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Request for Public Comments Regarding the Revised Dewey-Burdock Uranium In-Situ Recovery Underground Injection Control Permits in Edgemont, South Dakota

Comment On: EPA-R08-OW-2019-0512-0017
Request for Public Comment

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Comment on EPA-R08-OW-2019-0512-0017

Submitter Information

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Government Agency Type: Tribal
Government Agency: Oglala Sioux Tribe

General Comment

Ms. Robinson - on behalf of the Oglala Sioux Tribe, thank you for the opportunity to comment on the Dewey-Burdock draft UIC permits and aquifer exemption. The Tribe's comments are somewhat lengthy - as such, we have broken them down into parts to accommodate the document size limitations of the comment portal website. Please do not hesitate to reach out to me directly if you have any questions or problems accessing the submitted materials.
Jeff Parsons, Western Mining Action Project
on behalf of
Oglala Sioux Tribe

Attachments

OST 2019 comments cover letter

Bell analysis

LaGarry 2019 UIC opinion

OST THPO comments

OST Functional Equivalence and NHPA FINAL w attachments

OST Functional Equivalence and NHPA FINAL Attachment 3

EJ analysis for D-B

DEWEY BURDOCK FINAL MEMORANDUM ON OST TREATY RIGHTS FINAL w ordinances

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December 9, 2019

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RE: Comments on USEPA's revised draft Underground Injection Control permits – Dewey Burdock

Dear Ms. Robinson:

This letter provides comments from the Oglala Sioux Tribe (OST or Tribe) on the EPA's 2019 revised draft Underground Injection Control (UIC) permits and the aquifer exemption for the proposed Dewey-Burdock uranium project by Powertech/Azarga (Permittee). The Tribe submitted detailed comments on this same matter during the public comment period for the original draft documents in 2017. The Tribe's review of the updated supporting documents for the 2019 draft permits indicate that EPA has not resolved the issues raised in the Tribe's 2017 comments. Indeed, in many respects, it appears EPA is backsliding in terms of providing the necessary comprehensive technical analysis and ensuring the protection of valuable ground water resources. As such, the Tribe hereby incorporates herein its previous comments.

As EPA is aware, the OST has long-standing and substantial concerns with the Dewey-Burdock project as it is currently proposed. Many of these serious concerns relate to issues related directly to potential groundwater contamination; the fate and transport of radioactive wastes from the operation; the lack of a thorough review of the direct, indirect and cumulative impacts from the project; and of course, the lack of any competent cultural resources survey at the site which fully ensures that the Tribe's cultural and spiritual values are protected.

The Tribe hopes that EPA will take the comments contained herein seriously and will work to improve the analysis and the permitting process in a manner that provides transparency and adequate protections for groundwater, cultural, and other resources at risk from this proposal. The Tribe understands that EPA's Tribal consultation efforts are ongoing in this matter and looks forward to the opportunity to provide additional input through that process in the near future in accordance with the Tribe's law and policies governing such government-to-government engagement.

Respectfully,

Julian Bear Runner/ma

Julian R. Bear Runner
President, Oglala Sioux Tribe

December 6, 2019

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Re: EPA-R08-OW-2019-0512-0017

Dear Ms. Shea:

This letter provides comments from the Oglala Sioux Tribe (OST) on the EPA's revised draft Underground Injection Control (UIC) permits and the aquifer exemption for the proposed Dewey-Burdock uranium project by Powertech/Azarga (Permittee). We oppose the EPA's proposed issuance of these UIC permits and an aquifer exemption for many reasons as explained in this letter.

Despite the EPA's revisions of these draft documents concerning the draft UIC permits and the draft aquifer exemption since 2017, there are still a number of problems with them as well as the process used by the EPA. The items we have identified as key issues include but are not limited to those itemized below.

ISSUE OF ECONOMIC VIABLILITY

One of the key questions raised by the public during the hearings was: "Is this proposed ISL uranium mining operation even economically viable?" Unfortunately, it is not answered in the EPA documents. At least 15 ISL mines in the US are either officially in "standby" mode or are currently not producing. Mining occurred here extensively in the 1950s to the 1970s. Is there enough uranium left to mine in the project area? So before the project goes any further, the Permittee should be required to prove that there is actually the amount of ore present that it claims. They should be required to provide this information under close supervision by a knowledgeable regulator selected by the EPA. And it should occur before any final permit is issued. If the Permittee refuses to answer this question, it should be inferred that they are not committed to the project as designed, that they know there is less uranium present than claimed, and/or that they expect the expenses of this activity actually makes the project unprofitable.

ISSUE OF CONFINEMENT IN THE CLASS III WELL AREAS

Perhaps the most important technical problem with the EPA documents has to do with the confinement of mining fluids in the Class III UIC well areas. This goes to the heart of the safety of the project, and to the heart of the future of the region. Real doubts exist whether the mining fluids can be contained at the proposed mine site. As Dr. Hannan LaGarry's direct observation of Permittee's records shows, there are around 7,500 old boreholes on the site, not the lower numbers put forward by the EPA or the Permittee. It is highly unlikely that *all* old boreholes can be found and properly plugged.

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In addition, research by Boggs and Jenkins ("Analysis of Aquifer Tests Conducted at the Proposed Burdock Uranium Mine Site: Burdock, South Dakota," 1980) indicated leakage across the Fuson shale between the Lakota and Fall River formations in the Burdock area; this is one of the TVA papers. The Class III Fact Sheet notes the connection between the Chilson and Fall River formations in the Dewey area, which was from the other TVA test done in the early 1980s. This found the Chilson member of the Lakota formation to be "exceptionally permeable," as quoted by Dr. Perry Rahn (2014. "Permeability of the Inyan Kara Group in the Black Hills Area and its relevance to a proposed in-situ leach uranium mine" in the *Proceedings of the South Dakota Academy of Science*). Dr. Rahn is Professor Emeritus at the South Dakota School of Mines and the acknowledged expert in matters related to hydrology in the southern Black Hills.

The EPA also notes that Permittee's pump test in the Dewey area was not only done differently, but the TVA test was done at a pumping rate of 16 times higher than the Permittee's tests. This would be the way such tests would be conducted if the purpose was to show that no connections exist between formations in the Dewey area. Therefore, a more comparable update of the Dewey study is needed.

One critical issue in the revised draft Class III UIC permit is the assumption that the Fuson Shale of the Lakota Formation serves as the confining zone between the Fall River Formation injection interval and the underlying Chilson Sandstone of the Lakota Formation. On p. 23 of the Class III Fact Sheet, it states that: "There may be points where the Fusion confining zone has been compromised by improperly plugged exploration drill holes or wells that penetrate the Fusion confining zone. Evidence that suggests at least one breach in the Fusion confining zone is included in the reports on the pump tests conducted by the Tennessee Valley Authority (TVA) and the Permittee in the Chilson aquifer in the Burdock area." The draft permit then goes on to specify that the Permittee will conduct wellfield delineation drilling during the initial stages of the pump testing phase to "provide more detailed information about the thickness and continuity of the Fusion confining zone" However, since breaches are already known to exist, the EPA should require corrective action be done BEFORE issuing the Class III area permit, not AFTER.

The revised draft Class III UIC permit also continues to rely heavily on belief that the Morrison Formation is an adequate lower confining layer. However, it should seriously be re-considered because "The Morrison Formation is intersected by 26 exploration drillholes throughout the Dewey-Burdock Project Area." (Found on p. 23 of the Class III Fact Sheet). Again, just like the Fusion case as noted above, the EPA should require the Permittee to verify that breaches do not exist before issuing the permit. We also do not agree with EPA's concurrence with the Permittee's assertion that the Unkpapa USDW underlying the Morrison Formation does not need to be monitored during the injection activities. In addition, the graphics supplied in the documents showing the Morrison Formation are not to scale and appear quite thick (e.g. Fig 6, p. 25), so it seems to be a purposeful way to mislead the public.

Research by Wicks, Dean, and Kulander ["Regional tectonics and fracture patterns in the Fall River Formation (Lower Cretaceous) around the Black Hills foreland uplift, western South Dakota and northeastern Wyoming." 2000] indicated that the Fall River formation is "pervasively fractured" along the western edge of the Black Hills. The opinions of Dr. Robert Moran and Dr. Hannan LaGarry, which were previously submitted to NRC, also indicate that fractures, faults, breccia pipes, and other geological characteristics of the project area, have not been adequately researched. The Second Draft Class III Fact Sheet (p. 32) says that there are 64 drinking water, irrigation, and livestock wells in or within 1.2 miles of the mine boundary. To families on the ground, the situation is a high-stakes of their long-term health. It is critical that the geology of the area be fully understood – preferably before the draft permits were issued – but certainly before any further steps are taken.

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Research by Tank (1958. "Clay Mineralogy of Morrison Formation, Black Hills area, Wyoming and South Dakota," *Bulletin of the American Association of Petroleum Geologists"*), which may be the only focused research on the Morrison formation in the Dewey-Burdock area, indicates that the formation's thickness varies widely and that there is a "marked difference" between the formation's composition in Edgemont and seven miles north of Edgemont.

Given the other information that is available and the importance of this particular issue, it is irresponsible for the EPA to conclude that mining fluids will be contained since this conclusion seems to be based mainly on the Permittee's documents, limited scientific information, and weak analysis. The EPA should obtain accurate and substantial third-party and peer-reviewed information and must analyze it thoroughly before granting these UIC permits and aquifer exemptions.

It says on the Page 123 of the Class III Fact Sheet:" The previous Class III draft Area Permit required the Permittee to conduct post-restoration monitoring to demonstrate that no ISR contaminants would cross the aquifer exemption boundary. This updated Class III draft Area Permit now requires the Permittee to develop a reactive transport geochemical model to evaluate the potential for ISR contaminant to cross the downgradient aquifer exemption boundary. To improve the predictive capabilities of the geochemical model, the Class III draft Area Permit requires the Permittee to first develop a Conceptual Site Model (CSM) and conduct targeted monitoring to calibrate the model as discussed later in this section." Unfortunately, when comparing EPA documents from 2017 to 2019, this is a major step in the wrong direction. EPA's proposal to eliminate down-gradient compliance boundary wells and post-restoration monitoring, and to replace them with a conceptual model is plainly wrong. Replacing physical monitoring with model-based extrapolation is a bad idea because models are not able to accurately depict the real world, especially in a complex hydrogeological environment like this area of the Black Hills. Both down-gradient compliance boundary wells and post-restoration monitoring should be kept as requirements of this project.

RELIANCE ON OTHER PERMITS

A glaring problem with EPA's documents on the proposed project is that large portions of the documents that were used to support the EPA's revised draft permits are still based on other permits that do not exist or that were prepared inadequately. For example, the EPA's documents defer repeatedly to the NRC's Supplemental Environmental Impact Statement (SEIS) for the Dewey-Burdock project. This document simply echoed the Permittee's submissions in many important respects, rather than the NRC taking a critical look at the issues. The EPA documents also refer repeatedly to the requirements of a state NPDES permit that has not even been applied for. And they refer frequently to a state Large Scale Mine Permit and a state Groundwater Discharge Permit (GDP) that are far from actually being issued.

To rely on non-existent regulatory instruments and what are essentially the Permittee's documents for large portions of the permitting documents indicates both problems with the regulatory process and a lack of analysis of the proposed mine, deep disposal wells, and aquifer exemption. These non-existent "permits" are relied upon for major aspects of the proposed mine and associated facilities. For example, the GDP and NPDES permits are relied upon for statements that the land waste disposal option will be safe and that there will be no contamination. This runs counter to the real world situation regarding this issue, which indicates a build-up of highly-toxic selenium at similar sites. Another problem is that EPA has apparently signed off on the Permittee's proposal to grow crops on these land disposal sites without any analysis of the safety of this practice for wildlife, domesticated animals, or humans

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Similarly, the EPA relies upon an "NPDES permit" that has not even been applied for to discuss the Emergency Preparedness Program and Environmental Management Plan that are the basis of its discussion of impacts from spills and leaks, worker safety, and other topics. The agency concludes "Because the project site will be reclaimed and released for unrestricted use," there won't be impacts to land use. It's a long way from a non-existent "permit" to full reclamation twenty years in the future. This use of speculative information should not be allowed as part of the application, cumulative effects, draft permit, or aquifer exemption documents.

CORRECTIVE ACTION

The purpose of the monitoring wells is to identify and assess impacts of ongoing uranium recovery operations and detect fluid movement out of the approved injection interval, should such an event occur. The problem is that the proposed corrective action required in the Class III permit is totally inadequate. Part II of the permit, section D.4.d. states that: "if wellfield pump test results indicate a possible breach in a confining unit that cannot be located for corrective action, or corrective action does not completely repair the confining zone breach, then the monitoring well system shall be designed to verify that wellfield injection interval fluids will remain within the approved injection interval per 40 CFR § 144.55(b)(4)." This is the worst kind of circular logic. Furthermore, to require the Permittee to develop "operational controls" as a method of achieving the corrective action is pure non-sense. Part III on Corrective Action only deals with problems that may occur when breaches are detected during pre-operational wellfield delineation and pump testing. There is absolutely nothing in Part III on Corrective Action that states what the Permittee should do during the subsequent operational period should a problem occur in which contaminants are detected in one of the monitoring wells (either vertically in one of the confining zones or horizontally outside the authorized wellfield area). In this case, the first thing that should be required is that the Permittee must shut down the entire system and the site restoration process should begin immediately while the problem is investigated. Why aren't these simple basic requirements included in the Corrective Action section? Because any potential breach in containment would be so impactful, it must be addressed immediately.

Another issue that should be addressed is that one set of monitoring wells is insufficient. In the nuclear industry, redundancy is always built into systems so they are practically fail-safe. The same thing is needed by this permit. Therefore, another ring of monitoring wells should be required to be installed outside the first ring (in the horizontal direction at least) in order to provide a second line of defense. So if and when an exceedance is detected in the first ring of monitoring wells, then it will be possible to have sufficient time to evaluate the proper course of action needed to address the situation.

ISSUE OF SUBSURACE RESTORATION

According to the Fact Sheet for the Class III wells, after the uranium recovery process has been completed in a wellfield, the groundwater restoration process begins for that wellfield. The contaminated groundwater is pumped from the wellfield and treated using reverse osmosis (RO). (See concern about RO treatment in subsequent section.) The restoration *bleed* and the reject water from the reverse osmosis treatment are injected into the Class V deep injection wells as described in the Fact Sheet for the Class V Draft Area Permit under Section 7.8 *Approved Injectate and Injectate Permit Limits.*

However, a critical issue with these permits that is not addressed by the EPA is whether the subsurface can ever be restored after the ISL mining operation shuts down. Otten and Hall of the U. S. Geological

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Survey are among those who have observed that "To date, no remediation of an ISR operation in the United States has successfully returned the aquifer to baseline conditions" ("In-situ recovery uranium mining in the United States: Overview of production and remediation issues" at http://www-pub.iaea.org/mtcd/meetings/PDFplus/2009/cn175/URAM2009/Session%204/08_56_Otton_USA.pdf). Bill Von Till of the NRC issued similar sentiments when he said in August 2010 "to date, restoration to background water quality for all constituents has proven to be not practically achievable at licensed NRC IS[L] sites" (credited in another source to EIS for Moore Ranch ISR project, WY., p. B-36). This is important because when companies cannot restore water to baseline conditions or to the standards set by the NRC, the NRC typically just raises the amount of contamination allowed. At some point, the restoration water "fits" those raised standards, and the mine's water is declared "restored." This is unacceptable for the NRC, and it is equally unacceptable for the EPA to establish Alternate Concentration Limits (ACLs) in this fashion. It is important that standards are set at the true "baseline" (the original condition of the project area's water prior to uranium drilling or mining), and that the EPA retains its baseline permit limits through the restoration process.

Given these experiences in the current real world of ISL mining during in the United States and the presumptions of companies who propose this type of mining, it is imperative that regulatory agencies approach these permits with abundant caution. If no U.S. ISL mine has ever returned the water to baseline and if restoration to background has proven to be not achievable, what makes the EPA believe that this unprecedented task will be accomplished at Dewey-Burdock site? This question must be addressed explicitly and analyzed thoroughly as a result of a full NEPA process, if the EPA decides to push forward rather than deny these UIC permits and the aquifer exemption.

PROCESS ISSUES

A key process issue is that EPA has seemingly gone through all sorts of contortions in its Class V Fact Sheet in an attempt to define what is clearly a Class I well as a Class V well. The disposal would clearly take place above a USDW, in the Madison formation, which is a large aquifer of broad use in the Black Hills. It is used by, among others, Edgemont and Rapid City. The EPA justifies its labeling of Class I wells as Class V wells by treating them as Class I wells for construction and monitoring purposes and by requiring the Permittee to treat the injectate until it is "at or below radioactive waste standards" (Class V Draft Area Permit Fact Sheet, p. 8). Many people in the area expressed their fear in the public hearings that this is insufficient because they believe the risk of our water becoming irreversibly contaminated is just too great.

The other glaring process issue is that the EPA has rushed the process, creating draft permits and exemption without going through the proper rule-making process. This is the first time that the EPA has issued draft permits for Class III wells for an ISL uranium mine and it seemed to be in a hurry to do so. There have been extensive private and behind-the-scenes discussions of the process with the Permittee and the uranium industry, resulting in these procedures, guidance, and draft documents. The draft permit and draft aquifer exemption documents often mimic others, including documents from the Permittee, rather than creating a thoughtful analysis of the situation. (See Document Issues). However, there has been no public process on the de facto regulations created and used to craft the draft permits and draft exemption – no public notice, no public hearings, no analysis of public input. This violates the Administrative Procedure Act (APA), as well as the spirit of American government. If allowed to stand, the entire process would fail to fully consider the project, provide adequate public input, leave western South Dakota with contaminated water, set a bad precedent for future proposed projects, and violate the APA.

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WASTEWATER TREATMENT ISSUES

One critical issue not adequately addressed by these permits is that no analysis or discussion of whether it is even possible to treat the quantity of water being used by this project to the required standards. If it is not and if the process is not closely monitored, then water will be permanently contaminated. There is no analysis or discussion of whether it is possible to treat the water quickly enough to keep up with the injection rate proposed by this project.

There is also no analysis or discussion of the reverse osmosis (RO) facilities, their location(s) in the project area, or the impacts they would bring. Included in the Class V Fact Sheet is the assumption that at least 30% of the water put through the RO process typically becomes waste water. However, RO units really use approximately three times as much water as they treat (ref. https://www.epa.gov/sites/production/files/2015-11/documents/2005_11_17_faq_fs_healthseries_filtration.pdf). So an estimate of wastewater generation is more like 300%, or an order of magnitude higher that stated in the draft permit. And this wastewater is a brine that will be radioactive and full of heavy metals requiring further treatment before being disposed of as 11e waste. Even if the RO treatment is feasible, there is also the question of whether RO treatment of all this water can be done economically given the other project costs and the current price of uranium at about $25.00/lb. A responsible agency would include a full discussion of the RO process and its impacts on the environment, waste treatment, bonding requirements, and the feasibility of the project. It would also provide numerous examples of places in which this operation has proceeded successfully at the flow rates and with the contaminants proposed by the Permittee.

In addition, membranes from the RO process typically last only two to five years, even with adequate pre-treatment and routine maintenance. (https://www.epa.gov/sites/production/files/2015-08/documents/ reference_guide_to_treatment_technologies_for_miw.pdf) What happens to these membranes when they are no longer usable and how must they be disposed of?

At the end of the day, we contend that, if the RO process and the actual costs of full aquifer restoration were considered, this project would not be feasible economically, technically, or environmentally. The history of the uranium industry includes abandonment of almost 200 mines and prospects in the southern Black Hills and over 3,000 in the Upper Missouri River basin, plus thousands more in the Southwest. Given this history, the Permittee should be forced to provide an economic analysis using current uranium prices that shows that this project is feasible before they are given any UIC permits or an aquifer exemption. They should also provide a copy of a contract with a buyer for the uranium that would be produced at the mine. Even at a modern ISL mine, the Smith Ranch-Highlands mine in Wyoming, aquifer restoration took place for 10 years, and the water quality was about the same as when mining ended, according to a Violation issued by the Wyoming Department of Environmental Quality. Part of the reason appeared to be that the company was allowed to stop remediation because of costs. This situation should not be allowed to happen again. Strict and regular on-site regulatory enforcement must be an important part of the EPA's permitting and exemption process.

COMPLETION OF KEY TESTS ARE LEFT UNTIL AFTER PERMITS ARE ISSUED

The EPA also wrongly leaves the completion of key tests until after permits are issued, including the following:

- wellfield delineation drilling,
- establishment of current water baselines,
- identification of faults,

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- tests of the integrity of the confining zones,
- identification of leakage in the Fuson confining zone,
- how to deal with a 10" diameter leaking TVA well,
- information on unsaturated groundwater flow (this should be done in real life testing, not using a model that can be easily manipulated),
- collecting drill cores to determine the characteristics of down-gradient aquifers' geochemistry,
- measurement of confining zone thickness,
- all of the work leading up to and including the Injection Authorization Data Package Reports (Class III Fact Sheet, pp. 70-71),
- radiological impacts analysis (independent of the Permittee's analysis),
- demonstration of the effectiveness of vertical and horizontal monitoring systems,
- identifying and creating a contract for disposal for 11e wastes and solid wastes,
- the establishment of down-gradient compliance boundary wells (these should not be moved in case of an excursion, but should be maintained at their original locations), and
- pump tests.

These key tests need to be completed BEFORE any permits are issued.

FINANCIAL ASSURANCE

Based on the history of the uranium industry, it is our position that uranium mining cannot be done safely. So having adequate financial assurances in place is absolutely imperative.

P. 129 of the Class III Fact Sheet and p. 58 of the Class V Fact Sheet says that demonstration of financial responsibility by the Permittee should be done through a surety bond "or other adequate assurance." However, the only assurance that should be accepted is an adequate surety bond. The value of the Permittee's company, if there is any, should not be used to demonstrate financial responsibility. In addition, the definition of an "adequate" surety bond is critical. As noted above, in western South Dakota and elsewhere, it is common history that uranium and other mining companies have been unable to fund full restoration after mining. They often go bankrupt and leave the cleanup burden on taxpayers – if restoration is even technically feasible.

Another key issue is that the amount of financial assurance required of the Permittee by these two UIC permits is too low by a wide margin. To be based *only* on the plugging and abandonment costs (in the case of potentially thousands of Class III wells [$583,620 for only the first year of operations] and in the case of the two Class V wells [$371,160]) for a total of only $954,780 is absolutely ludicrous! The actual amount of liability represented by this operation will be many times this figure.

For example, in the case of in situ leach uranium mining, the Wyoming Department of Environmental Quality (DEQ) raised the bonds at the Highland and Smith Ranch ISL mines from $38,416,500 to $80,000,000, after it discovered that restoration attempts were not having any effect. In its March 10, 2008, Notice of Violation, the DEQ indicated that the real cost of restoration would be "on the order of $150 million." The EPA should heed the Wyoming experience and insure that bonds for all activities that are associated with this technology are adequate, especially since full restoration has never happened at any ISL in the US. Based on this information, it is our recommendation that EPA stipulate that the Permittee be required to post a surety bond for this project of at least $100,000,000 so as not to be on the hook for a significant portion of the remedial action that will be required in the future.

This is especially important because the Permittee has already admitted that its restoration is likely to be incomplete. In a 2014 "Restoration Action Plan" submitted to the NRC, the Permittee said that

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"elevated concentrations above the restoration criteria may remain in the production zone following restoration," which the Permittee called "hot spots." The Permittee suggests that, after further study, the "hot spots" could be ignored and the "well field be declared restored." This is unacceptable, and the EPA should explicitly prohibit this practice.

We also do not want a repeat of what happened at Wasta, SD, about 50 miles east of Rapid City. There, a drill bit and 150' section of equipment broke off when a driller was looking for oil. Groundwater can be exposed, creating a possible link between the Minnelusa and Inyan Kara formations, and plugging the resulting hole may be impossible. The State's bond was wildly inadequate (*Rapid City Journal*, January 23, 2017 and March 17, 2017). We are not willing to take the risk that something similar might happen at the proposed Dewey-Burdock site which could actually be much more catastrophic.

OTHER ISSUES

There are many other issues with the EPA documents and statements with which we simply disagree. For example, on pages 14-16 of the Class III Fact Sheet, it talks about ten "wellfields" in the Burdock area and four "wellfields" in the Dewey area. But nowhere has EPA set a limit of how many injection and production wells the Permittee may construct. However, EPA should certainly set a limit and that limit should be a conservative number of wells.

One major permit revision that we had hoped would be made based on previous comments is a stronger statement by EPA forbidding any further action by Powertech until the company has identified and plugged the 7500+ old boreholes on the Dewey-Burdock site. Unfortunately it was not made, but it's absolutely critical because without this requirement, the project is clearly an accident waiting to happen.

The various types of ponds allowed by these permits should not be built where there are old drillholes. Best practices should be followed for all ponds to avoid leakage either through the bottom or through flooding. This includes at least the following: thick, high-quality double liners, clay liners, leak detection systems, procedures for frequent checking of leak detection systems, and the maintenance of substantial empty space in the ponds to accommodate flood events.

It is also not wise to build ponds in the 500-year floodplain, especially given the increase in flooding incidents in the area, and this should not be allowed. Similarly, the design of sediment control structures should protect from events larger than a 5-year, 24-hour precipitation event – especially because the mine and the ponds will exist for up to twenty years. This will ultimately result in spills from these ponds. It also goes against EPA's statement that surface water impacts "should be minimal." Impacts will not be minimal if a flood washes out sediment structures or over-tops a pond containing hazardous materials even once.

In addition, the EPA should not rely on the NRC's analysis, recommendations, or regulations. The processes by the two agencies should be independent, so that the benefits of the expertise and different regulatory focuses of both agencies would be utilized for the proposed operations, as well as the aquifer exemption and other issues.

All boreholes and old uranium mines in the project area should be plugged and reclaimed before any further mining is allowed. Not only does this protect the water, soil, and air of the area, but it also protects workers who would be exposed to the old, open mines. Abandoned open pit uranium mines spread contamination through the water, sediment, and air, as shown by research done by Dr. James Stone of the South Dakota School of Mines and Technology and others.[ii] The old mines must be

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reclaimed, and the soil, air, and water must be tested to insure that it is safe before allowing any new uranium mining to go forward.

As noted on p. 23 of the Class V Fact sheet, properly calculating the injection zone critical pressure rise is crucial to be able to safely operate the deep disposal wells. It was good that EPA did not agree with some of Powertech's assumptions and recalculated the critical pressure values in the Madison Formation in the revised permits. However, it is apparent that certain assumptions can vary the critical pressure rise results widely. For this reason, more oversight by EPA is needed rather than simply letting Powertech "recalculate the critical pressure rises for each injection zone based on the site-specific information collected during the construction of each well" (p. 25). EPA must also hold firm that if the resulting injection rates are even near the critical pressure, the permit would not be granted. It is vital to protect the Madison aquifer, and the nature of the upper portion of that aquifer is particularly concerning due to the presence of rapid water movement.

P. 42 says: "The Area Permit does not authorize injection into an USDW. As discussed in Section 5.3.2, Powertech must demonstrate that the Minnelusa injection zone is not an UDSW [sic]". As far as we are concerned, this permit should not be issued at all UNTIL after Powertech has done the work necessary to prove that the Minnelusa injection zone is not an USDW.

Next, deep disposal well integrity should be tested at least once per year, not as infrequently as every 5 years, as EPA required (Class V Fact Sheet p. 53). And injectate should be monitored and analyzed regularly, as the characteristics of wellfields will differ, and the functioning of the RO system may also vary in effectiveness. Records should be maintained until at least five years after the end of the project, in case problems develop over time, not for as little as three years, as specified (p. 56).

As mentioned above, modeling is a weak alternative to on-the-ground testing. The EPA should certainly not rely exclusively on models for any decision or requirement in the case of such a complex, controversial project – especially models developed by or for the Permittee. There should be independent analysis of any information currently left to modeling. As the EPA notes in the Cumulative Effects Analysis, "there is inherent uncertainty in the results" (p. 108) when modeling is involved.

The length of time that the proposed Dewey-Burdock project would be active should be clarified. This goes directly to the potential impacts of the project. The estimate in the State Mining Permit Application is seven to 20 years of uranium recovery, maybe more, with the Central Processing Plant likely to operate longer. The Class III draft permit is for the "operating life of the facility." So with 14 wellfields, each operating for two years, this could be as long as 28 years, if the Permittee ran them consecutively. There is also the potential for the Permittee to expand the project to include its contiguous claims to either the east or west of the current project area. There's a difference between regulating a project that lasts seven years and regulating a project that lasts over 20 years. The draft permits and Cumulative Effects Analysis should discuss the full range of potential impacts and scenarios.

A number of statements in both Fact Sheets make it apparent that the EPA is acting subjectively in many cases rather than factually – basically where ever it says "expected." Given the critical nature of this project, many of these statements should, instead, be made factual. For example, statements such as: "The overlying confining zone for the Lower Chilson is expected to provide adequate confinement…" (p. 67 of the Class III Fact Sheet) and "The uranium ore is located in the Lower Chilson sand unit, which is expected to be locally hydraulically confined in the area of Burdock Wellfield 6." (p.68) do not instill confidence in the process. Other examples include: "The proposed injection zone for injection wells DW No. 2 and DW No. 4 is the Deadwood Formation, which is expected to lie beneath all

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USDWs in the area." (p. 8 of the Class V Fact Sheet). Such statements should be scientifically proven, not "expected" into existence.

We support the conclusion of EPA's statutory analysis that the Dewey-Burdock mine is subject to the Clean Air Act and subpart W. If the project goes forward, we request that public education sessions and public comment periods be held as part of the subpart W regulatory process.

The citizens of the area that would be most impacted by this project spoke loudly and clearly at the hearings in April and May of 2017, as well as the hearings in Hot Springs on October 4, 2019, that they were opposed to this project. The will of the people is what counts to most in a democracy. So the EPA should act consistently with the voices of the vast majority of the people at these hearings, rather than approving a project that is poorly considered, ill-advised, full of gaps, and dangerous to the health, the economy, the cultural resources, and the environment of the Black Hills. And if these drilling activities are actually allowed to proceed, there should be a provision that makes all resulting information public.

None of this information will be subject to public review or comment, and key information would become available only after permits have been granted. This turns the regulatory process on its head. All testing should be done, subject to both professional and public reviews, before any of the draft permits or the aquifer exemption are issued.

As part of this process, note that current conditions do not provide an adequate or accurate "baseline." All baseline measurements (ground and surface water, air, soil, sediment, etc.) should be defined as the original condition of the project area, before drilling and mining.

Moving to the nature of the ISL uranium industry, the Fact Sheets and Cumulative Effects documents do not discuss the uranium industry's record in relation to problems with the ISL process at other sites. This minimizes the many problems that the ISL industry has experienced and, thus, the potential problems from the Dewey-Burdock project. This makes the portions of the draft permit dealing with excursions and leaks inadequate, as well as sections about mitigation and reclamation. For example, the Crow Butte ISL mine near Crawford, NE., has had 85 license violations and reportable incidents. These range from excursions to leaks and spills to wells failing integrity tests. One leak at this site was not found or dealt with for over two years, which makes a mockery of the EPA's great faith in gauges, sensors, alarms, and other hardware to identify leaks and related system problems.

If EPA staff looks over the information about ISL mines and regulation at http://www.wise-uranium.org/umopusa.html (WISE Uranium, "Issues at Operating Uranium Mines and Mills – USA," last updated April 19, 2017), it quickly becomes clear that excursions are "normal," as the former CEO of the Permittee said in a public forum in Colorado, and that leaks of both pipelines and ponds are common. This indicates that both surface and ground water are at risk.

This source also documents the movement of mining fluid beyond the mine boundary at the Kingsville Dome ISL mine in Texas (Rice. 2013. "Excursions of Mining Solution at the Kingsville Dome In-Situ Leach Uranium Mine." *Austin Geological Society Bulletin)* and the Highland Uranium Project in Wyoming. A summary of this type of information can also be found at Daniel Simmons-Ritchie, "Troubled history" in the *Rapid City Journal*. September 23, 2013. A history of these issues in the northern Plains region can be found in "Uranium Activities' Impacts on Lakota Territory," in the *Indigenous Policy Journal* (by L. Jarding. 2011).

As for other companies, there are 11 uranium companies that have expressed an interest in the Black Hills, and one – Peninsula Minerals – recently started an ISL mine on the northwestern edge of the Hills

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in Wyoming. If the Dewey-Burdock project is not abandoned and if the Permittee acquires all the needed permits (at least 10 at last count, including the Clean Air Act permit), then this would be the first ISL mine in South Dakota. If the Permittee is allowed to move forward – especially on such flimsy permitting documents – a precedent would be set. We do not want to open South Dakota to a stampede of ISL uranium mining companies, for all the reasons discussed in this document. However, for the EPA's documents to be complete, the existing mine(s) in the Black Hills and the potential for a much larger number of ISL uranium mines must be fully considered.

In addition, the Permittee has claims to the east of the current project boundary, and it has contiguous claims just across the border in Wyoming. This is very clearly a topic that should be considered under any discussion of cumulative effects. According to our research, the Permittee has approximately 744 federal claims in Wyoming, with the majority being across the border from the Dewey-Burdock project area.

Another important omission is that the draft permits beg the question of who is going to do on-the-ground regulation of the proposed mine and deep disposal wells. In 2011, the State of South Dakota suspended its ability to regulate in situ leach uranium mining, so it has no authority to do that regulation at this time. The NRC has two inspectors based in Texas, who visit ISL mines once or twice a year. There is no indication that their regulation can be complete or happen often enough to catch problems. This is tremendously important. The draft permits include some very critical actions, such as testing the Minnelusa Aquifer to determine its water quality before deciding whether the Permittee can proceed with deep disposal wells. This is a high-stakes test that would impact the future of the southwestern Black Hills. First, the water quality test should have been done under EPA's direct supervision before a draft permit was issued. If water in the Minnelusa aquifer turns out to be appropriate for drinking water, the time and expense of creating the application and the Class V draft permit would have been avoided – as would have the stress on people in the area who use and rely on the aquifer.

The testing of the water in the Minnelusa aquifer should be done under EPA's direct supervision, rather than allowing the Permittee to do a test in the areas of its choice using equipment it supervises, sending the sample to the lab of its choice, and expecting the people who use the Minnelusa Aquifer in the southern Black Hills to believe the results.

Similarly, the following must be done under the direct supervision of a knowledgeable regulator:

- pre-mining water quality testing in the proposed mining area,
- testing designed to determine the likelihood of down-gradient excursions,
- information underlying decisions about what holes and wells should be plugged,
- mitigation of air quality impacts,
- pump tests,
- well construction,
- reports on and handling of vehicle accidents involving hazardous or radioactive contaminants,
- groundwater level measurements,
- injection fluid characteristics,
- post-restoration monitoring,
- determination of the corrective response that must be taken when an excursion happens (this is currently left to the regulated company),
- well plugging and abandonment,
- analysis of radiological issues,
- disposal of hazardous wastes,
- regulation of a variety of soil issues (Section 7.0 of Draft Cumulative Effects Analysis),

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impacts that this water use could have on the environment and economy of the southwestern Black Hills. The southern Black Hills is a semi-arid area that will need all its ground water in the future. This need will grow with climate change and with the ongoing depletion of the High Plains (Ogallala) aquifer a bit to the south.

Another major problem is the admission in section 4.7.1 on p. 52 that injectate from the Class V wells will mingle with Madison aquifer water and come to the surface at Cascade Springs, about 20 miles away. While the EPA says this will happen "on the scale of 10,000 years" in its CEA, remember that calculations of water movement underground at the site vary widely. The information presented in the documents indicates that EPA apparently believes that water movement is many times slower than independent estimates. Also, there are other wells into the Minnelusa and Madison aquifers to the south and east, over the 20-mile span between the project site and Cascade Springs. This admission should result in the EPA denying the Class V UIC permit.

There is also a question about the rate of pumping of water during the mining operations. In Section 5.2.1 of the Draft Cumulative Effects Analysis, the text says that the "header piping [would be] designed to accommodate injection and production flow rates of 2,000 gpm…." (p. 56). On the next page, the document says that each header house will service up to 20 production wells and 80 injection wells. The schedule for the project indicates that as many as five wellfields will be active at one time. As each wellfield is likely to have more than 100 wells, so these numbers add up to more than the 8,500 gpm that the Permittee is asking to use. This amount of water is huge and its cumulative effects need to be carefully researched and analyzed before issuing any permits on the proposed project.

Much of the mitigation sections appears to be vague, incomplete, or based on stock language picked from other documents, such as the discussion of soil impacts mitigation in the CEA (pp. 78-79). The mitigation sections of EPA documents should offer a complete and detailed analysis of the required mitigation that is site specific at the Dewey-Burdock location. To top it off, the EPA makes use of the Draft Cumulative Effects Analysis difficult, as the document has neither a Table of Contents nor an Index. In the future – and before further action is taken on the proposed mine, Class V wells, and aquifer exemption -- we hope that the EPA will rectify this and the other omissions.

In addition, many key aspects of this CEA rely upon non-existent "permits." Examples are almost too numerous to count, but suffice it to say that unless these non-existent "permits" are actually issued, information based on them should be omitted from the EPA's documents. This draft CEA as written by the EPA is neither realistic nor complete and should therefore be re-done.

The statement that "radon-222 itself has very little radiological impact on human health or the environment" (p. 85) runs counter to what is common knowledge. It certainly runs counter to EPA's own website on the topic: https://www.epa.gov/radon/health-risk-radon. The UIC Program needs to go back to the drawing board and do a comprehensive, science-based analysis of this issue.

Along the same line, in its discussion of the Central Processing Plant, the CEA says that "ventilation systems will exhaust outside the building" and that there will be "open doorways" on processing buildings (p. 86). It should be specified that, for the safety of workers, the open doorways are nowhere near the exhausts and that employees should be fully informed of this situation.

The treatment of radiological wastes from the drying cycle at the Central Processing Plant is not specified. On p. 86, the CEA says: "The off-gases generated during the drying cycle will be filtered through a baghouse…" and it also mentions a "sock filter" (p. 87). However, the document does not give any information on where or how the wastes collected in the baghouse or sock filters would be

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disposed. It is assumed that these wastes will be radioactive, so will probably be 11e wastes. But readers (and the Permittee) should not have to guess about such things. This situation should be the subject of comprehensive analysis, and the entire waste cycle should be specified clearly. There is also no discussion of potential accidents during processing (which have occurred historically at other sites) or the remediation or mitigation that might be needed as a result.

The sections on ground water use in the draft CEA overly rely on the opinion of one person, the former South Dakota State Engineer. Other people should also be consulted. Another problem that has been common in the mine area and that is omitted from the EPA's discussion is wildfires. There have been at least three large wildfires in the area in the last five years. The Crow Butte ISL mine – only about 65 miles from Dewey-Burdock -- was evacuated in 2012 due to a wildfire. The impacts on water, air, and land could be enormous, if a building containing nuclear materials, wellfields, or storage ponds were impacted by a wildfire. The discussion of cumulative effects must include a thorough discussion of how this type of problem would be dealt with to protect the land, air, and water.

NATIONAL ENVIRONMENTAL POLICY ACT ISSUES

A major issue in this case to which we have strong objections has been due to the failure of the EPA to adhere to the National Environmental Policy Act (NEPA) process. While the NRC has attempted to follow that process for the possession of nuclear materials, its actions have not adequately covered a variety of issues that are under the EPA's purview, particularly water issues. The EPA needs to complete its own NEPA process.

The Permittee's project has also changed in many important respects between the time the NRC began considering it and the time the EPA began considering it. Examples include:

- NRC original documents consider the use of 4,000 gallons of water per minute (GPM) for the mining and reclamation process. The current revised draft permit indicates that the expected use of water to be 8,500 GPM, almost twice as much! This is equivalent to withdrawing over 12 million gallons per day, a huge amount to be taken from the area's limited water resources.
- This project was originally described as involving 1,500 injection, recovery, and monitoring wells. EPA's current draft permits indicates that this number is more than 4,000 wells, which is nearly three times more wells than originally given.
- The projected bleed rates have varied over time, from 0.5% of the water used to 17% of the water used currently. In addition, the reverse osmosis process makes at least 30% of the water put through the RO process into waste, and this is not fully considered in the EPA documents. This seriously weakens all the assumptions and calculations on water use in the Class III draft permit and in the Draft Cumulative Effects Analysis.
- Documents prepared by Petrotek for the Permittee set subsurface water movement rates at 6 to 7 feet per year (without offering peer-reviewed sources). NRC documents set the transmissivity rate in the Fall River formation at 255 ft. per day and in the Lakota formation at 150 ft. per day. Dr. Perry Rahn's 2014 article, mentioned above, concluded that the average ground water velocity for the Lakota and Fall River formations in the Dewey-Burdock area was 66.1 ft. per year. But, he said, groundwater velocity in the Inyan Kara Aquifers at the Dewey-Burdock site might be as much as 5,480 feet per year – over a mile. He considered this number "very high," and it "might indicate fast groundwater movement through very permeable units or through fractures." The draft permits omit this critical information that could have very real impacts on wells that are downgradient of the proposed mine site. This issue is critically important, and further independent studies should be done before any permits are issued.

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- The Permittee talked about the possibility of doing open pit mining at the NRC hearings, and this possibility is not raised in the EPA documents.

These changes in the parameters of the proposed project go to the heart of the information that informs the process in this case. The NRC and the EPA have had different projects submitted to them. The processes are not functional equivalents, and consideration of both projects would not be redundant – it would be sensible. The EPA should begin a thorough NEPA process to assess the project as it is currently proposed.

As part of any new or continued process, the EPA should consider more than one alternative action. Although there are places where more than one alternative is considered for a minor action, the major actions only offer one alternative – giving the Permittee a Class III Area UIC permit, a Class V Area UIC permit, and an aquifer exemption.

The EPA must also do a thorough tribal consultation. The existing documents indicate that this process has barely begun, and yet the draft permits have been issued. This makes a mockery of the consultation process, which should be completed well before draft permits are issued, so that the resulting information can be analyzed. The EPA must halt all further action until mutually-satisfactory, government-to-government consultation is completed. All cultural and historical properties must be identified by Lakota experts, who should be paid if they so desire, and given complete protection.

ENDANGERED SPECIES ACT ISSUES

At the end of the Class V Fact Sheet and the Draft Cumulative Effects Analysis, the EPA states that the Endangered Species Act will be complied with, but gives no information on how it intends to do this. When will this be done? What species will be considered? Who will do the analysis (surely not the Permittee)? This should already have been completed before draft permits were issued.
The EPA mentions the presence of a short-horned lizard, which is rare and protected in South Dakota, in the proposed project area. After stating that the species is "important in some tribal cultures," it offers the solution "Once construction activities begin at the site, the EPA expects that the [sic] any short-horned lizards that were in the area will seek less disturbed locations." This is pure conjecture, without any back-up information on the size or habits of the lizards. Are they territorial, or is it species-appropriate for them to move? Are they large enough to move fast enough to out-run a bulldozer or pick-up truck? Or are they, in reality, unprotected?

This and similar information must be provided and backed by scientific research at the Dewey-Burdock site for this and other species. Animals should not simply be expected to move out of a site that's over 10,000 acres in a systematic and comprehensive process. And the EPA then expects them to just move back in after mining is complete – as if the same animals will be alive and remember their former homes after as many as 20 years. This is beyond unacceptable in the direction of ludicrous – and is certainly unacceptable.

Species other than animals are not considered in this discussion. Plants cannot simply move off the site. Some of them are important to tribal practices and customs, such as medicinal plants and timpsila (prairie turnips). Full scientific information should be gathered, and full analysis must be done, for non-animal species. Species that are important to the long-term residents of the area -- the Lakota, Cheyenne, and other native nations – require special protection. There is already information on protection of some species in project documents that could serve as a base for part of this analysis. However, a full and independent analysis is also needed.

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In conclusion, we believe that this uranium should be left in the ground because when uranium is mined, it becomes harmful to both the people and the planet. The Oglala Sioux Tribe respectfully requests that the EPA halt the permitting processes for the proposed Dewey-Burdock project by denying both Class III and Class V UIC well permits and the aquifer exemption.

Sincerely,

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Sustainable Environmental Energy Engineering, LLC
Consultant for the Oglala Sioux Tribe

Notes & References:

[i] Note that if these drilling activities are actually allowed to proceed, there should be a provision that makes the resulting information public.

[ii] Onyeukwu, Kyrian. 2007. *Assessment of Wind- and Soil-Related Hazards Associates with Abandoned Uranium Mines in the North Cave Hills, Harding County, South Dakota.* Master's Thesis, S.D. School of Mines and Technology; Stone, James, and Larry Stetler. 2008. Environmental Impacts from the North Cave Hills Abandoned Uranium Mines, South Dakota. *Uranium, Mining and Hydrogeology;* Tuombe, Emmanuel. 2008. *Surface water and sediment investigation concerning abandoned uranium mines in the South Cave Hills, North Cave Hills, and Flint Buttes region, Harding County, South Dakota.* Master's Thesis, S.D. School of Mines and Technology; Albertus-Benham, Hannah. 2009. *Surface water and sediment investigation concerning abandoned uranium mines within the Slim Buttes region, Harding County, South Dakota.* Master's Thesis, S.D. School of Mines and Technology; Stone, James, Larry Stetler, and Albrecht Schwalm. 2007. *Final Report: North Cave Hills Abandoned Uranium Mines Impact Investigation.* Prepared for U.S. Department of Agriculture: Forest Service-Region I, Missoula, MT. at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3834131.pdf; Sharma, Rohit, and James Stone. 2013. Chemical composition of bottom sediments within black hills region reservoirs of South Dakota and Wyoming. *Environmental Earth Sciences.*

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Re: SUPPLEMENTAL WRITTEN TESTIMONY on the potential adverse effects of changes to the proposed UIC draft permits for the Powertech/Dewey-Burdock project.

Dear Valois,

The undersigned, Dr. Hannan E. LaGarry, an individual, residing at 526 Chapin Street in Chadron NE 69337, hereby provide the following SUPPLEMENTAL WRITTEN TESTIMONY to the above-referenced draft permits and documents related to Powertech/Dewey-Burdock. These written comments are provided in addition to the written testimony provided at the original hearing in Hot Springs SD in May 2017, and additional written testimony from July 2017.

INTRODUCTION

I have served as an expert witness for the Consolidated Intervenors and the Oglala Sioux Tribe since 2008, and have provided numerous expert written expert testimonies for both the Crow Butte Resources (CAMECO) and Dewey-Burdock (POWERTECH/ AZARGA) ISL uranium license interventions. In my initial testimony I provided the data we recovered from our examination of Powertech's belatedly disclosed borehole data purchased from the Tennessee Valley Authority (TVA). Within this data we observed that the drillers of the TVA boreholes documented uncased holes, improperly plugged holes, artesian water, breccia pipes and caves, and faults. In my expert opinion, secondary porosities in the Dewey-Burdock area are such that loss of containment and the escape of pressurized fluids from underground waste injection are almost a certainty should either mining or injection be allowed. In this document, I will briefly outline my concerns with respect to the proposed changes to the 2017 draft permit.

PROFESSIONAL BACKGROUND

I have 25 years of experience studying the rocks and fossils of northwestern Nebraska. From 1988- 1991 I collected fossils from northern Sioux County for my dissertation work. From 1991-1996 I led field parties from the University of Nebraska State Museum while mapping the

fossils and geology of the Oglala National Grassland in Sioux and Dawes Counties. From 1996-2006 I led a team of geologists from the Nebraska Geological Survey that mapped in detail the surficial geology of most of northwestern Nebraska (a total of 80 1:24,000 quadrangles). This mapping included the entire Pine Ridge area and the area between Crawford, Nebraska and Pine Ridge, South Dakota. These maps, including digital versions (ArcInfo) and supporting field notes, are available from the University of Nebraska-Lincoln School of Natural Resources. As a direct consequence of this mapping, I have published peer-reviewed articles on the Chadron Formation (Terry & LaGarry 1998), the Brule Formation (LaGarry 1998), the mapping of surficial deposits (Wysocki & others 2000, 2005), and local faults (Fielding & others 2007). In future, we also intend to revise and reclassify the remaining rocks and surficial sediments of northwestern Nebraska and adjacent South Dakota.

In addition to my ongoing geological work in Nebraska, I have been working with students and faculty to study the geology, groundwater, surface water, and heavy metal contaminants of southwestern South Dakota and the Pine Ridge Reservation. For the past 6 years our research has been funded by the National Science Foundation's Tribal Colleges and Universities Program and Experimental Program for Stimulating Competitive Research, and the USDA National Institute for Food and Agriculture Tribal College Equity Program. We have formed and maintained partnerships with Chadron State College, the South Dakota Geological Survey, the South Dakota School of Mines and Technology, South Dakota State University, the University of Illinois Urbana-Champaign, the University of Illinois Center for Advanced Materials Purification of Water Systems, the Department of Health Physics at the University of Michigan School of Nuclear Engineering, the University of Washington Native American Research Center for Health, and the Technological University of Darmstadt, Germany. I have authored or coauthored reports detailing the preliminary results of studies describing toxic heavy metal contamination of drinking water (Salvatore & others 2010, Botzum & others 2011), characteristics of local aquifers (Gaddie & LaGarry 2010, LaGarry & others 2012), potential uranium contamination risk to communities on the Pine Ridge Reservation (LaGarry & Yellow Thunder 2012), and the transmission of uranium-contaminated water along regional faults (Bhattacharyya & others 2012), among others.

THE CHANGES FROM 2017 TO 2019

The EPA's proposed changes to the 2017 are paraphrased as follows:

1. The injection wells can be 600' closer to the mine
2. Looser regulation of size and scope of aquifer exemptions
3. Removal of down-gradient monitoring requirements

4. Open-hole completion for well construction
5. Removal of post-restoration monitoring requirements
6. Optional Madison well compensation for wells lost to contamination
7. Ending testing requirements for Class V injection adjacent aquifers
8. Requiring disclosure of private wells impacted by aquifer exemption
9. Limiting injection to Powertech generated waste
10. No reporting of seismic events <4.0 MMI
11. Original request for 8 wells reduced to 4, with 2 being fast tracked

Injection wells can be 600' closer to the mine

In two earlier opinions, including the one I submitted at the May 2017 hearings in Hot Springs, I described the "swiss-cheese" nature of the wellfielde at Dewey-Burdock and its long-term lack of containment. This assess meant was supported by the ASLB in that they imposed licensing requirements that Powertech exhume and properly close large numbers of potentially open holes. I fail to see the logic or benefit to moving a pressurized injection site closer to a demonstrably unconfined wellfield. It is as if you want to increase the likelihood of a pressurized leak.

Looser regulation of size and scope of aquifer exemptions

Without clearly demarcated limits of exactly where and how much of an aquifer is exempted, the pattern of behavior long established by ISL mines is to automatically default to ACLs, or as seems to be the case here, no limits at all. This is permission to pollute and avoid accountability.

Removal of down-gradient monitoring requirements

During the hearings there was much discussion about whether or not groundwater within the Minnelusa Aquifer flowed west, east, or not at all. Based on groundwater flow mapping by the United States Geological Survey (Driscoll and others 2002), water in the vicinity of the Dewey-Burdock site flows S/SE along the southern edge of the Black Hills, and once into greater Fall River County, groundwater flow is due east. This report makes no mention of a groundwater divide or other circumstance that would indicate isolation of groundwater within the Dewey-Burdock vicinity.

