

**WYOMING OUTDOOR COUNCIL
POWDER RIVER BASIN RESOURCE COUNCIL**

March 3, 2010

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U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01
Washington, D.C.20555-0001

RE: Comments on Lost Creek SEIS, NUREG-1910, Supplement 3; Docket ID NRC
2008-0391

Sent via email to: lostcreekisrseis@nrc.gov

Dear Mr. Lesar:

We are writing on behalf of the Wyoming Outdoor Council and the Powder River Basin Resource Council to submit comments on the U.S. Nuclear Regulatory Commission's ("NRC's") supplemental environmental impact statement ("SEIS") to the Generic Environmental Impact Statement for *in situ recovery* ("ISR") uranium mining, NUREG-1910, Supplement 3, for the proposed Lost Creek ISR project. Thank you for this opportunity to submit comments.

Since 1967 the Wyoming Outdoor Council has worked to protect Wyoming's environment and quality of life for future generations. We envision a Wyoming thriving with abundant wildlife, healthy landscapes, clean air and water, strong communities, and sustained by renewable energy.

The Powder River Basin Resource Council is a grassroots Wyoming organization that promotes responsible extraction and use of our state's abundant mineral resources. Most of our approximately 1,000 members are rural landowners in Wyoming and many of them will be impacted by uranium exploration and production.

These comments are submitted on behalf of our organizations and behalf of our members who live, work, and/or recreate in areas impacted by the Lost Creek ISR project.

I. Introduction

On July 24, 2007, the U.S. Nuclear Regulatory Commission published a Notice of Intent to publish a Generic Environmental Impact Statement for Uranium Milling Facilities in the Federal Register. 72 Fed. Reg. 40,344 (July 24, 2007). The purpose of the GEIS is to assess the potential impacts of ISL milling in the "western United States"

as well as the impacts of alternative methods of uranium recovery, including conventional milling. This was to be done in a generic (i. e. non-site-specific) fashion.

The NRC later issued a notice of availability of a series of supplements to the GEIS, including the Lost Creek supplement, in December of 2009. *Notice of Availability of Draft Environmental Impact Statement for the Lost Creek In-Situ Recovery (ISR) Project in Sweetwater County, WY; Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities*, 74 Fed. Reg. 65,804 (Dec. 11, 2009). The following comments address the Lost Creek site specifically, as well as the GEIS, where relevant to the Lost Creek project site.

II. Alternatives Analysis is Inadequate

A. The Purpose and Need Statement Is Too Limited.

An agency's analysis of alternatives to a proposed project must present a range of alternatives and that range must be reasonable. This is a core principle of the National Environmental Policy Act (NEPA). An agency must not unreasonably limit the scope of alternatives considered. The statement of purpose and need contained in the GEIS is too limited. The result has been that for the Lost Creek supplement, a reasonable range of alternatives has not been identified.

The GEIS's statement of purpose and need provides:

Commercial uranium recovery companies have approached NRC with plans to submit as many as 15 license applications for new uranium recovery facilities, as well as up to 9 applications for the restart or expansion of existing facilities in the next several years. The majority of these potential applications (perhaps 18 of the 24) would involve use of the ISL process. The companies have indicated that these new, restarted, and expanded ISL facilities would be located in Wyoming, South Dakota, Nebraska and New Mexico.

NRC is the regulatory authority responsible for issuing a source material license for ISL facilities in those four states. 10 CFR Part 51 regulations require evaluating the environmental impacts of the ISL facility as part of the licensing process. Recognizing that the technology for ISL uranium milling is relatively standardized, that the applications may be submitted over a relatively short period of time, and that the potential ISL facilities would be located in relatively discrete regions of the western United States, NRC decided to prepare a GEIS to avoid unnecessary duplicative efforts and to identify environmental issues of concern to focus on in site-specific environmental reviews. In this way, NRC could increase the efficiency and consistency in its site-specific environmental review of license applications for ISL facilities and so provide an option for applicants to use and licensees to continue to use the ISL process for uranium recovery.

.....

NRC has concluded that it is not appropriate to determine the purpose and need for a site-specific license application in the GEIS.

GEIS at 1-5, citations omitted.

In the Lost Creek supplement, the NRC has defined the scope of the project's purpose and need as "to provide an option that allows for the applicant to use ISR technology to recover uranium and produce yellowcake slurry at the Lost Creek Project site." *Draft EIS for Lost Creek ISR Project*, NUREG 1910, Supp. 3 ("*SEIS*") § 1.3 at 1-1. the problem with this approach is that it does not allow for a site-specific analysis of whether there is a purpose and need for this particular project. The company, Lost Creek ISR, LLC (LCI) has not been required to identify a customer for its product. It is merely assumed that such a customer will exist to buy the uranium when the uranium is produced from the site. But this does not satisfy the "hard look" requirement of NEPA to determine if there is indeed a need for this project. With the many uranium projects apparently set to be developed in the next few years, as identified by the NRC in the GEIS, it is questionable whether there will be customers for the uranium developed from this particular Lost Creek site, without more information. A more thorough economic analysis is required.

The NRC has eliminated a range of reasonable alternatives that should be considered. Such a limited alternatives analysis violates both the letter and spirit of NEPA. The NRC should re-evaluate the alternatives analyses in both the GEIS and the Lost Creek SEIS. For instance, the SEIS eliminates conventional mining from consideration as an alternative, with the rationale being that conventional mining poses greater environmental impacts than ISR mining. But this is what the SEIS should be used for, to discuss the various impacts from different alternatives. It is not clear to us, at least, that conventional mining, if good top soil preservation and appropriate reclamation techniques are used, would not be better, from an environmental perspective, than ISR mining.

