2011	3,446,400	Pb-210	71.5	5.2	2	2.1E-14	1.5E-15	2.0E-15
		3,446,400	Ra-226	1.0	0.4	0.3	2.9E-16	1.2E-16	1.0E-16
		3,446,400	Th-230	0.5	0.3	0.3	1.5E-16	8.7E-17	1.0E-16
		3,446,400	U-Nat	1.1		0.1	3.2E-16		1.0E-16
AM5	1/4/2011	3,900,782	Pb-210	78.5	5.7	2	2.0E-14	1.5E-15	2.0E-15
		3,900,782	Ra-226	0.5	0.3	0.3	1.3E-16	7.7E-17	1.0E-16
		3,900,782	Th-230	<0.3		0.3	<1.0E-16		1.0E-16
		3,900,782	U-Nat	0.6		0.1	1.5E-16		1.0E-16

[1] Concentration is from lab calculated values

Table 7
Air Particulate Monitoring: First Quarter 2011

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	3/31/2011	3,349,100	Pb-210	44.8	4.4	2	1.3E-14	1.3E-15	2.0E-15
		3,349,100	Ra-226	0.4	0.1	0.3	1.2E-16	3.0E-17	1.0E-16
		3,349,100	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		3,349,100	U-Nat	0.4		0.3	1.1E-16		1.0E-16
AM2	3/31/2011	3,522,800	Pb-210	59.3	6.6	2	1.7E-14	1.9E-15	2.0E-15
		3,522,800	Ra-226	0.7	0.2	0.3	2.0E-16	5.7E-17	1.0E-16
		3,522,800	Th-230	0.6	0.3	0.2	1.7E-16	8.5E-17	1.0E-16
		3,522,800	U-Nat	1.0		0.3	2.8E-16		1.0E-16
AM3	3/31/2011	3,359,000	Pb-210	47.2	5.5	2	1.4E-14	1.6E-15	2.0E-15
		3,359,000	Ra-226	0.4	0.1	0.3	1.2E-16	3.0E-17	1.0E-16
		3,359,000	Th-230	0.2	0.2	0.2	<1.0E-16	3.0E-17	1.0E-16
		3,359,000	U-Nat	0.5		0.3	1.6E-16		1.0E-16
AM4	3/31/2011	3,230,000	Pb-210	58.4	5.2	2	1.8E-14	1.6E-15	2.0E-15
		3,230,000	Ra-226	<1.2		1.2	2.1E-16	9.3E-17	2.1E-16
		3,230,000	Th-230	0.4	0.2	0.2	1.2E-16	6.2E-17	1.0E-16
		3,230,000	U-Nat	1.0		0.3	3.2E-16		1.0E-16
AM5	3/31/2011	3,125,721	Pb-210	52.4	4.9	2	1.7E-14	1.6E-15	2.0E-15
		3,125,721	Ra-226	0.4	0.1	0.3	1.3E-16	3.2E-17	1.0E-16
		3,125,721	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		3,125,721	U-Nat	0.4		0.3	1.3E-16		1.0E-16

Table 8
Air Particulate Monitoring: Second Quarter 2011[1]

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	6/27/2011	4,175,300	Pb-210	39.0	3.4	3	9.4E-15	8.1E-16	2.0E-15
		4,175,300	Ra-226	0.3	0.1	0.3	<1.0E-16		1.0E-16
		4,175,300	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,175,300	U-Nat	0.3		0.3	<1.0E-16		1.0E-16
AM2	6/27/2011	3,660,900	Pb-210	34.7	3.2	3	9.5E-15	8.7E-16	2.0E-15
		3,660,900	Ra-226	0.5	0.1	0.3	1.4E-16	2.7E-17	1.0E-16
		3,660,900	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		3,660,900	U-Nat	0.6		0.3	1.5E-16		1.0E-16
AM3	6/27/2011	2,635,740	Pb-210	31.5	3.8	3	1.2E-14	1.4E-15	2.0E-15
		2,635,740	Ra-226	<0.3		0.3	<1.0E-16		1.0E-16
		2,635,740	Th-230	0.2	0.2	0.2	<1.0E-16		1.0E-16
		2,635,740	U-Nat	0.4		0.3	1.4E-16		1.0E-16
AM4	6/27/2011	3,470,300	Pb-210	29.9	3.0	2	8.6E-15	8.6E-16	2.0E-15
		3,470,300	Ra-226	0.5	0.1	0.3	1.5E-16	2.9E-17	2.1E-16
		3,470,300	Th-230	0.5	0.3	0.2	1.6E-16	8.6E-17	1.0E-16
		3,470,300	U-Nat	0.7		0.3	2.0E-16		1.0E-16
AM5	6/27/2011	3,788,500	Pb-210	32.2	3.1	3	8.5E-15	8.2E-16	2.0E-15
		3,788,500	Ra-226	<0.3		0.3	<1.0E-16		1.0E-16
		3,788,500	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		3,788,500	U-Nat	<0.3		0.3	<1.0E-16		1.0E-16

Table 9
Air Particulate Monitoring: Third Quarter 2011

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	9/27/2011	5,344,124	Pb-210	57.9	4.6	3	1.1E-14	8.6E-16	2.0E-15
		5,344,124	Ra-226	0.5	0.1	0.3	<1.0E-16		1.0E-16
		5,344,124	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		5,344,124	U-Nat	0.5		0.3	<1.0E-16		1.0E-16
AM2	9/27/2011	4,697,676	Pb-210	46.7	4.1	3	9.9E-15	8.7E-16	2.0E-15
		4,697,676	Ra-226	0.7	0.2	0.3	1.4E-16	4.3E-17	1.0E-16
		4,697,676	Th-230	0.5	0.3	0.2	1.2E-16	6.4E-17	1.0E-16
		4,697,676	U-Nat	0.9		0.3	1.8E-16		1.0E-16
AM3	9/27/2011	3,738,675	Pb-210	53.7	5.2	3	1.4E-14	1.4E-15	2.0E-15
		3,738,675	Ra-226	0.6	0.1	0.3	1.5E-16	2.7E-17	1.0E-16
		3,738,675	Th-230	0.4	0.2	0.2	1.0E-16	5.3E-17	1.0E-16
		3,738,675	U-Nat	0.9		0.3	2.3E-16		1.0E-16
AM4	9/27/2011	4,597,006	Pb-210	69.3	4.9	3	1.5E-14	1.1E-15	2.0E-15
		4,597,006	Ra-226	1.1	0.2	0.3	2.3E-16	4.4E-17	1.0E-16
		4,597,006	Th-230	1.1	0.4	0.2	2.4E-16	8.7E-17	1.0E-16
		4,597,006	U-Nat	2.2		0.3	4.8E-16		1.0E-16
AM5	9/27/2011	4,885,130	Pb-210	60.2	4.6	3	1.2E-14	9.4E-16	2.0E-15
		4,885,130	Ra-226	<0.3		0.3	<1.0E-16		1.0E-16
		4,885,130	Th-230	0.2	0.2	0.2	<1.0E-16		1.0E-16
		4,885,130	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM6	9/27/2011	6,093,170	Pb-210	52.8	4.3	2	8.7E-15	7.1E-16	2.0E-15
		6,093,170	Ra-226	0.5	0.1	0.3	<1.0E-16		1.0E-16
		6,093,170	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		6,093,170	U-Nat	1.1		0.3	1.8E-16		1.0E-16
AM7	9/27/2011	5,345,795	Pb-210	62.5	5.7	4	1.2E-14	1.1E-15	2.0E-15
		5,345,795	Ra-226	0.5	0.1	0.3	<1.0E-16		1.0E-16
		5,345,795	Th-230	1.1	0.5	0.2	2.1E-16	9.4E-17	1.0E-16

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
		5,345,795	U-Nat	0.5		0.3	<1.0E-16		1.0E-16
AM8	9/27/2011	6,078,899	Pb-210	81.4	5.4	3	1.3E-14	8.9E-16	2.0E-15
		6,078,899	Ra-226	1.0	0.2	0.3	1.6E-16	3.3E-17	1.0E-16
		6,078,899	Th-230	0.7	0.3	0.2	1.2E-16	4.9E-17	1.0E-16
		6,078,899	U-Nat	1.7		0.3	2.8E-16		1.0E-16
AM9	9/27/2011	5,320,210	Pb-210	61.5	5.0	3	1.2E-14	9.4E-16	2.0E-15
		5,320,210	Ra-226	<0.3		0.3	<1.0E-16		1.0E-16
		5,320,210	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		5,320,210	U-Nat	0.9		0.3	1.7E-16		1.0E-16

Table 10
Air Particulate Monitoring: Fourth Quarter 2011

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	12/27/2011	4,887,468	Pb-210	81.6	6.4	2	1.7E-14	1.3E-15	2.0E-15
		4,887,468	Ra-226	1.3	0.3	0.3	2.7E-16	6.1E-17	1.0E-16
		4,887,468	Th-230	0.2	0.2	0.2	<1.0E-16		1.0E-16
		4,887,468	U-Nat	0.9		0.3	1.9E-16		1.0E-16
AM2	12/27/2011	4,395,618	Pb-210	83.3	6.5	2	1.9E-14	1.5E-15	2.0E-15
		4,395,618	Ra-226	1.3	0.3	0.3	2.8E-16	6.8E-17	1.0E-16
		4,395,618	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		4,395,618	U-Nat	1.2		0.3	2.8E-16		1.0E-16
AM3	12/27/2011	4,655,631	Pb-210	73.9	6.0	2	1.6E-14	1.3E-15	2.0E-15
		4,655,631	Ra-226	3.3	0.4	0.3	7.0E-16	8.6E-17	1.0E-16
		4,655,631	Th-230	1.7	0.5	0.2	3.6E-16	1.1E-16	1.0E-16
		4,655,631	U-Nat	4.1		0.3	8.9E-16		1.0E-16
AM4	12/27/2011	4,174,006	Pb-210	63.5	5.0	2	1.5E-14	1.2E-15	2.0E-15
		4,174,006	Ra-226	1.6	0.3	0.3	3.7E-16	7.2E-17	1.0E-16
		4,174,006	Th-230	0.4	0.2	0.2	1.1E-16	4.8E17	1.0E-16
		4,174,006	U-Nat	1.6		0.3	3.9E-16		1.0E-16
AM5	12/27/2011	4,969,383	Pb-210	84.4	6.4	2	1.7E-14	1.3E-15	2.0E-15
		4,969,383	Ra-226	0.9	0.2	0.3	1.9E-16	4.0E-17	1.0E-16
		4,969,383	Th-230	0.2	0.2	0.2	<1.0E-16		1.0E-16
		4,969,383	U-Nat	0.8		0.3	1.7E-16		1.0E-16
AM6	12/27/2011	4,421,457	Pb-210	77.0	6.0	2	1.7E-14	1.4E-15	2.0E-15
		4,421,457	Ra-226	1.2	0.3	0.3	2.7E-16	6.8E-17	1.0E-16
		4,421,457	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		4,421,457	U-Nat	1.0		0.3	2.2E-16		1.0E-16
AM7	12/27/2011	4,612,712	Pb-210	63.1	5.6	2	1.4E-14	1.2E-15	2.0E-15
		4,612,712	Ra-226	1.2	0.2	0.3	2.5E-16	4.3E-17	1.0E-16
		4,612,712	Th-230	0.5	0.3	0.2	1.0E-16	6.5E-17	1.0E-16

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
		4,612,712	U-Nat	1.0		0.3	2.1E-16		1.0E-16
AM8	12/27/2011	4,678,340	Pb-210	78.6	5.8	2	1.7E-14	1.2E-15	2.0E-15
		4,678,340	Ra-226	0.9	0.2	0.3	1.9E-16	4.3E-17	1.0E-16
		4,678,340	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,678,340	U-Nat	0.7		0.3	1.4E-16		1.0E-16
AM9	12/27/2011	5,236,768	Pb-210	83.0	6.4	2	1.6E-14	1.2E-15	2.0E-15
		5,236,768	Ra-226	1.3	0.3	0.3	2.4E-16	5.7E-17	1.0E-16
		5,236,768	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		5,236,768	U-Nat	0.9		0.3	1.8E-16		1.0E-16

Table 11
Air Particulate Monitoring: First Quarter 2012

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	3/28/12	4,828,496	Pb-210	90.9	7.0	2	1.9E-14	1.4E-15	2.0E-15
		4,828,496	Ra-226	0.7	0.2	0.3	1.4E-16	4.1E-17	1.0E-16
		4,828,496	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,828,496	U-Nat	0.8		0.3	1.7E-16		1.0E-16
AM2	3/28/12	4,518,610	Pb-210	55.4	4.9	2	1.2E-14	1.4E-15	2.0E-15
		4,518,610	Ra-226	1.0	0.2	0.3	2.2E-16	4.4E-17	1.0E-16
		4,518,610	Th-230	1.4	0.5	0.2	3.1E-16	1.1E-16	1.0E-16
		4,518,610	U-Nat	2.8		0.3	6.2E-16		1.0E-16
AM3	3/28/12	4,672,074	Pb-210	50.0	4.6	2	1.1E-14	9.8E-16	2.0E-15
		4,672,074	Ra-226	1.2	0.2	0.3	2.5E-16	4.3E-17	1.0E-16
		4,672,074	Th-230	0.6	0.3	0.2	1.3E-16	6.4E-17	1.0E-16
		4,672,074	U-Nat	2.3		0.3	4.9E-16		1.0E-16
AM4	3/28/12	4,187,307	Pb-210	61.3	5.0	2	1.5E-14	1.2E-15	2.0E-15
		4,187,307	Ra-226	2.5	0.3	0.3	5.9E-16	7.2E-17	1.0E-16
		4,187,307	Th-230	1.9	0.5	0.2	4.6E-16	1.2E-16	1.0E-16
		4,187,307	U-Nat	3.9		0.3	9.4E-16		1.0E-16
AM5	3/28/12	4,944,570	Pb-210	65.5	5.3	2	1.3E-14	1.1E-15	2.0E-15
		4,944,570	Ra-226	0.7	0.2	0.3	1.3E-16	4.0E-17	1.0E-16
		4,944,570	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		4,944,570	U-Nat	0.8		0.3	1.6E-16		1.0E-16
AM6	3/28/12	4,983,498	Pb-210	62.3	5.0	2	1.3E-14	1.0E-15	2.0E-15
		4,983,498	Ra-226	0.6	0.2	0.3	1.1E-16	4.0E-17	1.0E-16
		4,983,498	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,983,498	U-Nat	0.8		0.3	1.6E-16		1.0E-16
AM7	3/28/12	4,340,298	Pb-210	55.3	4.8	2	1.3E-14	1.1E-15	2.0E-15
		4,340,298	Ra-226	0.7	0.2	0.3	1.7E-16	4.6E-17	1.0E-16
		4,340,298	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
		4,340,298	U-Nat	1.0		0.3	2.4E-16		1.0E-16
AM8	3/28/12	4,625,520	Pb-210	56.5	5.0	2	1.2E-14	1.1E-15	2.0E-15
		4,625,520	Ra-226	3.9	0.4	0.3	8.5E-16	8.6E-17	1.0E-16
		4,625,520	Th-230	3.5	0.7	0.2	7.6E-16	1.5E-16	1.0E-16
		4,625,520	U-Nat	5.2		0.3	1.1E-15		1.0E-16
AM9	3/28/12	4,743,659	Pb-210	63.4	5.1	2	1.3E-14	1.1E-15	2.0E-15
		4,743,659	Ra-226	0.5	0.1	0.3	1.2E-16	2.1E-17	1.0E-16
		4,743,659	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,743,659	U-Nat	0.7		0.3	1.5E-16		1.0E-16

Table 12
Air Particulate Monitoring: Second Quarter 2012

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	3/28/2012	4,234,024	Pb-210	51.6	5.7	2	1.2E-14	1.3E-15	2.0E-15
		4,234,024	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,234,024	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,234,024	U-Nat	0.5		0.3	1.2E-16		1.0E-16
AM2	3/28/2012	3,622,831	Pb-210	49.7	6.2	2	1.4E-14	1.7E-15	2.0E-15
		3,622,831	Ra-226	0.5	0.1	0.3	1.4E-16	2.8E-17	1.0E-16
		3,622,831	Th-230	0.2	0.2	0.2	<1.0E-16		1.0E-16
		3,622,831	U-Nat	0.5		0.3	1.3E-16		1.0E-16
AM3	3/28/2012	4,470,310	Pb-210	55.8	6.1	2	1.2E-14	1.4E-15	2.0E-15
		4,470,310	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,470,310	Th-230	0.2		0.2	<1.0E-16		1.0E-16
		4,470,310	U-Nat	0.7		0.3	1.5E-16		1.0E-16
AM4	3/28/2012	4,207,538	Pb-210	62.3	6.7	2	1.5E-14	1.6E-15	2.0E-15
		4,207,538	Ra-226	0.6	0.1	0.3	1.3E-16	2.4E-17	1.0E-16
		4,207,538	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,207,538	U-Nat	0.7		0.3	1.6E-16		1.0E-16
AM5	3/28/2012	4,809,229	Pb-210	53.6	5.8	2	1.1E-14	1.2E-15	2.0E-15
		4,809,229	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,809,229	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,809,229	U-Nat	0.3		0.3	<1.0E-16		1.0E-16
AM6	3/28/2012	4,772,075	Pb-210	48.5	5.0	2	1.0E-14	1.0E-15	2.0E-15
		4,772,075	Ra-226	<0.3		0.3	<1.0E-16		1.0E-16
		4,772,075	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,772,075	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM7	3/28/2012	3,689,474	Pb-210	44.0	4.6	2	1.2E-14	1.2E-15	2.0E-15
		3,689,474	Ra-226	0.4	0.1	0.3	1.1E-16	2.7E-17	1.0E-16
		3,689,474	Th-230	<0.2		0.2	<1.0E-16		1.0E-16

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
		3,689,474	U-Nat	0.4		0.3	1.1E-16		1.0E-16
AM8	3/28/2012	4,112,019	Pb-210	45.8	4.8	2	1.1E-14	1.2E-15	2.0E-15
		4,112,019	Ra-226	0.9	0.2	0.3	2.3E-16	4.9E-17	1.0E-16
		4,112,019	Th-230	1.3	1.3	0.2	3.1E-16	3.2E-16	1.0E-16
		4,112,019	U-Nat	1.2		0.3	3.0E-16		1.0E-16
AM9	3/28/2012	4,430,827	Pb-210	49.2	5.0	2	1.1E-14	1.1E-15	2.0E-15
		4,430,827	Ra-226	0.5	0.1	0.3	1.2E-16	2.3E-17	1.0E-16
		4,430,827	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,430,827	U-Nat	0.4		0.3	<1.0E-16		1.0E-16

Table 13
Air Particulate Monitoring: Third Quarter 2012

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	9/30/2012	4,317,282	Pb-210	79.9	5.8	2	1.8E-14	1.3E-15	2.0E-15
		4,317,282	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,317,282	Th-230	0.2	0.2	0.2	<1.0E-16		1.0E-16
		4,317,282	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM2	9/30/2012	4,291,002	Pb-210	69.6	6.3	2	1.6E-14	1.5E-15	2.0E-15
		4,291,002	Ra-226	0.3	0.1	0.3	<1.0E-16		1.0E-16
		4,291,002	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,291,002	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM3	9/30/2012	4,996,481	Pb-210	82.5	5.9	2	1.7E-14	1.2E-15	2.0E-15
		4,996,481	Ra-226	0.6	0.2	0.3	1.2E-16	4.0E-17	1.0E-16
		4,996,481	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,996,481	U-Nat	0.7		0.3	1.4E-16		1.0E-16
AM4	9/30/2012	4,964,002	Pb-210	73.3	5.7	2	1.5E-14	1.1E-15	2.0E-15
		4,964,002	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,964,002	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,964,002	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM5	9/30/2012	4,735,430	Pb-210	87.6	6.2	2	1.9E-14	1.3E-15	2.0E-15
		4,735,430	Ra-226	0.5	0.1	0.3	1.1E-16	2.1E-17	1.0E-16
		4,735,430	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,735,430	U-Nat	0.3		0.3	<1.0E-16		1.0E-16
AM6	9/30/2012	4,979,380	Pb-210	82.7	6.0	2	1.7E-14	1.2E-15	2.0E-15
		4,979,380	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,979,380	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,979,380	U-Nat	0.3		0.3	<1.0E-16		1.0E-16
AM7	9/30/2012	4,160,426	Pb-210	64.1	5.3	2	1.5E-14	1.3E-15	2.0E-15
		4,160,426	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,160,426	Th-230	<0.2		0.2	<1.0E-16		1.0E-16

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
		4,160,426	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM8	9/30/2012	5,105,620	Pb-210	78.2	6.2	2	1.5E-14	1.2E-15	2.0E-15
		5,105,620	Ra-226	0.7	0.2	0.3	1.3E-16	3.9E-17	1.0E-16
		5,105,620	Th-230	0.4		0.2	<1.0E-16		1.0E-16
		5,105,620	U-Nat	0.8		0.3	1.6E-16		1.0E-16
AM9	9/30/2012	4,588,716	Pb-210	80.3	5.9	2	1.8E-14	1.3E-15	2.0E-15
		4,588,716	Ra-226	0.5	0.1	0.3	1.1E-16	2.2E-17	1.0E-16
		4,588,716	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,588,716	U-Nat	0.4		0.3	<1.0E-16		1.0E-16

Table 14
Air Particulate Monitoring: Fourth Quarter 2012

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	12/24/2012	3,993,919	Pb-210	59.5	5.8	2	1.5E-14	1.5E-15	2.0E-15
		3,993,919	Ra-226	<0.3		0.3	<1.0E-16		1.0E-16
		3,993,919	Th-230	0.2	0.1	0.2	<1.0E-16		1.0E-16
		3,993,919	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM2	12/24/2012	3,858,431	Pb-210	63.4	6.0	2	1.6E-14	1.6E-15	2.0E-15
		3,858,431	Ra-226	0.5	0.1	0.3	1.4E-16	2.6E-17	1.0E-16
		3,858,431	Th-230	<0.20		0.2	<1.0E-16		1.0E-16
		3,858,431	U-Nat	0.5		0.3	1.2E-16		1.0E-16
AM4	12/24/2012	4,511,349	Pb-210	56.9	5.6	2	1.3E-14	1.2E-15	2.0E-15
		4,511,349	Ra-226	1.0	0.2	0.3	2.2E-16	4.4E-17	1.0E-16
		4,511,349	Th-230	0.7	0.3	0.2	1.5E-16	6.6E-17	1.0E-16
		4,511,349	U-Nat	1.3		0.3	2.8E-16		1.0E-16
AM5	12/24/2012	4,387,349	Pb-210	69.5	6.6	2	1.6E-14	1.5E-15	2.0E-15
		4,387,349	Ra-226	0.5	0.1	0.3	1.1E-16	2.3E-17	1.0E-16
		4,387,349	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,387,349	U-Nat	0.5		0.3	1.1E-16		1.0E-16
AM6	12/24/2012	4,540,000	Pb-210	72.7	6.5	2	1.6E-14	1.4E-15	2.0E-15
		4,540,000	Ra-226	0.3	0.1	0.3	<1.0E-16		1.0E-16
		4,540,000	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,540,000	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM7	12/24/2012	3,951,045	Pb-210	54.7	6.0	2	1.4E-14	1.5E-15	2.0E-15
		3,951,045	Ra-226	0.4	0.1	0.3	1.0E-16	1.5E-15	1.0E-16
		3,951,045	Th-230	0.2	0.1	0.2	<1.0E-16		1.0E-16
		3,951,045	U-Nat	0.4		0.3	1.0E-16		1.0E-16
AM8	12/24/2012	4,585,199	Pb-210	66.6	6.4	2	1.5E-14	1.E-15	2.0E-15
		4,585,199	Ra-226	3.4	0.4	0.3	7.5E-16	8.7E-17	1.0E-16
		4,585,199	Th-230	2.4	0.5	0.2	5.2E-16	1.1E-16	1.0E-16

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
		4,585,199	U-Nat	4.1		0.3	9.0E-16		1.0E-16
AM9	12/24/2012	4,163,513	Pb-210	64.8	6.7	2	1.6E-14	1.6E-15	2.0E-15
		4,163,513	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,163,513	Th-230	0.2	0.1	0.2	<1.0E-16		1.0E-16
		4,163,513	U-Nat	0.4		0.3	<1.0E-16		1.0E-16
AM10	12/24/2012	4,426,438	Pb-210	42.6	5.9	2	9.6E-15	1.3E-15	2.0E-15
		4,426,438	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,426,438	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		4,426,438	U-Nat	0.3		0.3	<1.0E-16		1.0E-16

Table 15
Air Particulate Monitoring: First Quarter 2013

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1	3/30/13	3,542,807	Pb-210	36.7	3.6	2	1.0E-14	1.0E-15	2.0E-15
		3,542,807	Ra-226	0.4	0.1	0.3	1.1E-16	2.8E-17	1.0E-16
		3,542,807	Th-230	0.5	0.4	0.2	1.5E-16	1.1E-16	1.0E-16
		3,542,807	U-Nat	0.6		0.3	1.6E-16		1.0E-16
AM2	3/30/13	4,071,122	Pb-210	34.9	3.4	2	8.6E-15	8.4E-16	2.0E-15
		4,071,122	Ra-226	0.6	0.1	0.3	1.4E-16	2.5E-17	1.0E-16
		4,071,122	Th-230	0.7	0.4	0.2	1.8E-16	9.8E-17	1.0E-16
		4,071,122	U-Nat	0.8		0.3	1.9E-16		1.0E-16
AM4	3/30/13	4,772,331	Pb-210	77.1	6.4	2	1.6E-14	1.3E-15	2.0E-15
		4,772,331	Ra-226	0.6	0.2	0.3	1.3E-16	4.2E-17	1.0E-16
		4,772,331	Th-230	0.8	0.4	0.2	1.6E-16	8.4E-17	1.0E-16
		4,772,331	U-Nat	0.7		0.3	1.5E-16		1.0E-16
AM5	3/30/13	4,573,126	Pb-210	72.4	6.1	2	1.6E-14	1.3E-15	2.0E-15
		4,573,126	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,573,126	Th-230	0.2	0.2	0.2	<1.0E-16		1.0E-16
		4,573,126	U-Nat	0.6		0.3	1.4E-16		1.0E-16
AM6	3/30/13	4,842,921	Pb-210	75.6	6.4	2	1.6E-14	1.3E-15	2.0E-15
		4,842,921	Ra-226	0.6	0.2	0.3	1.3E-16	4.1E-17	1.0E-16
		4,842,921	Th-230	0.5	0.3	0.2	<1.0E-16		1.0E-16
		4,842,921	U-Nat	0.7		0.3	1.5E-16		1.0E-16
AM7	3/30/13	4,492,199	Pb-210	65.2	6.0	2	1.5E-14	1.3E-15	2.0E-15
		4,492,199	Ra-226	0.6	0.2	0.3	1.4E-16	4.5E-17	1.0E-16
		4,492,199	Th-230	0.4	0.3	0.2	<1.0E-16		1.0E-16
		4,492,199	U-Nat	0.6		0.3	1.4E-16		1.0E-16
AM8	3/30/13	4,757,296	Pb-210	69.9	6.1	2	1.5E-14	1.3E-15	2.0E-15
		4,757,296	Ra-226	1.6	0.2	0.3	3.3E-16	4.2E-17	1.0E-16
		4,757,296	Th-230	2.4	0.7	0.2	4.9E-16	1.5E-16	1.0E-16

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
		4,757,296	U-Nat	2.0		0.3	4.1E-16		1.0E-16
AM9	3/30/13	4,832,233	Pb-210	76.8	6.4	2	1.6E-14	1.3E-15	2.0E-15
		4,832,233	Ra-226	0.6	0.1	0.3	1.2E-16	2.1E-17	1.0E-16
		4,832,233	Th-230	0.4	0.3	0.2	<1.0E-16		1.0E-16
		4,832,233	U-Nat	0.7		0.3	1.4E-16		1.0E-16
AM10	3/30/13	4,960,729	Pb-210	78.5	6.4	2	1.6E-14	1.3E-15	2.0E-15
		4,960,729	Ra-226	0.4	0.1	0.3	<1.0E-16		1.0E-16
		4,960,729	Th-230	0.3	0.3	0.2	<1.0E-16		1.0E-16
		4,960,729	U-Nat	0.5		0.3	1.1E-16		1.0E-16

Table 16
Air Particulate Monitoring: Second Quarter 2013

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
AM1[1]	6/29/2013	2,681,836	Pb-210	33.5	3.8	2	1.2E-14	1.4E-15	2.0E-15
		2,681,836	Ra-226	0.4	0.1	0.3	1.6E-16	3.7E-17	1.0E-16
		2,681,836	Th-230	0.7	0.3	0.2	2.6E-16	1.1E-16	1.0E-16
		2,681,836	U-Nat	0.6		0.3	2.4E-16		1.0E-16
AM2	6/29/2013	3,842,959	Pb-210	40.0	4.1	2	1.0E-14	1.1E-15	2.0E-15
		3,842,959	Ra-226	0.3	0.1	0.3	<1.0E-16		1.0E-16
		3,842,959	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		3,842,959	U-Nat	0.8		0.3	2.0E-16		1.0E-16
AM4[1]	6/29/2013	2,980,824	Pb-210	31.8	3.8	2	1.1E-14	1.3E-15	2.0E-15
		2,980,824	Ra-226	0.5	0.1	0.3	1.6E-16	3.4E-17	1.0E-16
		2,980,824	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		2,980,824	U-Nat	0.5		0.3	1.6E-16		1.0E-16
AM5[1]	6/29/2013	2,055,968	Pb-210	25.1	3.3	2	1.2E-14	1.6E-15	2.0E-15
		2,055,968	Ra-226	0.8	0.2	0.3	4.0E-16	9.7E-17	1.0E-16
		2,055,968	Th-230	0.3	0.2	0.2	1.5E-16	9.7E-17	1.0E-16
		2,055,968	U-Nat	1.0		0.3	4.7E-16		1.0E-16
AM6	6/29/2013	4,040,705	Pb-210	42.3	4.0	2	1.0E-14	9.9E-16	2.0E-15
		4,040,705	Ra-226	0.7	.02	0.3	1.6E-16	4.9E-17	1.0E-16
		4,040,705	Th-230	<0.2		0.2	<1.0E-16		1.0E-16
		4,040,705	U-Nat	0.8		0.3	1.9E-16		1.0E-16
AM7	6/29/2013	4,354,243	Pb-210	50.9	4.4	2	1.2E-14	1.0E-15	2.0E-15
		4,354,243	Ra-226	0.8	0.2	0.3	1.7E-16	4.6E-`7	1.0E-16
		4,354,243	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		4,354,243	U-Nat	1.2		0.3	2.7E-16		1.0E-16
AM8	6/29/2013	4,628,230	Pb-210	44.7	4.2	2	9.7E-15	9.1E-16	2.0E-15
		4,628,230	Ra-226	1.5	0.3	0.3	3.3E-16	6.5E-17	1.0E-16
		4,628,230	Th-230	1.4	0.4	0.2	3.1E-16	8.6E-17	1.0E-16

Air Station ID	Collection Date	Air Volume Sampled (L)	Analyte	Filter Conc. (pCi/filter)	Precision (pCi/filter)	Reporting Limit (pCi/filter)	Concentration (µCi/mL)	Precision (µCi/mL)	Reporting Limit (µCi/mL)
		4,628,230	U-Nat	1.8		0.3	3.9E-16		1.0E-16
AM9	6/29/2013	4,604,134	Pb-210	46.2	4.3	2	1.0E-14	9.3E-16	2.0E-15
		4,604,134	Ra-226	0.7	0.2	0.3	1.6E-16	4.3E-17	1.0E-16
		4,604,134	Th-230	0.4	0.2	0.2	<1.0E-16		1.0E-16
		4,604,134	U-Nat	77.2		0.3	1.3E-16		1.0E-16
AM10	6/29/2013	3,832,148	Pb-210	42.0	4.0	2	1.1E-14	1.0E-15	2.0E-15
		3,832,148	Ra-226	0.7	0.2	0.3	1.7E-16	5.2E-17	1.0E-16
		3,832,148	Th-230	0.3	0.2	0.2	<1.0E-16		1.0E-16
		3,832,148	U-Nat	0.7		0.3	1.7E-16		1.0E-16

[1] *flow was less than minimum required flow of 3,000,000 Liters per quarter*

Table 17
Summary of Radioparticulate Concentrations at Air Monitoring Stations

Air Station ID	Analyte	Radioparticulate Concentration (uCl/ml)			Air Station ID	Analyte	Radioparticulate Concentration (uCl/ml)		
		Minimum	Maximum	Mean			Minimum	Maximum	Mean
AM-1	Pb-210	9.40E-15	1.90E-14	1.36E-14	AM6	Pb-210	8.70E-15	1.70E-14	1.35E-14
	Ra-226	1.10E-16	1.20E-15	3.33E-16		Ra-226	1.10E-16	2.70E-16	1.68E-16
	Th-230	1.50E-16	3.50E-16	2.53E-16		Th-230	<1.00E-16	<1.00E-16	<1.00E-16
	U-Nat	1.10E-16	2.40E-16	1.56E-16		U-Nat	1.50E-16	2.20E-16	1.80E-16
AM-2	Pb-210	5.40E-15	1.90E-14	1.30E-14	AM-7	Pb-210	1.20E-14	1.50E-14	1.34E-14
	Ra-226	1.40E-16	1.40E-15	3.00E-16		Ra-226	1.00E-16	2.50E-16	1.57E-16
	Th-230	1.20E-16	7.00E-16	2.72E-16		Th-230	1.00E-16	2.10E-16	1.55E-16
	U-Nat	1.20E-16	6.20E-16	2.55E-16		U-Nat	1.00E-16	2.70E-16	1.78E-16
AM-3	Pb-210	4.60E-15	1.80E-14	1.32E-14	AM-8	Pb-210	9.40E-15	1.70E-14	1.30E-14
	Ra-226	1.20E-16	8.50E-16	3.65E-16		Ra-226	1.30E-16	1.10E-14	1.55E-15
	Th-230	1.00E-16	7.60E-16	3.38E-16		Th-230	1.20E-16	1.70E-14	4.06E-15
	U-Nat	1.40E-16	8.90E-16	3.08E-16		U-Nat	1.20E-16	1.10E-15	4.22E-16
AM-4	Pb-210	8.60E-15	2.10E-14	1.50E-14	AM-9	Pb-210	9.50E-15	1.80E-14	1.35E-14
	Ra-226	1.30E-16	5.90E-16	2.42E-16		Ra-226	1.10E-16	9.90E-15	1.11E-15
	Th-230	1.10E-16	4.60E-16	2.02E-16		Th-230	1.40E-16	1.90E-14	1.20E-14
	U-Nat	1.50E-16	9.40E-16	3.49E-16		U-Nat	1.20E-16	2.00E-16	1.60E-16
AM-5	Pb-210	6.70E-15	2.00E-14	1.40E-14	AM-10	Pb-210	1.50E-16	1.60E-14	7.01E-15
	Ra-226	1.10E-16	2.50E-15	4.63E-16		Ra-226	1.70E-16	1.40E-14	3.68E-15
	Th-230	1.50E-16	5.20E-16	3.35E-16		Th-230	1.50E-16	1.80E-14	1.07E-14
	U-Nat	1.10E-16	4.70E-16	1.90E-16		U-Nat	1.00E-16	1.70E-16	1.28E-16

Appendix 3-B
Water Flow and Quality Monitoring Data

Table 1
Crooks Creek Discharge Measurements – Energy Fuels Monitoring Stations [1]

Location	Date	Discharge (cfs)
XSCCDS	6/16/2010	5.4
XSCCDS	8/17/2010	5.7
XSCCDS	10/6/2010	3.3
XSCCDS	3/30/2011	4.1
XSCCDS	5/18/2011	3.7
XSCCDS	3/14/2012	7.6
XSCCDS	5/18/2012	4.1
Weir	8/13/2012	2.4
Weir	9/20/2012	2.6
Weir	10/25/2012	3.5
Weir	3/6/2013	3.8
Weir	4/24/2013	4.2
Weir	5/8/2013	3.6
Weir	6/26/2013	2.3
XSCCUS	5/24/2010	6.8
XSCCUS	6/16/2010	4.6
XSCCUS	8/17/2010	5.5
XSCCUS	10/6/2010	3.3
XSCCUS	3/30/2011	3.8
XSCCUS	5/18/2011	3.8
XSCCUS	3/14/2012	5.9
XSCCUS	5/18/2012	3.6
XSCCMU	5/18/2011	3.3
XSCCMU	3/14/2012	Frozen
XSCCMU	5/15/2012	2.9

[1] Lidstone and Associates, Inc., 2013.