The flow from north of Dewey-Burdock to the SW has been measured at 591 feet/day, but flow south of the site has been measured at 7,393 feet/day. Once eastward flow is established, its been measured at 4,349 feet/day to the east at the SD-WY state line, then 1,463 feet/day to the east in northern Fall River County and 732 feet/day to the east in central and southern Fall River County. On average, flow from Dewey-Burdock towards Edgemont, Hot Springs, Buffalo Gap, Oelrichs, and the western border of the Pine Ridge Reservation is about 3,484 feet/day. The Pine Ridge Reservation (Oglala Lakota County) is 46 miles from the Dewy-Burdock site, which means contaminated water from Dewey-Burdock could travel to the Pine Ridge Reservation in 70 days.

Edgemont would be affected in weeks, and Hot Springs would be reached in as little as 35 days.

Removal of monitoring means that contaminant plumes will reach and be consumed by nearby community members with no advance warning. People will be directly impacted, and removal of the few available means of getting advance warning is a violation of the public trust by the EPA.

Open-hole completion for well construction

Mines being allowed to leave holes open deliberately weakens injection aquifer containment. These holes will join over 4,000 other potentially problematic wells in the Dewey-Burdock wellfield, along with numerous faults, fractures, and breccia pipes. In 30 as a geologist I have never seen a more poorly considered location for ongoing mining or injection. Open holes at the mine should automatically disqualify nearby injection and vice versa.

Removal of post-restoration monitoring requirements

When the UIC wells are full and subsequently abandoned they become pressurized repositories of chemicals. Should they leak, and they inevitably do, the downgradient public will remain uninformed of toxic contaminants headed towards their wells and will likely drink the stuff to eventually find out about it. Like the removal of Minnelusa monitoring, this is a betrayal of the public trust by the EPA.

Optional Madison well compensation for wells lost to contamination

The promise to replace lost Minnelusa wells with a newer, better one in the Madison Aquifer to then make it optional (a cash-strapped Powertech will certainly not pay for it) was an underhanded ploy to win support for polluting the Minnelusa aquifer.

Ending testing requirements for Class V injection adjacent aquifers

In earlier comments I've called out changes that undermine containment. This completes the undermining of containment by removing the testing that would identify that it has occurred.

Requiring disclosure of private wells impacted by aquifer exemption

This presumes that each and every aquifer user is aware of these changes and has the means to comply. This cannot be assumed to be the case! There's lots of people using this aquifer that may or may not want to identify themselves for many reasons. Local landowners face threats and intimidation from pro-mining neighbors, and many are reasonably worried about their own exposure.

Limiting injection to Powertech generated waste

On its surface, this seems like a good thing. However, if Powetertech is financially unable to conduct mining, and therefore aren't generating waste, why do the need injection wells in the first place? It seems to me that they could sell dump space to other operators in the vicinity and generate cash with which to continue mining. And with these new proposed weakening of the regulations and no direct oversight, EPA is virtually ensuring abuse will take place.

What's going to happen if Powertech takes some of that acid mine fluid from Wyoming and injects it in South Dakota? That acid will Destry what containment there is and ruin ALL of the aquifers. Not concerned because it hasn't happened yet? These are intended to be preventative measures so that these things never happen, because once they do there is no recovery. This is the situation being created here.

No reporting of seismic events <4.0 MMI

As I have mentioned previously in other expert opinions on this subject in this area, I've described seismic events along the the Whiteclay Fault (3.1 MMI) that opened previously closed cracks in the bedrock that essentially swallowed up Chadron's surface water supplies (the creek now drains into these cracks) despite being 40 miles from the epicenter. This mistake by the EPA will end up proving all of my opinions on the secondary porosity to be true. I will take no joy in it.

Original request for 8 wells reduced to 4, with 2 being fast tracked

Most ISL sites only need 1 injection well. Why does an operator, with no cash to mine and is not producing waste, need 4 injection wells with 2 of them fast tracked? This also lends Creedence to the idea that this is a way for Powertech to get some income by allowing others to inject into these unregulated and unmonitored wells. The entire application for permits seems frivolous, capricious, and arbitrary, UNLESS these are for another, hidden purpose.

CONCLUDING REMARKS

If these changes are intended to help a financially weak Powertech cut costs and be able to afford to mine on a smaller budget, they are misguided. Powertech is known to skirt regulations when they can and it suits them (I'm referring to the nondisclosure of thousands of sketchy boreholes in 2015), and these changes are a tacit invitation to do so again.

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SIGNATURE

The information contained herein is true and correct to the best of my knowledge at the time of this writing on 6 December, 2019.

Dr. Hannan E. LaGarry
526 Chapin Street
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December 2, 2018

Valois Robinson
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Re: Comments on EPA Water Permits for Dewey-Burdock

The thoughts provided in these comments will stress the continued need and request for a hard look cultural survey. These comments will also offer reasons the people of the Oglala Sioux Tribe hold the lands and resources sacred.

It is vital the Oglala Sioux Tribe is granted the opportunity to conduct a Traditional Cultural Survey of the Dewey-Burdock uranium mine project and take another look at the previous findings of the archeological survey in place.

The approval of the 1992 amendments of the National Historic Preservation act established Section 101 (d) (6) (A) & (B) that allow the Indian Tribes to identify historic properties of religious and cultural significance. The *Standards for developing environmental documents to comply with Section 106,* Indian Tribes must be consulted on the effects of the undertakings on historical properties. The Federal agency who is taking the lead in the endeavor won't be able to make a

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knowledgeable decision if the Oglala Sioux Tribe is not allowed to make a class III hard look survey and identify cultural and historic properties that are important to what the tribe holds sacred.

In 36 CFR 800.8 Coordination with the National Environmental Policy Act, requires the Federal lead agency to take a hard look when considering potential adverse effects. In the section of 800.8 (c) (1) *Standards for developing environmental documents to comply with Section 106, sub-(iii) states , Consult regarding the effects of the undertaking on historical properties with the SHPO/THPO, Indian tribes, that might attach religious and cultural significance to historic properties, other consulting parties, and the Council, where appropriate, during the NEPA scoping, environmental analysis, and the preparation of NEPA documents.*

The National Environmental Policy Act obligates every federal agency to prepare an adequate environmental impact statement before taking any major action, which includes issuing water permits for a uranium license. The statute does not permit an agency to act first and comply later. The Oglala need to show that any construction at the site would cause permanent damage to resources. Without an acceptable survey of the site the ability to show these potential effects would be practically impossible.

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On July 20, 2018 the United States Court of Appeals, For the District of Columbia Circuit decided in the matter of The Oglala Sioux Tribe v. U.S. Nuclear Regulatory Commission and United States of America , Powertech (USA), Inc. Intervenor, at the Dewey-Burdock uranium mine that the EIS did not satisfy NEPA because it failed to adequately address the environmental effects of the project on Native American cultural, religious, and historical resources.

The decision goes on to state, "the EIS in this proceeding does not contain an analysis of the impacts of the project on the cultural, historical, and religious sites of the Oglala Sioux Tribe and the majority of other consulting Native American tribes. Because the cultural, historical, and religious sites of the Oglala Sioux Tribe have not been adequately cataloged, the EIS does not include mitigation measures sufficient to protect this Native American tribes cultural, historical, and religious sites.

The Oglala Sioux Tribe maintains they were not afforded the opportunity to discuss the effects the Dewey-Burdock project has had on the cultural and religious properties that are considered significant. The archeologist(s) who conduct the surveys for the companies of drilling and mining projects do not have the knowledge of the connection the Lakota have to the water, land, air, or the cultural environment. The archeologist(s) are not able to identify what is important to the Lakota people, they cannot identify our stone features, cultural sites, and sacred

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landscapes that are attached to water. The knowledge of these and the ceremonies were and are passed from one generation to the next through oral interpretations. There are no individuals in modern science or technology who have the ability to describe or interpret this knowledge. The archeologist who are doing the surveys for the Dewey-Burdock expansion and other mining projects fall into this category of the uninformed.

To be able to identify and catalogue potential items of cultural, historical, and religious significance to the Oglala Sioux Tribe, a through survey needs to be conducted by person who are knowledgeable in aspects of what is important to the Tribe. The survey needs to be conducted by members of the Oglala Sioux Tribe with a methodology developed for these purposes.

Thomas Brings
Tribal Historic Preservation Officer
Cultural Affairs and Historic Preservation Office
Oglala Sioux Tribe

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Functional Equivalence for National Environmental Policy Act (NEPA) and EPA's Cumulative Effects Requirement

The National Environmental Policy Act 42 U.S.C. §§ 4321, et seq. ("NEPA") requires all federal agencies, including EPA, unless specifically exempted by statute, to take a "hard look" at the environmental impacts from all major federal actions. NEPA "prevent[s] or eliminate[s] damage to the environment and biosphere by focusing government and public attention on the environmental effects of proposed agency action." Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 371 (1989).

NEPA requires that federal agencies fully consider all direct, indirect, and cumulative environmental impacts of the proposed action. 40 C.F.R. §§1502.16; 1508.8; 1508.25(c). Direct effects are caused by the action and occur at the same time and place as the proposed project. §1508.8(a). Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. §1508.8(b). Id. Cumulative impacts are: "[T]he 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." §1508.7. For instance, for mining operations, the agency must fully review the impacts from off-site ore or waste processing and transportation. South Fork Band Council of W. Shoshone of Nev. v. U.S. Dep't of the Interior, 588 F.3d 718, 725 (9th Cir. 2009). Similarly, because impacts of the federal and state governments' foreseeable failure to ensure radioactive waste disposal facilities for past, present and future ISL projects could require wastes to be "stored on site [...] on a permanent basis," NEPA requires that the action agency "must assess the potential environmental effects of such a failure." *New York v. NRC*, 681 F.3d 471, 479 (2012).

Federal courts have dealt squarely with situations where a federal agency "says that cumulative impacts from non-Federal actions need not be analyzed because the Federal government cannot control them. That interpretation is inconsistent with 40 C.F.R. § 1508.7, which specifically requires such analysis." Center for Biological Diversity v. NHTSA, 508 F.3d 508, 517 (9th Cir. 2007). For example, an agency was required to consider the impacts of power turbines in Mexico in their EIS reviewing a U.S. transmission line because the projects were "two links in the same chain." Border Power Plant Working Group v. Dep't of Energy, 260 F. Supp. 2d 997, 1016 (S.D. Cal. 2003).

The EPA maintains a somewhat special status with regard to NEPA. Federal courts have allowed EPA to forgo strict and formal compliance with NEPA under a doctrine labeled "functional equivalence." The term "functional equivalent" was coined by the D.C. Circuit in Portland Cement Assoc. v. Ruckelshaus, 486 F.2nd 375 (1973), cert. denied 417 U.S. 921 (1974). Its requirements can be concisely summarized:

> The functional equivalency test provides that, where a federal agency is engaged primarily in an examination of environmental questions, and where substantive and

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> procedural standards ensure full and adequate consideration of environmental issues, then formal compliance with NEPA is not necessary, [and] functional compliance [is] * * * sufficient.

Warren County v. North Carolina, 528 F. Supp. 276, 286 (E.D. N.C. 1981).

The central requirement of the functional equivalence test is that the Agency's procedures provide for the same consideration of diverse environmental issues as required by NEPA. In International Harvester Co. v. Ruckelshaus, 478 F.2nd 615 (D.C. Cir. 1993), the court said that:

> we see little need in requiring a NEPA statement from an agency whose raison d'etre is the protection of the environment and whose decision ... is necessarily infused with the environmental consideration so pertinent to Congress in designing the statutory framework of NEPA. To require a "statement", in addition to a decision setting forth the same considerations, would be a legalism carried to the extreme.

478 F.2d at 650, n. 30. Thus, according to the federal courts, as interpreted by the Environmental Appeals Board, "functional equivalence could be present in cases where the statute mandated 'orderly consideration of diverse environmental factors,' rather than the five specific NEPA-EIS elements. Amoco Oil Co. v. EPA, 501 F.2d 722, 750 (D.C. Cir. 1974)." In re: Phelps Dodge Corporation, Verde Valley Ranch Development, 10 E.A.D. 460 (May 21, 2002).

Importantly, the SDWA does not exempt EPA's UIC program from NEPA. Rather, for EPA's UIC permits issued under the SDWA, EPA regulations provide that "all [UIC] permits are not subject to the environmental impact statement provisions of ... [NEPA]." 40 C.F.R. § 129.9(b)(6). As described, the basis for a regulatory exemption from NEPA, as opposed to statutory exemption, is the "orderly consideration of diverse environmental factors" in the same manner required by NEPA. In re: Phelps Dodge Corporation, Verde Valley Ranch Development, 10 E.A.D. 460 (May 21, 2002). One aspect of this required "orderly consideration of diverse environmental factors" is embodied in the EPA regulations providing that, for area Class III UIC permits, such as that at issue here, EPA must evaluate "[t]he cumulative effects of drilling and operation of additional injection wells...." 40 C.F.R. § 144.33(c)(3). In other words, EPA enjoys no automatic exemption from NEPA, and the regulations confirm that the question of compliance with NEPA's cumulative effects analysis mandate must be found in the EPA documents offered to meet NEPA's "twin aims" - informed decisionmakers and public involvement. *Baltimore Gas & Electric Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87 (1983),

In the present permitting exercise, EPA has not met the applicable standard. In other cases where the EAB has upheld an EPA cumulative effects analysis, it found that the agency had considered a diverse range of environmental impacts. For instance, in In re Avenal Power Center, LLC, 15 E.A.D. 384 (EAB 2011), the Board upheld an EPA cumulative effects analysis in the air pollution context because:

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> Agency provided an extensive discussion of the various projects and mitigation strategies underway in the area surrounding the proposed facility that are intended to mitigate the impacts of multiple existing sources on the communities located in close proximity to the proposed facility. *See* Response to Comments at 83-85. Specifically, the Agency determined that based on the types of environmental conditions already present in the area surrounding the proposed facility, the Agency believed these conditions would be more effectively addressed through actions that the Agency can take in conjunction with state and local governments. *See id.* (discussing mitigation strategies including, but not limited to, enforcement actions against a local hazardous waste facility, addressing nonattainment pollutants through the ongoing state and local air quality planning process, and issuing administrative compliance orders to address local violations of the Safe Drinking Water Act).

Id., slip. op. at 15. This type of analysis is not presented in this case, and EPA's Response to Comments do not contain the type of detail necessary to demonstrate compliance with the cumulative effects review requirements.

The 2019 Draft Cumulative Effects Analysis of the Dewey-Burdock Uranium In-Situ Recovery Underground Injection Control Area Permits fails to account for all of the cumulative impacts of the project. For instance, the company has recently released documents that demonstrate a planned expansion of the disturbed area from the project. See attached Map included in the applicant's December 2018 press release (Attachment 1) compared to the attached Map from the 2014 NRC Final Supplemental Environmental Impact Statement (Attachment 2). The company has even more recently proposed an increase in the amount of uranium ore it proposes mine from the property in a December 4, 2019 press release. See attached Azarga December 4, 2019 press release (Attachment 3). Unfortunately, the company appears to not be releasing the actual technical report accompanying the December 4, 2019 announcement for an additional 45 days. EPA should pause the public comment period and/or reopen that period based on the new maps and data being withheld by the company until after the close of public comment. Otherwise, EPA staff and the public are left without the necessary opportunity to analyze and comment on the expanded project Azarga has publicly announced, in violation of EPA regulations. See 40 C.F.R. § 124.11. In any case, the expanded mining area requires an updated analysis, for which additional EPA analysis must be conducted to meet SDWA and NEPA mandates, followed by public comment and review that must be provided to meet NEPA's requirement that the scope of analysis correspond with the scope of the proposal.

The cumulative effects analysis also fails to adequately discuss or review the cumulative effects associated with the transport of radioactive byproduct waste material to the White Mesa Mill in Utah. While the documents acknowledges White Mesa as the destination for the waste and includes waste disposal transport in its analysis of local truck traffic air impacts, the document does not review the associated impacts associated with such things as inevitable spills or the associated cumulative impacts at the White Mesa Mill, which has experienced and continues to experience significant problems – as detailed in the Tribe's 2017 comments to EPA. Significant environmental justice issues are presented by a project involving radioactive waste impacts in that disproportionately impact Native American Tribes' interests and their members' interests in

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the Black Hills and in the Four Corners region (*e.g.* Ute Mt. Ute, Hopi, and Navajo) where Energy Fuel's White Mesa disposal facility is located.

The storage capacity at White Mesa mill, if used up by others processing and disposal streams, will result in a default on-site disposal until a disposal site is identified and secured. Basically, the same sorry state of affairs that plagues reactor wastes. The licensed-disposal capacity of the White Mesa cells is a valuable (albeit toxic) commodity. A proper cumulative impacts analysis may reveal that the disposal capacity required for existing ISL licensees/UIC permittees exceeds existing (and planned) disposal capacity. EPA's cumulative effects analysis must address this issue.

The cumulative effects analysis also fails to account for other projects not just in and around the Black Hills, which cumulatively impact the Tribe culturally and spiritually, but also additional projects proposed in close proximity to the Dewey-Burdock property. For instance, Powertech has proposed opening satellite mines, including in the Dewey Terrace area, that would feed the processing facilities at the Dewey-Burdock site. Indeed, the company is on record specifically stating that the Dewey Terrace project is proposed as "a nearby satellite project, within 10 miles of the Dewey Burdock Project, the Company's initial development priority." See attached Azarga press release dated October 31, 2017 (Attachment 4). This project is in addition to others, such as the Aladdin and Savageton project the company promotes. The impact of these satellite mines must be incorporated into the cumulative effects analysis.

Azarga/Powertech has long admitted that the Dewey-Burdock facility is proposed to be used as a processing site for ongoing uranium mineral development in the region, even identifying specific projects that would provide future feed the Burdock regional processing/milling facility:

> It is likely that he CPP at the Burdock site will continue to operate for several years following the decommissioning of the Proposed Action well fields. The CPP may continue to process uranium from other ISL projects such as the nearby Powertech (USA) satellite ISL projects of Aladdin and Dewey Terrace planned in Wyoming, as well as possible tolling arrangements with other operators.

See attached Dewey-Burdock Project Application for NRC Uranium Recovery License Fall River and Custer Counties South Dakota Technical Report (excerpt) at page 1-8 (Attachment 5); see also Powertech (USA) Inc. Dewey-Burdock Project Class III Underground Injection Control Permit Application at page 10-14 (Attachment 6).

Powertech has specifically asserted that future processing of ore from the Aladdin and Dewey Terrace facilities are part of the "Proposed Action" included in the Dewey-Burdock license application:

> It is likely that the CPP at the Burdock site will continue to operate for several years following the D&D of the project well fields. The Proposed Action is for the plant to continue to receive and process uranium loaded resins from other Proposed Projects such as Powertech's nearby Aladdin and Dewey Terrace Proposed Satellite Facility Projects planned in Wyoming or from other licensed ISL operators or other licensed facilities

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generating uranium-loaded resins that are compatible with the Powertech (USA) production process.

See attached Dewey-Burdock Project Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Environmental Report, February 2009 (excerpt) at page 1-25 (Attachment 7). The handling of these foreseeable waste streams is not addressed, and there has not been an opportunity for public comment.

These foreseeable processing and tolling arrangements require a careful analysis of the actual effect of the EPA approval. It is foreseeable that the continuing processing could turn the Dewey-Burdock facility into a *de facto* waste facility, much as the White Mesa mill has transitioned from a uranium mill that rarely processes conventional ore into an alternate feed/ISL disposal facility. NRC, like EPA, has identified the use of a mill for disposal as potentially inviting "sham processing" and cannot ignore this foreseeable, and indeed espoused, aspect of the Azarga business plan. *In the Matter Of International Uranium (USA) Corporation* 51 N.R.C. 9, 2000 NRC LEXIS 21, (N.R.C. February 10, 2000).

Further, the mineral exploration and development activities around the Black Hills should be accounted for in the cumulative effects review, given the spiritual and cultural import Lakota people place on the Black Hills as a whole. For instance, publicly available records demonstrate oil and gas exploration/development operations in the direct vicinity of the proposed Dewey-Burdock project. See attached State of South Dakota approval in Case No. 5-2019 (Attachment 8). EPA must review this, and all similar, projects as part of the cumulative effects analysis. In addition, several gold mining companies are proposing mineral development projects on the east side of the Black Hills, particularly in the Rochford area, which is compounded by the long-standing contamination from the Homestake properties in the same area. Other mining development in and around the Black Hills region must be evaluated, including the Cameco operations in Nebraska and the proposed Bear Lodge rare earth minerals mine.

Also of concern with respect to cumulative effects are those associated with the Black Hills Ordnance Depot. Issues of soil and ground water contamination associated with this site are well documented. The cumulative impact analysis must address potential exacerbation of ground water contamination associated with chemicals from the Depot caused by the proposed Dewey-Burdock project, including ground water pumping both for mining purposes and for freshwater use, along with deep injection disposal.

Lastly, EPA's cumulative effects analysis fails to discuss the past uranium mining on the Dewey-Burdock property, left unreclaimed, and the associated cumulative contamination potential from those mines. The Darrow/Freezeout/Triangle mines have been the subject of some review by EPA and are recognized as potential pollution sources to groundwater that simply must be accounted for in the cumulative effects review. See attached Preliminary Assessment of Darrow/Freezeout/Triangle mines (Attachment 9). These mines are but one potential pollution source that are contributing to contamination of the Cheyenne River. The Tribe has conducted sampling in the Cheyenne River downstream of the proposed Dewey-Burdock site and found elevated levels of contaminants, including uranium. See attached Cheyenne River sampling data (Attachment 10). EPA must review these, and all other, pollution sources to the Cheyenne

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River, which may result in cumulative impacts to the water quality in the River when combined with the threats from the Dewey-Burdock project.

National Historic Preservation Act

The federal courts have addressed the strict mandates of the National Historic Preservation Act, 16 U.S.C. §§ 470, et seq.:

> Under the NHPA, a federal agency must make a reasonable and good faith effort to identify historic properties, 36 C.F.R. § 800.4(b); determine whether identified properties are eligible for listing on the National Register based on criteria in 36 C.F.R. § 60.4; assess the effects of the undertaking on any eligible historic properties found, 36 C.F.R. §§ 800.4(c), 800.5, 800.9(a); determine whether the effect will be adverse, 36 C.F.R. §§ 800.5(c), 800.9(b); and avoid or mitigate any adverse effects, 36 C.F.R. §§ 800.8[c], 800.9(c). The [federal agency] must confer with the State Historic Preservation Officer ("SHPO") and seek the approval of the Advisory Council on Historic Preservation ("Council").

Muckleshoot Indian Tribe v. U.S. Forest Service, 177 F.3d 800, 805 (9th Cir. 1999). See also, 36 C.F.R. § 800.8(c)(1)(v)(agency must "[d]evelop in consultation with identified consulting parties alternatives and proposed measures that might avoid, minimize or mitigate any adverse effects of the undertaking on historic properties….").

The Advisory Council on Historic Preservation ("ACHP"), the independent federal agency created by Congress to implement and enforce the NHPA, determines the methods for compliance with the NHPA's requirements. See National Center for Preservation Law v. Landrieu, 496 F. Supp. 716, 742 (D.S.C.), aff'd per curiam, 635 F.2d 324 (4th Cir. 1980). The ACHP's regulations "govern the implementation of Section 106," not only for the Council itself, but for all other federal agencies. Id. See also National Trust for Historic Preservation v. U.S. Army Corps of Eng'rs, 552 F. Supp. 784, 790-91 (S.D. Ohio 1982).

NHPA § 106 ("Section 106") requires federal agencies, prior to approving any "undertaking," to "take into account the effect of the undertaking on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register." 16 U.S.C. § 470(f). Section 106 applies to properties already listed in the National Register, as well as those properties that may be eligible for listing. See Pueblo of Sandia v. United States, 50 F.3d 856, 859 (10th Cir. 1995). Section 106 provides a mechanism by which governmental agencies may play an important role in "preserving, restoring, and maintaining the historic and cultural foundations of the nation." 16 U.S.C. § 470.

If an undertaking is the type that "may affect" an eligible site, the agency must make a reasonable and good faith effort to seek information from consulting parties, other members of the public, and Native American tribes to identify historic properties in the area of potential

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effect. 36 C.F.R. § 800.4(d)(2). See also, Pueblo of Sandia, 50 F.3d at 859-863 (agency failed to make reasonable and good faith effort to identify historic properties).

The NHPA also requires that federal agencies consult with any "Indian tribe ... that attaches religious and cultural significance" to the sites. 16 U.S.C. § 470(a)(d)(6)(B). Consultation must provide the tribe "a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects." 36 C.F.R. § 800.2(c)(2)(ii). As such, the Tribe must be involved in all three of these efforts – 1) identifying historic or cultural resources; 2) evaluating impacts on historic or cultural resources and those resources' eligibility for inclusion on the National Register of Historic Places (NRHP); and 3) developing project alternatives or mitigation measures to protect those resources that are or may be eligible.

The administrative record, including EPA's draft decision documents and the EPA's Response to Comments, fails to demonstrate that EPA complied with the consultation and historic resources protection requirements of the National Historic Preservation Act. Specifically, there has never been conducted a competent Lakota cultural resources survey of the Dewey-Burdock site. This has been the incontestable fact since the Nuclear Regulatory Commission's Atomic Safety and Licensing Board (ASLB) issued its ruling in LBP-15-16 in 2015. *In The Matter of Powertech (USA), Inc.* (Dewey-Burdock ISR Project), LBP-15-16, 81 NRC 618 (2015). This ruling has been repeatedly upheld by both the ASLB and the Nuclear Regulatory Commission itself. As such, without a competent cultural resources survey and analysis of the property, there is no way for the EPA to meaningfully consult with the Oglala Sioux Tribe – or any other Tribe – as to the identification, evaluation, or mitigation of impacts to those cultural resources. Given NRC Staff's abject failure to meet its obligations to ensure a competent cultural resources survey and analysis, EPA is legally obligated to do so. The Tribe remains ready, willing, and able to assist in this effort – short of being asked to expend entirely its own resources to pay professional survey staff, as NRC Staff has wrongfully attempted to date. Given the ASLB's ruling regarding the lack of identification of Lakota cultural resources, EPA cannot lawfully rely on its statement in the 2019 National Historic Preservation Act Draft Compliance and Review Document that:

> Based on the information the EPA has reviewed to date, and subject to any further developments in the course of the NRC administrative review process, the EPA believes that the identification of historic properties completed under the auspices of the NRC through the Class III Cultural Resources Survey appears sufficient for the APE defined by the NRC.

EPA National Historic Preservation Act Draft Compliance and Review Document at 2.

EPA asserts that it continues to evaluate simply signing on to the Programmatic Agreement (PA) developed by NRC Staff in order to attempt to fulfill its NHPA duties. However, the lack of a competent cultural resources survey has poisoned the Programmatic Agreement such that it is not a viable means for NHPA compliance. Specifically, the PA was finalized in 2014 at the time

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NRC Staff issued its Record of Decision for its licensure process for the project. As a fundamental basis for the PA, that document states in its recitals that "WHEREAS, surveys to identify historic properties have been completed for the project including Class III archaeological surveys and tribal surveys to identify properties of religious and cultural significance." Final PA at 3 (Attachment 11). As discussed, this assertion is demonstrably false, as the ASLB subsequently found that NRC Staff had objectively failed to conduct any competent "surveys to identify properties of religious and cultural significance." As such, the PA is not a lawful document for purposes EPA's NHPA compliance.

Notably, the Tribe contests the EPA's assumption of the Area of Potential Effect (APE) in the draft permitting documents. The APE appears to rely entirely on ground disturbance with an arbitrary buffer zone, but makes no effort to explain the basis for the limits of its "buffer zone" nor account for impacts to the cultural resources that may extend beyond the buffer zone. This speaks to the problems with proceeding toward permitting prior to having conducted a cultural resources survey and analysis. For instance, the Tribe believes that cultural resource sites present at the Dewey-Burdock property are significant for their ceremonial and/or spiritual values and purposes, which even if outside EPA's buffer zone, could still be dramatically and negatively affected by the project. This is but one example, but demonstrates that these issues have not been sufficiently reviewed or analyzed in EPA's draft permit documents. Further, as discussed herein, Powertech/Azarga has recently announced expansions of the projected disturbed area at the site, which do not appear to have been incorporated in any respect into EPA's analysis.

In addition to the Section 106 NHPA duties, NHPA Section 110 imposes responsibilities on EPA to ensure a proper identification and evaluation of cultural resources. These duties cannot be dispensed with simply through attempts to contact the Tribe in the Section 106 consultation context. Further, NEPA imposes a separate but closely related set of duties on federal agencies when addressing cultural resources. NRC has found the EIS inadequate to meet NEPA's statutory mandates, and EPA has made no serious effort to address these deficiencies – rendering EPA's analysis legally deficient with respect to a cultural resource impacts analysis. While NRC Staff is currently attempting to escape its NEPA responsibilities – arguing that the cultural resources information is "unavailable", the Tribe vigorously contests this argument. In any case, EPA may not rely on such arguments as NRC's position in this regard is highly specific to its own administrative process, timing, and financial constraints.

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ATTACHMENT 1

HAYWOOD SECURITIES INC.
Member of the Canadian Investor Protection Fund

Azarga Uranium Corp. (AZZ-T, $0.255)

Not Rated

Colin Healey, MBA | 604-697-6089 | chealey@haywood.com
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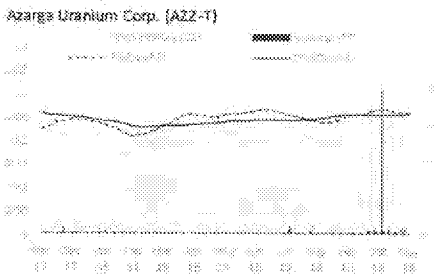
Dewey Burdock M&I Resources ↑97% as Prelude to Revised PEA in 2019

Event: Azarga Uranium announced a resource update for the Dewey Burdock ISR uranium project, South Dakota USA.

- **Azarga has grown the ISR-amenable 'all-categories' resource 47% at its Dewey Burdock project, with over 95% of project resources reporting to higher-certainty Measured & Indicated categories** (Exhibit 1):
  - **Measured ISR resources increase 234% to 13.8 Mlb U_3O_8 (5.2 Mt grading 0.132% U_3O_8)**
  - **Measured and Indicated ISR resources increase 97% to 16.9 Mlb U_3O_8 (7.5 Mt grading 0.113% U_3O_8)**
  - **Combined M,I,+Inf. Resources increase 47% to 17.75 Mlb U_3O_8 (grading 0.11% U_3O_8) from 12.1 Mlb U_3O_8 (grading 0.11% U_3O_8).** The new resource at Dewey is substantially larger, while average grade fell to about half of the prior resource but remains at the high-end of the typical U.S. ISR asset range.
- **Resource growth entirely within existing Nuclear Regulatory Commission (NRC) License boundary.** It is an important distinction that all of the tonnage outlined in today's resource update falls within Azarga's existing NRC license boundary and could confidently be integrated into an updated Preliminary Economic Assessment (PEA) of the project.
- **Larger resource should improve preliminary project economics.** We expect Azarga will likely integrate the new resources into a PEA update within H1/2019. As one of the highest-grade undeveloped ISR assets in the U.S., the 2015 PEA on Dewey demonstrated the potential for a low-cost 11-year mine producing ~1.0 Mlb U_3O_8 per year, with up-front CAPEX of just US$27M, and cash costs of US$12.53/lb (Exhibit 2). *(PEA at US$65/lb uranium, and 35% fed tax rate. The applicable fed tax rate has since been reduced to 21%, which is not reflected in the PEA).*
- **Azarga well-positioned as a vehicle to take advantage of U.S. uranium boon.** Azarga controls a diverse asset base within the U.S. now including over 45 Mlb U_3O_8 in NI 43-101 resources in South Dakota, Wyoming and Colorado. **We are looking for companies controlling U.S.-based uranium assets to outperform non-U.S. peers over the next 4-6 months** with the expected catalyst being the outcome of the U.S. Department of Commerce investigation into domestic uranium supply due by mid-April 2019. We believe this investigation will likely lead to a favourable outcome for U.S. domestic uranium suppliers in terms of realized price. **Azarga's firm-specific catalysts (PEA, final licensing progress) line up well with this macro-catalyst.**
- **Permitting well advanced and path to clear final NRC License contention defined:** Dewey licensing/permitting is well advanced and Azarga's 'Source and By-product Materials Licence' from the NRC is in the final steps of resolving the final contention lodged with the Atomic Safety and Licensing Board (ALSB). Earlier this month the NRC was given two options by the ASLB to "expeditiously conclude" litigation of the final contention and the NRC will choose a path by November 30th. From there, we should have clarity on the process and timing. **Other required permits ahead of construction** include the U.S. EPA Underground Injection Control (UIC) permits (issued in Draft form in March 2017); and three State permits submitted (and deemed complete) to the South Dakota Department of Environment and Natural Resources [Groundwater Disposal Plan, Water Rights and Large-Scale Mine Plan permits].

Current Price	$0.26	Market Capitalization	$44 million
YTD Performance	13.8%	Enterprise Value	$44 million
Dividend / Yield	$N/A / N/A%		
		Daily Volume (3 month avg)	205,280
52-Week High / Low	$0.34/ $0.19	Currency	C$ unless noted
Shares O/S	170 million	Web Site	www.azargauranium.com
		CEO/President	Blake Steele

Price Performance



Source: Capital IQ

Please see page 5 for Analyst Certification, pages 4 - 5 for Important Information, Disclaimers and notes.

Exhibit 1: Summary of Azarga's Corporate Resources including new Dewey Burdock Resource

South Dakota

Dewey Burdock ISR Amenable Resource Estimate

Category	Mt	Avg. GT	U_3O_8 (%)	U_3O_8 (lb)
Measured	5.200	0.73	0.132%	13,799,000
Indicated	2.328	0.40	0.068%	3,160,000
Inferred	0.732	0.33	0.056%	818,000
Global	**8.260**	**0.60**	**0.107%**	**17,777,000**

*At 0.05% U_3O_8 Cut-off & GT Cut-off of 0.5 (M&Ind.) or 0.2 (Inf.)

Dewey Burdock Non-ISR Resource Estimate (above water table)

Category	Mt	Avg. GT	U_3O_8 (%)	U_3O_8 (lb)
Measured	0.844		0.057%	1,060,000
Global	**0.844**		**0.057%**	**1,060,000***

*At 0.02% U_3O_8 Cut-off & GT Cut-off of 0.2 (M&Ind.), 0.2 (Inf.)

Wyoming

Aladdin Resource (5,100 acres surface rights, 4,600 acres mineral rights)

Category	Mt		U_3O_8 (%)	U_3O_8 (lb)
Indicated	0.466		0.111%	1,038,023
Inferred	0.043		0.119%	101,255
Global	**0.509**		**0.112%**	**1,139,278**

*A a GT Cut-off of 0.2 (M,Ind.&Inf.)

** The NI 43-101 Report also identified an "Exploration Target" of 5.0-11.0 Mlb at a grade range of 0.11% to 0.12% U_3O_8 (0.2 GT cut-off) at the Aladdin Project

Gas Hills

Category	Mt	Avg. GT	U_3O_8 (%)	U_3O_8 (lb)
Indicated	2.413		0.098%	4,729,000
Inferred	2.342		0.054%	2,529,000
Global	**4.754**	**0.00**	**0.076%**	**7,258,000**

Juniper Ridge

Category	Mt	Avg. GT	U_3O_8 (%)	U_3O_8 (lb)
Indicated	5.178		0.058%	6,006,000
Inferred	0.107		0.085%	182,000
Global	**5.285**		**0.059%**	**6,188,000**

Shirley Basin

Category	Mt	U_3O_8 (%)	U_3O_8 (lb)
Global	**0.000**		**0**

Dewey Terrace (1,834 acres surface rights, 7,514 acres mineral rights)

Category	Mt	U_3O_8 (%)	U_3O_8 (lb)
Global	**0.000**		**0**

Savageton (3,980 acres of Claims and Private Mineral Leases in the PRB)

Category	Mt	U_3O_8 (%)	U_3O_8 (lb)
Historic (non 43-101)			1,000,000

*Calculated by the Colorado School of Mines Research Institute

Colorado

Centennial Uranium Project

Category	Mt	U_3O_8 (%)	U_3O_8 (lb)
Indicated	6.873	0.090%	10,371,571
Inferred	1.365	0.090%	2,325,514
Global	**8.238**	**0.090%**	**12,697,085**

*A a GT Cut-off of 0.20 (M,Ind.&Inf.)

Kyrgyz Republic (70%-interest)

Kyzyl Ompul Project

Category	Mt	U_3O_8 (%)	U_3O_8 (lb)
Inferred	15.130	0.023%	7,511,758
Global	**15.130**	**0.023%**	**7,511,758**

*At a 100ppm U_3O_8 Cut-off (M,Ind.&Inf.)

Source: Azarga Uranium, Haywood Presentation

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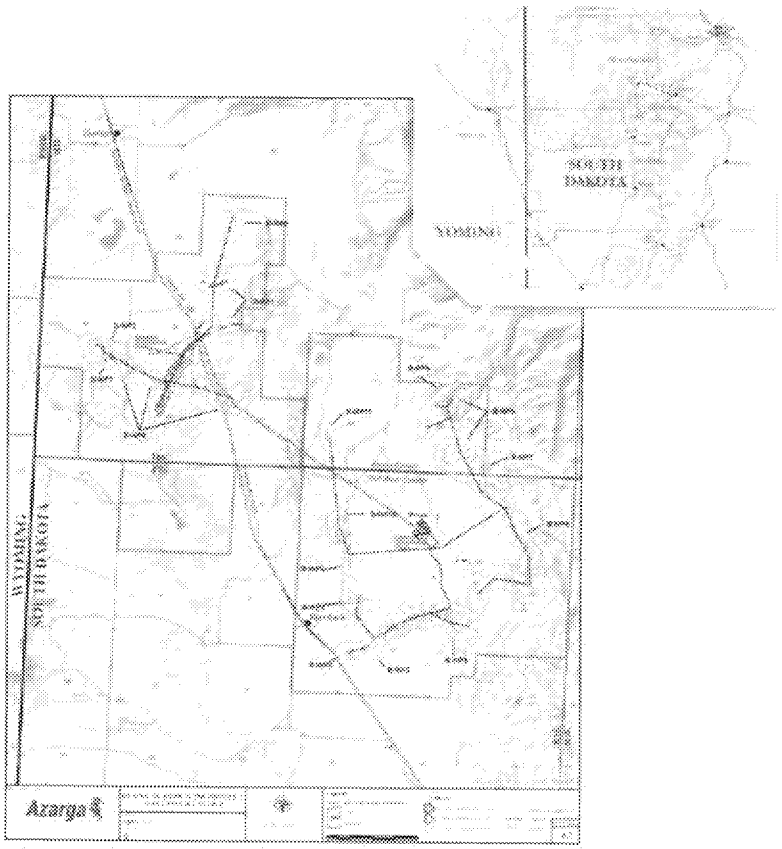
Exhibit 2: Summary of Dewey Burdock 2015 PEA

Mine Life	11 years (inc. 2 year ramp-up)
Annual Production	1.0 Mlbs/yr
LOM Production	9.7 Mlbs
Initial Capital Costs	US$27.0M US$2.85/lb
Cash Operating Costs	US$12.53/lb
- Plant and well field operation	US$8.50/lb
- Restoration / de-commissioning	US$1.25/lb
- Site management / overhead	US$2.75/lb
Local Taxes & Royalties	US$0.33/lb
Sustaining Capital Costs	US$14.00/lb
Pre / Post Tax NPV8%[1]	US$149.4M / US$113.6M
Pre / Post Tax IRR[1]	67% / 57%

Source: Azarga Uranium

Exhibit 3: Dewey Burdock Claims



Source: Dewey Burdock PEA / Azarga Uranium – Haywood modification

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I, Colin Healey, hereby certify that the views expressed in this report (which includes the rating assigned to the issuer's shares as well as the analytical substance and tone of the report) accurately reflect my/our personal views about the subject securities and the issuer. No part of my/our compensation was, is, or will be directly or indirectly related to the specific recommendations.

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* As of the end of the month immediately preceding this publication either Haywood Securities, Inc., one of its subsidiaries, its officers or directors beneficially owned 1% or more of Azarga Uranium Corp (AZZ-T).
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	%	#	IB Clients (TTM)
Buy	76.8%	73	96.3%
Hold	10.5%	10	0.0%
Sell	1.1%	1	0.0%
Tender	2.1%	2	0.0%
UR (Buy)	0.0%	0	0.0%
UR (Hold)	0.0%	0	0.0%
UR (Sell)	0.0%	0	0.0%
Dropped (TTM)	9.5%	9	3.7%

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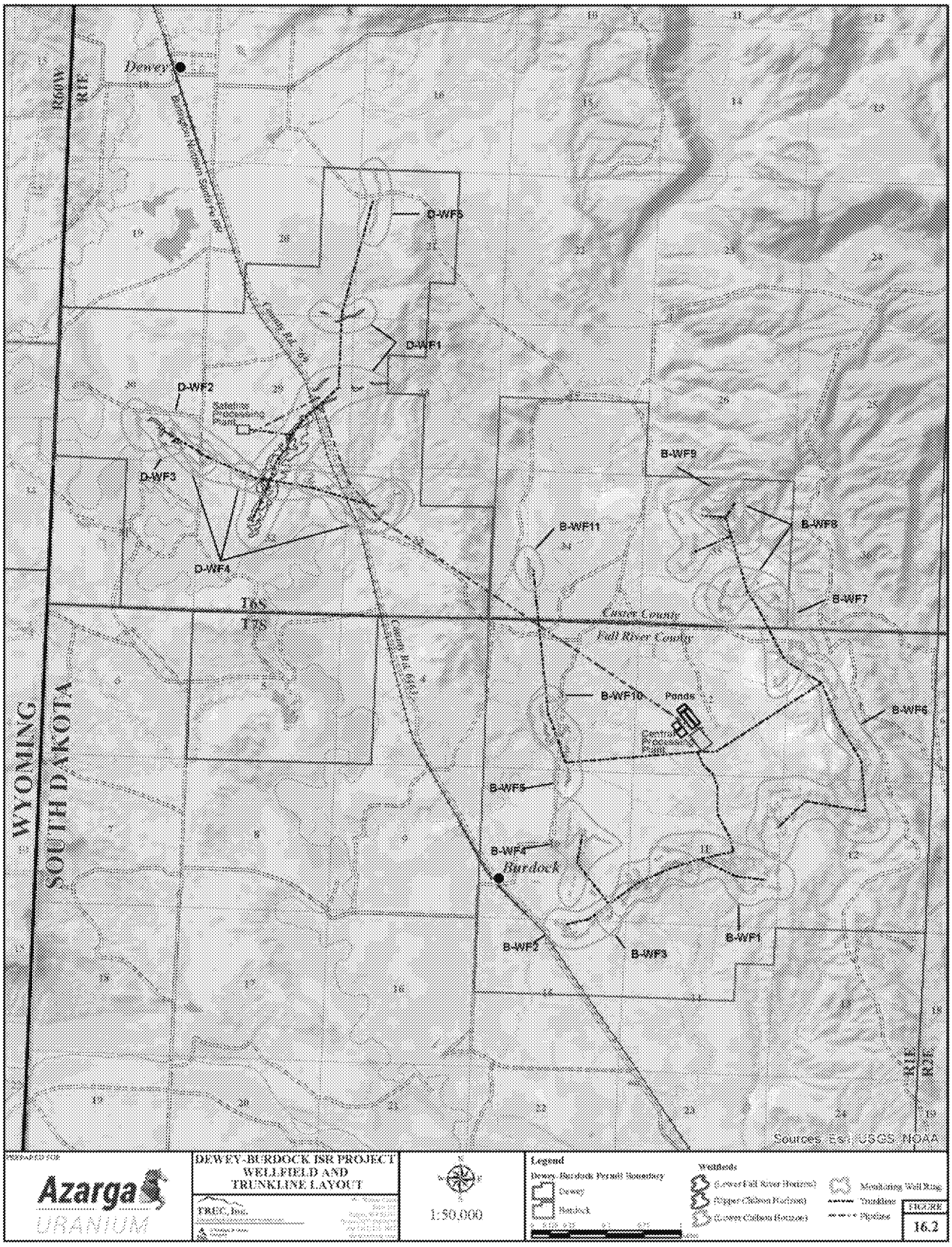
Figure 16.2: Well Field and Trunkline Layout



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ATTACHMENT 2

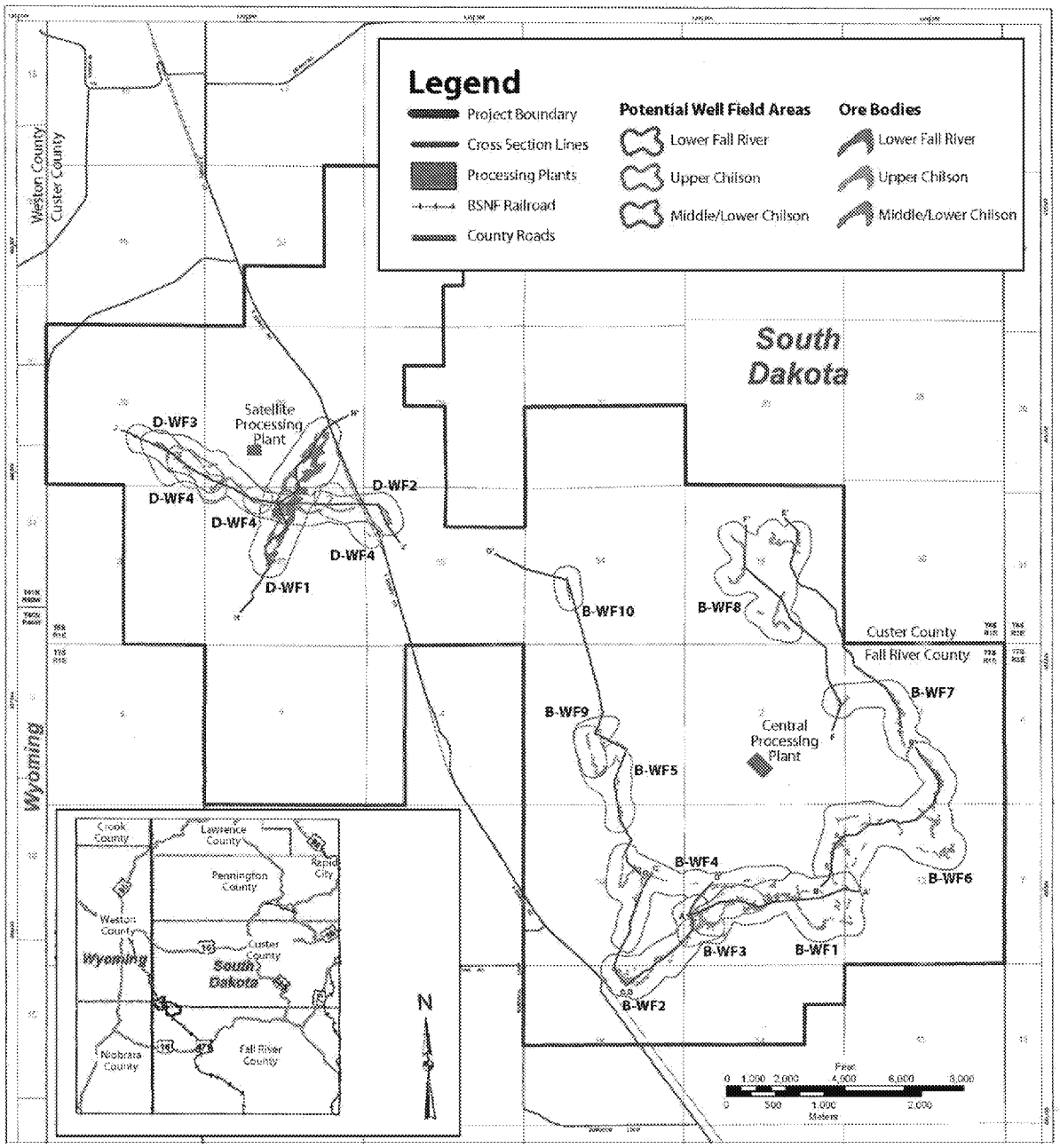

Figure 2.1-6. Map of Dewey-Burdock *In-Situ* Recovery Project Area Showing Locations of the Dewey Satellite Facility, Burdock Central Plant, Mapped Orebodies, and Proposed Wellfields
Source: Modified From Powertech (2011)

the initial wellfields during the construction phase of the proposed project (Powertech, 2010c). The wells will be "cased" by lowering a pipe into the borehole either during or after drilling to prevent the sides of the borehole from caving, prevent loss of drilling fluids into porous formations, and prevent unwanted fluids from entering the borehole. The base of the well casing at all injection and production wells will extend to or below the confining unit overlying the mineralized zone. The screened interval of injection and production wells will be completed only

ATTACHMENT 4

Source: *Azarga Uranium Corp.*

October 31, 2017 16:30 ET

Azarga Uranium Data Analysis Identifies Uranium Mineralization at Dewey Terrace

GREENWOOD VILLAGE, COLORADO--(Marketwired - Oct. 31, 2017) - AZARGA URANIUM CORP. (TSX:AZZ)(FRANKFURT:P8AA)(OTC PINK:PWURF) ("Azarga Uranium" or the "Company") has identified uranium mineralization at the Company's Dewey Terrace Project through the analysis of historical data owned by the Company (the "Data Set"). The Dewey Terrace Project is located in Wyoming, adjacent to the Company's NRC licensed Dewey Burdock in-situ recovery uranium Project (the "Dewey Burdock Project").

Highlights of the analysis at Dewey Terrace include:

- 91 mineralized drill holes with 129 intercepts equal to or exceeding a 0.2 grade-thickness (GT) cutoff using a .02% grade cutoff with an average eU_3O_8 grade of 0.062% and an average thickness of 7.4 feet
- Uranium mineralization covering seven (7) separate mineralized zones over a trend of approximately 2.5 miles
- Mineralization within the same ore bearing sandstone as the Dewey Burdock Project and conditions that indicate possible in-situ recovery ("ISR") amenability

"We are very pleased to see that our initial analysis indicates uranium resource potential at the Dewey Terrace Project. The Data Set confirms that within the same Inyan Kara sands as the Dewey Burdock Project, uranium mineralization, potentially suitable for ISR, exists. This uranium mineralization indicates possibilities for further discoveries in the vicinity of the Company's Dewey Terrace and Dewey Burdock Projects. We believe that further analysis of the Data Set will allow expansion of our uranium resources and the location of the identified uranium mineralization at the Dewey Terrace Project presents an opportunity for a nearby satellite project, within 10 miles of the Dewey Burdock Project, the Company's initial development priority," said John Mays, Chief Operating Officer.

The Data Set identified 259 mineralized drill holes indicating significant potential for a new resource area at the Dewey Terrace Project. Further, deposition is consistent with sand channel systems categorized within the Dewey Burdock Project. Several drill holes encountered multiple intercepts demonstrating a vertically stacked group of separate mineralized zones similar to those at the Dewey Burdock Project. The objective of the Data Set analysis is to identify uranium mineralization in a cost effective manner in the vicinity of the Company's Dewey Terrace and Dewey Burdock Projects. The Company is continuing its review of the Data Set for further uranium mineralization with the objective of identifying additional uranium resources.