The NRC's stated Purpose and Need, *SEIS* at xiii, lines 29-42 and §1.3, does not satisfy the fundamental requirements of the National Environmental Policy Act. The Congressional purpose of the NEPA is, *inter alia*, "to promote efforts which will prevent or eliminate damage to the environment and biosphere..." 42 U.S.C. §4321. Instead, the NRC states that its sole consideration and federal action is "to provide an option that allows the applicant to use the ISR technology to recover uranium and produce yellowcake slurry at the Lost Creek Project" and that the NRC's federal action is "the decision whether to issue the license to LCI." *SEIS* at xiii, lines 32-37; *see also* §1.3. The SEIS is deficient in this regard because the agency has not balanced the need for this project in this location against the potential impacts on the human and natural environment. 42 U.S.C. §4332(C). Thus, when the NRC considers Alternatives, as NEPA requires, the initial Purpose and Need identified causes the agency to fail to consider any meaningful alternatives other than approval or rejection of the application. *SEIS* at xiv-xv.

The NRC states that it does not have any "role in the company's business decision to submit a license application." *SEIS* at p 1-1. But it does have a role. Whether there is a

purpose and need for this project cannot be determined without the NRC evaluating whether or not this project is economically viable, at this site, for this product. An economic analysis is required.

B. The Alternatives Analysis is not Adequate.

The NRC eliminated from consideration the alternatives of conventional mining and milling, heap leaching, using alternative lixivants and alternative methods of waste disposal. *SEIS* § 2.2 at 2-32.

While NEPA does not require the NRC to consider every possible alternative to the proposed action, it does require that the NRC consider all reasonable alternatives. The NRC fails to do this in its Lost Creek SEIS. For example, the NRC does not consider requiring an alternative site for the facility or extensive additional testing requirements that would conclusively demonstrate that the zone in which uranium will be mobilized for liquid extraction cannot infiltrate the crucial surface aquifer that is part of a very large surface aquifer system that provides potential drinking water and water for livestock. Similar considerations exist for the lack of characterization of surface water flows at the site.

Surface water flow at the site may be a serious problem. Surface flow is significant enough to warrant culverts at the Battle Spring Draw and Stratton Draw crossings. The project area contains numerous "ephemeral and meandering channels and washes." There is also a "seasonal pond" called "Crooked Well Reservoir" that is located within the project area that provides "seasonal drinking water for local wildlife and livestock". There is also no gauging data for streams within the Lost Creek project area. Yet, the NRC's SEIS does not address this issue and does not require that the license be conditioned upon additional studies that would supply additional data and properly characterize the surface water flows within the Lost Creek project site.

The "proposed ISR project is situated near Battle Spring Draw, which drains to Battle Spring Flat, approximately 15 km (9 mi) southwest of the site." *SEIS* §2.1.1.1 at 2-5. But the "shallowest occurrence of groundwater within the project area is within the DE horizon, with the depth to water table varying from approximately 24 to 46 m (80 to 150 ft) below the ground surface." *SEIS* §3.5.2.1 at 3-19. This poses a significant issue as to whether the project injection will be contained or escape into the aquifers that serve as regional water supplies. The NRC should not rely upon the existence of a fault to protect against cross-contamination of the potable aquifer. In fact, the existence of a fault in the area is a significant problem, possibly allowing contamination from one aquifer to another to migrate along this fault. As noted in the SEIS, "some hydraulic influence was noted across the Fault ..., indicating that ... it is not impervious to groundwater flow." *SEIS* 3.5.2.3 at p. 3-19.

It would be expected that migration along this Fault would occur as potentiometric pressures are changed by the in situ drill holes and uranium drilling, as mineral extraction recovery occurs and progresses at the site. This finding alone, given the potential for permanently polluting an entire aquifer, should have caused the NRC to consider other

alternatives to granting this application—such as changes in location, directional drilling, and requirements for significant and extensive additional studies and tests. This kind of precaution, where the potential for harm to the aquifer is substantial, should be incorporated into the proposed action, but is not found in the NRC's SEIS for the Lost Creek ISR project.

III. The Water Resources Impact Analyses is not Adequate

A. Will the Mineral Zone Be Confined?

In the GEIS at 2-1 it states that "Hydrologic (formation) geometry must prevent uranium-bearing fluids (i.e., lixiviant) from vertically migrating... This isolates the uranium-producing horizon from overlying and underlying aquifers." Even the National Mining Association, in its comments on ISL GEIS, § 1.B.1 at 7 states that "The confining strata assist ISR operators' control of recovery solutions by limiting their movement to radial or lateral flow paths." So: industry and the NRC agree, uranium should only be mined in an ISR fashion where it is found within a confining aquifer.

But the NRC now seeks to adopt a new approach to analyzing impacts from ISL operations that would allow mining or uranium in an unconfined aquifer at the Lost Creek site. This is a significant departure from past practice.

This departure is quite serious. But beyond that, there does not appear to be adequate measures identified for excursions of uranium and lixiviant from the mineral zone, which are quite likely to occur given the nature of the unconfined aquifer that is present in the Lost Creek site.

Given the NRC's past position on this question, it seems incongruous to see this statement in the SEIS:

ISR activities could potentially impact aquifers above and below the uranium bearing production zone as well as the uranium-bearing aquifer itself outside of the license area. Surface and near-surface activities that can introduce contaminants into soils are more likely to impact shallow (near-surface) aquifers while ISR operations and aquifer restoration will likely impact the deeper uranium-bearing aquifer, and potentially impact any aquifers above and below, and adjacent surrounding aquifers.

SEIS 4.5.2 at p. 4-28

Yet the impacts to groundwater resources are identified as either moderate or small. Where there does not appear to be a well-defined confining layer, how can these impacts be assured to be small or moderate? While there are a few clay lenses at the site, this is not sufficient. The only way to control excursions would be to over-produce the groundwater aquifers to create a drawdown that would depress the water table and thereby keep polluted groundwater from migrating outward. It would require miles and miles of drawdown, in all likelihood.

Without such a precaution, the impacts to surrounding groundwater resources will likely be substantial. The NRC should re-assess the potential for such excursions, given the lack of a well-defined confining layer at the Lost Creek site. (This problem is exacerbated by the presence of old drill holes that are abandoned but not properly cased and/or plugged. See additional discussion below.)