Table 2
West Fork of Crooks Creek Discharge Measurements – USGS Gaging Station #06638300

Date	Flow (cfs)	Comments
1961	22	Peak flow measurement from gage.
3/1962	128	Peak flow measurement from gage.
1963	26	Peak flow measurement from gage.
1964	26	Peak flow measurement from gage.
4/1965	67	Peak flow measurement from gage.
1966	13	Peak flow measurement from gage.
1967	13	Peak flow measurement from gage.
1968	13	Peak flow measurement from gage.
1969	13	Peak flow measurement from gage.
4/24/1970	12	Peak flow measurement from gage.
4/1971	108	Peak flow measurement from gage.
4/1972	51	Peak flow measurement from gage.
5/20/1973	97	Peak flow measurement from gage.
4/20/1974	3	Peak flow measurement from gage.
7/10/1975	255	Peak flow measurement from gage.
4/10/1976	1.0	Instantaneous measurement during sampling.
5/14/1976	1.3	Instantaneous measurement during sampling.
5/19/1976	2	Peak flow measurement from gage.
6/9/1976	0.95	Instantaneous measurement during sampling.
7/1/1976	1.5	Estimated flow during sampling.
8/2/1976	1.0	Estimated flow during sampling.
9/16/1976	0.96	Instantaneous measurement during sampling.
10/1/1976	1.4	Instantaneous measurement during sampling.
4/11/1977	2.2	Instantaneous measurement during sampling.
4/27/1977	1.6	Instantaneous measurement during sampling.
5/31/1977	1.3	Instantaneous measurement during sampling.
6/30/1977	0.5	Instantaneous measurement during sampling.
7/25/1977	37	Peak flow measurement from gage.
8/4/1977	1.6	Instantaneous measurement during sampling.
9/13/1977	0.75	Instantaneous measurement during sampling.
10/3/1977	1.3	Instantaneous measurement during sampling.
3/31/1978	2.2	Instantaneous measurement during sampling.
5/30/1978	2.6	Instantaneous measurement during sampling.
6/27/1978	1.0	Instantaneous measurement during sampling.
7/21/1978	29	Peak flow measurement from gage.
8/3/1978	3.5	Instantaneous measurement during sampling.
8/29/1978	0.85	Instantaneous measurement during sampling.
4/20/1979	3	Peak flow measurement from gage.
4/23/1980	49	Peak flow measurement from gage.
5/24/1981	17	Peak flow measurement from gage.

Table 3
Surface Water Sampling History – Energy Fuels

Year	Quarter	Crooks Creek			Perennial Impoundments		Ephemeral Impoundments		
		XSCCMU	XSCCUS	XSCCDS	McIntosh Pit	Western Nuclear Pond	SW-1	SW-2	SW-3
2010	1st	NA	NA	NA	NA	NA	NA	NA	NA
	2nd	NA	5/25; 6/28	5/25; 6/29	6/28	NA	4/13; 5/25	4/13; 5/25	4/13
	3rd	NA	7/22; 8/18; 9/14	7/22; 8/18; 9/21	9/14	NA	Dry	Dry	Dry
	4th	NA	10/7; 11/15	10/7; 11/15; 12/10	11/17	NA	NA	NA	NA
2011	1st	NA	3/29	3/16; 3/29	3/28	NA	NA	NA	NA
	2nd	5/19	4/28; 5/19; 6/21	4/28; 5/19; 6/21	6/21	NA	NA	NA	NA
	3rd	8/17; 9/26	8/17; 9/26	8/17; 9/26	8/17	8/17	NA	NA	NA
	4th	10/31	10/31	10/31		NA	NA	NA	NA
2012	1st	Frozen	3/14	3/14	3/28	NA	3/14	3/14	3/28
	2nd	4/16; 5/15; 6/27	4/16; 5/15; 6/27	4/16; 5/15; 6/27	5/14	NA	4/16	Dry	Dry
	3rd	7/23; 8/13; 9/20	7/23; 8/13; 9/20	7/23; 8/13; 9/20	8/13	NA	NA	NA	NA
	4th	10/25; 11/28	10/25; 11/28	10/25; 11/28	11/28	NA	NA	NA	NA
2013	1st	3/6	3/6	Frozen	Frozen	Frozen	NA	NA	NA
	2nd	4/24; 5/8; 6/26	4/24; 5/8; 6/26	4/24; 5/8; 6/26	4/24; 6/26	4/24; 6/26	4/24	Dry	Dry

Note:
NA = Not Analyzed.

Table 4
Surface Water and Groundwater Quality Regulatory Criteria

Parameter	WDEQ-WQD Surface Water Criteria				WDEQ-WQD Groundwater Class-of-Use Criteria				EPA Drinking Water Criteria		
	Aquatic Life Acute Value	Aquatic Life Chronic Value	Human Health Value Fish & Drinking Water	Human Health Value Fish Only	Domestic (Class I)	Agriculture (Class II)	Livestock (Class III)	Special (A) Fish & Aquatic	MCL	Treatment Action Level	Secondary Standard
Aluminum	--	--	--	--	--	5.0	5.0	0.1	--	--	0.05 to 0.2
Ammonia	--	--	--	--	0.5	--	--	0.02	--	--	--
Arsenic	0.340	0.150	0.010	0.010	0.05	0.1	0.2	0.05	0.010	--	--
Barium	--	--	2.000	--	2.0	--	--	5.0	2.0	--	--
Beryllium	--	--	--	--	--	0.1	--	0.011	--	--	--
Boron	--	--	--	--	0.75	0.75	5.0	--	--	--	--
Cadmium	0.0020	0.00025	0.0050	--	0.005	0.01	0.05	0.0004	0.005	--	--
Chloride	860.000	230.000		--	250.0	100.0	2000.0	--	--	--	250.0
Chromium	0.016	0.011	0.100	--	0.1	0.1	0.05	0.05	0.005	--	--
Copper	0.013	0.009	1.000	--	1.0	0.2	0.5	0.01	--	1.0	--
Fluoride			2.000	--	4.0	--	--	--	4.0	--	2.0
Gross Alpha (pCi/L, including Radium-226, excluding Radon & Uranium)	--	--	--	--	15.0	15.0	15.0	15.0	15.0	--	--
Iron	--	1.000	0.300	--	0.300	5.0	--	0.5	--	--	--
Lead	0.0646	0.003	0.015	--	0.015	5.0	0.1	0.004	--	0.015	--
Managnese	3.110	1.462	0.050	--	0.05	0.2	--	1.0	0.05	--	--
Mercury	0.0014	0.00077	0.00005	0.000051	0.002	--	0.00005	0.00005	0.002	--	--
Nickel	0.4682	0.052	0.100	4.600	--	0.2	--	0.05	--	--	--
Nitrate	--	--		--	10.0	--	--	--	10.0	--	--
Nitrate+Nitrite (as N)	--	--	10.000	--	--	--	--	--	--	--	--
pH (standard units)	--	--	6.5 - 9.5	--	6.5 - 8.5	4.5 - 9.0	6.5 - 8.5	6.5 - 9.0	--	--	6.5 - 8.5
Radium-226+Radium-228 (pCi/L)	--	--	--	--	5.0	5.0	5.0	5.0	5.0	--	--
Selenium	0.020	0.005	0.050	4.200	0.05	0.02	0.01	0.05	0.05	--	--
Sulfate	--	--	--	--	250.0	200.0	3000.0	--	--	--	250.0
Total Dissolved Solids	--	--	--	--	500.0	2000.0	5000.0	500.0	--	--	500.0
Uranium	--	--	--	--	--	--	--	0.03	0.03	--	--
Vanadium	--	--	--	--	--	0.1	0.1	--	--	--	--
Zinc	0.1172	0.1181	5.000	26.000	5.0	2.0	25.0	0.05	--	--	5.0

All concentrations are in mg/L unless otherwise noted. Dashes indicate no criteria have been established.
WQD Class-of-Use criteria are from Table I in Chapter 8 (Quality Standards for Wyoming Groundwater) of the WQD Rules & Regulations, available at http://deq.state.wy.us/wqd/WQDrules/Chapter_08.pdf, accessed on November 3, 2008.
EPA Drinking Water Criteria are from http://www.epa.gov/safewater/consumer/pdf/mcl.pdf, accessed on November 3, 2008. Excludes parameters, such as pesticides, which are not likely to be present at the site.

Table 5
Energy Fuels Crooks Creek Water Quality Summary – Energy Fuels Sampling

	XSCCMU (May 2011 through June 2013)						XSCCUS (May 2010 through June 2013)						XSCCDS (May 2010 through June 2013)					
	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects
MAJOR IONS (mg/L)																		
Total Alkalinity as CaCO3	121	161	136	8.78	0	16	110	164	145	12.5	0	27	107	168	150	12.8	0	28
Alkalinity, Bicarbonate	139	197	162	12.4	0	16	108	191	172	17.1	0	27	130	199	177	14.1	0	28
Alkalinity, Carbonate	<5	<5	-	-	100	16	<5	13	7.8	3.1	85	27	<5	9	7	2	79	28
Chloride	2	6	3	1	0	16	2	6	3	1	0	27	2	5	4	1	0	28
Fluoride	0.1	0.2	0.2	0.0	0	16	<0.1	0.2	0.2	0.0	4	27	<0.1	0.5	0.2	0.07	7	28
Sulfate	19	39	25	5.1	0	16	14	38	31	5.6	0	27	19	46	36	6.2	0	28
Nitrogen, Ammonia	<0.1	**0.4**	**0.2**	0.1	81	16	<0.1	**0.1**	**0.1**	0.0	93	2	<0.1	**0.5**	**0.4**	0.2	93	28
Nitrogen, Nitrate & Nitrite	<0.1	0.2	0.2	0.0	94	16	<0.1	0.2	0.2	0.0	96	27	<0.1	0.1	0.1	0	96	28
Calcium	36	47	41	2.6	0	16	12	49	44	7.2	0	27	31	53	47	4.2	0	28
Magnesium	4	5	4.2	0.4	0	16	4	11	5	1	0	27	4	6	6	0.6	0	28
Potassium	1	3	1.8	0.6	0	16	1	4	2	0.6	0	27	1	4	2	0.6	0	28
Sodium	15	23	18	2.0	0	16	16	25	21	2.2	0	27	17	28	24	2.5	0	28
Silica	18	23	21	1.3	0	16	2	24	20	4	0		13	23	21	2.0	0	28
PHYSICAL PROPERITES																		
pH (std units)	8.0	8.5	8.4	0.12	0	16	8.0	***9.3***	8.4	0.24	0	27	8.0	***8.6***	8.4	0.15	0	28
Conductivity (umho/cm)	267	371	311	28.8	0	16	259	390	336	32.1	0	27	289	416	359	34	0	28
Total Dissolved Solids @ 180°C (mg/l)	180	300	223	28.7	0	16	170	350	243	38.2	0	27	150	290	247	31.5	0	28
Total Suspended Solids	<5	18	9.5	5.1	73	15	<5	26	12	5.4	46	26	<5	46	18	12	19	27
Turbidity (NTU)	0.6	4.3	1.8	0.9	0	15	1.2	8.3	3.0	1.8	0	26	1.5	26.1	7.0	6.4	0	26
Field pH (std units)	7.0	8.6	8.0	0.43	0	15	7.1	8.9	8.2	0.41	0	23	6.7	9.1	8.3	0.54	0	24
Field Conductivity (umho/cm)	236	396	312	44.0	0	14	290	418	366	32.9	0	22	312	723	402	75.2	0	24
Field Temperature (°C)	1.1	37	15	8.4	0	15	0.4	37.6	13	9	0	23	0.60	38.6	13	8.8	0	23
Field Turbidity (NTU)	1.0	167	15	41	0	15	2.0	460	33	102	0	21	3.0	147	15	31	0	20
TRACE METALS (mg/L) DISSOLVED																		
Aluminum	<0.1	<0.1	-	-	100	16	<0.1	<0.1	-	-	100	27	<0.1	<0.1	-	-	100	28
Arsenic	<0.001	0.008	0.002	0.002	19	16	<0.001	0.006	0.002	0.001	37	27	<0.005	0.008	0.002	0.002	32	28
Barium	<0.1	<0.1	-	-	100	16	<0.1	<0.1	-	-	100	27	<0.1	<0.1	-	-	100	28
Beryllium	<0.001	<0.001	-	-	100	16	<0.001	<0.001	-	-	100	27	<0.001	<0.001	-	-	100	28
Boron	<0.1	<0.1	-	-	100	16	<0.1	0.2	0.2	0.0	96	27	<0.1	0.2	0.2	0	4	28
Cadmium	<0.001	<0.001	-	-	100	16	<0.001	<0.001	-	-	100	27	<0.001	<0.001	-	-	100	28
Chromium	<0.01	<0.01	-	-	100	16	<0.001	<0.001	-	-	100	27	<0.01	<0.01	-	-	100	28
Copper	<0.01	<0.01	-	-	100	16	<0.01	<0.01	-	-	100	27	<0.01	<0.01	-	-	100	28
Iron	<0.05	0.14	0.1	0.03	13	16	<0.05	0.18	0.1	0.03	11	27	<0.05	0.15	0.08	0.03	18	28
Lead	<0.01	<0.01	-	-	100	16	<0.01	<0.01	-	-	100	27	<0.01	<0.01	-	-	100	28
Manganese	<0.02	0.04	0.02	0.01	6	16	<0.01	***0.08***	0.04	0.02	11	27	<0.02	0.04	0.02	0.01	29	28
Mercury	<0.001	<0.001	-	-	100	16	<0.001	<0.001	-	-	100	27	<0.001	<0.001	-	-	100	28
Molybdenum	<0.01	<0.01	-	-	100	16	<0.01	<0.01	-	-	100	27	<0.01	<0.01	-	-	100	28
Nickel	<0.05	<0.05	-	-	100	16	<0.05	<0.05	-	-	100	27	<0.05	<0.05	-	-	100	28
Selenium	<0.001	0.001	0.001	0.000	94	16	<0.001	0.001	0.001	0.000	96	27	<0.001	0.002	0.002	0.001	86	28
Uranium	0.0105	0.0171	0.0105	0.00212	0	16	0.0094	0.0611	0.016	0.0093	0	27	0.0137	0.0279	0.0198	0.00297	0	28
Vanadium	<0.1	<0.1	-	-	100	16	<0.1	<0.1	-	-	100	27	<0.1	<0.1	-	-	100	28
Zinc	<0.01	0.1	0.1	0.0	94	16	<0.01	0.01	0.01	0.00	96	27	<0.01	0.02	0.02	0.00	93	28

Table 5
Energy Fuels Crooks Creek Water Quality Summary – Energy Fuels Sampling (continued)

Analyses	XSCCMU (May 2011 through June 2013)							XCSSUS (May 2010 through June 2013)						XSCCDS (May 2010 through June 2013)					
	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Sample Size with Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects
TRACE METALS (mg/L) TOTAL																			
Iron	0.09	**0.69**	**0.3**	0.16	16	0	16	0.08	**0.63**	**0.34**	0.10	0	27	0.2	***1.5***	***0.5***	0.3	0	28
Manganese	<0.02	***0.06***	0.04	0.01	16	6	16	0.03	***0.11***	***0.06***	0.02	0	27	0.02	***0.11***	0.05	0.02	0	28
RADIOMETRICS (pCi/L) DISSOLVED																			
Unadjusted Gross Alpha	8.7	***18.3***	14	2.7	16	0	16	8.2	***48.5***	14	8.2	0	20	12.0	***20.4***	***16.4***	2.45	0	19
Gross Beta	3.2	6.9	4.8	1.0	16	0	16	<3	10.4	5.31	1.66	5	19	4.4	83.7	10	17	0	19
Lead 210	<1	4.3	2.0	0.93	16	44	16	<1	5.3	1.6	1.1	44	27	<1	4.2	1.8	0.83	44	27
Polonium 210	<1	1.2	1.2	0.0	16	94	16	<1	<1	-	-	100	27	<1	1.3	1.3	0	96	27
Radium 226	0.5	1.2	0.9	0.2	16	0	16	0.7	2.1	0.9	0.3	0	27	0.6	1.6	0.9	0.2	0	27
Radium 228	<1	<1	-	-	16	100	16	<1	1.9	1.5	0.33	89	27	<1	1.2	1.1	0.05	89	27
Thorium 230	<0.2	<0.2	-	-	16	100	16	<0.2	0.3	0.3	0.00	93	27	<0.2	0.59	0.59	0.00	96	27
RADIOMETRICS (pCI/L) SUSPENDED																			
Lead 210	<1	4.0	2	1	16	63	16	<1	3.5	1.9	0.95	67	27	<1	5.3	1.9	1.3	67	27
Polonium 210	<1	<1	-	-	16	100	16	<1	4.4	4.3	0.19	89	27	<1	2.3	2.3	0.05	93	27
Radium 226	<0.2	***7.1***	1.9	3.0	16	75	16	<0.2	3.6	0.53	0.80	41	27	<0.2	***6.3***	0.78	1.4	33	27
Thorium 230	<0.2	0.2	0.2	0.0	16	94	16	<0.2	0.3	0.3	0.05	93	27	<0.2	2.2	0.74	0.74	81	27
Uranium (mg/L)	<0.0003	0.0007	0.001	0.000	16	94	16	<0.0003	***0.118***	***0.04***	0.06	89	27	<0.0003	***0.287***	***0.04***	0.09	71	28

NOTES:

0.01	Concentration exceeds WDEQ-WQD Surface Water standard.
0.01	Concentration exceeds WDEQ-WQD Groundwater Classification criteria.
0.01	Concentration exceeds WDEQ-WQD Surface Water Standard & Groundwater Classification criteria.
0.01	Concentration exceeds EPA criteria.

Highlight for concentration exceeding WDEQ-WQD criteria is based on the lowest criteria exceeded.

If detection limit is greater than WDEQ-WQD or EPA criteria, and all values are non-detect, concentration is not highlighted.

Table 6
McIntosh Pit and Western Nuclear Pond Water Quality Summary – Energy Fuels Sampling

Analyses	McIntosh Pit (June 2010 through June 2013)						Western Nuclear Pond (August 2011 through June 2013)					
	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	SampleSize with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	SampleSize with Non-Detects
MAJOR IONS (mg/L)												
Total Alkalinity as CaCO3	56	150	125	22.7	0	12	128	169	155	19.1	0	3
Alkalinity, Bicarbonate	68	169	150	26.0	0	12	156	196	180	17.1	0	3
Alkalinity, Carbonate	<5	7	7	0.0	92	12	<5	9	9	0.0	67	3
Chloride	3	19	7	4	0	12	3	5	4	1	0	3
Fluoride	0.1	0.2	0.2	0.04	0	12	0.1	0.4	0.3	0.1	0	3
Sulfate	99	***302***	223	46	0	12	20	32	27	5.1	0	3
Nitrogen, Ammonia	<0.1	<0.1	-	-	100	12	<0.1	**2.6**	**1.4**	1.3	33	3
Nitrogen, Nitrate & Nitrite	<0.1	<0.1	-	-	100	12	<0.1	<0.1	-	-	100	3
Calcium	29	63	57	9.1	0	12	33	38	36	2.4	0	3
Magnesium	3	8	7	1	0	12	4	12	9	4	0	3
Potassium	2	4	3	1	0	12	1	4	3	1	0	3
Sodium	38	108	94	19	0	12	16	27	23	5.0	0	3
PHYSICAL PROPERITES												
pH (std units)	8.0	8.5	8.3	0.13	0	12	8.3	***8.7***	8.5	0.16	0	3
Conductivity (umho/cm)	313	841	738	136	0	12	299	392	360	43.2	0	3
Total Dissolved Solids @ 180°C (mg/L)	210	***600***	***511***	98.2	0	12	200	260	237	26.2	0	3
Total Suspended Solids	<5	62	23	23	33	6	<5	77	64	14	33	3
Turbidity (NTU)	1.1	16.3	5.7	5.7	0	6	3.2	19.3	10	6.7	0	3
Field pH (std units)	6.8	8.7	8.1	0.55	0	10	8.3	9.1	8.7	0.32	0	3
Field Conductivity (umho/cm)	380	872	769	137	0	10	270	436	352	67.8	0	3
Field Temperature (°C)	1	23	12	7	0	11	7	20	15	6.0	0	3
Field Turbidity (NTU)	1.7	57	10	17	0	9	12.2	32.0	20	8.8	0	3
TRACE METALS (mg/L) DISSOLVED												
Aluminum	<0.1	<0.1	-	-	100	12	<0.1	<0.1	-	-	100	3
Arsenic	<0.001	<0.001	-	-	100	12	<0.005	0.002	0.002	0	67	3
Barium	<0.1	<0.1	-	-	100	12	<0.1	<0.1	-	-	100	3
Beryllium	<0.001	<0.001	-	-	100	12	<0.001	<0.001	-	-	100	3
Boron	<0.1	<0.1	-	-	100	12	<0.1	<0.1	-	-	100	3
Cadmium	<0.001	<0.001	-	-	100	12	<0.001	<0.001	-	-	100	0
Chromium	<0.01	<0.01	-	-	100	12	<0.01	<0.01	-	-	100	0
Copper	<0.01	<0.01	-	-	100	12	<0.01	<0.01	-	-	100	3

Table 6
McIntosh Pit and Western Nuclear Pond Water Quality Summary – Energy Fuels Sampling (cont.)

Analyses	McIntosh Pit (June 2010 through June 2013)						Western Nuclear Pond (May 2010 through June 2013)					
	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect	Sample Size with Non-Detects
TRACE METALS (mg/L) DISSOLVED (continued)												
Iron	<0.05	0.06	0.1	0.0	92	12	<0.05	0.09	0.09	0.00	67	3
Lead	<0.01	<0.01	-	-	100	12	<0.01	<0.01	-	-	100	3
Manganese	<0.01	<0.01	-	-	100	12	<0.01	0.04	0.04	0.00	67	3
Mercury	<0.001	<0.001	-	-	100	12	<0.001	<0.001	-	-	100	3
Molybdenum	<0.02	0.01	0.01	0.00	42	12	<0.01	<0.01	-	-	100	3
Nickel	<0.05	<0.05	-	-	100	12	<0.05	<0.05	-	-	100	3
Selenium	<0.005	0.005	0.004	0.001	33	12	<0.001	<0.001	-	-	100	3
Uranium	***1.26***	***3.69***	***3.21***	0.624	0	12	0.0124	***0.108***	***0.0761***	0.0451	0	3
Vanadium	<0.1	<0.1	-	-	100	12	<0.1	<0.1	-	-	100	3
Zinc	<0.01	0.02	0.02	0.00	67	12	<0.01	<0.01	-	-	100	3
TRACE METALS (mg/L) TOTAL												
Iron	<0.05	0.27	0.15	0.08	42	12	0.24	**0.55**	**0.39**	0.13	0	3
Manganese	<0.01	<0.01	-	-	100	12	0.07	***0.25***	***0.1***	0.08	0	3
RADIOMETRICS (pCi/L) DISSOLVED												
Unadjusted Gross Alpha	**804**	**2340**	**1863**	427	0	9	12.8	**60.7**	**44.2**	22.2	0	3
Gross Beta	281	1230	720	323	0	9	3.0	26.4	16	9.6	0	3
Lead 210	1.0	45.5	10	12	0	12	1.4	5.7	3.6	1.8	0	3
Polonium 210	<1	1.4	1.4	0.0	91	12	<1	<1	-	-	100	3
Radium 226	***10.8***	***41.4***	***19.1***	7.75	0	12	<0.2	1.6	1.4	0.25	33	3
Radium 228	<1	5.09	2.59	1.08	33	12	<1	<1	-	-	100	3
Thorium 230	<0.2	0.2	0.2	0.0	92	12	<0.2	<0.2	-	-	100	3
RADIOMETRICS (pCi/L) SUSPENDED												
Lead 210	<1	121	20.6	33.0	8	12	1.4	2.4	1.7	0.47	0	3
Polonium 210	<1	10.3	4.00	3.69	67	12	<1	<1	-	-	100	3
Radium 226	0.2	***7.5***	1.9	1.9	0	12	0.8	1.2	0.97	0.17	0	3
Thorium 230	<0.2	16.7	2.8	4.7	17	12	0.5	0.7	0.6	0.09	0	3
Uranium (mg/L)	0.0009	0.0206	0.005	0.01	0	12	0.0006	0.0012	0.001	0.0002	0	3
RADIOMETRICS (pCi/L) TOTAL												
Unadjusted Gross Alpha	**1450**	**2368**	**1908**	375	0	3	NA	NA	NA	NA	NA	NA
Gross Beta	854	1121	989	109	0	3	NA	NA	NA	NA	NA	NA

NOTES:

0.01	Concentration exceeds WDEQ-WQD Surface Water standard.
0.01	Concentration exceeds WDEQ-WQD Groundwater Classification criteria.
0.01	Concentration exceeds WDEQ-WQD Surface Water Standard & Groundwater Classification criteria.
0.01	Concentration exceeds EPA criteria.

Highlight for concentration exceeding WDEQ-WQD criteria is based on the lowest criteria exceeded.

If detection limit is greater than WDEQ-WQD or EPA criteria, and all values are non-detect, concentration is not highlighted.

NA = Not Analyzed.

Table 7
Ephemeral Impoundments SW-1, SW-2, and SW-3 Water Quality Summary – Energy Fuels Sampling

Analyses	SW-1 (April 2010 through May 2013) (Dry 3 of the 8 observations from April 2010 to May 2013)						SW-2 (April 2010 through May 2013) (Dry 4 of the 7 observations from April 2010 to May 2013)						SW-3 (April 2010 through May 2013) (Dry 5 of the 7 observations from April 2010 to May 2013)					
	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects
MAJOR IONS (mg/L)																		
Alkalinity as CaCO3	33	251	131	90	0	4	25	94	60	35	0	2	15	15	15	0	0	1
Alkalinity, Bicarbonate	40	305	159	98	0	5	27	114	57	40	0	3	18	36	27	9	0	2
Alkalinity, Carbonate	<5	<5	-	-	100	5	<5	<5	-	-	100	3	<5	<5	-	-	100	2
Chloride	<1	**105**	40.3	45.7	40	5	<1	1	1	0	33	3	<1	<1	-	-	100	2
Fluoride	<0.1	0.3	0.2	0.04	20	5	<0.1	0.1	0.1	0	67	3	<0.1	<0.1	-	-	100	2
Sulfate	18.0	***3790***	***817***	1488	0	5	1.0	5	4	2	0	3	8	8	8	0	0	2
Nitrogen, Ammonia	<0.05	**0.2**	**0.2**	0.0	60	5	<0.05	<0.1	-	-	100	3	<0.05	<0.1	-	-	100	2
Nitrogen, Nitrate & Nitrite	<0.1	0.2	0.2	0.0	80	5	<0.1	<0.1	-	-	100	3	<0.1	<0.1	-	-	100	2
Calcium	9	233	69	84	0	5	4	27	13	10	0	3	6	8	7	1	0	2
Magnesium	10	118	29.2	44.6	20	5	<1	4	2.5	1.5	33	3	1	1	1	0	100	2
Potassium	2	18	7	6	0	5	4	7	5	1	0	3	2	3	2.5	1	0	2
Sodium	3.00	1670	358	656	0	5	<1	3	3	0	67	3	<1	1	1	0	50	2
Silica as SiO2	4.0	15	10.0	4.0	0	5	2.2	12	7.4	4	0	3	2.9	3	3	0.1	0	2
PHYSICAL PROPERITES																		
pH (std units)	7.1	8.3	7.9	0.5	0	5	6.7	8.0	7.2	0.5	0	3	7.1	7.5	7.3	0.2	0	2
Conductivity (umho/cm)	114	8240	1932	3160	0	5	45	194	105	64	0	3	60	72	66	6	0	2
Total Dissolved Solids @ 180°C	100	***7010***	***1610***	2704	0	5	62	220	147	65	0	3	50	126	88	38	0	2
Total Suspended Solids	34	2040	708	796	0	4	260	1210	735	475	0	2	28	28	28	0	0	1
Turbidity (NTU)	16.3	3440	942	1444	0	4	295	2520	1408	1113	0	2	95	95	95	0	0	1
Field pH (std units)	7.4	8.6	8.1	0.53	0	3	7.3	7.3	7.3	0	0	1	8.3	8.3	8.3	0	0	1
Field Conductivity (umho/cm)	8.3	173	103	69	0	3	103	103	103	0	0	1	73	73	73	0	0	1
Field Temperature (°C)	6.2	15.8	10	4.3	0	3	7.4	7.4	7.4	0	0	1	13.2	13.2	13	0.0	0	1
Field Turbidity (NTU)	27.8	1000	427	416	0	3	NA	NA	NA	NA	NA	NA	121	121	121	0	0	1
TRACE METALS (mg/L) DISSOLVED																		
Aluminum	<0.1	***1.2***	***0.50***	0.50	40	5	0.1	***1.4***	***0.57***	0.59	0	3	0.1	***0.3***	***0.20***	0.10	0	2
Arsenic	<0.001	0.002	0.001	0	40	5	<0.001	0.001	0.001	0	67	3	<0.001	<0.001	-	-	100	2
Barium	<0.1	0.2	0.1	0.05	40	5	<0.1	<0.1	-	-	100	3	<0.1	<0.1	-	-	100	2
Beryllium	<0.001	<0.001	-	-	100	4	<0.001	<0.001	-	-	100	2	<0.001	<0.001	-	-	100	1
Boron	<0.1	0.3	0.3	0	80	5	<0.1	<0.1	-	-	100	3	<0.1	<0.1	-	-	100	2
Cadmium	<0.001	<0.005	-	-	100	5	<0.001	<0.005	-	-	100	3	<0.001	<0.005	-	-	100	2
Chromium	<0.01	<0.05	-	-	100	5	<0.01	<0.05	-	-	100	3	<0.01	<0.05	-	-	100	2
Copper	<0.01	**0.01**	**0.01**	0	80	5	<0.01	<0.01	-	-	100	3	<0.01	<0.01	-	-	100	2

Table 7
Ephemeral Impoundments SW-1, SW-2, and SW-3 Water Quality Summary – Energy Fuels Sampling (cont.)

Analyses	SW-1 (April 2010 through May 2013)						SW-2 (April 2010 through May 2013)						SW-3 (April 2010 through May 2013)					
	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects	Minimum	Maximum	Average Without Non-Detects	Standard Deviation Without Non-Detects	Percent Non-Detect (%)	Sample Size with Non-Detects
TRACE METALS (mg/L) DISSOLVED (continued)																		
Iron	<0.05	**0.5**	0.3	0.2	40	5	0.1	**0.6**	0.3	0.2	0	3	0.08	**0.11**	0.095	0.015	100	2
Lead	<0.01	<0.02	-	-	100	5	<0.001	<0.01	-	-	100	3	<0.01	0.001	0.001	0	50	2
Manganese	<0.01	***0.23***	***0.23***	0.00	80	5	<0.01	***0.01***	***0.01***	0	67	3	<0.01	<0.01	-	-	100	2
Mercury	<0.001	<0.001	-	-	100	5	<0.001	<0.001	-	-	100	3	<0.001	<0.001	-	-	100	2
Molybdenum	<0.01	0.05	0.04	0.02	60	5	<0.01	<0.1	-	-	100	3	<0.01	<0.1	-	-	100	2
Nickel	<0.01	<0.05	-	-	100	5	<0.05	<0.05	-	-	100	3	<0.05	<0.05	-	-	100	2
Selenium	<0.005	**0.008**	**0.006**	0.002	20	5	<0.001	<0.001	-	-	100	3	<0.001	<0.001	-	-	100	2
Uranium	0.137	***15.0***	***4.0***	5.6	0	5	0.003	***0.08***	***0.031***	0.03	0	3	0.013	0.03	0.022	0.008	0	2
Vanadium	<0.02	<0.1	-	-	100	5	<0.1	<0.1	-	-	100	3	<0.1	<0.1	-	-	100	2
Zinc	<0.01	0.02	0.02	0	80	5	<0.01	0.02	0.02	0	67	3	<0.01	<0.01	-	-	100	2
TRACE METALS (mg/L) TOTAL																		
Iron	**0.52**	**27.5**	**7.2**	10.2	0	5	**3.94**	**19.8**	**10.0**	7.0	0	3	**1.84**	**20.8**	**11.3**	9.5	0	2
Manganese	0.02	***0.49***	***0.2***	0.2	0	5	0.04	***0.23***	***0.1***	0.1	0	3	0.02	0.16	0.09	0.07	0	2
RADIOMETRICS (pCi/L) DISSOLVED																		
Unadjusted Gross Alpha	***336***	***10400***	***3449***	4043	0	4	9.1	***1340***	***675***	665	0	2	***56.7***	***94.3***	***76***	19	0	2
Gross Beta	77.6	3700	1185	1462	0	4	11.9	458	235	223	0	2	24.7	46	35	11	0	2
Lead 210	12.3	27	19	6.6	0	4	<1	24	24	0.0	50	2	3.9	3.9	3.9	0	0	1
Polonium 210	<1	11.1	6.3	4.9	50	4	<1	9.8	9.8	0.0	50	2	1.6	1.6	1.6	0	0	1
Radium 226	<0.2	***656***	***166***	283	20	5	0.52	***878***	***293***	413	0	3	***5.7***	***9.8***	***8***	2	0	2
Radium 228	<1	***22.6***	***8.93***	9.7	40	5	0.9	***36.5***	***13.2***	16.5	0	3	***1.2***	***1.5***	***1.35***	0.1	0	2
Thorium 230	0.28	9.7	3.1	3.9	0	4	0.55	5.2	2.9	2.3	0	2	4.7	4.7	4.7	0	0	1
RADIOMETRICS (pCi/L) SUSPENDED																		
Lead 210	2.7	293	91	118	0	4	4.5	210	107	103	0	2	10.9	10.9	10.9	0	0	1
Polonium 210	<1	9.5	5.0	3.4	25	4	<1	2.4	2.4	0.0	50	2	1.2	1.2	1.2	0	0	1
Radium 226	1.5	***314***	***89***	130	0	4	***6.6***	***204***	***105***	99	0	2	***14.9***	***14.9***	***14.9***	0	0	1
Thorium 230	2.4	305	85	127	0	4	6.1	188	97	91	0	2	8.8	8.8	8.8	0	0	1
Uranium (mg/L)	0.02	***38.5***	***10***	17	0	4	***0.34***	***16.0***	***8***	8	0	2	***0.031***	***0.031***	***0.031***	0	0	1
RADIOMETRICS (pCi/L) TOTAL																		
Unadjusted Gross Alpha	***1560***	***1560***	***1560***	0	0	1	***104***	***104***	***104***	0	0	1	NA	NA	NA	NA	NA	NA
Gross Beta	1035	1035	1035	0	0	1	58.2	58	58	0	0	1	NA	NA	NA	NA	NA	NA

NOTES:

0.01	Concentration exceeds WDEQ-WQD Surface Water standard.
0.01	Concentration exceeds WDEQ-WQD Groundwater Classification criteria.
0.01	Concentration exceeds WDEQ-WQD Surface Water Standard & Groundwater Classification criteria.
0.01	Concentration exceeds EPA criteria.