The following table provides a detailed summary of the results for the 91 mineralized drill holes with 129 intercepts that equal or exceed a 0.2 GT cutoff using a .02% grade cutoff:

Hole ID	Zone	Depth (ft)	Thickness (ft)	Avg. GT	Avg. Grade (%)
DEX 033	LE	649.5	6.3	0.21	0.034
DEX 035	UD	627.0	9.5	0.39	0.041
DEX 039	LE	650.0	10.5	0.47	0.045
DEX 052	LD	640.0	1.2	0.50	0.417
DEX 075	UD	602.3	4.0	0.26	0.066
DEX 097	C	586.5	12.0	0.31	0.026
DEX 101	C	589.0	2.0	0.23	0.114
DEX 113	UE	622.0	3.2	0.21	0.065
DEX 113	UD	590.5	2.9	0.32	0.112
DEX 116	LE	642.0	5.0	0.33	0.067
DEX 125	C	585.0	6.1	0.21	0.035
DEX 133	LE	638.8	3.7	0.24	0.064
DEX 144	UD	604.3	3.5	0.27	0.076
DEX 144	LD	613.0	8.2	0.49	0.060
DEX 168	LE	632.3	2.7	0.25	0.092
DEX 172	UD	599.5	6.3	0.22	0.035
DEX 175	UE	626.1	2.7	0.24	0.089
DEX 200	LD	718.2	10.9	0.29	0.026
DEX 204	UD	665.8	11.0	0.25	0.023
DEX 220	C	578.0	3.1	0.25	0.080
DEX 220	UE	624.4	5.8	0.61	0.105
DEX 230	LE	650.3	1.5	0.26	0.170
DEX 231	UD	594.0	5.0	0.94	0.187
DEX 233	UE	617.5	5.5	0.31	0.056
DEX 237	UE	638.5	3.8	0.20	0.053
DEX 237	C	604.7	6.3	0.30	0.048
DEX 240	LE	628.0	9.0	0.90	0.100
DEX 241	C	594.0	7.2	0.28	0.039
DEX 245	LD	615.0	6.3	0.24	0.038
DEX 245	UD	599.9	9.7	0.45	0.046
DEX 245	C	581.9	12.6	0.52	0.041
DEX 251	UE	677.0	4.0	0.22	0.055
DEX 260	LD	663.5	9.5	0.24	0.026
DEX 263	LE	641.5	8.5	0.26	0.030
DEX 264	LD	620.8	6.9	0.24	0.035
DEX 268	LE	620.2	8.1	0.21	0.025
DEX 268	UE	608.5	10.1	0.41	0.041
DEX 272	UD	588.5	3.5	0.23	0.067
DEX 275	UE	619.9	5.4	0.35	0.064
DEX 275	UD	589.7	4.0	0.36	0.089
DEX 275	LD	604.5	8.0	0.36	0.045
DEX 278	UD	592.0	4.8	0.32	0.067

DEX 278	LE	634.3	4.3	0.34	0.078
DEX 283	C	582.1	6.0	0.24	0.039
DEX 284	UD	596.0	11.3	0.56	0.049
DEX 288	UE	616.6	7.4	0.21	0.029
DEX 288	LD	607.0	4.5	0.35	0.077
DEX 288	UD	595.1	8.2	0.40	0.049
DEX 288	C	579.5	7.9	0.47	0.060
DEX 289	UE	619.0	7.5	0.75	0.099
DEX 291	UE	634.9	6.1	0.39	0.065
DEX 292	LD	620.0	6.7	0.34	0.050
DEX 292	UE	634.0	10.6	0.38	0.036
DEX 297	LE	631.2	4.3	0.22	0.051
DEX 297	UE	617.0	9.3	0.47	0.051
DEX 308	LE	675.0	7.5	0.51	0.068
DEX 309	LD	619.0	6.8	0.21	0.031
DEX 326	LD	632.0	9.4	0.39	0.041
DEX 326	UD	622.0	6.0	0.56	0.094
DEX 327	LD	620.0	8.0	0.22	0.027
DEX 328	UE	625.5	11.5	0.47	0.041
DEX 338	C	591.8	2.7	0.33	0.123
DEX 339	C	591.5	6.6	0.41	0.062
DEX 340	LD	630.0	3.8	0.23	0.061
DEX 340	UD	618.3	7.0	0.28	0.040
DEX 341	C	590.0	4.6	0.32	0.068
DEX 344	UD	608.0	8.2	0.38	0.047
DEX 344	LD	619.5	9.5	0.43	0.046
DEX 348	UD	618.5	3.2	0.20	0.064
DEX 362	UE	618.3	12.9	0.41	0.032
DEX 362	UD	595.0	19.5	0.45	0.023
DEX 374	LE	631.3	7.5	0.23	0.030
DEX 375	LD	603.8	10.2	0.22	0.022
DEX 378	UD	616.0	9.0	0.41	0.045
DEX 378	LD	625.0	10.5	0.47	0.045
DEX 384	C	582.3	6.9	0.29	0.042
DEX 386	C	598.5	7.0	0.27	0.039
DEX 387	LD	632.3	7.8	0.84	0.107
DEX 388	UD	591.0	14.0	0.66	0.047
DEX 391	UD	584.5	6.0	0.22	0.036
DEX 392	LD	627.0	9.3	0.25	0.027
DEX 392	C	591.0	10.5	0.38	0.036
DEX 392	UD	611.1	4.0	0.70	0.175
DEX 393	UD	609.0	2.7	0.46	0.170
DEX 393	C	598.3	2.3	0.50	0.219

DEX 393	LD	618.8	11.0	0.79	0.072
DEX 397	C	578.1	9.5	0.23	0.024
DEX 398	C	578.0	9.3	0.21	0.023
DEX 398	UD	593.7	6.7	0.47	0.070
DEX 398	LD	610.5	8.1	0.55	0.069
DEX 403	LD	613.5	11.3	0.35	0.031
DEX 403	C	588.9	12.6	0.36	0.029
DEX 404	UB	562.0	15.3	0.38	0.025
DEX 417	C	583.3	11.6	0.45	0.038
DEX 417	LD	611.2	10.8	0.59	0.055
DEX 418	LD	619.0	4.9	0.28	0.057
DEX 426	LD	595.0	10.6	0.32	0.030
DEX 426	UD	583.5	2.4	0.38	0.158
DEX 431	UE	614.0	5.2	0.28	0.054
DEX 432	UD	594.1	9.8	0.36	0.037
DEX 441	C	571.0	9.3	0.25	0.027
DEX 441	UD	587.0	15.6	1.01	0.065
DEX 442	UE	618.3	6.1	0.33	0.055
DEX 442	LD	602.5	12.8	0.48	0.038
DEX 451	LD	609.0	4.9	0.34	0.070
DEX 451	UD	600.0	6.3	0.45	0.071
DEX 456C	LD	632.0	9.8	1.07	0.110
DEX 458	LD	614.1	5.1	0.26	0.051
DEX 458	UD	600.1	8.8	0.34	0.038
DEX 459	UD	584.9	12.2	0.38	0.031
DEX 460	UD	593.3	9.0	0.30	0.033
DEX 462	LD	589.5	4.5	0.26	0.057
DEX 462	UD	575.2	6.5	0.31	0.047
DEX 463	UD	592.0	5.3	0.22	0.042
DEX 463	LD	603.3	5.7	0.31	0.054
DEX 464	UD	593.2	5.8	0.24	0.041
DEX 464	C	584.0	6.7	0.27	0.040
DEX 469	UD	582.1	5.0	0.37	0.074
DEX 471	UE	598.3	13.2	0.70	0.053
DEX 473	UD	576.0	3.2	0.20	0.063
DEX 474	C	585.0	3.1	0.23	0.076
DEX 474	LD	610.2	5.0	0.37	0.074
DEX 475	UD	581.5	8.9	0.24	0.026
DEX 479	UD	582.0	11.8	0.35	0.030
DEX 479	LD	599.5	4.6	0.42	0.091
DEX 482	LD	585.9	6.4	0.42	0.065
DEX 483	C	565.0	10.9	0.54	0.050
ST 23	FR	492.0	13.5	0.38	0.028

TER 07-11	UD	599.0	5.5	0.26	0.047

The Company also identified 93 drill holes with 112 intercepts that had GT values ranging from 0.1 to 0.2 GT based on review of the Data Set. These intercepts had an average thickness of 4.1 feet with an average grade of 0.041% eU3O8. The remaining 187 drill holes reviewed to date range from barren to an average GT of 0.1.

The technical information in this news release has been prepared in accordance with the Canadian regulatory requirements set out in National Instrument 43-101 ("NI 43-101") and was reviewed by John Mays, P.E., Chief Operating Officer for the Company and a Qualified Person under NI 43-101.

The Data Set includes historical drilling information that has been reviewed by the Company's geological team, as well as 20 exploratory drill holes completed by the Company in a previous exploration campaign. The exploratory drill holes completed by the Company confirm the presence of uranium mineralization at the Dewey Terrace Project. The Company's review of the records and information within the Data Set reasonably substantiate the validity of this information; however, the Company cannot directly verify the accuracy of the historical data, including the procedures used for sample collection and analysis. Therefore, the Company encourages investors not to place undue weight on these results.

About Azarga Uranium Corp.

Azarga Uranium is an integrated uranium exploration and development company that controls six uranium projects, deposits and prospects in the United States of America (South Dakota, Wyoming and Colorado) and the Kyrgyz Republic. The Dewey Burdock in-situ recovery uranium project in South Dakota (the "Dewey Burdock Project"), which is the Company's initial development priority, has received its Nuclear Regulatory Commission License and draft Class III and Class V Underground Injection Control ("UIC") permits from the Environmental Protection Agency ("EPA") and the Company is in the process of completing other major regulatory permit approvals necessary for the construction of the Dewey Burdock Project, including the final Class III and Class V UIC permits from the EPA.

For more information please visit www.azargauranium.com.

Follow us on Twitter at @AzargaUranium.

Disclaimer for Forward-Looking Information

Certain statements in this news release are forward-looking statements, which reflect the expectations of management regarding its disclosure and amendments thereto. Forward-looking statements consist of statements that are not purely historical, including any statements regarding beliefs, plans, expectations or intentions regarding the future. Such statements may include, but are not limited to, statements with respect to the Company's continued efforts to obtain all major regulatory permit approvals necessary for the construction of the Dewey Burdock Project, including the final Class III and Class V UIC permits from the EPA, the Company's belief that mineralization conditions at the Dewey Terrace Project indicate possible ISR amenability, that the Company's initial analysis indicates uranium resource potential at the Dewey Terrace Project, that uranium mineralization identified in the Data Set indicates possibilities for further discoveries in the vicinity of the Company's Dewey Terrace and Dewey Burdock Projects, the Company's belief that further analysis of the Data Set will allow expansion of our uranium resources and the location of the identified uranium mineralization at the Dewey Terrace Project presents an opportunity for a nearby satellite project, that the identified mineralization from the Data Set indicates significant potential for a new resource area at the Dewey Terrace Project, that the objective of the Data Set analysis is

to identify uranium mineralization in a cost effective manner in the vicinity of the Company's Dewey Terrace and Dewey Burdock Projects and that the Company's is continuing its review of the Data Set for further uranium mineralization with the objective of identifying additional uranium resources. Such statements are subject to risks and uncertainties that may cause actual results, performance or developments to differ materially from those contained in the statements. No assurance can be given that any of the events anticipated by the forward-looking statements will occur or, if they do occur, what benefits the Company will obtain from them.

These forward-looking statements reflect management's current views and are based on certain expectations, estimates and assumptions, which may prove to be incorrect. A number of risks and uncertainties could cause our actual results to differ materially from those expressed or implied by the forward-looking statements, including without limitation: (1) the risk that the Company does not obtain all major regulatory permit approvals necessary for construction of the Dewey Burdock Project, including the final Class III and Class V UIC permits from the EPA, (2) the risk that mineralization conditions at the Dewey Terrace Project are not amenable to ISR, (3) the risk that the Company's initial analysis indicating uranium resource potential at the Dewey Terrace Project is not correct, (4) the risk that uranium mineralization identified in the Data Set does not indicate possibilities for further discoveries in the vicinity of the Company's Dewey Terrace and Dewey Burdock Projects, (5) the risk that further analysis of the Data Set does not allow expansion of the Company's uranium resources and the location of the identified uranium mineralization at the Dewey Terrace Project does not present an opportunity for a nearby satellite project, (6) the risk that the identified mineralization from the Data Set does not indicate significant potential for a new resource area at the Dewey Terrace Project, (7) the risk that the Data Set analysis does not identify uranium mineralization in a cost effective manner in the vicinity of the Company's Dewey Terrace and Dewey Burdock Projects, (8) the risk that the Company's review of the Data Set does not identify further uranium mineralization and additional uranium resources are not identified, (9) the risk that such statements may prove to be inaccurate and (10) other factors beyond the Company's control. These forward-looking statements are made as of the date of this news release and, except as required by applicable securities laws, the Company assumes no obligation to update these forward-looking statements, or to update the reasons why actual results differed from those projected in the forward-looking statements. Additional information about these and other assumptions, risks and uncertainties are set out in the "Risks and Uncertainties" section in the Company's most recent MD&A filed with Canadian security regulators.

The TSX has not reviewed and does not accept responsibility for the adequacy or accuracy of the content of this News Release.

Contact Information:

Azarga Uranium Corp.
John Mays
COO
+1 303 790-7528
info@azargauranium.com
www.azargauranium.com

ATTACHMENT 5

POWERTECH (USA) INC.

Dewey-Burdock Project
Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota
Technical Report

February 2009

Prepared for

U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852

Prepared by

Powertech (USA) Inc.
5575 DTC Parkway, Suite #140
Greenwood Village, CO 80111
Phone: 303-790-7528
Facsimile: 303-790-3885

1.8 Operating Plans, Design Throughput, and Production

The Proposed Action will utilize uranium ISL production facilities at both the Dewey and Burdock sites with a CPP located at the Burdock site. The IX process and well fields are designed for a nominal flow rate of 2000 gpm at each site. Total production from both sites is expected to produce approximately 1,000,000 pounds of U_3O_8 per year.

1.9 Project Schedule

Following the issuance of an NRC uranium recovery license and other relevant permits it is anticipated that construction of the Burdock Well Field 1, CPP and ancillary facilities including storage ponds and land application pivots will commence. The construction of the Dewey Well Field 1 and ancillary facilities will follow shortly thereafter. Startup of the Dewey and Burdock operations will commence upon completion of construction and will continue for approximately 7 to 20 years or more during which additional well fields will be completed along the roll fronts at both Dewey and Burdock sites. It is planned that groundwater restoration can be accomplished within NRC requirements for timeliness in decommissioning (10 CFR § 40.42); however, in the event restoration cannot be accomplished within this timeframe, Powertech (USA) will seek NRC approval for an alternate schedule. The projected construction, operation, restoration and decommissioning schedule is provided in Figure 1.9-1.

Decommissioning of the well fields including well abandonment, the removal of piping, tanks, ancillary buildings and equipment, cleanup of surface soil to applicable standards and revegetation of disturbed areas will be implemented following the cessation of ISL operations at the Dewey and Burdock sites. It is likely that the CPP at the Burdock site will continue to operate for several years following the decommissioning of the Proposed Action well fields. The CPP may continue to process uranium from other ISL projects such as the nearby Powertech (USA) satellite ISL projects of Aladdin and Dewey Terrace planned in Wyoming, as well as possible tolling arrangements with other operators.

ED_005364I_00029056-00057

ATTACHMENT 6

OMB No. 2040-0042 Approval Expires 12/31/2011

EPA

United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved (mo day year)	Date received (mo day year)	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Powertech (USA) Inc.

Street Address: 5575 DTC Parkway, Suite 140 | Phone Number: (303) 790-7528

City: Greenwood Village | State: CO | ZIP CODE: 80111

III. Operator Name and Address

Owner Name: Powertech (USA) Inc.

Street Address: 5575 DTC Parkway, Suite 140 | Phone Number: (303) 790-7528

City: Greenwood Village | State: CO | ZIP CODE: 80111

IV. Commercial Facility

- [ ] Yes
- [x] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [x] Owner
- [ ] Operator

VII. SIC Codes

SIC: 1094
NAISC: 212291

VIII. Well Status *(Mark "x")*

- [ ] A. Operating — Date Started (mo day year):
- [ ] B. Modification/Conversion
- [x] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
0	Up to 4,000	Dewey-Burdock

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
III	U		Up to 4,000

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Latitude Min	Latitude Sec	Longitude Deg	Longitude Min	Longitude Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
103	59	43	43	28	55	34	6S	1E	SW	93	W	1403	S

XII. Indian Lands (Mark 'x')

- [ ] Yes
- [x] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XIV. Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

A. Name and Title *(Type or Print)*: Richard Blubaugh, Vice President Environmental Health & Safety Resources

B. Phone No. *(Area Code and No.)*: (303) 790-7528

C. Signature: Richard Blubaugh

D. Date Signed: 8/1/2012

EPA Form 7520-6 (Rev. 12-08)

Following regulatory approval of successful aquifer restoration, each well field will be decommissioned. It is likely that the CPP will continue to operate for several years following decommissioning of the well fields. The CPP may continue to process uranium-loaded ion exchange resin from other ISR projects such as the nearby Powertech Aladdin and Dewey Terrace ISR projects planned in Wyoming, as well as possible tolling arrangements with other operators. The entire Dewey-Burdock Project will then be decommissioned and reclaimed in accordance with NRC, EPA, BLM and DENR requirements. The projected construction, operation, restoration and decommissioning schedule is provided in Figure 10.2.

ED_005364I_00029056-00060

ATTACHMENT 7

POWERTECH (USA) INC.

Dewey-Burdock Project
Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota
Environmental Report

February 2009

Prepared for

U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852

Prepared by

Powertech (USA) Inc.
5575 DTC Parkway, Suite #140
Greenwood Village, CO 80111
Phone: 303-790-7528
Facsimile: 303-790-3885

Dewey and Burdock sites. The projected schedule for construction, operation, and decommissioning (including restoration) is provided in Figure 1.3-1.

In each well field, production activities will proceed until such time as the uranium concentration in the pregnant solution has declined to an uneconomic recovery level. After production ceases, Powertech (USA) will be restoring the groundwater consistent with baseline and in accordance with 10 CFR Part 40 Appendix A, Criterion 5(b)(5). Reclamation of surface disturbances will occur after completion of restoration activities in a well field and will continue the same manner after additional well fields are developed, produced and restored. Therefore, at any time there may be well fields in three different stages of the process: wellfields in production, well fields undergoing groundwater restoration, and well fields undergoing surface reclamation. Additionally, there also may be some small areas indirectly related to these process phases that are held unreclaimed for short periods of time (e.g., storage of top soil). This proposed operational and reclamation plan ensures minimal potential environmental impacts.

D&D of the well fields includes well abandonment, the removal of piping, tanks, ancillary buildings and equipment, cleanup of surface soil to radiological standards in 10 CFR Part 40, Appendix A, Criterion 6 and revegetation of disturbed areas. It is likely that the CPP at the Burdock site will continue to operate for several years following the D&D of the project well fields. The Proposed Action is for the plant to continue to receive and process uranium loaded resins from other Proposed Projects such as Powertech's nearby Aladdin and Dewey Terrace Proposed Satellite Facility Projects planned in Wyoming or from other licensed ISL operators or other licensed facilities generating uranium-loaded resins that are compatible with the Powertech (USA) production process.

ED_005364I_00029056-00063

ATTACHMENT 8

ORDER / CASE NO:	ORDER NO. 5-2019
ORDER / NOTICE OF RECOMMENDATION TYPE:	EXCEPTION LOCATION
COUNTY:	FALL RIVER
LOCATION(S):	T. 8S., R. 1E., SEC. 7
OPERATOR:	T-C OIL COMPANY, LLC
DATE ORDER ISSUED:	07/09/2019
DATE ORDER CLOSED:	
AMENDS:	
AMENDED BY:	
APPROVAL STATUS:	
FIELD NAME:	
UNIT NAME:	

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

July 9, 2019

Gerald Freidrichs
Drilling Supervisor
T-C Oil Company, LLC
427 FM 774
Refugio, TX 78377

Dear Mr. Freidrichs:

Thank you for your application filed May 28, 2019, requesting approval to drill an oil well at a location that is an exception to statewide spacing. The well is located 513 feet from the east line and 261 feet from the north line in Section 7, Township 8 South, Range 1 East, approximately 11.9 miles northwest of Edgemont, Fall River County, SD.

The department published a Notice of Recommendation, Oil and Gas Case No. 5-2019, recommending approval of the application. The date for intervention was July 3, 2019, and no parties petitioned the Board of Minerals and Environment for a hearing on the application by the deadline.

Therefore, in accordance with the Administrative Rules of South Dakota 74:12:02:08 and 74:12:02:09, approval of the application is hereby granted. Enclosed is the Notice of Recommendation.

If our office can be of further assistance to you, please do not hesitate to contact me at (605) 773-4201.

Sincerely,

Mike Lees, Administrator
Minerals and Mining Program

Enclosure

cy/w enc: Joe Rochelle, P.E., Engineer for T-C Oil Company, LLC, Allen & Crouch Petroleum Engineers, P. O. Box 976, Casper, WY 82601

STATE OF SOUTH DAKOTA
SECRETARY OF THE
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

IN THE MATTER OF THE APPLICATION OF T-C OIL COMPANY, LLC, REFUGIO, TX, FOR A PERMIT TO DRILL AN OIL AND GAS WELL AT AN EXCEPTION LOCATION TO STATEWIDE SPACING, DESCRIBED AS THE SOUTH DAKOTA FEDERAL 7-1 WELL, LOCATED 261 FEET FROM THE NORTH LINE AND 513 FEET FROM THE EAST LINE IN SECTION 7, TOWNSHIP 8 SOUTH, RANGE 1 EAST; APPROXIMATELY 11.9 MILES NORTHWEST OF EDGEMONT, FALL RIVER COUNTY, SD.	NOTICE OF RECOMMENDATION OIL AND GAS CASE NO. 5-2019

Notice is hereby given to the public and to all interested persons that pursuant to South Dakota Codified Laws (SDCL) Chapter 1-26 and Chapter 45-9 and further pursuant to the Administrative Rules of South Dakota (ARSD) 74:12:02:08 and 74:12:09, the following matter has come to the attention of the Secretary of the Department of Environment and Natural Resources, hereinafter "Secretary."

The Secretary recommends approval of the exception location for the following reasons:

1. The applicant asserts that drilling this well at the location prescribed by the statewide spacing rule would likely result in a well unable to produce in economic quantities, as indicated by three dimensional seismic interpretation.

2. No other producing or drilled oil and gas wells are located within 1,000 feet of the proposed location.

Authority for the Secretary to approve this application is contained in ARSD 74:12:02:08 and 74:12:09. Unless a person files a petition requesting a hearing on the above application pursuant to the provisions of ARSD 74:09:01 on or before July 3, 2019, the Secretary's recommendation will be considered final and the Secretary will approve the application in accordance with that recommendation.

The application and notice of recommendation are also posted on the department's website at: http://denr.sd.gov/des/og/pubhearing.aspx and http://denr.sd.gov/public. Additional information about this application is available from Mike Lees, Administrator, Minerals and Mining Program, Department of Environment and Natural Resources, 523 East Capitol Avenue, Pierre, SD 57501, telephone (605) 773-4201, email michael.lees@state.sd.us.

June 7, 2019

Steven M. Pirner
Secretary

Published once at the total approximate cost of _____.

ALLEN & CROUCH
PETROLEUM ENGINEERS

RECEIVED
JUL 01 2019
MINERALS & MINING PROGRAM

June 26, 2019

Re: Reply to Letter Dated June 7, 2019 Notice of Recommendation
T-C Oil Company, LLC 427 FM 774 Refugio, TX 78377
South Dakota Federal 7-1 (Confidential)
261' FNL & 513' FEL NE NE Section 7-T8S-R1E, Fall River County, South Dakota

Department of Environment and Natural Resources Attention: Miles Lee
Joe Foss Building 523 East Capitol
Pierre, South Dakota 57501

Dear Mr. Lee:

This letter is a response to the South Dakota Department of Environment & Natural Resources letter dated June 7, 2019 for the South Dakota Federal 7-1 exception request.

Please find attached:
1. Affidavit of Notification
2. Certified mail return receipts
3. A list of persons notified

All of the mineral property within one-half mile of the location is owned or has been leased by T-C Oil Company, LLC.

If you have any questions or need additional information, please call me at (307) 234-3571.

Sincerely,

Joe Rochelle

Joe Rochelle, PE
Engineer for T-C Oil Company, LLC

Attachments

Cc: Gerald Friedrichs T-C Oil Company

Allen & Crouch Petroleum Engineer 307.234.3571
646 River Cross Road, Casper, WY 82601 phone
PO Box 976, Casper, WY 8260 307.234.9865 fax

Re: Request for Location Exception
T-C Oil Company, LLC 427 FM 774 Refugio, TX 78377
South Dakota Federal 7-1 (Confidential)
261' FNL & 513' FEL NE NE Section 7-T8S-R1E, Fall River County, South Dakota

AFFIDAVIT OF NOTIFICATION

STATE OF WYOMING)
) ss
COUNTY OF NATRONA)

The undersigned, Joe Rochelle, of lawful age, after having first duly sworn upon his oath, disposes and states:

- All of the lease operators or owners, all surface owners and royalty owners within a one-half (½) mile radius of the proposed South Dakota Federal 7-1 are listed on Exhibit L-1.

- Notifications of the application were mailed by certified mail, return receipt requested, to all of the lease operators or owners and all surface owners listed on Exhibit L-1, by depositing same in the same in the United States mail on the 26th Day of June, 2019.

By: Joe Rochelle
Joe Rochelle

for T-C Oil Company, LLC

STATE OF WYOMING)
) ss
COUNTY OF NATRONA)

The foregoing instrument was subscribed and sworn to before me this 26th day of June 2019.

Witness my hand and official seal.

Notary Public

My Commission Expires:

MARCH 24, 2022

NOTARY PUBLIC
AMY SALE
STATE OF WYOMING
COUNTY OF NATRONA
My Commission Expires Mar 24, 2022

Exhibit L-1

List of Surface Owners, Lease Operators, Mineral Owners within ½ mile radius of the South Dakota Federal 7-1 NE NE Section 7-T8S-R1E, Fall River County, South Dakota.

Name and Address	Type of Interest
T-C Oil Company, LLC 427 FM 774 Refugio, TX 78377	Lease Owner
Nebraska National Forest and Grasslands 1801 Highway 18 Bypass Hot Springs, SD 57747	Surface Owner
Bureau of Land Management North Dakota Field Office 99 23rd Ave., Suite A Dickinson, ND 58601	Mineral Owner
Bureau of Land Management South Dakota Field Office 310 Roundup Street Belle Fourche, SD 57717	Mineral Owner

7019 0140 0000 7332 3857

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- Certified Mail Restricted Delivery $ $0.00
- Adult Signature Required $ $0.00
- Adult Signature Restricted Delivery $

Postage $0.55
$
Total Postage and Fees $6.85
$

0945
08

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06/26/2019

Sent To BLM
North Dakota Field Office
Street and 99 23rd Ave., Suite A
City, State Dickinson, ND 58601

TC

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 7332 3864

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REFUGIO, TX 78377

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$ $2.80
Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $ $0.00
- Return Receipt (electronic) $ $0.00
- Certified Mail Restricted Delivery $ $0.00
- Adult Signature Required $ $0.00
- Adult Signature Restricted Delivery $

Postage $0.55
$
Total Postage and Fees $6.85
$

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06/26/2019

Sent To T-C Oil Company, LLC
427 FM 774
Street and Refugio, TX 78377
City, State

TC

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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HOT SPRINGS, SD 57747

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Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $ $0.00
- Return Receipt (electronic) $ $0.00
- Certified Mail Restricted Delivery $ $0.00
- Adult Signature Required $ $0.00
- Adult Signature Restricted Delivery $

Postage $0.55
$
Total Postage and Fees $6.85
$

0945
08

Postmark Here

06/26/2019

Sent To Nebraska National Forest & Grasslands
1801 Highway 18 Bypass
Street and Hot Springs, SD 57747
City, State

TC

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 7332 3871

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BELLE FOURCHE, SD 57717

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$ $2.80
Extra Services & Fees (check box, add fee as appropriate)
- Return Receipt (hardcopy) $ $0.00
- Return Receipt (electronic) $ $0.00
- Certified Mail Restricted Delivery $ $0.00
- Adult Signature Required $ $0.00
- Adult Signature Restricted Delivery $

Postage $0.55
$
Total Postage and Fees $6.85
$

0945
08

Postmark Here

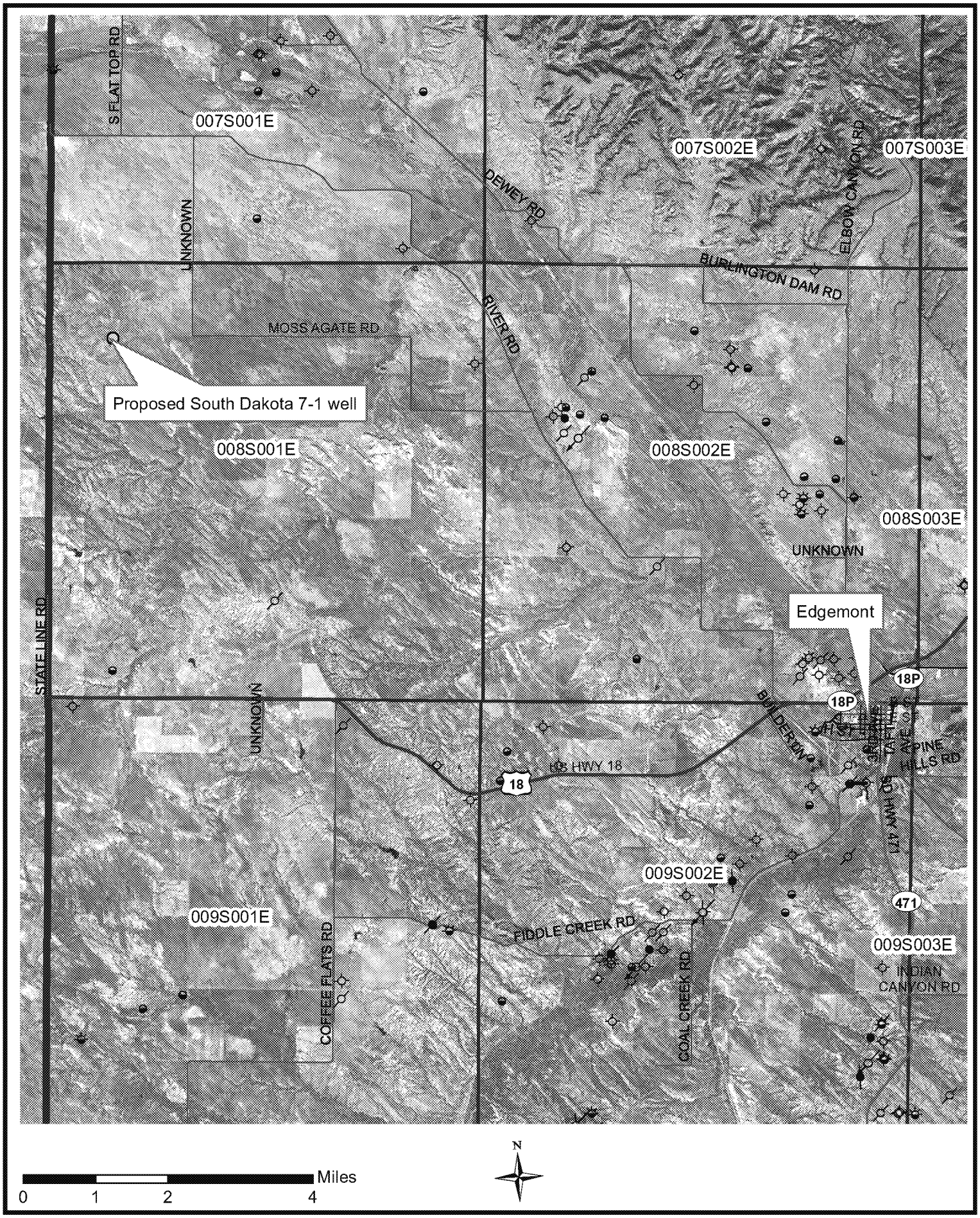
06/26/2019

Sent To BLM
South Dakota Field Office
Street and 310 Roundup Street
City, State Belle Fourche, SD 57717

TC

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

South Dakota 7-1 Locator Map, T-C Oil



DENR

RECEIVED
JUN 17 2019
DEPT OF ENVIRONMENT & NATURAL RESOURCES - RAPID CITY

Affidavit of Publication

State of South Dakota
County of Fall River

Taylor Risse, being, first duly sworn, on oath, says: That he/she is an employee of Scherer Publishing, LLC, and that the Fall River County Herald is, and during all the times hereinafter mentioned was, a weekly legal newspaper as defined in the SDCL 17-2-2.1 through the 17-2-2.4 inclusive; that said newspaper has been published within the said county of Fall River and State of South Dakota, for at least one year next prior to the first publication of the attached public notice, and that the printed copy of which, taken from the paper in which the same was published, and which is hereto attached and made a part of this affidavit, was published in said newspaper for **1** successive week(s) to wit:

June 13, 2019

That the full amount of the fee charged for the publication of the attached public notice, **$31.74** insures to the sole benefit of the publisher or publishers; that no agreement or understanding for the division thereof has been made with any other person, and that no part thereof has been agreed to be paid to any person whomsoever; that the fees charged for the publication thereof are:

Signed: Taylor Risse

Subscribed and sworn to before me this 13 day of June, 2019.

Mandy K. Scherer
Notary Public

My Commission Expires
December 9, 2021

MANDY K. SCHERER NOTARY PUBLIC SEAL STATE OF SOUTH DAKOTA

Notice of Vacancy

[illegible]

Proceedings

[illegible]

Proceedings

[illegible]

Notice of Recommendation

[illegible]

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DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

June 7, 2019

Gerald Freidrichs
Drilling Supervisor
T-C Oil Company, LLC
427 FM 774
Refugio, TX 78377

Dear Mr. Freidrichs:

Enclosed is a copy of the Notice of Recommendation for T-C Oil Company, LLC, Refugio, TX - Oil and Gas Case No. 5-2019, Fall River County, SD. The Notice of Recommendation has been sent to the Fall River County Herald for publication on Thursday, June 13, 2019.

The purpose of this letter is to advise you that it is the applicant's responsibility to serve notice on those persons "....whose property may be affected..." as specified in South Dakota Codified Laws 45-9-58.

Please file with this office the following:

1. Affidavit of Notification
2. Certified mail return receipts
3. A list of persons notified

The department recommends T-C Oil Company complete its notification, and submits the affidavit of notification and the list of persons notified prior to the end of the notification period specified in the enclosed notice of recommendation.

Thank you for your cooperation.

Sincerely,

Mike Lees, Administrator
Minerals and Mining Program

Enclosure

cy/w enc: Joe Rochelle, P.E., Engineer for T-C Oil Company, LLC, Allen & Crouch Petroleum Engineers, P. O. Box 976, Casper, WY 82601

ALLEN & CROUCH
PETROLEUM ENGINEERS

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DEPT OF ENVIRONMENT & NATURAL RESOURCES - RAPID CITY

June 5, 2019

Re: Request for Location Exception
T-C Oil Company, LLC 427 FM 774 Refugio, TX 78377
South Dakota Federal 7-1 (Confidential)
261' FNL & 513' FEL NE NE Section 7-T8S-R1E, Fall River County, South Dakota

Minerals and Mining Program Attention: Lucy Dahl
2050 West Main Street, Suite #1
Rapid City, SD 57702-2493

Dear Ms. Dahl:

Pursuant to the rules and regulations of the South Dakota Department of Environment & Natural Resources, T-C Oil Company, LLC Company hereby requests administrative approval for a location exception for the referenced wellbore. The reason for the exception is due to the geology and structural conditions for optimizing the location. T-C Oil Company has run extensive seismic across this area. If the location is not moved, we will miss our planned target. As a consequence, the South Dakota Federal 7-1 was moved to an acceptable surface location.

All of the mineral property within one-half mile of the location is owned or has been leased by T-C Oil Company, LLC. The legal survey plat and a map showing the location is attached.

If no objections are received, and if the supervisor is of the opinion that a hearing is unnecessary, please administratively approve this application. If you have any questions or need additional information, please call me at (307) 234-3571.

Sincerely,

Joe Rochelle

Joe Rochelle, PE
Engineer for T-C Oil Company, LLC

Attachments

Cc: Gerald Freidrichs T-C Oil Company

Allen & Crouch Petroleum Engineer
646 River Cross Road, Casper, WY 82601
PO Box 976, Casper, WY 8260
307.234.3571
phone
307.234.9865 fax

STATE OF SOUTH DAKOTA
SECRETARY OF THE
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

IN THE MATTER OF THE APPLICATION OF T-C OIL COMPANY, LLC, REFUGIO, TX, FOR A PERMIT TO DRILL AN OIL AND GAS WELL AT AN EXCEPTION LOCATION TO STATEWIDE SPACING, DESCRIBED AS THE SOUTH DAKOTA FEDERAL 7-1 WELL, LOCATED 261 FEET FROM THE NORTH LINE AND 513 FEET FROM THE EAST LINE IN SECTION 7, TOWNSHIP 8 SOUTH, RANGE 1 EAST; APPROXIMATELY 11.9 MILES NORTHWEST OF EDGEMONT, FALL RIVER COUNTY, SD.	NOTICE OF RECOMMENDATION OIL AND GAS CASE NO. 5-2019

Notice is hereby given to the public and to all interested persons that pursuant to South Dakota Codified Laws (SDCL) Chapter 1-26 and Chapter 45-9 and further pursuant to the Administrative Rules of South Dakota (ARSD) 74:12:02:08 and 74:12:09, the following matter has come to the attention of the Secretary of the Department of Environment and Natural Resources, hereinafter "Secretary."

The Secretary recommends approval of the exception location for the following reasons:

1. The applicant asserts that drilling this well at the location prescribed by the statewide spacing rule would likely result in a well unable to produce in economic quantities, as indicated by three dimensional seismic interpretation.

2. No other producing or drilled oil and gas wells are located within 1,000 feet of the proposed location.

Authority for the Secretary to approve this application is contained in ARSD 74:12:02:08 and 74:12:09. Unless a person files a petition requesting a hearing on the above application pursuant to the provisions of ARSD 74:09:01 on or before July 3, 2019, the Secretary's recommendation will be considered final and the Secretary will approve the application in accordance with that recommendation.

The application and notice of recommendation are also posted on the department's website at: http://denr.sd.gov/des/og/pubhearing.aspx and http://denr.sd.gov/public. Additional information about this application is available from Mike Lees, Administrator, Minerals and Mining Program, Department of Environment and Natural Resources, 523 East Capitol Avenue, Pierre, SD 57501, telephone (605) 773-4201, email michael.lees@state.sd.us.

June 7, 2019

Steven M. Pirner
Secretary

Published once at the total approximate cost of _____.

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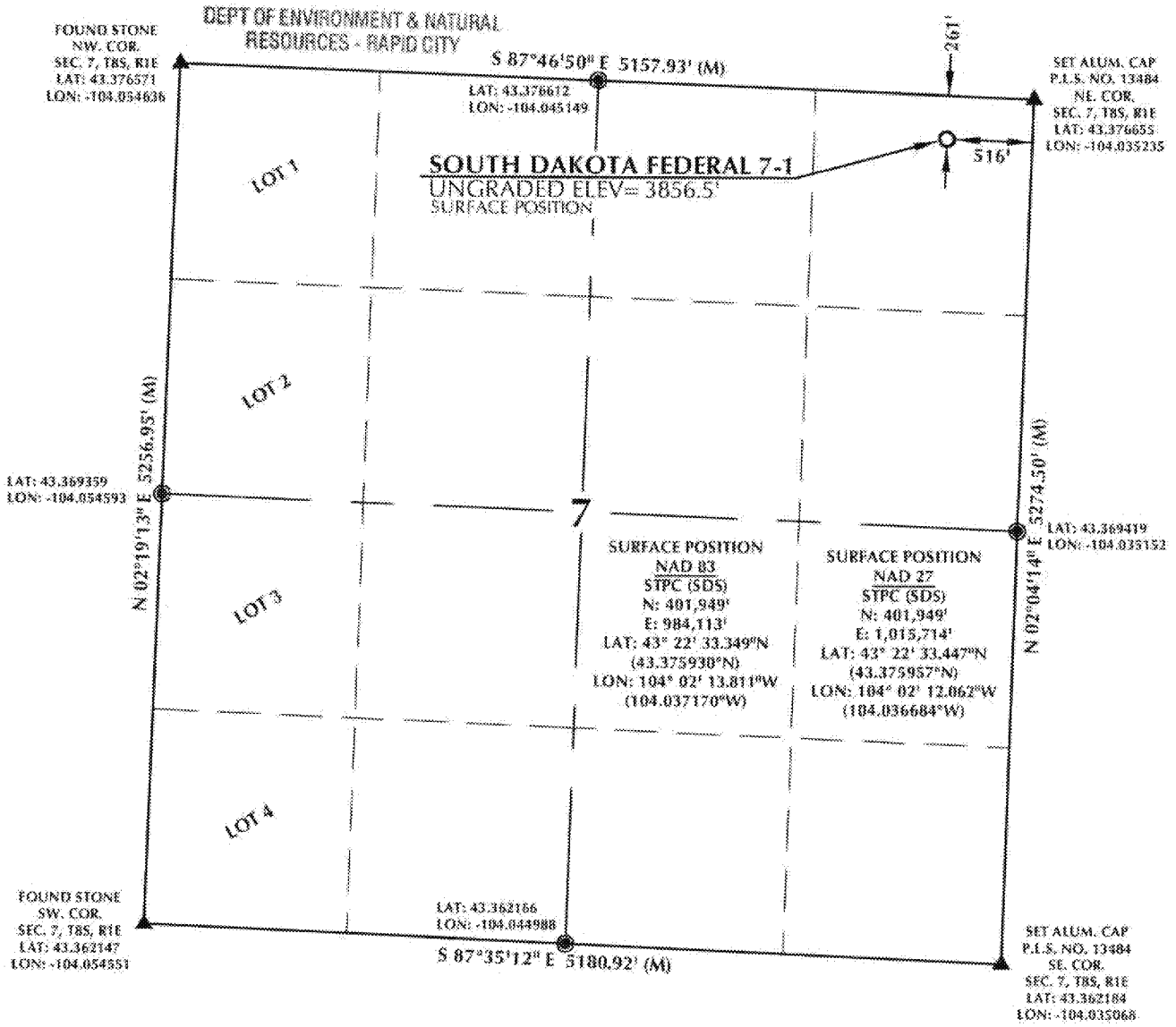
T8S, R1E



CERTIFICATE OF SURVEYOR:

I, WRANGLER GROHS, A LICENSED PROFESSIONAL LAND SURVEYOR IN THE STATE OF SOUTH DAKOTA, DO HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM INFORMATION DURING AN ACTUAL SURVEY MADE BY ME OR UNDER MY SUPERVISION AND THAT THE LOCATION AND LEGAL NECESSARY LOCATIONS PERFORMED BY ME OR UNDER MY DESCRIPTION PRESENTED HON THE SURFACE LOCATION ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

REGISTERED LAND SURVEYOR
13484
WRANGLER J. GROHS
SOUTH DAKOTA

Wrangler Grohs

WRANGLER GROHS
PROFESSIONAL LAND SURVEYOR
SOUTH DAKOTA REGISTRATION NUMBER 13484

Date 4/24/19

N

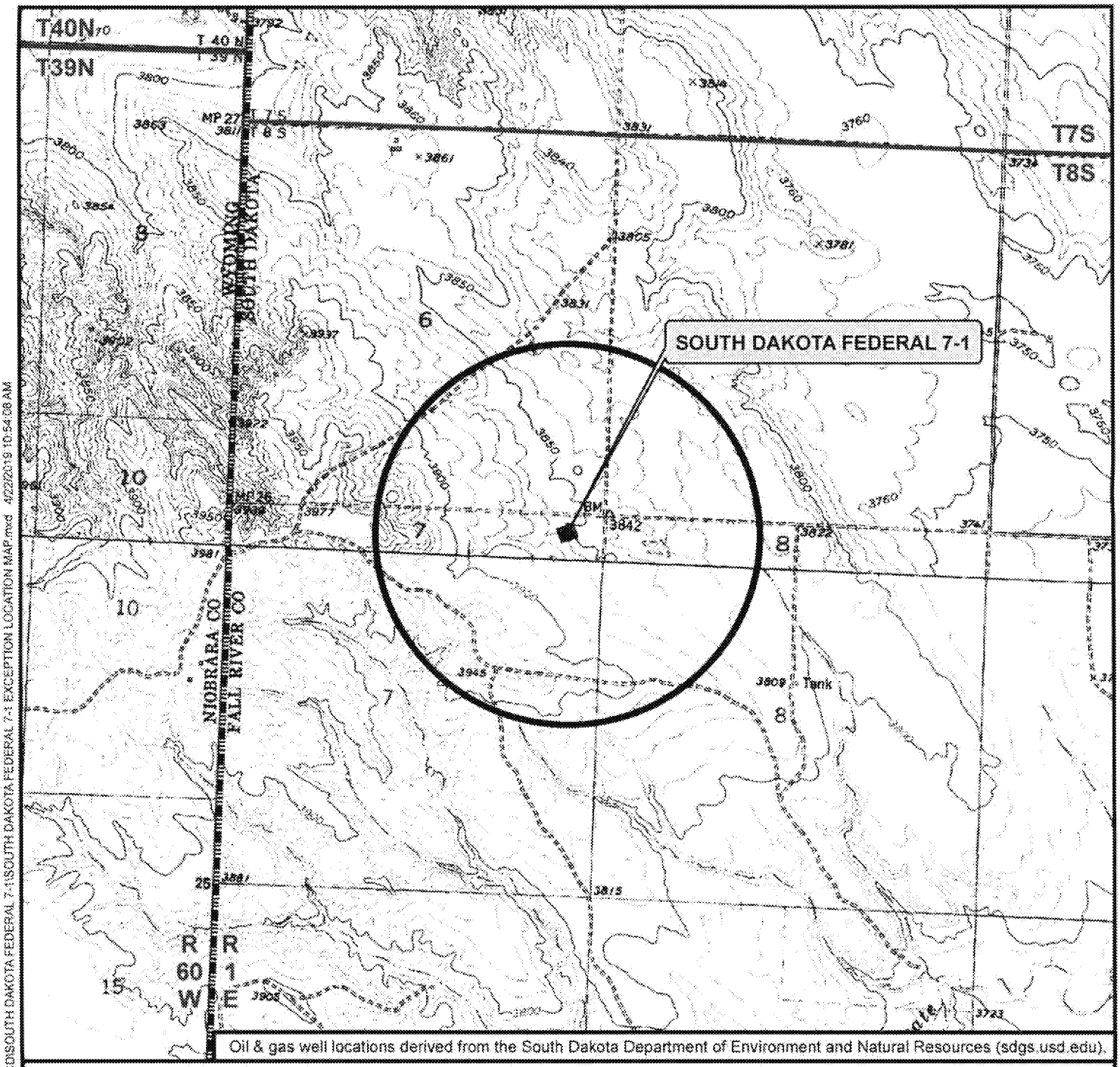
0 1000' 2000'

HORIZONTAL
SCALE: 1" = 1000'

NOTES:

1. ▲ INDICATES SECTION CORNER.
2. ◉ INDICATES CALCULATED CORNER.
3. SECTION CORNER LATITUDES AND LONGITUDES ARE NAD83 (2011)(EPOCH:2010).
4. ELEVATION BASED ON NAVD88 (GEOID12B).
5. BASIS OF BEARING IS FROM SOUTH DAKOTA COORDINATE SYSTEM NAD83, SOUTH ZONE, U.S. SURVEY FEET.
6. ALL MEASURED DISTANCES ARE GRID. COMBINED SCALE FACTOR: .99972955 CALCULATED FROM THE NW. CORNER OF SECTION 7, T8S, R1E.

WELL LEGAL PLAT	Prepared For: T-C OIL COMPANY, LLC, 427 FM 774, REFUGIO, TEXAS 78377	609 CONSULTING, LLC, 1095 Saberton Avenue, Sheridan, Wyoming 82801, Phone 307-674-0609, Fax 307-674-0182	
SOUTH DAKOTA FEDERAL 7-1 261' FNL & 516' FEL (SURFACE POSITION) NE1/4 NE1/4, SECTION 7 T8S, R1E, B.H.M. FALL RIVER COUNTY, SOUTH DAKOTA		DRAFTED BY: SIM / CHECKED BY: WJG	SHEET NO: 1
		DATE DRAFTED: 4/24/19 / DATE SURVEYED: 4/4/19	1 OF 1
		REVISED: / FILE NAME: 18-225	



Legend

- Well - Proposed
- Well Pad - Proposed
- Half-Mile Radius
- Injecting
- Plugged and Abandoned
- Producing
- Shut In
- Spudded
- Temporarily Abandoned

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EXCEPTION LOCATION MAP

SOUTH DAKOTA FEDERAL 7-1
LOCATED IN NENE OF SECTION 7
T8S, R1E, B.H.M.
FALL RIVER COUNTY, SOUTH DAKOTA

Prepared For:

T-C OIL COMPANY, LLC
427 FM 774
REFUGIO, TEXAS 78377

609 CONSULTING, LLC
1095 Sabertoo Avenue
Sheridan, Wyoming 82801
Phone 307-674-0609
Fax 307-674-0182

N

SCALE: 1" = 2,000ft	NAD83 SD-Sft	SHEET NO: 1
DRAWN: TL	DATE: 18 Apr 2019	
REVISED:	DATE:	1 OF 1

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ATTACHMENT 9

Seagull Environmental Technologies, Inc.

3555 Chase Street
Wheat Ridge, CO 80212
www.seagullenvirotech.com

September 24, 2014

Victor Ketellapper, Site Assessment Team Leader
U.S. Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Subject: Preliminary Assessment Report regarding the Darrow/Freezeout/Triangle Uranium Mine Site near Edgemont, South Dakota
EPA ID: SDN000803095
EPA Region 8 START 8(a) Carve-Out Contract EP-S8-11-05, Task Order 0014
Task Monitor: Victor Ketellapper, Site Assessment Team Leader

Dear Mr. Ketellapper:

Seagull Environmental Technologies, Inc. (Seagull) is pleased to submit the attached Preliminary Assessment report regarding the Darrow/Freezeout/Triangle Uranium Mine site near Edgemont, South Dakota. Please contact the Project Manager via email at rlunt@seagullenvirotech.com or by phone at (720) 459-7874 if you have any questions.