B. Groundwater Restoration.

The GEIS and the Lost Creek SEIS, conclude that groundwater and surface water impacts will be small to moderate. There is an assumptions that groundwater restoration will be successful and that groundwater contaminated with radioactive elements and heavy metals will be contained within the production zone during operations and after restoration. But these assumptions, given the available data, are not valid.

Given the history of production, reclamation, and decommissioning activities at uranium in situ recovery operation sites, any assurances that impacts from spills and leaks will be small or moderate should be viewed skeptically. Groundwater restoration at ISR sites is difficult at best -- even with good geologic and hydrologic conditions at the site.

Even the NRC's own data has demonstrated that ISR site operation restoration efforts that are considered "successful" actually do not restore groundwater to pre-mining conditions. *Consideration of Geochemical Issues in Groundwater Restoration in Uranium In-Situ Leach Mining Facilities*, NUREG CR-6870 (Jan. 2007) at p.19, Table 3; p. 20, Table 4; p. 21, Table 5; p. 22, Table 6. That NRC report indicates that after "restoration" has been deemed complete, contaminant levels may actually rise and migrate due to geochemical conditions. *Id.* at 17, 22, 23.

In short, the data indicate that restoring groundwater to pre-mining conditions may not be achieved. In fact, it may not be, unfortunately, a realistic goal. Therefore, the NRC's conclusion that impacts to groundwater will be small seems incorrect. The NRC should fully evaluate the ability of the uranium ISR industry to restore groundwater and reconsider the impacts to groundwater, both regionally and locally, based on that history.

C. All Wells in the Lost Creek Project Area Should Plugged and Abandoned

This project site is riddled with drill holes that have not been properly plugged and abandoned. These holes can become conduits for migrating pollution from the uranium mineral zone and must be addressed before mining can begin. An extensive sweep of the project area should be made with equipment designed to identify such drill holes and a thorough mapping of such holes should be made. Subsequently, each hole that has not been properly abandoned should be properly plugged and abandoned. This should occur before any ISR operations are initiated.

Failure to require LCI to perform this very necessary function at the project site will enhance the possibility of excursions of contaminated groundwater out of the mineral

zone -- especially to shallower aquifers that are used for livestock watering. Springs could also be affected if this action is not taken.

LCI may respond that it should not be their responsibility to address the failed reclamation efforts of other companies, whether the drill holes were drilled for ISR operations, or oil and gas operations, or for some other purpose. But this is really beside the point. The operator (LCI) must take the site as it finds it. Uranium and/or lixiviant contaminated groundwater is much more likely to migrate outside of the mineral zone if these wells are not properly plugged and abandoned. It is to the advantage of both the operator and the general public, not to mention the environment, that site integrity be maintained and contamination be minimized. Site integrity must be maintained from the beginning. That will be more likely to occur if the site does not have numerous conduits allowing the escape of contaminated material.

IV. The Cumulative Impacts Analysis is Inadequate

The Council on Environmental Quality (“CEQ”) regulations provide:

Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
40 C.F.R. § 1508.7.

The NRC fails to consider cumulative impacts in a number of respects. The GEIS states that "Due to the complex and site-specific nature of a cumulative impact assessment, this chapter provides useful information for understanding the potential for cumulative impacts when licensing future ISL facilities in the milling regions, but does not make any conclusions regarding cumulative impacts that could be applied to specific sites." GEIS at 5-1. Instead, the NRC defers cumulative impact consideration for site specific *SEISs*. *Id.* The GEIS does not, therefore, take the “hard look” at cumulative environmental impacts required by NEPA.

But the *SEIS* in its discussion of cumulative impacts seems to be more of a list of development activities, rather than a careful assessment of what the impacts will be. The *SEIS* does not evaluate the cumulative impacts from non-Federal projects. The *SEIS* does not look at the cumulative impacts of the Lost Creek project combined with the impacts of past contamination from uranium mining and milling. The NRC determined, in fact, that contamination from past uranium mining and milling was beyond the GEIS’s scope. GEIS § 1.5.4 at 1-14. The GEIS further provides, “[e]valuating the potential impacts from past mining activities on new ISL proposals is a site-specific analysis that, if applicable to a proposed site, would be evaluated by applicants during the site characterization and by the NRC staff when a site-specific licensing review is conducted.” *Id.*, § 5.2.1 at 5-3. Why then was this not done in the *SEIS*?

While the *SEIS* does provide a list of the past, current and reasonably foreseeable uranium recovery projects in the region, it does not address those impacts. *SEIS*, Table 5-1 at 5-2 - 5-3. The *SEIS* provides no quantification or analysis of the cumulative impacts of the past, present and reasonably foreseeable uranium exploitation projects combined with the Lost Creek project. Cumulative impacts analysis could reveal significant environmental and public health threats. The *SEIS* does not disclose or evaluate how contamination from past mining or milling sites may impact resources, particularly groundwater resources, when combined with the proposed Lost Creek project. Nor does the *SEIS* disclose how close other past, present and future uranium extraction projects are to the Lost Creek project, or whether those projects are upstream or downstream from Lost Creek.

V. The Fragmented Process for the Lost Creek ISR Site is Problematic

The Lost Creek ISR project environmental analysis has been fragmented and split in unfortunate ways. In November of 2009, the NRC announced a proposed plan to allow LCI to commence construction of certain aspects of the project prior to making a decision on issuance of the license. The Environmental Analysis for that proposal was very brief and truncated, yet some substantial construction activities were involved. Then, in February of 2010, the Bureau of Land Management announced a 21 day comment period for surface disturbance activities at the Lost Creek site. Apparently the BLM intends to go forward with its own environmental analysis with respect to surface activities at the site.

This lack of coordination between the federal agencies with respect to this decision is not only frustrating for the public who wishes to follow and comment on this project, but is also problematic for the decision-making process itself. The NRC and the BLM, as well as other federal agencies that have jurisdiction, should become cooperating agencies and produce one document, an EIS, that analyzes all environmental impacts caused by the project in one document.

The fragmentation of the environmental analysis and planning for this project needs to be remedied. Only then can the best environmental conclusions be reached, and the most information shared among agencies, so that the best plan or the best methods for the proposed development can be utilized at the site.