Highlight for concentration exceeding WDEQ-WQD criteria is based on the lowest criteria exceeded.

If detection limit is greater than WDEQ-WQD or EPA criteria, and all values are non-detect, concentration is not highlighted.

NA = Not Analyzed.

Table 8
Groundwater Quality Mean Values (Q2 2010 through Q3 2013) – Energy Fuels Sampling

Well No. & Completion / Analyses	Mean Concentrations																				
	PZ-1	PZ-2	PZ-3	PZ-4	PZ-5	PZ-7	PZ-8	PZ-9	PZ-10	MW-6	MW-6N	MW-6S	MW-7	MW-9	MW-10	G-3	G-4	G-5	G-6	G-7	G-8	Sheep I
	PAA	PAA	PAA	PAA	PAA	PAA	PAA	PAA	Ft. Union	PAA	Cody Shale	Cody Shale	PAA	PAA	PAA	Cody Shale	PAA	PAA	Battle Spring	Battle Spring	PAA	PAA
MAJOR IONS (mg/L)																						
Alkalinity	172	98	141	164	105	117	105	231	153	185	403	482	234	207	162	340	186	139	196	218	330	97
Bicarbonate	210	118	158	196	121	117	102	278	186	220	451	544	280	235	176	411	226	169	237	266	402	118
Carbonate	<5	<5	<5	5.3	6.4	<5	18.0	5.0	<5	5.3	20.2	21.5	5.5	9.2	11.4	5.8	<5	<5	5.1	5.0	<5	<5
Chloride	10	3	4	6	4	6	2	18	5	13	11	***262***	4	32	4	14	6	5	17	19	14	4
Fluoride, Total	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.7	0.4	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.1	0.5	0.1
Sulfate	77	8	159	20	36	***384***	53	170	73	106	**219**	6	28	190	40	***1287***	132	***349***	145	***296***	**220**	**223**
Nitrogen, Ammonia	***0.09***	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	***0.2***	***0.15***	***0.2***	***0.4***	***0.7***	***0.2***	***0.6***	***0.5***	<0.1	<0.1	***0.1***	***0.1***	***0.3***	***0.2***
Nitrogen, Nitrate & Nitrite	0.55	<0.1	0.14	0.16	<0.1	<0.1	<0.1	0.17	0.10	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	0.18	0.11	2.15	<0.1	<0.1
Calcium, Dissolved	54	17	62	49	11	116	12	22	54	43	4	6	43	4	2	165	81	133	88	166	55	17
Magnesium, Dissolved	7	2	5	7	1	23	2	6	13	10	1	2	19	1	1	93	10	18	10	16	12	4
Potassium, Dissolved	2	2	2	2	1	5	2	4	2	3	2	3	5	3	4	9	2	3	2	4	7	3
Sodium, Dissolved	46	27	62	17	54	60	58	157	20	73	300	399	33	205	90	424	34	39	50	38	181	126
Silica	20	15	17	12	11	19	8	8	25	13	8	9	9	8	16	11	22	23	19	23	10	4
PHYSICAL PROPERITES																						
pH (Std. Units)	8.0	8.3	8.0	8.3	8.4	7.4	***8.6***	8.3	7.9	8.2	***8.7***	***8.6***	8.1	8.4	***8.6***	8.2	8.1	7.6	8.1	8.0	8.1	8.0
Conductivity (umho/cm)	503	210	608	357	292	946	325	846	426	601	1228	1675	481	944	400	2720	618	935	713	997	1060	706
Solids, Total Dissolved TDS @ 180°C (mg/L)	352	145	419	223	192	733	253	***597***	316	398	***854***	***965***	272	***608***	***635***	***2296***	416	***738***	486	***788***	***630***	475
Solids, Total Suspended (mg/L)	3.1	9.0	<5	<5	7.2	-	-	-	-	7.7	15.5	32.0	48.1	942	1471.8	74.8	33.3	34.0	372.0	107.0	22300.0	-
Field pH (std units)	7.1	8.3	7.7	7.9	8.5	***8.7***	***8.6***	7.9	7.8	***8.6***	***8.6***	8.4	7.8	8.4	***8.8***	7.4	7.5	6.5	7.5	7.0	-	7.7
Field Conductivity (umho/cm)	520	219	623	356	297	733	373	939	476	540	1294	1748	481	8.7	389	2741	585	891	697	951	-	390
Field Temperature (°C)	10.2	2.6	9.8	9.4	10.4	6.1	9.3	9.5	9.1	8.6	9.2	9.3	10.6	9.7	9.9	8.6	8.7	9.1	9.2	9.9	-	13.0
Field Turbidity (NTU)	7	1	1	5	<1	29	13	9	11	24	31	123	31	57	612	115	44	65	342	186	-	25
Dissolved Oxygen (mg/l)	2.7	2.6	2.6	2.7	1.9	6.0	4.1	4.3	4.3	4.1	1.7	2.6	1.9	2.2	2.0	3.7	3.2	3.2	3.8	4.0	-	3.0
TRACE METALS (mg/L) DISSOLVED																						
Aluminum	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***0.15***	***0.16***	***0.4***	<0.1	***0.11***	***1.1***	<0.1	<0.1	<0.1	***0.11***	<0.1	<0.1	<0.1
Arsenic	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.002	<0.005	0.002	<0.005	<0.005	***0.0104***	0.003	<0.005	<0.005	<0.005	<0.001	0.001	<0.001
Barium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.001
Boron	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.10	0.3	<0.1	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	0.20	<0.1
Cadmium	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.04**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.011**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table 8
Groundwater Quality Mean Values (Q2 2010 through Q3 2013) – Energy Fuels Sampling (cont.)

Well No. & Completion / Analyses	Mean Concentrations																				
	PZ-1	PZ-2	PZ-3	PZ-4	PZ-5	PZ-7	PZ-8	PZ-9	PZ-10	MW-6	MW-6N	MW-6S	MW-7	MW-9	MW-10	G-3	G-4	G-5	G-6	G-7	G-8	Sheep I
	PAA	PAA	PAA	PAA	PAA	PAA	PAA	PAA	Ft. Union	PAA	Cody Shale	Cody Shale	PAA	PAA	PAA	Cody Shale	PAA	PAA	Battle Spring	Battle Spring	PAA	PAA
TRACE METALS (mg/L) DISSOLVED (continued)																						
Iron	<0.05	0.0578	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.22	<0.05	<0.05	**0.33**	<0.05	<0.05	<0.05	<0.05	0.095	<0.05	<0.05
Lead	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Manganese	0.05	<0.02	***0.06***	<0.02	<0.02	***0.29***	<0.02	<0.02	0.02	***0.10***	0.01	0.02	0.03	<0.02	<0.02	***0.65***	***0.13***	***0.26***	***0.17***	***0.16***	***0.39***	<0.1
Mercury	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	0.03	0.02
Nickel	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium	0.005	<0.005	<0.005	<0.005	0.002	<0.005	0.004	<0.005	<0.005	<0.005	<0.005	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	0.020	<0.005	**0.0295**	0.004	<0.001
Uranium	***0.74***	0.00354	0.00492	***0.257***	0.002	***0.50***	***0.16***	***0.044***	***0.067***	***0.0785***	0.00222	0.0008	0.0074	0.0021	0.0086	***0.104***	***0.0396***	***0.395***	***0.0640***	***6.6400***	***0.3740***	***0.1890***
Vanadium	0.08	0.08	<0.1	0.08	<0.1	<0.02	0.05	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	0.08	<0.1	0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	<0.01	0.011	0.01	<0.01	0.011	0.1	0.1	0.3	0.02	0.02	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	0.013	0.05	0.012	<0.01	<0.01	<0.01
TRACE METALS (mg/L) TOTAL																						
Iron, Total (mg/L)	**0.92**	0.06	<0.05	0.25	<0.05	**5.43**	**0.39**	**0.38**	**0.45**	**0.32**	**1.38**	**3.28**	**1.45**	0.18	**9.89**	**4.78**	**0.75**	**3.80**	**10.20**	**1.05**	**136.00**	**3.79**
Manganese, Total (mg/L)	***0.15***	<0.02	***0.06***	<0.02	<0.02	***0.32***	***0.13***	0.04	0.03	***0.14***	0.03	***0.06***	0.04	<0.02	***0.17***	***0.72***	***0.18***	***0.28***	***0.39***	***0.17***	***2.83***	***0.12***
RADIOMETRICS (pCi/L) DISSOLVED																						
Gross Alpha	***459.3***	***17.6***	11.3	***160.8***	9.3	***189.0***	***120.0***	***27.2***	***21.7***	***35.0***	7.7	4.0	***22.8***	6.6	***65.0***	***57.4***	***48.8***	***265.5***	***46.6***	***4115.0***	***252.0***	-
Adjusted Gross Alpha	6.5	***15.3***	7.5	5.00	8	***33.3***	***32.7***	<1	1.7	4.4	6.2	3.7	***18.3***	5.7	***63.3***	<1	***22.0***	***10.9***	5.2	<1	<1	-
Lead 210	3.0	3.2	0.9	3.4	1.9	4.7	15.7	2.5	1.6	3.1	1.5	1.7	1.3	1.4	6.9	2.3	3.2	4.3	4.6	6.8	-	15.3
Polonium 210	<1.0	1.66	1.15	1.086	<1.0	1.6	1.8	1.33	1	<1.0	<1.0	<1.0	<1.0	1.06	6.1	1.17	<1.0	<1	2.0	<1	-	<1
Radium 226	***3.8***	***9.9***	***2.6***	***2.4***	2.0	***16.1***	3.2	2.8	***4.8***	3.0	0.6	0.4	***11.4***	2.4	***5.6***	0.9	***19.0***	***5.7***	***4.3***	***18.0***	***8.0***	***24.5***
Radium 228	***2.3***	***1.1***	***4.0***	***2.9***	1.9	***4.2***	<1.0	<1	***5.4***	1.7	1.3	<1.0	***1.2***	1.1	***4.0***	1.1	***4.3***	***6.5***	***3.4***	***3.5***	***-***	***1.6***
Thorium 230	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.6	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	1.5	<0.2	0.5	0.2	0.4	<0.2	-	<0.2
RADIOMETRICS (pCi/L) SUSPENDED																						
Lead 210	7.2	2.6	1.3	8.6	1.2	75.0	29.4	25.8	29.7	1.7	1.4	0.8	2.9	1.7	18.5	2.4	7.7	5.2	9.0	8.3	-	18.1
Polonium 210	0.85	1.4	1.18	5.5	<1.0	10.0	12.3	1.6	4.0	<1.0	<1.0	<1.0	1.05	1.13	13.2	1.01	1.6	1.5	1.32	1.725	-	5
Radium 226	2.5	0.4	0.2	0.4	<0.2	2.6	0.2	0.3	0.7	0.4	0.4	0.3	1.5	0.5	***16.5***	1.5	***7.8***	4.2	***14.3***	***4.8***	***207.0***	***56.5***
Thorium 230	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.7	<0.2	<0.2	<0.2	0.6	0.5	6.0	0.7	1.3	0.8	14.3	9.0	-	4.2
Uranium S(mg/L)	0.001	<0.0003	<0.0003	0.0003	<0.0003	***0.1***	0.001	0.0004	0.0004	0.0006	***0.0036***	0.0003	0.001	0.0009	***0.031***	0.003	0.002	***0.01***	***0.02***	***0.02***	***0.14***	***0.02***
RADIOMETRICS (pCi/L) TOTAL																						
Gross Alpha	***374.3***	***20.5***	9.9	***196.3***	9.8	***508.5***	***223.0***	***63.0***	***72.7***	-	14.6	4.3	***32.1***	***31.5***	***370.4***	-	-	-	-	-	-	208.5
Gross Beta	134	9	9	81	6	334	102	49	74	-	12	4	15	16	104	-	-	-	-	-	-	107

Table 8
Groundwater Quality Mean Values (Q2 2010 through Q3 2013) – Energy Fuels Sampling (cont.)

Well No. & Completion / Analyses	Mean Concentrations																				
	PZ-1	PZ-2	PZ-3	PZ-4	PZ-5	PZ-7	PZ-8	PZ-9	PZ-10	MW-6	MW-6N	MW-6S	MW-7	MW-9	MW-10	G-3	G-4	G-5	G-6	G-7	G-8	Sheep I
	PAA	PAA	PAA	PAA	PAA	PAA	PAA	PAA	Ft. Union	PAA	Cody Shale	Cody Shale	PAA	PAA	PAA	Cody Shale	PAA	PAA	Battle Spring	Battle Spring	PAA	PAA

Notes:

Well completion indicates the formation in which the well is completed. PAA indicates Project Area Aquifer, i.e., undifferentiated Battle Spring and Fort Union Formations.

Wells PZ-7 through PZ-9 were sampled from 3Q 2010 through 1Q 2011, and Well PZ-10 was sampled from 3Q 2010 through 2Q 2011.

Well MW-6 and the G series wells were completed in 2011. Sampling of Well MW-6 began in Q1 2011. Sampling of Wells G-3 through G-6 began in 2Q 2011, and Sampling of Well G-7 began in 4Q 2012.

Well G-8 is essentially dry. Data represents one sampling event in March 2013, without well purge

The Sheep 1 Shaft was sampled in 3Q and 4Q 2010.

0.01	Concentration exceeds WDEQ-WQD Surface Water standard.
0.01	Concentration exceeds WDEQ-WQD Groundwater Classification criteria.
0.01	Concentration exceeds WDEQ-WQD Surface Water Standard & Groundwater Classification criteria.
0.01	Concentration exceeds EPA criteria.

Highlight for concentration exceeding WDEQ-WQD criteria is based on the lowest criteria exceeded.

If detection limit is greater than WDEQ-WQD or EPA criteria, and all values are non-detect, concentration is not highlighted.

Appendix 3-C
Water Rights

Table 1
Surface Water Rights within the Project Area and within 0.5 Mile Downstream of the Project Area

Stream Source	Water Right (WR) Number	Twn	Rng	Sec	Qtr-Qtr	Latitude	Longitude	Priority Date	Facility Name	Company / Owner	Facility Type	Total Capacity (AF/Yr)	Diversion Capacity at Headgate (CFS)	Active Capacity (AF)	Inactive Capacity (AF)	Size of Reservoir (AF)	Total Flow (CFS) / Approp. (GPM)	Uses	Summary Water Right (WR) Status
Sheep Creek Drainage																			
Sheep Creek	CR CC29/283	028N	092W	22	NW1/4NE1/4	42.39021	-107.80159	12/31/1903	Sheep Creek Ditch No. 1	JESSE JOHNSON	Stream			0	0	0	0.78	IRR_SW	
Sheep Creek	CR CC29/284	028N	092W	22	NW1/4NE1/4	42.39021	-107.80159	5/24/1901	Sheep Creek Ditch No. 2	JESSE JOHNSON	Stream			0	0	0	0.8	IRR_SW	
Sheep Creek	P3197.0D	028N	092W	22	NW1/4NE1/4	42.390565	-107.803613	5/24/1901	Sheep Creek Ditch No. 2	MATILDA J. MCLAUGHLIN	Stream		-1	0	0	0	1.14	IRR_SW	Fully Adjudicated
Sheep Creek	P17019.0D	028N	092W	15	NE1/4NW1/4	42.404658	-107.807458	8/31/1925	Sheep Creek Pipe Line No. 1	UNION OIL COMPANY OF CALIFORNIA	Stream		0.026	0	0	0	0.03	DOM_SW; DRI; MIS_SW; OIL; STO	Fully Adjudicated
Sheep Creek	CR CC45/287	028N	092W	15	NE1/4NW1/4	42.40466	-107.80642	8/31/1925	Sheep Creek Pipe Line No. 1	UNION OIL COMPANY OF CALIFORNIA	Stream			0	0	0	0.03	DOM_SW	
Spring	CR CC45/288	028N	092W	15	NE1/4NW1/4	42.40466	-107.80642	8/31/1925	Sheep Creek Pipe Line No. 2	UNION OIL COMPANY OF CALIFORNIA	Spring			0	0	0	0.03	DOM_SW	
Spring	P17020.0D	028N	092W	15	NE1/4NW1/4	42.404659	-107.806424	8/31/1925	Sheep Creek Pipe Line No. 2	UNION OIL COMPANY OF CALIFORNIA	Spring		0.026	0	0	0	0.03	DOM_SW; DRI; MIS_SW; OIL; STO	Fully Adjudicated
Crooks Creek Drainage																			
Quaking Asp Creek	CR CR11/187	028N	092W	32	SE1/4NE1/4	42.35781	-107.83578	3/11/1976	McIntosh No. 2 Stock Reservoir	U.S. ENERGY - CRESTED CORP.	Reservoir	14.2		0	0	14.2	0	STO	
Quaking Asp Creek	P8104.0S	028N	092W	32	SE1/4NE1/4	42.357816	-107.835783	3/11/1976	McIntosh No. 2 Stock Reservoir	U.S. ENERGY/CRESTED CORPORATION	Reservoir	14.2		0	0	14.2	0	STO	Fully Adjudicated
McIntosh Draw	P8393.0R	028N	092W	32	SE1/4NE1/4	42.357817	-107.835783	3/13/1981	McIntosh Pit Reservoir	JENNIFER MCINTOSH	Reservoir	537.35		0	537.35	537.35	0	STO; WL	Complete
Sheehan Springs Draw	P7714.0R	028N	092W	29	SE1/4NE1/4	42.372132	-107.835668	3/11/1976	McIntosh No. 1 Reservoir	U.S. ENERGY/CRESTED CORPORATION	Spring	481.36		0	0	481.36	0	MIN; MIS_SW; COMBBU	Unadjudicated
Sheehan Spring	P22281.0D	028N	092W	28	SW1/4NW1/4	42.372118	-107.830837	6/20/1958	Sheehan Spring Diversion	HEALD PROJECT #2	Spring		0.1	0	0	0	0.1	DOM_SW; MIN	
Crook's Creek	CR CC37/076	028N	092W	20	SE1/4SW1/4	42.37938	-107.84526	5/20/1907	Crook's Creek Ditch	RED CREEK SHEEP COMPANY	Stream			0	0	0	1.06	IRR_SW	
Crook's Creek	P7774.0D	028N	092W	20	SE1/4SW1/4	42.379657	-107.84661	5/20/1907	Crook's Creek	CABRIN LEMMON	Stream		-1	0	0	0	1.06	IRR_SW	Fully Adjudicated

Stream Source	Water Right (WR) Number	Twn	Rng	Sec	Qtr-Qtr	Latitude	Longitude	Priority Date	Facility Name	Company / Owner	Facility Type	Total Capacity (AF/Yr)	Diversion Capacity at Headgate (CFS)	Active Capacity (AF)	Inactive Capacity (AF)	Size of Reservoir (AF)	Total Flow (CFS) / Approp. (GPM)	Uses	Summary Water Right (WR) Status
									Ditch										
Crook's Creek	P35001.0D	028N	092W	20	SE1/4SW1/4	42.38	-107.846889	5/13/2013	Crooks Gap Water Haul	FREMONT COUNTY TRANSPORTATION DEPARTMENT	Stream			0	0	0	1	TEM	Complete
Crook's Creek	CR CC09/056	028N	092W	20	SW1/4NW1/4	42.38647	-107.8502	5/24/1901	Stevens Ditch No. 3	CHARLES JOHNSON	Stream			0	0	0	0.37	IRR_SW	
Crook's Creek	P3963.0E	028N	092W	19	NE1/4NE1/4	42.389991	-107.855153	1/10/1919	Stevens Ditch No. 3 {Enl. of}	CHARLES JOHNSON	Stream		3.75	0	0	0	1.39	IRR_SW	Unadjudicated
Crook's Creek	P3195.0D	028N	092W	19	NE1/4NE1/4	42.390468	-107.853921	5/24/1901	Stevens Ditch No. 3	GILBERT STEVENS	Stream		-1	0	0	0	1.5	IRR_SW	Fully Adjudicated
Crook's Creek	P17025.0D	028N	092W	18	NE1/4SE1/4	42.397083	-107.854889	10/5/1925	Crooks Creek 2" Water Line Pipeline	ATLANTIC RICHFIELD CO.	Stream		0.048	0	0	0	0.05	DOM_SW; DRI; MIS_SW; OIL; STO	Fully Adjudicated
Crook's Creek	CR CC45/559	028N	092W	18	NE1/4SE1/4	42.39722	-107.85504	10/5/1925	Crooks Creek 2" Water Line Pipeline	PRODUCERS REFINERS CORPORATION	Stream			0	0	0	0.05	DOM_SW; OIL; STO	
East Hanks Draw	P13991.0R	028N	092W	16	SE1/4SW1/4	42.393167	-107.825611	2/23/1987	Congo Pit Reservoir	ENERGY FUELS WYOMING INC	Reservoir			0	1234.5	1234.5	0	STO; WL	Incomplete

Note: Grey shading indicates water right within the Sheep Mountain Project and controlled by Energy Fuels, Inc.

Table 2
Surface Water Rights within 0.5 to 3 miles Downstream of the Project Area

Stream Source	Water Right (WR) Number	Twn	Rng	Sec	Qtr-Qtr	Latitude	Longitude	Priority Date	Facility Name	Company / Owner	Facility type	Total Capacity (AF/Yr)	Diversion Capacity at Headgate (CFS)	Active Capacity (AF)	Inactive Capacity (AF)	Size of Reservoir (AF)	Total Flow (CFS) / Approp. (GPM)	Uses	Summary Water Right (WR) Status
Sheep Creek Drainage																			
Sheep Creek	P7817.0D	028N	092W	4	SE1/4SE1/4	42.422752	-107.815744	5/20/1907	Sheep Creek Ditch No. 1	A.M. RUSHTON	Stream		-1	0	0	0	0.58	IRR_SW	Fully Adjudicated
Sheep Creek	CR CC29/285	028N	092W	4	SE1/4SE1/4	42.42256	-107.81621	5/20/1907	Sheep Creek Ditch No. 1	MRS. DAVID JOHNSON	Stream			0	0	0	0.57	IRR_SW	
Sheep Creek	P7823.0D	028N	092W	4	SE1/4SE1/4	42.422764	-107.815755	6/6/1907	Sheep Creek Ditch No. 2	A.M. RUSHTON	Stream			0	0	0	0.11	IRR_SW	Fully Adjudicated
Sheep Creek	CR CC29/286	028N	092W	4	SE1/4SE1/4	42.42256	-107.81621	6/6/1907	Sheep Creek Ditch No. 2	MRS. DAVID JOHNSON	Stream			0	0	0	0.11	IRR_SW	
Sheep Creek	CR CC35/125	028N	092W	4	NE1/4SE1/4	42.42615	-107.81622	6/26/1909	Sheep Creek Ditch No. 3	AMANDA M. JOHNSON	Stream			0	0	0	0	DOM_SW; STO	
Sheep Creek	P9136.0D	028N	092W	4	NE1/4SE1/4	42.426209	-107.817422	6/26/1909	Sheep Creek Ditch No. 3	DAVID JOHNSON	Stream		-1	0	0	0	0	DOM_SW; IRR_SW; STO	Fully Adjudicated
Sheep Creek	CR CC29/287	028N	092W	4	NE1/4SE1/4	42.42615	-107.81622	5/5/1909	Sheep Creek Ditch No. 4	MRS. DAVID JOHNSON	Stream			0	0	0	0.02	DOM_SW; IRR_SW; STO	
Sheep Creek	P8994.0D	028N	092W	4	NE1/4SE1/4	42.42623	-107.817438	5/5/1909	Sheep Creek Ditch No. 4	DAVID JOHNSON	Stream		-1	0	0	0	0.02	DOM_SW; IRR_SW; STO	Fully Adjudicated
Crooks Creek Drainage																			
Crook's Creek	P3963.0E	028N	092W	19	NE1/4NE1/4	42.389991	-107.855153	1/10/1919	Stevens Ditch No. 3 {Enl. of}	CHARLES JOHNSON	Stream		3.75	0	0	0	1.39	IRR_SW	Unadjudicated
Crook's Creek	P3195.0D	028N	092W	19	NE1/4NE1/4	42.390468	-107.853921	5/24/1901	Stevens Ditch No. 3	GILBERT STEVENS	Stream		-1	0	0	0	1.5	IRR_SW	Fully Adjudicated
Crook's Creek	CR CC79/013	028N	092W	7	SE1/4SE1/4	42.40644	-107.85558	9/22/1926	SUPPLY DITCH NO. 4 (AS CHANGED TO KIRK NO. 1 DITCH)	LONNIE J. CLAYTOR	Stream			0	0	0	0	RES	Fully Adjudicated
Crook's Creek	CR CC47/402	028N	092W	7	SE1/4SE1/4	42.40814	-107.85496	9/18/1919	Kirk Ditch No. 1	USDI BUREAU OF RECLAMATION	Stream			0	0	0	1.21	IRR_SW	
Crook's Creek	P15570.0D	028N	092W	7	SE1/4SE1/4	42.408306	-107.855056	9/18/1919	Kirk Ditch No. 1	LONNIE J. CLAYTOR	Stream		4.03	0	0	0	1.21	IRR_SW	Fully Adjudicated
Crook's Creek	CR CC47/403	028N	092W	7	NE1/4SE1/4	42.41175	-107.85493	9/18/1919	Kirk Ditch No. 2	USDI BUREAU OF RECLAMATION	Stream			0	0	0	0.17	IRR_SW	
Crook's Creek	P15571.0D	028N	092W	7	NE1/4SE1/4	42.413417	-107.854611	9/18/1919	Kirk Ditch No. 2	LONNIE J. CLAYTOR	Stream		1.1	0	0	0	0.17	IRR_SW	Fully Adjudicated
Crook's Creek	P17409.0D	028N	092W	5	SW1/4SW1/4	42.42263	-107.850089	9/22/1926	Supply Ditch No. 4 (as Changed to Kirk No. 1 Ditch)	LONNIE J. CLAYTOR	Stream		19.6	0	0	0	0	DOM_SW; IRR_SW; RES; STO	Fully Adjudicated
Crook's Creek	P17410.0D	028N	092W	5	SW1/4NW1/4	42.427997	-107.847668	9/24/1926	Kirk Pipe Line	J. M. KIRK	Stream		0.03	0	0	0	0.03	DOM_SW; STO	
Crook's Creek	P17412.0D	028N	092W	5	SW1/4NW1/4	42.428015	-107.847651	9/24/1926	Garden Ditch	J. M. KIRK	Stream		2	0	0	0	0	IRR_SW	
Crook's Creek	P17411.0D	028N	092W	5	NW1/4NW1/4	42.433373	-107.850002	9/24/1926	J. M. Ditch	J. M. KIRK	Stream		10	0	0	0	0	DOM_SW; IRR_SW; RES; STO	
Crook's Creek	P4073.0R	028N	092W	5	SW1/4NW1/4	42.429823	-107.849995	9/24/1926	J. M. Reservoir	J. M. KIRK	Reservoir	2.84		0	0	2.84	0	DOM_SW; IRR_SW; STO; COMBBU	

Stream Source	Water Right (WR) Number	Twn	Rng	Sec	Qtr-Qtr	Latitude	Longitude	Priority Date	Facility Name	Company / Owner	Facility type	Total Capacity (AF/Yr)	Diversion Capacity at Headgate (CFS)	Active Capacity (AF)	Inactive Capacity (AF)	Size of Reservoir (AF)	Total Flow (CFS) / Approp. (GPM)	Uses	Summary Water Right (WR) Status
Crook's Creek	CR CC09/053	029N	092W	34	NE1/4NW1/4	42.4478	-107.82829	08/10/1897	Rigby Reservoir Supply Ditch	MASON RIGBY	Stream			0	0	0	0	RES	
Crook's Creek	P1565.0D	029N	092W	34	NE1/4NW1/4	42.449083	-107.827417	08/10/1897	Rigby Reservoir Supply Ditch	MASON RIGBY	Stream		-1	0	0	0	0	RES	Fully Adjudicated
Thompson Gulch	P5429.0R	029N	092W	33	NE1/4SW1/4	42.440644	-107.847541	5/11/1933	Diehl Reservoir	HENRY C. DIEHL	Reservoir	23.19		0	0	23.19	0	DOM_SW; STO; COMBBU	

Table 3
Groundwater Rights within the Project Area and within 3 Miles of the Project Area

Water Right (WR) Number	Twn	Rng	Sec	Qtr-Qtr	Latitude	Longitude	Priority Date	Facility Name	Company / Owner	Total Depth (Ft)	Static Water Level (Ft)	Appropriation (GPM)	Well Log (Y/N)	Uses	Summary Water Right (WR) Status
P34440.0W	027N	092W	11	NW1/4NW1/4	42.3322	-107.7923	8/19/1976	ROCK WELL #1	GREEN MOUNTAIN MINING VENTURE	358	16.7	0		MIS	Incomplete
P35444.0W	027N	092W	11	NW1/4NW1/4	42.3322	-107.7923	10/29/1976	ROCK WELL #2	GREEN MOUNTAIN MINING VENTURE	99.6	11	0		MON	Complete
P102900.0W	027N	092W	10	NE1/4NE1/4	42.3322	-107.7971	7/5/1996	JP-40	GREEN MOUNTAIN MINING VENTURE	38	10.5	0		MON	
P147542.0W	027N	092W	2	SE1/4SE1/4	42.3357	-107.7776	10/21/2002	BEMW-001		98	56	0		MON	Complete
P147588.0W	027N	092W	2	SE1/4SE1/4	42.3357	-107.7778	10/22/2002	BEMW-002		80	51.6	0		MON	Complete
P147589.0W	027N	092W	2	SE1/4SE1/4	42.3357	-107.7778	10/22/2002	BEMW-003		95	73.25	0		MON	Complete
P147590.0W	027N	092W	2	SE1/4SE1/4	42.3357	-107.7778	10/22/2002	BEMW-004	KENNECOTT URANIUM CO.	100	73.2	0		MON	Complete
P147591.0W	027N	092W	2	SE1/4SE1/4	42.3357	-107.7778	10/22/2002	BEMW-005	KENNECOTT URANIUM CO.	120	90.06	0		MON	Complete
P147592.0W	027N	092W	2	NW1/4SE1/4	42.3393	-107.7825	10/22/2002	BEMW-006		170	148.99	0		MON	Complete
P181642.0W	027N	092W	1	NW1/4SW1/4	42.3393	-107.7727	6/8/2007	ENL. ZENITH #1 WELL	GREEN MOUNTAIN MINING VENTURE	850	210	0		MIS	Complete
P41033.0W	027N	092W	1	NW1/4SW1/4	42.3393	-107.7727	4/15/1977	ZENITH #1	GREEN MOUNTAIN MINING VENTURE	850	210	60		MIS	Adjudicated
CR UW03/438	027N	092W	1	NW1/4SW1/4	42.3393	-107.7727	4/15/1977	ZENITH #1	KENNETH L. MARBLE			60		MIS	
P49789.0W	028N	092W	33	NW1/4NW1/4	42.3613	-107.8309	7/25/1979	PIEZO #4	ENERGY FUELS WYOMING INC	220	168	0		MON	Complete
P49790.0W	028N	092W	32	SE1/4NE1/4	42.3578	-107.8358	7/25/1979	PIEZO #5	ENERGY FUELS WYOMING INC	440	134.5	0		MON	Complete
P49788.0W	028N	092W	29	SE1/4SE1/4	42.3649	-107.8357	7/25/1979	PIEZO #3	ENERGY FUELS WYOMING INC	280	129	0		MON	Complete
P33910.0W	028N	092W	29	NE1/4SE1/4	42.3685	-107.8357	5/18/1976	MCINTOSH WELL #2 (i.e., “Shop Well”)	ENERGY FUELS WYOMING INC	250	160	5	N	MIS	Adjudicated
P43954.0W	028N	092W	29	NE1/4SE1/4	42.3685	-107.8357	6/14/1978	MCINTOSH WELL #3	ENERGY FUELS WYOMING INC	300	120.7	25	N	MIS	Adjudicated
P49786.0W	028N	092W	29	NE1/4SE1/4	42.3685	-107.8357	7/25/1979	PIEZO #1	ENERGY FUELS WYOMING INC	200	101	0		MON	Complete
CR UW04/134	028N	092W	29	NE1/4SE1/4	42.3685	-107.8357	5/18/1976	MCINTOSH WELL #2	WILLIAM MCINTOSH			5		MIS	
CR UW04/135	028N	092W	29	NE1/4SE1/4	42.3685	-107.8357	6/14/1978	MCINTOSH WELL #3	WILLIAM MCINTOSH			25		MIS	
P49787.0W	028N	092W	28	NE1/4SW1/4	42.3691	-107.8243	7/25/1979	PIEZO #2	ENERGY FUELS WYOMING INC	730	236	0		MON	Complete
P44469.0W	028N	092W	28	SW1/4NE1/4	42.3721	-107.8211	7/17/1978	SD 18 16	ENERGY FUELS WYOMING INC	1410	757	20		MIS	Unadjudicated
U.W. 201721	028N	092W	28	NW1/4NE1/4	42.3819	-107.8136	12/19/2013	SHEEP II SHAFT	ENERGY FUELS WYOMING INC.	3955		1000	N	MIS	Incomplete
P44886.0W	028N	092W	22	NE1/4SW1/4	42.3830	-107.8065	8/21/1978	PL-21A	ENERGY FUELS WYOMING INC	1410	675	35		MIS	Unadjudicated
U.W. 201720	028N	092W	22	NW1/4SW1/4	42.3741	-107.8223	12/19/2013	SHEEP I SHAFT	ENERGY FUELS WYOMING INC.	1940		1000	N	MIS	Incomplete
P1490.0W	028N	092W	21	SW1/4NE1/4	42.3865	-107.8211	5/6/1965	GOLDEN GOOSE WATER WELL NO.1	ENERGY FUELS WYOMING INC	800	-1	5		DOM_GW; IND_GW	Incomplete
P52291.0W	028N	092W	21	SE1/4NW1/4	42.3864	-107.8260	5/30/1980	PZ-8	ENERGY FUELS WYOMING INC	420	304	0		MON	Complete
P192612.0W	028N	092W	21	NE1/4NE1/4	42.3897	-107.8161	1/19/2010	CONGO MW 3	ENERGY FUELS WYOMING INC			0		MON	Incomplete
P52293.0W	028N	092W	21	NE1/4NE1/4	42.3902	-107.8162	5/30/1980	PZ-10	ENERGY FUELS WYOMING INC	400	31.55	0		MON	Complete
P28675.0W	028N	092W	20	SE1/4SE1/4	42.3793	-107.8356	8/27/1974	GOLDEN GOOSE II WATER	ENERGY FUELS WYOMING INC	500	0	7	N	IND_GW	Adjudicated
P4158.0W	028N	092W	20	SE1/4SE1/4	42.3793	-107.8356	1/12/1970	YELLOWSANDS NO.1	ENERGY FUELS WYOMING	500	200	12		DOM_GW;	Unadjudicated

Water Right (WR) Number	Twn	Rng	Sec	Qtr-Qtr	Latitude	Longitude	Priority Date	Facility Name	Company / Owner	Total Depth (Ft)	Static Water Level (Ft)	Appropriation (GPM)	Well Log (Y/N)	Uses	Summary Water Right (WR) Status
									INC					IND_GW	
CR UW04/136	028N	092W	20	NE1/4SE1/4	42.3828	-107.8356	8/27/1974	GOLDEN GOOSE II WATER	U.S. ENERGY-CRESTED CORPORATION			7		MIS	
P192613.0W	028N	092W	20	NE1/4NE1/4	42.3894	-107.8356	1/19/2010	CONGO MW 4	ENERGY FUELS WYOMING INC			0		MON	Incomplete
P52289.0W	028N	092W	20	NW1/4NE1/4	42.3899	-107.8404	5/30/1980	PZ-6C	ENERGY FUELS WYOMING INC	240	123	0		MON	Complete
P145360.0W	028N	092W	20	NE1/4NE1/4	42.3899	-107.8356	5/8/2002	PAY DIRT PIT				2500		MIS	
P52287.0W	028N	092W	20	NE1/4NE1/4	42.3899	-107.8356	5/30/1980	PZ-6A	ENERGY FUELS WYOMING INC	240	123	0		MON	Complete
P52288.0W	028N	092W	20	NW1/4NE1/4	42.3900	-107.8403	5/30/1980	PZ-6B	ENERGY FUELS WYOMING INC	241	124	0		MON	Complete
P409.0C	028N	092W	18	NE1/4NE1/4	42.4045	-107.8550	7/31/1945	CROOKS GAP STATION WATER WELL	SINCLAIR REFINING CO.	215	10	15		IND_GW	Incomplete
P192610.0W	028N	092W	16	SW1/4SW1/4	42.3931	-107.8309	1/19/2010	CONGO MW 1	ENERGY FUELS WYOMING INC			0		MON	Incomplete
P170167.0W	028N	092W	16	SW1/4SW1/4	42.3936	-107.8308	8/24/2005	PZ7	Wyo. State Lands & Investments			25		STK	
P172609.0W	028N	092W	16	SE1/4SW1/4	42.3937	-107.8260	12/14/2005	CONGO PIT NO. 1 WELL	ENERGY FUELS WYOMING INC			25		MIS	
P192611.0W	028N	092W	16	NW1/4SE1/4	42.3968	-107.8209	1/19/2010	CONGO MW 2	ENERGY FUELS WYOMING INC			0		MON	Incomplete
P52292.0W	028N	092W	16	NW1/4SE1/4	42.3976	-107.8206	5/30/1980	PZ-9	ENERGY FUELS WYOMING INC	840	205	0		MON	Complete
P16758.0W	028N	092W	12	NW1/4NE1/4	42.4188	-107.7630	11/29/1972	BOULDER SPRING #4039		8	-1	10		STK	Complete
P43197.0W	028N	092W	5	NW1/4SE1/4	42.4261	-107.8405	5/9/1978	BORDENS WELL #101		235	140	12		DOM_GW; STK	Complete
P148684.0W	028N	092W	5	SW1/4NE1/4	42.4297	-107.8405	12/3/2002	RIGBY PASTURE NO. 1		100	40	25		DOM_GW; STK	Complete
P7439.0P	029N	092W	33	SW1/4SE1/4	42.4370	-107.8430	5/15/1929	LAZY C S #1	BESSIE A. MCINTOSH	280	20	10		DOM_GW; STK	Complete

Note: Grey shading indicates water right within the Sheep Mountain Project and controlled by Energy Fuels, Inc.