Sincerely,

Ryan M. Lunt

Ryan M. Lunt
Task Order Project Manager

Hieu Q. Vu, PE
EPA Region 8 START 8(a) Program Manager

Enclosures

PRELIMINARY ASSESSMENT REPORT

Regarding the

DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE

NEAR EDGEMONT, SOUTH DAKOTA

EPA ID: SDN000803095

Contract No.: EP-S8-11-05
Task Order No.: 0014

Prepared By:

SEAGULL ENVIRONMENTAL TECHNOLOGIES, INC.
3555 CHASE STREET
WHEAT RIDGE, COLORADO 80202-1129

September 24, 2014

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PRELIMINARY ASSESSMENT REPORT APPROVED BY:

Hieu Q. Vu, PE, Program Manager	September 24, 2014 Date
Lynn Parman, PG, CHMM, QA/QC Manager	September 24, 2014 Date
Ryan M. Lunt, CHMM, Task Order Project Manager	September 24, 2014 Date
Victor Ketellapper, EPA Region 8, Site Assessment Team Leader	Sep 24 2014 Date

DISTRIBUTION LIST

U.S. ENVIRONMENTAL PROTECTION AGENCY

Victor Ketellapper (1 Copy)	Site Assessment Team Leader

SEAGULL ENVIRONMENTAL TECHNOLOGIES, INC.

Hieu Q. Vu (1 Copy)	Program Manager, START 8(a) Carve-Out, EPA Region 8
File (1 Copy)	START 8(a) Carve-Out, EPA Region 8

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1.0 INTRODUCTION

Under the U.S. Environmental Protection Agency (EPA) Region 8 Superfund Technical Assessment and Response Team (START) Carve-Out 8(a) Contract (No. EP-S8-11-05), Task Order No. 0014, Seagull Environmental Technologies, Inc. (Seagull) has been tasked to conduct a Preliminary Assessment (PA) of the Darrow/Freezeout/Triangle Uranium Mine site (the Site) near Edgemont, Custer and Fall River Counties, South Dakota. This PA is to determine whether the site poses a threat to human health and the environment and if further investigation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is warranted.

This PA was conducted in accordance with *Guidance for Performing Preliminary Assessments Under CERCLA* (EPA 1994). The Site is listed in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database as EPA ID SDN000803095. The CERCLIS non-National Priorities List (NPL) status of the site as of February 7, 2014, was "Ongoing Preliminary Assessment" (EPA 2014a).

2.0 OBJECTIVES

Objectives of this PA were to:

- Evaluate existing information and analytical data.
- Assess presence, quantity, or absence of uranium-mine-related contaminants at the Site.
- Document any releases to the environment from the Site.
- Acquire information regarding exposure pathways, surrounding population density, and other target data, including environmentally sensitive receptors (wetlands, fisheries, and threatened or endangered species).
- Assess whether the Site warrants further investigation under CERCLA.
- Identify data gaps or limitations of existing data reviewed in this PA.

3.0 SITE LOCATION AND DESCRIPTION

The Site is near Edgemont, in Custer and Fall River Counties, South Dakota. Geographic coordinates at the approximate center of the site are 43.478486 degrees north latitude and 103.962746 degrees west longitude. Currently used primarily for cattle grazing, the Site encompasses approximately 1,426 acres at the southwest edge of the Black Hills uplift approximately 13 miles northwest of Edgemont, South Dakota (see Figures 1 and 2).

The Site lies within the proposed Dewey-Burdock in-situ uranium recovery (ISR) project area. ISR is a means of extracting uranium from underground ore bodies through a series of injection and production

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wells, and pumping it to the surface for production of nuclear fuel (Powertech Uranium Corporation [Powertech] 2014). In 2009, Powertech submitted the Dewey-Burdock Project Application Technical Report in order to obtain a U.S. Nuclear Regulatory Commission (NRC) Uranium Recovery License for working within the Proposed Action Area (PAA) (Powertech 2009). The PAA boundary encompasses approximately 10,580 acres of mostly private land, including a series of sequentially developed well fields, a satellite ion exchange facility, a central processing plant, and associated facilities to recover and process the final uranium product. The NRC prepared a draft Supplemental Environmental Impact Statement (SEIS) to evaluate potential environmental impacts from proposed construction, operation, aquifer restoration, and decommission of an ISR uranium facility at the proposed site (NRC 2012). The Final Environmental Impact Statement (EIS) was completed in January 2014 (NRC 2014a). The technical report completed by Powertech included results of baseline sampling within the PAA. Sampling data from the area of the Site obtained during that effort were used for this PA to evaluate conditions at the Site. Mining waste remains in abundance at the Site, and is suspected to be a source of radionuclide contamination to nearby streams and groundwater (see Figure 2).

The site is within the Great Plains physiographic province, where vegetation is a mix of short grasses and shrubs typical of semi-arid steppe land, along with Ponderosa Pine forest toward the Black Hills. Most of the surrounding land is used for rangeland (Powertech 2009).

3.1 SITE HISTORY

The Site is an abandoned uranium mine. Uranium was discovered in the Edgemont area in 1952 (Powertech 2009). Early mining of the material was limited to surface deposits; however, later drilling revealed deeper deposits. In the mid-1970s, the Tennessee Valley Authority (TVA) purchased a major interest in the Edgemont area and hired Silver King Mines, Inc., to explore the property. However, in the mid-1980s, the operation was halted due to an economically unsustainable decline in uranium prices. In 1994, Energy Fuels Nuclear (EFN) acquired the property but relinquished it due to low uranium prices. Surface land rights and mineral rights in the site area belong to private owners and the U.S. government (Powertech 2012a, b).

A number of uranium mine sites have been investigated under Superfund authority, as these sites can present potential for (1) public exposure to radon and other radionuclides, (2) contamination of groundwater and surface water supplies (via acid drainage and mobilization of heavy metals), (3) natural habitat disturbance, (4) increased instability of the land via erosion and slope stability failure, and (5) other physical safety hazards. Therefore, these sites may pose a threat to nearby human health and the environment (EPA 2007).

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3.2 CURRENT SITE CONDITIONS

During a site reconnaissance on November 5, 2013, Seagull team members and EPA traveled along public roads in the vicinity of the Site in an unsuccessful attempt to identify a vantage point from which to view the Site. Photos of the area of the Site—including drainage areas, historical points of interest, and current conditions of the surrounding area—were taken during this site reconnaissance (see Appendix A). START and EPA visited Edgemont City Hall to meet with local officials to discuss purposes of the PA and to obtain information for the report. Following the meeting with local officials, the City Engineer/Code Administrator of Edgemont accompanied START and EPA to visit areas of interest in and around Edgemont, including the nearby uranium mill tailings repository and location of the former mill. The visit also included travel to current City of Edgemont Public Water Supply (PWS) wells to confirm their locations.

4.0 SITE CHARACTERISTICS

The following sections discuss the geology and hydrogeology, hydrology, and meteorology of the site vicinity.

4.1 GEOLOGY AND HYDROGEOLOGY

The Site is within the Black Hills; soils within the Site's boundaries are generally clayey or silty, with patches of sandy loam on upland areas and clay in or near drainages. The level upland areas have deep soils, and shallow soils are on hills, ridges, and breaks (NRC 2012). Wide areas of unconsolidated alluvial and terrace deposits of Quaternary age overlie the sedimentary rocks of Cretaceous and Jurassic age. The sedimentary rocks include the Cretaceous-age Belle Fourche Shale, Granerous Group (Mowry Shale and Skull Creek Shale), and Inyan Kara Group (Fall River and Lakota Formations). The Fall River Formation consists of sandstone, siltstone, and interbedded sandstone and shale. The Lakota Formation consists of the Fuson Member (shale and siltstone with discontinuous sandstone) and Chilson Member (interbedded shale and sandstone, and a basal mudstone). The Chilson Member is also known as the Lakota Sandstone (Schnabel 1963, NRC 2012).

The Jurassic-age Morrison and Sundance Formations underlie the Inyan Kara Group. The Morrison Formation consists of shale and claystone interbedded with limestone. The Sundance Formation is composed of the Stockade Beaver Member (shale), Hulett Member (sandstone), Lak Member (sandstone, siltstone, and mudstone), and Redwater Member (shale) (Schnabel 1963).

Many occurrences of uranium minerals have been prospected within the Burdock quadrangle. Generally, the ore minerals occur as impregnations in sandstone, siltstone, and mudstone beds, but not consistently

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in a carbonaceous environment. Uranium and vanadium minerals from these deposits have been identified as uraninite, carnotite, and tyuyamunite. Corvusite and rauvite are probably present in some of the deposits, although these have not been positively identified. The uranium minerals are restricted to the sandstone and sandy or silty facies in the Fall River Formation and the sandstone in the Chilson Member of the Lakota Formation (Schnabel 1963).

Major aquifers in the Black Hills area include (from top to bottom) the Inyan Kara Group, Minnekahta, Minnelusa, Madison, and Deadwood aquifers (see Appendix B). These aquifers are separated by confining layers with low permeability, except where they outcrop (NRC 2012). The Inyan Kara Group aquifer ranges from 250 to 500 feet thick and contains two subaquifers, the Fall River aquifer and Chilson aquifer, which are separated by the Fuson Shale. Aquifer pumping tests have provided data indicating a hydraulic connection between the Lakota and Fall River Formations through the intervening Fuson Shale in the Burdock area (NRC 2012). The Inyan Kara Group aquifer is separated from the Minnekahta aquifer by the Morrison Formation (60 to 140 feet thick), Sundance/Unkpapa aquifer (a minor aquifer), Gypsum Spring Formation, and the Spearfish Formation (320 feet thick). The Minnekahta aquifer ranges in thickness from 25 to 65 feet. Underlying the Minnekahta aquifer is the Opeche Shale (a confining layer) and the Minnelusa aquifer. The Minnelusa aquifer ranges in thickness from 375 to 1,175 feet. Confining layers are present at the base of the Minnelusa Formation; however, locally, these confining layers may be absent or provide ineffective confinement from the underlying Madison aquifer. The Madison aquifer is the most important aquifer in the region, supplying municipal water for numerous communities, including Rapid City and Edgemont, South Dakota. The Madison Formation is 200 to 1,000 feet thick and mainly consists of a dolomite unit characterized by fractures and karst features. The Madison aquifer is separated from the underlying Deadwood aquifer by the low-permeability Whitewood, Winnipeg, and Englewood Formations (NRC 2012). With the exception of Edgemont, which has two municipal wells in the Madison aquifer, the deeper aquifers are not used as a source of water in the area (Powertech 2009).

The hydrogeologic setting in the Black Hills area also involves minor aquifers, which include the Sundance/Unkpapa, Newcastle, and alluvial aquifers. These minor aquifers yield small volumes of water locally for domestic and stock uses. Alluvial aquifers with thicknesses of 0 to 50 feet are along Beaver Creek, Pass Creek, and the Cheyenne River. They are typically unconfined, but may be confined locally. Alluvial aquifers are separated from the underlying Fall River Formation by the low-permeability Graneros Group confining unit. An alluvial drilling program completed in 2012 did not indicate any areas of discharge to the alluvium along Beaver Creek and Pass Creek from the underlying Fall River aquifer (NRC 2012).

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Groundwater in the Fall River and Chilson aquifers flows from northeast to southwest. Regionally, groundwater flows radially outward from the Black Hills toward the surrounding plains (NRC 2012).

Groundwater Levels

Regionally, groundwater levels in alluvial aquifers range from 14.4 to 22.5 feet below ground surface (bgs). Groundwater levels in the Fall River aquifer range from 80 to 680 feet bgs. Groundwater levels in the Chilson aquifer range from 196 to 1,000 feet bgs (Powertech 2009).

4.2 HYDROLOGY

The site lies within the Pass Creek sub-watershed, which comprises most of the east-southeast portion of the larger Beaver Creek watershed. The site is drained by Pass Creek and its tributaries. Located adjacent and east of the site, Pass Creek is an intermittent creek with periods of high runoff following major storm events. No permanent stream flow gages are stationed along Pass Creek (Powertech 2009). Pass Creek flows southwest from the northwest boundary of the Site approximately 6 stream miles to Beaver Creek. Approximately 5.5 stream miles southeast of the confluence of Pass and Beaver Creeks, Beaver Creek flows into the Cheyenne River (Google Earth 2013). In 2013, the mean annual discharge from the Cheyenne River was 38.2 cubic feet per second (cfs), according to a gaging station in Edgemont, downstream of its confluence with Beaver Creek (U.S. Geological Survey [USGS] 2014).

4.3 METEOROLOGY

According to the High Plains Regional Climate Center's (HPRCC) station in Edgemont, the average maximum and minimum annual temperatures in the site area are 61.2 and 33.1 degrees Fahrenheit (°F), respectively. The annual average precipitation is 15.79 inches (HPRCC 2014).

5.0 PREVIOUS ANALYTICAL DATA

Analytical data from groundwater, surface water, sediment, soil, and air were collected within the study area by Powertech and were included in the Dewey-Burdock Project Application for NRC Uranium Recovery License Technical Report (Powertech 2009). These data were referenced in the Environmental Impact Statement (EIS) completed by the NRC.

5.1 GROUNDWATER

The following sections address groundwater sampling and results of that sampling.

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5.1.1 Groundwater Sampling

According to a well inventory conducted by Powertech, the following wells are within a 4-mile radius of the Site boundary: one domestic well and five stock wells are within the Site boundary; one domestic well is within 0.25 mile of the Site; one domestic well and four stock wells are between 0.25 and 0.50 mile of the Site; one domestic well and six stock wells are within 0.50 and 1 mile of the Site; 12 stock wells are between 1 and 2 miles of the Site; eight domestic wells, 10 stock wells, and one irrigation well are between 2 and 3 miles of the Site; and six domestic and 10 stock wells are between 3 and 4 miles of the Site (Figure 3).

Powertech conducted groundwater sampling of wells at the proposed Dewey-Burdock ISR project area from October 2006 through February 2009 (see Figure 4). Groundwater samples were collected from domestic, stock, irrigation, monitoring, and temporary wells, the majority of which were downgradient of the Site. Groundwater samples were collected from wells in various aquifers: 17 wells were in the Fall River Formation, 19 wells were in the Lakota Formation (Chilson Member), two wells were in the Inyan Kara Group, three wells were in the Unkpapa Formation, two wells were in unknown aquifers, one well was in the Sundance Formation, and five wells were in alluvium. Generally, groundwater samples were collected for analysis for water quality parameters: major ions; metals, including mercury (total, suspended, and dissolved); and radionuclides (total, suspended, and dissolved).

USGS also conducted groundwater sampling in the Dewey-Burdock area during June 2011. USGS collected 28 groundwater samples from monitoring wells in and around the Dewey-Burdock site that were screened in multiple aquifers.

During July 2012, American Engineering and Testing, Inc. installed additional alluvial groundwater monitoring wells in the area of the Site to supplement the groundwater monitoring results included in the initial application submitted to NRC by Powertech. The additional wells were compliance point wells within the alluvial aquifers along Beaver Creek and Pass Creek (see Figure 5). The wells were sampled monthly by Powertech from July 2012 to June 2013. Most of the samples were analyzed for water quality measurements, metals (including mercury), and dissolved radionuclides.

5.1.2 Groundwater Analytical Results Summary

Groundwater sampling results indicated that in 36 of 49 samples, at least one analyte exceeded the Maximum Contaminant Level (MCL). Of 38 groundwater samples collected from the proposed ore-bearing aquifer, 28 contained analyte concentrations exceeding at least one MCL for drinking water (NRC 2012). The designated crossgradient background well (Well 650) contained concentrations of the

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contaminants of concern, including total and dissolved radium-226 (Ra-226) (3.2/2.7 picocuries per liter [pCi/L]), total and dissolved uranium (0.4/1.9 micrograms per liter [µg/L]), and dissolved gross alpha (13.1 pCi/L). None of these background concentrations exceeded its MCL.

Samples collected from Wells 615, 684, and 3026, which were screened within the Chilson aquifer, exceeded the MCL for arsenic (0.01 milligram per liter [mg/L]); Wells 650 and 689, also within the Chilson aquifer, exceeded the EPA action level for lead (0.015 mg/L). Samples from Well 622 in the Fall River aquifer and from Wells 676 and 679 in alluvial aquifers along Pass Creek exceeded the MCL for arsenic and EPA action level for lead. Samples from Wells 681 and 688 in the Fall River aquifer exceeded the MCL for arsenic. The MCL for uranium (30 µg/L) was exceeded in samples collected from four of five wells sampled in the alluvial aquifers. Samples from Wells 42, 680, 684, and 3026 in the Chilson aquifer and Well 698 in the Fall River aquifer also exceeded the MCL for uranium. No MCLs for other metals were exceeded in any of the groundwater samples (NRC 2012).

Approximately 50 percent of the samples collected from the Fall River and Chilson aquifers for analysis for dissolved Ra-226 exceeded the MCL of 5 pCi/L. Dissolved Ra-226 levels exceeding the MCL ranged between 5.2 and 1,440 pCi/L. Approximately 75 percent of the samples collected from wells in the Fall River, Chilson, and alluvial aquifers for analysis for dissolved gross alpha exceeded the MCL of 15 pCi/L. Gross alpha levels exceeding the MCL in alluvial wells ranged between 18.3 and 129 pCi/L; however, gross alpha levels exceeding the MCL in the Fall River and Chilson aquifers were higher, ranging from 15.1 to 6,730 pCi/L. Samples from wells 16, 619, 680, 688, and 692 contained dissolved Ra-226 ranging from 6.4 to 1,440 pCi/L, and dissolved gross alpha concentrations ranging from 17.3 to 6,730 pCi/L exceeding their respective MCLs; these wells are within a 1-mile radius of the Site boundary, and are crossgradient or downgradient of the Site.

A primary drinking water standard for radon-222 (Rn-222) has not been established; however, EPA has proposed a limit of 300 pCi/L (EPA 2000). Of samples from all the wells tested during baseline groundwater sampling, only the sample from Well 650 (background) did not exceed the proposed EPA limit; Well 650 is screened in the Chilson aquifer, and is crossgradient of the Site (NRC 2012). Concentrations of Rn-222 found to exceed the EPA's proposed limit for Rn-222 ranged from 11,247 to 17,092,120 Becquerels per cubic meter (Bq/m^3) (304 to 462,000 pCi/L). Wells 680 and 42 in the mapped ore bodies in the Chilson aquifer, and Well 681 in the Fall River aquifer, contained the highest concentrations of Rn-222. Well 42 provides water for domestic use and stock water (NRC 2012).

Groundwater samples collected from all domestic wells except Well 8 contained concentrations of at least one analyte that exceeded its MCL. Groundwater samples exceeding MCLs for uranium (total and

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dissolved), Ra-226 (total and dissolved), dissolved gross alpha, and arsenic, and the EPA action level for lead, are listed in Table 1.

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TABLE 1

GROUNDWATER DATA SUMMARY
DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE
JULY 2007 THROUGH FEBRUARY 2009

Well ID	Aquifer	Well Description	Ra-226 (Total) (pCi/L)	Ra-226 (Dissolved) (pCi/L)	Uranium (Total) (µg/L)	Uranium (Dissolved) (µg/L)	Gross Alpha (Dissolved) (pCi/L)	Arsenic (mg/L)	Lead (mg/L)
2	Chilson	Domestic/Stock	--	--	--	--	--	--	--
4	Unknown	Stock	--	--	--	--	--	--	--
5	Fall River	Stock	--	--	--	--	--	--	--
7	Fall River	Domestic	--	--	--	--	15.5 – 17.0	--	--
8	Fall River	Domestic	--	--	--	--	--	--	--
13	Chilson	Domestic	--	--	--	--	19.5	--	--
16	Chilson	Domestic	17.4	6.4 – 33.6	--	--	28.3 – 110	--	--
18	Fall River	Domestic	--	5.8	--	--	15.7 – 37.0	--	--
41	Unknown	Stock	--	16.5	--	--	88	--	
42	Chilson	Domestic	79.7	87.6 – 102	--	32.4 – 40	371 – 560	--	--
49	Fall River	Stock	--	--	--	--	--	--	--
615	Chilson	Monitoring	--	7.2	--	--	15.1 – 38.3	0.021 – 0.024	--
619	Chilson	Stock	120	99.7 – 120	--	--	341 – 438	--	--
622	Fall River	Monitoring	--	7.9	--	--	22.6 – 1,470	0.027	0.023 – 0.03
628	Inyan Kara	Stock	6.8	6.1 – 20.7	--	--	29.9 – 83.9	--	--
631	Fall River	Stock	15.2	9.5 – 22.1	--	--	46.5 – 162	--	--
635	Sundance	Stock	--	--	--	--	--	--	--
650	Chilson	Stock (background)	--	--	--	--	--	--	0.05
675	Alluvial	Alluvial	--	--	38.7 – 50.2	30.7 – 49.3	18.3 – 55.2	--	--
676	Alluvial	Alluvial	--	--	59.1 – 68.7	49.4 – 58.6	31.9 – 95.5	0.021	0.06
677	Alluvial	Alluvial	--	--	41.4 – 47.1	40.2 – 45.0	38.7 – 129	--	--
678	Alluvial	Alluvial	--	--	37.9 – 38.7	34.9 – 36.8	18.9 – 54.7	--	--
679	Alluvial	Alluvial (background)	--	--	--	--	18.4 – 22.4	0.011	0.015 – 0.022

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TABLE 1 (Continued)

**GROUNDWATER DATA SUMMARY
DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE
JULY 2007 THROUGH FEBRUARY 2009**

Well ID	Aquifer	Well Description	Ra-226 (Total) (pCi/L)	Ra-226 (Dissolved) (pCi/L)	Uranium (Total) (µg/L)	Uranium (Dissolved) (µg/L)	Gross Alpha (Dissolved) (pCi/L)	Arsenic (mg/L)	Lead (mg/L)
680	Chilson	Test Well	--	1,110 – 1,440	54.1	30.3 – 172	4,090 – 6,730	--	--
681	Fall River	Test Well	--	258 – 445	--	--	656 – 2,220	0.024	--
682	Chilson	Monitoring	--	--	--	--	50.3	--	--
683	Fall River	Monitoring	--	--	--	--	--	--	--
684	Chilson	Monitoring	--	543	336	66.7	1890	0.04	--
685	Fall River	Monitoring	--	--	--	--	23.8	--	--
686	Chilson	Monitoring	--	--	--	--	--	--	--
687	Fall River	Monitoring	--	25.7	--	--	114	--	--
688	Fall River	Test Well		6.7 – 7.9	--	--	17.3 – 29.8	0.015	--
689	Chilson	Test Well	--	5.4 – 7.9	--	--	23.9 – 64.3	--	0.017
690	Unkpapa	Monitoring	--	--	--	--	--	--	--
691	Fall River	Monitoring	--	--	--	--	--	--	--
692	Chilson	Monitoring	--	484	--	--	1450	--	--
693	Unkpapa	Monitoring	--	--	--	--	--	--	--
694	Fall River	Domestic	--	--	--	--	20.2 – 23.9	--	--
695	Fall River	Stock	--	5.2–6.3	--	--	15.9 – 52.2	--	--
696	Chilson	Domestic	--	--	--	--	15.1 – 25.9	--	--
697	Chilson	Stock	--	5.6	--	--	18.2 – 21.7	--	--
698	Fall River	Weather Station	--	347 – 429	101 – 132	99.8 – 119	36.3 – 2,110	--	--
703	Unkpapa	Domestic	--	--	--	--	42.6	--	--
704	Chilson	Monitoring	--	--	--	--	--	--	--
705	Chilson	Monitoring	--	--	--	--	--	--	--

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TABLE 1 (Continued)

**GROUNDWATER DATA SUMMARY
DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE
JULY 2007 THROUGH FEBRUARY 2009**

Well ID	Aquifer	Well Description	Ra-226 (Total) (pCi/L)	Ra-226 (Dissolved) (pCi/L)	Uranium (Total) (µg/L)	Uranium (Dissolved) (µg/L)	Gross Alpha (Dissolved) (pCi/L)	Arsenic (mg/L)	Lead (mg/L)
706	Fall River	Monitoring	--	--	--	--	20.5 – 56.3	--	--
3026	Chilson	Stock	--	9.5 – 10.4	32.2	--	15.4 – 116	0.022–0.044	--
4002	Inyan Kara	Stock	62.7	52.3 – 63.6	--	--	120 – 314	--	--
7002	Chilson	Stock	6.3	8.0 – 8.8	--	--	29.5 – 91.4	--	--
MCL			5	5	30	30	15	0.01	0.015[a]

Source: Powertech 2012c

Notes:

[a] EPA action level
-- Below the MCL or not analyzed
ID Identification
MCL Maximum Contaminant Level
mg/L Milligrams per liter
pCi/L Picocuries per liter
Ra-226 Radium-226
µg/L Micrograms per liter

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Samples collected by USGS from Wells 676 and 678 (also sampled by Powertech), which were screened in the alluvial aquifer along Pass Creek, exceeded the MCL for uranium. Additionally, a sample collected from Well 698 (also sampled by Powertech), screened in the Fall River aquifer and immediately downstream of runoff from the Site, also exceeded the MCL for uranium (Johnson 2012).

Samples collected by Powertech from monitoring wells in 2012 and 2013 contained concentrations of gross alpha that exceeded its MCL (15 pCi/L). Well BC1, downgradient of the Site, was the only well that contained a concentration of uranium above its MCL. As previously mentioned, a primary drinking water standard for Rn-222 has not been established; however, EPA has proposed a limit of 300 pCi/L (EPA 2000). All groundwater samples collected from the alluvial monitoring wells contained concentrations of Rn-222 that exceeded 300 pCi/L. A summary of groundwater results from the alluvial monitoring wells in the area of the Site is in Table 2 below.

TABLE 2

MONITORING WELL SUMMARY DATA
DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE
2012-2013

Well ID	Sample Location	Ra-226 (pCi/L)	Uranium (pCi/L)	Gross Alpha (pCi/L)
BC1	Pass Creek watershed	--	75.7 – 111	50.1 – 108
BC2	Pass Creek watershed	--	--	20.0 – 38.9
BC3	Pass Creek watershed	--	--	19.3 – 43.5
DC1	Beaver Creek watershed	--	--	15.9 – 88.7
DC2	Beaver Creek watershed	--	--	20.7 – 41.7
DC3	Beaver Creek watershed	--	--	--
DC4	Beaver Creek watershed	--	--	16.5 – 29.6
MCL		5	30	15

Source: Powertech 2013

Notes:
-- Below the MCL or not analyzed
ID Identification
MCL Maximum Contaminant Level
pCi/L Picocuries per liter
Ra-226 Radium-226

5.2 SURFACE WATER AND SEDIMENT

The following sections address analytical data from surface water and sediment samples collected at the study area. Sample locations are shown on Figure 6.

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5.2.1 Surface Water Sampling

Surface water samples were collected monthly between July 2007 and June 2008 from perennial and ephemeral streams near the area of the Site. The perennial streams, Beaver Creek and the Cheyenne River, were each sampled at two locations. The ephemeral streams included Pass Creek, Bennett Canyon, and an unnamed tributary (see Figure 6). Passive samplers were installed at the ephemeral stream locations to collect samples during flow events. Two sample locations were on Pass Creek, while samples were to be collected at one location each at Bennet Canyon and the unnamed tributary (Powertech 2009). The Bennet Canyon sample location was absent of water during both sampling periods.

Surface water samples were also collected at impoundment locations in the area of the Site during 2007-2008. In all, 48 impoundments had been identified on aerial photographs and topographic maps prior to field activities and were subsequently field-verified. A subset of 11 impoundments were chosen from the total of 48, based on presence of water during sampling activities and spatial distribution of the impoundments. The locations included the Darrow Pit, Triangle Pit, and nine other impoundments (see Figure 6). Some of the impoundments on the site meet the definition of "surface impoundment" described in Hazard Ranking System (HRS) Table 2-5, indicating they could also be evaluated as potential sources of contamination for HRS scoring purposes (EPA 2011).

5.2.2 Surface Water Analytical Results Summary

Total gross alpha concentrations were detected at all seven sample locations and ranged from 1.9 to 65.8 pCi/L. The highest concentration was detected in a sample collected at the downstream Beaver Creek location. Total and dissolved uranium were detected in every sample except the one collected from the unnamed tributary. The highest concentrations of total uranium (37.8 µg/L) and dissolved uranium (36.8 µg/L) were in a sample collected at the downstream Cheyenne River location. Total and dissolved Ra-226 were detected at concentrations ranging from 0.2 to 5.1 pCi/L. The highest detections occurred in samples collected at the downstream sample locations on Beaver Creek and the Cheyenne River. Total and dissolved Pb-210 were detected at concentrations up to 35 pCi/L. The highest concentration was detected at the upstream sample location on Beaver Creek.

Samples collected at downstream locations on Beaver Creek and Pass Creek met observed release criteria by containing analytes that exceeded three times background concentrations. The sample collected downstream on Pass Creek contained elevated concentrations of gross alpha (8.8 pCi/L), and total and dissolved uranium (25.2/5.0 µg/L), meeting observed release criteria. The sample collected downstream on Beaver Creek contained elevated concentrations of gross alpha (65.8 pCi/L); however, the

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concentration did not meet observed release criteria. Additionally, a sample collected at the downstream location on the Cheyenne River contained an elevated concentration of Pb-210 (22.0 pCi/L) that met observed release criteria. However, that downstream sampling location on the Cheyenne River was beyond the 15-mile Target Distance Limit (TDL).

Analytical results from surface water samples are listed in Table 3 (Powertech 2012). To summarize the surface water data, the highest downstream detections of each analyte are listed with the corresponding upstream sample results from the same sampling event. For example, the highest concentration of total gross alpha at the downstream Beaver Creek location was detected in a sample collected on November 19, 2007 (65.8 pCi/L at BVC01). Therefore, the total gross alpha concentration detected in the upstream Beaver Creek sample collected on November 19, 2007 (34.7 pCi/L at BVC04), is also listed in the table. The date on which concentrations of Pb-210 were detected at the Cheyenne River downstream location had no counterpart date of Pb-210 data acquisition at the upstream location; thus data obtained on the date of upstream data acquisition closest to the date of data acquisition at the downstream location were used for the comparison. No Superfund Chemical Data Matrix (SCDM) benchmarks have been established for radionuclides in surface water.

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TABLE 3

RADIOLOGICAL DATA FOR SURFACE WATER SAMPLES DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE 2007-2008

Sample Location	Sample Description	Gross Alpha Total (pCi/L)	Uranium (µg/L)		Ra-226 (pCi/L)		Pb-210 (pCi/L)	
			Total	Dissolved	Total	Dissolved	Total	Dissolved
BVC04	Beaver Creek–upstream	34.7	6.1	5.6	2.2j	-0.06j	35	26
BVC01	Beaver Creek–downstream	65.8	26.2	26.9	5.1	2.0	14.0	11.0
CHR01	Cheyenne River–upstream	35.3	32.0	30.8	4.1	0.06j	<1	<1
CHR05	Cheyenne River–downstream	29.9	37.8	36.8	5.1	1.4	22.0	<1
PSC02	Pass Creek–upstream	1.9	5.7	0.7	<0.2	NM	0.0j	1.7j
PSC01	Pass Creek–downstream	8.8	25.2	5.0	0.7	NM	3.0j	2.2j
UNT01	Unnamed Tributary	6.1	0.9	ND	0.3	0.2	NA	NA

Source: Powertech 2012d

Notes:

Shaded result indicates the value exceeds three times the background (upstream) level (or above the detection limit if non-detect in the background sample).

<	Less than
ID	Identification
j	Not detected above minimum detectable concentration
NA	Not analyzed
ND	Non detect
NM	Not measured in field/not requested for analysis from laboratory
Pb-210	Lead-210
pCi/L	Picocuries per liter
Ra-226	Radium-226
µg/L	Micrograms per liter

Samples collected from the Darrow Pit (Sub06) and the Triangle Mine Pit (Sub02) contained the highest radionuclide concentrations of the 11 impoundment samples. Total gross alpha was detected at 8,750 pCi/L at location Sub06 and 199 pCi/L at location Sub02. Total and dissolved uranium were detected at 7,380 and 7,840 pCi/L, respectively, at location Sub06, and at 190 and 177 pCi/L, respectively, at location Sub02. In addition, samples collected at Sub01, Sub03, Sub04, Sub09, and Sub10 contained concentrations of total gross alpha ranging from 15.9 to 19.9 pCi/L. Samples collected from Sub01, Sub06, and Sub08 through Sub11 contained concentrations of total Pb-210 ranging from 1.1 to 8.2 pCi/L. Samples collected from Sub02, Sub08, and Sub11 contained concentrations of dissolved

Pb-210 ranging from 1.5 to 4.6 pCi/L. Maximum results for each surface water impoundment in the area of the Site are listed in Table 4.

TABLE 4

RADIOLOGICAL DATA FOR SURFACE WATER IMPOUNDMENT SAMPLES DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE 2007-2008

Sample Location	Sample Description	Gross Alpha Total (pCi/L)	Uranium (µg/L)		Ra-226 (pCi/L)		Pb-210 (pCi/L)	
			Total	Dissolved	Total	Dissolved	Total	Dissolved
Sub01	Stock pond	16.2	2.0	0.3	1.2	0.5	-1.4 j	0.7
Sub02	Triangle Mine Pit	199	190	177	0.6	0.7	0.5	0j
Sub03	Mine dam	19.9	3.1	2.3	4.0	4.5	-3.8j	-3.0j
Sub04	Stock pond	13.6	2.4	2.1	3.5	3.4	-3.0j	-2.1j
Sub05	Mine dam	NS	NS	NS	NS	NS	NS	NS
Sub06	Darrow Mine Pit - Northwest	8,750	7,380d	7,840	2.0	4.3	3.1	-0.6j
Sub07	Stock dam	5.8	1.3	2.4	0.8	0.8	-0.8j	-1.4j
Sub08	Stock pond	14.1	2.3	2.8	0.5	0.5	5.3	4.6
Sub09	Stock pond	15.9	2.3	5.6	0.5	0.1	3.6	-0.9j
Sub10	Stock pond	16.3	3.3	2.7	1.2	0.2	5.3j	0.1
Sub11	Stock pond	9.4	1.6	33.6d	0.9	0.7	8.2	3.2

Source: Powertech 2012d

Notes:

<	Less than
d	Reporting limit increased due to sample matrix interference
ID	Identification
j	Not detected above minimum detectable concentration
NS	Not sampled because no water present
Pb-210	Lead-210
pCi/L	Picocuries per liter
Ra-226	Radium-226

5.2.3 Sediment Sampling

Sediment samples were collected by Powertech at collocated surface water sample locations previously cited in Section 5.2.1 (see Figure 6). At each location, four sample aliquots were collected by use of a plastic hand trowel to a depth of 5 centimeters (cm), along a transect spanning the width of the channel in areas where sediment had been deposited. The aliquots were then composited into a single sample to represent the average radionuclide concentration across the channel (Powertech 2009).

Additional sediment samples were collected in the area of the Site from on-site impoundments described in Section 5.2.1. At each location, a single sample was collected by use of a trowel to a depth of 5 cm. Samples were collected near the edge of the water at locations appearing relatively undisturbed. At dry impoundments, sediment samples were collected within areas determined likely to be submerged if water would be present (Powertech 2009). The sediment samples were analyzed for natural uranium, Ra-226, thorium-230 (Th-230), and Pb-210 (Powertech 2009).

5.2.4 Sediment Analytical Results Summary

Samples collected at the downstream Pass Creek location (PSC01) exceeded three times background concentrations for all analytes, thereby meeting observed release criteria. Additionally, a sample collected at the downstream Cheyenne River location (CHR05) exceeded three times the background level for uranium, thereby meeting observed release criteria. Table 5 summarizes analytical results from sediment samples collected at locations on Pass Creek, Beaver Creek, the Cheyenne River, Bennet Canyon, and an unnamed tributary.

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TABLE 5
RADIOLOGICAL DATA FROM STREAM SEDIMENT SAMPLES
DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE
2008

Sample Location	Sample Description	Sample Date	U-nat Total (mg/kg-dry)	Ra-226 Total (pCi/g-dry)	Pb-210 Total (pCi/g-dry)	Th-230 Total (pCi/g-dry)
BEN01	Bennet Canyon	6/23/2008	1.8	0.6	2.3U	0.6
		8/21/2008	2.4	0.6	2.0	0.5
BVC04	Beaver Creek-upstream	6/17/2008	2.0	1.5	1.9U	0.7
		8/21/2008	2.0	1.0	1.8	1.0
BVC01	Beaver Creek-downstream	6/17/2008	2.0	1.3	0.5U	0.8
		8/21/2008	2.0	0.6	2.6	1.2
CHR01	Cheyenne River-upstream	6/17/2008	1.7	1.0	0.2U	0.6
		8/21/2008	2.7	0.9	1.7	1.4
CHR05	Cheyenne River-downstream	6/17/2008	6.2	2.1	1.7U	1.9
		8/21/2008	1.2	0.6	1.3	0.5
PSC02	Pass Creek-upstream	6/17/2008	1.1	0.6	1.2U	0.4
		8/21/2008	1.0	0.4	0.4U	0.4
PSC01	Pass Creek-downstream	6/17/2008	3.9	2.9	4.7	2.0
		8/21/2008	6.5	1.8	4.0	4.1
UNT01	Unnamed Tributary	6/23/2008	2.0	0.8	2.2U	0.5
		8/21/2008	2.5	0.7	1.7	1.0

Source: Powertech 2009

Notes:

Shaded result indicates the value exceeds three times the background (upstream) level (or above the detection limit if non-detect in the background sample).

ID Identification
mg/kg Milligrams per kilogram
NE Not established
Pb-210 Lead-210
pCi/g Picocuries per gram
Ra-226 Radium-226
Th-230 Throium-230
U Analyte not detected at or above the reporting limit
U-nat Natural uranium

Uranium concentrations in samples from the Darrow Mine Pit – Northwest (Sub06) and Triangle Mine Pit (Sub02) ranged from 18 to 37 mg/kg. Samples from two mine dams (Sub03 and Sub05) and one stock pond (Sub04) contained concentrations of uranium ranging from 4.2 to 8.5 mg/kg. Samples collected from Sub02, Sub05, and Sub06 contained concentrations that exceeded three times background concentrations of uranium, Ra-226 and Th-230, meeting observed release criteria. The sample collected at location Sub03 also contained a concentration of Ra-226 that exceeded three times background, meeting observed release criteria. The sample quantitation limit (SQL) for Pb-210 could not be confirmed through laboratory data information, and therefore the data could not be used to establish an

observed release. Table 6 summarizes analytical results from sediment samples collected at impoundment locations throughout the area of the Site.

TABLE 6

**RADIOLOGICAL DATA FOR IMPOUNDMENT SEDIMENT SAMPLES
DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE
2008**

Sample Location	Location Description	Sample Date	U-nat Total (mg/kg-dry)	Ra-226 Total (pCi/g-dry)	Pb-210 Total (pCi/g-dry)	Th-230 Total (pCi/g-dry)
Sub01 (background)	Stock pond	6/18/2008	2.2	1.2	0.5U	0.7
		8/21/2008	3.3	1.1	1.0U	1.0
Sub02	Triangle Mine Pit	6/18/2008	18	3.9	2.8U	2.9
		8/21/2008	19	1.3	3.1	6.8
Sub03	Mine dam	6/18/2008	7.2	4.1	3.9	2.1
		8/21/2008	4.2	1.1	3.2	1.9
Sub04	Stock pond	6/17/2008	6.5	2.5	1.2U	0.9
		8/21/2008	5.1	0.7	2.1	1.8
Sub05	Mine dam	6/18/2008	8.5	4.2	4.2	2.4
		8/21/2008	6.0	3.0	2.8	2.3
Sub06	Darrow Mine Pit – Northwest	6/23/2008	37	8.6	9.6	7.8
		8/21/2008	32	5.2	4.0	5.9
Sub07	Stock dam	6/23/2008	1.7	0.7	0.6U	0.5
		8/21/2008	2.2	0.4	1.9	0.9
Sub08	Stock pond	6/23/2008	1.2	0.6	0.6U	0.4
		8/21/2008	1.9	0.4	1.7	0.8
Sub09	Stock pond	6/23/2008	2.4	1.0	1.5U	0.7
		8/21/2008	2.3	0.6	1.7	0.9
Sub10	Stock pond	6/23/2008	1.5	0.8	1.5U	0.7
		8/21/2008	2.1	0.6	0.9U	0.7
Sub11	Stock pond	6/23/2008	2.7	0.8	2.1U	0.5
		8/21/2008	1.8	0.6	1.5	0.8

Source: Powertech 2009
Notes:

Shaded result indicates a concentration that exceeds three times the background level (sample results from June 18, 2008)

ID Identification
mg/kg Milligrams per kilogram
Pb-210 Lead-210
pCi/g Picocuries per gram
Ra-226 Radium-226
Th-230 Thorium-230
U Analyte not detected at or above the reporting limit
U-nat Natural uranium

5.3 SOIL

The following sections address soil sampling and analytical results from soil sampling.

5.3.1 Soil Sampling

Powertech conducted soil sampling within the proposed Dewey-Burdock permit area, which included the area of the Site. Surface soil samples were collected from the top 15 cm by use of a hand shovel. All of the soil samples were analyzed for Ra-226. In all, 25 samples were collected at the area of the Site (Powertech 2009).

5.3.2 Soil Analytical Results Summary

Samples SMA-B01 through SMA-B29 (not consecutive) were collected at the area of the Site (see Figure 7). Sample SMA-B01 was the designated background sample. The sample results were compared to SCDM cancer risk (CR) screening levels for ingestion of soil, and the health-based standard of 5.0 pCi/g for Ra-226 in surface soil (15 pCi/g for subsurface soil) based on the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978. That standard was developed for cleanup of radiation-contaminated soil, specifically uranium mill tailings sites. An EPA memorandum dated February 12, 1998, clarifies use of the UMTRCA soil cleanup standard for CERCLA sites (EPA 1998). The purpose of the standard was to limit risk from inhalation of radon decay products in houses built on mine tailings, and to limit gamma radiation exposure to people using contaminated land. The standard was developed to control the hazard from gamma radiation; therefore, this standard may be appropriate and relevant to CERCLA sites (EPA 1998).

Samples SMA-B03, -B07, -B09, -B10, -B11, -B13, -B14, -B15, -B19, -B21, and -B23 through -B30 contained concentrations of Ra-226 that exceeded the SCDM CR screening level of 1.0 pCi/g. Samples SMA-B26 through -B30, collected near the Triangle Mine Pit area and the Darrow Mine Pit, contained concentrations exceeding both the SCDM CR benchmark for Ra-226 and the UMTRCA standard for surface soil for Ra-226 of 5.0 pCi/g. Samples SMA-B07, -B23, -B26, -B28, and -B30 contained concentrations of Ra-226 at or above three times background (0.9 pCi/g), meeting observed release criteria. The exact location of sample SMA-B28 could not be confirmed from the source map produced by Powertech. In addition, samples SMA-B27 and -B29 contained concentrations of natural uranium (U-nat), Pb-210, and Th-230 at concentrations exceeding three times background, also meeting observed release criteria. Table 7 summarizes the surface soil sample analytical results.

TABLE 7

RADIOLOGICAL DATA FROM SURFACE SOIL SAMPLES DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE 2012

Sample ID	Sample Date	Ra-226 (pCi/g)	U-nat (pCi/g)	Pb-210 (pCi/g)	Th-230 (pCi/g)
SMA-B01(background)	9/24/2007	0.9	1.2	0.6	0.5
SMA-B03	9/24/2007	**1.5**	-	-	-
SMA-B04	9/24/2007	1.0	-	-	-
SMA-B07	9/24/2007	3.2	-	-	-
SMA-B09	9/24/2007	**1.2**	-	-	-
SMA-B10	9/25/2007	**1.4**	-	-	-
SMA-B11	9/24/2007	**2.3**	-	-	-
SMA-B13	9/25/2007	**1.7**	-	-	-
SMA-B14	9/24/2007	**1.4**	-	-	-
SMA-B15	9/24/2007	**1.6**	-	-	-
SMA-B16	9/24/2007	0.8	-	-	-
SMA-B17	9/24/2007	0.9	-	-	-
SMA-B18	9/25/2007	0.5	-	-	-
SMA-B19	9/24/2007	**1.2**	-	-	-
SMA-B20	9/27/2007	0.9	-	-	-
SMA-B21	9/24/2007	**1.4**	-	-	-
SMA-B22	9/24/2007	0.8	-	-	-
SMA-B23	9/24/2007	2.7	-	-	-
SMA-B24	9/24/2007	**1.3**	-	-	-
SMA-B25	9/24/2007	**1.1**	-	-	-
SMA-B26	9/28/2007	11	-	-	-
SMA-B27	9/28/2007	40	67	30	30
SMA-B28	9/29/2007	6.4	-	-	-
SMA-B29	9/28/2007	29	16	20	20
SMA-B30	9/28/2007	34	-	-	-
SCDM Cancer Risk (ingestion)		1.0	3.7*	NE	3.0
UMTRCA Standard for Surface Soil		5.0	30*	NE	NE

Source: Powertech 2009

Notes:

Bold result indicates a concentration that exceeds the SCDM or UMTRCA benchmark.
Shaded result indicates a concentration that exceeds three times the background level.

*	Uranium-238 concentration	pCi/g	Picocuries per gram
-	Not analyzed	Ra-226	Radium-226
ID	Identification	SCDM	Superfund Chemical Data Matrix
NA	Not applicable	Th-230	Thorium-230
NE	Not established	UMTRCA	Uranium Mill Tailings Radiation Control Act
Pb-210	Lead-210	U-nat	Natural uranium

Powertech conducted baseline radiological surveys and sampling in the area of the Site between August 2007 and July 2008 to characterize and quantify radiation levels and radionuclide concentrations in soils. Within the surface mine area, external gamma exposure rates ranged from 5.9 to 324 microroentgens per hour (µR/hr). Elevated readings were associated with the abandoned open pit mines, waste rock, and drainages in the surface mine area (Powertech 2009). Background external gamma exposure rates near the Site were approximately 5.0 µR/hr (USGS 1993). Gamma exposure rates within the area of the Site exceeded three times the background, meeting observed release criteria. Table 8 summarizes gamma exposure rates in surface soil in the mine area.

TABLE 8

EXTERNAL GAMMA EXPOSURE RATES IN SURFACE SOIL IN MINE AREA DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE

2007-2008

Parameter	Gamma-Ray Count Rate (µR/hr)
Mean	13.8
Standard Deviation	18.4
Median	10.9
Minimum	5.9
Maximum	324.1
Background	5.0*

Sources: Powertech 2009, USGS 1993

Notes:

* Approximate
µR/hr Microroentgens per hour

5.4 AIR

The following sections address air sampling and analytical results from air sampling.

5.4.1 Air Sampling

Powertech conducted air monitoring and sampling within the area of the Site during three monitoring periods: August 18, 2007 to February 4, 2008; February 4 to May 17, 2008; and May 17 to July 17, 2008. Ambient exposure rates were measured by use of thermo luminescent dosimeters (TLD) placed at eight locations throughout the Dewey-Burdock site; however, five of the TLDs deployed were lost due to suspected disturbance by livestock in the area.

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In addition, Radtrak passive track etch detectors were placed at each of those air monitoring locations, and at an additional eight biased locations to measure radon-222 (Rn-222) concentrations in air. The measurement events were separated into four quarterly periods as follows: August 14 to September 27, 2007; September 27, 2007, to February 1 through 12, 2008; February 1 through 12, 2008, to May 17, 2008; and May 17 to July 17, 2008 (Powertech 2009).

5.4.2 Air Sampling Results Summary

The associated annualized dose rates ranged from 114 to 323 mrem/yr. Typical ranges of average worldwide exposures are 60 to 160 mrem/yr (Powertech 2009).

Ambient radon monitoring results were as follows: Period 1 concentrations ranged from 1.0 to 9.8 pCi/L, with an average of 2.4 pCi/L; Period 2 concentrations ranged from 0.4 to 1.8 pCi/L, with an average of 1.2 pCi/L; Period 3 concentrations ranged from 0.4 to 3.3 pCi/L, with an average of 1.8 pCi/L; Period 4 concentrations ranged from 0.5 to 0.8 pCi/L, with an average of 0.5 pCi/L. In terms of effluent limits, the measured values exceeded the 10 *Code of Federal Regulations* (CFR) Part 20 limit of 0.1 pCi/L for Rn-222 with daughters present (Powertech 2009).

6.0 SOURCES OF CONTAMINATION AND WASTE CHARACTERISTICS

The source areas at the Site were geo-referenced to establish an approximate boundary and area of the four mine waste piles within the site boundary (see Figure 8). Waste Pile #1 (approximately 941,651.45 ft^2) is near the Triangle Mine Pit in the northwest portion of the site. Waste Pile #2 (approximately 11,037.49 ft^2) is 0.25 mile east of Pile #1. Waste Pile #3 (approximately 1,372,012.21 ft^2) is in the north central portion of the site. Waste Pile #4 (approximately 8,552,514.66 ft^2) is near the Darrow Mine Pit in the southeast portion of the site. The combined area of the waste piles is approximately10,877,215 ft^2 (see Figure 8). Radionuclides are the contaminants of concern, including natural uranium, Ra-226, Th-230, and Pb-210. Natural uranium is uranium containing the following relative concentrations of isotopes found in nature: uranium-235 (0.7 %), uranium-238 (99.3 %), and uranium-234 (trace amounts) (NRC 2014b). These radionuclides are present across the area of the Site, and migration of these off site into nearby surface water bodies has been documented. Surface soil samples near the open pits and mine waste piles have contained significantly elevated concentrations of radionuclides, exceeding UMTRCA standards and three times background concentrations.

Uranium, radium, and radon are naturally occurring. Chronic (long-term) inhalation exposure to uranium and radon in humans has been linked to respiratory effects such as chronic lung disease, while radium exposure has resulted in acute leukopenia, anemia, necrosis of the jaw, and other effects. Cancer is the

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major effect of concern from exposure to radium via oral exposure, which is known to cause bone, head, and nasal passage tumors in humans. Uranium may cause lung cancer and tumors in lymphatic and hematopoietic tissues (EPA 2000).

7.0 PATHWAY ANALYSIS

This section discusses contaminant migration pathways evaluated under the HRS. A CERCLA Eligibility Checklist (Appendix B) and a Potential Hazardous Waste Preliminary Assessment Form (Appendix C) have been completed for the PA. Additionally, site risks and pathways of concern have been presented in a Conceptual Site Model (Appendix D).

7.1 GROUNDWATER PATHWAY AND TARGETS

Radiological results from samples indicate that groundwater in the area of the Site contains concentrations of radionuclides that exceed MCLs for uranium, Ra-226, and gross alpha. In addition, some wells contain concentrations of lead and arsenic that exceed the EPA action level for lead and MCL for arsenic. The majority of the samples exceeding these standards were collected from the Inyan Kara Group aquifer. This aquifer ranges from 250 to 500 feet thick and contains two subaquifers—the Fall River aquifer and Chilson aquifer—which are separated by the Fuson Shale. Data from aquifer pumping tests indicate a hydraulic connection between the Lakota and Fall River Formations through the intervening Fuson Shale in the Burdock area (NRC 2012). Samples collected from the alluvial aquifer in the area of the Site have also contained elevated concentrations of radionuclides. Minor aquifers also occur within the Black Hills, including the Sundance/Unkpapa, Newcastle, and alluvial aquifers. These minor aquifers yield small volumes of water locally for domestic and stock uses. Alluvial aquifers with thicknesses of 0 to 50 feet are along Beaver Creek, Pass Creek, and the Cheyenne River. They are typically unconfined, but may be confined locally. Alluvial aquifers are separated from the underlying Fall River Formation by the low-permeability Graneros Group confining unit. An alluvial drilling program completed in 2012 did not indicate any areas of discharge to the alluvium along Beaver Creek and Pass Creek from the underlying Fall River aquifer (NRC 2012).