VI. Wildlife Concerns

A. The Proposed Action Does Not Adequately Protect Wildlife

The current *SEIS* fails to adequately analyze impacts to the project area's wildlife and does not provide adequate mitigation measures to protect wildlife in the face of uranium extraction activities. The NRC indicates that impacts to wildlife *could* be mitigated by following Bureau of Land Management (BLM), Wyoming Game and Fish Department (WGFD), and Avian Power Line Interaction Committee (APLIC) guidelines but gives no

indication of LCI's intent to do so. SEIS 4-42. Since these are voluntary guidelines, there is no assurance that LCI would institute any of these entities' recommendations.

B. The Proposed Action Fails to Comply with the Governor's Sage-grouse Core Area Strategy or the Wyoming Game and Fish Department's Recommendations for In-Situ Uranium Mining

As noted in the SEIS, the proposed project occurs within one of the sage-grouse Core Population Areas as delineated by Governor Freudenthal's Sage-Grouse Implementation Team in 2008 and officially designated by the WGFD pursuant to the Governor's Executive Order (EO) 2008-2. Entities operating on state lands in sage-grouse core areas must comply with the management and development directives set forth in the Governor's EO. Although the NRC appears to recognize this by stating that "activities associated with ISR uranium recovery facility construction would conform to the Governor's policy on the Stipulations for Development in Core Sage Grouse Population Areas," the development plans and mitigation measures outlined in the SEIS do not conform to these regulations. SEIS at 1-13. To begin with, the EO states that new development or land uses on state land should only be authorized or conducted when it can be demonstrated that the activity will not cause declines in greater sage-grouse populations. EO 2008-2. Based on information presented in the current SEIS, the NRC has failed to show that LCI's activities will not result in sage-grouse population declines. In addition, LCI fails to provide adequate mitigation measures for protecting core area sage-grouse in the face of its proposed development.

Classification of Active Sage-grouse Leks

According to the SEIS, there are six active sage-grouse leks within two miles of the project area and three additional leks in close proximity. The NRC discounts an additional lek that actually occurs **inside** the study area (in our estimation there are therefore **seven** active sage-grouse leks within two miles of the project area). The NRC maintains that:

According to the sage-grouse surveys conducted in 2006 and 2007, no active sage-grouse leks were located in the project area (LCI, 2008b). The Crooked Well Lek, which is a known strutting ground along the northeast boundary of the project area, was inactive during three site visits in April 2006. Four males were observed on the lek on April 4, 2007, but no sage-grouse were present in two additional lek surveys; therefore, it is considered inactive (LCI, 2008b). SEIS at 3-36 - 3-37).

Based on the WGFD's definition of an active lek, the NRC is erroneous in dismissing the Crooked Well Lek and therefore must consider impacts to this lek in its impact analyses. The WGFD's defines an **active** lek as "Any lek that has been attended by male sage-grouse during the strutting season. Acceptable documentation of grouse presence includes observation of birds using the site or signs of strutting activity." Exhibit 1 at 2. As long as male sage-grouse were using the lek during the strutting season, that lek is

considered to be active. The presence of four males on the lek on April 4, 2007 is sufficient indication that this lek is active based on the WGFD definition. For a lek to be considered inactive, a number of conditions need to be met. According to the WGFD, an **inactive** lek is:

Any lek where sufficient data suggests that there was no strutting activity throughout a strutting season. Absence of strutting grouse during a single visit is insufficient documentation to establish that a lek is inactive. This designation requires documentation of either: 1) an absence of birds on the lek during at least 2 ground surveys separated by at least 7 days. These surveys must be conducted under ideal conditions (4/1-5/7, no precipitation, light or no wind, _ hour before to 1 hour after sunrise) or, 2) a ground check of the exact known lek site late in the strutting season (after 4/15) that fails to find any sign (droppings/feathers) of strutting activity. Data collected by aerial surveys may not be used to designate inactive status.

The NRC provides no indication that any of these conditions for determining that a lek is inactive have been met. To our knowledge, however, the point is moot, since a lek that is recognized as a traditional lek site, as is the Crooked Well Lek, is considered active if male sage-grouse are documented using it during the breeding season. Indeed, determining activity status can be accomplished with only one visit to a lek according to the WGFD. Whereas lek *counts*, which document the actual number of male sage-grouse observed attending a particular lek, require three count surveys, lek *surveys*, which “are designed principally to determine whether leks are active or inactive, require[e] as few as one visit to a lek.” Exhibit 1 at 1. Considering that as of the writing of the SEIS, LCI still intended “to request the WGFD to reclassify the lek as Unoccupied/Abandoned,” it seems particularly premature for the NRC to consider it inactive and subsequently ignore it and the potential impacts to it for the remainder of the SEIS analysis. SEIS at 3-37. *Impact of Roads and Vehicle Traffic*

Regardless of whether the Crooked Well Lek is included in the analysis or not, the NRC still does not adhere to the Governor’s EO by showing that the project will not result in sage-grouse population declines. In fact, the NRC admits that “The increased traffic adjacent to the Sooner lek (located approximately 91.4 m [300 ft] from Sooner Road) could result in lower lek attendance.” SEIS at 4-47 – 4-48. This is likely to be particularly true during the construction phase since “Most construction workers are expected to travel to the project area from Casper and Rawlins. They would travel US 287 to Lamont, then west to Bairoil approximately 10 km (6 mi) on WY 73, then about 20 km (12 mi) west on CR 22 to Sooner Road (BLM #3215) to the project area access road.” SEIS at 4-6.