Appendix 4-A
Air Quality Technical Support Document

AIR QUALITY TECHNICAL SUPPORT DOCUMENT FOR THE ENERGY FUELS RESOURCES (USA) INC. SHEEP MOUNTAIN PROJECT ENVIRONMENTAL IMPACT STATEMENT

Prepared for

U.S. Department of the Interior
Bureau of Land Management
Lander Field Office
Lander, Wyoming

By

Carter Lake Consulting
Laramie, Wyoming

SLR Consulting
Fort Collins, Colorado

Two Lines, Inc.
Grand Junction, Colorado

Edge Environmental, Inc.
Lakewood, Colorado

May 2015

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List of Abbreviations and Acronyms

µg/m^3	micrograms per cubic meter
µeq/l	microequivalents per liter
ANC	Acid Neutralizing Capacity
AQD	Air Quality Division
AQRV	Air Quality Related Values
AQS	Air Quality System
AQTSD	Air Quality Technical Support Document
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BPIP	Building Profile Input Program
Carter Lake	Carter Lake Consulting
CASTNET	Clean Air Status and Trends Network
CAPCOA	California Air Pollution Control Officers Association
CBNG	Coal Bed Natural Gas
CD-C	Continental Divide-Creston
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DATs	deposition analysis thresholds
Ddv	delta deciview

dv	deciview
Edge	Edge Environmental, Inc.
EIS	Environmental Impact Statement
Energy Fuels	Energy Fuels Resources (USA) Inc.
EPA	U.S. Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FLAG	Federal Land Managers Air Quality Related Values Workgroup
FLMs	Federal Land Managers
Forest Service	U.S. Forest Service
GHG	greenhouse gas
HAPs	hazardous air pollutants
K	degrees Kelvin
kg/ha-yr	kilograms per hectare per year
km	kilometers
LAC	level of acceptable change
m	meters
MMIF	Mesoscale Model Interface Program
N	nitrogen
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Data
NEPA	National Environmental Policy Act
NO_x	nitrogen oxides
NRC	Nuclear Regulatory Commission
NWS	National Weather Station
O_3	ozone
OLM	Ozone Limiting Method
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in size
PM_{10}	particulate matter less than or equal to 10 microns in size
ppb	parts per billion
PRISM	Parameter-elevation Regressions on Independent Slopes Model
Project	Sheep Mountain Project
PSD	Prevention of Significant Deterioration
S	sulfur
s	second
SLR	SLR Incorporated
SO_2	sulfur dioxide
TLI	Two Lines, Inc.
VOCs	volatile organic compounds
WAAQS	Wyoming Ambient Air Quality Standards
WDEQ	Wyoming Department of Environmental Quality
WestJumpAQMS	West-wide Jump Start Air Quality Modeling Study
WRAP	Western Regional Air Partnership
WRF	Weather Research and Forecasting
WRIR	Wind River Indian Reservation

1.0 INTRODUCTION

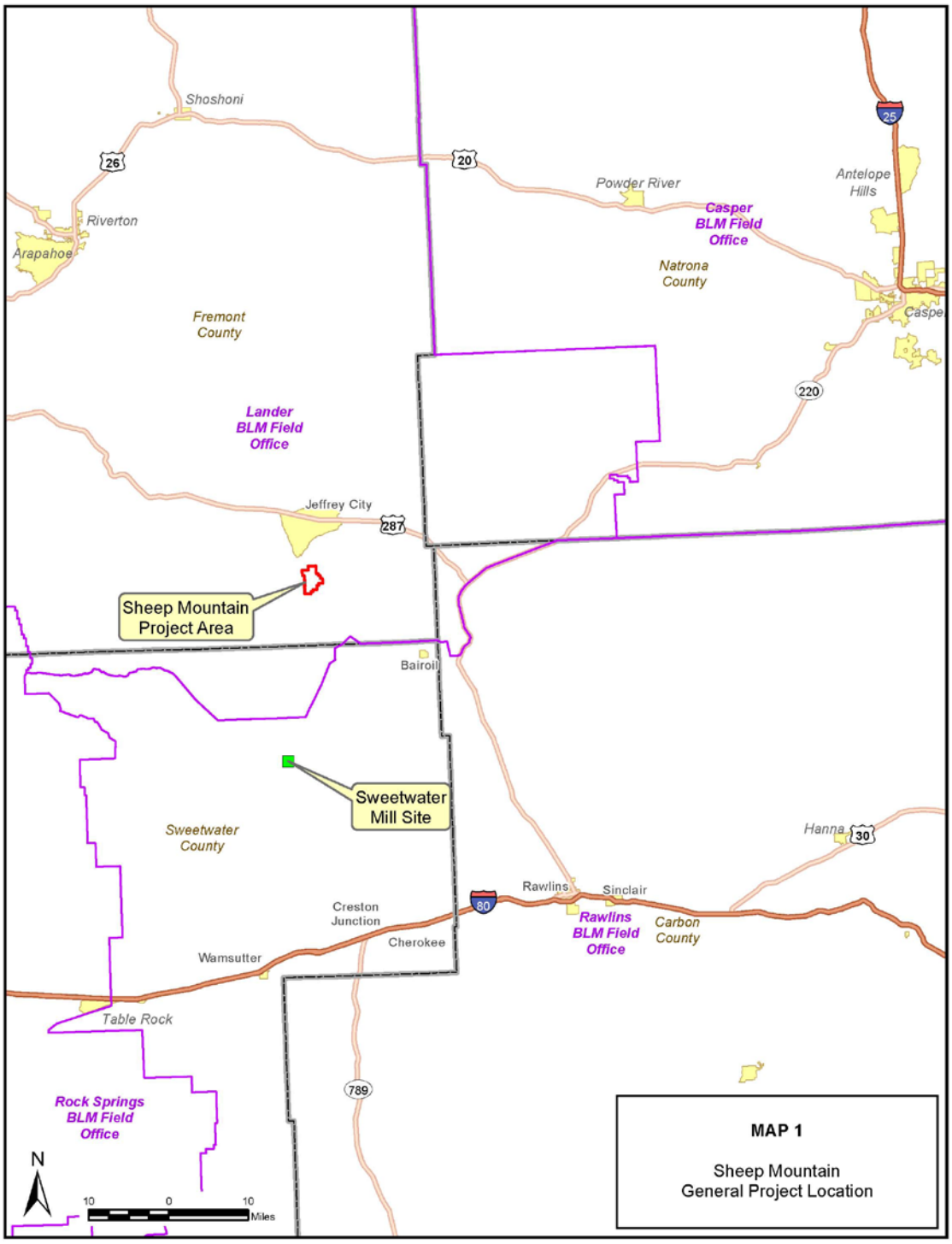
Carter Lake Consulting (Carter Lake), SLR Incorporated (SLR), Two Lines, Inc (TLI), and Edge Environmental, Inc. (Edge) have prepared this Air Quality Technical Support Document (AQTSD) to document the results of an air quality impact assessment conducted to quantify potential air quality impacts from the Energy Fuels Resources (USA) Inc. (Energy Fuels) Sheep Mountain Project (the Project). This assessment follows methodologies set forth in the Air Quality Impact Assessment Protocol prepared for the Bureau of Land Management (BLM) in March 2014 (BLM, 2014a), which documented the approach, input data, and computation methods to be used in the study.

The Sheep Mountain Project Area is located approximately 8 road miles south of Jeffrey City, Wyoming in Fremont County, Township 28 North, Range 92 West, Sections 4, 5, 9, 16, 17, 20, 21, 27, 29, 30, 32 and 33, as shown on Map 1. This area lies approximately 62 road miles southeast of Riverton, approximately 67 miles north of Rawlins, and approximately 105 road miles west of Casper and is located on Jeffrey City and Crooks Peak U.S. Geological Survey 7.5-minute topographic quadrangles. The Project Area includes approximately 3,625 surface acres (approximately 5.7 square miles) of mixed ownership including 2,313 acres of federal surface, 768 acres under state ownership, and 544 acres of fee lands. Approximately 2,836 acres of federal mineral estate is included in the Project Area.

The analysis includes an assessment of the potential near-field and far-field impacts to ambient air quality concentrations from the potential pollutant emissions associated with the Proposed Action and alternatives. The analysis utilizes the U.S. Environmental Protection Agency's (EPA's) Guideline model AERMOD to estimate potential pollutant impacts from proposed project sources within and nearby the Project Area, and the EPA Guideline model CALPUFF to estimate potential air quality and air quality related value (AQRV) impacts (impacts on visibility [regional haze], atmospheric deposition, and potential increases in acidification to acid sensitive lakes) at Prevention of Significant Deterioration (PSD) Class I and sensitive Class II areas of concern that are within 200 kilometers (km) of the Sheep Mountain Project Area.

The cumulative air quality emissions impacts (project source emissions and regional source emissions) are not analyzed herein. The regional modeling analysis for the Continental Divide-Creston (CD-C) Natural Gas Development Project Final Environmental Impact Statement – FEIS (BLM, 2014b) is used for addressing cumulative impacts for the Project. The CD-C Project analysis included a regional air quality assessment (including ozone) and AQRV analysis for southwest Wyoming including the region surrounding the Sheep Mountain Project Area. The analyses were performed using the CAMx model. The cumulative air quality and AQRV results for the CD-C Project FEIS are summarized in the Sheep Mountain Project Environmental Impact Statement (EIS).

Potential radiological impacts to members of the public were calculated for Project radon gas and radioparticulate emissions impacts using the MILDOS model (Version 3.10) (Argonne National Laboratory, 1989). The radiological modeling assessment is provided as Appendix B of this AQTSD.


Shoshoni
26
20
25
Powder River
Antelope Hills
Casper BLM Field Office
Riverton
Arapahoe
Natrona County
Fremont County
Caspe
220
Lander BLM Field Office
Jeffrey City
287
Sheep Mountain Project Area
Bairoil
Sweetwater Mill Site
Sweetwater County
Hanna
30
Rawlins
Sinclair
80
Creston Junction
Rawlins BLM Field Office
Carbon County
Cherokee
Wamsutter
Table Rock
789
Rock Springs BLM Field Office
N
10
0
10
Miles
MAP 1
Sheep Mountain
General Project Location

1.1 Project Description

Proposed Action

Energy Fuels proposes to explore for, and develop uranium reserves to extract approximately 1.0 million to 2.0 million pounds of uranium from the ore per year during active operations (estimated at 20 years). Mining would be completed using conventional methods including both open-pit and underground methods. There are three principal phases in the Proposed Action: Construction, Operations, and Reclamation. The Proposed Action would require up to 929 acres of disturbance of which 356.5 acres would be new disturbance and 572.5 acres was previously disturbed.

Construction includes the building of facilities and installation of equipment that would be needed prior to Operations. Operations would include the mining and milling of uranium ore (Map 2). Conventional open pit (Congo Pit) and modified room and pillar underground (Sheep Underground) mining methods would be employed to remove mineralized uranium ore. Ore from both the Congo Pit and underground mine would be stockpiled at the entry to the underground mine on the Ore Stockpile for later transport to:

- An On-Site Ore Processing Facility, which would be licensed by the NRC as a uranium processing mill. Ore would be transported to this Facility via conveyor, which would be within the Project Area. The Facility would include a Heap Leach Pad for dissolution of the uranium from the ore; a series of Treatment Ponds (Holding Pond, Collection Pond, and Raffinate Pond) for the solution from the Pad; an Extraction Plant for removing the ore from solution, and a Precipitation and Packaging Plant.

- An Off-Site Ore Processing Facility. Ore would be transported to this location via truck to the Sweetwater Mill. The Sweetwater Uranium Mill is owned and operated by Kennecott Uranium Company (Kennecott), a division of Rio Tinto Americas, Inc. The mill is located entirely on private lands owned by Kennecott.

The option to pursue off-site processing is a sub-part of the Proposed Action because it is advanced by Energy Fuels. The Sweetwater Uranium Mill (owned and operated by Kennecott Uranium Company - Kennecott, a division of Rio Tinto) is located entirely on private lands owned by Kennecott and permitted with the NRC as an operating license under Source Material License SUA-1350 which allows for production of 4,100,000 pounds of yellowcake per year. Therefore, Kennecott could receive ore and begin operations under the stipulations of their permit at any time. For the purpose of analysis within this EIS, it is assumed that operations at the Sweetwater Mill would occur under the existing license without significant revisions, and impacts associated with the operations of the mill would be similar to those of the operation of the Heap Leach facility at Sheep Mountain and/or the Piñon Ridge Mill in Colorado in relation to applicable resources such as air and human health and safety. The impacts associated with hauling ore to the Sweetwater Mill from the Sheep Mountain site and operating the Sweetwater Mill are disclosed in this EIS because they are connected actions. However, the BLM would not be involved in permitting or authorizing hauling of ore to the Sweetwater Mill along county roads or processing at the Sweetwater Mill.

Reclamation would include decommissioning of facilities, backfilling, and re-vegetating of the mined areas, and covering of the heap leach pad to prepare for long-term care and maintenance by the State of Wyoming or the U.S. Department of Energy (DOE).

No Action Alternative

Under this Alternative, BLM would deny Energy Fuel's Plan of Operations as proposed. Therefore, the BLM would be denying the proponent's right to extract minerals on federal lands from their mining claims. The selection of the No Action Alternative may constitute a taking because it violates valid existing rights under the U.S. Mining laws and result in legal action by the proponent. For these reasons the selection of the No Action Alternative is unlikely, but is described in this document in order to satisfy the requirements under the National Environmental Policy Act (NEPA).

Alternative 3-BLM Mitigation Alternative

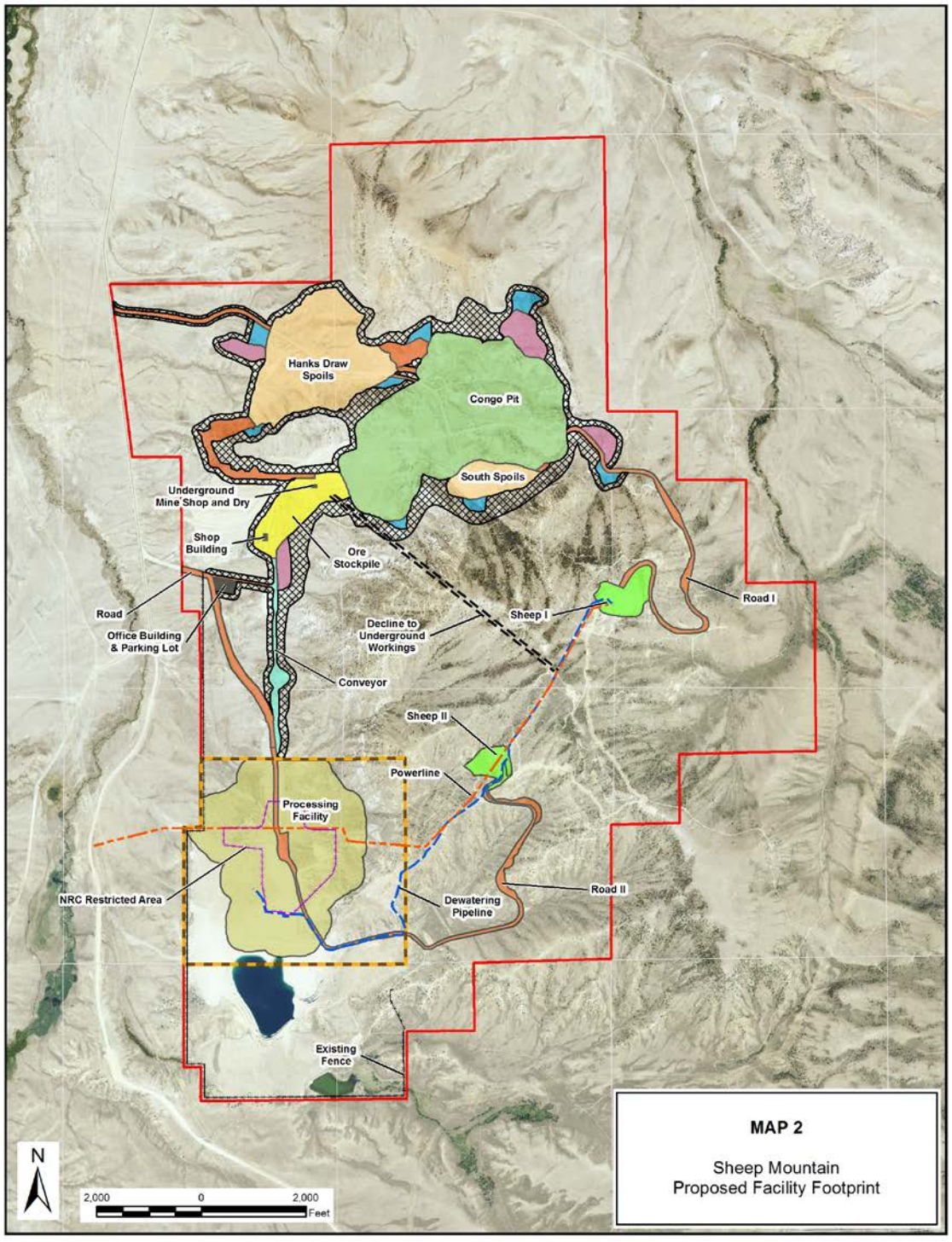
This alternative was developed in response to public and agency input collected during the scoping process in order to potentially reduce the environmental impacts of the Project. This alternative is similar to the Proposed Action Alternative, in that conventional mining techniques would be utilized and uranium would be produced using heap leach and solvent extraction/ion exchange procedures. This alternative would utilize the same processes and take place over the same time period as the Proposed Action but would include changes and mitigation procedures implemented to reduce and/or otherwise offset surface disturbance and potentially limit impacts to human health, safety, and the environment. Changes to the Proposed Action and additional mitigation measures under this alternative would include: revisions to Energy Fuel's proposed reclamation plan and requiring an inventory of existing roads and development of a Travel Management Plan.

1.2 Relationship to Existing Plans and Documents

Available NEPA analyses were used for the air quality assessments for this Project. The following NEPA analyses have been conducted and have relevance, as noted below, to this Project:

Continental Divide – Creston Natural Gas Infill Project Environmental Impact Statement (CD-C) (Ongoing). BP America Production Company, Devon Energy, and other operators propose to develop natural gas resources within the existing Continental Divide, Wamsutter, Creston, and Blue Gap natural gas fields, located in Carbon and Sweetwater counties, Wyoming. The cumulative modeling analysis prepared in support of the FEIS (BLM, 2014b) associated with this project are applicable for addressing cumulative impacts for the Sheep Mountain Project.

Riverton Dome Coal Bed Natural Gas and Conventional Gas Development Project Final Environmental Impact Statement (August 2008). Devon Energy proposed to develop Coal Bed Natural Gas Wells (CBNG) wells and conventional gas wells on existing leases and additional leases approximately 5 miles sourtheast of Riverton on the Wind River Indian Reservation (WRIR), in Fremont County. The air quality analysis prepared for the FEIS analyzed air quality, and AQRVs at several Class I and sensitive Class II areas surrounding the project area (Bureau of Indian Affairs - BIA, 2008). The sensitive Class II area receptors developed for the Riverton Dome study were used for the Sheep Mountain study.


Hanks Draw Spoils
Congo Pit
South Spoils
Underground Mine Shop and Dry
Shop Building
Ore Stockpile
Road
Office Building & Parking Lot
Decline to Underground Workings
Sheep I
Road I
Conveyor
Sheep II
Powerline
Processing Facility
NRC Restricted Area
Dewatering Pipeline
Road II
Existing Fence
N
2,000
0
2,000
Feet
MAP 2
Sheep Mountain
Proposed Facility Footprint

In addition, the Nuclear Regulatory Commission (NRC) has jurisdiction over the heap leach, ponds, and processing facilities within the NRC License Boundary. They will be preparing a separate EIS and will analyze radiological impacts from these sources.

The EPA regulates the radon emissions from uranium byproduct impoundments under 40 CFR Part 61 subpart W, which includes the heap leach and processing ponds. Also, EPA regulates and sets standards on radon emissions from underground uranium mines under 40 CFR Part 61 subpart B.

1.3 Air Quality Assessment Summary

The air quality analysis addresses the impacts on ambient air quality and AQRVs from the potential air emissions from the Sheep Mountain Project. Potential ambient air quality impacts were quantified and compared to applicable state and federal standards, and AQRV impacts (impacts on visibility [regional haze], atmospheric deposition, and potential increases in acidification to acid sensitive lakes) were quantified and compared to applicable thresholds as defined in the Federal Land Managers' (FLMs') Air Quality Related Values Workgroup (FLAG) guidance document (FLAG, 2010), and other state and federal agency guidance. Impact assessment criteria and results of the analysis are discussed in further detail in Section 5.0.

The assessment of impacts included:

- Development of Project construction and production emissions inventory (see Section 2.0).
- Prediction of near-field ambient impacts from Project emissions sources (see Sections 3.0 and 5.1).
- Prediction of far-field impacts from Project emissions sources, including pollutant concentrations, visibility and atmospheric deposition impacts, and potential increases in acidification of acid sensitive lakes at federal Class I and Class II sensitive areas within 200 km of the Project Area (see Sections 4.0 and 5.2).

2.0 PROJECT EMISSIONS

Air pollutant emissions inventories prepared for the Sheep Mountain Project quantify total nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter less than or equal to 10 microns in size (PM_{10}), particulate matter less than or equal to 2.5 microns in size ($PM_{2.5}$), volatile organic compounds (VOCs), and the Hazardous Air Pollutants (HAPs); formaldehyde, benzene, toluene, ethyl benzene, and n-hexane. Lead emissions are negligible and have not been calculated in the inventory.

Methane (CH_4), nitrous oxide (N_2O), and carbon dioxide (CO_2) emissions are also included in the project inventory for purposes of quantifying greenhouse gas (GHG) emissions. Total annual CO_2 equivalent (CO_2e) is calculated in the emissions inventory in Appendix A and reported over the life of the Project in the EIS.

Emissions are calculated from construction and operations as part of the Proposed Action Alternative, with operation emissions calculated for both the on-site and off-site ore processing options. Air emissions from the No Action Alternative and Alternative 3 would be equal to or less than those calculated for the Proposed Action; therefore, no emissions inventories were developed for these alternatives.

The emissions inventory was developed using AP-42 (EPA, 1995), Wyoming Department of Environmental Quality (WDEQ) Air Quality Division (AQD) mining emission factors, and other accepted engineering methods combined with equipment specifications, material throughput, and activity and operating rates provided by the operator. Pollutant emission rates were calculated for both annual and short-term periods of operation, and used as input to model pollutant concentrations with corresponding averaging periods.

Annual emissions calculations utilized activity rates and material throughputs representative of a full year of operation. Twenty-four-hour or daily emission rates were calculated based on maximum 24-hour activity rates and hourly emission rates were calculated based on maximum hourly activity rates. For some sources, annual activity rates were equivalent to the hourly and/or daily rate occurring year-round. For other sources, shorter-term emission rates were higher than the annual rate due to operational considerations; for example, certain mobile sources in the fleet could operate concurrently in a worst-case hour, but annually their operation would be more limited. The calculation of both annual and short-term emission rates is shown in the emissions inventories provided in Appendix A.

The specific components of facility construction and production and emissions calculation methodology for these activities are discussed in the following subsections. Emissions inventories for the Proposed Action construction phase and the two operation options are included as Appendix A.

2.1 Construction Emissions

Emission calculations for construction utilize operator-supplied equipment specifications and operating data. Emissions-generating activities occurring during construction include:

- Underground blasting and construction;
- Mine intake air heaters;
- Surface dozing, overburden removal and overburden unloading (similar to surface mining activity occurring during operation);
- Facilties construction;
- Heavy-duty and light-duty vehicles (unpaved road travel);
- Wind erosion of open acres and stockpiles; and
- Mobile source fuel combustion.

2.2 Operation Emissions

Emissions were calculated for 1) operation with on-site processing and 2) operation with off-site processing occurring at the Sweetwater Mill. Calculations rely on operator-provided specifications and operating and throughput data. While most parameters provided by the operator reflected a maximum rate regardless of year, the tons hauled to each spoils pile location varied by year in the mine plan (Energy Fuels, 2014), and calculation of overburden hauling required an estimate of these tons. Operator-provided projections were reviewed to determine a maximum scenario, and year 3 of the mine plan was selected because it exhibited the highest overburden excavation rate of years during which overburden would be hauled to the spoils piles. All throughputs and operating rates are shown in the inventories contained in Appendix A.

Emissions-generating activities occurring during operation are:

- Underground blasting;
- Mine intake air heaters;
- Primary crushers;
- Conveyor transfers;
- Surface dozing, product removal, overburden removal, and unloading of product and overburden;
- Radial stacker transferring material to leach pad;
- Production facility;
- Unpaved road travel;
- Wind erosion of open acres and stockpiles;
- Mobile source fuel combustion;
- Shop, plant, office heating; and
- Ore haul to off-site processing site at Sweetwater Mill (off-site processing option only).

Emissions for the maximum PM_{10} emissions case, production with off-site processing, are shown in Table 1. The primary criteria pollutants to be emitted at and analyzed for the facility are included in Table 1 (NO_x, CO, PM_{10} and $PM_{2.5}$). The complete emissions inventories for construction and both operation cases and construction are included in Appendix A.

Table 1
Annual Emissions by Activity (tons per year)
Proposed Action - Production with Off-Site Processing

Activity	NO_x	CO	PM_{10}	$PM_{2.5}$
Underground Mine Sources				
Blasting	6.35	22.12	0.014	0.0008
Mine Intake Air Heaters	0.05	0.04	0.003	0.0034
Primary Crusher	--	--	0.17	0.02
Coarse ore conveyor transfers	--	--	0.08	0.02
Mobile sources	42.13	44.88	2.55	2.55
Surface Mine Sources				
Dozing	--	--	7.43	3.90
Product removal	--	--	0.33	0.07
Overburden removal	--	--	35.19	7.04
Overburden unloading	--	--	7.58	1.52
Truck dump	--	--	1.88	0.38
Primary Crusher	--	--	0.33	0.05
Overland coarse ore conveyor transfers	--	--	2.41	0.48
Radial stacker to leach pad	--	--	0.73	0.15
Surface facilities heating	0.20	0.17	0.02	0.02
Production facility	0.69	0.48	21.89	3.28
Wind Erosion				
Open acres	--	--	24.62	3.69
Stockpiles	--	--	34.83	5.22
Surface Mobile Sources				
Mine-Wide Unpaved Road Travel	--	--	114.06	11.40
Surface Mobile/Nonroad Sources	151.66	89.09	1.29	1.29
TOTAL	201.08	156.78	254.41	41.08

"- -" means either there are no emissions of that pollutant at all, or there are no emissions of that pollutant accounted for in the line item and are accounted for in mobile source category (for diesel equipment , etc.).

3.0 NEAR-FIELD ANALYSIS

3.1 Modeling Methodology

The near-field ambient air quality impact assessment was performed to quantify maximum pollutant impacts within and near the Project Area resulting from Project-related emissions. Criteria pollutant emissions of PM_{10}, $PM_{2.5}$, NO_x, SO_2, and CO were evaluated as part of the near-field study. Emissions of the HAPs formaldehyde, benzene, toluene, ethylbenzene, and n-hexane are not evaluated given the minimal emissions levels calculated for these pollutants.

Near-field dispersion modeling was conducted for the Proposed Action Alternative. Pollutant emissions from the No Action Alternative and Alternative 3 would be less than the Proposed Action and therefore would produce lower ambient air impacts; the Proposed Action provides the most conservative estimate of maximum annual and short-term near-field impacts.

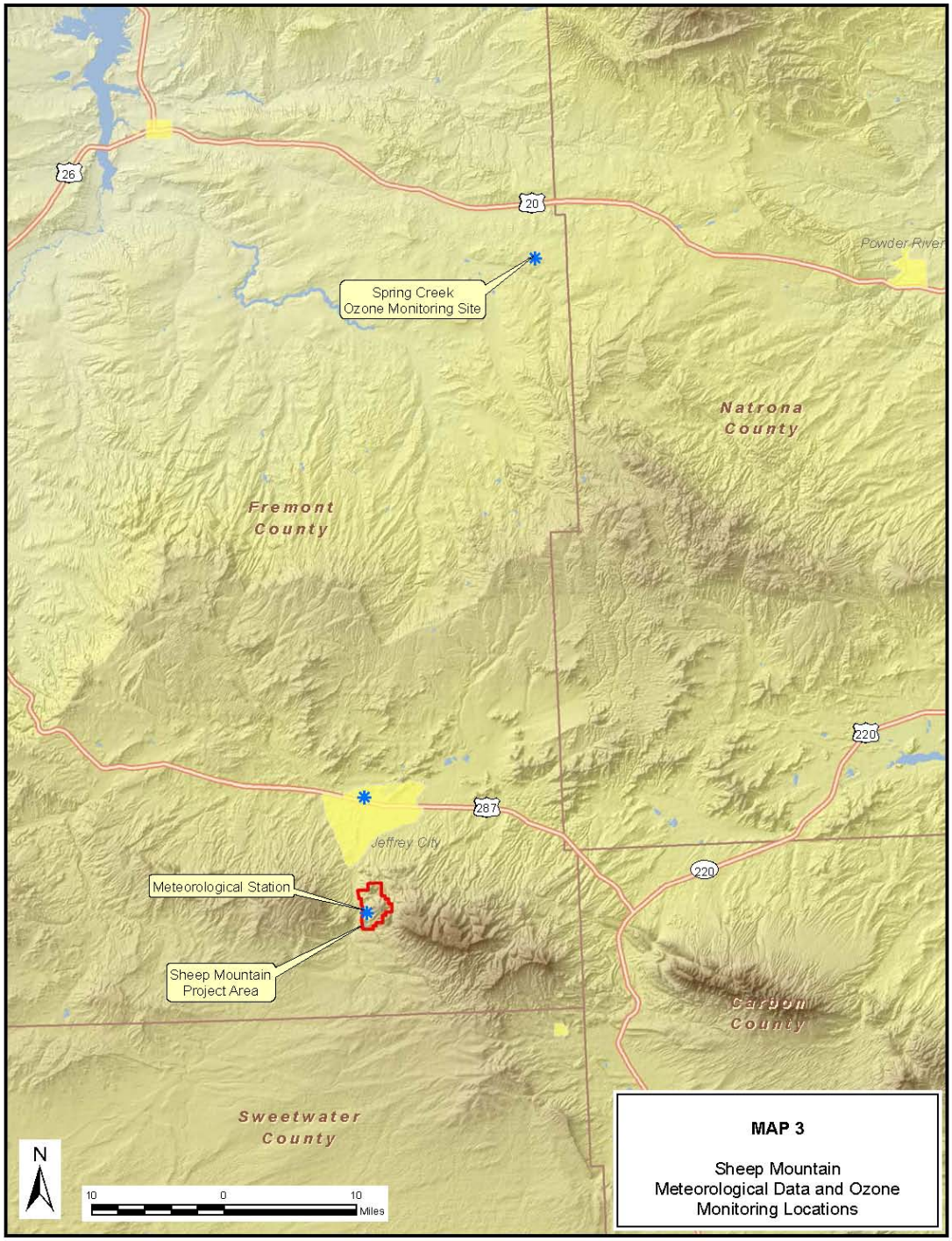
The EPA's Guideline (EPA, 2005) model, AERMOD (Version 13350), was used to assess these near-field impacts. Regulatory model settings was utilized, with the exception of the non-regulatory Ozone Limiting Method (OLM) option, which was used for modeling nitrogen dioxide (NO_2) concentration estimates. Modeling NO_2 utilized hourly ozone concentration data collected at the Spring Creek, Wyoming monitoring station during 2011 and 2012, located 49 miles northeast of the Project Area as shown on Map 3.

Ozone (O_3) formation and impacts were not modeled as part of the air quality assessment, rather a qualitative assessment of the potential contribution to regional ozone formation, based on representative studies in the region (e.g. the CD-C Infill Project Draft EIS), is presented in the EIS document.