Groundwater in the Fall River and Chilson aquifers flows from northeast to southwest. Regionally, groundwater flows radially outward from the Black Hills toward the surrounding plains (NRC 2012). The Site is not within a wellhead protection area (South Dakota Department of Environment and Natural Resources [SDDENR] 2013).

According to a well inventory of the area of the Site conducted by Powertech, the following water wells are within a 4-mile TDL of the Site boundary (see Figure 9): one domestic well and five stock wells are

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within the Site boundary; one domestic well is within 0.25 mile of the Site; one domestic well and four stock wells are within 0.25 and 0.50 mile of the Site; one domestic well and six stock wells are within 0.50 and 1 mile of the Site; 12 Stock wells are within 1 to 2 miles of the Site; eight domestic wells, 10 Stock wells, and one irrigation well are within 2 to 3 miles of the Site; and six domestic and 10 stock wells are within 3 to 4 miles of the Site. The Site is on the border of Custer and Fall River Counties; the average persons per household in Custer County is 2.17, and the average persons per household in Fall River County is 2.12. Based on the number of domestic wells and the average number of persons per household, approximately 15 people could obtain their water from private wells in Custer County within the 4-mile TDL. Approximately 23 people could obtain their water from private wells in Fall River County within the 4-mile TDL. Table 9 summarizes the drinking water target population in the area of the Site. This estimated population differs slightly from the data obtained for the 2010 census, which indicated fewer (approximately 29) people live within 4 miles of the approximate center of the Site (Mable/Geocorr12: Geographic Correspondence Engine with Census 2010 Geography [Mable/Geocorr] 2014).

TABLE 9

DRINKING WATER TARGET POPULATION
DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE

Distance From Site	Number of Wells Within TDL	Population Served
On Site	1	2.12
0 to .25 mile	1	2.12
0.25 to 0.5 mile	1	2.17
0.5 to 1 mile	1	2.12
1 mile to 2 miles	0	0
2 miles to 3 miles	8	16.96
3 miles to 4 miles	6	13.02
Total	18	38.51

Source: Mable/Geocorr 2014

Notes:

TDL Target distance limit

7.2 SURFACE WATER PATHWAY AND TARGETS

Hydrology associated with the Site is discussed in Section 4.2. The primary surface water bodies associated with the 15-mile TDL are Pass Creek, Beaver Creek, and the Cheyenne River (see Figure 8).

According to SDDENR, no potable water intakes are on Pass Creek, Beaver Creek, or the Cheyenne River within the 15-mile TDL. Beaver Creek and the Cheyenne River are used by recreational anglers;

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however, documentation of the extent of use of the water bodies as fisheries is not available. All surface water bodies within the 15-mile TDL are used for fish and wildlife propagation, recreation, and stock watering. Pass Creek has been designated for irrigation use; however, because the stream is intermittent, insufficient data are available to determine whether Pass Creek actually has been used for irrigation. Beaver Creek, from its headwaters to the Cheyenne River, has been determined to be impaired or threatened due to potential impacts of detrimental specific conductance, total dissolved solids, and salinity in these waters on warm water semi-permanent fish life, fish and wildlife propagation, recreation, stock watering, and irrigation. In addition, the Cheyenne River, between its confluence with Beaver Creek and Cascade Creek, has also been found to present threats to fish and wildlife propagation, recreation, stock watering, irrigation, and warm water semi-permanent fish life because of detrimental specific conductance, total dissolved solids, total suspended solids, and salinity in those waters stemming from runoff from nearby livestock grazing areas, feeding operations, and/or crop production (SDDENR 2012b).

Wetlands have been identified within the area of the Site and downstream of the Site along Pass Creek within the 15-mile TDL. The wetlands within the area of the Site are primarily designated as Palustrine Emergent (PEM) or Palustrine Unconsolidated Shore (PUS), with modifiers identifying the wetlands as seasonally or temporarily flooded and excavated or diked/impounded features. In addition, the Triangle Mine Pit area includes a Palustrine Unconsolidated Bottom (PUB) intermittently exposed excavated feature. Downstream from the Site along Pass Creek are Palustrine Aquatic Bed (PAB) and PEM wetlands that are semi-permanently flooded (U.S. Fish and Wildlife Service [USFWS] 2014). The wetlands within the area of the Site do not meet actual shoreline (frontage) qualifications to be evaluated for HRS scoring (EPA 2013).

The segment of Beaver Creek downstream of its confluence with Pass Creek does not contain identified wetlands until its confluence with the Cheyenne River, where Riverine Lower Perennial Unconsolidated Bottom semi-permanently flooded (R2UBF) and Palustrine Emergent temporarily flooded (PEMA) wetlands exist. Along the Cheyenne River, classified wetlands include Riverine Lower Perennial Unconsolidated Shore temporarily flooded (R2USA), seasonally flooded (R2USC), R2UBF, and PEMA (USFWS 2014). PEMA wetlands on the Cheyenne River approximately 1.7 miles downstream of its confluence with Beaver Creek include approximately 0.23 mile of contiguous frontage, meeting eligibility requirements and size criteria to be evaluated for HRS scoring. Additional PEMA wetlands on the Cheyenne River occur approximately 2.9 miles downstream of its confluence with Beaver Creek, where approximately 0.14 mile of contiguous frontage exists, also meeting eligibility requirements and size criteria to be evaluated for HRS scoring. Other R2USA and R2USC wetlands are present along the

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Cheyenne River; however, additional information is needed to determine whether these wetlands have been impacted by the Site. The previous downstream sample location on the Cheyenne River was outside of the 15-mile TDL; therefore, data from that location cannot be used to evaluate attribution of contamination to the Site for HRS scoring purposes (EPA 2014).

Threatened and endangered species known or likely to occur in Custer and Fall River Counties are listed in Table 10. Powertech conducted surveys of the proposed PAA (including the area of the Site), including a 1-mile perimeter of the area, for threatened and endangered species, bald eagle winter roosts, all nesting raptors, upland game bird leks, and big game. In addition to the surveys, incidental observations of all vertebrate wildlife species within the PAA were recorded during each site visit during the year-long baseline survey period. Surveys were also conducted within the PAA for other vertebrate species of concern tracked by the South Dakota National Heritage Program (SDNHP), as well as bats, small mammals, lagomorphs, prairie dog colonies, breeding birds, predators, and herptiles (reptiles and amphibians). All the surveys were conducted by qualified biologists using standard field equipment and appropriate field guides. The black-footed ferret and the greater sage-grouse are the only federally listed species known to occur in both Custer and Fall River Counties. No federally listed vertebrate species were documented within the project survey area. Surveys for the black-footed ferret were not required for this project due to a block-clearance issued by the USFWS that includes the entire PAA and vicinity. The only exception to that clearance is in Custer State Park in northern Custer County. Surveys were also conducted by TVA in the general vicinity of the PAA during fall 1977. No ferrets or evidence of their presence were observed during those historical surveys (Powertech 2009). The following federally listed threatened and endangered species listed in Table 10 possibly occur in the two counties or possibly migrate through the counties (USFWS 2013).

TABLE 10

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE

Common Name	Scientific Name	Status
Whooping Crane	Grus americana	Endangered
Red knot	Calidris canutus rufa	Proposed threatened
Sprague's pipit	Anthus spragueii	Candidate
Black-footed ferret	Mustela nigripes	Endangered
Northern Long-Eared Bat	Myotic septentrionalis	Proposed Endangered
Greater sage-grouse	Centrocercus urophasianus	Candidate

Source: U.S. Fish & Wildlife Service 2013

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The State of South Dakota has listed 23 vertebrate species as threatened or endangered. Only one of the species listed was documented within the PAA or 1-mile perimeter during the survey period (mid-July 2007 through early August 2008). One active bald eagle nest was observed within the northwestern portion of the revised permit area (SW ¼, Section 30, Township 6 South, Range 1 East). The nest was in a cottonwood tree along Beaver Creek, and reportedly fledged one young in 2008. The bald eagle was removed from the Federal List of Endangered and Threatened Wildlife on August 8, 2007. However, protection provided to the bald eagle under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act has continued after the species was delisted. The rule change does not affect the bald eagle's status as a threatened or endangered species under state laws, or suspend any other legal protections provided by state laws. In South Dakota, the bald eagle is still considered a threatened species. Bald eagles were repeatedly observed along Beaver Creek in the western portion of the PPA and perimeter during winter roost surveys in late 2007 and early 2008.

7.3 SOIL EXPOSURE AND AIR PATHWAYS AND TARGETS

Standards have been developed for cleanup of radiation-contaminated soil under UMTRCA of 1978 (40 CFR Part 192). The purpose of these standards was to limit risk from inhalation of radon decay products in houses built on mine tailings, and to limit gamma radiation exposure to people using contaminated land. UMTRCA specifies two cleanup standards based on concentrations of Ra-226: (1) surface soil cleanup to 5 pCi/g, and (2) subsurface soil cleanup to 15 pCi/g. An EPA memorandum dated February 12, 1998, clarifies use of these two UMTRCA soil cleanup standards for CERCLA sites (EPA 1998). The surface soil standard of 5 pCi/g for Ra-226 is a health-based standard developed to control the hazard from gamma radiation; therefore, this standard may be appropriate and relevant to CERCLA sites.

Air samples collected within the Site area contained concentrations of Ra-226 that exceeded the 10 CFR Part 20 limit of 0.1 pCi/L for Rn-222 with daughters present (Powertech 2009).

The land within the Site is privately owned and leased. Land use is primarily agricultural and for livestock grazing. Edgemont, the town nearest the Site (approximately 13 miles away), had an estimated population of 774 people in 2010 (U.S. Census 2010). The area surrounding the Site is primarily agricultural. Residents and people farming surrounding land are potential targets. Nobody resides within 200 feet of the Site. No residents are within 1 mile of the Site, and approximately 26 persons reside within the 4-mile TDL (Mable/Geocorr 2014). No daycare centers or schools are within 200 feet of the Site.

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8.0 DATA GAPS

Most of the data reviewed for this PA were acquired and reported during the period of approximately 2006 to 2009. Some significant data gaps exist within the information reported. For the PA, source areas were estimated by tracing boundaries of waste piles and surface impoundments by reference to two-dimensional aerial imagery. Soil samples collected by Powertech within the area of the Site (Surface Mine Area [SMA-XX]) were all analyzed for Ra-226. However, of the 25 samples collected, only three were analyzed for additional radionuclides including uranium, Pb-210, and Th-230—the other known contaminants on site. Groundwater samples were collected within the area of the Site from various types of wells; however, lack of groundwater sampling data from near and upgradient of the Site limited availability of reliable background concentrations. Surface water samples were collected from multiple water bodies in the area of the Site, including Pass Creek, Beaver Creek, and the Cheyenne River. However, the downstream Pass Creek surface water sample location was upstream of the probable point of entry (PPE) for surface water migrating from the Site. Additionally, the downstream sample location on the Cheyenne River was beyond the 15-mile TDL (see Figure 8). Therefore, data acquired at that sample point could not be used to evaluate potential surface water impacts from the Site in this PA. Biological samples including fish were collected by Powertech to evaluate potential impacts on surface water bodies including Beaver Creek and the Cheyenne River. Beaver Creek and the Cheyenne River are used by recreational anglers; however, documentation of the extent of use of the water bodies as fisheries is not available. Uranium was detected in all fish collected during July 2008. The detections were interpreted to be the result of increased sample sizes of the species submitted for laboratory analysis. No detections of uranium occurred in samples collected during April 2008; however, the detection limit was higher during that sampling period due to matrix interferences. Pb-210, Th-230, and Ra-226 were detected, but at low concentrations in most samples. Pb-210 was detected in one specimen collected at the downstream Beaver Creek location; however, the precision of the result was questionable due to matrix interferences. Additional data are needed to determine whether the Site is impacting fish in water bodies downstream of the Site.

9.0 SUMMARY

The Site (EPA ID: SDN000803095) is 15 miles from Edgemont, in Custer and Fall River Counties, South Dakota. Geographic coordinates at the approximate center of the Site are 43.478486 degrees north latitude and 103.962746 degrees west longitude. The 1,426-acre Site is used primarily for cattle grazing. ISR is proposed as a possible future use of this site.

<u>Sources</u>

By reference to aerial imagery, approximate areas of mine waste piles were quantified. Surface soil near the mine waste piles has been determined to contain levels of radionuclides exceeding health-based benchmarks and exceeding three times background concentrations, meeting observed release criteria. Additionally, samples collected from impoundments within the area of the Site have contained elevated levels of radionuclides and could also be considered potential source areas for HRS evaluation. Radionuclides are the contaminants of concern, including uranium, Ra-226, Th-230, and Pb-210.

Groundwater Migration Pathway

Sampling results indicate an observed release to groundwater has occurred at the Site. According to results of groundwater sampling and a well inventory conducted by Powertech, 18 domestic wells are within a 4-mile radius of the site boundary. Wells 16 and 42 have contained concentrations of Ra-226 exceeding its MCL and meeting observed release criteria. Concentrations in other wells have been above background levels but have not met observed release criteria; therefore, those wells are subject to potential contamination.

Surface Water Migration Pathway

Sampling results indicate a release of radionuclides has occurred to Pass Creek, Beaver Creek, and the Cheyenne River. There are no known drinking water intakes within the 15-mile TDL. The Cheyenne River and Beaver Creek support fish life and possible food chain targets; however, the extent of use of the water bodies as fisheries is not available. Freshwater emergent and riverine wetlands are present along the riparian areas at the confluence of Beaver Creek and the Cheyenne River and downstream (along the Cheyenne River); however, it is unknown whether these sensitive environments have been impacted by releases from the site. Additional data are needed to properly evaluate the surface water pathway and confirm attribution to contaminants present at the Site.

Soil Exposure and Air Migration Pathways

Surface soil samples collected at the Site have contained elevated concentrations of radionuclides. Additionally, air samples have indicated elevated concentrations of Rn-222 within the area of the Site. However, because of the small number of targets in the immediate vicinity of the Site, those pathways pose limited threat to human health and the environment.

Conclusions

Additional surface soil sampling within the Site appears warranted to better characterize and define source areas. Additional data could be used to quantify source materials within the area of the Site, and volumes of waste piles should be measured more accurately. Additional sampling of surface water and

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sediment also appears warranted to determine if releases from the Site are impacting downstream sensitive environments (i.e., wetlands and possible fish habitat).

9.1 EMERGENCY RESPONSE AND REMOVAL ACTION CONSIDERATIONS

Based on available data from previous site assessments by Powertech, a removal action appears warranted to address radium-226 contamination in mine waste piles at the Site. Five soil samples collected from the Site contained radium-226 concentrations that exceeded the EPA health-based standard of 5 pCi/g and exceeded three times background concentrations. Emergency response actions do not appear warranted at the Site.

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FIGURES

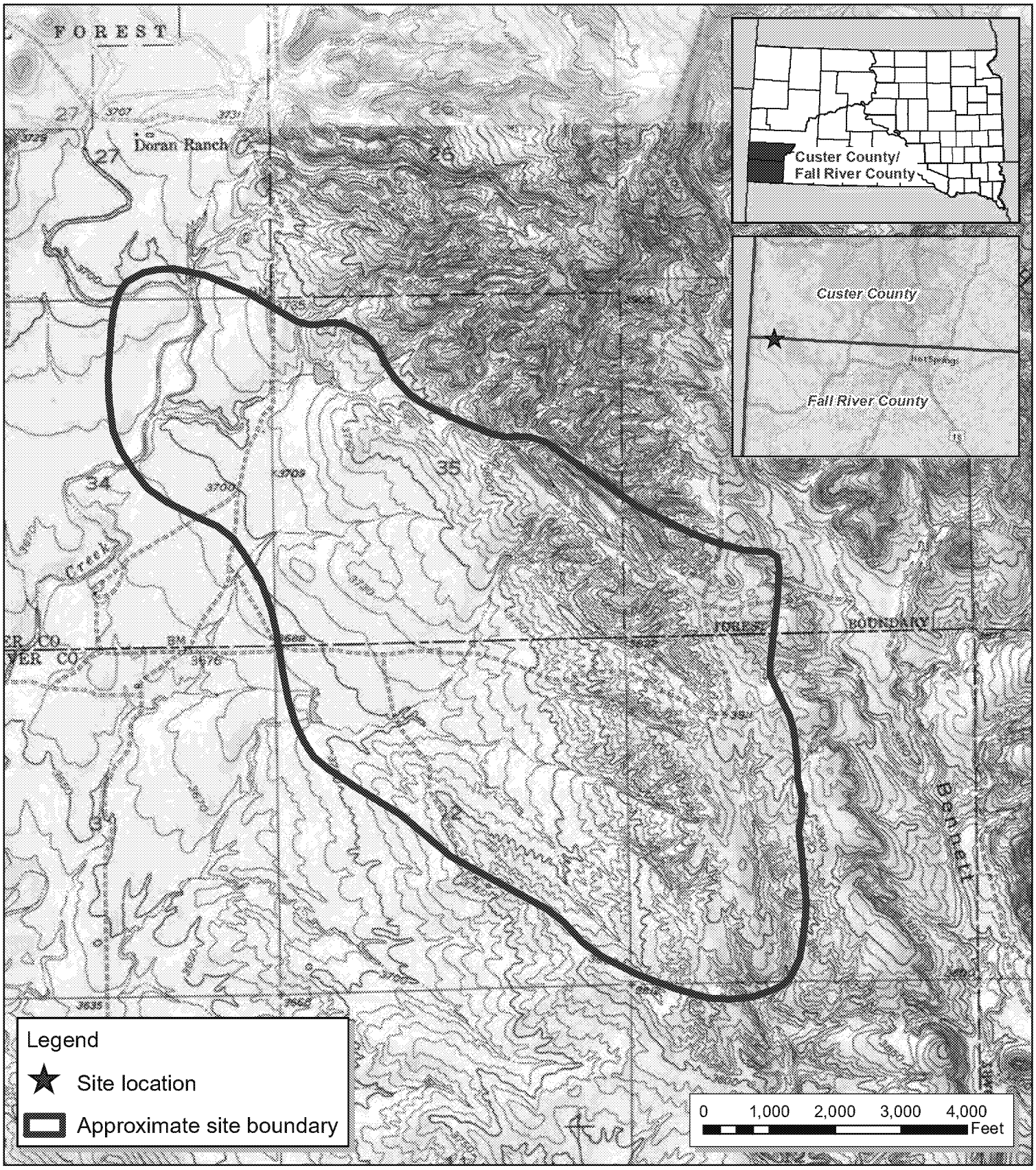

Figure 1
Site Location Map

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

Seagull Environmental Technologies, Inc.

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Source: ArcGIS Online, World Imagery, 2011

Date: May 2014

Project No: EPS81105.0014

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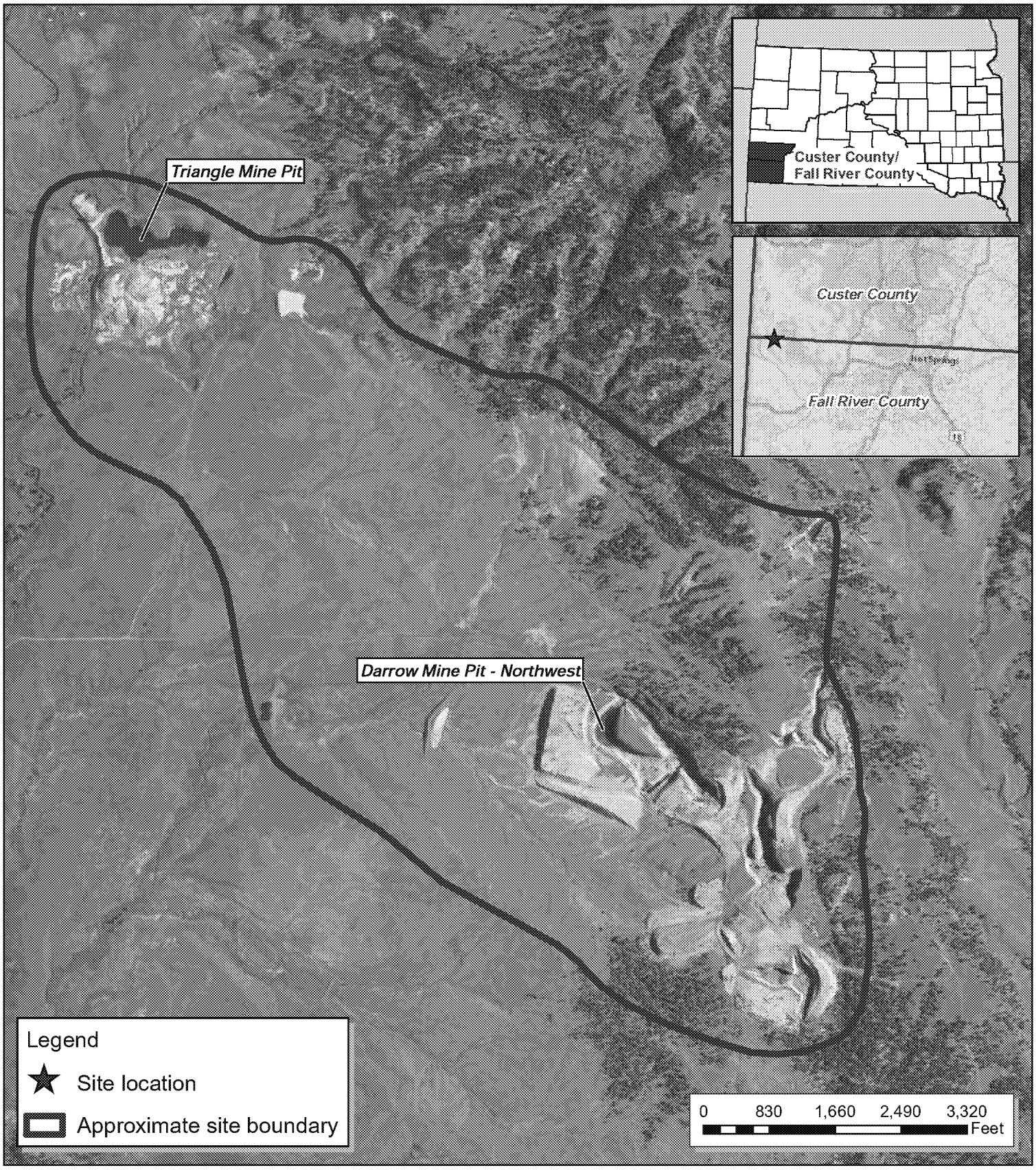

Figure 2
Site Layout Map

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

Seagull Environmental Technologies, Inc.

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Source: ArcGIS Online, World Imagery, 2011

Date: May 2014

Project No: EPS81105.0014

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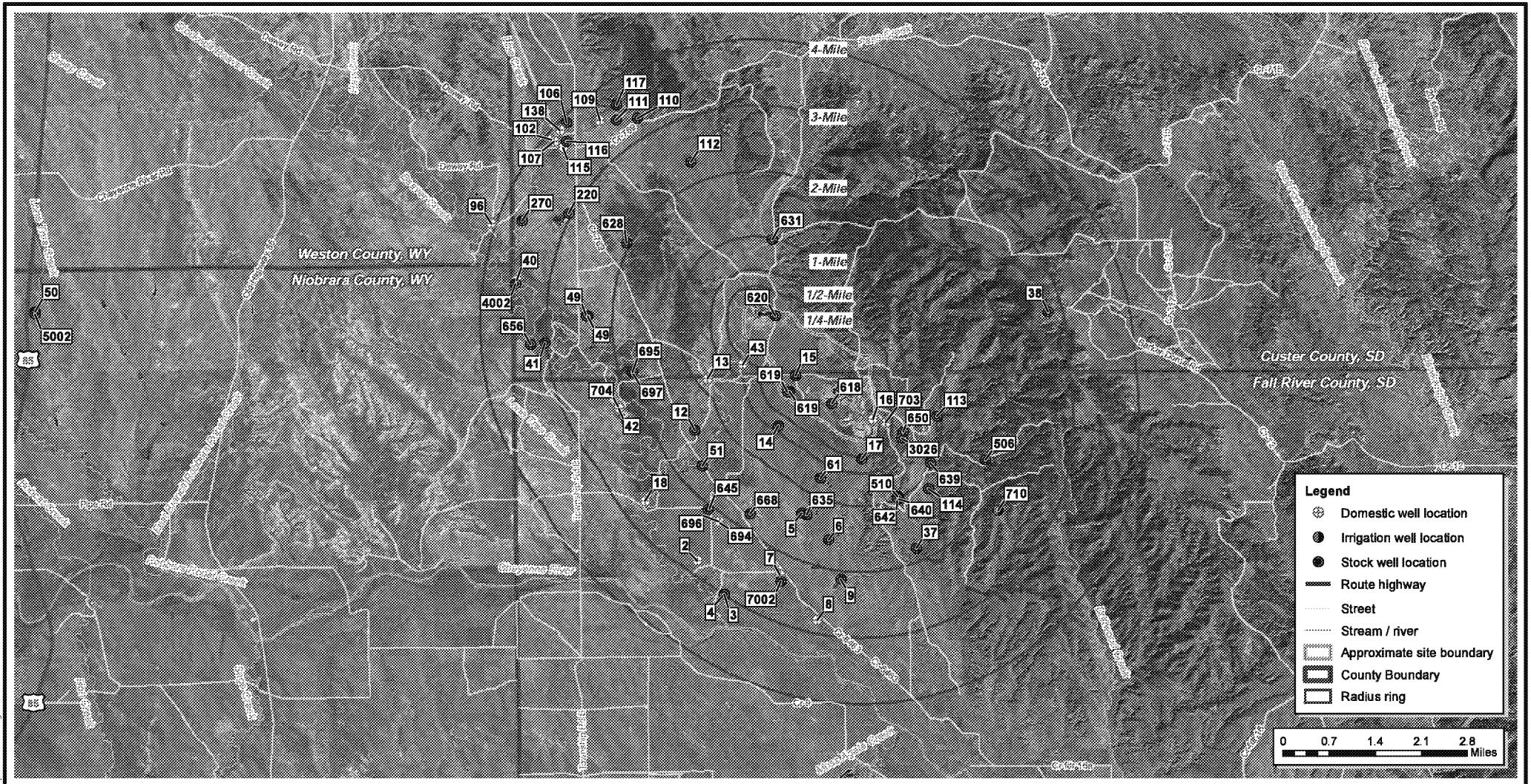

Figure 3
4-Mile Radius Well Locations

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

Seagull Environmental Technologies, Inc.

N W E S

Date: May 2014 | Source: ArcGIS Online, World Imagery, 2011; ESRI Data Maps, 2007; HSIP Gold, 2007; Powertech, Inc, 2012. | Project No: EPS81105.0014

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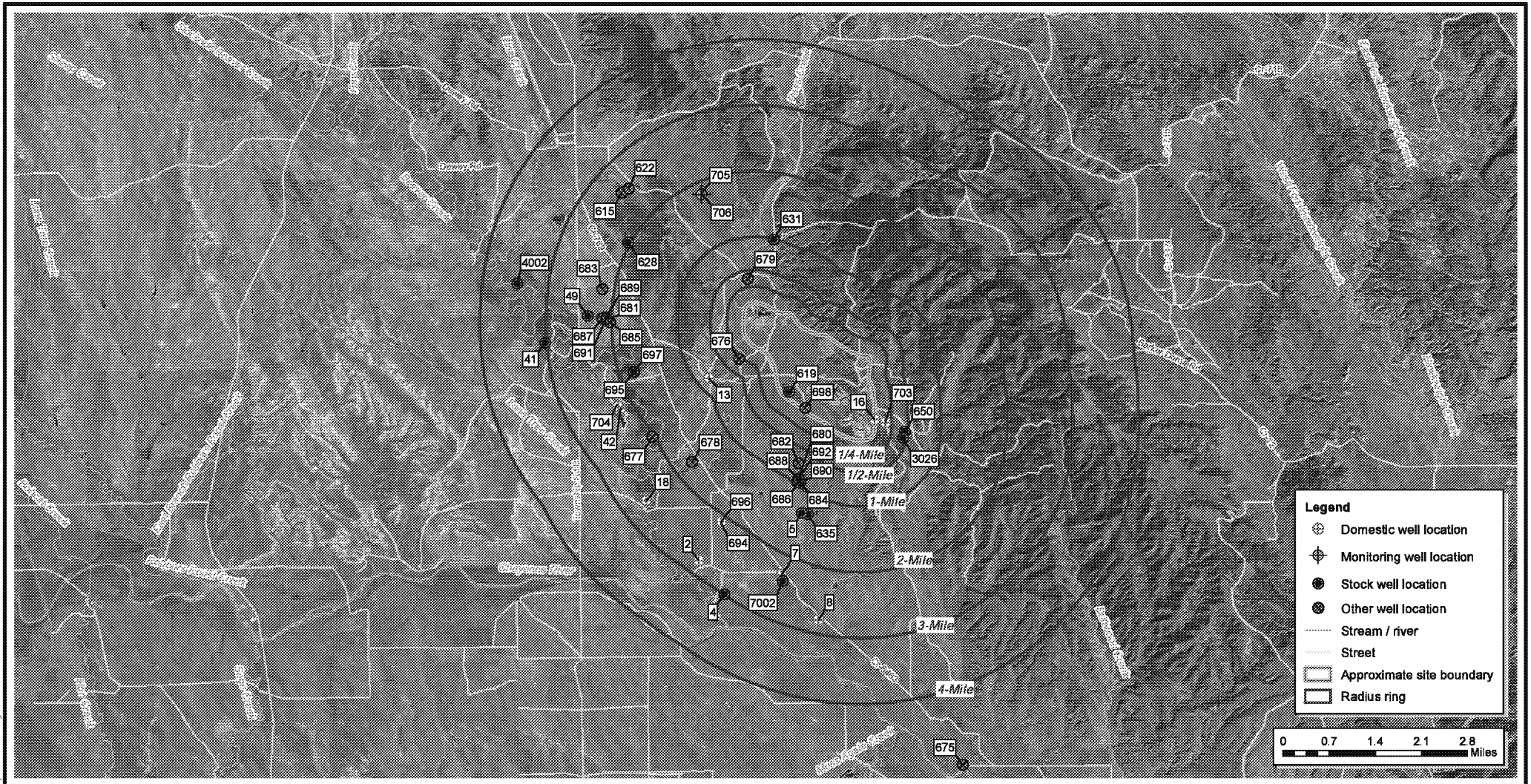

Figure 4
Groundwater Sample Location Map

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

Seagull Environmental Technologies, Inc.

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Date: May 2014 | Source: ArcGIS Online, World Imagery, 2011; ESRI Data Maps, 2007; HSIP Gold, 2007; Powertech, Inc, 2009 | Project No: EPS81105.0014

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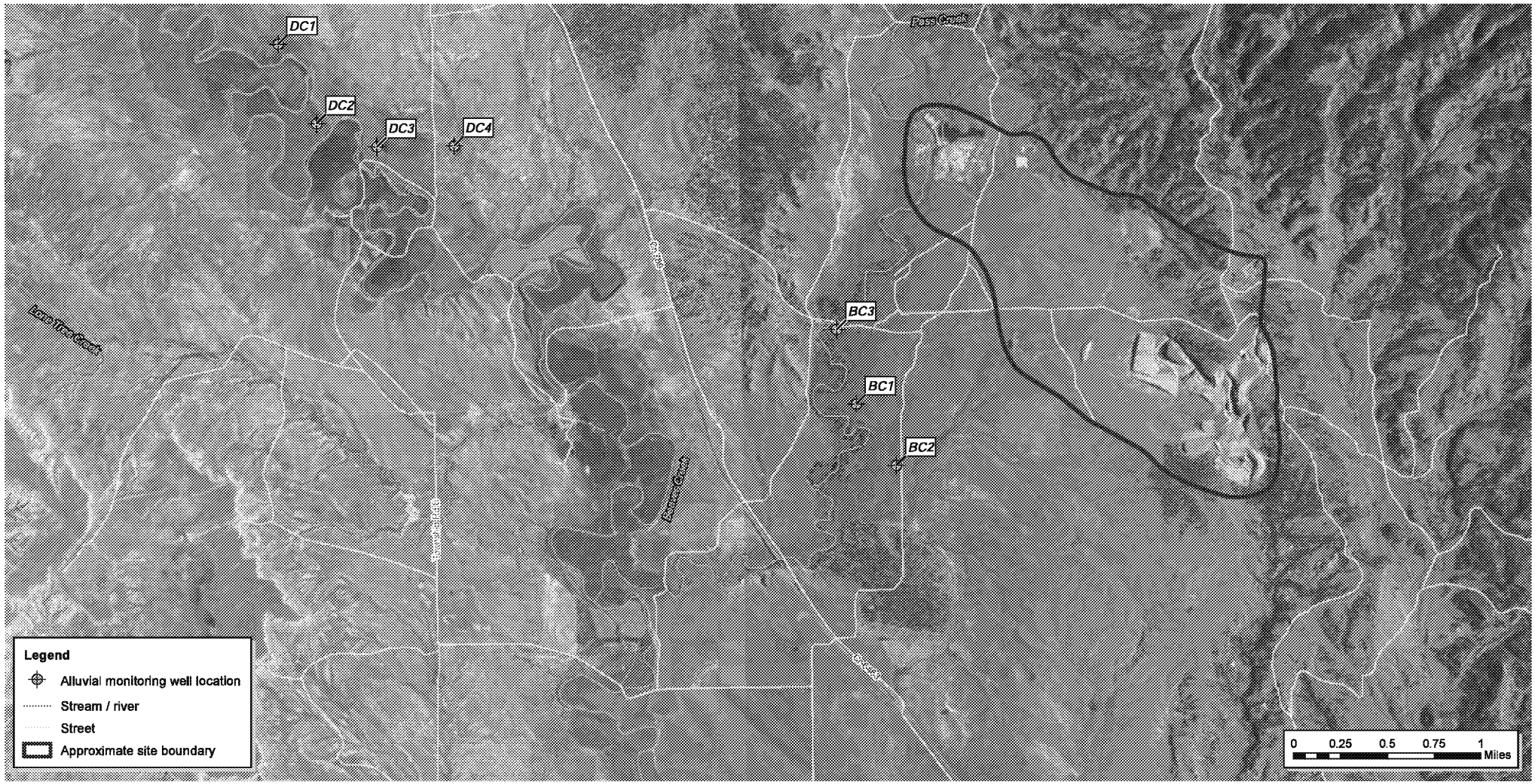

Figure 5
Alluvial Monitoring Well Locations

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

Seagull Environmental Technologies, Inc.

N W E S

Date: May 2014 | Source: ESRI, ArcGIS Online World Imagery, 2011; ESRI Data Maps, 2007; HSIP Gold, 2007 | Project No: EPS81105.0014

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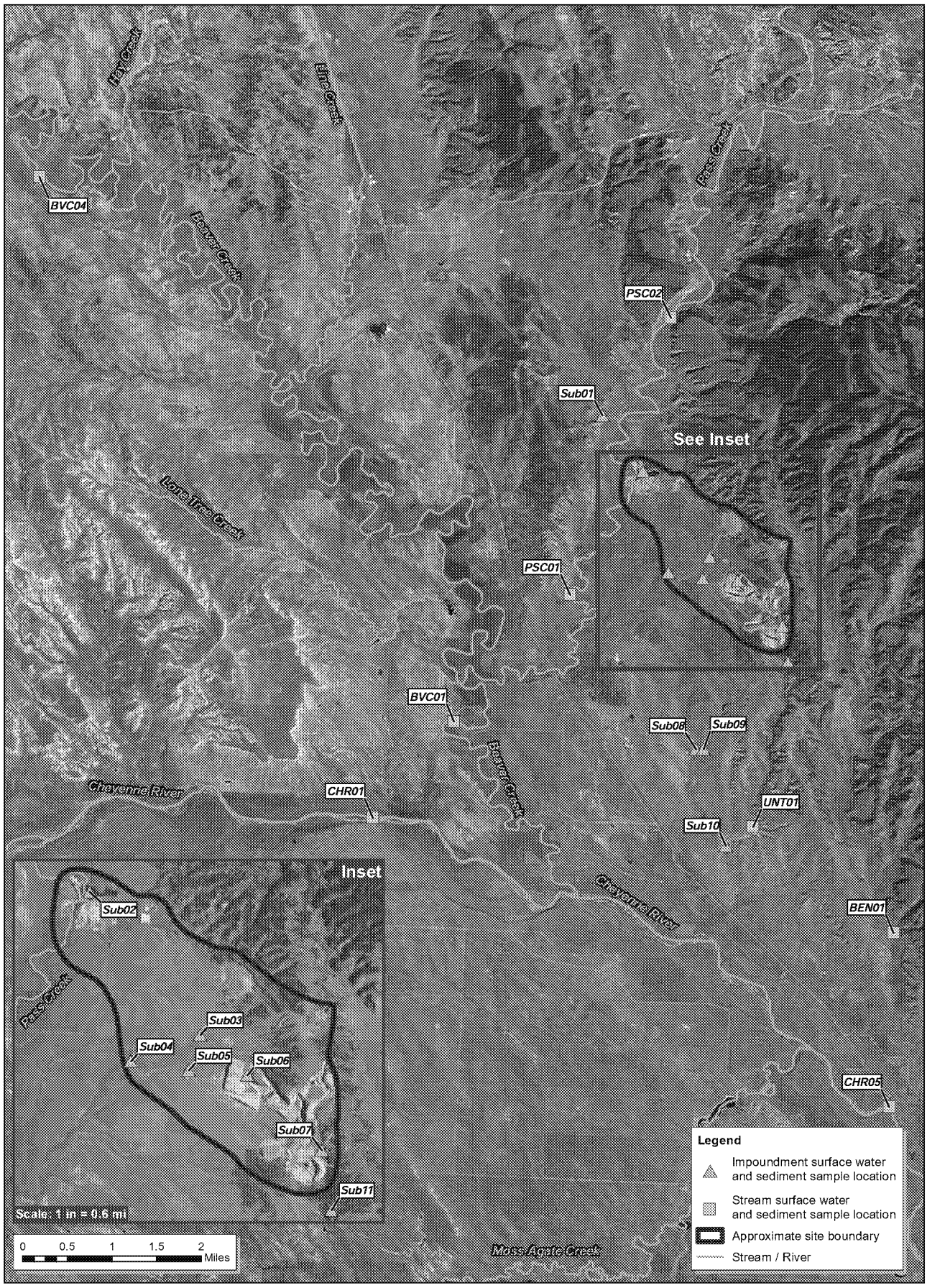

Figure 6
Surface Water and Sediment Sample Locations (Powertech 2008)

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

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Seagull Environmental Technologies, Inc.

Date: May 2014 | Source: ArcGIS Online, World Imagery, 2011; NHDPlus, 2013, Powertech, Inc, 2008 | Project No: EPS81105.0014

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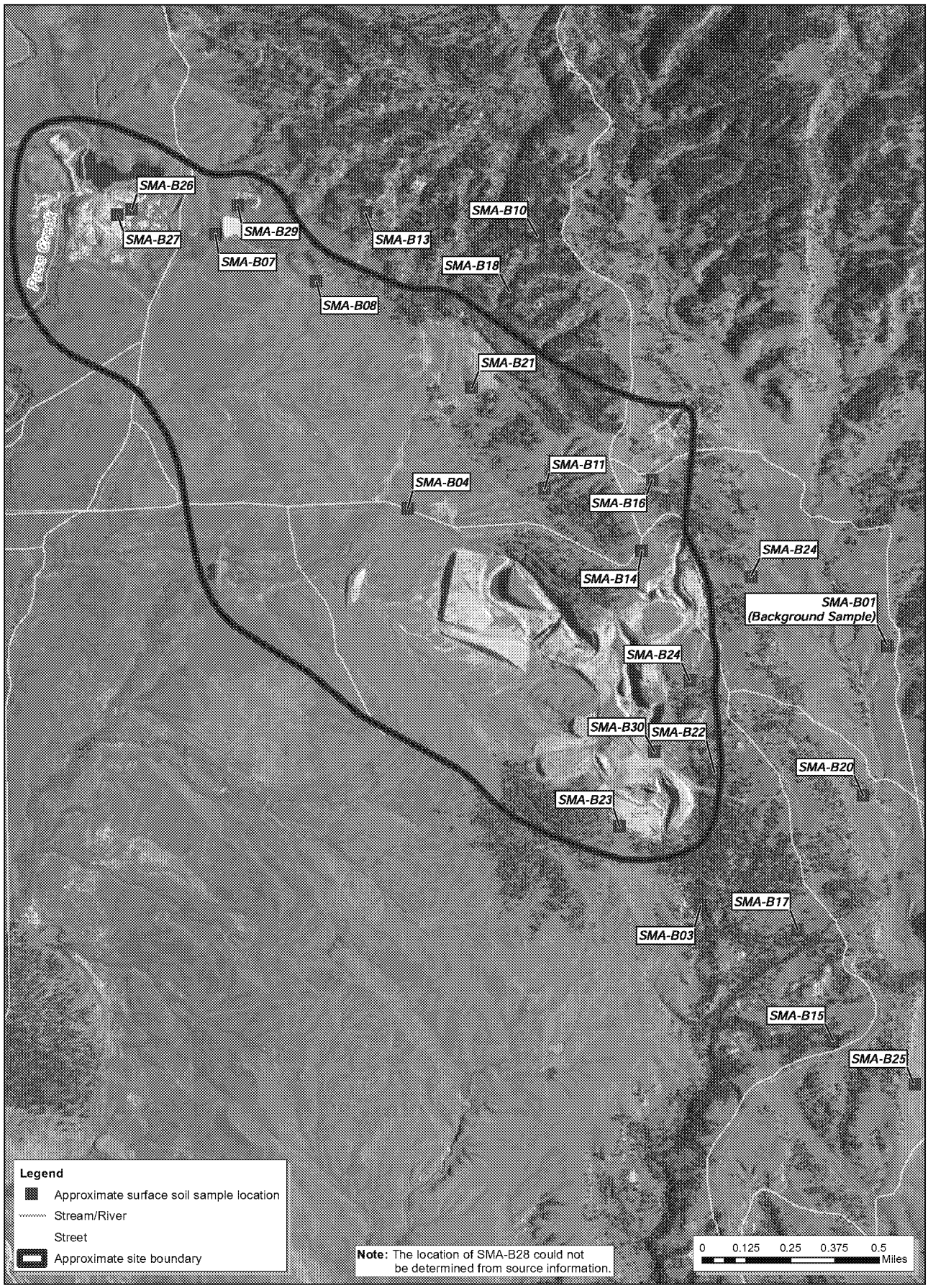

Figure 7
Approximate Surface Soil Sample Locations

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

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Seagull Environmental Technologies, Inc.

Date: May 2014 | Source: ArcGIS Online, World Imagery, 2010; HSIP Gold, 2007; Powertech, 2009 | Project No: EPS81105.0014

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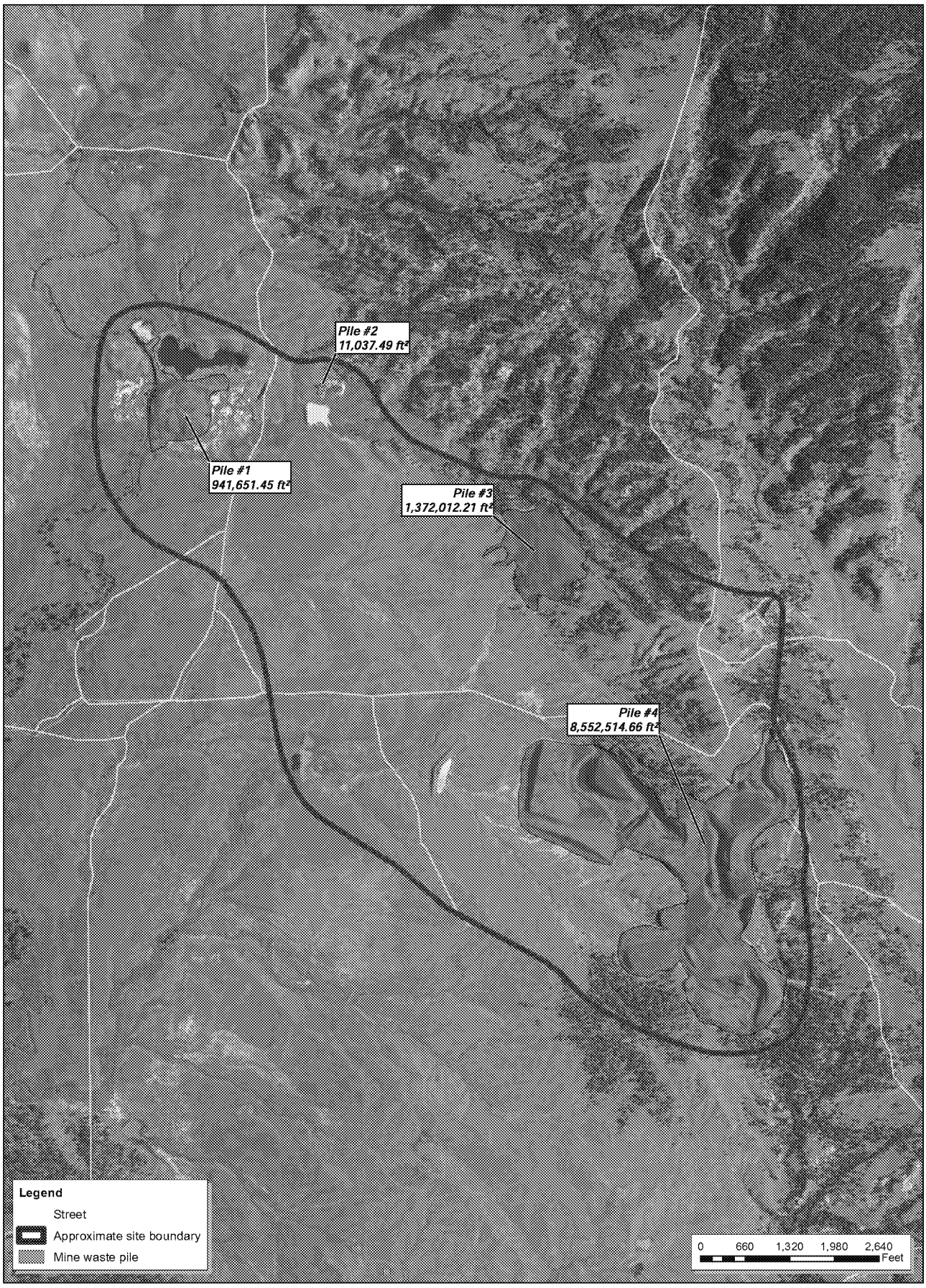

Figure 8
Approximate Source Area Boundaries

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

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Seagull Environmental Technologies, Inc.

Date: May 2014 | Source: ArcGIS Online, World Imagery, 2010; HSIP Gold, 2007; Powertech, 2009 | Project No: EPS81105.0014

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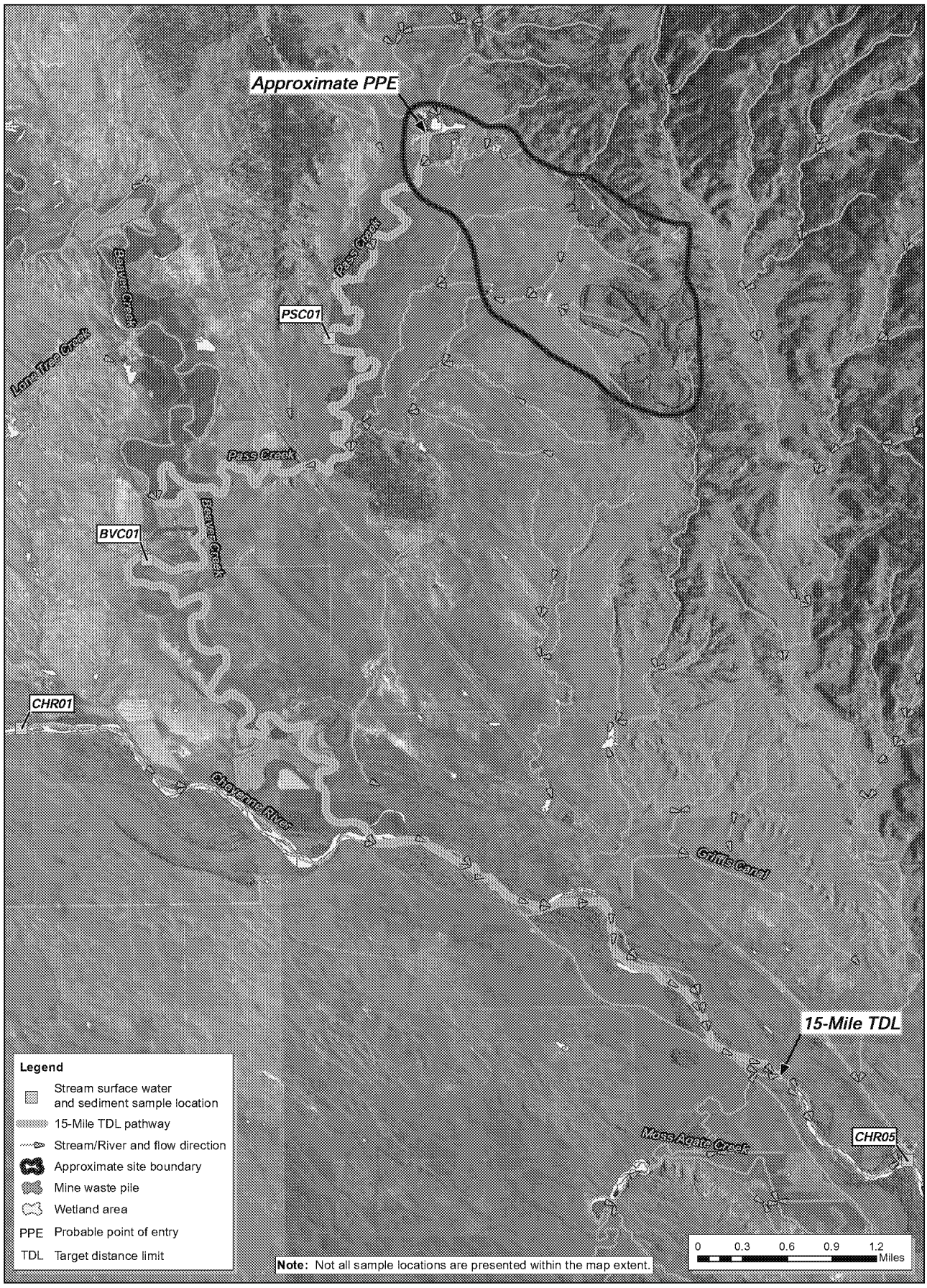

Figure 9
15-Mile Target Distance Limit and Surface Water Sample Locations

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

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Seagull Environmental Technologies, Inc.

Date: May 2014 Source: ArcGIS Online, World Imagery, 2010; USGS, NHDPlus, 2013; USFWS, NWI, 2013 Project No: EPS81105.0014

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APPENDIX A

SITE RECONNAISSANCE REPORT

Seagull Environmental Technologies, Inc.