Furthermore, LCI plans to provide principal access to the project site by upgrading an existing two-track road that bisects the project area. The road would be “an all-season, gravel-surfaced road” that “would be crowned-and-ditched with a 6-m (20-ft) wide driving surface consisting of 15.4 cm (6 in) of compacted road base.” SEIS at 2-8. This road (known as the Lost Creek Road) “would be improved for heavy truck usage and

would likely remain as a permanent feature beyond site decommissioning. SEIS at 4-24. (Emphasis added). The NRC does not address the potential impact of the planned upgrade and increased traffic volume of the Lost Creek Road, which will be approximately half a mile from the Crooked Well Lek and even closer to two leks that are adjacent to the west end of the project area. Research has shown that traffic during the strutting period results in declining lek attendance by breeding males when road-related disturbances are within 0.8 miles of a lek. Holloran 2005. Vehicular activity also has been shown to negatively affect female grouse. In a study in Pinedale, Wyoming, only 65 percent of sage-grouse hens from leks disturbed by roads and oil and gas development initiated nests, whereas 89 percent of hens from leks in undisturbed areas did so. Lyon and Anderson 2003. The study suggests that light traffic disturbance (1-12 vehicles/day) during the breeding season might reduce female nest-initiation rates and increase the distances that females move from leks when selecting their nest sites. Lyon and Anderson 2003. An upgrade of haul roads associated with surface coal mining in Colorado, resulted in a lek that was 50 meters (164 feet) from a road becoming inactive and led to an 83 percent reduction in strutting males on another lek located 500 meters (1,640 feet) from a road within three years of the upgrade. Braun 1986.

Given the documented impact of roads and vehicular activity on sage-grouse, the WGFD's recommends "Locat[ing] main haul roads used to transport production and/or wastes to a centralized facility or market point ≥ 1.9 miles from the perimeter of occupied sage-grouse leks" and "Locat[ing] other roads used to provide facility site access and maintenance ≥ 0.6 miles from the perimeter of occupied sage-grouse leks" in core sage-grouse areas subjected to in-situ uranium development. WGFD 2009 at 114, Appendix C.

More generally, the WGFD recommends prohibiting or substantially limiting traffic during high wildlife-use hours (within three hours of sunrise and sunset) and posting speed limits to reduce wildlife collisions and limit dust. WGFD 2009 at 102, Appendix A. The SEIS makes no specific mention that LCI will adhere to any of these recommendations other than stating vaguely that "Impacts to sage-grouse ... could also be mitigated if BLM and WGFD guidelines are followed." SEIS at 4-42. Indeed, the NRC gives no indication of any intention or commitment by LCI to adhere to any of the recommended guidelines. Furthermore, LCI's proposed development plans frequently contradict these guidelines outright. In its summary analysis, the NRC further states that "If BMPs are implemented that minimize noise, vehicular traffic, and human proximity in the vicinity of leks (within the 2-mile radius of an active lek), direct and indirect impacts to sage-grouse would be reduced from MODERATE to SMALL." SEIS 4-48. However, the NRC gives no indication of which BMPs LCI is considering to reduce the impact of development activities on impacts, nor whether LCI has any interest in implementing them so as to achieve "small" rather than "moderate" direct and indirect impacts. It is quite possible that LCI would not think the necessary BMP measures for reducing impacts were either cost-effective or worthwhile and the NRC provides no assurances that such measures will be instituted.

Comparison of Different Alternatives' Impacts on Sage-grouse

Given the sensitivity of sage-grouse to roads and anthropogenic disturbances, the NRC should provide a comprehensive analysis with regards to the potential impact of the different alternatives on sage-grouse. The NRC mentions that Alternative 3 (the Dried Yellowcake Alternative) would result in fewer heavy-truck trips to and from the project area, but does not analyze the potential benefits that lowered rates of traffic would have on the project area's sage-grouse. If the project footprint is expected to be the same under Alternatives 1 and 3, and there is no difference in the potential impact of the alternatives on air quality and emissions, then a more extensive analysis of the different potential impact between the two alternatives on sage-grouse is warranted. Given the sage-grouse's tenuous status in the west, any means by which the impacts of energy development on local sage-grouse populations may be reduced merit evaluation.

Critical Seasonal Sage-grouse Habitats

Aside from ignoring standard mitigation measures for sage-grouse and the potential impact of proposed roads on core-area sage-grouse, LCI does not appear to have acquired the necessary biological information to protect the project area's sage-grouse. As a result, LCI cannot adhere to recommended mitigation measures. For example, LCI gives no indication of having mapped any nesting and brood-rearing habitat in the project area. The NRC does not even mention these critical seasonal grouse habitats in the SEIS. Furthermore, the NRC makes no mention of LCI's intent to adhere to the WGFD's recommendation regarding avoiding surface-disturbing activities and/or disruptive activities in nesting and early brood-rearing habitat within **three** miles of the perimeter of occupied leks and in mapped nesting and early brood-rearing habitat outside the three-mile perimeter from March 15 – June 30. WGFD 2009 at 110, Appendix B. Indeed, the NRC does not even depict the project area's sage-grouse leks with three-mile buffers. Given that research has shown that 74-80 percent of females nest within four miles of leks, such stipulations are critical to protecting nesting females and their young, and ensuring successful future juvenile recruitment into local sage-grouse populations. Moynahan 2004, Holloran and Anderson 2005.

Similarly, the NRC makes no mention of LCI's intent to adhere to any stipulations involving sage-grouse winter concentration areas. These areas do not appear to have been surveyed and mapped in the LCI project area, nor even considered by the NRC. The WGFD recommends avoiding the placement of roads ... and other structures that may require human presence in winter concentration areas in both sage-grouse core and non-core areas. WGFD 2009 at 109, Appendix B. In addition it recommends avoiding human and equipment activity within winter concentration areas from 15 November through 14 March in core and non-core areas. WGFD 2009 at 109, Appendix B. Given the number of leks in the vicinity of the proposed project area, the likelihood of disturbing grouse winter concentrations areas could be a significant concern. These areas should be identified and mapped and adequate mitigation measures instituted to protect key seasonal habitats. As the U.S. Fish and Wildlife Service stated in its November 12, 2008 letter to the project proponent, "No project activities that may exacerbate habitat loss or degradation should be permitted in important habitats." SEIS at A-12. LCI must first identify these important habitats and then institute the requisite mitigation measures to ensure that they are not threatened by the projected development. Until it does so, the

project's potential impact on this core area sage-grouse population cannot be comprehensively evaluated.