3.2 Meteorological Data

Meteorology data collected by Energy Fuels at the Sheep Mountain site is most representative of the meteorological conditions at the site and was used in the near-field analysis. Monitoring at the site began in June 2010. The on-site data include 10 meter level measurements of wind speed, wind direction, standard deviation of wind direction [sigma theta], solar radiation, temperature (10 meter and 2 meter), and temperature difference. The calendar years January 2011 through December 2012 were selected for use in this analysis, the most recent two years of data available. The data meet the 90 percent completeness criteria established by EPA in the “Meteorological Monitoring Guidance for Regulatory Modeling Applications” report (EPA, 2000). The location of the Sheep Mountain on-site meteorological station is shown on Map 3. A wind rose for the on-site station is presented in Figure 1.

The Sheep Mountain meteorological measurements were processed into datasets (surface data and profile data) compatible with the AERMOD dispersion model using the AERMET (Version 13350) meteorological processor. Because temperature difference and solar radiation are collected on-site, AERMET were applied following the Bulk Richardson method switch settings to combine the on-site tower data with twice daily sounding data from the Riverton, Wyoming, National Weather Station (NWS). AERSURFACE (Version 13016) was used to develop twelve sector seasonal surface characteristics for the project area, and these surface characteristics were used in the AERMET processing.


26
20
Powder River
Spring Creek
Ozone Monitoring Site
Natrona
County
Fremont
County
220
287
Jeffrey City
220
Meteorological Station
Sheep Mountain
Project Area
Carbon
County
Sweetwater
County
N
10
0
10
Miles
MAP 3
Sheep Mountain
Meteorological Data and Ozone
Monitoring Locations

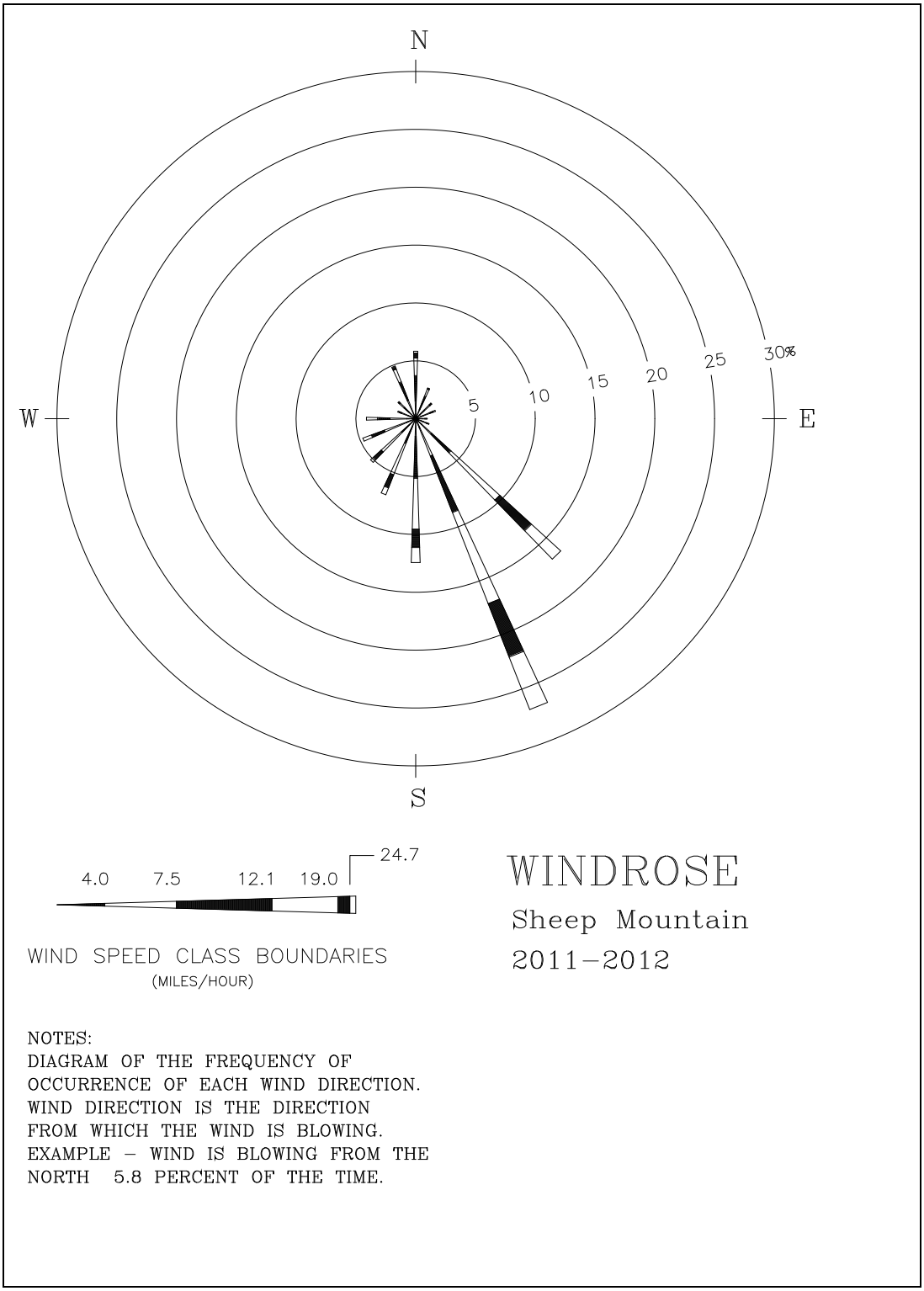


Figure 1
Sheep Mountain Meteorological Data Windrose

3.3 Background Data

Background pollutant concentrations are used as an indicator of existing conditions in the region, and are assumed to include emissions from industrial emission sources in operation and from mobile, urban, biogenic, other non-industrial emission sources, and transport into the region. These background concentrations are added to modeled near-field Project impacts to calculate total ambient air quality impacts. Table 2 presents the background values provided for the region by the WDEQ-AQD (WDEQ, 2014).

Table 2
Near-Field Analysis Background Ambient Air Quality Concentrations

Pollutant	Averaging Period	Measured Background Concentration ($\mu g/m^3$)
Carbon monoxide (CO)[1]	1-hour 8-hour	904 572
Nitrogen dioxide (NO_2)[2]	1-hour Annual	9.4 1.9
PM_{10}[2]	24-hour Annual	49 11
$PM_{2.5}$[3]	24-hour Annual	27 7.0
Sulfur dioxide (SO_2)[1]	1-hour 3-hour	18.3 18.3

[1] Background data collected at Cheyenne, Wyoming during 2012, WDEQ-AQD, 2014.
[2] Background data collected at South Pass, Wyoming during 2012, WDEQ-AQD, 2014.
[3] Background data collected in Rock Springs, Wyoming during 2012, WDEQ-AQD, 2014.

3.4 Criteria Pollutant Modeling

The construction and operation phases of mine life were found to produce maximum pollutant emissions. A near-field criteria pollutant assessment was performed to estimate maximum potential impacts of PM_{10}, $PM_{2.5}$, NO_x, SO_2, and CO from project emission sources active under each modeled construction and production scenario.

A single construction scenario was analyzed, based on a maximum year of construction activity. Two separate production scenarios were analyzed; the on-site processing scenario and the off-site processing scenario. The on-site processing scenario includes all operation activities, with the heap leach and processing operations occurring on-site and within the Project Area boundary. The off-site processing scenario includes the same production activities and emissions, but heap leach and processing would occur off-site at the Sweetwater Mill, and additional unpaved road traffic from the transport of ore off-site was modeled.

Model input for the construction phase, the operations phase with on-site processing, and the operations phase with off-site processing was determined from Energy Fuels-provided field assumptions within the Project Area, and prepared consistent with EPA and WDEQ-AQD guidance. Twenty-four-hour and annual PM_{10} and $PM_{2.5}$ concentrations, 1-hour and annual average NO_2 concentrations, 1-hour and 8-hour CO concentrations, and 1-hour, 3-hour, 24-hour, and annual SO_2 concentrations were predicted. Maximum short-term Project emissions were used for modeling impacts for comparison to short-term air quality standards, with hourly maximum emission rates used for 1-hour, 3-hour, and 8-hour pollutant averaging periods, and 24-hour maximum emissions used for 24-hour pollutant averaging periods. Modeled source configuration and locations within the Project Area for construction, operations with on-site processing , and operations with off-site processing are provided on Maps 4, 5, and 6, respectively.

Point sources were used for modeling emissions from the underground mine exhaust and any stationary sources identified. All point sources were oriented vertically, except for the underground mine exhaust points, Sheep1 and Sheep 2. These exhaust points were horizontal and assumed to be at ambient temperature. Following EPA guidance, the exit velocity was set to a low value and stack diameter increased to conserve the mass of the flow from the vents. Volume sources were used for modeling unpaved road travel and material transfers. Area sources were used to model stockpiles, wind erosion of open acres, and pit activity. Model input parameters for each modeled emissions source and scenario are given in Table 3. The most recent version of the Building Profile Input Program (BPIP-Prime 04274) was used to determine appropriate direction-specific building dimension downwash parameters.

All scenarios include employee transport and bulk delivery truck travel to and from the site on unpaved roads. The production phase off-site processing scenario includes ore haul travel as well. Dispersion modeling includes only the portion of this travel occurring within the ambient air boundary.

As mentioned in Section 3.1, modeling analyses for NO_2 concentration estimates were performed using the OLM methodologies with the AERMOD model. NO_2 modeling utilized hourly ozone concentration data collected at the Spring Creek monitoring station for calendar year 2011-2012. The Spring Creek site is located 49 miles north-northeast of the Project Area, and is the closest representative ozone monitoring station available. These data are concurrent with the 2011-2012 Sheep Mountain meteorological data used in the analysis. A value of 20 percent was used for all source in-stack NO_2 concentration estimates. This value is a conservative estimate supported by data from EPA's NO_2/NO_x In-Stack Ratio (ISR) Database (EPA, 2013) and from the California Air Pollution Control Officers Association (CAPCOA) "Modeling Compliance of the Federal 1-Hour NO_2 NAAQS" Guidance Document (CAPCOA, 2011).

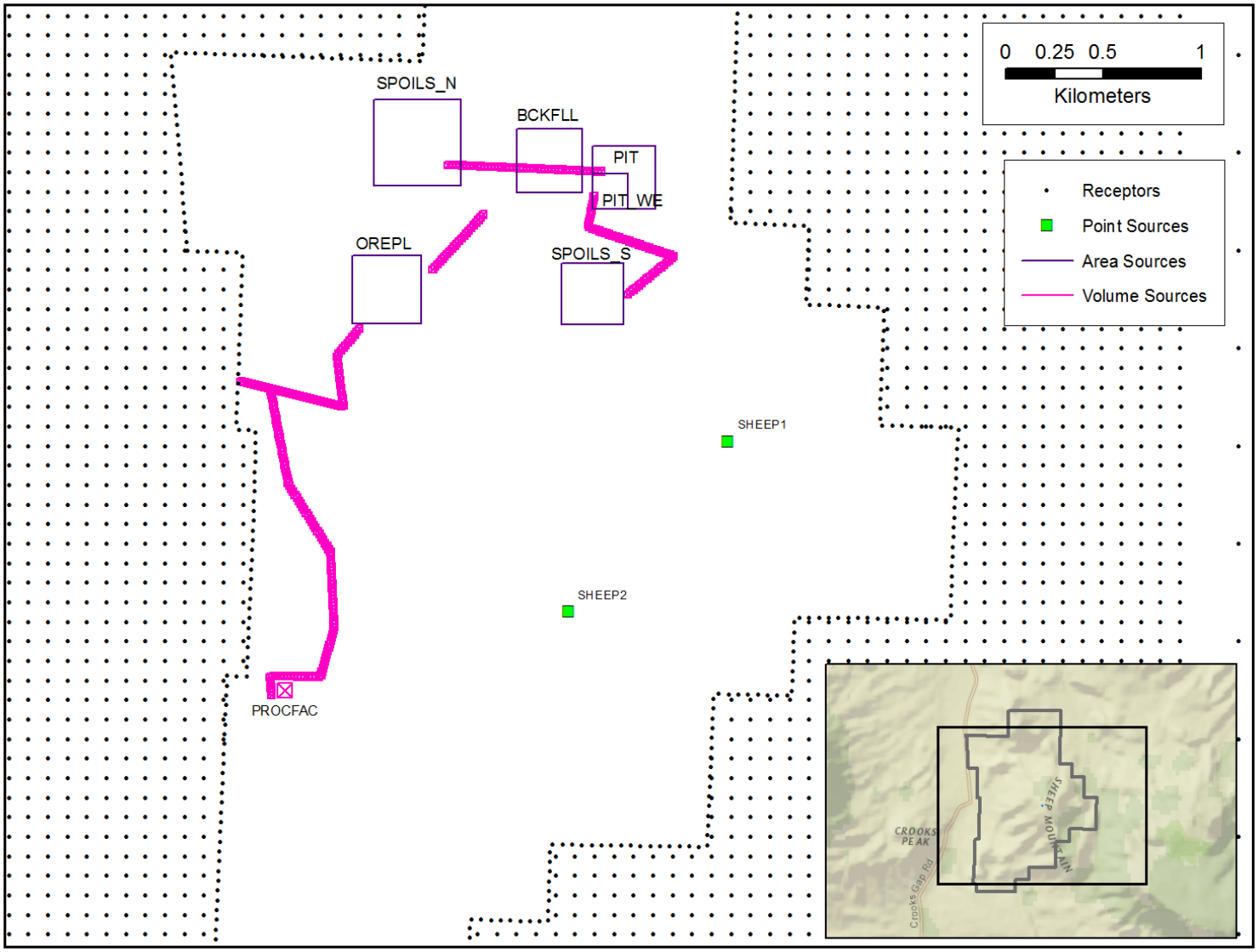
Discrete model receptors were developed in accordance with current WDEQ-AQD modeling guidance (WDEQ, 2010), at locations at and beyond the ambient air boundary. The area within the ambient air boundary is not accessible to the public. Discrete modeling receptors were placed at a minimum of 50-meter intervals along the ambient air boundary, at 100-meter spacing to a distance of 1 kilometer from the facility, and at 500-meter spacing to a distance of 5 kilometers from the facility. Map 7 illustrates receptor locations utilized for the area around the primary mine site for all construction and operations, and the additional model receptors utililized for the off-site processing are shown in Map 8.

Terrain heights for each receptor and source were assigned following EPA guidance, and using the AERMAP (Version 11103) terrain processor. Digital elevation data from the National Elevation Dataset (NED) at a 10-meter resolution were used in conjunction with this processor to assign elevations in meters above sea level to receptors and sources.

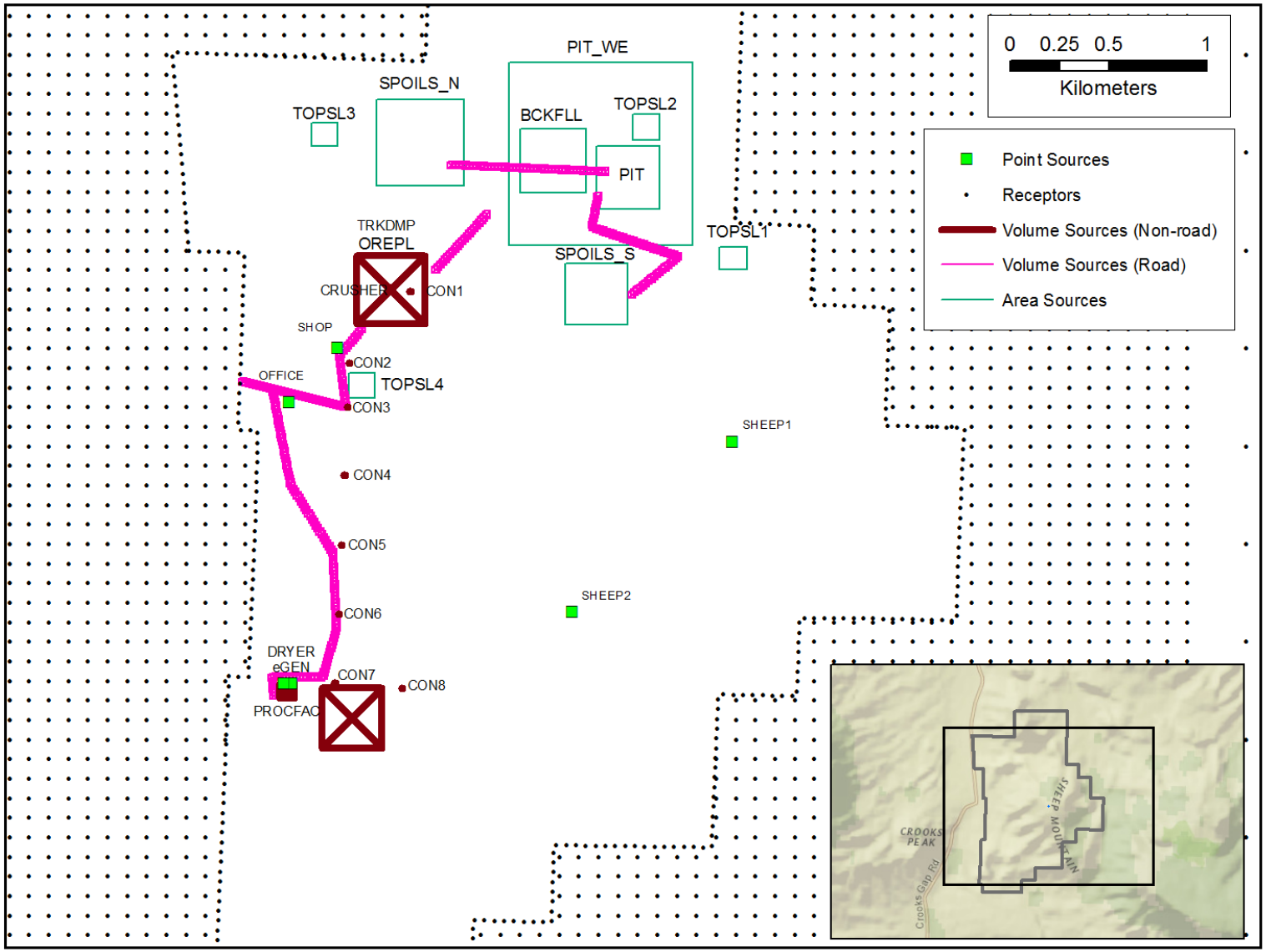
Table 3
Modeled Emissions Source Input Parameters

Type	Model ID	Description	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)	X Init (m)	Y Init (m)	Angle (deg)	Sigma-y Init (m)	Sz Init (m)
Point	DRYER	Uranium Dryer	10.00	366.48	72.53	0.30					
Point	EMERGEN	Emergency Generator	10.00	800.00	40.00	0.10					
Point	OFFICE	Office Heating	10.00	350.00	20.00	0.10					
Point	SHOP	Shop Heating	10.00	350.00	20.00	0.10					
Point	PROC	Process Building Heating	10.00	350.00	20.00	0.10					
Point	SHEEP1	Underground Mine Exhaust	1.25	0.00	0.01	115.87					
Point	SHEEP2	Underground Mine Exhaust	1.25	0.00	0.01	115.87					
Area	PIT	Mechanical Fugitives At Pit	10.00				325.23	322.89	0.00		4.65
Area	BCKFLL	Mechanical Fugitives From Backfill	10.00				332.25	322.89	0.00		4.65
Area	SPOILS_N	Mechanical Fugitives At Spoils	10.00				446.90	442.23	0.00		4.65
Area	SPOILS_S	Mechanical Fugitives At Spoils	10.00				316.35	314.70	0.00		4.65
Area	OREPL	Wind Erosion At Ore Pile	5.00				351.00	351.00	0.00		2.33
Area	TOPSL(1-4)	Wind Erosion At Topsoil Pile	5.00				138.05	116.99	0.00		2.33
Area	PIT_WE	Wind Erosion At Pit	5.00				935.00	935.00	0.00		2.33
Area	SPOILS_NWE	Wind Erosion At Spoils	5.00				446.90	442.23	0.00		2.33
Area	SPOILS_SWE	Wind Erosion At Spoils	5.00				316.35	314.70	0.00		2.33

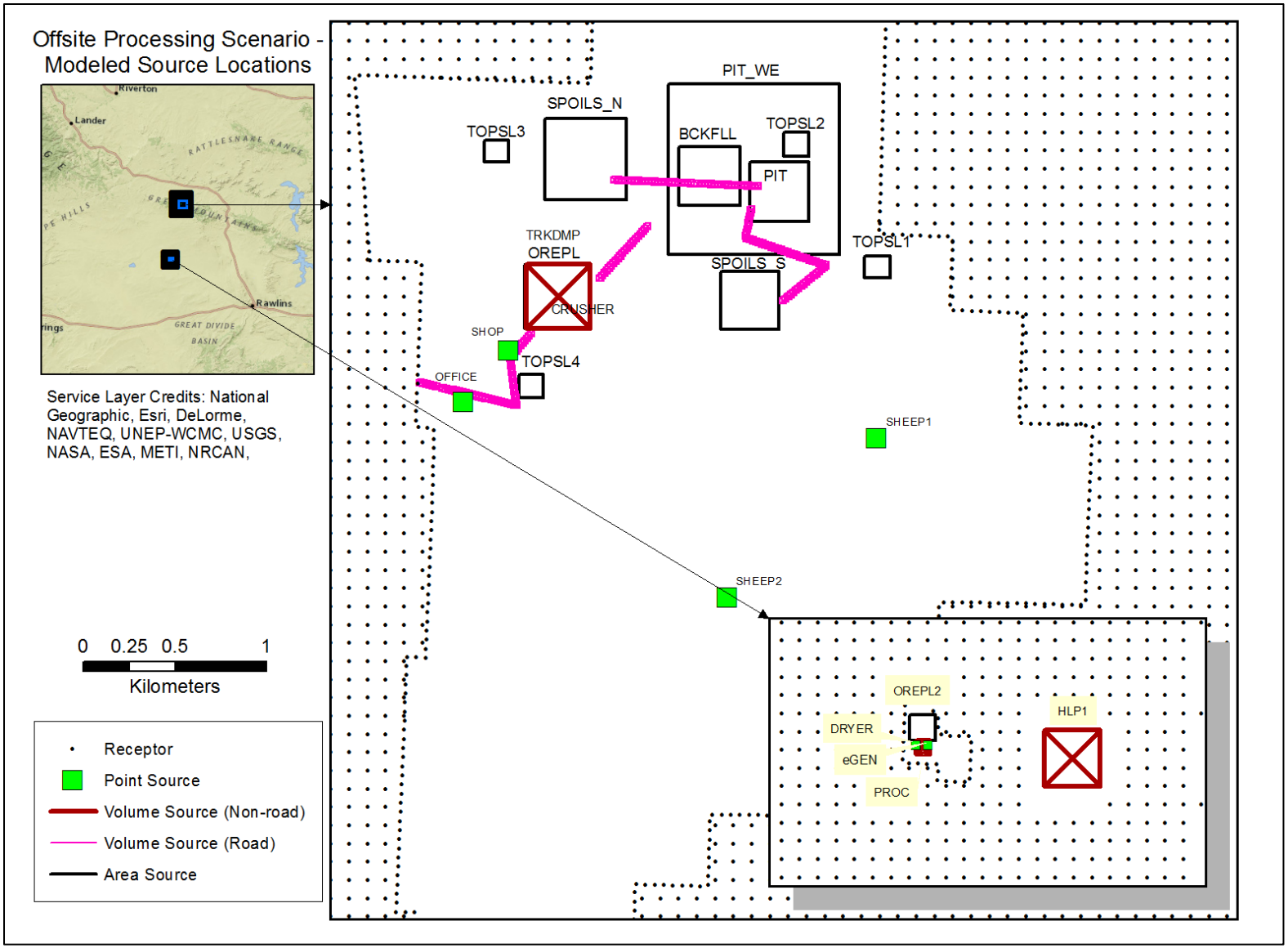
Type	Model ID	Description	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)	X Init (m)	Y Init (m)	Angle (deg)	Sigma-y Init (m)	Sz Init (m)
Area	PIT_MOB	Tailpipe Emissions At Pit	10.00				325.23	322.89	0.00		4.65
Area	BCKFLL_MOB	Tailpipe Emissions At Backfill	10.00				332.25	322.89	0.00		4.65
Area	SPOILN_MOB	Tailpipe Emission At Spoils	10.00				446.90	442.23	0.00		4.65
Area	SPOILS_MOB	Tailpipe Emission At Spoils	10.00				316.35	314.70	0.00		4.65
Area	OREPL_MOB	Tailpipe Emissions At Ore Pile	10.00				351.00	351.00	0.00		4.65
Volume	HLP1	Heap Leach Pad	4.57							71.16	4.25
Volume	CRUSHER	Crusher	2.50							4.65	2.33
Volume	TRKDMP	Truck Dump	2.50							81.63	2.33
Volume	CONV(1-8)	Conveyor Transfers	6.25							1.16	0.07
Volume	PRODFAC	Production Facility	2.50							17.88	2.33
Volume	RADSTK	Radial Stacker	10.27							0.21	0.06
Volume	HAUL	Haul Roads	5.10							8.46	4.74



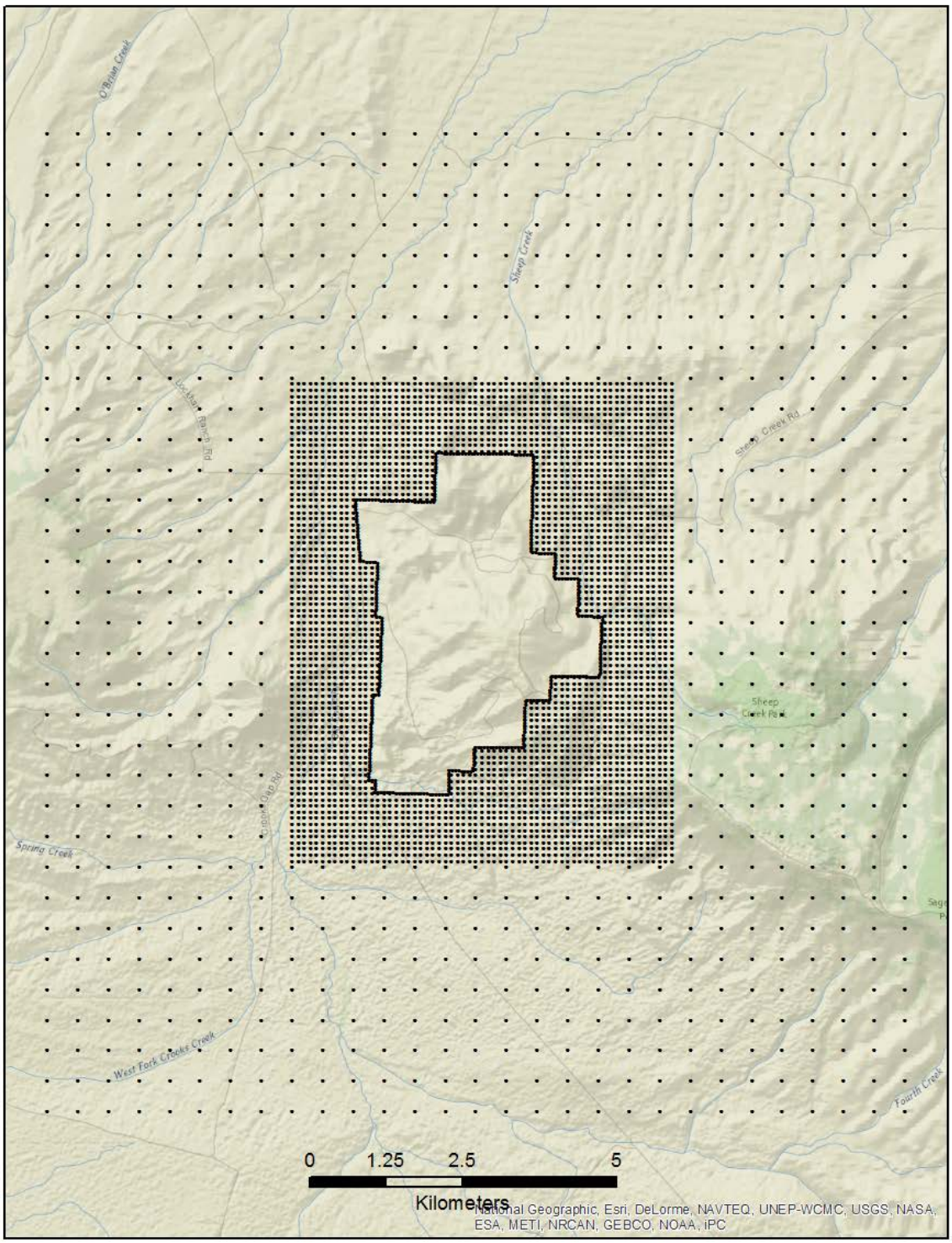
Map 4
Modeled Source Locations – Construction Scenario



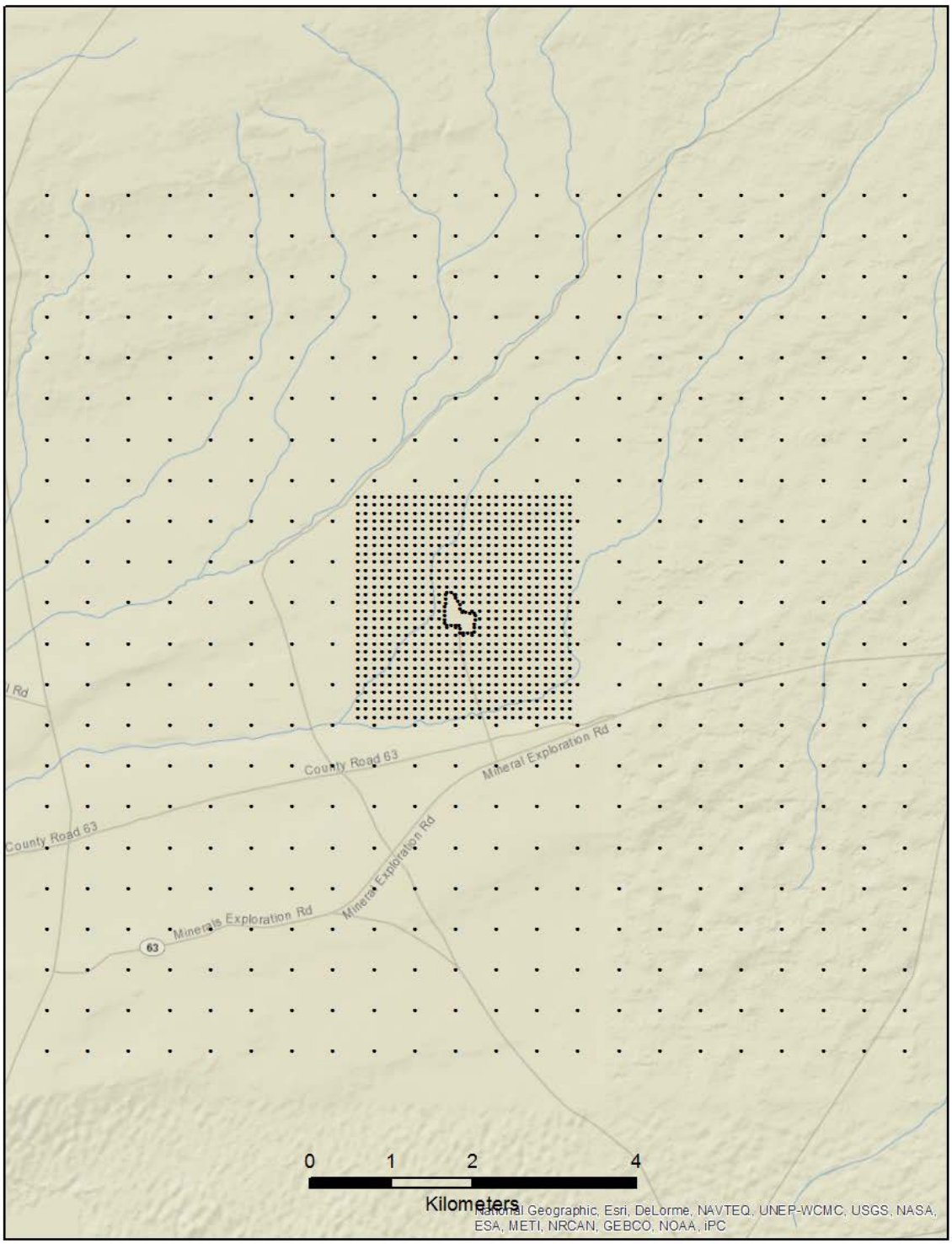
Map 5
Modeled Source Locations – On-Site Processing Scenario



Map 6
Modeled Source Locations – Off-Site Processing Scenario



Map 7
Dispersion Model Receptors – Construction, On-Site and Off-Site Processing Scenarios at the Primary Site



Map 8
Dispersion Model Receptors – Additional Receptors
for the Off-Site Processing Scenario

4.0 FAR-FIELD ANALYSIS

The purpose of the far-field analysis is to quantify potential air quality impacts to both ambient air concentrations and AQRVs from air pollutant emissions of NO_x, SO_2, PM_{10} and $PM_{2.5}$ expected to result from construction and operation of the Proposed Action and alternatives. Ambient air quality impacts of NO_2, SO_2, PM_{10}, and $PM_{2.5}$, and AQRVs were analyzed at federal Class I and sensitive Class II areas that are within 200 km of the Project Area. The analyses were performed using the EPA-approved version of the CALPUFF modeling system (Version 5.8.4) with the exception of the use of Mesoscale Model Interface Program (MMIF) Version 3.0 (ENVIRON, 2013) to develop a meteorological windfield rather than CALMET. All CALPUFF model options conform to the 2009 EPA guidance (EPA, 2009) and all CALPOST model options and inputs conform to FLAG 2010 guidance (FLAG, 2010). Maximum Project emissions, described in Section 2.0, were modeled for the far-field analysis. Sources were placed at the same locations used in the near-field analysis as presented in Maps 4 through 6.