3555 Chase Street
Wheat Ridge, Colorado 80212
www.seagullenvirotech.com

May 2, 2014

Victor Ketellapper, Site Assessment Team Leader
U.S. Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Subject: Site Reconnaissance Report regarding the Darrow/Freezeout/Triangle Uranium Mine Site, near Edgemont, Custer and Fall River Counties, South Dakota
EPA Region 8 START 8(a) Carve-Out Contract EP-S8-11-05, Task Order #0014
Task Monitor: Victor Ketellapper, Site Assessment Team Leader

Dear Mr. Ketellapper

Seagull Environmental Technologies, Inc. (Seagull) is pleased to submit this Site Reconnaissance Report regarding the Darrow/Freezeout/Triangle Uranium Mine site near Edgemont, Custer and Fall River Counties, South Dakota. If you have any questions or comments, please contact the Project Manager via email at gdillon@seagullenvirotech.com or by phone at (816) 412-1953.

Sincerely,

Gregory R. Dillon
Task Order Project Manager

Hieu Q. Vu, PE
Program Manager

Enclosures

PRELIMINARY ASSESSMENT REPORT

Regarding the

DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE

NEAR EDGEMONT, SOUTH DAKOTA

EPA ID: SDN000803095

Contract No.: EP-S8-11-05
Task Order No.: 0014

Prepared By:

SEAGULL ENVIRONMENTAL TECHNOLOGIES, INC.
3555 CHASE STREET
WHEAT RIDGE, COLORADO 80202-1129

May 2, 2014

ED_005364I_00029056-00133

SITE RECONNAISSANCE REPORT
Darrow/Freezeout/Triangle Uranium Mine Site

DATE/TIME: November 5, 2013, 08:00-17:00.

WEATHER CONDITIONS: Cloudy, snow and rain mixture, calm wind ~26° degrees Fahrenheit (°F).

PARTICIPANTS/AFFILIATION: Gregory Dillon and Jon DeBruine of Seagull Environmental Technologies, Inc.

1.0 INTRODUCTION

Under the U.S. Environmental Protection Agency (EPA) Region 8 Superfund Technical Assessment and Response Team (START) Carve-Out 8(a) Contract (No. EP-S8-11-05), Task Order No. 0014, Seagull Environmental Technologies, Inc. (Seagull) has been tasked to conduct a Preliminary Assessment (PA) for the Darrow/Freezeout/Triangle Uranium Mine (Site) site near Edgemont, Custer and Fall River Counties, South Dakota. As part of the PA, Seagull is submitting this Site Visit Report for activities conducted on November 5, 2013, at the Site. The site visit was conducted to locate previously identified source areas and potential sample locations, and to become familiar with the site layout. The Site is located approximately 13 miles northwest of Edgemont, South Dakota.

2.0 SITE DESCRIPTION

The Site encompasses approximately 1,426 acres and is located primarily on private land. Attempts to gain access to the Site area via letters to private landowners were unsuccessful. During the site reconnaissance, START team members Gregory Dillon and Jonathan DeBruine, and Maple Barnard and Valois Shea of EPA traveled along public roads in the site vicinity in an attempt to attain a vantage point of the Site area. However, the public access roads were inadequate to gain a view of the Site.

Photos of the site area, including drainage areas, historical points of interest, and current conditions of the surrounding area were taken during the site reconnaissance. START and EPA visited Edgemont City Hall to meet with local officials to discuss the purpose of the PA and to obtain information for the report. Following the meeting with local officials, Mr. Mike Koopman, City Engineer/Code Administrator, accompanied START and EPA to visit areas of interest in and around Edgemont. The Edgemont, South Dakota, Uranium Mill Tailings Repository and former mill location were visited during the site reconnaissance. In addition, current City of Edgemont Public Water Supply (PWS) wells were visited to document and confirm their locations.

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3.0 AREA DESCRIPTION

The Site is located in Custer and Fall River Counties in the Great Plains physiographic province on the edge of the Black Hills uplift. Land use in the area is primarily agricultural range land for livestock. Surface water from the site drains into tributaries of Pass Creek and Beaver Creek, eventually flowing into the Cheyenne River.

4.0 PHOTOGRAPHIC DOCUMENTATION:

Photographs documenting the site visit are included in Appendix A.

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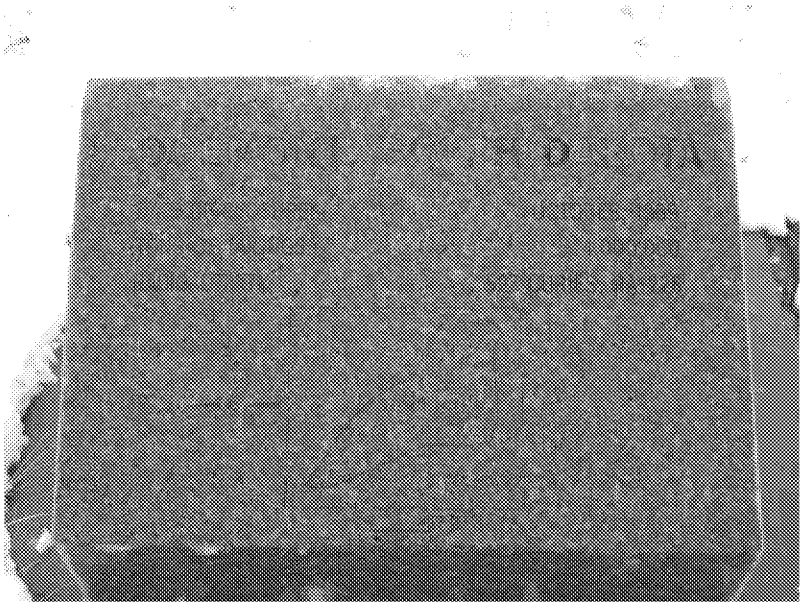
APPENDIX A

PHOTOGRAPHIC DOCUMENTATION



Client: U.S. Environmental Protection Agency	Description: Photograph of the geographic marker at the Edgemont, South Dakota, Uranium Mill Tailings Repository.	Photograph Number: 1
Direction: N/A	Photographer: Gregory Dillon	Date: 11/5/2013

Client: U.S. Environmental Protection Agency	Description: Photograph of no trespassing signage at the Edgemont, South Dakota, Uranium Mill Tailings Repository.	Photograph Number: 2
Direction: East	Photographer: Gregory Dillon	Date: 11/5/2013

Client: U.S. Environmental Protection Agency	Description: Photograph of City of Edgemont Municipal Well #2 southwest of town. It is currently an active well for the City's Public Water Supply (PWS).	Photograph Number: 3
Direction: North	Photographer: Jon DeBruine	Date: 11/5/2013

Client: U.S. Environmental Protection Agency	Description: Photograph of City of Edgemont Municipal Well #4 southwest of town. It is currently an active well for the City's PWS.	Photograph Number: 4
Direction: East	Photographer: Gregory Dillon	Date: 11/5/2013

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Client: U.S. Environmental Protection Agency	Description: Photograph of an overflow outfall of a City PWS basin and stormwater in the Edgemont City Park. The pond is used for recreational fishing seasonally.	Photograph Number: 5
Direction: South	Photographer: Jon DeBruine	Date: 11/5/2013

Client: U.S. Environmental Protection Agency	Description: Photograph of signage at the boundary of the Black Hills National Forest taken from County Road 16.	Photograph Number: 6
Direction: Northeast	Photographer: Gregory Dillon	Date: 11/5/2013

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Client: U.S. Environmental Protection Agency	Description: Photograph of Pass Creek at crossing of County Highway 6463.	Photograph Number: 7
Direction: Southwest	Photographer: Gregory Dillon	Date: 11/5/2013

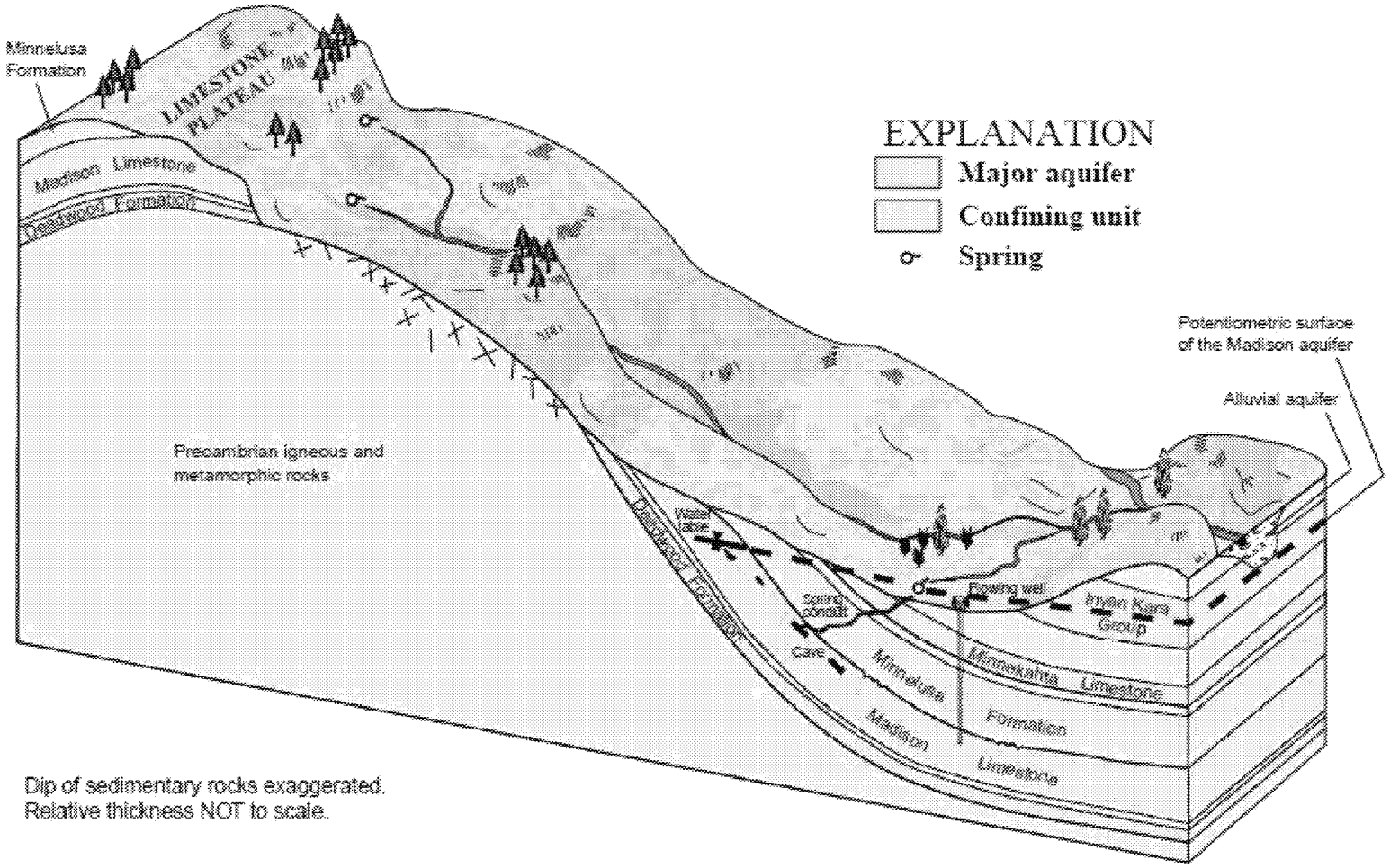
Client: U.S. Environmental Protection Agency	Description: Photograph of Pass Creek at crossing of County Highway 6463.	Photograph Number: 8
Direction: Northeast	Photographer: Gregory Dillon	Date: 11/5/2013

Client: U.S. Environmental Protection Agency	Description: Photograph of the Cheyenne River at the approximate 15-mile Target Distance Limit (TDL).	Photograph Number: 9
Direction: West	Photographer: Gregory Dillon	Date: 11/5/2013

Client: U.S. Environmental Protection Agency	Description: Photograph of the Cheyenne River at the approximate 15-mile TDL.	Photograph Number: 10
Direction: South	Photographer: Gregory Dillon	Date: 11/5/2013

APPENDIX B

DIAGRAM OF HYDROGEOLOGY OF BLACK HILLS AREA



Simplified Hydrogeologic Setting of the Black Hills Area

Darrow/Freezeout/Triangle Uranium Mine
Edgemont, South Dakota

Seagull Environmental Technologies, Inc.

Date: May 2014 | Source: Driscoll, et al. (2002) | Project No: EPS81105.0014

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APPENDIX C

CERCLA ELIGIBILITY CHECKLIST

CERCLA Eligibility Checklist

Site Name: Darrow/Freezeout/Triangle Uranium Mine
Alias: _____
City: near Edgemont **State** South Dakota **Zip code** 57735
EPA ID Number ***(Note - This may be a RCRA or other program ID)***: SDN000803095

Note: The site is automatically CERCLA eligible if it is a federally owned or operated RCRA site.

I. CERCLA Authority	Y	N
A. Is the release or threat of release a result of naturally occurring substances in its unaltered form, or altered solely through naturally occurring processes of phenomena, from a location where it is naturally found?		X
B. Is the release or threat of release a result of products that are part of the structure of, and result in exposure within, residential buildings or business or community structures?		X
C. Does the release or threat of release affect public or private drinking water supplies due to deterioration of the system through ordinary use?		X
If YES to A, B, or C, the EPA may not have authority to respond.		
If NO to A, B, or C, the EPA may have authority to respond.		

II. CERCLA Eligibility	Y	N
A. Has this site been previously entered into CERCLIS or is it part of, or adjacent to, an existing CERCLIS site?	X	
B. Is this site part of a National Priority List site?		X
C. Did the facility cease operations prior to November 19, 1980?		X
If YES to A, B, or C, then STOP. The facility is probably a CERCLA site.		
If NO, Continue		
1. RCRA Deferral Factors Did the facility file a RCRA Part A application?		
If YES: a. Does the facility currently have interim status?		
b. Did the facility withdraw its Part A application?		
c. Is the facility a known or possible protective filer? (e.g., filed in error, or never operated as TSDFs)		
d. Does the facility have a RCRA Part B Operating Permit or a post closure permit?		
e. Is the facility a late (after 11/19/80) or non-filer that has been identified by the EPA or the state? (i.e., facility did not know it needed to file under RCRA)		
If all answers to questions a, b, and c are NO, STOP. The facility is a CERCLA eligible site.		
If answer to b or c is YES, STOP. The facility is a CERCLA eligible site.		
If answer to b and c are NO and any other answer is YES, site is RCRA, continue to Part 2.		

CERCLA Eligibility Checklist

2. RCRA Sites Eligible for the NPL Type of facility: Generator____ Transporter___ Recycler_____ TSDF (Treatment/Storage/Disposal Facility)X		
a. Has the facility owner filed for bankruptcy under federal or state laws?		
b. Has the facility lost RCRA authorization to operate or shown probable unwillingness to carry out corrective actions?		
c. Is the facility a TSDF "converter," i.e., former TSF that did not pursue a RCRA operating permit and have changed status to "generator" or "non-handler"?		
d. Is the facility a non- or late filer?		
If answer to a, b, c, or d is YES, STOP. The facility is a CERCLA eligible site.		
D. Excluded Releases:		
1. Does the CERCLA Petroleum Exclusion apply (CERCLA section 101 (13))?		
2. Does the facility have discharges of CERCLA hazardous substances that are in compliance with federally permitted releases as described in CERCLA section 101 (10)?		
3. Does the facility have a release or threat of release which results in exposure to persons solely within a workplace, with respect to a claim which such persons may assert against their employer as described in CERCLA section 101 (22)?		
4. Does the facility have a release or threat of release which results from emissions from engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine as described in CERCLA section 101 (22)?		
5. Does the facility have a release or threat of release which results from source, byproduct or special nuclear material from a nuclear incident subject to section 170 of the Atomic Energy Act; or from any processing site specifically designated under the Uranium Mill Tailings Radiation Control Act of 1978 as described in CERCLA section 101 (22)?		
6. Does the facility have a release or threat of release which results from the normal application of fertilizer?		
If answer to 1, 2, 3, 4, 5, or 6 is YES, the facility is NOT CERCLA eligible.		
If NO, the facility may be CERCLA eligible. (If unknown, answer NO). Please list hazardous substances here. .		

CERCLA Eligibility Checklist

III. Other programs: The site may never reach the NPL or be a candidate for removal. We need to be able to refer it to any other programs in EPA or state agencies which may have jurisdiction, and thus be able to affect a cleanup. Responses should summarize available information pertaining to the question. Include information in existing files in these programs as part of the PA. Answer all that apply.		
A. Is there an owner or operator?		
B. NPDES-CWA: Is there a discharge water containing pollutants with surface water through a point source (pipe, ditch, channel, conduit, etc.)?		
C. CWA (404): Have fill or dredged material been deposited in a wetland or on the banks of a stream? Is there evidence of heavy equipment operating in ponds, streams or wetlands?		
D. UIC-SDWA: Are fluids being disposed of to the subsurface through a well, cesspool, septic system, pit, etc.?		
E. TSCA: Is it suspected that there are PCB's on the site which came from a source with greater than 50 ppm PCB's such as oil from electrical transformers or capacitors?		
F. FIFRA: Is there a suspected release of pesticides from a pesticide storage site? Are there pesticide containers on site?		
G. RCRA (D): Is there an owner or operator who is obligated to manage solid waste storage or disposal units under state solid waste or groundwater protection regulations?		
H. UST: Is it suspected that there is a leaking underground storage tank containing a product which is a hazardous substance or petroleum?		
I. Brownfields: Is there redevelopment/revitalization interest		

Is the site eligible for an assessment under CERCLA authority? Please circle: Yes or No

Site Determination:

Is this site a valid site or incident? Please Circle and explain below

YES or NO

☐ **Enter the site into CERCLIS. Further assessment is recommended (explain below)**

☐ **The site is not recommended for placement into CERCLIS (explain below)**

DECISION/DISCUSSION/RATIONALE:

CERCLA Eligibility Checklist

Regional EPA Reviewer:_____ **Date:**_____

State Agency Reviewer:_____ **Date:**_____

APPENDIX D

POTENTIAL HAZARDOUS WASTE PRELIMINARY ASSESSMENT FORM

OMB Approval Number: 2050-0095
Approved for Use Through: 1/92

EPA Potential Hazardous Waste Site Preliminary Assessment Form

Identification
SDN000803095

State SD	Site Number SDN000803095

CERCLIS Discovery Date: March 15, 2013

1. General Site Information

Name: Darrow/Freezeout/Triangle Uranium Mine	Street Address: 13 miles NNW of Edgemont				
City: near Edgemont	State: SD	Zip Code: 57735	County: Custer and Fall River	Co. Code 21 and 27	Cong. Dist: 30
Latitude: 43.478486 Longitude:-103.962746	Approximate Area of Site: 1,426 Acres _____ Square Miles		Status of Site: ☐ Active X Inactive ☐ Not Specified ☐ NA		

2. Owner/Operator Information

Owner: Not Applicable (NA)			Operator:		
Street Address:			Street Address:		
City:			City:		
State:	Zip Code:	Telephone	State:	Zip Code:	Telephone
Type of Ownership: ☐ Private ☐ Federal Agency Name _____ ☐ State ☐ Indian ☐ County ☐ Municipal ☐ Not Specified ☐ Other _			How Initially Identified: ☐ Citizen Complaint ☐ PA Petition ☐ State/Local Program ☐ RCRA, CERCLA Notification ☐ Federal Program ☐ Incidental ☐ Not Specified ☐ Other _____		

3. Site Evaluator Information

Name of Evaluator: Gregory R. Dillon	Agency/Organization: Seagull Environmental Technologies, Inc.	Date Prepared: 04/29/2014
Street Address: 3555 Chase Street	City: Wheat Ridge	State: Colorado
Name of EPA or State Agency Contact: Victor Ketellapper (EPA)	Street Address: 1595 Wynkoop Street	
City: Denver	State: Colorado	Telephone: 303-312-6578

4. Site Disposition (for EPA use only)

Emergency Response/Removal Assessment Recommendation: ☐ Yes ☐ No Date _____	CERCLIS Recommendation: ☐ Higher Priority SI ☐ Lower Priority SI ☐ NFRAP ☐ RCRA ☐ Other _____ ☐ Date_____	Signature: Name (typed): Position:

EPA Potential Hazardous Waste Site

Preliminary Assessment Form - Page 2 of 4

CERCLIS Number:

SDN000803095

5. *General Site Characteristics*

Predominant Land Uses Within One Mile of Site (Check all that apply):

- ☐ Industrial
- ☐ Commercial
- ☐ Residential
- X Forest/Fields
- X Agricultural
- X Mining
- ☐ DOD
- ☐ DOE
- ☐ DOI
- ☐ Other Federal Facility _____
- ☐ Other _____

Site Setting:

- ☐ Urban
- ☐ Suburban
- X Rural

Years of Operation:

Beginning Year 1952

Ending Year 1994

☐ Unknown

Type of Site Operations (Check all that apply):

- ☐ Manufacturing (must check subcategory)
  - ☐ Lumber and Wood Products
  - ☐ Inorganic Chemicals
  - ☐ Plastic and/or Rubber Products
  - ☐ Paints, Varnishes
  - ☐ Industrial Organic Chemicals
  - ☐ Agricultural Chemicals (e.g., pesticides, fertilizers)
  - X Miscellaneous Chemical Products (e.g., adhesives, explosives, ink)
  - ☐ Primary Metals
  - ☐ Metal Coating, Plating, Engraving
  - ☐ Metal Forging, Stamping
  - ☐ Fabricated Structural Metal Products
  - ☐ Electronic Equipment
  - ☐ Other Manufacturing
- X Mining
- X Metals
- ☐ Coal
- ☐ Oil and Gas
- X Non-metallic Minerals
- ☐ Retail
- ☐ Recycling
- ☐ Junk/Salvage Yard
- ☐ Municipal Landfill
- ☐ Other Landfill
- ☐ DOD
- ☐ DOE
- ☐ DOI
- ☐ Other Federal Facility _____
- ☐ RCRA
- ☐ Treatment, Storage, or Disposal
- ☐ Large Quantity Generator
- ☐ Small Quantity Generator
- ☐ Subtitle D
- ☐ Municipal
- ☐ Industrial
- ☐ Converter
- ☐ Protective Filer
- ☐ Non- or Late Filer
- ☐ Not Specified
- ☐ Other _____

Waste Generated:

- ☐ On site
- ☐ Off-site
- X On site and off-site

Waste Deposition Authorized By:*

- ☐ Present Owner
- X Former Owner
- ☐ Present & Former Owner
- ☐ Unauthorized
- ☐ Custer County Roads & Bridges

Waste Accessible to the Public:*

- ☐ Yes
- X No (on site) Unknown if off-site disposal is accessible to public.

Distance to Nearest Dwelling, School, or Workplace:

> 200 Feet

6. *Waste Characteristics Information*

Source Type: (Check all that apply)	Source Waste Quantity: (Include units)	Tier*:
☐ Landfill		
☐ Surface Impoundment		
☐ Drums		
☐ Tanks and Non-Drum Containers		
☐ Chemical Waste Pile		
☐ Scrap Metal or Junk Pile		
X Tailings Pile	10,877,215.81 ft^2	A
☐ Trash Pile (open dump)		
☐ Land Treatment		
☐ Contaminated Groundwater Plume (unidentified source)		
☐ Contaminated Surface Water/Sediment (unidentified source)		
☐ Contaminated Soil		
☐ Other_____		
☐ No Sources		

* C = Constituent W = Waste stream V = Volume A = Area

General Types of Waste (Check all that apply)

- ☐ Metals
- ☐ Organics
- X Inorganics
- ☐ Solvents
- ☐ Paints/Pigments
- ☐ Laboratory/Hospital Waste
- X Radioactive Waste
- ☐ Construction/Demolition Waste
- ☐ Pesticides/Herbicides
- ☐ Acids/Bases
- ☐ Oily Waste
- ☐ Municipal Waste
- ☐ Mining Waste
- ☐ Explosives
- ☐ Other _____

Physical State of Waste as Deposited (Check all that apply):*

- X Solid
- ☐ Liquid
- ☐ Sludge
- ☐ Gas
- ☐ Powder

CERCLIS Number:
SDN000803095

7. *Groundwater Pathway*

Is Groundwater Used for Drinking Water Within 4 Miles?

X Yes
☐ No

Type of Drinking Water Wells Within 4 Miles (Check all that apply):

☐ Municipal
X Private
☐ None

Is There a Suspected Release to Groundwater?

X Yes
☐ No

Have Primary Target Drinking Water Wells Been Identified?

X Yes
☐ No

If yes, Enter Primary Target Population: Approximately 4.24 individuals based on County average populations per household.

List Secondary Target Population Served by Groundwater Withdrawn From:

0 - ¼ Mile * 2.12
> ¼ - ½ Mile * 2.17
> ½ - 1 Mile * 2.12
> 1 - 2 Miles * 0
> 2 - 3 Miles * 14.84
> 3 - 4 Miles * 13.02
Total Within 4 Miles 34.27

Depth to Shallowest Aquifer:

0 to 50 feet below ground surface

Karst Terrain/Aquifer Present:

☐ Yes
X No

Nearest Designated Wellhead Protection Area:

☐ Underlies Site
☐ > 0 - 4 Miles
X None Within 4 Miles

8. *Surface Water Pathway*

Type of Surface Water Draining Site and 15 Miles Downstream (Check all that apply):

X Stream X River X Pond ☐ Lake
☐ Bay ☐ Ocean ☐ Other _____

Shortest Overland Distance From Any Source To Surface Water:*

< 100 Feet
_____ Miles

Is There a Suspected Release to Surface Water?

X Yes
☐ No
☐ Unknown

Site is Located in:

☐ Annual - 10-year Floodplain
X > 10-year - 100-year Floodplain
☐ > 100-year - 500-year Floodplain
☐ > 500-year Floodplain

Drinking Water Intakes Located Along the Surface Water Migration Path:

☐ Yes
X No

Have Primary Target Drinking Water Intakes Been Identified:

☐ Yes
X No

If Yes, Enter Population Served by Primary Target Intakes:
0 People

List All Secondary Target Drinking Water Intakes:

Name	Water Body	Flow (cfs)	Population Served

Fisheries Located Along the Surface Water Migration Path:

X Yes
☐ No

Have Primary Target Fisheries Been Identified:

X Yes
☐ No

List All Secondary Target Fisheries:

Water Body/Fishery Name	Flow (cfs)
Beaver Creek	9.9
Cheyenne River	23.0

EPA Potential Hazardous Waste Site

Preliminary Assessment Form - Page 4 of 4

CERCLIS Number:

SDN000803095

8. Surface Water Pathway (continued)

Wetlands Located Along the Surface Water Migration Path:
X Yes
☐ No
☐ Unknown

Have Primary Target Wetlands Been Identified:
☐ Yes
X No

List Secondary Target Wetlands:

Water Body	Flow (cfs)	Frontage Miles
Cheyenne River (PEMA)	23.0	0.23
Cheyenne River (R2USA)	23.0	0.74
Cheyenne River (R2USA)	23.0	0.27

Other Sensitive Environments Located Along the Surface Water Migration Path:
☐ Yes
X No

Have Primary Target Sensitive Environments Been Identified:
☐ Yes
X No

List Secondary Target Sensitive Environments:

Water Body	Flow (cfs)	Sensitive Environment Type

9. Soil Exposure Pathway

Are People Occupying Residences or Attending School or Daycare On or Within 200 Feet of Areas of Known or Suspected Contamination:*
☐ Yes
X No

If Yes, Enter Total Resident Population:

_____ People (part-time

Number of Workers On Site:*
X None
☐ 1 - 100
☐ 101 - 1,000
☐ >1,000

Have Terrestrial Sensitive Environments Been Identified On or Within 200 Feet of Areas of Known or Suspected Contamination?
☐ Yes
X No

If Yes, List Each Terrestrial Sensitive Environment:

_____

_____

10. Air Pathway

Is There a Suspected Release to Air:
☐ Yes
X No

Enter Total Population On or Within:

On Site	
0 – 1/4 Mile	
>1/4 – 1/2 Mile	
>1/2 Mile - 1 Mile	
>1 - 2 Miles	
>2 - 3 Miles	
>3 - 4 Miles	
Total Within 4 Miles	

Wetlands Located Within 4 Miles of the Site:
X Yes
☐ No
☐ Unknown

Other Sensitive Environments Located Within 4 Miles of the Site:*
☐ Yes
☐ No
X Unknown

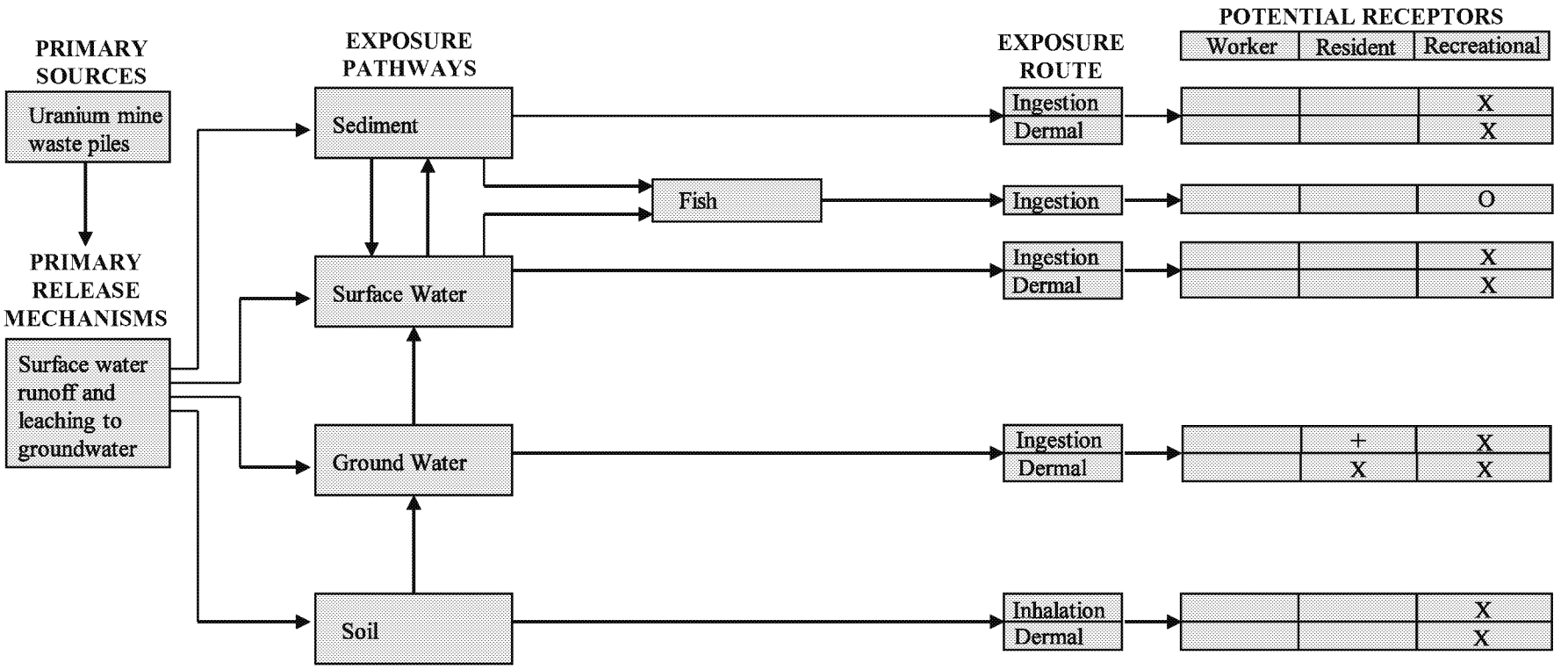
List All Sensitive Environments Within 1/2 Mile of the Site:

Distance	Sensitive Environment Type/Wetlands Area (acres)
On Site	
0 – 1/4 Mile	
> 1/4 - 1/2 Mile	

APPENDIX E

CONCEPTUAL SITE MODEL

SITE CONCEPTUAL MODEL
DARROW/FREEZEOUT/TRIANGLE URANIUM MINE SITE
EDGEMONT, SOUTH DAKOTA



Legend

	No evaluation required.
O	Pathway is not complete.
X	Pathway is or might be complete but is judged to be minor.
+	Pathway is or might be complete and could be significant.

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ATTACHMENT 10

ANALYTICAL SUMMARY REPORT

January 12, 2015

Oglala Sioux Tribe Natural Resource Reg Agency
W Hwy 18
Pine Ridge, SD 57770

Work Order: R14120184 Quote ID: R462

Project Name: Radiological

Energy Laboratories Inc. Rapid City SD received the following 1 sample for Oglala Sioux Tribe Natural Resource Reg Agency on 12/11/2014 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
R14120184-001	Cheyenne River/Red Shirt	12/11/14 10:35	12/11/14	Aqueous	Total Uranium Metals Digestion by EPA 200.2 Gross Alpha, Gross Beta

This report was prepared by Energy Laboratories, Inc., 2821 Plant St., Rapid City, SD 57702. As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:

Linda K. Larson
Branch Manager

Digitally signed by
Linda Larson
Date: 2015.01.15 16:15:56 -07:00

CLIENT: Oglala Sioux Tribe Natural Resource Reg A
Project: Radiological
Work Order: R14120184

Report Date: 01/12/15

CASE NARRATIVE

Tests associated with analyst identified as ELI-CA were subcontracted to Energy Laboratories, 2393 Salt Creek Hwy., Casper, WY, EPA Number WY00002 and WY00937.

LABORATORY ANALYTICAL REPORT

Prepared by Rapid City, SD Branch

Client: Oglala Sioux Tribe Natural Resource Reg Agency
Project: Radiological
Lab ID: R14120184-001
Client Sample ID: Cheyenne River/Red Shirt

Report Date: 01/12/15
Collection Date: 12/11/14 10:35
Date Received: 12/11/14
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	DF	Method	Analysis Date / By
METALS								
Uranium	17	ug/L		1	30	1	E200.8	12/24/14 17:02/eli-ca
Uranium, Activity	11.7	pCi/L		0.7	20	1	E200.8	12/24/14 17:02/eli-ca
RADIONUCLIDES - TOTAL								
Gross Alpha	26.7	pCi/L	*		15	1	E900.0	12/24/14 12:34/eli-ca
Gross Alpha precision (±)	6.7	pCi/L				1	E900.0	12/24/14 12:34/eli-ca
Gross Alpha MDC	5.1	pCi/L				1	E900.0	12/24/14 12:34/eli-ca

Adjusted gross alpha is 15.0 pCi/L

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
* - The result exceeds the MCL.

QA/QC Summary Report

Prepared by Rapid City, SD Branch

Client: Oglala Sioux Tribe Natural Resource Reg Agenc **Report Date:** 01/12/15

Project: Radiological **Work Order:** R14120184

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E200.8**								Analytical Run: SUB-C194664	
Lab ID:	**ICV**	Initial Calibration Verification Standard							12/24/14 14:51	
Uranium		0.0475	mg/L	0.00030	95	90	110			
Method:	**E200.8**								Batch: C_43486	
Lab ID:	**MB-43486**	Method Blank				Run: SUB-C194664			12/24/14 15:50	
Uranium		4E-05	mg/L	1E-05						
Lab ID:	**LCS3-43486**	Laboratory Control Sample				Run: SUB-C194664			12/24/14 15:54	
Uranium		0.50	mg/L	0.00030	99	85	115			
Lab ID:	**C14120456-001BMS3**	Sample Matrix Spike				Run: SUB-C194664			12/24/14 16:18	
Uranium		0.54	mg/L	0.00030	108	70	130			
Lab ID:	**C14120456-001BMSD3**	Sample Matrix Spike Duplicate				Run: SUB-C194664			12/24/14 16:20	
Uranium		0.55	mg/L	0.00030	110	70	130	2.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Rapid City, SD Branch

Client: Oglala Sioux Tribe Natural Resource Reg Agenc **Report Date:** 01/12/15

Project: Radiological **Work Order:** R14120184

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E900.0									Batch: C_GrDW-0658
Lab ID: Th230-GrDW-0658	Laboratory Control Sample				Run: SUB-C194686				12/24/14 12:34
Gross Alpha	140	pCi/L		120	80	120			
Lab ID: MB-GrDW-0658	Method Blank				Run: SUB-C194686				12/24/14 12:34
Gross Alpha	2	pCi/L							
Gross Alpha precision (±)	0.9	pCi/L							
Gross Alpha MDC	0.8	pCi/L							
Lab ID: C14120574-001BMS	Sample Matrix Spike				Run: SUB-C194686				12/24/14 12:34
Gross Alpha	100	pCi/L		80	70	130			
Lab ID: C14120574-001BMSD	Sample Matrix Spike Duplicate				Run: SUB-C194686				12/24/14 12:34
Gross Alpha	95	pCi/L		74	70	130	7.1	20	

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

Workorder Receipt Checklist

Oglala Sioux Tribe Natural Resource Reg Agency

R14120184

Login completed by: Steve Froiland

Date Received: 12/11/2014

Reviewed by: Linda Larson

Received by: sf

Reviewed Date: 1/8/2015

Carrier name: Hand Delivered

Shipping container/cooler in good condition?	Yes D	No D	Not Present O
Custody seals intact on all shipping container(s)/cooler(s)?	Yes D	No D	Not Present O
Custody seals intact on all sample bottles?	Yes D	No D	Not Present O
Chain of custody present?	Yes O	No D	
Chain of custody signed when relinquished and received?	Yes O	No D	
Chain of custody agrees with sample labels?	Yes O	No D	
Samples in proper container/bottle?	Yes O	No D	
Sample containers intact?	Yes O	No D	
Sufficient sample volume for indicated test?	Yes O	No D	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes O	No D	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes D	No O	Not Applicable D
Container/Temp Blank temperature:	21.4°C From Field		
Water - VOA vials have zero headspace?	Yes D	No D	No VOA vials submitted O
Water - pH acceptable upon receipt?	Yes O	No D	Not Applicable D

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

Company Name:	Project Name, PWS, Permit, Etc.	Sample Origin State:	EPA/State Compliance: Yes O No O
Report Mail Address (Required):	Contact Name: / Phone/Fax:	Cell:	Sampler: (Please Print)
No Hard Copy Email:	Invoice Contact & Phone:	Purchase Order:	Quote/Bottle Order:
Invoice Address (Required):			
No Hard Copy Email:			

Special Report/Formats:

- O DW
- O POTW/WWTP
- O State:
- O Other:
- O EDD/EDT (Electronic Data) Format:
- O LEVEL IV
- O NELAC

Contact ELI prior to RUSH sample submittal for charges and scheduling – See Instruction Page

Comments:

R U S H

Shipped by:

Cooler ID(s):

Receipt Temp °C

On Ice: Y N

Custody Seal On Cooler Y N

Intact On Bottle Y N

Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:

Sample Disposal: Return to Client: Lab Disposal:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.

ATTACHMENT 11

PROGRAMMATIC AGREEMENT
AMONG
U.S. NUCLEAR REGULATORY COMMISSION
U.S. BUREAU OF LAND MANAGEMENT
SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE
POWERTECH (USA), INC.
AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
DEWEY-BURDOCK IN SITU RECOVERY PROJECT
LOCATED IN CUSTER AND FALL RIVER COUNTIES
SOUTH DAKOTA

Date 03-19-14

WHEREAS, the U.S. Nuclear Regulatory Commission (NRC) received an application from Powertech (USA), Inc. (Powertech or applicant) for a new radioactive source materials license to develop and operate the Dewey-Burdock Project (the undertaking) located near Edgemont, South Dakota in Fall River and Custer counties (Project) pursuant to the NRC licensing authority under the Atomic Energy Act of 1954 (AEA), 42 U.S.C. §§ 2011 *et seq.*; and

WHEREAS, NRC is considering issuance of a license for the Dewey-Burdock In Situ Recovery [ISR] Project pursuant to its authority under the Atomic Energy Act of 1954 (AEA), 42 U.S.C. §§ 2011 *et seq.* which makes the project an undertaking requiring compliance by NRC with Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470, and its implementing regulations (36 CFR § 800 (2004)); and

WHEREAS, if licensed, the proposed project will use an In Situ Recovery (ISR) methodology to extract uranium and process it into yellowcake at the Dewey-Burdock site; and

WHEREAS, the proposed project area consists of approximately 10,580 acres (4,282 ha) located on both sides of Dewey Road (County Road 6463) and includes portions of Sections 1-5, 10-12, 14, and 15, in Township 7 South, Range 1 East and portions of Sections 20, 21, 27, 28, 29, and 30-35 in Township 6 South, Range 1 East, Black Hill Meridian, (see Appendix A and Figure 1.0 for fuller description and a map of the project area); and

WHEREAS, under the terms of the General Mining Act of 1872 Powertech has filed Federal Lode mining claims and secured mineral rights on 240 acres [97 ha] of public lands open to mineral entry and administered by the U.S. Department of the Interior, Bureau of Land Management (BLM), and has the right to develop the mining claims as long as this can be accomplished without causing unnecessary or undue degradation to public lands and in accordance with pertinent laws and regulations under 43 CFR Subpart 3809; and

WHEREAS, review and approval of a Plan of Operations for the project that meets the requirements of 43 CFR Subpart 3809 by the BLM-South Dakota Field Office makes the project an undertaking requiring compliance by BLM with Section 106 of the NHPA, 16 U.S.C. § 470 and 36 CFR Part 800; and

WHEREAS, the BLM, by letter dated April 7, 2011, has designated the NRC as the lead agency for compliance with requirements of Section 106 of the NHPA regarding the Dewey-Burdock Project

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(ADAMS Accession No. ML11116A091) pursuant to 36 CFR § 800.2(a)(2) of the Section 106 regulations; and

WHEREAS, under the terms of the Safe Drinking Water Act, Powertech has submitted to the Environmental Protection Agency (EPA) two Underground Injection Control (UIC) Permit Applications for ISR uranium recovery and the disposal of treated ISR process fluids at the Dewey-Burdock site; the EPA will issue draft permit decisions that meet the requirements of UIC regulations found at 40 CFR Parts 124, 144, 146 and 147; and

WHEREAS, the NRC determined a phased process for compliance with Section 106 of the NHPA is appropriate for this undertaking, as specifically permitted under 36 CFR § 800.4(b)(2), such that completion of the evaluation of and determinations of effects on historic properties, and consultation concerning measures to avoid, minimize, or mitigate any adverse effects will be carried out in phases, as set forth in this Programmatic Agreement (PA) (see Appendix A for details); and

WHEREAS, the area of potential effects (APE) for the undertaking is the area at the Dewey-Burdock Project site and its immediate environs, which may be directly or indirectly impacted by construction and operation activities associated with the proposed project, as described in Appendix A; and

WHEREAS, Project activities may occur on lands outside the license boundary for the installation of electrical transmission lines, and will be addressed in accordance with Stipulations 3 and 4 of this PA; and

WHEREAS, in accordance with 36 CFR § 800.6(a)(1)(i)(C), the NRC, by letter dated April 24, 2013, notified the Advisory Council on Historic Preservation (ACHP) of the potential for adverse effects to historic properties from the undertaking and invited the ACHP to participate in Section 106 consultation and in the preparation of this PA; and

WHEREAS, the ACHP, by letter, dated October 28, 2013, formally entered the consultation; and

WHEREAS, the NRC initiated consultation with the South Dakota State Historic Preservation Officer (SD SHPO) on December 2, 2009, during a face-to-face meeting held in Pierre, South Dakota; and

WHEREAS, the NRC invited Powertech to participate in Section 106 consultation and preparation of this PA; and

WHEREAS, by letters dated March 19, 2010 (ML100331999) and September 8, 2010 (ML102450647), the NRC invited 23 federally-recognized Indian Tribes who may ascribe religious and cultural significance to historic properties that may be affected by the undertaking, including the Cheyenne and Arapaho Tribes of Oklahoma, the Cheyenne River Sioux Tribe, the Crow Nation, the Crow Creek Sioux Tribe, the Eastern Shoshone Tribe, the Flandreau Santee Sioux Tribe, the Fort Peck Assiniboine and Sioux Tribes, the Lower Brule Sioux Tribe, the Lower Sioux Indian Community, the Northern Arapaho Tribe, the Northern Cheyenne Tribe, the Oglala Sioux Tribe, the Omaha Tribe of Nebraska, the Pawnee Nation of Oklahoma, the Ponca Tribe of Nebraska, the Rosebud Sioux Tribe, the Santee Sioux Tribe of Nebraska, the Sisseton-Wahpeton Oyate, the Spirit Lake Sioux Tribe, the Standing Rock Sioux Tribe, the Three Affiliated Tribes (Mandan, Hidatsa & Arikara Nations), the Turtle Mountain Band of Chippewa Indians, and the Yankton Sioux Tribe (collectively referred to as Tribes), to each be a consulting party in the Section 106 process; and

WHEREAS, the following 23 Tribes participated in consultation at varying levels with the NRC and BLM regarding the proposed Dewey-Burdock Project: the Cheyenne and Arapaho Tribes of Oklahoma,

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the Cheyenne River Sioux Tribe, the Crow Nation, the Crow Creek Sioux Tribe, the Eastern Shoshone Tribe, the Flandreau Santee Sioux Tribe, the Fort Peck Assiniboine and Sioux Tribes, the Lower Brule Sioux Tribe, the Lower Sioux Indian Community, the Northern Arapaho Tribe, the Northern Cheyenne Tribe, the Oglala Sioux Tribe, the Omaha Tribe of Nebraska, the Pawnee Nation of Oklahoma, the Ponca Tribe of Nebraska, the Rosebud Sioux Tribe, the Santee Sioux Tribe of Nebraska, the Sisseton-Wahpeton Oyate, the Spirit Lake Sioux Tribe, the Standing Rock Sioux Tribe, the Three Affiliated Tribes (Mandan, Hidatsa & Arikara Nations), the Turtle Mountain Band of Chippewa Indians, and the Yankton Sioux Tribe; and

WHEREAS, the NRC worked with consulting Tribes between November 2011 and October 2012 to develop an approach for identifying historic properties of cultural and religious significance to Tribes; the NRC conducted a face-to-face consultation focused on the identification of these properties in February 2012. Although several work plans for a tribal field survey were prepared and discussed by the consulting parties throughout 2012, the parties were unable to reach agreement on the scope and the cost of the Tribal survey (see Appendix B for details); and

WHEREAS, in October 2012, the NRC requested alternative approaches to conduct a tribal field survey and subsequently proposed opening the project area to all interested Tribes to complete the survey according to their needs and interests, with payments to be made to participating Tribes (see Appendix B for details); and

WHEREAS, the NRC offered all 23 consulting Tribes the opportunity to participate in a tribal field survey to identify properties of religious and cultural significance to them for the proposed Dewey-Burdock project ISR facility by letter dated February 8, 2013; and

WHEREAS, the following seven Tribes participated in the tribal field survey: the Northern Arapaho Tribe, the Northern Cheyenne Tribe, the Cheyenne and Arapaho Tribes of Oklahoma, the Crow Nation, the Santee Sioux Tribe, the Crow Creek Sioux Tribe, and the Turtle Mountain Band of Chippewa Indians as discussed in details in Appendix A; and

WHEREAS, surveys to identify historic properties have been completed for the project including Class III archaeological surveys and tribal surveys to identify properties of religious and cultural significance; and

WHEREAS, the NRC received tribal survey reports with eligibility recommendations from the Northern Arapaho Tribe, the Northern Cheyenne Tribe, and the Cheyenne and Arapaho Tribes of Oklahoma, as well as field notes from the Crow Nation as discussed in Appendix A; and

WHEREAS, the NRC staff has reviewed and evaluated the results of the applicant's Class III archaeological surveys and tribal surveys in the development of its initial recommendations concerning eligibility of properties identified within the APE for the undertaking for inclusion on the National Register of Historic Places (NRHP) as presented in Appendix B; and

WHEREAS, the NRC has received concurrence from the SD SHPO on these eligibility determinations as discussed in Appendix B, eligibility determinations were also sent to the Tribes with a 30-day review and comment period; and

WHEREAS, the NRC invited each of the 23 consulting Tribes to participate in the development of this PA; and

WHEREAS, the following Tribes participated at varying levels in webinars and/or provided written comments during the preparation of this PA: Northern Cheyenne, Cheyenne River Sioux, Oglala Sioux, Standing Rock Sioux, Fort Peck Assiniboine and Sioux, and Cheyenne and Arapaho Tribes; (see Appendix B for list of participants); and

WHEREAS, each of the 23 consulting tribes will be invited to sign the PA as a Concurring Party; and

WHEREAS, the BLM, as a federal agency with a federal action related to this undertaking has participated in the Section 106 consultation and development of this agreement and will be a signatory; and

WHEREAS, the EPA has participated in discussions of this agreement; and

WHEREAS, the PA will be entered as a condition on the NRC license, if granted; and

WHEREAS, the PA will be entered as a condition of Powertech Inc.'s Plan of Operation, if approved by the BLM; and

WHEREAS, Powertech, as the applicant for federal approvals has been invited to execute this agreement as an invited signatory in recognition of the responsibilities assigned to the applicant under the terms of this agreement;

NOW, THEREFORE, the NRC, BLM, SD SHPO, Powertech, and the ACHP agree that the undertaking will be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties.

STIPULATIONS:

NRC (or BLM on BLM-administered land) shall ensure that the following measures are carried out within its regulatory authority:

1) Conditions for Federal Approval:

a) The NRC will require that Powertech comply with all applicable stipulations and provisions of this PA, as a condition of the Powertech license for the Project.

b) The BLM will ensure that a Record of Decision on an acceptable Plan of Operation will not be signed until all required signatories have executed this PA.

c) The NRC shall not grant a license to Powertech until all required signatories have executed this PA. Upon receipt of a fully executed PA, the NRC will issue the license when all other requirements for the license have been met.

d) If a license amendment is required due to a change in the design or operation of the Project, and if that change would involve ground disturbing activities outside the currently identified disturbance areas, NRC will reconsider the eligibility determinations (in accordance with Stipulation 3) of any archaeological sites with tribally defined features and any tribally identified sites previously found not eligible that may be affected by the new ground disturbance.

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2) **Identification and Evaluation of Historic Properties within the License Boundary:**

a) Appendix B provides information on the archaeological and tribal filed surveys and describes the cultural resources identified within and adjacent to the boundary of the 10,580-acre project site. More than 300 cultural resources were identified.

b) In consultation with SD SHPO and the Tribes, the NRC and BLM have proposed eligibility determinations for 69 percent of the properties identified. Approximately 14 percent of identified sites have been determined eligible for listing on the NRHP, 55 percent have been determined not eligible, and 31 percent remain unevaluated.