West Nile Virus

Greater sage-grouse are particularly vulnerable to the West Nile Virus (WNV). Clark et al. 2006. The disease poses a serious threat to the species and can lead to the extirpation of local breeding populations. Naugle et al. 2004, 2005; Walker et al. 2004. Evaporation ponds resulting from energy development can provide breeding grounds for mosquitoes (the WNV vector), thereby increasing the threat of WNV to sage-grouse. For example, between 1999 – 2004, researchers documented a 75% increase in potential mosquito larval habitats in a study area in the Powder River Basin as a result of Coalbed Natural Gas Development. Zou et al. 2006. Increased vector distributions could lead to increased WNV exposure and infection rates in the project area's sage-grouse. The NRC does not discuss the potential threat that LCI's evaporation ponds and other water sources may pose for sage-grouse, nor does it discuss any potential mitigation measures for limiting favorable mosquito habitat in the project area. The WGFD recommends reservoir designs to limit potential mosquito habitat to protect grouse in core and non-core areas. WGFD 2009 at 108-109, Appendix B. The NRC should evaluate the potential disease threat that LCI's activities may pose for sage-grouse and ensure that adequate mitigation measures are instituted so that such a threat does not result in local sage-grouse population declines.

Fencing

Finally, the NRC states that LCI will enclose the central processing plant and maintenance building compound with various types of fencing, including a "standard livestock fence." SEIS at 2-14. In addition, the SEIS indicates that each mine unit and storage pond will be fenced. Research has shown that wire fences pose a significant collision threat to sage-grouse. Rangeland fences accounted for 18 percent of sage-grouse deaths in a Utah study. Danvir 2002. More recently, research by the WGFD documented 170 bird strikes, 146 (86%) of which were by sage-grouse, along a 4.7-mile stretch of livestock fence in southwestern Wyoming. Christiansen 2009. Two sage-grouse leks were located within two miles of the fence. Christiansen 2009. The threat to grouse posed by fences can be mitigated through the use of "sage-grouse diverters," which make fence lines more visible to flying grouse. These low cost (approximately \$1.75 each) devices clip onto the top line of fences, flap in the wind reflecting sunlight, and glow in the dark for 10-12 hours. The use of sage-grouse diverters on portions of the fence in the Wyoming study reduced overall bird-fence collisions by 70 percent over unmarked sections (61 percent for sage-grouse). Christiansen 2009. Only seven bird strikes (all sage-grouse) were recorded along fence segments that were marked with bird diverters, compared to 47 bird strikes, including 36 sage-grouse, recorded in the unmarked section (Christiansen 2009). Given the threat that fences pose to grouse (and other birds), the NRC should evaluate the potential threat that LCI's proposed fences may pose to the area's grouse and commit to implementing mitigation measures that address this threat. We believe that all fences within two miles of leks should be outfitted with sage-grouse diverters to protect grouse and other bird life.

C. The Proposed Action Does Not Incorporate the Bureau of Land Management's Recent Directives on Sage-grouse Protection

The BLM Wyoming State Office recently (December 29, 2009) issued new guidance on sage-grouse habitat management that applies to all activities occurring on public lands and Federal mineral estate in Wyoming. The NRC does not incorporate these new directives and the proposed project should be reevaluated with these directives in mind and redesigned to comply with BLM guidelines. The BLM guidance echoes the WGFD recommendations in restricting or prohibiting surface-disturbing activity or surface occupancy within 0.6 miles of the perimeter of occupied leks or those of undetermined status. BLM 2009 at 3. This regulation is likely to necessitate some modification of the proponent's road-building and access plans since proposed roads appear to be within 0.6 miles of certain leks.

The directives also prohibit or restrict surface-disturbing and/or disruptive activities from March 15 – June 30 in suitable sage-grouse nesting and early brood-rearing habitat. BLM 2009 at 3. As mentioned above LCI does not appear to have mapped these critical seasonal habitats and provides no mitigation measures related to these habitats. The NRC makes no mention of these crucial habitat types in any analyses or discussions in the SEIS. Similarly, the BLM prohibits or restricts surface-disturbing and/or disruptive activities from November 15 – March 14 in mapped or modeled sage-grouse winter habitats/concentration areas that support core area grouse populations. BLM 2009 at 3. The SEIS provides no information on any winter concentration areas that may be associated with project-area sage-grouse. Such issues should be addressed before LCI proceeds with its proposed development plans.

Like the WGFD, BLM also recommends specific mitigation measures to reduce the threat of WNV to sage-grouse when dealing with artificial water impoundments. The SEIS fails to address the design of the project's evaporation ponds and other potential water sources in the context of their potential role in escalating the threat of WNV to sage-grouse in and around the project area.

The proposed project must also go through the WY BLM's new "Greater Sage-grouse Project Authorization Screen. The screen is to be used to "determine the appropriate timing, distance, and density restrictions that must be evaluated regardless of whether the sage-grouse habitat has been, or has yet to be, fully mapped and modeled." BLM 2009 at 4. In addition, the screen provides "a process to determine, within the context of an analysis, the appropriate management of sage-grouse seasonal habitats based on the relative amount of disturbance and anthropogenic features on the landscape at the proposed project site." BLM 2009 at 4.

Additional analysis would also be required of the project proponent since the BLM's new guidance requires that a sage-grouse habitat evaluation extend out to four miles from relatively small individual proposed actions such as exploratory wells, and individual rights-of-way, and out to 11 miles from the project boundary for large-scale proposed actions. BLM 2009 at 8.

Given the tenuous status of the West's sage-grouse populations and the lengths that the state of Wyoming has gone to protect its remaining grouse, the proposed project should not be approved as outlined since it fails to adequately consider and mitigate its impacts on sage-grouse and does not comply with the guidance provided by the Governor's EO, the WGFD, or the Wyoming BLM.