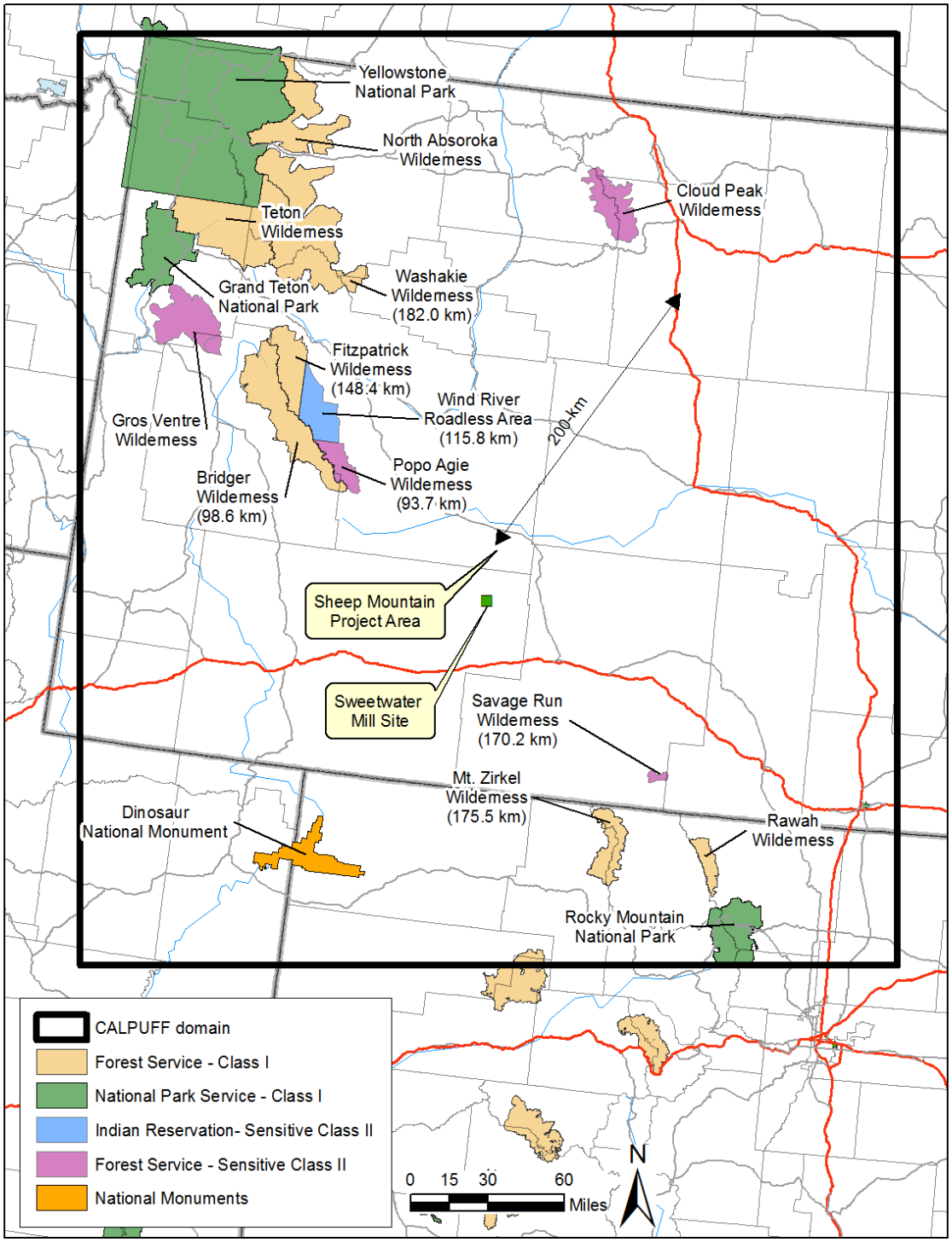
The federal Class I and sensitive Class II areas located within 200 km of the Project Area are listed in Table 4. Table 4 also lists the agency responsible for managing the area, and the PSD classification. Map 9 indicates the proposed CALPUFF modeling domain and shows the Class I and sensitive Class II areas within 200 km of the Project Area. As shown in Map 9, the Project is approximately 94 km from the nearest sensitive area (Class II Popo Agie Wilderness Area).

The receptors for the Class I areas were obtained the FLM receptor database. The receptors for sensitive Class II areas were obtained from prior CALPUFF air quality analyses, i.e. the Riverton Dome EIS (BIA, 2008).

Table 4
Class I and Sensitive Class II Areas

Area of Concern	Managing Agency	PSD Classification
Bridger Wilderness Area	US Forest Service	I
Fitzpatrick Wilderness Area	US Forest Service	I
Mount Zirkel Wilderness Area	US Forest Service	I
Washakie Wilderness Area	US Forest Service	I
Popo Agie Wilderness Area	US Forest Service	II
Savage Run Wilderness Area	US Forest Service	II
Wind River Roadless Area	Bureau of Indian Affairs	II

Ambient air impacts of NO_2, SO_2, PM_{10}, $PM_{2.5}$ and AQRVs (visibility and acid deposition) were analyzed at the each of the Class I and sensitive Class II areas. In addition, ten lakes that are designated as acid sensitive were assessed for potential lake acidification from atmospheric deposition impacts. These include Black Joe, Deep, Hobbs, Lazy Boy, and Upper Frozen lakes in the Bridger Wilderness; Ross Lake in the Fitzpatrick Wilderness; Lake Elbert, Seven Lakes, and Summit Lake in the Mount Zirkel Wilderness; and Lower Saddlebag Lake in the Popo Agie Wilderness.



Map 9
CALPUFF Modeling Domain and Class I and Sensitive Class II Areas within 200km of the Sheep Mountain Project Area

The CALPUFF-predicted concentration impacts were compared with ambient air quality standards and Class I and II Increments, and post-processed to compute: (1) AQRV impacts due to light extinction change for comparison to visibility impact thresholds in Class I and sensitive Class II areas; and (2) AQRV impacts due to deposition rates for comparison to sulfur (S) and nitrogen (N) deposition thresholds, and to calculate change in acid neutralizing capacity (ANC) for sensitive water bodies.

4.1 Meteorological data

The 2008 Weather Research and Forecasting (WRF) meteorological model output produced as part of the Western Regional Air Partnership's (WRAP) West-wide Jump Start Air Quality Modeling Study (WestJumpAQMS) (ENVIRON et. al., 2012) were used as the meteorological dataset for input into the CALPUFF modeling. The WestJumpAQMS WRF model was run for an extensive 4 km domain that focuses on the intermountain West, including the Project location and surrounding areas.

A subset of the WestJumpAQMS modeling output were extracted for the air quality modeling domain and processed into CALPUFF-ready format using the MMIF meteorological preprocessor. The PSD Class I and sensitive Class II areas within 200 km of the Project were contained within the modeling domain along with with sufficient buffer for potential recirculation effects.

The WRF model output was processed with MMIF with the following options selected:

- Output for CALPUFF version 5.8.4;
- The WRF vertical layers were interpolated to the FLM/EPA-recommended vertical layers using the TOP option;
- The PG stability classes were calculated with the Golder option; and
- Planetary boundary layer heights were recalculated.

This resulted in the CALPUFF-ready meteorological files with the following specifications:

- Projection of LCC with RLAT0 = 40N, RLON0 = 97W, XLAT1 = 33N and XLAT2 = 45N;
- Datum = NWS-84;
- NX =130;
- NY =148;
- NZ =10;
- DGRIDKM = 4.; and
- ZFACE = 0., 20., 40., 80., 160., 320., 640., 1200., 2000., 3000., 4000.

The MMIF output, for the entire year of 2008, was consistent with both the original WRF model output and EPA-recommended settings as applicable.

4.2 Ozone and Ammonia Data

Representative ozone and ammonia data is required for use in the chemical transformation of primary pollutant emissions. Hourly ozone is used by CALPUFF to oxidize NO_X and SO_2 emissions within the modeling domain to nitric acid and sulfuric acid, respectively. The predicted nitric acid and sulfuric acid are then partitioned in CALPUFF between the gaseous and particulate nitrate and sulfate phases based on the available ammonia, and ambient temperature and relative humidity.

Hourly ozone data from EPA Air Quality System (AQS) and Clean Air Status and Trends Network (CASTNET) ozone sites within the modeling domain was used in the analysis.

The background ammonia value used in the CALPUFF modeling was 1.0 parts per billion (ppb) for each month of the year following FLAG 2010 guidance for arid lands.

4.3 Visibility

CALPUFF predicted 24-hour concentrations of nitrate, sulfate, PM_{10} and $PM_{2.5}$ at each of the analyzed Class I and sensitive Class II areas were processed using CALPOST following the procedures described in the FLAG 2010 document to estimate potential change in light extinction. Analyses were conducted using the methodology recommended in the FLAG 2010 report for the 20^{th} percentile best natural visibility conditions. Applicable background visibility data and monthly relative humidity factors used in the calculations are defined in the FLAG report. Natural background and relative humidity factors are available for the Class I Bridger, Fitzpatrick, Washakie, and Mount Zirkel Wilderness Areas only. For the Popo Agie and Wind River Roadless sensitive Class II areas the data for the Bridger Wilderness Area were used. For the Savage Run Wilderness, the data for the Mount Zirkel Wilderness Area were used.

4.4 Deposition

The POSTUTIL and CALPOST processor were used to determine annual deposition of total S and total N from CALPUFF modeled deposition results at each Class I and sensitive Class II area. The results were expressed in kilograms per hectare per year (kg/ha-yr).

4.5 Lake Chemistry

CALPUFF modeled annual N and S deposition impacts at sensitive lake locations were used to estimate changes in ANC. The changes in ANC were calculated following the January 2000, U.S. Forest Service (Forest Service) Rocky Mountain Region's *Screening Methodology for Calculating ANC Change to High Elevation Lakes, User's Guide* (Forest Service, 2000). The most recent lake chemistry background ANC data available from the Forest Service for the ten sensitive lakes listed in Section 4.0 are shown in Table 5. The 10th percentile lowest ANC values were calculated for each lake following procedures provided by the Forest Service. Of the ten lakes listed in Table 5, two lakes (Lazy Boy and Upper Frozen) are considered by the Forest Service as extremely sensitive to atmospheric deposition because the background ANC values are less than 25 microequivalents per liter (µeq/l). Annual precipitation data for each lake were obtained from the Parameter-elevation Regressions on Independent Slopes Model (PRISM) (PRISM, 2014) climate mapping system data base, and these precipitation values were used in the calculation of ANC changes.

Table 5
Background ANC Values for Acid Sensitive Lakes[1]

Wilderness Area	Lake	Latitude (Degs)	Longitude (Degs)	10th Percentile Lowest ANC Value (µeq/l)[2]	Number of Samples	Monitoring Period
Bridger	Black Joe	42.739	109.171	62.6	78	1984-2009
Bridger	Deep	42.719	109.172	57.7	68	1984-2009
Bridger	Hobbs	43.035	109.673	69.9	80	1984-2009
Bridger	Lazy Boy	43.332	109.729	9.1	5	1997-2009
Bridger	Upper Frozen	42.687	109.161	7.5	12	1997-2009
Fitzpatrick	Ross	43.393	109.658	53.0	61	1988-2010
Mount Zirkel	Lake Elbert	40.634	106.707	56.9	68	1985-2007
Mount Zirkel	Seven Lakes (LG East)	40.896	106.682	36.2	67	1985-2007
Mount Zirkel	Summit Lake	40.545	106.682	48.0	107	1985-2007
Popo Agie	Lower Saddlebag	42.623	108.995	54.6	64	1989-2010

[1] Source: Forest Service, 2014.
[2] 10th Percentile Lowest ANC Values reported.

5.0 AIR QUALITY IMPACTS

5.1 Near-Field

5.1.1 Criteria Pollutant Impacts

Near-field modeling for criteria pollutants PM_{10}, $PM_{2.5}$, NO_x, and CO was performed for: construction, operations with on-site processing, and operations with off-site processing. The results of this modeling is presented in this section.

Wyoming Ambient Air Quality Standards (WAAQS), National Ambient Air Quality Standards (NAAQS), and applicable PSD Class II increments are shown in Table 6. Near-field modeled concentrations are combined with ambient air quality background concentrations shown in Table 2 and compared to the corresponding NAAQS and WAAQS in the equivalent form of the standard and equivalent units.

Maximum predicted pollutant concentrations from Project emissions sources combined with existing ambient air quality background concentrations and compared to the NAAQS and WAAQS as shown in Table 7 for construction; Table 8 for operations with on-site processing; and Table 9 for operations with off-site processing. All total predicted concentrations were found to be below applicable NAAQS and WAAQS.

Project-only impacts for the operations are compared to PSD Class II increments and are shown in Table 10 for on-site processing and Table 11 for off-site processing. The impacts from construction activities were not compared to PSD increments because construction actvitites are temporary sources and would not consume PSD increment. The predicted pollutant concentrations from stationary sources were found to be below PSD Class II Increments. Predicted impacts from all sources, including both stationary and fugitive sources, were found to be below PSD Class II Increments with the exception of the 24-hour averaging period for PM_{10} and $PM_{2.5}$. Under the operations with on-site processing case, 24-hour PM_{10} concentrations from both stationary and fugitive sources were 11 percent above the PM_{10} 24-hour PSD Class II Increment and 61 percent above the $PM_{2.5}$ 24-hour PSD Class II Increment. Under the operations with off-site processing case, 24-hour PM_{10} concentrations from both stationary and fugitive sources were 77 percent above the 24-hour PM_{10} PSD Class II Increment and 35 percent above the 24-hour $PM_{2.5}$ PSD Class II Increment. This PSD demonstration is for information only and is not a regulatory PSD Increment consumption analysis, which would be completed as necessary during the WDEQ permitting process. The 24-hour PM_{10} and $PM_{2.5}$ impacts are controlled by fugitive sources such as the mining pit and roads associated with operations.

Table 6
NAAQS, WAAQS, and PSD Class II Increments for Comparison to Analysis Results (µg/m^3)[1]

Pollutant/Averaging Time	NAAQS	WAAQS	PSD Class I Increment[1]	PSD Class II Increment[2]
CO				
1-hour[3]	40,000	40,000	--[4]	--[4]
8-hour[3]	10,000	10,000	--[4]	--[4]
NO_2				
1-hour[5]	188	188	--[4]	--[4]
Annual[6]	100	100	2.5	25
PM_{10}				
24-hour[3]	150	150	8	30
Annual[6]	--[7]	50	4	17
$PM_{2.5}$				
24-hour[8]	35	35	2	9
Annual[6]	12	15[9]	1	4
SO_2				
1-hour[10]	196	196	--[4]	--[4]
3-hour[3]	1,300	1,300	25	512
24-hour[3]	--[7]	--[11]	5	91
Annual[6]	--[7]	--[11]	2	20

[1] For gaseous pollutants, NAAQS and WAAQS conversion from ppm or ppb was performed assuming standard conditions (25 degs C and 29.92 inches Hg).
[2] The PSD demonstrations serve information purposes only and do not constitute a regulatory PSD increment consumption analysis.
[3] No more than one exceedance per year.
[4] No PSD increments have been established for this pollutant–averaging time.
[5] An area is in compliance with the standard if the 98th percentile of daily maximum 1-hour NO_2 concentrations in a year, averaged over 3 years, is less than or equal to the level of the standard.
[6] Annual arithmetic mean.
[7] The NAAQS for this averaging time for this pollutant has been revoked by EPA.
[8] An area is in compliance with the standard if the maximum 24-hour PM2.5 concentrations in a year, averaged over 3 years, is less than or equal to the level of the standard.
[9] The EPA revised the NAAQS for this pollutant (effective March 18 2013) and the WDEQ has not yet adopted the revised NAAQS as part of their rulemaking. All compliance demonstrations of modeled concentrations will use the more stringent NAAQS value.
[10] An area is in compliance with the standard if the 99th percentile of daily maximum 1-hour SO_2 concentrations in a year, averaged over 3 years, is less than or equal to the level of the standard.
[11] No standards are established for this pollutant-averaging time.

Table 7
Construction - Near-Field Criteria Pollutant
Concentrations Compared to NAAQS and WAAQS

Pollutant	Averaging Period	Predicted Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)	Percent of NAAQS
CO	1-hour [1]	1048.1	904.0	1952.1	40,000	40,000	5
	8-hour [1]	266.7	572.0	838.7	10,000	10,000	8
NO_2	1-hour [2]	170.2	9.4	179.6	188	188	96
	Annual	10.5	1.9	12.4	100	100	12
PM_{10}	24-hour [1]	47.5	49.0	96.5	150	150	64
	Annual	2.1	11.0	13.1	n/a	50	n/a
$PM_{2.5}$	24-hour [3]	5.3	27.0	32.3	35	35	92
	Annual	0.4	7.0	7.4	12	15	62
SO_2	1-hour [4]	6.3	18.3	24.6	196	196	13
	3-hour [1]	5.0	18.3	23.3	1,300	1,300	2

[1] Highest second-high value.
[2] Two-year average of the 98th percentile daily maximum 1-hour concentrations.
[3] Maximum 98th percentile concentration.
[4] Maximum 99th percentile daily maximum concentration.

Table 8
On-Site Processing - Near-Field Criteria Pollutant
Concentrations Compared to NAAQS and WAAQS

Pollutant	Averaging Period	Predicted Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)	Percent of NAAQS
CO	1-hour [1]	1048.1	904.0	1952.1	40,000	40,000	5
	8-hour [1]	159.4	572.0	731.4	10,000	10,000	7
NO_2	1-hour [2]	137.9	9.4	147.3	188	188	78
	Annual	8.0	1.9	9.9	100	100	10
PM_{10}	24-hour [1]	33.4	49.0	82.4	150	150	55
	Annual	4.9	11.0	15.9	n/a	50	n/a
$PM_{2.5}$	24-hour [3]	4.3	27.0	31.4	35	35	90
	Annual	0.7	7.0	7.7	12	15	64
SO_2	1-hour [4]	6.3	18.3	24.6	196	196	13
	3-hour [1]	3.3	18.3	21.6	1,300	1,300	2

[1] Highest second-high value.
[2] Two-year average of the 98th percentile daily maximum 1-hour concentrations.
[3] Maximum 98th percentile concentration.
[4] Maximum 99th percentile daily maximum concentration.

Table 9
Off-Site Processing - Near-Field Criteria
Pollutant Concentrations Compared to NAAQS and WAAQS

Pollutant	Averaging Period	Predicted Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)	Percent of NAAQS
CO	1-hour [1]	1069.0	904.0	1973.0	40,000	40,000	5
	8-hour [1]	185.5	572.0	757.5	10,000	10,000	8
NO_2	1-hour [2]	145.2	9.4	154.6	188	188	82
	Annual	8.6	1.9	10.5	100	100	11
PM_{10}	24-hour [1]	53.0	49.0	102.0	150	150	68
	Annual	12.3	11.0	23.3	n/a	50	n/a
$PM_{2.5}$	24-hour [3]	5.7	27.0	32.7	35	35	93
	Annual	1.3	7.0	8.3	12	15	69
SO_2	1-hour [4]	9.3	18.3	27.6	196	196	14
	3-hour [1]	7.6	18.3	25.9	1,300	1,300	2

[1] Highest second-high value.
[2] Two-year average of the 98th percentile daily maximum 1-hour concentrations.
[3] Maximum 98th percentile concentration.
[4] Maximum 99th percentile daily maximum concentration.

Table 10
On-Site Processing - Near-Field Criteria Pollutant
Concentrations Compared to PSD Class II Increments

Pollutant	Averaging Period	Predicted Impact ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)	Percent of Increment
NO_2	Annual [1]	8.0	25	32
PM_{10}	24-hour [1]	33.4	30	111
	Annual	4.9	17	29
$PM_{2.5}$	24-hour [1]	14.5	9	161
	Annual	0.7	4	18
SO_2	3-hour [1]	3.3	512	1
	24-hour [1]	1.1	91	1
	Annual	0.03	20	0.1

[1] Highest second high value.

Table 11
Off-Site Processing - Near-Field Criteria Pollutant Concentrations Compared to PSD Class II Increments

Pollutant	Averaging Period	Predicted Impact ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)	Percent of Increment
NO_2	Annual [1]	8.6	25	34
PM_{10}	24-hour [1]	53.0	30	177
	Annual	12.3	17	72
$PM_{2.5}$	24-hour [1]	12.1	9	135
	Annual	1.3	4	32
SO_2	3-hour [1]	7.6	512	1
	24-hour [1]	3.1	91	3
	Annual	0.03	20	0.1

[1] Highest second high value.

5.2 Far-Field

5.2.1 Ambient Concentration Impacts

Modeled direct project pollutant concentrations predicted to occur at the nearby PSD Class I and Sensitive Class II areas are compared to PSD Increments in Table 12 through 14 for construction, operations with on-site processing, and operations off-site processing, respectively. Although construction activities are temporary sources and would not consume increment, for informational purposes, the comparison of modeled construction impacts to PSD increments is provided in Table 12.

For all modeling scenarios air quality concentration impacts are well below the applicable PSD Increments at each of the PSD Class I and Sensitive Class II areas analyzed. The PSD demonstrations are for information only and are not regulatory PSD Increment consumption analyses, which would be completed as necessary by the WDEQ.

Table 12
Construction - Far-Field Criteria Pollutant Impacts Compared to PSD Increments

Location	Pollutant	Averaging Time	Direct Modeled ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)
Bridger WA	NO_2	Annual	1.86E-04	2.5
	SO_2	3-hour	7.39E-03	25
		24-hour	9.46E-04	5
		Annual	5.77E-06	2
	PM_{10}	24-hour	1.27E-02	8
		Annual	2.65E-04	4
	$PM_{2.5}$	24-hour	7.75E-03	2
		Annual	1.43E-04	1
Fitzpatrick WA	NO_2	Annual	1.46E-05	2.5
	SO_2	3-hour	1.73E-04	25
		24-hour	3.87E-05	5
		Annual	7.58E-07	2
	PM_{10}	24-hour	8.48E-03	8
		Annual	1.06E-04	4
	$PM_{2.5}$	24-hour	6.00E-03	2
		Annual	6.71E-05	1
Mount Zirkel WA	NO_2	Annual	1.51E-04	2.5
	SO_2	3-hour	1.94E-03	25
		24-hour	2.44E-04	5
		Annual	3.87E-06	2
	PM_{10}	24-hour	1.14E-02	8
		Annual	3.74E-04	4
	$PM_{2.5}$	24-hour	8.29E-03	2
		Annual	2.47E-04	1
Washakie WA	NO_2	Annual	9.03E-06	2.5
	SO_2	3-hour	9.64E-05	25
		24-hour	6.90E-05	5
		Annual	8.73E-07	2
	PM_{10}	24-hour	1.81E-02	8
		Annual	1.52E-04	4
	$PM_{2.5}$	24-hour	1.21E-02	2
		Annual	9.67E-05	1
Popo Agie WA	NO_2	Annual	2.41E-04	2.5
	SO_2	3-hour	1.16E-02	25
		24-hour	1.48E-03	5
		Annual	7.39E-06	2
	PM_{10}	24-hour	1.83E-02	8
		Annual	3.17E-04	4
	$PM_{2.5}$	24-hour	8.49E-03	2
		Annual	1.68E-04	1
Savage Run WA	NO_2	Annual	2.21E-04	25
	SO_2	3-hour	6.81E-03	512
		24-hour	8.57E-04	91
		Annual	6.24E-06	20
	PM_{10}	24-hour	2.99E-02	30
		Annual	5.14E-04	17
	$PM_{2.5}$	24-hour	2.67E-02	9
		Annual	3.46E-04	4
Wind River RA	NO_2	Annual	3.84E-05	25
	SO_2	3-hour	3.31E-04	512
		24-hour	6.61E-05	91
		Annual	1.64E-06	20
	PM_{10}	24-hour	9.32E-03	30
		Annual	1.86E-04	17
	$PM_{2.5}$	24-hour	6.60E-03	9
		Annual	1.08E-04	4

Table 13
On-Site Processing - Far-Field Criteria Pollutant Impacts Compared to PSD Increments

Location	Pollutant	Averaging Time	Direct Modeled ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)
Bridger WA	NO_2	Annual	1.86E-04	2.5
	SO_2	3-hour	7.39E-03	25
		24-hour	9.46E-04	5
		Annual	5.78E-06	2
	PM_{10}	24-hour	2.37E-02	8
		Annual	4.34E-04	4
	$PM_{2.5}$	24-hour	7.96E-03	2
		Annual	1.72E-04	1
Fitzpatrick WA	NO_2	Annual	1.47E-05	2.5
	SO_2	3-hour	1.73E-04	25
		24-hour	3.89E-05	5
		Annual	7.62E-07	2
	PM_{10}	24-hour	1.15E-02	8
		Annual	1.54E-04	4
	$PM_{2.5}$	24-hour	6.55E-03	2
		Annual	7.59E-05	1
Mount Zirkel WA	NO_2	Annual	1.51E-04	2.5
	SO_2	3-hour	1.94E-03	25
		24-hour	2.44E-04	5
		Annual	3.88E-06	2
	PM_{10}	24-hour	1.54E-02	8
		Annual	5.26E-04	4
	$PM_{2.5}$	24-hour	8.84E-03	2
		Annual	2.73E-04	1
Washakie WA	NO_2	Annual	9.04E-06	2.5
	SO_2	3-hour	9.69E-05	25
		24-hour	6.93E-05	5
		Annual	8.78E-07	2
	PM_{10}	24-hour	2.49E-02	8
		Annual	2.17E-04	4
	$PM_{2.5}$	24-hour	1.33E-02	2
		Annual	1.08E-04	1
Popo Agie WA	NO_2	Annual	2.41E-04	2.5
	SO_2	3-hour	1.16E-02	25
		24-hour	1.48E-03	5
		Annual	7.40E-06	2
	PM_{10}	24-hour	3.81E-02	8
		Annual	5.60E-04	4
	$PM_{2.5}$	24-hour	1.14E-02	2
		Annual	2.08E-04	1
Savage Run WA	NO_2	Annual	2.22E-04	25
	SO_2	3-hour	6.81E-03	512
		24-hour	8.55E-04	91
		Annual	6.25E-06	20
	PM_{10}	24-hour	3.36E-02	30
		Annual	7.00E-04	17
	$PM_{2.5}$	24-hour	2.74E-02	9
		Annual	3.78E-04	4
Wind River RA	NO_2	Annual	3.84E-05	25
	SO_2	3-hour	3.33E-04	512
		24-hour	6.65E-05	91
		Annual	1.65E-06	20
	PM_{10}	24-hour	1.25E-02	30
		Annual	2.87E-04	17
	$PM_{2.5}$	24-hour	7.18E-03	9
		Annual	1.26E-04	4

Table 14
Off-Site Processing - Far-Field Criteria Pollutant Impacts Compared to PSD Increments

Location	Pollutant	Averaging Time	Direct Modeled ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)
Bridger WA	NO_2	Annual	1.59E-04	2.5
	SO_2	3-hour	7.38E-03	25
		24-hour	9.44E-04	5
		Annual	5.75E-06	2
	PM_{10}	24-hour	2.19E-02	8
		Annual	3.87E-04	4
	$PM_{2.5}$	24-hour	7.03E-03	2
		Annual	1.01E-04	1
Fitzpatrick WA	NO_2	Annual	1.14E-05	2.5
	SO_2	3-hour	1.71E-04	25
		24-hour	3.86E-05	5
		Annual	7.54E-07	2
	PM_{10}	24-hour	9.50E-03	8
		Annual	1.32E-04	4
	$PM_{2.5}$	24-hour	4.46E-03	2
		Annual	4.77E-05	1
Mount Zirkel WA	NO_2	Annual	1.19E-04	2.5
	SO_2	3-hour	1.94E-03	25
		24-hour	2.44E-04	5
		Annual	3.86E-06	2
	PM_{10}	24-hour	1.29E-02	8
		Annual	4.72E-04	4
	$PM_{2.5}$	24-hour	7.93E-03	2
		Annual	1.84E-04	1
Washakie WA	NO_2	Annual	7.01E-06	2.5
	SO_2	3-hour	9.60E-05	25
		24-hour	6.87E-05	5
		Annual	8.68E-07	2
	PM_{10}	24-hour	2.08E-02	8
		Annual	1.82E-04	4
	$PM_{2.5}$	24-hour	9.22E-03	2
		Annual	7.10E-05	1
Popo Agie WA	NO_2	Annual	2.04E-04	2.5
	SO_2	3-hour	1.16E-02	25
		24-hour	1.48E-03	5
		Annual	7.37E-06	2
	PM_{10}	24-hour	3.64E-02	8
		Annual	5.06E-04	4
	$PM_{2.5}$	24-hour	6.65E-03	2
		Annual	1.18E-04	1
Savage Run WA	NO_2	Annual	1.83E-04	25
	SO_2	3-hour	6.81E-03	512
		24-hour	8.57E-04	91
		Annual	6.23E-06	20
	PM_{10}	24-hour	3.04E-02	30
		Annual	6.27E-04	17
	$PM_{2.5}$	24-hour	2.59E-02	9
		Annual	2.67E-04	4
Wind River RA	NO_2	Annual	3.01E-05	25
	SO_2	3-hour	3.29E-04	512
		24-hour	6.57E-05	91
		Annual	1.64E-06	20
	PM_{10}	24-hour	1.03E-02	30
		Annual	2.48E-04	17
	$PM_{2.5}$	24-hour	4.91E-03	9
		Annual	7.59E-05	4

5.2.2 Visibility

Change in atmospheric light extinction relative to background conditions is used to measure regional haze. Analysis thresholds for atmospheric light extinction are set forth in FLAG (2010), with the results reported in percent change in light extinction and change in deciview (dv or delta deciview [ddv]). A 5 percent change in light extinction [approximately equal to a 0.5 change in dv (Δdv)] is the threshold recommended in FLAG (2010) and is considered to contribute to regional haze visibility impairment. A 10 percent change in light extinction (approximately equal to 1.0 Δdv) is considered to represent a noticeable change in visibility when compared to background conditions. The BLM considers a 1.0 Δdv change as a significant adverse impact; however, there are no applicable local, state, tribal, or federal regulatory visibility standards. It is the responsibility of the jurisdictional FLM or Tribal government responsible for that land to determine when adverse impacts are significant or not, and these may differ from BLM levels for significant adverse impacts.

Visibility impacts were calculated for the each scenario of the Project (Proposed Action) and were evaluated at each Class I and sensitive Class II area of concern to determine if the maximum and 98th percentile change in light extinction exceeds either the 0.5 and 1.0 delta deciview thresholds (equivalent to 5 percent and 10 percent change in light extinction). Results are presented in Table 15 for construction; Table 16 for operations with on-site processing; and Table 17. for operations with off-site processing. The results were reported for each threshold using the 20th percentile best visibility background conditions. The results indicate that, for all modeling scenarios, impacts are below the thresholds of concern at all Class I and sensitive Class II areas.

Table 15
Construction - Far-Field Visibility Impacts Using the 20th Percentile Cleanest Backgrounds

Area of Concern	Days Greater Than 0.5 Δdv	Days Greater Than 1.0 Δdv	Maximum Δdv	98th Percentile Δdv
Bridger Wilderness Area	0	0	0.032	0.010
Fitzpatrick Wilderness Area	0	0	0.036	0.005
Mount Zirkel Wilderness Area	0	0	0.049	0.020
Washakie Wilderness Area	0	0	0.071	0.013
Popo Agie Wilderness Area	0	0	0.028	0.013
Savage Run Wilderness Area	0	0	0.048	0.005
Wind River Roadless Area	0	0	0.030	0.006

Table 16
On-Site Processing - Far-Field Visibility Impacts Using the 20th Percentile Cleanest Backgrounds

Area of Concern	Days Greater Than 0.5 Δdv	Days Greater Than 1.0 Δdv	Maximum Δdv	98th Percentile Δdv
Bridger Wilderness Area	0	0	0.037	0.014
Fitzpatrick Wilderness Area	0	0	0.039	0.006
Mount Zirkel Wilderness Area	0	0	0.052	0.022
Washakie Wilderness Area	0	0	0.076	0.015
Popo Agie Wilderness Area	0	0	0.051	0.020
Savage Run Wilderness Area	0	0	0.052	0.006
Wind River Roadless Area	0	0	0.043	0.008

Table 17
Off-Site Processing - Far-Field Visibility Impacts Using the 20th Percentile Cleanest Backgrounds

Area of Concern	Days Greater Than 0.5 Δdv	Days Greater Than 1.0 Δdv	Maximum Δdv	98th Percentile Δdv
Bridger Wilderness Area	0	0	0.032	0.011
Fitzpatrick Wilderness Area	0	0	0.030	0.004
Mount Zirkel Wilderness Area	0	0	0.046	0.017
Washakie Wilderness Area	0	0	0.060	0.011
Popo Agie Wilderness Area	0	0	0.032	0.011
Savage Run Wilderness Area	0	0	0.046	0.004
Wind River Roadless Area	0	0	0.025	0.005

5.2.3 Deposition

FLAG (2010) recommends that applicable sources assess impacts of N and S deposition at Class I areas. The guidance does recommends the use of deposition analysis thresholds (DATs) developed by the National Park Service and the U.S. Fish and Wildlife Service. The DATs represent screening level values for N and S deposition from project alone emission sources below which estimated impacts are considered insignificant. The DAT established for both N and S in western Class I areas is 0.005 kg/ha-yr. Impacts are presented in Table 18 for construction; Table 19 for operations with on-site processing; and Table 20. for operations with off-site processing. The results indicate that, for all modeling scenarios, impacts are below the DATs at the areas of concern.

Table 18
Construction - Deposition Impacts Compared to the DAT

Area of Concern	Maximum Nitrogen Impact (kg/ha-yr)	Maximum Sulfur Impact (kg/ha-yr)	DAT (kg/ha-yr)	Nitrogen Percent of DAT	Sulfur Percent of DAT
Bridger Wilderness Area	0.0002	0.000005	0.005	4	0.1
Fitzpatrick Wilderness Area	0.0002	0.000004	0.005	3	0.1
Mt Zirkel Wilderness Area	0.0002	0.000002	0.005	4	0.05
Popo Agie Wilderness Area	0.0002	0.000006	0.005	5	0.1
Savage Run Wilderness Area	0.0004	0.000004	0.005	7	0.1
Washakie Wilderness Area	0.0001	0.000002	0.005	2	0.04
Wind River Roadless Area	0.0002	0.000004	0.005	3	0.1

Table 19
On-Site Processing - Deposition Impacts Compared to the DAT

Area of Concern	Maximum Nitrogen Impact (kg/ha-yr)	Maximum Sulfur Impact (kg/ha-yr)	DAT (kg/ha-yr)	Nitrogen Percent of DAT	Sulfur Percent of DAT
Bridger Wilderness Area	0.0002	0.000005	0.005	4	0.10
Fitzpatrick Wilderness Area	0.0002	0.000004	0.005	3	0.10
Mt Zirkel Wilderness Area	0.0002	0.000002	0.005	4	0.05
Popo Agie Wilderness Area	0.0002	0.000006	0.005	5	0.10
Savage Run Wilderness Area	0.0004	0.000004	0.005	7	0.10
Washakie Wilderness Area	0.0001	0.000002	0.005	2	0.04
Wind River Roadless Area	0.0002	0.000004	0.005	3	0.10

Table 20
Off-Site Processing - Deposition Impacts Compared to the DAT

Area of Concern	Maximum Nitrogen Impact (kg/ha-yr)	Maximum Sulfur Impact (kg/ha-yr)	DAT (kg/ha-yr)	Nitrogen Percent of DAT	Sulfur Percent of DAT
Bridger Wilderness Area	0.0002	0.000005	0.005	3	0.10
Fitzpatrick Wilderness Area	0.0001	0.000004	0.005	3	0.10
Mt Zirkel Wilderness Area	0.0002	0.000002	0.005	3	0.05
Popo Agie Wilderness Area	0.0002	0.000006	0.005	4	0.10
Savage Run Wilderness Area	0.0003	0.000004	0.005	6	0.10
Washakie Wilderness Area	0.0001	0.000002	0.005	1	0.04
Wind River Roadless Area	0.0001	0.000004	0.005	3	0.10

5.2.4 ANC

The CALPUFF-predicted annual deposition fluxes of S and N at sensitive lake receptors listed in Section 4.5 were used to estimate the change in ANC. The predicted changes in ANC were compared with the Forest Service's Level of Acceptable Change (LAC) thresholds of a 10 percent change in ANC for lakes with ANC values equal to or greater than 25 µeq/l and 1 µeq/l for lakes with ANC values of 25 µeq/l and less. Results are presented in Table 21 for construction; Table 22 for operations with on-site processing; and Table 23. for operations with off-site processing. The results indicate that, for all modeling scenarios, impacts are below the thresholds of concern at each of the sensitive lakes.