3) **Protection and Evaluation of Unevaluated Properties within the APE:**

a) Powertech will protect all unevaluated properties until an NRHP-eligibility determination is completed, in accordance with 36 CFR § 800.4(c).

b) If changes in the design or operation of the Project, including wellfield configurations, result in ground disturbance that could affect unevaluated properties, Powertech shall sponsor necessary supplemental research and/or field investigations prior to commencing any ground-disturbance activities. Powertech will provide opportunities for consulting Tribes to help develop a draft investigation methodology for archaeological sites with tribal features and sites identified by the Tribes. The additional studies will provide information to enable NRC and/or BLM, in consultation with consulting Tribes, and the SD SHPO, to make NRHP-eligibility determinations for unevaluated cultural resources.

c) Powertech must provide a written plan of its investigation methodology (investigation plan) at least four months prior to commencement of work, to enable the NRC and BLM to allocate staff resources for Section 106 reviews; additional review time may be necessary if NRC and BLM staff resources are limited or due to conditions beyond the staff's control.

d) The NRC will distribute the proposed investigation plan to the 23 consulting Tribes soon after it is received from Powertech.

e) Upon receipt of the Powertech investigation plan, the NRC, the BLM, consulting Tribes and the SD SHPO will have 30 days to review the proposed plan. The NRC will consider any comments received in writing from consulting parties within the specified review period. If revisions to the plan are necessary, Powertech will revise the plan accordingly and circulate the revised investigation plan to the NRC (or BLM on BLM-administered land). The NRC will forward the revised plan to all consulting parties. A second review period of 30 days may be requested.

f) Upon approval of the investigation plan by the NRC (or BLM on BLM-administered land), Powertech will conduct supplemental research and/or field investigations and provide recommendations concerning NRHP-eligibility of previously unevaluated cultural resources for NRC consideration. If appropriate, testing will be conducted under the supervision of individuals meeting the Secretary of the Interior's Professional Qualifications Standards. The report shall follow documentation standards outlined in 36 CFR § 800.11.

g) After the completion of any additional studies, the NRC will submit the findings of NRHP-eligibility evaluation to BLM, SD SHPO, and consulting Tribes, with a 45-day period of review and comment.

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h) The NRC may request revisions to the reports or additional investigations after consideration of comments received from BLM, SD SHPO, and consulting Tribes. The NRC will provide revisions to BLM, SD SHPO, and consulting Tribes, with a 30-day period for a second review and comments.

i) The NRC will submit final determinations of NRHP-eligibility and effects to SD SHPO for review and concurrence; this review will be completed by the SD SHPO within 30 days.

j) When the NRC, BLM, and SD SHPO, in consultation with the Tribes, agree on NRHP-eligibility, avoidance will be the preferred option. Avoidance measures may include, but are not limited to, the relocation of pipelines, roads, facilities, monitoring wells, and other disturbances. When avoidance is not possible, adverse effects will be resolved in accordance with Stipulation 5—Resolution of Adverse Effects.

k) If the NRC, BLM, and SD SHPO, in consultation with the Tribes, make the determination that identified cultural resources are not NRHP-eligible, no further review or consideration of the properties will be required under this PA.

l) When the NRC (or BLM on BLM-administered land) and the SD SHPO disagree on NRHP-eligibility and the disagreement is not resolved through further consultation and the resource cannot be avoided, the NRC will refer the issue to the Keeper of the National Register (Keeper) and request a formal determination of eligibility, in accordance with 36 CFR § 800.4(c)(2). The ACHP may also request referral of an NRHP-eligibility determination to the Keeper.

m) If a consulting Tribe that attaches religious and cultural significance to a property disagrees with an NRC (or BLM on BLM-administered land) eligibility determination, it may ask the ACHP to request the NRC or BLM to obtain a determination of eligibility from the Keeper in accordance with 36 § 800.4(c)(2).

4) Assessment of Effects:

a) As part of its consideration of the effects of construction and operations on the landscape, the NRC conducted a line-of-sight analysis to assess the potential for adverse visual effects on all known historic properties located within three miles of the tallest buildings on both the Dewey and Burdock facilities.

b) The NRC and BLM consulted with SD SHPO and consulting Tribes in making its determination that eligible or unevaluated archaeological sites and properties of religious and cultural significance will be adversely affected by the undertaking. The effects determination is presented in Appendix B Table 1:0.

c) The NRC and BLM will consult with all consulting parties to develop proposals to resolve these adverse effects (as summarized in Appendix B Table 2:0) in accordance with the process set forth in Stipulation 5—Resolution of Adverse Effects.

5) Resolution of Adverse Effects:

a) The NRC will solicit suggestions from consulting parties concerning potential measures to avoid, minimize, or mitigate adverse effects on historic properties described in Appendix B after the PA is executed.

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b) The NRC and BLM, in consultation with consulting parties, will determine what treatment measures are appropriate to each adversely affected historic property.

c) Treatment measures can include, but are not limited to the following:

   i. For archaeological properties that are significant for their research data potential (Eligibility Criterion D, National Register of Historic Places), the treatment measures may follow standard mitigation through data recovery. Treatment plan(s) for data recovery shall include, at a minimum, a research design with provisions for data recovery and recordation, analysis, reporting, and curation of resulting collection and records, and shall be consistent with the *Secretary of Interior's Standards and Guidelines* (48 FR 44734-44737). Treatment plan(s) must be consistent with easement and permit requirements of other agencies, when applicable. To the extent possible, treatment plan(s) should group related sites and areas, so related resources can be considered in context, and to minimize the burden of review and approval by agencies.

   ii. Treatment plan(s) for properties eligible under Criteria A, B and C, or significant for values other than their potential research potential shall specify approaches for treatment or mitigation of the property in accordance with the principles, standards, and guidelines appropriate to the resource, if warranted. This may include, but not be limited to, use of such approaches as relocating the historic property, landscaping to reduce visual effects, public interpretation, ethnographic recordation, oral history, archival research, or prescribing use of a component or activity of this undertaking in such a way as to minimize effects to historic properties. Methods of recordation and documentation described in the treatment plan(s) shall conform to the *Secretary of the Interior's Standards for Architectural and Engineering Documentation* (48 FR 44730-44734) or other standards specified by NRC.

   iii. In lieu of standard mitigation approaches described above, treatment plan(s) may adopt other alternative approaches to avoid, minimize, or mitigate effects to historic properties, including, but not limited to, assisting in the development of Tribal historic preservation plans, developing detailed historic contexts for the region, developing educational materials, purchasing properties containing historic resources, or developing historic property management plans.

d) Powertech shall prepare a treatment plan for each affected historic property, following the potential treatment measures developed through consultation with all consulting parties,

e) In conjunction with the submission of their Plan of Activities, which detail construction and operations activities for each year, Powertech will submit one or more draft treatment plans based on input provided by all consulting parities. A draft plan will identify properties that will be affected that year and measures that will be taken to avoid, minimize, or mitigate those effects. A draft treatment plan will be submitted for NRC and BLM review and approval four months prior to construction, so the NRC and BLM can appropriately allocate staff resources to the extent possible; additional time may be necessary in the event that NRC and BLM staff resources are limited due to conditions beyond the staff's control.

   i. The treatment plan shall contain a description of the effects on each adversely affected historic property and a description of the proposed treatment for each of those historic properties.

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ii. If monitoring by a qualified archaeologist and/or Tribal monitor is part of the strategy for resolving or preventing adverse effects, the treatment plan shall include a Monitoring Plan. The objective of monitoring is to protect known sites from construction impacts, identify at the time of discovery any archaeological materials exposed during ground disturbance, and protect such resources from damage until the procedures for discoveries per Stipulation 9—Unanticipated Discoveries are implemented.

iii. If data recovery is determined to be an appropriate treatment and part of the strategy for resolving adverse effects, the treatment plan shall specify all details of the research design, field and laboratory work methodology (including mapping, geomorphological or other specialized studies, controlled scientific excavation methods, analyses of data recovered, and photographic documentation as appropriate), and report preparation.

f) Upon receipt of a draft treatment plan, the NRC will submit the draft treatment plan to all signatories and consulting Tribes for a 45-day review and comment period. The NRC will consider any comments received in writing from consulting parties within the specified review period.

g) The NRC may ask Powertech to revise the draft treatment plan based on comments received from the consulting parties. The NRC will forward revisions to the draft treatment plan and request for a second review by all signatories and consulting Tribes within a 30-day period.

h) The NRC will then distribute the final treatment plan to SD SHPO for a 30-day review period, and copies of the plan will be distributed to consulting parties.

i) Upon concurrence by the SD SHPO, or if the SD SHPO does not respond in writing within 30 days, the NRC shall direct Powertech to implement the treatment plan.

j) If, after consultation, the NRC and the SD SHPO cannot agree on appropriate terms for the treatment plan, the NRC will refer the matter to the ACHP for comment pursuant to Stipulation 14—Dispute Resolution. The NRC will consider ACHP comments in making its final decision on measures to resolve the adverse effects.

6) Future Identification of Cultural Resources for Installation of Power Transmission Lines in Areas to be Determined:

a) Powertech will notify the NRC and BLM in writing, if it determines that ground-disturbing activities will be required for the installation of electrical transmission lines outside the license boundary. Powertech must provide written notification at least four months prior to commencement of work, to enable the NRC and BLM to allocate staff resources for Section 106 reviews; additional review time may be necessary if NRC and BLM staff resources are limited or due to conditions beyond the staff's control.

b) Powertech must provide the NRC, the BLM, and the SD SHPO a proposed work plan for a survey to inventory historic properties within the APE for each transmission line as part of the written notification. The plan will include methods for identification of all kinds of cultural properties within the transmission line corridor, including identification of properties of religious

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and cultural significance with the involvement of the Tribes. The proposed plan should also include report preparation requirements and schedules for the identification efforts.

c) The NRC will distribute the proposed work plan to the 23 consulting Tribes soon after it is received from Powertech.

d) Upon receipt of the proposed Powertech work plan, the NRC, the BLM, consulting Tribes and the SD SHPO will review and provide comments on the plan within 30 days. The NRC will consider any comments received in writing from consulting parties within the specified review period. The NRC may ask Powertech to revise the draft work plan based on comments received from the consulting parties. The NRC will forward the revised plan to all consulting parties. A second review period of 30 days may be requested.

e) Upon NRC approval of the work plan, Powertech will conduct surveys to identify historic properties along the transmission corridor within an appropriate APE. Powertech will also undertake necessary testing in order to propose NRHP-eligibility of any newly identified properties for NRC consideration. Survey and testing will be conducted under the supervision of individuals meeting the Secretary of the Interior's Professional Qualifications Standards. The report shall follow documentation standards outlined in 36 CFR § 800.11.

f) Powertech shall offer to provide appropriate financial compensation to Tribal Representatives for the work on the identification of properties of religious and cultural significance. The identification of properties of religious and cultural significance will occur at the same time or prior to identification of archaeological properties.

g) The NRC will consult with the 23 consulting Tribes on identification of properties of religious and cultural significance. This consultation could include various approaches such as an open site survey opportunity to identify and evaluate places of religious and cultural significance to the Tribes.

h) Upon receipt of Powertech's completed survey report, the NRC will submit the findings to the BLM, SD SHPO, ACHP, and the consulting Tribes for a review and comment period of 45 days.

i) The NRC may request revisions to survey reports or additional investigations, after consideration of timely comments made by BLM, SD SHPO, ACHP, and consulting Tribes. The NRC will provide revised documents to BLM, SD SHPO, and Tribes. A second review period of 30 days may be requested.

j) The NRC will submit final determinations of NRHP-eligibility and effects to the SD SHPO for review and concurrence; this review will be completed within 30 days of the SD SHPO receiving complete information. The NRC will circulate copies of this correspondence to the other consulting parties. The NRC will consider any comments received within the 30-day period.

k) When the NRC, BLM, and SD SHPO agree evaluated properties are NRHP-eligible, avoidance of the properties will be the preferred option. When avoidance is not possible and adverse effects will result, adverse effects will be resolved in accordance with Stipulation 5—Resolution of Adverse Effects.

l) If the NRC, BLM, and SD SHPO make the determination that identified cultural resources are not eligible for listing on the NRHP, no further review or consideration of the properties will be required under this PA.

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m) When the NRC (or BLM on BLM-administered land) and the SD SHPO disagree on NRHP-eligibility and the disagreement cannot not be resolved through further consultation and avoidance is not an option, the NRC will refer the issue to the Keeper and request a formal determination of eligibility, in accordance with 36 CFR § 800.4(c)(2). The ACHP may also request referral of an NRHP-eligibility determination to the Keeper. The decision of the Keeper will be final.

n) If a consulting Tribe that attaches religious and cultural significance to a property disagrees with an NRC (or BLM on BLM-administered land) eligibility determination, it may ask the ACHP to request the NRC or BLM to obtain a determination of eligibility from the Keeper in accordance with 36 § 800.4(c)(2).

7) Coordination with Other Federal Reviews:

Any federal agency that will provide approvals or assistance for the undertaking as presently proposed may comply with its Section 106 responsibilities for the undertaking by agreeing to the terms of this PA in writing and sending copies of such written agreement to all the signatories and consulting parties of this PA. Such agreement to the terms of this PA will not necessitate an amendment to the PA.

8) Confidentiality:

The NRC, BLM, and other parties to this agreement acknowledge the need for confidentiality concerning tribal spiritual and cultural information, which was or may be provided to the NRC and BLM during the consultation process. Information provided by consulting tribal representatives, which has been identified as sensitive and was accompanied by a request for confidentiality, will remain confidential to the extent permitted by state and federal laws.

All consulting parties shall restrict disclosure of information concerning the location or other characteristics of historic properties, as well as properties of religious and cultural significance to Tribes, to the fullest extent permitted by law in conformance with Section 304 of the NHPA, South Dakota Codified Laws (SDCL), § 1-20-21.2, Section 9 of the ARPA, and Executive Order on Indian Sacred Sites 13007 (61 FR 26771; May 29, 1996).

9) Unanticipated Discoveries:

In the event a previously unknown cultural resource is discovered during the implementation of the Dewey-Burdock Project, all ground disturbance activities shall halt within 150 feet of the area of discovery to avoid or minimize impacts until the property is evaluated for listing on the NRHP by qualified personnel. The following additional steps shall be taken:

a) Powertech will notify the NRC, the BLM (if the site is on BLM land), and the SD SHPO of the discovery within 48 hours. Unanticipated discoveries may include artifacts, bone, features, or concentrations of these materials outside previously identified sites, or in and adjacent to previously identified eligible and not eligible sites. Discoveries may also include stones and groups of stones that are out of place in their sedimentary contexts and may be parts of stone features. A "discovery" may also include changes in soil color and texture, or content suspected to be man-made, such as burned soil, ash, or charcoal fragments.

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b) The NRC and BLM (as appropriate) will contact the THPO and/or the Tribal Cultural Resource Office(s) to notify them of an unanticipated discovery soon after notification from Powertech is received.

c) Powertech will have the discovery evaluated for NRHP eligibility by a professional who meets the Secretary of the Interior's Professional Qualifications Standards in Archaeology (36 CFR § 61).

d) Powertech will provide results of evaluation and initial eligibility recommendation to the NRC and BLM within ten business days of the discovery. If Tribes want to participate in the evaluation efforts, they should contact Powertech within the specified review period.

e) The NRC and/or BLM, in consultation with Tribes and other consulting parties, shall evaluate the cultural resources to determine whether they meet the NRHP criteria and request concurrence of the SD SHPO. Evaluation will be carried out as expeditiously as possible, not to exceed 5 business days.

f) When the NRC, BLM, and SD SHPO agree evaluated properties are NRHP-eligible, avoidance of the properties will be the preferred option. When avoidance is not possible and adverse effects will result, adverse effects will be resolved in accordance with Stipulation 5—Resolution of Adverse Effects.

g) If the NRC, BLM, and SD SHPO, in consultation with the Tribes, make the determination that identified cultural resources are not eligible for listing on the NRHP, no further review or consideration of the properties will be required under this PA.

h) Human remains identified during ground disturbance activities will be treated in accordance with Stipulation 10—Human Remains and Appendix D—Treatment of Human Remains on State, Private, and BLM Land.

i) In the event of unanticipated discovery, Powertech may continue to work in other areas of the site; however, ground disturbance activities shall not resume in the area of discovery until the NRC and BLM have issued a written notice to proceed.

10) Human Remains:

a) The NRC, BLM, and Powertech recognize human remains, funerary objects, sacred objects, and items of cultural patrimony encountered during ground disturbance activities should be treated with dignity and respect.

b) Native American human remains, funerary objects, sacred objects, or items of cultural patrimony found on BLM land will be handled according to Section 3 of the Native American Graves Protection and Repatriation Act (NAGPRA) and its implementing regulations (43 CFR § 10). BLM will be responsible for compliance with the provisions of NAGPRA on Federal land.

c) Native American human remains, funerary objects, sacred objects, or items of cultural patrimony found on state or private land will be handled in accordance with applicable law as described in Appendix D – Treatment of Human Remains on State, Private, and BLM Land.

d) Non-Native American human remains found on federal, state, or private land will also be treated in accordance with applicable state law.

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11) Disposition of Archaeological Collections:

a) BLM will curate artifacts, materials or records resulting from archaeological identification and mitigation conducted on BLM land at the Billings Curation Center, in accordance with the Billings Curation Center Packaging Requirements in accordance with 36 CFR § 79, "Curation of Federally-Owned and Administered Archaeological Collections." BLM will consult with Tribes as required by 36 CFR § 79.

b) Where testing or excavation is conducted on private land, any recovered artifacts remain the property of the landowner. Powertech will return the artifacts to landowners. Powertech will encourage landowners to donate the artifacts to the SD Archaeological Research Center or a Tribal entity, in coordination with the NRC, SHPO, and participating Tribes. Where a property owner declines to accept responsibility for the artifacts and agrees to transfer ownership of the artifacts to SD Archaeological Research Center or Tribal entity, Powertech will assume the cost for curating the artifacts in a facility meeting the requirements of 36 CFR § 79, "Curation of Federally-Owned and Administered Archaeological Collections."

12) Qualifications:

The identification, evaluation, and mitigation of historic properties carried out pursuant to this PA shall be performed by or under the direct supervision of qualified individuals in the appropriate historic preservation discipline meeting, at a minimum, the appropriate standards set forth in 36 CFR § 61.

In recognition of the special expertise Tribal experts have concerning properties of religious and cultural significance, the standards of 36 CFR § 61 will not apply to knowledgeable, designated tribal representatives carrying out identification and evaluation efforts for properties of religious and cultural significance to Tribes.

13) Compliance Monitoring:

NRC affirms avoidance of adverse effects to historic properties remains the preferred course of action.

a) Powertech will ensure employees and/or contractors involved in all phases of the Project are aware of and comply with the requirements of the PA. Powertech may use measures such as initial orientation training, as well as pre-job briefings to inform employees and contractors of their responsibilities under the PA. Compliance with this PA is a condition of the NRC license and a condition of the BLM Plan of Operations.

b) Prior to initiating construction activities, Powertech will develop a Monitoring Plan specific to the project, identifying specific areas, activities, and if appropriate, historic properties that require monitoring during development of the Project, ensuring the requirements of this PA and the treatment plans developed under the provisions of Stipulation 5—Resolution of Adverse Effects are met. The monitoring plan will include provisions for annual reporting of the results of the monitoring program to the signatories and the consulting Tribes to this PA.

    i. Powertech will provide the Monitoring Plan to the NRC, which will distribute it to the signatories and consulting Tribes to this agreement for a 30-day review and comment period.

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ii. The NRC will request that Powertech make any necessary revisions to the plan, and the revised Monitoring Plan will remain in effect for all covered ground-disturbing activities during the license period.

c) Powertech will engage the services of a Monitor with specific responsibilities to coordinate the requirements of the monitoring plan, the treatment plans, and this agreement during project construction.

i. The Monitor will meet the Secretary of the Interior's Professional Qualifications for Archaeology. Preference will be given to individuals meeting those qualifications who are employed by tribal enterprises, especially during phases of the monitoring program where sites with religious and cultural significance to the Tribes might be affected. In the case of an unanticipated discovery or imminent threat to a historic property (for which avoidance had been planned), the Monitor shall have authority to stop certain construction activities.

ii. The Monitor will coordinate with Powertech and its contractors during the construction phases of the Project.

d) Powertech will provide periodic updates to all consulting parties on the status of the monitoring program as specified in Appendix C.

14) Dispute Resolution:

Should any signatory to this PA object in writing to any actions proposed or to the manner in which terms of the PA are implemented, the NRC shall consult with the party to resolve the objection. If the NRC determines the objection cannot be resolved, the NRC will:

a) Forward all documentation relevant to the dispute, including the NRC proposed resolution, to the ACHP and send a copy to all other consulting parties. The ACHP shall provide NRC with its advice on the resolution of the objection within 30 days of receiving adequate documentation. Prior to reaching a final decision on the dispute, NRC shall prepare a written response that takes into account timely advice or comments regarding the dispute from the ACHP, signatories, concurring parties, and consulting parties, and provide a copy of this written response to them. NRC will then proceed according to its final decision.

b) If the ACHP does not provide its advice regarding the dispute within the 30-day period, the NRC may make a final decision on the dispute and proceed accordingly. Prior to reaching a final decision, NRC shall prepare a written response that takes into account timely comments regarding the dispute from the signatories, concurring parties, and consulting parties, and provide them and the ACHP with a copy of such written response.

c) NRC responsibilities under this Agreement, which are not the subject of the dispute, shall remain unchanged.

15) Amendment:

This PA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

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Concurring parties will be provided an opportunity to consult and comment on the proposed amendment. An amendment will be effective on the date the amended PA is signed by all of the signatories to this PA. If a required signatory does not sign the amended PA, the amendment will be void. The amendment shall be appended to this PA as an Appendix.

16) Termination:

a) If any signatory to this PA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment to the PA pursuant to Stipulation 15—Amendment. If within 30-days (or another period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the PA upon written notification to the other signatories.

b) If this PA is terminated the NRC shall either (i) execute a new PA pursuant to 36 CFR § 800.6(c)(8) with signatories as defined in Section 800.6 (c)(1) of Title 36 or, (ii) the NRC shall request comments, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7(c)(4). NRC shall notify the signatories as to the course of action it will pursue.

c) After the termination of this PA and until the NRC completes consultation and a new PA is executed or the NRC has requested, taken into account, and responded to the comments of the ACHP under 36 CFR § 800.7(c)(4), Powertech is required to follow the terms and conditions of this PA for current ground-disturbing activities and is not permitted to begin any such activities in new areas.

d) If the terms of this PA are satisfied prior to its expiration date, NRC shall provide written notification to the other signatories and consulting parties to close out this agreement.

17) Duration:

This PA shall remain in effect for 10 years from its date of execution (last date of signature), or until completion of the work stipulated, whichever comes first, unless extended by agreement among the signatories. During the effective period and prior to the expiration of the PA, the NRC may consult with the signatories and concurring parties to amend this stipulation to extend the duration of the PA, in accordance with Stipulation 15—Amendment.

18) Anti-Deficiency Act:

The stipulations of this Agreement are subject to the provisions of the Anti-Deficiency Act (Pub.L. 97–258, 96 Stat. 923; 31 U.S.C. §1341, Limitations on expending and obligating amounts). If compliance with the Anti-Deficiency Act alters or impairs the ability of the NRC to implement this Agreement, the NRC will consult in accordance with the amendment and termination procedures in this Agreement.

Execution of this PA by the NRC, BLM, SD SHPO, ACHP, and Powertech and the implementation of its terms is evidence the NRC and BLM have taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

This PA may be executed in counterparts, each of which shall constitute an original, and all of which shall constitute one and the same agreement.

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ATTACHMENT 3

Azarga Reports Robust PEA Results for Dewey Burdock Project

December 4, 2019 8:00 am

Highlights:

- Pre-income tax IRR of 55% and NPV of US$171.3 million (at US$55 per pound uranium sales price and 8% discount rate)
- Post-income tax IRR of 50% and NPV of US$147.5 million (at US$55 per pound uranium sales price and 8% discount rate
- 14.3 million pounds of U_3O_8 production over 16 years; steady state production of approximately 1 million pounds per year achieved in year
- Low initial capital expenditures estimated at US$31.7 million
- Direct cash operating costs estimated at US$10.46 per pound of production

AZARGA URANIUM CORP. (TSX: AZZ, OTCQB: AZZUF, FRA: P8AA) ("Azarga Uranium" or the "Company") is pleased to announce the positive results of an independent Preliminary Economic Assessment ("PEA") on its flagship Dewey Burdock In-situ Recovery Uranium Project in South Dakota, USA (the "Dewey Burdock Project") following an updated mineral resource estimate. The PEA has been prepared in accordance with the requirements of National Instrument 43-101 ("NI 43-101").

Blake Steele, the Company's President and CEO commented: "We are extremely pleased with the results of the updated PEA for the Dewey Burdock Project. The PEA demonstrates robust economics and cements the Dewey Burdock Project as one of the preeminent undeveloped in-situ recovery ("ISR") projects in the United States. The PEA results further validate our Company's strategy and we continue to progress the project towards construction as the global uranium market strengthens by virtue of supplier discipline and higher demand. The estimated cost profile and modest initial capital expenditures leave Dewey Burdock and the Company well positioned to capitalize on the anticipated recovery in the uranium price."

Summary of Economics

The base case economic assessment results in a pre-income tax internal rate of return ("IRR") of 55% and a pre-income tax net present value ("NPV") of US$171.3 million when applying an eight percent discount rate. Using the same discount rate, the post-income tax IRR is 50% and the post-income tax NPV is US$147.5 million.

Life of Mine Cash Flow Line Items

	Units	Total or average	US$ per pound of production
Uranium production (U_3O_8)	Lbs '000s	14,268	–
Base case uranium price	US$/lb	55.00	–
Uranium gross revenue	*US$ '000s*	*784,740*	–
Less: surface and mineral royalties	US$ '000s	38,060	2.67
Taxable revenue	*US$ '000s*	*746,680*	–
Less: severance and conservation tax	US$ '000s	35,393	2.48
Net gross sales	*US$ '000s*	*711,287*	–
Less: plant and well field operating costs	US$ '000s	108,084	7.58
Less: product transaction costs	US$ '000s	11,889	0.83
Less: administrative support costs	US$ '000s	5,362	0.38
Less: D&D and restoration costs	US$ '000s	16,659	1.17
Less: property tax	US$ '000s	7,200	0.50
Net operating cash flow	*US$ '000s*	*562,093*	–
Less: pre-construction capital costs	US$ '000s	1,025	0.07
Less: plant development costs	US$ '000s	52,140	3.65
Less: wellfield capital development costs	US$ '000s	136,190	9.55

Net pre-income tax cash flow	*US$ '000s*	*372,738*	–
Less: income taxes	US$ '000s	48,386	3.39
After tax cash flow	*US$ '000s*	*324,352*	–

The projected cash flows for the Dewey Burdock Project PEA are positive in the second year of production, two years after the commencement of construction. Initial capital expenditures are estimated at US$31.7 million.

Direct cash operating costs are estimated to be US$10.46 per pound of production, royalties and local taxes (excluding property tax) are estimated to be US$5.15 per pound of production and the total pre-income tax cost of uranium production is estimated to be US$28.88 per pound of production. Income taxes are estimated to be US$3.39 per pound of production and have been calculated on a project basis in accordance with NI 43-101 requirements; therefore, certain tax shelter balances, such as tax loss carry forwards available at the corporate level, have not been considered.

Pre-income tax NPV and IRR Sensitivity to Alternative Uranium Price Scenarios

Uranium price scenario	**NPV**	**IRR**
US$35/lb	US$26.6m	17%
US$40/lb	US$62.8m	28%
US$45/lb	US$98.9m	37%
US$50/lb	US$135.1m	46%
US$55/lb (base case)	US$171.3m	55%
US$60/lb	US$207.4m	64%
US$65/lb	US$243.6m	72%
US$70/lb	US$279.7m	80%
US$75/lb	US$315.9m	88%

Cautionary statement: The results of the Dewey Burdock Project PEA are preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability. The estimated mineral recovery used in the Dewey Burdock Project PEA is based on site-specific laboratory recovery data as well as Azarga Uranium personnel and industry experience at similar facilities. There can be no assurance that recovery at this level will be achieved. There is no certainty that the Dewey Burdock Project PEA will be realized.

Updated Mineral Resource Estimate – 3 December 2019[1]

Dewey Burdock Project ISR Mineral Resource Estimate

	Measured Resources	Indicated Resources	Inferred Resources

			Measured plus Indicated Resources	
Tons	5,419,779	1,968,443	7,388,222	645,546
Average grade (% U_3O_8)	0.132	0.072	0.116	0.055
Average thickness (feet)	5.56	5.74	5.65	5.87
Average grade-thickness ("GT")	0.733	0.413	0.655	0.324
Uranium (pounds)	14,285,988	2,836,159	17,122,147	712,624

1. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

In addition to the ISR mineral resource estimate, the NI 43-101 resource estimate includes a non-ISR (located above the water table) resource estimate containing Measured resources of 857,186 pounds at 0.060% U_3O_8, Indicated resources of 407,851 pounds at 0.053% U_3O_8 and inferred resources of 114,858 pounds at 0.051% U_3O_8. These resources are not included in the ISR resources presented in the table above and are not included in the economic analysis for the Dewey Burdock Project PEA.

Both the ISR and non-ISR resources were determined using the GT contour method and met the following criteria:

1. 02 percent grade cutoff;
2. Occur within the same mineral horizon (roll front);
3. Fall within the 0.20 GT contour; and
4. Extend no farther from the drill hole than the radius of influence specified for each category, i.e., measured, indicated or inferred.

For the purpose of the PEA, the uranium recovery is estimated at 80% for all categories of ISR resources. Therefore, life of mine U_3O_8 production is estimated to be 14.3 million pounds.

The Dewey Burdock Project PEA has been prepared in accordance with the requirements of NI 43-101 and was prepared by TREC, Inc. ("TREC"), Douglass Graves, P.E., a qualified person ("QP") as defined under NI 43-101, and Roughstock Mining Services ("Roughstock"), Steve Cutler, P.G., QP. The full technical report and PEA will be filed on SEDAR at www.sedar.com and Azarga Uranium's website www.azargauranium.com within 45 days of the issuance of this news release.

Project Description

The Dewey Burdock Project is an advanced-stage uranium project located in South Dakota, USA. The Company has received its Nuclear Regulatory Commission ("NRC") License, which has one remaining contention outstanding, and its draft Class III and Class V Underground Injection Control permits from the Environmental Protection Agency. The Company looks forward to the Atomic Safety and Licensing Board decision on the final remaining NRC License contention for the Dewey Burdock Project, which is now expected on 16 December 2019.

The Dewey Burdock uranium mineralization is comprised of "roll-front" type uranium mineralization hosted in several sandstone stratigraphic horizons that are hydro-geologically isolated and therefore amenable to ISR mining methods. The Dewey Burdock Project is located in a region where ISR projects have been and are operated successfully. The ISR mining method has been proven effective in geologic formations near the Dewey Burdock Project in Wyoming and Nebraska.

The Dewey Burdock Project consists of two resource areas: the Burdock resource area and the Dewey resource area. The central processing plant ("CPP") for the Dewey Burdock Project will be located at the Burdock resource. A satellite facility will be constructed at the Dewey resource area.

The Dewey Burdock Project PEA contemplates a phased development approach. The Burdock CPP will be constructed to initially accept a flow rate of up to 1,000 gallons per minute ("GPM") of lixiviant solution. Capacity will gradually be expanded to accept a flow rate of 4,000 GPM of lixiviant solution.

Similarly, ion exchange ("IX") capacity will gradually be increased. During the first few years of operation, resin will be transferred from IX vessels to resin trailers to be transported and processed at an off-site processing facility. Once the CPP flow rate capacity has reached 4,000 GPM, the Burdock CPP will be expanded to include processing capabilities for approximately one million pounds per annum of U_3O_8.

First production occurs after year one of construction, with approximately 126,000 pounds of U_3O_8 being produced. The production ramp-up continues until reaching a steady-state production level of approximately 1 million pounds of U_3O_8 two years later, in the third year after construction commences. Restoration and surface reclamation will also be implemented concurrently with production and will continue approximately four years beyond the production period. The overall mine life will be approximately 21 years from initiating construction to completing decommissioning.

Data Verification

An overall assessment of the data used for the classification of resources into various categories is required by the CIM Definition Standards. This assessment showed that historical data gathering and interpretation of the data was conducted by a well-respected, major uranium exploration company with high-quality uranium exploration staff. It also showed that at key points, professional geologic consultants reviewed and verified the results of the historic exploration programs. Numerous academic reports have also been published on geologic settings and uranium mineralization of the Dewey Burdock Project.

Interpretive geologic evaluation has also been completed under the direction of the Company's senior geologic staff. All these factors provide a high level of confidence in the geological information available on the mineral deposit and that historic drillhole data on the Dewey Burdock Project is accurate and useable for continued evaluation of the project.

The QP (Mr. Cutler) notes that the drilling conducted by Azarga Uranium has verified the location and grade of uranium mineralization in the updated resource estimate. There are no known discrepancies in locations, depths, thicknesses, or grades that would render the project data questionable. The QP has adequately verified the historical data for the Dewey Burdock project. The QP has reviewed the data confirmation procedures and concludes that the drillhole database has been sufficiently verified and is adequate for use in resource estimation. The QP concludes the work done by Azarga Uranium to verify the historical records has validated the project information in the updated resource estimate.

Qualified Person

The disclosure of a scientific and technical nature contained in this press release was approved by Douglass Graves, P.E. and Steve Cutler, P.G., qualified persons as that term is defined under NI 43-101.

About Azarga Uranium Corp.

Uranium is an integrated uranium exploration and development company that controls ten uranium projects and prospects in the United States of America ("USA") (South Dakota, Wyoming, Utah and Colorado), with a primary focus of developing in-situ recovery uranium projects. The Dewey Burdock in-situ recovery uranium project in South Dakota, USA (the "Dewey Burdock Project"), which is the Company's initial development priority, has received its Nuclear Regulatory Commission License and draft Class III and Class V Underground Injection Control ("UIC") permits from the Environmental Protection Agency (the "EPA") and the Company is in the process of completing other major regulatory permit approvals necessary for the construction of the Dewey Burdock Project, including the final Class III and Class V UIC permits from the EPA.

For more information please visit www.azargauranium.com.

Follow us on Twitter at @AzargaUranium.

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Disclaimer for Forward-Looking Information

Certain information and statements in this news release may be considered forward-looking information or forward-looking statements for purposes of applicable securities laws (collectively, "forward-looking statements"), which reflect the expectations of management regarding its disclosure and amendments thereto. Forward-looking statements consist of information or statements that are not purely historical, including any information or statements regarding beliefs, plans, expectations or intentions regarding the future. Such information or statements may include, but are not limited to, statements with respect to the Company's Dewey Burdock Project PEA, the future financial or operating performance of the Company and its mineral projects, including the Dewey Burdock Project, the estimation of mineral resources, the timing and amount of estimated future production and capital, operating and exploration expenditures, the Company looking forward to the Atomic Safety and Licensing Board decision on the final remaining Nuclear Regulatory Commission License contention for the Dewey Burdock Project, which is now expected on 16 December 2019 and Azarga Uranium's continued efforts to obtain all major regulatory permit approvals necessary for the construction of the Dewey Burdock Project, including the final Class III and Class V UIC permits from the EPA. Such statements are subject to risks and uncertainties that may cause actual results, performance or developments to differ materially from those contained in the statements. No assurance can be given that any of the events anticipated by the forward-looking statements will occur or, if they do occur, what benefits Azarga Uranium will obtain from them. These forward-looking statements reflect management's current views and are based on certain expectations, estimates and assumptions, which may prove to be incorrect. A number of risks and uncertainties could cause actual results to differ materially from those expressed or implied by the forward-looking statements, including without limitation: the risk that the Dewey Burdock Project is not constructed and the estimated economics of the PEA are not realized, the risk that the estimated economics contained in the PEA do not reflect actual project economics, the risk that the Atomic Safety and Licensing Board decision on the final remaining Nuclear Regulatory Commission License contention for the Dewey Burdock Project is delayed beyond 16 December 2019, or is not favorable,

the risk that Azarga Uranium does not obtain all major regulatory permit approvals necessary for construction of the Dewey Burdock Project, including the final Class III and Class V UIC permits from the EPA, the risk that such statements may prove to be inaccurate and other factors beyond the Company's control. These forward-looking statements are made as of the date of this news release and, except as required by applicable securities laws, Azarga Uranium assumes no obligation to update these forward-looking statements, or to update the reasons why actual results differed from those projected in the forward-looking statements. Additional information about these and other assumptions, risks and uncertainties are set out in the "Risks and Uncertainties" section in the most recent AIF filed with Canadian security regulators.

The TSX has not reviewed and does not accept responsibility for the adequacy or accuracy of the content of this News Release.

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There are a number of issues with the EPA's "Draft Revised Environmental Justice Analysis for the Proposed UIC Permitting Actions for the Dewey-Burdock Uranium In-Situ Recovery Project in the Southern Black Hills Region of South Dakota" document.

In this document, the EPA describes the adjusted EJ Study Area from 2017 to 2019 thus:

"The EPA's 2017 draft EJ analysis included a Study Area comprised of a 20-mile buffer zone measured from the approximate Dewey-Burdock Project Area Boundary. The EPA conducted a preliminary EJ screening process of the Study Area based upon demographic and environmental indicators, as well as a more targeted preliminary screening of an area comprised of a 5-mile radius around Edgemont, South Dakota, which lies within the Study Area. Based on the preliminary screening processes and additional evaluation, the EPA Region 8 considers the City of Edgemont, South Dakota to be a potentially overburdened community.

This revised EJ analysis expands the geographic scope of the draft EJ analysis to include the Black Hills as a sacred site to many Tribal Nations and Tribal members. The revised analysis includes information on the Black Hills that the EPA received during Tribal consultation discussions as well as the public participation processes and describes historic and current information on mining activities in the Black Hills. Based on this information, the EPA proposes to identify Tribal Nations and Tribal members with interests in the Black Hills as a sacred site as potentially overburdened populations" (47).

The EPA states that following from public comments received in 2017, they have adjusted their analysis in two ways:

"(1) the geographic scope of the analysis is expanded to include the Black Hills which, in its entirety, extends far beyond 20 miles from the proposed project area; and (2) although the formal Indian Reservations of potentially affected Indian tribes are located well beyond the 20-mile radius, this revised analysis considers tribal interests in the Black Hills regardless of where the majority of tribal members may reside" (31).

Beginning on p. 33, the EPA discusses contamination issues resulting from historic mining in the Black Hills.

Later, the EPA cites a 2018 NRC-contracted literature review "of existing information about historic, cultural, and religious resources of significance to Tribes for purposes of its National Environmental Policy Act analysis for the Dewey-Burdock project. The Report includes Information on the historical and present-day significance of the Black Hills to many Tribes" (41).

The EPA also refers to the treaty history relevant to the Dewey-Burdock area, citing the 1851 and 1868 Fort Laramie treaties and the 1980 Supreme Court decision.

The EPA largely sidesteps both treaty and cultural issues thus:

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"The EPA is aware of the Sioux Nation's continued claim to the lands subject to the Fort Laramie Treaty of 1868, the Supreme Court's ruling cited above, as well as the longstanding treaty disputes between Native American tribes and the United States. In its role as a regulatory agency, the EPA lacks the authority to resolve these disputes" (31).

"The Black Hills is a sacred site to many Tribal Nations and Tribal members. Tribal Nations and Tribal members describe impact by historic and present-day mining activities in the Black Hills not only with regard to environmental and other impacts to physical resources, but also based their interests in the preservation of the area for spiritual, religious and cultural purposes. While recognizing these interests, the EPA's authorities to address potential impacts from its SDWA actions are limited to the protection of underground sources of drinking water. More specifically, the EPA may regulate to protect groundwater that supplies or can reasonably be expected to supply any public water system from any contaminant that may be present as a result of underground injection activities. SDWA § 1421(d)(2); see also 40 C.F.R. §144.12(a). The purpose of the UIC regulations is to prevent the movement of fluids containing contaminants into USDWs if the presence of those contaminants may cause a violation of a primary drinking water regulation or otherwise adversely affect human health. See 40 C.F.R. § 144.12(a)." (43).

The deficiencies of this analysis include, but are not limited to:

1. **EPA's reliance on the NRC's cultural resources analysis**. The EPA should not use any aspect of the NRC's cultural resources analysis, given that the NRC process is currently tied up in legal proceedings with the Oglala Sioux Tribe over Powertech's controversial analysis of groundwater impacts, waste disposal sites, mitigation measures, and cultural resources. In particular, the US Court of Appeals for the District of Columbia ruled in 2018 that the NRC staff has failed to properly identify and consider impacts to cultural resources related to the proposed Dewey-Burdock project, per the National Environmental Policy Act. Citing the 2018 NRC-contracted literature review to discuss cultural matters related to the Dewey-Burdock site is thus inappropriate.

2. **Separation of treaty/legal and cultural issues from technical/scientific issues**. The EPA is appearing to separate treaty issues and the significance of the Black Hills as a sacred site from their technical responsibility to protect underground sources of drinking water. However, the EPA must consider potential adverse impacts to human health from a cultural perspective as well as from a technical/scientific perspective, and the EPA must remember that per Article 6 of the US Constitution, treaties remain the supreme law of the land. The EPA cannot separate scientific and technical questions from cultural and legal questions. And the impacts from historic mining in the Black Hills region, detailed in section 7.4 of the Draft Revised Environmental Justice Analysis, must be meaningfully considered, not simply acknowledged and dismissed.

3. **Failure to meaningfully consider potential impacts to Oglala Sioux Tribal lands, especially given impacts of historic mining activities**. Given that the proposed Dewey-Burdock site is

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up gradient from the Pine Ridge Indian Reservation, and given that the proposed Dewey-Burdock site sits very near to the Cheyenne River, which flows along the northwestern boundary of the Pine Ridge Indian Reservation, specific impacts to Oglala Sioux Tribal lands and communities must be considered. The EPA says it has expanded the geographic scope of its EJ analysis since 2017, but it still does not take into account potential impacts to reservation communities, in particular those communities which have been proven detrimentally impacted by mining activities in the past, including Red Shirt and communities along the White River.[1] In relation to potential impacts to Oglala Sioux Tribal lands and communities, the following must be meaningfully considered:

a. Crow Butte ISL operation near Crawford, NE[2]
b. 1962 tailings spill in Edgemont, SD
c. Historic uranium mining in the greater southern Black Hills area[3]
d. Oil and gas operations in Converse County, Wyoming[4]
e. Historic and ongoing uranium mining operations in Wyoming headwaters region, including the first low pH (acid) ISL uranium operation in the US, Peninsula/Strata's Ross Project[5]
f. Wastewater disposal by the City of Edgemont into the Cheyenne River, which involved effluent violations of pH in 2015 and 2016[6]

4. **Impacts related to waste disposal plan at White Mesa**. In both the 2017 and 2019 versions of the Draft Environmental Justice Analysis, the EPA considers the addition of Dewey-Burdock waste material to the White Mesa Mill to be "not significant." Numerous issues have been documented in relation to the White Mesa Mill, including transportation incidents[7] [8], questionable remaining storage capacity as companies increase the amount of waste material sent to the Mill[9], and groundwater contamination. Given these issues, and given the proximity of the Mill to the Ute Mountain Ute White Mesa community, the impacts of sending Dewey-Burdock waste material to White Mesa merit further consideration by the EPA.

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[1] Women of All Red Nations. "Radiation: Dangerous to Pine Ridge Women." Akwesasne Notes, Mohawk Nation via Rooseveltown, NY. Spring, 1980; LaDuke, Winona, and Ward Churchill. 1985. "Native America: The Political Economy of Radioactive Colonialism." *Journal of Ethnic Studies* 13 (3): 107–32.
[2] See Appendix A for list of license violations and reportable events at Crow Butte.
[3] Sharma, Rohit K., Keith D. Putirka, and James J. Stone. 2016. "Stream Sediment Geochemistry of the Upper Cheyenne River Watershed within the Abandoned Uranium Mining Region of the Southern Black Hills, South Dakota, USA." *Environmental Earth Sciences* 75 (9): 823.
[4] See Appendix B, Oglala Sioux Tribe Resolution No. 18-55XB.
[5] For particular impacts resulting from low pH ISL uranium operations elsewhere in the world, see Mudd, G. M. 2000. "Acid In Situ Leach Uranium Mining: 1 - USA and Australia." Tailings & Mine Waste: 517-526 and Mudd, G. M. 1998. "An Environmental Critique of In Situ Leach Mining: The Case Against Uranium Solution Mining." A Research Report for Friends of the Earth (Fitzroy) with The Australian Conservation Foundation.
[6] See Appendix C, Statement of Basis for the City of Edgemont's Surface Water Discharge Permit.
[7] See Appendix D for documentation of transportation incident at White Mesa Mill.
[8] See Appendix E for documentation of barium sulfate sludge spill near entrance of White Mesa Mill.
[9] See Appendix F for documentation of Energy Fuels Resources request to dispose of more ISL material at White Mesa.

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Issues with the Draft Environmental Justice Analysis are closely related to the EPA's Draft Cumulative Effects Analysis, and thus if the aforementioned concerns do not directly apply to matters of Environmental Justice, as the EPA sees it, then they should be relevant to matters of Cumulative Effects.

Appendix A

License Violations and reportable events at Crow Butte ISL uranium mine (Nebraska)[10]

- Aug. 22, 2019: Monitor well excursion
- July 11, 2019: Production well fails 5-year mechanical integrity test
- June 24, 2019: Production well fails 5-year mechanical integrity test
- June 5, 2019: Monitor well excursion
- May 29, 2019: Evaporation Pond 1 liner leak
- May 2, 2019: Monitor well excursion
- Apr. 18, 2019: Monitor well excursion
- Apr. 9, 2019: Monitor well excursion
- Mar. 27, 2019: Monitor well excursion
- Mar. 25, 2019: Monitor well excursion
- Nov. 28, 2018: Monitor well excursion
- June 1, 2018: Monitor well excursion
- Sep. 12, 2017: 27,287 gallon spill of injection solution
- Aug. 29, 2017: Monitor well excursion
- July 27, 2017: Production well fails 5-year mechanical integrity test
- Mar. 14, 2017: Injection well fails 5-year mechanical integrity test
- June 8, 2016: Evaporation Pond 1 liner leak
- May 5, 2016: two Monitor well excursions
- Apr. 21, 2016: Monitor well excursion
- Apr. 20, 2016: Injection well fails 5-year mechanical integrity test
- Nov. 19, 2015: Monitor well excursion
- Oct. 27, 2015: Monitor well excursion
- Aug. 17, 2015: Injection well fails 5-year mechanical integrity test
- Aug. 13,2015: Monitor well excursion
- July 9, 2015: Monitor well excursion
- July 2, 2015: Injection well fails 5-year mechanical integrity test
- June 3, 2015: Monitor well excursion
- May 28, 2015: Monitor well excursion
- May 27, 2015: Monitor well excursion
- May 21, 2015: Monitor well excursions
- May 19, 2015: Monitor well excursion
- Apr. 14, 2015: Monitor well excursion
- Feb. 11, 2015: Monitor well excursion
- July 22, 2014: Monitor well excursion
- July 2, 2014: Failure to sample the underdrains of a leaking pond and to submit a corrective action plan
- May 20, 2014: Monitor well excursion
- May 8, 2014: Monitor well excursion
- May 7, 2014: Evaporation Pond 1 liner leak
- Dec. 10, 2013: Monitor well excursion
- Sep. 11, 2013: Monitor well excursion
- Aug. 22, 2013: Well fails 5-year mechanical integrity test
- Aug. 6, 2013: Well fails 15-year mechanical integrity test
- Jun. 5, 2013: Radiation dose in unrestricted area exceeds 0.02 mSv/h standard

[10] Downloaded 5 December 2019 from https://www.wise-uranium.org/umopusa.html#NE.

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- Mar. 14, 2013: Evaporation Pond 1 liner leak
- Jan. 18, 2013: Well fails mechanical integrity test
- Oct. 24, 2012: Well fails 20-year mechanical integrity test
- Aug. 20, 2012: Well fails 5-year mechanical integrity test
- June 4, 2012: Well fails 5-year mechanical integrity test
- May 25, 2012: Monitor well fails 15-year mechanical integrity test
- Oct. 7, 2011: Monitor well excursion
- Aug. 9, 2011: Exceedance of Well Head Manifold Pressure Limitations
- July 18, 2011: two wells fail 5-year mechanical integrity test
- June 1, 2011: Evaporation Pond 1 liner leak
- May 27, 2011: two Monitor well excursions
- May 24, 2011: Monitor well excursion
- Mar. 16, 2011: Monitor well excursion
- Jan. 13, 2011: Monitor well excursion
- July 8, 2010: Monitor well excursion
- July 6, 2010: Well fails 5-year mechanical integrity test
- June 22, 2010: Excursions at two monitor wells "due to increased groundwater levels"
- June 22, 2010: Monitor well excursion
- June 16, 2010: Excursions at three monitor wells "due to increased groundwater levels"
- June 11, 2010: Evaporation Pond 3 liner leak detected
- May 10, 2010: Well fails 5-year mechanical integrity test
- Apr. 13, 2010: Excursion at monitor well due to "natural conditions"
- Dec. 31, 2009: Evaporation Pond 4 Liner Leak
- Nov. 19, 2009: Well fails 15-year mechanical integrity test
- Oct. 15, 2009: Mechanical integrity test missed for two wells
- June 18, 2009: Evaporation Pond 4 liner leak detected
- June 11, 2009: Monitor well excursion
- June 5, 2009: Evaporation Pond 1 liner leak detected
- April 27, 2009: Monitor well placed on excursion status
- April 17, 2009: Production well fails 5-year mechanical integrity test
- June 4, 2008: Exceedance of Well Head Manifold Pressure Limitations
- May 31, 2008: Monitor well placed on excursion status
- May 23, 2008: $50,000 penalty imposed for violations
- May 19, 2008: Monitor well placed on excursion status
- April 29, 2008: Five-year mechanical integrity test missed for 42 wells
- September 26, 2006: Monitor well placed on excursion status
- May 5, 2006: leak detected at Pond 4
- January 19, 2006: Monitor well placed on excursion status
- October 27, 2005: Injection well leak detected
- August 4, 2005: Monitor well placed on excursion status
- June 28, 2005: Monitor well placed on excursion status
- June 17, 2005: Monitor well placed on excursion status
- May 2, 2005: Monitor well placed on excursion status
- May 14, 2004: leak detected at Pond 1
- December 23, 2003: Monitor well placed on excursion status
- December 26, 2002: Monitor well placed on excursion status
- September 10, 2002: Monitor well placed on excursion status
- April 4, 2002: Monitor well placed on excursion status

- December 4, 2001: Monitor well placed on excursion status
- March 2, 2001: Monitor well placed on excursion status
- September 10, 2000: Monitor well placed on excursion status
- May 26, 2000: Monitor well placed on excursion status
- April 27, 2000: Monitor well placed on excursion status
- March 6, 2000: Monitor well placed on excursion status
- July 2, 1999: Monitor well placed on excursion status
- August 7, 1998: Spill of 10,260 gallons of injection fluid
- March 21, 1998: Monitor well placed on excursion status
- August 12, 1997: Discovery of Pinhole Leaks in Upper Liner of Process Water Evaporation Pond

(details on post-Nov.1,1999, events available through ADAMS, Docket No. 04008943)

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Appendix B

RESOLUTION NO. 18-55XB

RESOLUTION OF THE EXECUTIVE COMMITTEE
OF THE OGLALA SIOUX TRIBE
(An Unincorporated Tribe)

RESOLUTION OF THE EXECUTIVE COMMITTEE OF THE OGLALA SIOUX TRIBE REQUESTING GOVERNMENT-TO-GOVERNMENT CONSULTATIONS WITH THE UNITED STATES BUREAU OF LAND MANAGEMENT AND THE UNITED STATES FISH AND WILDLIFE SERVICE ON THE FINDINGS OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE CONVERSE COUNTY (WYOMING) OIL AND GAS PROJECT.