D. The Proponents Must Carefully Evaluate the Potential Impacts of Development on and Provide Adequate Protection for Migratory Birds

The SEIS does not adequately address the potential impacts that the proposed project poses to migratory birds, which are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-712). Nor does it provide suitable mitigation measures to ensure that the project's impact on these birds is minimized and that unnecessary fatalities are avoided. We are concerned about the potential negative impact on migratory birds from exposure to constituents in the proposed evaporation ponds. The SEIS states that "If the fluid in the storage ponds is determined to be harmful to birds, netting or other appropriate deterrents would be placed to eliminate any hazard to migratory birds, sage-grouse or other wildlife. The deterrent would be consistent with agency recommendations." SEIS 4-43. However, the SEIS makes no statements about *how* a determination that the fluid in the storage ponds is harmful to birds would be made. Would ponds be tested regularly for contaminants? Would a dozen birds have to die? Would one bird dying suffice? And what if birds ingested harmful fluids and died off site, providing no indication that the storage fluids were harmful? Knowing that these waste fluids can contain high selenium concentrations (Boon 1989) that are harmful to birds (See et al. 1992, Skorupa and Ohlendorf 1991, Ohlendorf 2002) and because of the difficulty of documenting the threat that these fluids may pose to wildlife, the project proponents should place netting and/or other appropriate deterrents over the ponds as a matter of course. Given that the vast majority of bird species in the project area are protected under the Migratory Bird Treaty Act, LCI should take every precaution necessary to ensure that its development activities do not cause preventable bird fatalities. The use of netting and deterrents on the proposed evaporation ponds also would have the added benefit of preventing the ingestion of toxic water by sage-grouse, big game, and other animals, as well as protecting migratory birds. The efficacy of the netting and deterrents should be monitored on a regular basis and upgraded as needed to ensure that they are achieving their intended purpose.

Not only does the SEIS provide an inadequate analysis of the potential impacts of the proposed impact on migratory birds, but it is also unduly dismissive about the potential consequences of those impacts. The SEIS states that:

Indirect impacts to passerine birds would include the displacement of shrub-dependent species while construction activities are ongoing. Birds are mobile and would likely disperse into adjacent habitat areas where there is an abundance of similar habitat. Impacts to passerine birds would not be expected to be outside the natural range of variability and would not be expected to have any long-term impacts on the general population. SEIS 4-42.

These statements fail to acknowledge fundamental ecological concepts such as territoriality and intra- and inter-specific competition. Songbirds typically establish and defend territories and many show fidelity to particular nest sites. As a result, birds that are displaced into adjacent areas to accommodate development may suffer adverse impacts. Birds with established territories adjacent to the former territories of the displaced birds may not always accommodate the newcomers. The movements of displaced birds could lead to increased densities (and concomitant increases in agonistic interactions and lower reproductive rates) in good habitats or it could lead to birds being pushed into suboptimal habitats where resources are inadequate to allow for successful reproduction. While such impacts may not be any greater than those experienced by an area's birds as a result of a natural disturbance such as a fire, wildlife in and around the proposed project area currently are dealing with ever-escalating cumulative impacts on the landscape. As is stated in the SEIS, there are eight in-situ uranium facilities and seven conventional uranium mines in various stages of the licensing process in the Great Divide Basin, along with two surface coal mines, over 6,400 producing gas wells (with the potential for over 8,000 more), and a rapidly escalating number of wind energy projects. SEIS 5-1 – 5-5. As a result, the SEIS's assumption that the project will not negatively impact birds because they can move to adjacent, abundant similar habitat is based more on wishful thinking than on any meaningful science.

Bird species throughout the U.S have experienced significant declines [North American Bird Conservation Initiative (NABCI) 2009]. Almost one quarter of U.S. bird species are considered to be species of conservation concern and about eight percent are federally listed as endangered (NABCI 2009). Grassland and arid-land birds have experienced the most rapid declines over the last four decades (NABCI 2009). Sagebrush lands, in particular, face wide-ranging threats and are considered to be one of the most threatened types of ecosystems. Given that approximately 45 percent of potential sagebrush habitat has been converted to other habitat types, as a result of agriculture, urbanization, and other pressures (NABCI 2009), the potential impact of proposed energy development on sagebrush birds must be evaluated particularly carefully, rather than assuming that birds may simply move elsewhere.

For example, research has shown that densities of sagebrush obligates – particularly Brewer's sparrow and sage sparrow, which both occur in the proposed project area – were 39-60 percent lower within 100 meters (328 feet) of a single dirt road with a traffic volume of 10 to 700 vehicles per day that was associated with a natural gas field in Wyoming. Ingelfinger and Anderson 2004. Given the number of roads associated with each energy development project in the Great Divide Basin's sagebrush ecosystems, the cumulative impact of the additional roads proposed for the LCI project on sagebrush obligate and other birds should be addressed.

Additional potential impacts of in-situ uranium mining on birds in general, and sagebrush obligates in particular, also are worth consideration. For example, preliminary research suggests that sagebrush obligates may select habitat with lower well densities in oil and gas fields in Wyoming (Gilbert 2009). In addition, sagebrush obligates in areas with lower well densities had a higher probability of daily nest survival (Gilbert 2009).

E. The Proposed Action Does Not Provide Adequate Protection for Raptors

No methodologies are presented for how raptor surveys were conducted in the proposed project area, making it difficult to determine if the lack of raptor nests that were found was the result of no raptors being present or surveys being conducted inappropriately. In addition, the NRC's inconsistent presentation of the raptor information further complicates an evaluation of potential impacts.

The SEIS states that "File searches identified 12 previously documented raptor (ferruginous hawk) nests within a 1.6-km (1.0 mi) buffer zone of the project area." SEIS 3-37. It then states that "The status and details are presented in the table below (Table 3-6[sic])." Table 3-5, which lists the raptor nests, contains only *four* raptor nests, all ferruginous hawk nests. All nests are listed as being active and in good condition. One occurs within a 1-mile buffer of the project area, whereas the remaining three occur outside the 1-mile buffer. We are unclear why only four of the 12 raptor nests are listed. We are also unclear why the SEIS states that all of the nests occur within a 1.0 mi buffer zone of the project area, but then only shows one nest occurring within the 1-mile buffer in the table.