Table 21
Construction ANC Impacts

Sensitive Lake	Annual Precipitation[1] (meters)	ANC Value[2] (µeq/l)	N (kg/ha-yr)	S (kg/ha-yr)	ANC Relative Change[3] (percent)	ANC Absolute Change[3] (µeq/l)
Black Joe Lake	1.6	62.6	1.52E-04	3.05E-06	0.002	n/a
Deep Lake	1.4	57.7	1.55E-04	3.34E-06	0.002	n/a
Hobbs Lake	1.1	69.9	8.45E-05	1.42E-06	0.001	n/a
Lazy Boy	1.1	9.1	1.06E-04	2.30E-06	n/a	0.001
Lower Saddlebag Lake	1.1	54.6	2.06E-04	5.13E-06	0.004	n/a
Ross Lake	1.1	53.0	1.23E-04	2.74E-06	0.002	n/a
Upper Frozen Lake	0.8	7.5	1.57E-04	3.58E-06	n/a	0.002
Lake Elbert	1.7	56.9	1.90E-04	1.57E-06	0.002	n/a
Seven Lakes	1.3	36.2	2.10E-04	1.93E-06	0.005	n/a
Summit Lake	1.4	48	1.96E-04	1.49E-06	0.003	n/a

[1] 2008 annual precipitation for these sites from PRISM.
[2] 10th Percentile Lowest ANC Values reported.
[3] For lakes with baseline ANC values less than 25 µeq/l, the threshold is 1 µeq/l. For lakes with baseline ANC values equal to or greater than 25 µeq/l the threshold is a 10 percent change in ANC.

Table 22
On-Site Processing ANC Impacts

Sensitive Lake	Annual Precipitation[1] (meters)	ANC Value[2] (µeq/l)	N (kg/ha-yr)	S (kg/ha-yr)	ANC Relative Change[3] (percent)	ANC Absolute Change[3] (µeq/l)
Black Joe Lake	1.6	62.6	1.52E-04	3.06E-06	0.002	n/a
Deep Lake	1.4	57.7	1.56E-04	3.35E-06	0.002	n/a
Hobbs Lake	1.1	69.9	8.47E-05	1.43E-06	0.001	n/a
Lazy Boy	1.1	9.1	1.06E-04	2.31E-06	n/a	0.001
Lower Saddlebag Lake	1.1	54.6	2.06E-04	5.14E-06	0.004	n/a
Ross Lake	1.1	53.0	1.23E-04	2.76E-06	0.002	n/a
Upper Frozen Lake	0.8	7.5	1.57E-04	3.60E-06	n/a	0.002
Lake Elbert	1.7	56.9	1.90E-04	1.58E-06	0.002	n/a
Seven Lakes	1.3	36.2	2.11E-04	1.94E-06	0.005	n/a
Summit Lake	1.4	48	1.96E-04	1.49E-06	0.003	n/a

[1] 2008 annual precipitation for these sites from PRISM.
[2] 10th Percentile Lowest ANC Values reported.
[3] For lakes with baseline ANC values less than 25 µeq/l, the threshold is 1 µeq/l. For lakes with baseline ANC values equal to or greater than 25 µeq/l the threshold is a 10 percent change in ANC.

Table 23
Off-Site Processing ANC Impacts

Sensitive Lake	Annual Precipitation[1] (meters)	ANC Value[2] (µeq/l)	N (kg/ha-yr)	S (kg/ha-yr)	ANC Relative Change[3] (percent)	ANC Absolute Change[3] (µeq/l)
Black Joe Lake	1.6	62.6	1.21E-04	3.04E-06	0.001	n/a
Deep Lake	1.4	57.7	1.25E-04	3.33E-06	0.002	n/a
Hobbs Lake	1.1	69.9	6.62E-05	1.42E-06	0.001	n/a
Lazy Boy	1.1	9.1	8.30E-05	2.29E-06	n/a	0.001
Lower Saddlebag Lake	1.1	54.6	1.70E-04	5.12E-06	0.003	n/a
Ross Lake	1.1	53.0	9.57E-05	2.73E-06	0.002	n/a
Upper Frozen Lake	0.8	7.5	1.28E-04	3.58E-06	n/a	0.002
Lake Elbert	1.7	56.9	1.48E-04	1.57E-06	0.002	n/a
Seven Lakes	1.3	36.2	1.64E-04	1.92E-06	0.004	n/a
Summit Lake	1.4	48	1.52E-04	1.48E-06	0.002	n/a

[1] 2008 annual precipitation for these sites from PRISM.
[2] 10th Percentile Lowest ANC Values reported.
[3] For lakes with baseline ANC values less than 25 µeq/l, the threshold is 1 µeq/l. For lakes with baseline ANC values equal to or greater than 25 µeq/l the threshold is a 10 percent change in ANC.

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APPENDIX A

AIR POLLUTANT EMISSIONS INVENTORY
SHEEP MOUNTAIN MINE

Sheep Mountain Mine
Construction Phase
Air Emissions Summary

Appendix A - Table C1

Source ID Number	Description	General Location	Point, Fugitive or Nonroad	Annual PM_{10} Emissions (tpy) [1]	24-Hour PM_{10} Emissions (lb/day)	Annual $PM_{2.5}$ Emissions (tpy) [1]	24-Hour $PM_{2.5}$ Emissions (lb/day)	Annual NO_x Emissions (tpy) [1]	24-Hour NO_x Emissions (lb/day)	Annual CO Emissions (tpy) [1]	24-Hour CO Emissions (lb/day)	Annual SO_2 Emissions (tpy) [1]	24-Hour SO_2 Emissions (lb/day)	Annual VOC Emissions (tpy) [1]	24-Hour VOC Emissions (lb/day)	Annual H2SO4 Emissions (tpy)	Annual H2SO4 Emissions (lb/day)	Annual CH_2O Emissions (tpy)	24-Hour CH_2O Emissions (lb/day)	Annual CO2e Emissions (metric tpy)	Annual Benzene Emissions (tpy)	Annual Toluene Emissions (tpy)	Annual Ethylbenzene Emissions (tpy)	Annual n-hexane Emissions (tpy)
1.0	**Mine Sources**																							
	Blasting - Particulate	Underground	F	0.0139	0.0802	0.0008	0.0046	--	--	--	--	--	--	--	--	--	--	--	--	--				
	Blasting - Gaseous	Underground	F	--	--	--	--	6.3450	34.8100	22.1225	121.4600	0.6025	3.3100	--	--	--	--	--	--	--				
	Natural Gas Heaters - Mine Intake	Underground	P	0.0034	0.0187	0.0034	0.0187	0.0450	0.2466	0.0378	0.2071	0.0003	0.0015	0.0025	0.0136	--	--	3.38E-05	1.85E-04	49.1022	9.45E-07	1.53E-06	--	8.10E-04
	Underground Mine Construction	Underground	F	0.0772	0.4232	0.0154	0.0846	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Underground Mobile Sources	Underground	N	2.5472	19.5936	2.5472	19.5936	42.1337	324.1051	44.8769	345.2073	--	--	5.1356	39.5043	--	--	0.8408	6.4680	4852.9663	0.0537	0.0780	0.0092	0.0000
																					--	--	--	--
2.0	**Surface Sources**																				--	--	--	--
	Dozing	Pit	F	7.4264	57.1264	3.8996	29.9973	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Overburden Removal	Pit	F	1.6560	9.0720	0.3312	1.8144	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Overburden Unloading	Spoils	F	0.3566	1.9537	0.0713	0.3907	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Facility Construction	Facility	F	0.5280	5.8667	0.0792	0.8800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Facilities Material Removal	Facility	F	2.6550	14.5485	0.5310	2.9097	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Facilities Material Unloading	Facility	F	0.5718	3.1332	0.1144	0.6266	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3.0	**Unpaved Roads**																							
	Water Trucks	Haul Routes	F	5.3053	63.1579	0.5305	6.3158	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Support Vehicles	Unpaved Access Road	F	0.9034	197.6076	0.0903	19.7608	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Bulk Delivery Trucks	Unpaved Access Road	F	0.3733	3.2661	0.0373	0.3266	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Misc. Delivery Trucks	Unpaved Access Road	F	0.2277	1.9922	0.0228	0.1992	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Material Delivery Trucks	Unpaved Access Road	F	0.1923	3.0088	0.0192	0.3009	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Light Vehicles	Unpaved Access Road	F	5.7736	173.6126	0.5774	17.3613	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4.0	**Wind Erosion**																							
	Open Acres	Mine-Wide	F	9.9180	54.3452	1.4877	8.1518	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Stockpiles	Mine-Wide	F	2.7945	15.3121	0.4192	2.2968	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5.0	**Surface Mobile Sources**																							
	Surface Mobile/Nonroad Sources	Mine-Wide	N/M	1.9890	10.9288	1.9890	10.9288	199.0330	1093.5880	119.6273	657.2928	0.2732	1.5012	14.0182	77.0229	--	--	5.2987	29.1136	6186.4053	0.4270	0.2066	0.0496	0.0996
	Total Point Source Emissions			0.0034	0.0187	0.0034	0.0187	0.0450	0.2466	0.0378	0.2071	0.0003	0.0015	0.0025	0.0136	--	--	3.38E-05	1.85E-04	49.1022	9.45E-07	1.53E-06	--	8.10E-04
	Total Fugitive Source Emissions			38.7729	604.5065	8.2274	91.4212	6.3450	34.8100	22.1225	121.4600	0.6025	3.3100	--	--	--	--	--	--	--				
																					--	--	--	--
	Total Nonroad/Mobile Source Emissions			4.5362	30.5224	4.5362	30.5224	241.1667	1417.6931	164.5042	1002.5000	0.2732	1.5012	19.1537	116.5272	--	--	6.1395	35.5816	11039.3717	0.4807	0.2845	0.0588	0.0996
	Total Construction Phase			43.31		12.77		247.56		186.66		0.88		19.16		0.00		6.14		11088.47	0.4807	0.2845	0.0588	0.1005

1. Annual emission rates may not be equivalent to daily emission rates x 365 days/year due to limitations on annual operating schedule, fuel input, or other factors. See individual calculation sheets for source-specific details.

Sheep Mountain Mine
Production Phase with Off-Site Processing
Air Emissions Summary

Appendix A - Table PF1

Source ID Number	Description	General Location	Point, Fugitive or Nonroad	Annual PM_{10} Emissions (tpy) [1]	24-Hour PM_{10} Emissions (lb/day)	Annual $PM_{2.5}$ Emissions (tpy) [1]	24-Hour $PM_{2.5}$ Emissions (lb/day)	Annual NO_x Emissions (tpy) [1]	24-Hour NO_x Emissions (lb/day)	Annual CO Emissions (tpy) [1]	24-Hour CO Emissions (lb/day)	Annual SO_2 Emissions (tpy) [1]	24-Hour SO_2 Emissions (lb/day)	Annual VOC Emissions (tpy) [1]	24-Hour VOC Emissions (lb/day)	Annual H2SO4 Emissions (tpy)	Annual H2SO4 Emissions (lb/day)	Annual CH_2O Emissions (tpy)	24-Hour CH_2O Emissions (lb/day)	Annual CO2e Emissions (metric tpy)	Annual Benzene Emissions (tpy)	Annual Toluene Emissions (tpy)	Annual Ethylbenzene Emissions (tpy)	Annual n-hexane Emissions (tpy)
1.0	**Mine Sources**																							
	Blasting - Particulate	Underground	F	0.0139	0.0802	0.0008	0.0046	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Blasting - Gaseous	Underground	F	--	--	--	--	6.3450	34.8100	22.1225	121.4600	0.6025	3.3100	--	--	--	--	--	--	--	--	--	--	--
	Natural Gas Heaters - Mine Intake	Underground	P	0.0034	0.0187	0.0034	0.0187	0.0450	0.2466	0.0378	0.2071	0.0003	0.0015	0.0025	0.0136	--	--	3.38E-05	1.85E-04	49.1022	9.45E-07	1.53E-06	--	8.10E-04
	Primary Crusher	Underground	P	0.1656	1.3500	0.0248	0.2025	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Coarse Ore Conveyor Transfers	Underground	P	0.0772	0.4230	0.0154	0.0846	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Underground Mobile Sources	Underground	N	2.5472	19.5936	2.5472	19.5936	42.1337	324.1051	44.8769	345.2073	0.0915	0.7041	5.1356	39.5043	--	--	0.8408	6.4680	3525.7090	0.0537	0.0780	0.0092	0.0000
2.0	**Surface Sources**																							
	Dozing	Pit	F	7.4264	28.5632	3.8996	14.9986	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Product Removal	Pit	F	0.3312	1.8144	0.0662	0.3629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Overburden Removal	Pit	F	35.1897	192.8250	7.0379	38.5650	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Overburden Unloading	Spoils	F	7.5784	41.5267	1.5157	8.3053	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Truck Dump	Truck Dump	P	1.8768	10.2838	0.3754	2.0568	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Primary Crusher	Crusher	P	0.3312	2.7000	0.0497	0.4050	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Overland Coarse Ore Conveyor	Crusher to Pad	P	2.4128	13.2208	0.4826	2.6442	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Radial Stacker to Leach Pad	Leach Pad	F	0.7307	4.0039	0.1461	0.8008	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Surface Facilities Heating	Shop, Plant, Office	P	0.0150	0.0822	0.0150	0.0822	0.1975	1.0822	0.1659	0.9090	0.0012	0.0065	0.0109	0.0595	--	--	0.0001	0.0008	215.5042	4.15E-06	6.72E-06	--	0.0036
	Production Facility-Point Sources	Plant	P	0.0520	5.5306	0.0519	5.5302	0.6925	77.7132	0.4844	18.5827	0.0135	4.9622	41.7635	234.7306	0.0000	0.0000	--	--	--	--	--	--	--
	Production Facility-Fugitive Sources	Plant	F	21.8880	119.9342	3.2832	17.9901	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3.0	**Unpaved Roads**																							
	Surface Ore Haul to Truck Dump	Pit to Truck Dump	F	5.7173	29.3626	0.5717	2.9363	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Haul to Off-Site Mill	Ore Stckpl to Mill	F	24.0125	154.1537	2.4013	15.4154	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Surface Haul OB to Hanks Draw Spoils	Pit to Spoils	F	49.1143	317.8920	4.9114	31.7892																	
	Surface Haul OB to South Spoils	Pit to Spoils	F	27.0201	174.8871	2.7020	17.4887																	
	Water Trucks (2)	Haul Routes	F	5.3053	63.1579	0.5305	6.3158	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Haul Road Repair (Grading)	Haul Routes	F	0.4781	3.8250	0.0433	0.6585	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Light Vehicles	Unpaved Roads	F	2.0577	28.9354	0.2058	2.8935	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Bulk Delivery Trucks[6]	Haul Routes	F	0.3594	6.5322	0.0359	0.6532	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4.0	**Wind Erosion**																							
	Open Acres	Mine-Wide	F	24.6240	134.9260	3.6936	20.2389	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Stockpiles	Mine-Wide	F	34.8271	190.8332	5.2241	28.6250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5.0	**Surface Mobile Sources**																							
	Surface Mobile/Nonroad Sources	Mine-Wide	N/M	1.2906	7.0914	1.2906	7.0914	151.6612	833.3031	89.0888	489.4989	0.1951	1.0718	10.4838	57.6035	--	--	4.0354	22.1727	7513.6627	0.1044	0.0554	0.0124	0.0232
	Total Point Source Emissions			4.9340	33.6092	1.0182	11.0243	0.9350	79.0419	0.6881	19.6989	0.0150	4.9702	41.7768	234.8036	0.0000	0.0000	1.82E-04	1.85E-04	264.6064	5.09E-06	8.25E-06	--	4.37E-03
	Total Fugitive Source Emissions			246.6742	1493.2529	36.2693	208.0419	6.3450	34.8100	22.1225	121.4600	0.6025	3.3100	--	--	--	--	--	--	--	--	--	--	--
	Total Nonroad/Mobile Source Emissions			3.8378	26.6850	3.8378	26.6850	193.7948	1157.4083	133.9657	834.7061	0.2866	1.7759	15.6194	97.1078	0.0000	0.0000	4.8763	28.6407	11039.3717	0.1580	0.1333	0.0216	0.0232
	Total Annual Emissions Production Phase			255.4459		41.1253		201.0749		156.7764		0.9041		57.3962		0.0000		4.8764		11303.9780	0.1580	0.1333	0.0216	0.0275

1. Annual emission rates may not be equivalent to daily emission rates x 365 days/year due to limitations on annual operating schedule, fuel input, or other factors. See individual calculation sheets for source-specific details.

Sheep Mountain Mine
Production Phase with On-Site Processing
Air Emissions Summary

Appendix A - Table PN1

Source ID Number	Description	General Location	Point, Fugitive or Nonroad	Annual PM_{10} Emissions (tpy) [1]	24-Hour PM_{10} Emissions (lb/day)	Annual $PM_{2.5}$ Emissions (tpy) [1]	24-Hour $PM_{2.5}$ Emissions (lb/day)	Annual NO_x Emissions (tpy) [1]	24-Hour NO_x Emissions (lb/day)	Annual CO Emissions (tpy) [1]	24-Hour CO Emissions (lb/day)	Annual SO_2 Emissions (tpy) [1]	24-Hour SO_2 Emissions (lb/day)	Annual VOC Emissions (tpy) [1]	24-Hour VOC Emissions (lb/day)	Annual H2SO4 Emissions (tpy)	Annual H2SO4 Emissions (lb/day)	Annual CH_2O Emissions (tpy)	24-Hour CH_2O Emissions (lb/day)	Annual CO2e Emissions (metric tpy)	Annual Benzene Emissions (tpy)	Annual Toluene Emissions (tpy)	Annual Ethylbenzene Emissions (tpy)	Annual n-hexane Emissions (tpy)
1.0	**Mine Sources**																							
	Blasting - Particulate	Underground	F	0.0139	0.0802	0.0008	0.0046	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Blasting - Gaseous	Underground	F	--	--	--	--	6.3450	34.8100	22.1225	121.4600	0.6025	3.3100	--	--	--	--	--	--	--	--	--	--	--
	Natural Gas Heaters - Mine Intake	Underground	P	0.0034	0.0187	0.0034	0.0187	0.0450	0.2466	0.0378	0.2071	0.0003	0.0015	0.0025	0.0136	--	--	3.38E-05	1.85E-04	49.10	9.45E-07	1.53E-06	--	8.10E-04
	Primary Crusher	Underground	P	0.1656	1.3500	0.0248	0.2025	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Coarse Ore Conveyor Transfers	Underground	P	0.0772	0.4230	0.0154	0.0846	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Underground Mobile Sources	Underground	N	2.5472	19.5936	2.5472	19.5936	42.1337	324.1051	44.8769	345.2073	--	--	5.1356	39.5043	--	--	0.8408	6.4680	3676.8986	0.0537	0.0780	0.0092	0.0000
2.0	**Surface Sources**																							
	Dozing	Pit	F	7.4264	57.1264	3.8996	29.9973	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Product Removal	Pit	F	0.3312	1.8144	0.0662	0.3629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Overburden Removal	Pit	F	35.1897	192.8250	7.0379	38.5650	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Overburden Unloading	Spoils	F	7.5784	41.5267	1.5157	8.3053	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Truck Dump	Truck Dump	P	1.8768	10.2838	0.3754	2.0568	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Primary Crusher	Crusher	P	0.3312	2.7000	0.0497	0.4050	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Overland Coarse Ore Conveyor	Crusher to Pad	P	2.4128	13.2208	0.4826	2.6442	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Radial Stacker to Leach Pad	Leach Pad	F	0.7307	4.0039	0.1461	0.8008	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Surface Facilities Heating	Shop, Plant, Office	P	0.0150	0.0822	0.0150	0.0822	0.1975	1.0822	0.1659	0.9090	0.0012	0.0065	0.0109	0.0595	--	--	0.0001	0.0008	215.5042	4.15E-06	6.72E-06	--	0.0036
	Production Facility-Point Sources	Plant	P	0.0520	5.5306	0.0519	5.5302	0.6925	77.7132	0.4844	18.5827	0.0135	4.9622	41.7635	234.7306	0.0000	0.0000	--	--	--	--	--	--	--
	Production Facility-Fugitive Sources	Plant	F	21.8880	119.9342	3.2832	17.9901	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3.0	**Unpaved Roads**																							
	Surface Ore Haul to Truck Dump	Pit to Truck Dump	F	4.0838	29.3626	0.4084	2.9363	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Surface OB Haul to Hanks Draw Spoils	Pit to Hanks Draw Spoils	F	49.1143	317.8920	4.9114	31.7892	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Surface OB Haul to South Spoils	Pit to South Spoils	F	27.0201	174.8871	2.7020	17.4887	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Water Trucks	Haul Routes	F	5.3053	63.1579	0.5305	6.3158	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Haul Road Repair	Haul Routes	F	0.4781	3.8250	0.0433	0.6585	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Light Vehicles	Unpaved Roads	F	2.0577	28.9354	0.2058	2.8935	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Bulk Delivery Trucks	Haul Routes	F	0.3594	6.5322	0.0359	0.6532	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4.0	**Wind Erosion**																							
	Open Acres	Mine-Wide	F	24.6240	134.9260	3.6936	20.2389	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Stockpiles	Mine-Wide	F	33.9248	185.8894	5.0887	27.8834	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5.0	**Surface Mobile Sources**																							
	Surface Mobile/Nonroad Sources	Mine-Wide	N/M	1.2406	6.8164	1.2406	6.8164	136.6471	750.8085	80.4140	441.8353	0.1833	1.0071	9.4829	52.1038	--	--	3.6350	19.9728	7362.4731	0.2818	0.1399	0.0330	0.0649
	Total Point Source Emissions			4.9340	33.6092	1.0182	11.0243	0.9350	79.0419	0.6881	19.6989	0.0150	4.9702	41.7768	234.8036	0.0000	0.0000	0.0002	0.0010	264.6064	5.09E-06	8.25E-06	--	0.0044
	Total Fugitive Source Emissions			220.1259	1362.7185	33.5694	206.8836	6.3450	34.8100	22.1225	121.4600	0.6025	3.3100	--	--	--	--	--	--	--	--	--	--	--
	Total Nonroad/Mobile Source Emissions			3.7878	26.4100	3.7878	26.4100	178.7808	1074.9136	125.2910	787.0426	0.1833	1.0071	14.6185	91.6081	0.0000	0.0000	4.4759	26.4408	11039.3717	0.3354	0.2178	0.0422	0.0649
	Total Annual Emissions Production Phase			228.8476		38.3753		186.0609		148.1016		0.8008		56.3953		0.0000		4.4761		11303.9780	0.3354	0.2178	0.0422	0.0692

1. Annual emission rates may not be equivalent to daily emission rates x 365 days/year due to limitations on annual operating schedule, fuel input, or other factors. See individual calculation sheets for source-specific details.

APPENDIX B

RADIOLOGICAL IMPACTS ANALYSIS TECHNICAL DOCUMENT

Estimated Radiation Doses To Members of the Public from the Proposed Sheep Mountain Mine

Prepared for:

U.S. Department of the Interior
Bureau of Land Management
Lander Field Office
Lander, Wyoming

Prepared by:

Two Lines, Inc.
896 Overview Rd.
Grand Junction, Colorado

August, 2014

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LIST OF MAPS

LIST OF ABBREVIATIONS AND ACRONYMS

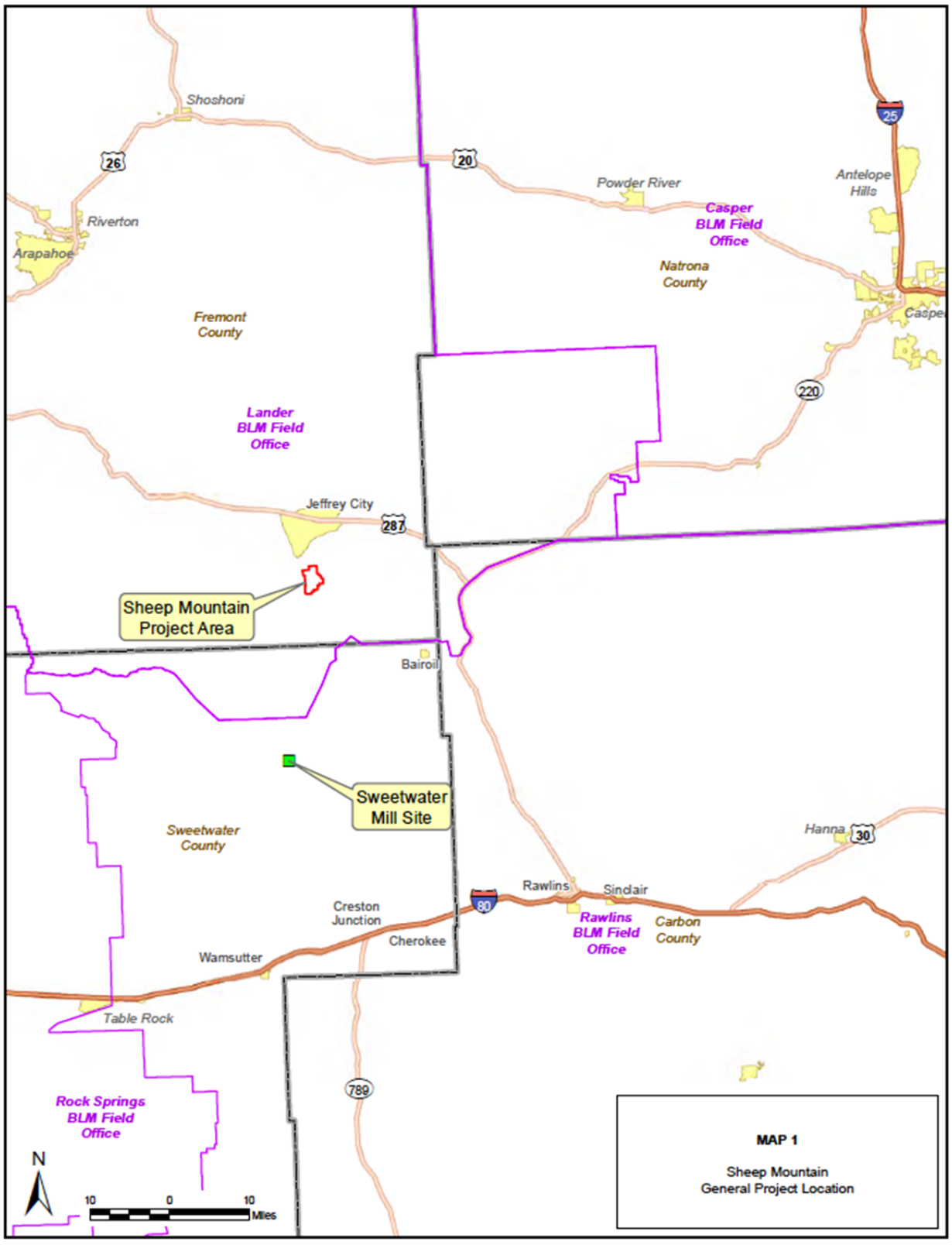
222Rn	radon-222
226Ra	radium-226
238U	uranium-238
ANL	Argonne National Laboratory
AQTSD	Air Quality Technical Support Document
CPP	Central Processing Plant
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
Energy Fuels	Energy Fuels Resources (USA) Inc.
EPA	U.S. Environmental Protection Agency
ISR	in situ recovery
Kennecott	Kennecott Uranium Company
MILDOS	MILDOS-AREA version 3.10
NRC	Nuclear Regulatory Commission
TEDE	total effective dose equivalents
TLI	Two Lines, Inc.

1.0 INTRODUCTION

Energy Fuels Resources (USA) Inc. (Energy Fuels) is proposing to develop and operate the Sheep Mountain mine located approximately 8 road miles South of Jeffrey City, Wyoming in Fremont County, Township 28 North, Range 92 West, Sections 4, 5, 9, 16, 17, 20, 21, 27, 29, 30, 32 and 33, as shown on Map 1. This area lies approximately 62 road miles southeast of Riverton, approximately 67 miles north of Rawlins, and approximately 105 road miles west of Casper and is located on Jeffrey City and Crooks Peak U.S. Geological Survey 7.5-minute topographic quadrangles. The Project Area includes approximately 3,625 surface acres (approximately 5.7 square miles) of mixed ownership including 2,313 acres of federal surface, 768 acres under state ownership, and 544 acres of fee lands. Approximately 2,836 acres of federal mineral estate is included in the Project Area.

The Project will include an open pit mine (the Congo Pit) and an underground mine with two adits. A heap leach uranium processing facility will be built to the south of the mines. Potential doses to members of the public from the heap leach facility were modeled previously and will be included in Energy Fuels' license application to the Nuclear Regulatory Commission (NRC).

In support of the Environmental Impact Statement (EIS) for the Sheep Mountain Project, Two Lines, Inc. (TLI) was asked to model potential radiation doses to members of the public that would result from releases from the Project. This report describes the modeling approach and results.


Shoshoni
26
20
25
Riverton
Arapahoe
Powder River
Antelope Hills
Casper BLM Field Office
Natrona County
Fremont County
Lander BLM Field Office
220
Jeffrey City
287
Sheep Mountain Project Area
Bairoil
Sweetwater Mill Site
Sweetwater County
Hanna
30
Rawlins
Sinclair
80
Creston Junction
Cherokee
Rawlins BLM Field Office
Carbon County
Wamsutter
Table Rock
789
Rock Springs BLM Field Office
N
10 0 10
Miles
MAP 1
Sheep Mountain
General Project Location

2.0 PROJECT DESCRIPTION

Energy Fuels proposes to explore for, and develop uranium reserves to extract approximately 1.0 million to 2.0 million pounds of uranium from the ore per year during active operations (estimated at 20 years). Mining would be completed using conventional methods including both open-pit and underground methods. There are three principal phases in the Proposed Action: Construction, Operations, and Reclamation. The Proposed Action would require up to 929 acres of disturbance of which 356.5 acres would be new disturbance and 572.5 acres was previously disturbed.

Construction includes the building of facilities and installation of equipment that would be needed prior to Operations. Operations would include the mining and milling of uranium ore (Map 2). Conventional open pit (Congo Pit) and modified room and pillar underground (Sheep Underground) mining methods would be employed to remove mineralized uranium ore. Ore from both the Congo Pit and underground mine would be stockpiled at the entry to the underground mine on the Ore Stockpile for later transport to:

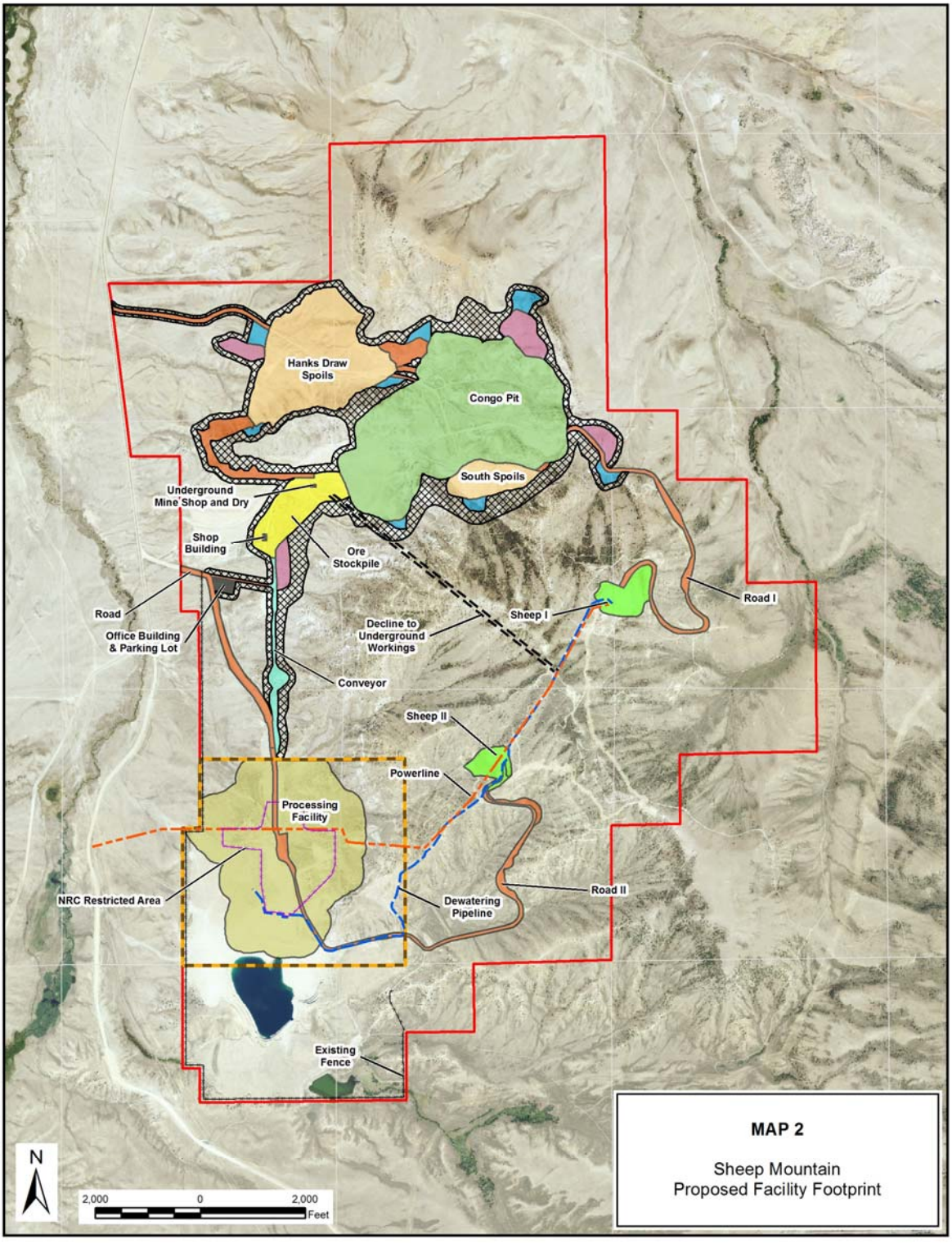
- An On-Site Ore Processing Facility, which would be licensed by the NRC as a uranium processing mill. Ore would be transported to this Facility via conveyor, which would be within the Project Area. The Facility would include a Heap Leach Pad for dissolution of the uranium from the ore; a series of Treatment Ponds (Holding Pond, Collection Pond, and Raffinate Pond) for the solution from the Pad; an Extraction Plant for removing the ore from solution, and a Precipitation and Packaging Plant.
- An Off-Site Ore Processing Facility. Ore would be transported to this location via truck to the Sweetwater Mill. The Sweetwater Uranium Mill is owned and operated by Kennecott Uranium Company (Kennecott), a division of Rio Tinto Americas, Inc. The mill is located entirely on private lands owned by Kennecott.

The option to pursue off-site processing is a sub-part of the Proposed Action because it is advanced by Energy Fuels. The Sweetwater Uranium Mill (owned and operated by Kennecott Uranium Company - Kennecott, a division of Rio Tinto) is located entirely on private lands owned by Kennecott and permitted with the NRC as an operating license under Source Material License SUA-1350 which allows for production of 4,100,000 pounds of yellowcake per year. Therefore, Kennecott could receive ore and begin operations under the stipulations of their permit at any time. For the purpose of analysis within this EIS, it is assumed that operations at the Sweetwater Mill would occur under the existing license without significant revisions, and impacts associated with the operations of the mill would be similar to those of the operation of the Heap Leach facility at Sheep Mountain and/or the Piñon Ridge Mill in Colorado in relation to applicable resources such as air and human health and safety. The impacts associated with hauling ore to the Sweetwater Mill from the Sheep Mountain site and operating the Sweetwater Mill are disclosed in this EIS because they are connected actions. However, the BLM would not be involved in permitting or authorizing hauling of ore to the Sweetwater Mill along county roads or processing at the Sweetwater Mill.

Reclamation would include decommissioning of facilities, backfilling, and re-vegetating of the mined areas, and covering of the heap leach pad to prepare for long-term care and maintenance by the State of Wyoming or the U.S. Department of Energy (DOE).

As mentioned above, potential doses to members of the public from the NRC-regulated heap leach facility would be part of Energy Fuels' license application to the NRC. The purpose of this report is to describe potential doses to members of the public from mining-related activities including the Congo Pit, stockpiling of ore, storage of spoils materials and releases from the underground mine adits.

Potential doses were modeled using MILDOS-AREA version 3.10 (MILDOS), released in 2012. The users manual for MILDOS was published in 1989 by Argonne National Laboratory (ANL, 1989) and has not been updated since that time. A new version of MILDOS-AREA is undergoing beta testing at this time, but has not been released for use.


Hanks Draw Spoils
Congo Pit
South Spoils
Underground Mine Shop and Dry
Shop Building
Ore Stockpile
Road
Office Building & Parking Lot
Decline to Underground Workings
Sheep I
Road I
Conveyor
Sheep II
Powerline
Processing Facility
NRC Restricted Area
Dewatering Pipeline
Road II
Existing Fence
N
2,000
0
2,000
Feet
MAP 2
Sheep Mountain
Proposed Facility Footprint

3.0 POTENTIAL RADIOACTIVE EFFLUENTS

Uranium-238 (^{238}U) in the ore body ultimately decays to radium-226 (^{226}Ra) and then radon-222 (^{222}Rn). MILDOS was designed to model releases of uranium decay products from uranium production facilities including conventional mills. It was later amended to include modules for *in* situ recovery facilities and may be used to model releases from heap leach facilities, as well. For the purposes of this Project, doses to members of the public were modeled to arise from radioactive material released from the following site features:

- **Congo Pit**: Radon from the pit will be released when the encountered ore is disturbed. Radioparticulates from the pit were not modeled on the assumption that water spray would limit releases from the rim of the pit, especially as it gets deeper.
- **Ore stockpile**: Radon as well as radioparticulates of the uranium decay chain will be released over time by wind action on the stored material.
- **Hanks Draw and South Spoils**: Releases of uranium decay chain radioparticulates and radon from stored waste rock or spoils areas.
- **Sheep I and II underground mine adits**: Radon will be released from the adits of the underground mine.
- **Handling of materials**. During handling and transport of materials, both radioparticulates and radon will be released.

Each of the sources were modeled to estimate impacts at receptors of interest. Modeling assumptions and results are presented below.

4.0 MODELING

The computer code MILDOS-AREA was used to estimate potential radiation doses from releases as mentioned above. MILDOS (ANL, 1989) was originally developed to estimate doses from conventional uranium milling operations, including large area releases such as ore storage pads and tailings beaches. Inputs to the dose are limited to uranium decay chain radionuclides. MILDOS was subsequently updated in 1998 to address potential impacts of uranium *in situ* leaching operations (ANL, 1998). In situ leach specific types of source terms, such as production wells and restoration wells are included in the updated version. Modeling parameters and assumptions are addressed below.

MILDOS calculates effective dose as well as organ doses from inhalation, ingestion, direct exposure from deposition of radioparticulates on ground surfaces, and submersion in contaminated air. For each source, there are calculations both with and without radon to allow comparison to 10 CFR 20.1301 (including radon) and 40 CFR 190 (doses excluding radon) dose limits.

Meteorology

Meteorological conditions greatly influence dispersion of radionuclides from estimated releases during the year. The Sheep Mountain Project has an on-site meteorological station. Data for the period August 2010 through September 2013 were used (Table 1 and Figure 1). The data set included wind speed, wind direction, and stability class. These data were converted to stability array joint frequency distribution (STAR file) required for input to MILDOS. These calculations were performed using the STARMD program which is based on the Sigma-Theta method in EPA 454/R-99-005 (EPA, 1987). STAR data represent percentages of time for each wind direction (16 compass points) in particular wind speed and stability classes. As shown in Table 1, winds are from the southeast, south-southeast and south account for nearly 60 percent of the time.

Table 1 - Wind Direction Frequency Distribution

Direction From	Percentage of Total Hours	Direction From	Percentage of Total Hours
N	6.30	S	10.93
NNE	2.58	SSW	5.91
NE	1.98	SW	4.59
ENE	1.58	WSW	3.80
E	0.89	W	3.35
ESE	1.27	WNW	1.28
SE	19.48	NW	2.20
SSE	28.66	NNW	5.19
Total……..100.00			

Wind Rose of Sheep Mountain Meteorological Station (IML,2013)

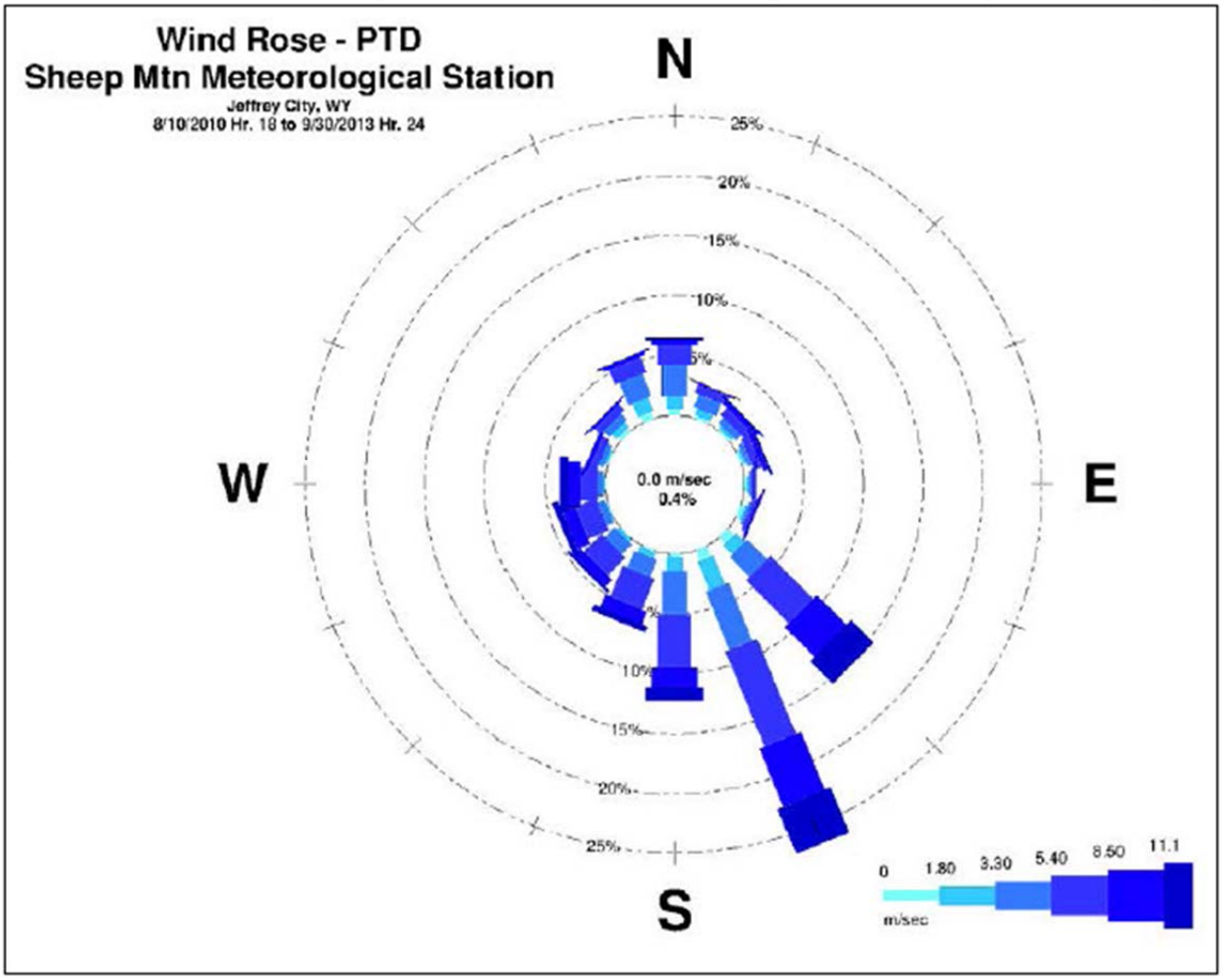


Figure 1. Windrose for Sheep Mountain Meteorological Station

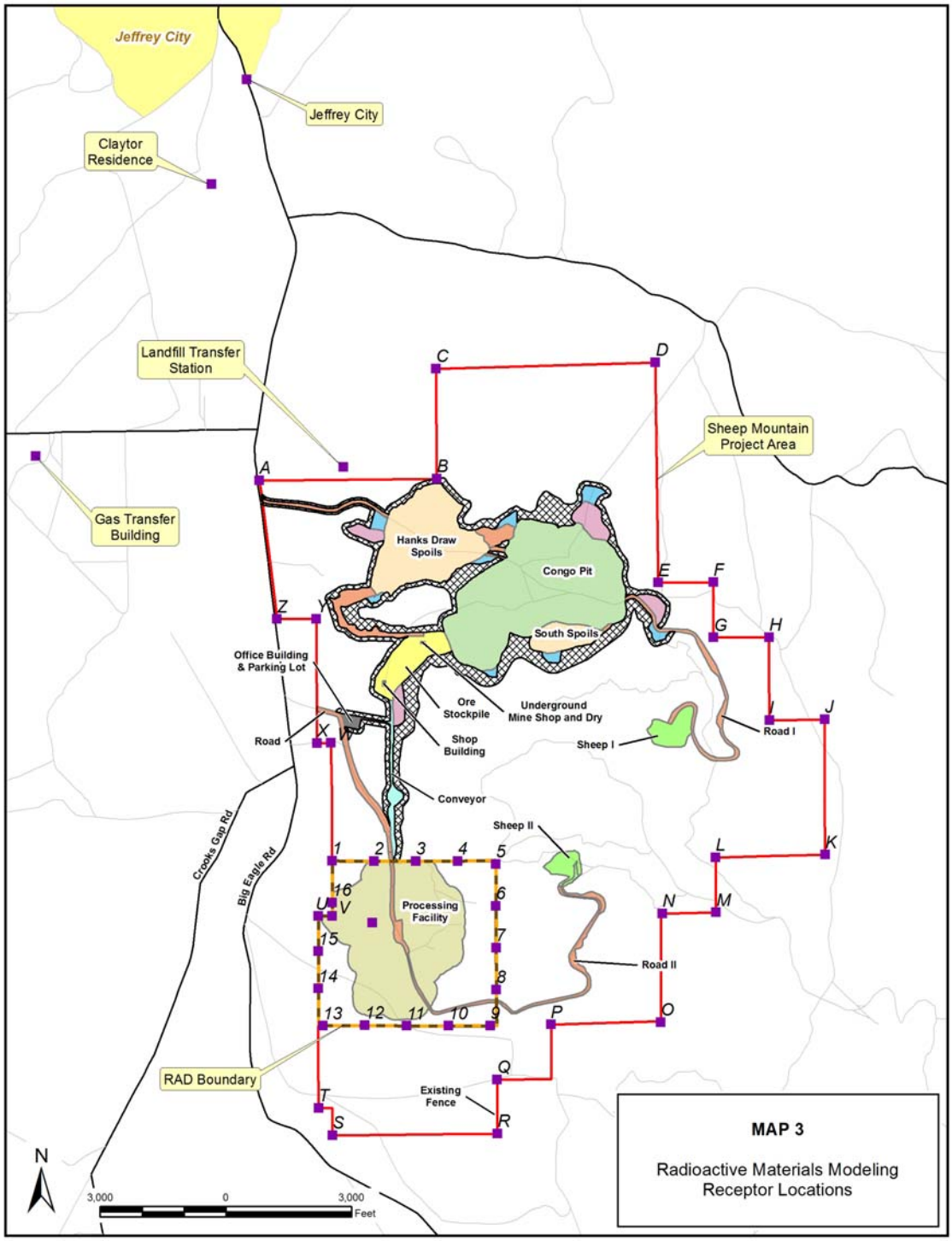
Receptor Locations

For MILDOS purposes, receptors are situated relative to a central location. The locations of receptors are shown on Map 3.

There are few permanent receptors in the vicinity of the Sheep Mountain project. The nearest permanent residence, the Claytor ranch, is 5.5 km to the north-northwest of the plant. The nearest town is Jeffrey City, which is approximately 6 km to the northwest of the proposed central processing facility.

Table 2 - Location of Modeled Receptors (Relative to the Ore Processing Facility)

Name	X (km)	Y (km)	Z (m)	Name	X (km)	Y (km)	Z (m)
Project Area Boundary Receptor Locations							
A	-0.85	3.22	-72	N	2.17	0.14	277
B	0.44	3.26	85	O	2.18	-0.65	175
C	0.41	4.06	141	P	1.38	-0.69	112
D	2.01	4.15	-4	Q	0.99	-1.10	40
E	2.07	2.55	77	R	1.01	-1.50	10
F	2.48	2.56	62	S	-0.19	-1.54	23
G	2.49	2.16	88	T	-0.30	-1.35	-18
H	2.89	2.17	53	U	-0.34	0.05	-33
I	2.91	1.57	111	V	-0.24	0.05	-27
J	3.31	1.58	84	W	-0.28	1.32	-44
K	3.34	0.60	171	X	-0.38	1.31	-50
L	2.54	0.56	207	Y	-0.41	2.22	-18
M	2.56	0.16	297	Z	-0.70	2.21	-58
NRC Boundary Receptor Locations							
1	-0.25	0.46	-36	9	0.94	-0.71	70
2	0.06	0.46	-18	10	0.63	-0.72	47
3	0.36	0.47	0	11	0.33	-0.73	-51
4	0.67	0.48	36	12	0.02	-0.73	-6
5	0.94	0.46	149	13	-0.28	-0.75	-12
6	0.95	0.16	71	14	-0.32	-0.48	-7
7	0.96	-0.15	106	15	-0.33	-0.20	-18
8	0.97	-0.45	76	16	-0.24	0.15	-30
Inhabited Receptor Locations							
Claytor Ranch	1.26	5.36	-111	Landfill Transfer station	-0.24	3.33	-41
Gas Transfer building	2.49	3.35	-61	Jeffrey City	1.02	6.13	-114


Jeffrey City
Jeffrey City
Claytor Residence
Landfill Transfer Station
Gas Transfer Building
Sheep Mountain Project Area
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
Hanks Draw Spoils
Congo Pit
South Spoils
Office Building & Parking Lot
Ore Stockpile
Underground Mine Shop and Dry
Shop Building
Road
Sheep I
Road I
Conveyor
Sheep II
Crooks Gap Rd
Big Eagle Rd
Processing Facility
Road II
RAD Boundary
Existing Fence
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
N
3,000
0
3,000
Feet
MAP 3
Radioactive Materials Modeling
Receptor Locations

Input Parameters for MILDOS Model

Parameters that apply to the entire Project are shown in Table 3.

Table 3 - Important Input Parameters

All sources	Ore grade	0.122% (342 pCi/g U)
	General emanation rate (after Leach et al. 1982)	2160 pCi/ m^2 sec per % ore
	Particle release rate	6.62E-06 g/m^2 sec
Ore stockpile	Area	30.5 ac (1.23E+05 m^2)
	U decay chain concentration	342 pCi/g
	Particulate release rate	6.62E-06 g/m^2 sec
	Enrichment factor, N	2.5
Spoils piles	U decay chain concentration	40 pCi/g
	Area (Hanks Draw + South spoils)	124 ac (5.00E+05 m^2)
	Enrichment factor, N	2.5
Congo Pit	Area	216 ac (8.75E+05 m^2)
	Radon emanation rate	264 pCi / m^2 sec
Sheep I and II adits	Radon release (after Mudd, 2008)	1190 pCi/y
Handling	Particulate releases - Truck dumping	1.88 ton/yr
	Particulate releases - Crusher	0.33 ton/yr
	Particulate releases - Conveyor	2.41 ton/yr
	Radon emission factor	0.1

The particulate release rate was taken from the stockpiles values presented in Table 1 of the Air Quality Technical Support Document (AQTSD) and converted to the size of the ore stockpile. This value was used to calculate the releases from storage of materials. The activity enrichment factor, N, is set at 2.5 to reflect the extent to which suspended airborne particles have a higher uranium concentration than in bulk ore (NRC, 1987, page 3.59-8).

For modeling of spoils storage, it was conservatively assumed that the uranium decay chain concentrations of the spoils materials was 40 pCi/g, or approximately 1/8 that of the ore itself.

To model handling of overburden and placement on spoil piles, the values presented in the AQTSD Table 1 were used. Overburden was assumed to have only 5 pCi/g of uranium, while ore has a concentration of 342 pCi/g. For handling of ore via truck dumping, crushing, and transport by conveyor, the particulate release rates from the AQTSD Table 1 were used.

The general emanation rate for radon gas from ore deposits was taken from Leach et al. (1982) who studied a relatively high grade pit mine in Australia. They observed that the ratio of radon emanation rate to ore grade was fairly stable. Unless the ore was weathered, the emanation rate held steady at 80 Bq/m^2 sec per % ore, which is equivalent to 2,160 pCi/ m^2 sec per % ore. For the Sheep Mountain ore, this computes to 264 pCi/ m^2 sec for ore.

Radon releases from the Sheep I and Sheep II adits were derived using data presented by Mudd (2008). Mudd studied radon releases from uranium mining and milling projects in

Australia and cites releases from the Jabiluka and Olympic Dam mines which averaged 121 GBq/day, equivalent to 1190 pCi/yr.

For handling of materials, the radon emission fraction was set as 0.1 because of the relatively short residence time of materials in these processes (NRC 1987, page 3.59-15). The general equation to estimate a radioparticulate release rate for handling of ore is:

$$S = EF * C * E * 9.08E - 07 \text{ Ci/yr}$$

Where:

S = source term, amount released
EF = Emissions, tons/yr
C = Concentration, pCI/g
E = Enrichment ratio, 2.5 unitless

For truck dumping, this accounts for 1.46E-3 Ci released per year from the ore pad dumping point source. The enrichment factor of 2.5 accounts for the fact radionuclide concentrations in suspended airborne materials is considerably higher than in bulk ore.

Radon releases from crushing ore are calculated using:

$$S = EF * C * 0.1 * 9.08E - 07 \frac{Ci}{yr}$$

Where:

S = amount of Rn released
EF = Emissions, tons/yr
C = Concentration, pCI/g
0.1 = fraction of radon in ore released during crushing

For crushing, this amounts to 22.9 Ci/yr of Rn released as a point source.

Modeling

MILDOS allows a variety of types of source terms, including:

- Point sources: used for releases from stacks, material handling, and various stationary sources.
- Area sources: used for sources such as ore pads or tailings beaches. Implicitly assumes a square footprint.
- Quadrilateral area sources: allow modeling of sources such as ore pads and tailings beaches having a non-square footprint.
- New well field sources: models radon release from installation of new wells at an *in situ* recovery (ISR) site.
- Production well field sources: models releases of radon from venting or purge water releases from wells, piping, or ion exchange columns during uranium production at an ISR site.

- Drying and packaging sources: allows for modeling of releases of radioparticulates from non-vacuum dryers.
- Restoration well field sources: m models releases of radon from venting or purge water releases from wells, piping, or ion exchange columns during restoration of a wellfield at an ISR site.

For purposes of this modeling exercise, sources were considered to be either point sources or quadrilateral sources. The model was run for each of the following situations for a time step of one year:

- **Ore stockpile:** The ore stockpile was modeled as a quadrilateral source that mimics the size and location shown on Map 2.
- **Spoils pile:** The Hanks Draw spoils pile was modeled as two quadrilaterals shaped to mimic the single pile shown on Map 2. The South Spoils pile was modeled as a single quadrilateral.
- **Congo Pit:** Radon releases from the Congo Pit were modeled as a three quadrilateral sources that collectively overlay the proposed pit. Radon emanation was conservatively calculated assuming that the entire shape was composed of ore, with the general emanation rate shown in Table 4.
- **Sheep I and Sheep II adits:** Releases from the adits were calculated using the release rates presented by Mudd (2008).
- **Handling:** As mentioned above, handling of materials used the particulate and radon release rates described above for each source, considered to be a point. Releases were assumed to occur at the centroid of the source with the exception of the conveyor. The total conveyor releases for both radioparticulates and radon were modeled as six separate sources stretching from the ore stockpile/crusher to the NRC boundary.

Inhalation, direct exposure from material deposited on the surface (ground) and submersion in contaminated air (cloud) were calculated for all receptors. Food pathways were included for vegetables and cattle grown in the area. It was assumed that all cattle feed was from pasture grass, not hay or other feed. The milk pathway was turned off for all receptors because there is no commercial dairy in the vicinity. Doses were calculated for an 8,760-hr year, a conservative assumption meaning that, unless otherwise noted, exposure at a receptor location occurs for 100 percent of the time.

5.0 MODEL RESULTS

This section presents the results of the MILDOS modeling.

Radon Release Rates

Potential annual radon release rates calculated by MILDOS from input parameters during the Project from the various sources are listed in Table 4. The activity of ^{238}U decay products is equivalent to the ^{238}U activity because they are considered to be in secular equilibrium with the parent radionuclide.

Table 4 - Calculated Radioactivity Releases by Source

	Source	Ci/yr
Activity	**Radioparticulates (^{238}U and decay products in equilibrium)**	
Storage	Ore stockpile	2.23E-02
	Hanks Draw spoils	7.50E-03
	South spoils	7.70E-04
Handling	Overburden unloading	8.14E-05
	Truck dumping	1.46E-03
	Crusher	2.56E-04
	Conveyor	1.87E-03
	Radon	
Storage	Ore stockpile	1.04E+03
	Hanks Draw spoils	3.45E+02
	South spoils	3.53E+01
	Congo Pit	6.03E+03
	Sheep I and II adits	1.19E+03
Handling	Overburden unloading	7.10E-00
	Truck dumping	2.29E+01
	Crusher	2.29E+01
	Conveyor	4.68E+01

Dose to Individual Receptor Locations

Estimated maximum annual total effective dose equivalents (TEDE) and 40 CFR 190 doses (without radon) at individual boundary receptor locations are shown below in Tables 5 and 6. The maximum TEDE to any Project Area boundary location occurs at location B and is estimated at 19.7 mrem, which is far below that 100 mrem/yr limit expressed in 10 CFR 20.1301. At the same location, the bone dose exceeds the 25 mrem/yr limit of 40 CFR 190 for any organ. The dose strictly from radon and radon decay products at location B is the difference between the TEDE (dose including particulates and radon) and the 40 CFR 190 effective dose (dose without radon) or 17.3 mrem/yr. Location B is very near to the Hanks Draw spoils pile, so it makes sense that it would be the highest dose location.

Table 4
Total Effective Dose Equivalent (TEDE) and 40 CFR 190 Doses (without radon) to an Adult at Sheep Mountain Project Area Boundary Locations

Location	TEDE (mrem/yr)	40 CFR 190 Dose (mrem/yr)		
		Eff	Bone	Lung
A	6.47E+00	6.59E-01	7.69E+00	1.86E+00
B	**1.97E+01**	**2.41E+00**	**2.93E+01**	**6.39E+00**
C	1.52E+01	7.28E-01	8.75E+00	1.96E+00
D	3.25E+00	1.19E-01	1.41E+00	3.30E-01
E	3.60E+00	1.45E-01	1.71E+00	4.03E-01
F	2.38E+00	1.01E-01	1.19E+00	2.82E-01
G	2.33E+00	8.78E-02	1.03E+00	2.49E-01
H	1.62E+00	6.76E-02	7.90E-01	1.92E-01
I	1.62E+00	4.67E-02	5.38E-01	1.35E-01
J	1.14E+00	3.73E-02	4.29E-01	1.08E-01
K	1.86E+00	1.99E-02	2.24E-01	5.94E-02
L	6.20E+00	3.74E-02	4.28E-01	1.09E-01
M	4.81E+00	3.52E-02	4.02E-01	1.03E-01
N	6.06E+00	5.20E-02	5.92E-01	1.51E-01
O	4.03E+00	4.24E-02	4.76E-01	1.26E-01
P	3.19E+00	7.17E-02	7.93E-01	2.19E-01
Q	2.52E+00	6.68E-02	7.33E-01	2.08E-01
R	2.20E+00	5.43E-02	5.94E-01	1.69E-01
S	1.44E+00	4.76E-02	5.16E-01	1.51E-01
T	1.41E+00	5.30E-02	5.65E-01	1.72E-01
U	2.03E+00	1.09E-01	1.18E+00	3.51E-01
V	2.22E+00	1.29E-01	1.37E+00	4.23E-01
W	4.63E+00	3.83E-01	4.45E+00	1.07E+00
X	3.80E+00	2.83E-01	3.30E+00	7.96E-01
Y	1.27E+01	2.03E+00	2.31E+01	6.02E+00
Z	4.80E+00	4.83E-01	5.56E+00	1.40E+00

Doses at the so-called NRC Restricted Area boundary are shown in Table 6. The maximum TEDE for any NRC boundary location is 12.9 mrem/yr at NRC5. The maximum organ dose occurs in the bone of an adult at the NRC3 location. Both the TEDE and organ doses are below the public dose limits of 100 mrem/yr and 25 mrem/yr dose limits from 10 CFR 20.1301 and 40 CFR 190, respectively.

Table 7 lists doses to locations actually inhabited or utilized. The Gas Transfer building has the highest estimated TEDE of 19.8 mrem/yr. The Claytor Ranch location would be subject to 7.76 mrem/yr and Jeffrey City 6.99 mrem/yr TEDE. No 40CFR190 dose exceeds the 25 mrem/yr limit.

It is important to note that the calculated doses are conservative (overestimates) for several reasons. The primary reason is that MILDOS assumes 100 percent occupancy at the modeled

location. That means to receive 19.7 mrem, as modeled for location B, a person would be required to be at that location for 8,760 hours during the year. This is a very unlikely scenario. Likewise, a worker at the Gas Transfer building who spent 40 hours/week or 2,000 hours per year would receive 19.8*2000/8760 hours/year or 4.5 mrem/yr. In reality, workers are at the gas transfer building only sporadically and for far less than 40 hours/week.

Table 5
Total Effective Dose Equivalent (TEDE) and 40 CFR 190 (without radon) dose to Adult at NRC Boundary Locations

Name	TEDE (mrem/yr)	40 CFR 190 Dose (mrem/yr)		
		Effective	Bone	Lung
NRC1	3.82E+00	1.77E-01	1.98E+00	5.14E-01
NRC2	6.01E+00	4.94E-01	5.29E+00	1.48E+00
NRC3	8.43E+00	**6.41E-01**	**6.79E+00**	**1.94E+00**
NRC4	9.69E+00	2.95E-01	3.28E+00	8.64E-01
NRC5	**1.29E+01**	2.06E-01	2.32E+00	5.99E-01
NRC6	1.07E+01	1.65E-01	1.86E+00	4.79E-01
NRC7	8.15E+00	1.40E-01	1.56E+00	4.07E-01
NRC8	6.53E+00	1.18E-01	1.31E+00	3.46E-01
NRC9	5.41E+00	1.03E-01	1.14E+00	3.02E-01
NRC10	1.82E+00	2.92E-02	3.32E-01	8.39E-02
NRC11	3.32E+00	1.22E-01	1.35E+00	3.58E-01
NRC12	3.33E+00	1.10E-01	1.21E+00	3.26E-01
NRC13	2.71E+00	9.02E-02	9.87E-01	2.68E-01
NRC14	2.93E+00	9.15E-02	1.01E+00	2.70E-01
NRC15	3.11E+00	1.27E-01	1.39E+00	3.78E-01
NRC16	3.54E+00	1.68E-01	1.83E+00	4.93E-01

Table 6
Total Effective Dose Equivalent (TEDE) and Dose without Radon (40 CFR 190) to Adult at Each Inhabited Location

Name	TEDE (mrem/yr)	40 CFR 190 Dose (mrem/yr)		
		Effective	Bone	Lung
Claytor Ranch	7.76E+00	3.19E-01	3.74E+00	8.77E-01
Landfill Transfer	2.15E+00	7.75E-02	8.59E-01	2.26E-01
Gas Transfer	1.98E+01	1.41E+00	1.67E+01	3.86E+00
Jeffrey City	6.99E+00	2.37E-01	2.77E+00	6.54E-01

Dose to Members of the Public Under Various Scenarios

The above doses are to locations and represent a maximum potential dose due to the 100 percent occupancy assumption. In reality, various members of the public may potentially be exposed under a variety of different situations. Several common exposure scenarios include a courier or delivery person, a worker at the landfill transfer station, a visitor at the mine site, and

a person camping nearby. Potential doses to each of these scenarios were calculated and the results are shown in Table 8.

Table 7
Potential Classes of Exposure to Members of the Public

Class	Annual Hours Exposed	MILDOS Dose Rate (modeled location)	Estimated Annual Dose
Delivery person	2.5 hr/wk * 50 wks/yr = 125 hr/yr	4.63 mrem/yr (location W)	(125 hr/yr * 4.63 mrem/yr) / 8760 hr/yr = 6.6E-02 mrem/yr
Tour group	8 hr/yr	12.2 mrem/yr (average of locations B & W)	(8 hr/yr * 12.2 mrem/yr) / 8760 hr/yr = 1.1E-02 mrem/yr
Landfill worker	8 hr/wk * 50 wk/yr = 400 hr/yr	2.15 mrem/yr (landfill transfer station)	(400 hr/yr * 2.15 mrem/yr) / 8760 hr/yr = 9.8E-02 mrem/yr
Camper	1 wk/yr = 168 hr/yr	19.7 mrem/yr (Location B)	(168 hr/yr * 19.7 mrem/yr) / 8760 hr/yr = 3.8E-01 mrem/yr

Delivery Person or Courier

It is reasonable to assume that a courier or delivery person might spend as much as 125 hours per year at the Project office building (Map 2). The nearest modeled dose location to that building is location W (Map 4) which has an estimated dose rate of 4.63 mrem/yr. Prorating that rate for the 125 hour exposure equates to an annual dose of 6.6E-02 mrem.

Tour Group Member

Tours of the Project would likely spend some time being briefed at the office building (Map 2) and then be transported to various locations around the Project Area. A likely maximum exposure time of 8 hours seems reasonable. To account for various dose rates at multiple locations, the average of the highest dose rate location and the location nearest the office building was used. The projected tour group member might receive as much as 1.1E-02 mrem during a visit.

Landfill Worker

The landfill transfer station is not occupied by a full-time worker. A worker at that location one day per week would be exposed for 400 hours/year. At the modeled dose rate of 2.1 mrem/yr the annual dose equates to 9.8E-02 mrem.

Camper

It is conceivable, though not likely, that someone might decide to camp near the Project. To be conservative, assume that the campsite is situated near location B, just adjacent to the Hanks Draw Spoils Pile. A camper spending an entire week, 168 hours, at that location would be subjected to a dose rate of 19.7 mrem/yr, which would prorate to 3.8E-01 mrem for the week.

Dose from Mine Adits

As mentioned above, radon releases from the underground mine are from the Sheep I and Sheep II adits. These releases were modeled as point sources with the following results. The maximum dose from the mine adits alone are to location 1 on the NRC Restricted Area boundary and location L on the Project Area boundary (Map 4). Those doses are 5.58 mrem/yr and 3.80 mrem/yr, respectively.

The 40 CFR 61.22 limits dose to a member of the public from an underground mine to 10 mrem/yr. Both these locations are well below that standard.

Contribution from Processing Facility

As shown on Map 2, Energy Fuels intends to operate a heap leach processing facility to the south of the mine complex. A license application will be submitted to the NRC. As part of the application, potential doses from the heap leach facility (mill) were modeled using MILDOS. That facility will also potentially contribute dose to members of the public. Table 9 provides modeled doses to common locations.

Table 8
Modeled TEDE Doses from Mining and Processing

Name	TEDE (mrem/yr)		
	Mine	Mill	Total
Claytor ranch	7.76E+00	9.27E-01	8.69E+00
Landfill Transfer	2.15E+00	7.15E-01	2.87E+00
Jeffrey City	6.99E+00	1.69E-01	7.16E+00
Maximum NRC – mine max (NRC5/NLA-NE)	1.29E+01	2.23E+00	1.51E+01
Maximum NRC - processing max (NRC3/NLA-N1)	8.43E+01	1.8E+01	2.64E+01

The Claytor Ranch location was estimated to received a total of approximately 8.7 mrem/yr from the combined mine and mill operations. The majority of that would result from mining operations which is reasonable given the proximity of the mine compared to the mill. The same is true of Jeffrey City, which would receive a total of 7.2 mrem/yr. Common boundary locations modeled for the mine and the mill are also shown. The maximum dose rate location mining, which was in common with the mill is location NRC5, designated NLA-NE for the mill modeling project. For that location the maximum dose rate was 12.9 mrem/yr, most of which likely results from the Sheep II underground mine adit. Contributions from the mill accounted for 2.23 mrem/yr. The maximum dose rate location modeled for the mill facility is the NRC3 location, designated NLA-N1 in the mill modeling project. The total dose rate at that location is estimated to be 26.4 mrem/yr, nearly 70 percent of which results from the milling process, not mining activities.

Uncertainties in Dose Estimates

MILDOS is not designed to calculate uncertainty associated with estimates of doses. Use of the Gaussian Plume Dispersion coefficients and the uncertainty in the dose conversion factors themselves introduce an unknown amount of uncertainty into estimated doses at receptor locations.

Doses calculated by the code represent an entire year of occupancy at the specified receptor location. For any actual resident, this represents a large overestimate of the actual dose that would be received. Residents in the vicinity would leave their place of residence for work or recreation and the model does not account for those absences. To account for those absences, which would reduce the estimated potential dose, a separate dose assessment using MILDOS-calculated values and prorating for time away from the modeled location would be required. This approach is similar to the scenario approach used above to estimate dose to an individual member of the public.

In addition, conservative assumptions were made in the modeling exercise. For example, radon releases from the Congo Pit were assumed to come from an area equivalent to the entire footprint of the pit with ore grade material. In reality, radon from ore will only be generated from the uncovered ore in the pit, not the entire footprint at once.

6.0 SUMMARY

The maximum TEDE at a receptor point on the Sheep Mountain Project Area Boundary was less than 20 mrem/yr at location B, which is just adjacent to the Hanks Draw Spoils area. The maximum TEDE at any NRC boundary location is estimated to be 12.9 mrem at location NRC5. Neither of these exceed the 10 CFR 20.1301 limit for dose to a member of the public of 100 mrem/yr. At location B, the maximum bone dose is estimated to be 29.3 mrem/yr, which does exceed the 40 CFR190 bone dose of 25 mrem/yr. It is important to remember that these dose rates are to locations, not actual members of the public and are calculated under the assumption of 100 percent occupancy at that location.

The TEDE dose rate at inhabited locations does not exceed 8 mrem/yr for any of the four modeled locations. The dose excluding radon (as per 40CFR190) does not exceed 4 mrem for any of the four. The same caveats regarding occupancy apply to the inhabited locations.

The maximum estimated TEDE from radon releases from the two underground mine adits, labeled Sheep I and Sheep II on Map 2, was 5.58 mrem/yr to location NRC1. This is below the 40 CFR 61.22 dose limit to a member of the public from an underground mine of 10 mrem/yr.

To get a more accurate assessment of actual potential dose to a member of the public, the length of exposure must be accounted for. Doses were estimated for four different classes of members of the public: courier, tour group, landfill worker, and camper. The estimated dose to each of those classes under certain scenarios was less than 1 mrem/yr in all cases.

In summary, while two static locations exceeded the potential bone dose from particulate releases, the TEDE limit was not exceeded at any location, nor by any member of the public under several exposure scenarios. The calculated doses to static locations is conservative due to the assumption of 100 percent occupancy at each location.

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