Despite listing four active nests that are in good condition in its raptor nest table, the NRC goes on to say that LCI conducted surveys during 2006 and 2007 and found no active raptor nests within the project area and that other nests previously documented by the BLM in the 1.0 mi buffer zone were not located despite the use of GPS units. SEIS 3-39. Ferruginous hawks often nest on the ground and their nests can be difficult to find even when they occur in known locations. Nevertheless, the nests persist for a long time and some remnant of them usually can be found even if only the general vicinity is known. Searchers often need to search a wide area around a GPS point and follow nest-site descriptions because those who originally marked the nest may not have been able to record an exact nest location if raptors were using the nest when it was located. The fact that not one of the 12 nests previously documented by BLM was found raises concerns about the reliability of the surveys. Alternatively, the nests may have been documented by BLM many years prior to these surveys, but complete survey information for the BLM-documented nests is not provided, so we cannot know whether surveys were inadequate or whether the database being used was severely out of date. Regardless, we are very concerned that potentially active nests were not located and therefore will not receive the needed seasonal and timing protective stipulations that would enable raptors (and particularly ferruginous hawks) to reproduce successfully despite the proposed development.

We are similarly concerned about future proposed raptor nest surveys. The SEIS states that raptor nest surveys "would be scheduled for as late in the nesting season as possible to avoid disturbance during the incubation and early brood rearing periods." SEIS 6-13. Although we recognize the intense sensitivity of the incubation and early brood-rearing periods, surveys can be conducted in such a way that nesting raptors are not disturbed. However, by surveying too late, surveyors risk missing nests that were initiated and failed early. As a result these active nests will not receive the protection that they merit

in future years. The SEIS also states that although surveys for new raptor nests would be conducted yearly within the project area, surveys would extend to a 1.6-km (1 mi) radius outside of the project area only once every five years. Surveying for these buffer nests only once every five years could lead to many nests not being surveyed and subsequently many nests not receiving the protection that they require. Raptors often change nests yearly throughout their territory and easily could move from just inside the project area to just outside it. As a result active nests would go undocumented. In addition, new nests often are not found in the first year, especially if they failed early. To ensure that all active nests are found, surveys should be conducted for known and new nests both within the project area and *within* the 1.6 km (1 mi) buffer on a *yearly* basis. By not doing so, LCI risks violating the Migratory Bird Treaty Act by providing inadequate protection from development to raptors during their nesting season.

While we certainly concur that “Impacts to raptor species from power distribution lines could be mitigated by following the Avian Power Line Interaction Committee (APLIC) guidance, and avoid [sic] disturbing areas near active nests and prior to the fledgling of young (APLIC 2006)” we are concerned that the NRC gives no indication that LCI intends to adhere to these best management practices. The NRC should provide reassurances that LCI intends to implement practices that mitigate the threat of development to raptors if the proposed project goes forward.

F. The Proposed Action Does Not Adequately Address Species of Greatest Conservation Need

The NRC appears to discount the potential threat of the proposed development to certain Species of Greatest Conservation Need, because LCI did not document these small, cryptic species in the project area. The SEIS states that:

The state-listed olive-backed pocket mouse and prairie vole were not observed at the project area; however, suitable habitat exists and these species are known to be in the region (WGFD, 2004). Loss of potential habitat would occur with project construction and operation and direct mortality could occur during the construction and clearing phase of the project; however, local populations should recover rapidly. These impacts would be SMALL because only a few individuals would be affected. These species would likely travel to suitable habitat adjacent to the construction areas. SEIS 4-50

It is unlikely that the olive-backed pocket mouse and the prairie vole would be observed at the project area unless trapping surveys were conducted that targeted these mammals. The NRC makes no mention of any small-mammal trapping surveys being conducted. Furthermore, the analysis of impacts on these species is not supported by any data or scientific information. Although, the NRC claims that “local populations should recover rapidly,” after construction and project development, it provides no data to support this conclusion. The NRC further claims that impacts will be small because only a few individuals would be affected. However, it has no basis for making this claim since no

surveys were conducted and therefore nothing is known about the species' distributions in the project area.

Finally, as it does with its "analysis" of the project's potential impact on passerines, the NRC states that the small mammal species of concern would leave the construction area and travel to safer adjacent habitat (although in a previous sentence, the NRC states that individuals could be killed). No information is provided to support the assumption that small-mammal species will simply "travel" to suitable adjacent habitat to avoid construction impacts. The home range of the olive-backed pocket mouse is not known. However, prairie voles typically have a home range of less than an acre and the species is not known for its long-distance movements. Stalling 1990. In fact, research has shown that narrow dirt roads inhibit prairie vole movements and act as dispersal barriers. Swihart and Slade 1984. Furthermore, the adjacent habitat already may be occupied by other territorial small mammals, in which case increased densities could lead to a reduction in habitat quality adjacent to the study area, thereby affecting not only the animals that were emigrating from the study area, but those whose territories they moved into. Alternatively, habitat adjacent to study area may be unsuitable and of poor quality, further reducing survival of emigrants. While the loss of a few small mammals during construction may be acceptable, cumulative losses may accumulate on a landscape scale as a result of multiple ongoing development projects, potentially placing little-known, little-studied species at risk.

G. Miscellaneous Comments

The EIS repeatedly refers to the "wouldow lark bunting" (pp. 3-44, 4-49). This should be the lark bunting. In addition, the EIS refers to the "wouldow flycatcher (pp. 3-46). This should be the willow flycatcher.

VII. Conclusion

The GEIS and the Lost Creek *SEIS* are inadequate for the purposes of NEPA and are in need of revision. The NRC should withdraw the Lost Creek *SEIS*, begin a scoping process for the Lost Creek environmental impact statement (which did not occur in the past), and then re-issue an *SEIS* for public comment.

Thank you for the opportunity to comment on the Lost Creek *SEIS* and please do not hesitate to contact us if you have any questions or concerns.

Sincerely,

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