OST authority to protect its tribal trust property

WHEREAS, the Oglala Band of the Teton Sioux is a sovereign band of Indians with attendant powers that reorganized the "Oglala Sioux Tribe of the Pine Ridge Indian Reservation" ("OST") by adopting the benefits of the Indian Reorganization Act ("IRA") of June 18, 1934, (25 U.S.C. § 5101 *et seq.)*, and a Constitution and Bylaws under Section 16 of the Act, (25 U.S.C § 5123), and

WHEREAS, Article III, Section 1 of the Tribal Constitution provides that the governing body of the Oglala Sioux Tribe is the "Oglala Sioux Tribal Council," and

WHEREAS, the Tribal Constitution empowers the Tribal Council to:

1. "To negotiate with the Federal, State, and local governments, on behalf of the tribe, and to advise the representatives of the Interior Department on all activities of the Department that may affect the Pine Ridge Indian Reservation" under Article IV, Section 1 (a);

2. To protect and preserve the property, wild life and natural resources - gases, oil, and other materials, etc. - of the tribe . . ." under Article IV, Section 1 (m); and

3. "To adopt laws protecting and promoting the health and general welfare of the Oglala Sioux Tribe and its membership" under Article IV, Section 1 (w), and

The 1825, 1851 and 1868 Treaties

WHEREAS, the OST enjoys all of the rights and privileges guaranteed under its existing treaties with the United States in accordance with (25 U.S.C. § 71) and (25 U.S.C. § 5128), including rights and privileges under the Treaty of July 5, 1825 with the Sioune and Oglala Tribes (7 Stat. 252), the Fort Laramie Treaty of September 17, 1851 (11 Stat. 749), and the Fort Laramie Treaty of April 29, 1868 (15 Stat. 635), and

WHEREAS, the following 1825 Treaty provisions are pertinent and are directly applicable to the Draft Environmental Impact Statement ("Draft EIS") for the Converse County (Wyoming) Oil and Gas Project:

1. Article 2 of the 1825 Treaty, which provided that the OST agreed that it "reside[d] within the territorial limits of the United and . . . claim[ed] their protection", and

2. The Article 3 of the 1825 Treaty, which provided that the United States "agreed to bring the OST "under their protection . . . . ..", and

3. Under Articles 2 and 3 of the 1825 Treaty, the OST became a protectorate nation of the United States and established the initial *government-to-government and trust* relationship between the OST and the United States, and

WHEREAS, since the ratification of the 1825 Treaty, the trust relationship between the United States and OST (and other Indian tribes) has been continuously recognized by U.S. Presidents and the U.S. Congress as follows:

1. In President Clinton's Executive Order 13175 of November 6, 2000 (Consultation and Coordination With Tribal Governments), which provides in Sections 2 (a) that the "Federal Government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with Indian tribes . . . ." and in Section 3 (a) that "[a]gencies shall respect Indian tribal self-government and sovereignty, honor tribal treaty and other rights, and strive to meet the responsibilities that arise from the unique legal relationship between the Federal government and Indian tribal governments";

2. In Acts of Congress, including the Mni Wiconi Act of October 24, 1988, P.L. 100-516, 102 Stat. 2566, which acknowledged in Section 2. (a) (4) that "the United States has a trust responsibility to ensure that adequate and safe water supplies are available to meet the economic, environmental, water supply and public needs of the Pine Ridge Indian Reservation"; and

3. In federal court decisions, including *Blue Legs v. U.S. Bureau of Indian Affairs*, 867 F.2d ,1094, 1100 (8th Cir. 1989) ("*[t]he existence of a trust duty between the United States and an Indian or* Indian tribe *can be inferred from the provisions of a statute, treaty or other agreement, reinforced by the undisputed existence of a general trust relationship between the United States and the Indian people"); and Covelo Indian Community v. FERC*, 895 F.2d 581 (9th Cir. 1990) (all government agencies have

"fiduciary" responsibilities to tribes, and must always act in the interests of the beneficiaries), and

WHEREAS, Article 5 of the 1851 Treaty is pertinent and directly applicable to the Draft Environmental Impact Statement ("EIS") for the Converse County Oil and Gas Project as follows:

1. Article 5 described and acknowledged the ownership of the OST and other Teton Sioux and Yankton Sioux signatory tribes to a 60 million acre tract of territory, and fishing and travel rights, described as follows:

   The aforesaid Indian nations do hereby recognize and acknowledge the following tracts of country, included within the metes and boundaries hereinafter designated, as their respective territories, viz: The territory of the Sioux or Dahcotah Nation, commencing the mouth of the White Earth River, on the Missouri River: thence in a southwesterly direction to the forks of the Platte River: thence up the north fork of the Platte River to a point known as the Red Bute, or where the road leaves the river; thence along the range of mountains known as the Black Hills, to the head-waters of Heart River; thence down Heart River to its mouth; and thence down the Missouri River to the place of beginning. * * * *It is, however, understood that, in making this recognition and acknowledgement, the aforesaid Indian nations* do not hereby abandon or prejudice any rights or claims they may have to other lands; and further, that *they do not surrender the privilege of . . . fishing or passing over any of the tracts of country heretofore described.*

2. All of Converse County, Wyoming, north of the North Platte River is located within the 1851 Sioux Treaty territory;

3. The "Sioux or Dahcotah Nation" with which the United States negotiated at Fort Laramie and in which title was recognized by the Treaty of September 17, 1851, included the Teton and Yankton divisions of Sioux, see *Sioux Nation v. United States*, 24 Ind. Cl. Comm. 147 (1970); and

4. The OST is one of seven Teton Sioux bands that are parties to the 1851 Treaty, and therefore has existing, unextinguished water and fishing rights within Converse County; and

5. Water rights, fishing rights and access rights, and the right to exercise such rights (among other rights) over property are classified as "usufructuary rights," but such OST's rights under the 1851 Treaty in Converse County, Wyoming should not be construed as an abandonment of the OST's underlying claims to

the 1851 Treaty territory in Wyoming as asserted and claimed by the OST in Indian Claim Commission Docket 74, and as articulated in part by Judge Newman's dissenting opinion in *Oglala Sioux Tribe and Rosebud Sioux Tribe v. United States*, 862 F2d 275 ([Fed. Cir. 1988), and

WHEREAS, Article 2 of the 1868 Treaty is also pertinent and directly applicable to the Draft Environmental Impact Statement ("EIS") for the Converse County Oil and Gas Project as follows:

1. Article 2 established the Great Sioux Reservation in western South Dakota; and

2. The Pine Ridge was carved out of the Great Sioux Reservation by Section 1 of the Act of March 2, 1889, 25 Stat. 888; and

3. The Cheyenne River also abuts the Pine Ridge Indian Reservation and so the middle channel of the river where it abuts the reservation is located within the boundaries of the reservation.

OST water and fishing rights in Converse County, Wyoming

WHEREAS, the OST has rights (along with other 1851 Treaty signatory Sioux tribes) in the territory constituting Converse County, Wyoming, including but are not limited to, the following:

1. Existing, unquantified OST aboriginal water rights in the Cheyenne River that traverses Converse County, Wyoming from its headwaters to the South Dakota state line (and includes the interconnecting ground water system that supplies water to the river) based on exclusive use and occupation of the 1851 Treaty territory "for a long time," see, e.g., *Turtle Mountain Band v. United States*, 23 Ind. Cl. Comm. 315 (1970) (exclusive use and occupation "for a long time" by a tribe is sufficient to give aboriginal title);

2. Existing unquantified OST Winters Doctrine water rights in the Cheyenne River, which abuts the Pine Ridge Indian Reservation, to fulfill the present and future water needs of the reservation under the doctrine, including the right to use such water rights for beneficial uses that includes maintaining wildlife habitat, i.e., fishing rights and irrigation;

3. Existing, unextinguished fishing rights in the Cheyenne River that includes;

   a. A corresponding 1851 Treaty right to maintain the Cheyenne River inhabitable for the OST's fisheries from the

headwaters of the river in Converse County to the South Dakota state line, i.e., water rights that impose a duty on BLM and F&WLS to protect both the OST's water rights and fishing rights from hydraulic fracking contaminates and other contaminates that will negatively impact and/or destroy the fishing rights in the river, see, e.g., *United States v. Adair*, 723 F.2d 1394, 1408-1415 (9th Cir. 1983) (*"Adair II"*), *cert. denied sub nom, Oregon v. United States*, 467 U.S. 1252, 104 S. Ct. 3536, 82 L. Ed. 2d 841 (1984).(off-reservation treaty right to fish implied reservation of water to support tribal fisheries); *Dep't of Ecology v. Yakima Reservation Irrigation Dist.*, 850 P.2d 1306, 1317 (Wash. 1993) (Washington Supreme Court recognized that tribes with treaty language . . . reflecting a reservation of aboriginal rights to fish also have water rights for instream flow habitat protection);

b. A corresponding Winters Doctrine right to maintain the Cheyenne River inhabitable for wildlife, i.e., fishing rights (as well as irrigation) as a beneficial use free from hydraulic fracking contaminates and other contaminates upstream in Converse County that will negatively impact and/or destroy the use of the river for such purpose, see., e.g., *United States v. Alpine Land & Reservoir Co.*, 788 F. Supp. 2d 1209 (D. Nev. 2011) ("the Tribe retains a *Winters* right . . . to water to maintain the fishery"), citing *Nevada v. United States*, 463 U.S. 110 (1983), and

OST on-reservation Cheyenne River water rights and fishing rights

WHEREAS, the OST also has existing unextinguished water rights and fishing rights within the Pine Ridge Indian Reservation under the 1851 and 1868 Treaties, including the portion of the Cheyenne River and river bed that abuts the reservation; that Public Law 280, 25 U.S.C. § 1332 (b), defines the scope of the State of Wyoming's civil authority to regulate the OST's water rights and 1851 Treaty fishing rights in the Cheyenne River from Converse County Wyoming to the South Dakota state line as follows:

(b) Alienation, encumbrance, taxation, and use of property; hunting, trapping or fishing.

Nothing in this section shall authorize the alienation, encumbrance, or taxation of any real or personal property, including water rights, belonging to any Indian tribe . . . that is held in trust by the United States . . .; or shall

> authorize regulation of the use of such property in a manner inconsistent with any Federal treaty . . .; or shall deprive any . . . Indian tribe, band, or community of any right, privilege, or immunity afforded under Federal treaty . . . with respect to. . . fishing or the control, licensing, or regulation thereof, and

WHEREAS, The OST's aboriginal and/or Winters Doctrine water rights in the Cheyenne River includes water rights upstream to Converse County, Wyoming; that the Wyoming State Engineer has no authority to regulate the use of the OST's water rights in the river, or in the ground waters that feed the river, or 1851 Treaty fishing rights that depend on such water right, under 25 U.S.C. § 1332 (b), and

Trust status of OST water rights

WHEREAS, the OST's aboriginal waters rights, Winters Doctrine water rights and unextinguished 1851 Treaty fishing rights, are held in trust by the United States for the OST and other 1851 Treaty tribes and are vested property rights that are protected by the Fifth Amendment to the United States Constitution, See generally, Robert T. Anderson, *Indian Water Rights and the Federal Trust Responsibility*, 46 Nat. Resources J. 399 (2006) ("Indian reserved water rights are trust property with legal title held by the United States"); 55 Fed. Reg. 9223 (Mar. 12, 1990) ("Indian water rights are vested property rights for which the United States has a trust responsibility, with the United States holding legal title to such water in trust for the benefit of the Indians"), and

OST claim to burial sites, human remains, ownership of cultural resources, and access to Sacred Sites in Converse County Wyoming

WHEREAS, the OST has rights (along with other 1851 Treaty signatory Sioux tribes) to human remains and ownership rights to all Native American cultural resources excavated or discovered on:

1. Federal lands (recognized by a final judgment of the Indian Claims Commission or Court of Claims) in Converse County, Wyoming, under the Native American Graves Protection and Repatriation Act of November 16, 1990 (25 U.S.C. §§ 3001 *et seq.*) ("NAGPRA"); that the OST's ownership rights to the said cultural resources is supported by a final judgment of the Indian Claims Commission. See *Sioux Tribe v. United States*, 15 Ind. Cl. Comm. 577 (1965) (the 1851 treaty recognized title in the "Sioux or Dahcotah Nation" to approximately 60 million acres of territory situated east of the Missouri River in what is now the states of North Dakota, South Dakota, Nebraska, Wyoming, and Montana) and *Sioux Nation v. United States*, 24 Ind. Cl. Comm. 147 (1970) (the "Sioux or Dahcotah Nation" with which the United

States negotiated at Fort Laramie and in which title was recognized by the Treaty of September 17, 1851, included the Teton and Yankton divisions of Sioux); and

2. Private lands under the legal principles recognized in *Charrier v. Bell*, 496 So. 2(d) 601 (La. App. 1 Cir. 1986) *cert. denied*, 498 So. 2d 753 (La. 1986) (Tunica-Biloxi Tribe retained ownership of cultural items discovered on privately held lands) and *Black Hills Inst. of Geological Research v. South Dakota Sch. of Mines*, 12 F.3d 737, 742-744 (8th Cir. 1993) (Black Hills III) (Because the [dinosaur] fossil was trust property that was removed from the Indian trust land without the knowledge or consent of the United States, it remained the property of the United States and the attempted sale of the fossil was void and the Institute had no legal right, title, or interest in the fossil as severed from the land), *cert. denied*, 513 U.S. 810 (1994); that cultural items found on private lands in Converse County remain the trust property of the OST and other 1851 Treaty Sioux Tribes, and were not conveyed to the present non-Indian occupants under the Homestead Act or otherwise, and the United States and its agencies, i.e., BLM and F&WLS, continue to have a fiduciary duty to protect them to the same extent as they had a duty to protect the fossil in the *Black Hills Inst. Of Geological Research v. South Dakota School of Mines* case cited above, and

WHEREAS, the U.S. Department of Interior and its agencies, including the BLM and F&WLS are hereby put on notice that the OST claims (along with other 1851 Treaty signatory Sioux tribes) all Native American burial sites and human remains, and an ownership interest in all cultural items, associated funerary objects, unassociated funerary objects, sacred objects, cultural patrimony, including stone features, i.e., stone rings, stone effigies, stone alignments, and rock cairns located on federally held lands in Converse County under NAGPRA, and a right of access to sacred sites located on federally held lands within Converse County, under the American Indian Religious Freedom Act ("AIRFA"), 42 U.S.C. § 1996, and

WHEREAS, the U.S. Department of Interior and its agencies are further put on notice that the OST claims (along with other 1851 Treaty signatory Sioux tribes) all Native American burial sites and human remains, and an ownership interest in all cultural items, associated funerary objects, unassociated funerary objects, sacred objects, cultural patrimony, including stone features, i.e., stone rings, stone effigies, stone alignments, and rock cairns located on privately held lands in Converse County under the legal principles recognized in the *Charrier v. Bell* and *Black Hills Inst. of Geological Research v. South Dakota School of Mines* cases cited above, and that the OST regards such

items located on privately held lands to be its trust property for which the United States and its agencies have a fiduciary duty to protect, and

Necessity for water quality to protect OST off-reservation and on-reservation water and fishing rights

WHEREAS, the Draft EIS indicates that five oil and gas developers, i.e., Anadarko Petroleum Company, Chesapeake Energy Corporation, Devon Energy, EOG Resources, Inc., and SM Energy, have proposed (under Preferred Alternative "B") to develop 5,000 oil wells on 1,500 new well pads, plus an additional 455 pads for production, for water source wells and for water disposal wells on 1.5 million acres in Converse County, all of which will directly and negatively impact the air quality, water quality, cultural resources, and tribal off-reservation and on-reservation water rights and fishing rights; that water quantity and quality (free from hydraulic fracking) is essential to maintain the Tribe's 1851 Treaty fishing rights in rivers and streams in the 1851 Treaty territory as well as fishing rights. irrigation rights, and other beneficial uses, in the Cheyenne River which originates in Converse County and abuts the Pine Ridge Indian Reservation downstream. See, e.g., *Hopi Tribe v. U.S.*, 782 F.3d 662, 669 (Fed. Cir. 2015) (In some circumstances, [the Winters Doctrine] may also give the United States the power to enjoin others from practices that reduce the quality of water feeding the reservation); Judith V. Royster, *Water Quality And The Winters Doctrine*, 107 Water Resources Update 50 (1997), http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1291&context=jcwre (A tribe may receive the quantity of water called for under its Winters rights, but the quality of the water may make it unusable for the purposes for which it was intended . . . * * * If the water provided at the reservation border is so degraded that it cannot be used for irrigation, then the water right is essentially meaningless), and

Rights to Government-to-Government and NHPA Section 106 consultations under federal and tribal law

WHEREAS, neither the BLM nor the F&WLS have engaged in government-to-government consultations with the Oglala Sioux Tribe on the Draft EIS in the manner required by federal and tribal law as follows:

1. Congress, through the 1992 amendments to the National Historic Preservation Act of 1966 ("NHPA"), passed Section 101 (d)(2)(A) that established *Tribal Historic Preservation Officers* (THPOs) on reservations to assume State Historic Preservation Officers (SHPOs) responsibilities within federally recognized reservation boundaries; and to provide THPOs authority to "regulate" Federal undertakings through consultation on any Section 106 activity *within their respective reservation boundaries on tribal lands.*

2. The main purpose of the 1992 amendments to NHPA was lobbied by the leadership of tribal governments to allow *Indian Tribes* to identify areas and places, cultural resources and sacred areas significant to the Indian Tribe's heritage and cultural identity with Congress; this process was the foundation to require government-to-government consultation with said Indian Tribes outside reservation boundaries.

3. Because of these lobbying efforts, Congress also amended the NHPA in 1992 creating a new section *in the act* (referenced in 36 CFR 800.2 (c) (ii) which stated in part that:

   "Section 101 (d) (6) (B) of the act requires the agency official to consult with any Indian tribe . . . that attaches religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location of the historic property."

4. 36 CFR 800.2 (c) (ii) (C) of the NHPA created the government-to-government consultation requirement with Indian tribes as follows:
   Consultation with an Indian tribe must recognize the government-to-government relationship between the Federal Government and Indian tribes. The agency official shall consult with representatives designated or identified by the tribal government . . . . Consultation with Indian tribes …should be conducted in a manner sensitive to the concerns and needs of the Indian tribe. The Indian tribe has to designate or identify by resolution the official tribal governmental leader(s) to consult with Federal and non-federal agencies, individuals or private industry outside reservation boundaries when that respective tribal government attaches religious and cultural significance to historic properties to areas or resources significant to them.

5. On November 6, 2000, President Clinton issued Executive Order 13175, which required federal departments and agencies to consult with Indian tribal governments when considering policies that would impact tribal communities and reiterated the federal government's previously acknowledged commitment to tribal self-government and limited autonomy; that President Osama thereafter issued a Memorandum issued on November 5, 2009 to fully implement Executive Order 13175; and that Executive Order No. 13175 is applicable to the OST's request for the government-to-government consultations on the Draft EIS for the Converse County Oil and Gas Project.

6. In 2011, the Oglala Sioux Tribal Council passed Ordinance No. 11-10 which defined the procedures that federal agencies must comply with to constitute a NHPA Section 106 consultation or a government-to-government consultation with the OST; that Section 7.a. of Ordinance No. 11-10 provides that all consultations between the OST and federal agencies must "*occur through a formal meeting with the Oglala Sioux Tribal Council,*" and

WHEREAS, the Oglala Sioux Tribal Council has never been consulted with by BLM or F&WLS on the Draft EIS under NHPA Section 106, or under Executive Order No. 13175 as implemented by President Osama's November 5, 2009 memorandum, or under Oglala Sioux Tribal Council Ordinance No. 11-10, and

WHEREAS, the BLM and F&WLS are hereby put on notice that the meeting between the BLM and THPOs that was held at the BLM office at Casper, Wyoming on February 20-21, 2018, did not constitute a NHPA Section 106 consultation, an Executive Order 13175 government-to-government consultation or a OST Tribal Council Ordinance No. 11-10 consultation, between the BLM and the OST on the Draft EIS, and

WHEREAS, official consultations on the Draft EIS must still be held between BLM, the F&WLS and the Oglala Sioux Tribal Sioux Tribal Council to comply with NHPA Section 106 and Oglala Sioux Tribal Council Ordinance No. 11-10.

Lack of NEPA Public Scoping Meetings on Pine Ridge Indian Reservation on Draft EIS

WHEREAS, neither BLM or F&WLS have held any NEPA scoping meetings on the Pine Ridge Indian Reservation and surrounding non-Indian communities that will be impacted by the Draft EIS for the Converse County Oil and Gas Project, as required by 43 CFR §§ 46.235 (a) and 46.235 (b), and

Protection of tribal water right, fishing rights, cultural resources and Sacred Sites under UNDRIP

WHEREAS, the also OST also notes, and brings to BLM's attention, the following articles contained in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), adopted by the General Assembly on Thursday, 13 September 2007, and supported by the December 6, 2010, declaration of President Obama:

> Article 11: Indigenous peoples have the right to practice and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites . . . .

Article 12: Indigenous peoples have the right to manifest, practice, develop and teach their spiritual and religious traditions, customs and ceremonies; the right to maintain, protect, and have access in privacy to their religious and cultural sites; the right to the use and control of their ceremonial objects; and the right to the repatriation of their human remains. 2. States shall seek to enable the access and/or repatriation of ceremonial objects and human remains in their possession through fair, transparent and effective mechanisms developed in conjunction with indigenous peoples concerned.

Article 19: States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing . . . *administrative* measures that may affect them.

Article 25: Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters . . . and other resources and to uphold their responsibilities to future generations in this regard.

Article 29: Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources.

Article 32: States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources; now

THEREFORE BE IT RESOLVED, that the OST hereby petitions and requests BLM (through Mike Robinson, Planning and Environmental Coordinator/Project Manager of the Casper Field Office) and the F&WLS to enter into NHPA Section 106, Executive Order No. 13175 and Oglala Sioux Tribal Ordinance No. 11-10 consultations with the Oglala Sioux Tribal Council on the Draft EIS for the Converse County Oil and Gas Project for the aforesaid reasons, and for other reasons to be brought up and discussed and resolved during the consultations, and

BE IT FURTHER RESOLVED, the consultations with the BLM and F&WLS requested in this resolution (on the Draft EIS for the Converse County Oil and Gas Project) shall be held at Prairie Wind Casino/Hotel

Conference Room on the Pine Ridge Indian Reservation on April 17-18, 2018, and

BE IT FURTHER RESOLVED, that Mike Robinson is hereby directed (as trustee of the OST) to personally participate in the consultations, and to notify the appropriate officials of the F&WLS of the Tribe's request for them to participate in the consultations requested in this resolution, and

BE IT FURTHER RESOLVED, that because of concerns among tribal members about the adverse impacts caused, or will be caused, from natural gas flaring and hydraulic fracking from the Converse County, Wyoming Oil and Gas Project (which is located approximately 100 miles due west of the Pine Ridge Indian Reservation) on tribal water rights, fishing rights, NAGPRA rights, and on the health, economy and general welfare of the OST and its members, the Tribal President and all Council and Executive Committee members are requested to attend the consultations on the Draft EIS for the Project, and

BE IT FURTHER RESOLVED, that the Tribal President shall send a copy of this Resolution and a copy of Oglala Sioux Tribal Council Ordinance No. 11-10 to Mike Robinson by certified mail, return receipt request, and by fax, as required by Section 7. a. of Ordinance No. 11-10, and

BE IT FURTHER RESOLVED, that the Tribal President shall invite the following Tribes to attend the consultations: (a) Cheyenne River Sioux Tribe, (b) Crow Creek Sioux Tribe, (c) Flandreau Sioux Tribe, (d) Fort Peck Sioux Tribe, (e) Lower Brule Sioux Tribe, (f) Rosebud Sioux Tribe, (g) Santee Sioux Tribe, (h) Sisseton-Wahpeton Oyate, (i) Standing Rock Sioux Tribe, (j) Yankton Sioux Tribe, and (k) the Eastern Shoshone and Arapahoe Tribes of Wyoming, and

BE IT FURTHER RESOLVED, that the Tribal President shall request that the Standing Rock Sioux Tribe authorize cultural resources expert Tim Mentz to make a presentation on the Draft EIS for the Converse County Oil and Gas Project at the consultations meeting.., and

BE IT FURTHER RESOLVED, that the Tribal President shall direct the OST THPO to attend the consultations and make a report on the status of the THPO's involvement on the Draft EIS for the Converse County Oil and Gas Project, and

BE IT FURTHER RESOLVED, that the Tribal President shall invite Mary Hopkins, the Wyoming State Historic Preservation Officer (SHPO), to attend the consultations and make a report on the status of the State's involvement in the Draft EIS for the Converse County Oil and Gas Project and to Lisa Lindemann, Wyoming State Engineer's Office, to report on the number of state ground water permits that have been issued for the Oil

and Gas Project, and to which oil and gas companies they were issued, and

BE IT FURTHER RESOLVED, that the Tribal Secretary and Fifth Member shall be responsible for:

1. Arranging for a meeting room at the Prairie Wind Casino for the consultations between the BLM, F&WLS, and the Tribal Council;

2. Establishing an agenda for the consultations;

3. Arranging for a moderator to chair the consultations;

4. Arranging for discounts at the Prairie Wind Casino Hotel for tribal representatives attending the consultations;

5. Arranging for refreshments for participants attending the consultations, and

6. Arranging for a Power Point/overhead projectors and a PA System for speakers for the consultations.

C-E-R-T-I-F-I-C-A-T-I-O-N

I, as the undersigned Secretary of the Executive Committee of the Oglala Sioux Tribe, do hereby certify that this Resolution was adopted by a vote of: 4 For; 0 Against; 0 Abstaining; 0 Not Voting during a REGULAR SESSION held on the 21ST day of MARCH, 2018.

DONNA M. SALOMON
Secretary
Oglala Sioux Tribe

A-T-T-E-S-T:

TROY S. WESTON
President
Oglala Sioux Tribe

RECEIVED
MAR 26 2018

Appendix C

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STATEMENT OF BASIS

Applicant:	City of Edgemont
Permit Number:	SD0023701
Contact Person:	Jerry Dibble, Mayor PO Box A Edgemont, SD 57735
Phone:	(605) 662-7422
Permit Type:	Minor Municipal - Renewal

This document is intended to explain the basis for the requirements contained in the draft Surface Water Discharge Permit. This document provides guidance to aid in complying with the permit requirements. This guidance is not a substitute for reading the draft permit and understanding its requirements.

DESCRIPTION

The city of Edgemont operates a wastewater treatment facility located about ½ mile east of the city in the North ½ of Section 6, Township 9 South, Range 3 East, in Fall River County, South Dakota (Latitude 43.302222°, Longitude -103.807889°, Navigational Quality GPS).

Wastewater flows by gravity to a main lift station, which pumps wastewater to a three cell stabilization system. The wastewater is pumped from the lift station to Cell 1 (20 acres in size) followed by Cell 2 (10 acres) and Cell 3 (7.5 acres). The stabilization cells are normally operated in series, but influent can be diverted to Cell 2. Discharges are valve controlled from Cell 3 through a weir box into the Cheyenne River.

The original wastewater treatment facility was built in 1957 and was upgraded to the existing three cell stabilization system in 1988. According to the permit application, the average design flow of the facility is 0.3 million gallons per day (MGD). This wastewater treatment facility serves a population of 785 persons (permit application), with no known industrial users contributing flow to the system.

RECEIVING WATERS

Any discharge from this facility will enter the Cheyenne River which is classified by the South Dakota Surface Water Quality Standards (SDSWQS), Administrative Rules of South Dakota (ARSD), Sections 74:51:03:01 and 74:51:03:08, for the following beneficial uses:

(5) Warmwater semipermanent fish life propagation waters;
(8) Limited contact recreation waters;
(9) Fish and wildlife propagation, recreation, and stock watering waters; and
(10) Irrigation waters.

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TOTAL MAXIMUM DAILY LOAD

Section 303(d) of the federal Clean Water Act requires states to develop Total Maximum Daily Loads (TMDLs) for waters at levels necessary to achieve and maintain water quality standards. TMDLs are calculations of the amount of pollution a waterbody can receive and still maintain applicable water quality standards. TMDLs are necessary for waters that do not meet or are not expected to meet water quality standards with the application of technology-based controls for point sources. TMDLs address specific waterbodies, segments of waterbodies, or even entire watersheds, and are pollutant specific. TMDLs must allow for seasonal variations and a margin of safety, which accounts for any lack of knowledge concerning the relationship between pollutant loads and water quality.

The Cheyenne River from the Wyoming border to Beaver Creek has been identified as being impaired for Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Sodium Absorption Ratio (SAR), and Conductivity but a TMDL has not been completed yet and no wasteload allocation has been assigned to the city of Edgemont's wastewater treatment facility. The permit will be reopened, if necessary, to address the facility's wasteload allocation once the TMDL is completed.

ANTIDEGRADATION

SDDENR has fulfilled the antidegradation review requirements for this permit. In accordance with South Dakota's Antidegradation Implementation Procedure and the SDSWQS, no further review is required. The results of SDDENR's review are included in Attachment 1.

MONITORING DATA

The city of Edgemont has been submitting Discharge Monitoring Reports (DMRs) as required under the current permit. As shown in Attachment 2, this facility has had one 30-Day Average and one Daily Maximum violation of ammonia, one daily minimum of pH, and one daily maximum violation of pH during the current permit cycle. However, these violations seem to be isolated incidences and do not reflect the overall treatment performance of this facility. No future violations are expected. No discharge was reported for the months not included in the table.

INSPECTIONS

Personnel from SDDENR conducted a *Compliance Inspection* of the city of Edgemont's wastewater treatment facility on September 10, 2015. The following comments and corrective actions were required in order to come into compliance with the city's Surface Water Discharge (SWD) permit:

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COMMENTS	REQUIRED CORRECTIVE ACTIONS
The City of Edgemont has experienced two effluent violations of pH in the last year. pH limits were violated in the February and March 2015 discharge.	These violations are not acceptable and can lead to enforcement actions which can include fines and penalties. The city should look into modifications of its operation to ensure adequate treatment of the wastewater.
A pH meter calibration log is not being kept. **This comment was made in previous inspections.**	A pH meter calibration log must be kept. This log needs to include the date, time, and initials of the person calibrating the meter, and the calibrated meter readings for the 7.0 and 10.0 buffer solutions.
The operator stated he is inspecting the pond site monthly as required by the permit. However, he is not keeping an inspection notebook documenting these inspections of the wastewater treatment facility as required by the permit. **This comment was made in previous inspections.**	All pond site inspections conducted by town personnel **must be documented** in a notebook to be reviewed by SDDENR personnel when an inspection occurs. At a minimum, the notebook shall include the following: 1. Date and time of the inspection; 2. Name of the inspector(s); 3. The facility's discharge status; 4. The measured water depth in all cells and the artificial wetlands; 5. Identification of operational problems and/or maintenance problems; 6. Recommendations, as appropriate, to remedy identified problems; 7. A brief description of any actions taken with regard to problems identified; and 8. Other information, as appropriate. The inspection notebook is a condition of the SWD permit.
The operator stated that overflows had occurred with the heavy rainfalls this year; however, those were not sampled or reported	All discharge and/or overflows, including sewer back-ups must be monitored, reported, and sampled according to the requirements in your SWD permit.

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COMMENTS	REQUIRED CORRECTIVE ACTIONS
There is no flow measuring device at the wastewater treatment facility. The city currently determines flow by calculating pond drawdown during a discharge; however, there are no pond depth indicators in the ponds, so the flow calculations are an estimate. **This comment was made in previous inspections.**	The city is required to report flow rate on its DMRs as a condition of the SWD permit. To ensure accurate reporting of flow, the city must install a flow measurement device.
There are no pond depth indicators in Cells 1, 2, and 3.	A pond depth indicator should be installed in each pond. The operator should record the ponds during each inspection. These records will be helpful in determining flows to and from the ponds and aid in maintaining the proper operating depths in the ponds at all times. The pond depth indicators can also be used as the effluent flow measurement device. Please note, discharge flow measurement is a requirement of the SWD permit.

EFFLUENT LIMITS

Outfall 001 – Any discharge from Cell 3 weir box to the Cheyenne River (Latitude 43.304056°, Longitude -103.807833°, Navigational Quality GPS).

No discharge shall occur from this facility until permission is granted by SDDENR. The permittee shall comply with the effluent limits specified below. This requirement is included in the permit because the discharge reaches a stream classified as a fishery. During any discharge, the permittee shall comply with the effluent limits specified below which are based on the Secondary Treatment Standards (ARSD Section 74:52:06:03), the SDSWQS, permit writer's judgment, and the current permit limits.

1. The Five-Day Biochemical Oxygen Demand (BOD_5) concentration shall not exceed 30 mg/L (30-day average) or 45 mg/L (7-day average). These limits are based on the Secondary Treatment Standards and are being included because SDDENR has determined there is a reasonable potential for BOD_5 to be present in the discharge at levels that may violate the SDSWQS.

2. The Total Suspended Solids (TSS) concentration shall not exceed 90 mg/L (30-day average) or 135 mg/L (7-day average). These limits are based on Secondary Treatment Standards, the warmwater semipermanent fish life propagation waters classification of

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the Cheyenne River, and the variance granted to the city during the current permit term and are being included because SDDENR has determined there is a reasonable potential for TSS to be present in the discharge at levels that may violate the SDSWQS.

Note: ARSD Section 74:52:06:04(2) allows TSS limits less stringent than Secondary Treatment Standards if it can be demonstrated that:

a) Waste stabilization ponds are the principal process used for secondary treatment;
b) Operation and maintenance data indicate that TSS values specified in subdivision 74:52:06:03(3) cannot be achieved;
c) The effluent quality for TSS does not exceed 110 mg/L for 30-day average and 165 mg/L for 7-day average; and
d) The POTW is achieving levels of effluent quality required for BOD_5 specified in Section 74:52:06:03.

Because the facility meets the above criteria, the TSS variance is allowed and will be continued in the draft permit. However, since the Cheyenne River is classified as a warmwater semipermanent fishery, the TSS limits will be 90 mg/L (30-day average) and 135 mg/L (7-day average) to ensure the discharge does not impair the beneficial uses of the Cheyenne River, in accordance with SDDENR's policy.

3. The pH shall not be less than 6.5 standard units or greater than 9.0 standard units in any single analysis and/or measurement. These limits are based on the warmwater semipermanent classification of the Cheyenne River and the Secondary Treatment Standards and are being included because SDDENR has determined there is a reasonable potential for the pH of the effluent to violate the SDSWQS. The minimum pH required under the Secondary Treatment Standards is 6.0 standard units; the minimum pH required by the beneficial uses assigned to the Cheyenne River is 6.5 standard units. Therefore, the more stringent limit of 6.5 standard units shall be applied to this discharge to ensure compliance with both the Secondary Treatment Standards and the SDSWQS.

Note: SDDENR specifies that pH analyses are to be conducted within 15 minutes of sample collection with a pH meter. Therefore, the permittee must have the ability to conduct onsite pH analyses. The pH meter used must be capable of simultaneous calibration to two points on the pH scale that bracket the expected pH and are approximately three standard units apart. The pH meter must read to 0.01 standard units and be equipped with temperature compensation adjustment. Readings shall be reported to the nearest 0.1 standard units.

4. The *Escherichia coli* (*E. coli*) organisms shall not exceed a concentration of 630 per 100 milliliters as a geometric mean based on a minimum of five samples obtained during separate 24-hour periods for any calendar month. *This limit is only applicable if five or more samples are taken and is only effective from May 1 to September 30.*

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In addition, the *E. coli* organisms shall not exceed 1,178 per 100 milliliters in any one sample from May 1 to September 30. These limits are based on the limited-contact recreation beneficial use classification of the Cheyenne River and the SDSWQS (ARSD Section 74:51:01:51) and are being included because SDDENR has determined there is a reasonable potential for *E. coli* to be present in the discharge at levels that may violate the SDSWQS.

5. The ammonia-nitrogen (as N) concentration shall not exceed the limits specified in the table below. These limits are based on the warmwater semipermanent fish life propagation waters classification of the Cheyenne River, the SDSWQS (ARSD Section 74:51:01:48), the current permit limits, and permit writer's professional judgment and are being included because SDDENR has determined there is a reasonable potential for ammonia-nitrogen to be present in the discharge at levels that may violate the SDSWQS. See Attachment 3 for more detail.

Month	Ammonia Limit (as N)	
	30-Day Average (mg/L)	Daily Maximum (mg/L)
January 1 – January 31	6.2	13.9
February 1 – February 29	6.2	12.4
March 1 – March 31	1.6	2.9
April 1 – April 30	1.6	2.9
May 1 – May 31	1.6	2.9
June 1 – June 30	1.0	1.5
July 1 – July 31	1.0	1.5
August 1 – August 31	1.0	1.5
September 1 – September 30	1.5	2.7
October 1 – October 31	1.5	2.7
November 1 – November 30	3.9	7.8
December 1 – December 31	5.4	11.5

6. No chemicals, such as chlorine, shall be used without prior written permission. This limit is based on permit writer's professional judgment.

SDDENR does not believe there is a reasonable potential for other pollutants to violate the SDSWQS. The limits and monitoring in the draft permit will be sufficient to ensure the protection of the water quality near the city of Edgemont's wastewater treatment facility's discharge.

SELF MONITORING REQUIREMENTS

Prior to requesting permission to discharge, the permittee shall collect a grab sample from each lagoon cell that will be discharged and have the sample analyzed for BOD_5, TSS, pH, water temperature, *E. coli*, and ammonia-nitrogen (as N). The results of the analyses, along with a request to discharge, shall be submitted to SDDENR. The request to discharge shall explain why a discharge is needed, when the discharge would start, the expected duration of the discharge,

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and the approximate volume of water to be discharged. The estimated flow condition of the receiving water shall also be reported (i.e. dry, low, normal, high). **No discharge shall occur until permission has been granted by SDDENR.**

The draft permit requires the permittee to monitor all discharges for BOD_5 (mg/L), TSS (mg/L), pH (su), ammonia-nitrogen (as N, mg/L), and *E. coli* (#/100mL). These monitoring requirements are based on the limits in the draft permit for these parameters. Effluent water temperature (°C), total flow (million gallons), flow rate (MGD), and duration of discharge (days) shall be monitored, but will not have a limit. These monitoring requirements are based on the need to fully characterize the discharge.

If a single, continuous discharge's duration is less than or equal to three days, the permittee shall take one sample per day. For a single, continuous discharge that is greater than three days and less than or equal to seven days, three samples shall be taken during the discharge. For discharges greater than seven days, three samples shall be taken during the first seven days of the discharge and then one sample shall be taken per week of discharge after that. All of the samples collected during the 7-day or 30-day period are to be used in determining the averages. The permittee always has the option of collecting additional samples if appropriate.

The city of Edgemont was approved to electronically submit DMRs through NetDMR on October 5, 2012. Effluent monitoring results shall be summarized for each month and recorded on a DMR to be submitted via NetDMR to SDDENR on a **monthly** basis. If no discharge occurs during a month, it shall be stated as such on the DMR.

On October 22, 2015, the Environmental Protection Agency (EPA) published in the federal register a rule that makes electronic reporting of permit reporting requirements mandatory for all SWD permits. Phase 1 of the rule requires that all DMRs must be submitted electronically as of December 21, 2016. Currently, SDDENR is approved to accept DMRs electronically via NetDMR. EPA's rule will require all permit reporting requirements (such as permit applications and violation reports) to be submitted electronically. SDDENR is working on programs to meet this requirement and will notify facilities as they become available.

Monitoring shall consist of **monthly** inspections of the facility and the outfall to verify that proper operation and maintenance procedures are being practiced and whether or not there is a discharge occurring from this facility. **Daily** inspections are required during a discharge. The lift station shall be inspected on at least a **weekly** basis, although **daily** inspections are recommended. During any sanitary overflow, the lift stations shall be inspected on a **daily** basis. Documentation of each of these visits shall be kept in a notebook to be reviewed by SDDENR or EPA personnel when an inspection occurs.

WHOLE EFFLUENT TOXICITY

The SDDENR *Reasonable Potential Implementation Procedure for SWD Permits* was reviewed to determine if Whole Effluent Toxicity (WET) testing is applicable to the city of Edgemont. Following the guidance document, the city of Edgemont is not believed to have reasonable potential to cause or contribute to an exceedance of the SDSWQS for toxicity.

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The draft permit will not include WET monitoring or limits. SDDENR has determined that due to the facility's minor discharge status and the lack of significant industrial contributions to the wastewater treatment facility there is no reasonable potential for WET. SDDENR has the authority to reopen the permit to add WET effluent limits, compliance schedules, monitoring, or other appropriate requirements.

PRETREATMENT

The city of Edgemont has a design flow of less than 5.0 MGD, and no industries who are likely to cause pass through or interference with the POTW. Therefore, the draft permit will not require the city of Edgemont to develop an industrial pretreatment program. Any categorical industrial user (CIU) or significant industrial user (SIU) that discharges to the POTW will be permitted by the state. However, the city must still meet the requirements for regulating nondomestic sources of wastewater entering its system in accordance with the requirements of section 6.0 of the draft permit.

SLUDGE

Based on the city of Edgemont's permit application, SDDENR does not anticipate sludge will be removed or disposed of during the life of the permit. Therefore, the draft Surface Water Discharge permit shall not contain sludge disposal requirements. However, if sludge disposal is necessary, the city of Edgemont is required to submit to SDDENR a sludge disposal plan for review

DRAINAGE ISSUES

Fall River County has the authority to regulate drainage. The city of Edgemont is responsible for getting any necessary drainage permits from the county **prior** to discharging.

ENDANGERED SPECIES

This is a renewal of an existing permit. No listed endangered species are expected to be impacted by activities related to this permit. According to the US Fish and Wildlife Service, no endangered species were expected to be found in Fall River County.

This information was accessible at the following US Fish and Wildlife Service website as of December 7, 2018, and was last updated by the US Fish and Wildlife Service January 11, 2017: https://www.fws.gov/southdakotafieldoffice/SpeciesByCounty_Jan2017.pdf.

PERMIT EXPIRATION

A five-year permit is recommended.

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PERMIT CONTACT

This statement of basis and the draft permit were developed by Tina McFarling, P.E., Engineer III for the Surface Water Quality Program. Any questions pertaining to this statement of basis or the draft permit can be directed to the Surface Water Quality Program, at (605) 773-3351.

December 7, 2018

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ATTACHMENT 1

Antidegradation Review

Permit Type: **Minor Municipal - Renewal** Applicant: **City of Edgemont**
Date Received: **October 3, 2013** Permit #: **SD0023701**
County: **Fall River** Legal Description: **N ½ of Sec. 6, T9S, R3E**
Receiving Stream: **Cheyenne River** Classification: **5, 8, 9, 10**
If the discharge affects a downstream waterbody with a higher use classification, list its name and uses:

APPLICABILITY

1. Is the permit or the stream segment exempt from the antidegradation review process under ARSD 74:51:01? Yes ☒ No ☐ If no, go to question #2. If yes, check those reasons why the review is not required:

- ☐ Existing facility covered under a surface water discharge permit is operating at or below design flows and pollutant loadings;
- ☐ *Existing effluent quality from a surface water discharge permitted facility is in compliance with all discharge permit limits;
- ☐ *Existing surface water discharge permittee was discharging to the current stream segment prior to March 27, 1973, and the quality and quantity of the discharge has not degraded the water quality of that segment as it existed on March 27, 1973;
- ☐ *The existing surface water discharge permittee, with DENR approval, has upgraded or built new wastewater treatment facilities between March 27, 1973, and July 1, 1988;
- ☐ The existing surface water discharge permittee discharges to a receiving water assigned only the beneficial uses of (9) and (10); the discharge is not expected to contain toxic pollutants in concentrations that may cause an impact to the receiving stream; and DENR has documented that the stream cannot attain a higher use classification. This exemption does not apply to discharges that may cause impacts to downstream segments that are of higher quality;
- ☐ Receiving water meets Tier 1 waters criteria. Any permitted discharge must meet water quality standards;
- ☐ The permitted discharge will be authorized by a Section 404 Corps of Engineers Permit, will undergo a similar review process in the issuance of that permit, and will be issued a 401 certification by the department, indicating compliance with the state's antidegradation provisions; or
- ☒ Other: This permit does not authorize an increase in effluent limits.

*An antidegradation review is not required where the proposal is to maintain or improve the existing effluent levels and conditions. Proposals for increased effluent levels, in these categories of activities are subject to review.

No further review required.

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ANTIDEGRADATION REVIEW SUMMARY

2. The outcome of the review is:

- ☒ A formal antidegradation review was not required for reasons stated in this worksheet. Any permitted discharge must ensure water quality standards will not be violated.
- ☐ The review has determined that degradation of water quality should not be allowed. Any permitted discharge would have to meet effluent limits or conditions that would not result in any degradation estimated through appropriate modeling techniques based on ambient water quality in the receiving stream, or pursue an alternative to discharging to the waterbody.
- ☐ The review has determined that the discharge will cause an insignificant change in water quality in the receiving stream. The appropriate agency may proceed with permit issuance with the appropriate conditions to ensure water quality standards are met.
- ☐ The review has determined, with public input, that the permitted discharge is allowed to discharge effluent at concentrations determined through a total maximum daily load (TMDL). The TMDL will determine the appropriate effluent limits based on the upstream ambient water quality and the water quality standard(s) of the receiving stream.
- ☐ The review has determined that the discharge is allowed. However, the full assimilative capacity of the receiving stream cannot be used in developing the permit effluent limits or conditions. In this case, a TMDL must be completed based on the upstream ambient water quality and the assimilative capacity allowed by the antidegradation review.
- ☐ Other: _____

3. Describe any other requirements to implement antidegradation or any special conditions That are required as a result of this antidegradation review: _____

Tina McFarling	December 7, 2018
Reviewer	Date
Albert Spangler	December 7, 2018
Team Leader	Date

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ATTACHMENT 2

Monitoring Data

The monitoring data was obtained from the facility's DMRs and retrieved through the ICIS database, accessed December 5, 2018. The period of the data is from **April 1, 2009 to November 30, 2018**. Public access to the facility's monitoring data is available at EPA's Enforcement and Compliance History Online (ECHO) website: https://echo.epa.gov/

	BOD_5		Fecal Coliform		Duration of discharge	Flow rate		Total Flow
	30 Day Avg.	Max 7 Day Avg.	30 Day Geo Mean	Daily Max	Monthly Total	30 Day Avg.	Daily Max	Monthly Total
Limit / DMR	30 mg/L	45 mg/L	1000 #/100mL	2000 #/100mL	N/A days	N/A MGD	N/A MGD	N/A Million Gallons
February 2010	10	13	NR	NR	15	1.29	1.29	19.35
February 2011	7	18	NR	NR	20	1.88	1.88	58
February 2012	15.4	17	NR	NR	20	1.88	1.89	37.6
February 2013	5.5	8	NR	NR	28	1.87	1.89	56.7
March 2014	4	4	NR	NR	14	0.28	0.28	4.04
April 2014	5	5	NR	NR	1	0.1	0.1	0.1
February 2015	5	11	NR	NR	25	0.29	0.29	7.25
March 2015	14	16	NR	NR	25	0.29	0.29	7.78
January 2016	12.54	35	NR	NR	20	0.72	0.72	14.4
February 2016	8.9	15	NR	NR	29	0.72	0.72	20.88
March 2016	13	13	NR	NR	4	0.72	0.72	2.88
April 2017	7.36	8.7	NR	NR	14	0.72	10.08*	10.08

	Ammonia		pH		TSS		Temperature	
	30 Day Avg.	Daily Max	Daily Min	Daily Max	30 Day Avg.	Max 7 Day Avg.	30 Day Avg.	Daily Max
Limit / DMR	Varies mg/L	Varies mg/L	6.5 SU	9 SU	90 mg/L	135 mg/L	N/A °C	N/A °C
February 2010	3.2	4	7.32	7.55	5.25	9	1.6	1.6
February 2011	2.7	6.5	7.44	8.24	3	5	12.9	15.8
February 2012	2.34	3.2	7.16	8.03	20.4	23.67	3.34	4.3
February 2013	1.99	3.6	7.56	8.08	6.2	19	8.32	9.6

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	Ammonia		pH		TSS		Temperature	
	30 Day Avg.	Daily Max	Daily Min	Daily Max	30 Day Avg.	Max 7 Day Avg.	30 Day Avg.	Daily Max
Limit / DMR	Varies mg/L	Varies mg/L	6.5 SU	9 SU	90 mg/L	135 mg/L	N/A °C	N/A °C
March 2014	0.27	0.56	7.8	8	BD	BD	11	13
April 2014	0.4	0.4	7.4	7.4	BD	BD	5.8	5.8
February 2015	0.06	0.06	6.2	7.5	11	17	5	8
March 2015	0.5	0.05	9.36	9.57	46	65	8	10
January 2016	1.14	2.67	7.78	8.26	34.76	89	3.6	5.6
February 2016	3.13	3.77	7.76	8.33	7.5	10	6.27	11
March 2016	3.3	3.3	9	9	13.6	13.6	9.4	9.4
April 2017	0.3	1.28	8.3	8.94	12.56	18.4	15.06	17.1

* Daily Maximum Flow Rate is inconsistent with other data provided. It appears that the Total Flow was reported instead of the Daily Maximum Flow Rate

BD is Below Detection. Pollutant concentrations were too small to be measured.

NR is Not Required. No sample was required for this parameter during the monitoring period.

Violations are bolded, shaded, and larger font.

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ATTACHMENT 3

Ammonia Limits Development
for the
City of Edgemont Treatment Facility

in the Cheyenne River
near
Edgemont, South Dakota

Prepared by

South Dakota Department of Environment and Natural Resources

2018

INTRODUCTION

Under Section 303(c) of the federal Clean Water Act, states have been required to develop water quality standards to protect public health and enhance water quality. In accordance with the Clean Water Act, the state of South Dakota has assigned beneficial uses to all waters of the state and developed water quality criteria to protect those uses. South Dakota's surface water quality standards and assigned beneficial uses are found in the Administrative Rules of South Dakota (ARSD) Article 74:51.

To ensure the protection of the state's surface water quality standards, the Clean Water Act authorized a permitting program for point source discharges of pollutants. The U.S. Environmental Protection Agency delegated this permitting program to the South Dakota Department of Environment and Natural Resources on December 30, 1993.

The department issues Surface Water Discharge permits containing, at a minimum, technology-based effluent limits. However, these limits are not always adequate to protect South Dakota's water quality. In those cases, the Department of Environment and Natural Resources develops water quality-based effluent limits. In accordance with the procedures and requirements outlined below, water quality-based effluent limits for ammonia will be developed for the city of Edgemont's wastewater treatment facility (WWTF). These limits will ensure the surface water quality standards for the Cheyenne River near the city of Edgemont are maintained and protected.

Developing the ammonia limits for the city of Edgemont's WWTF is a matter of determining the maximum level of ammonia that can be present in the Cheyenne River without causing the applicable South Dakota Surface Water Quality Standards (SDSWQS) for ammonia to be exceeded.

The effluent limits for ammonia are developed for critical conditions to be conservative, thereby assuring water quality standards are maintained under less critical conditions. Critical conditions are those at which the surface water quality standards are most likely to be violated. Critical conditions can be defined by several factors, including, but not limited to the following:

- stream flow (e.g., high, low);
- storm event occurrence and intensity;
- ambient water quality conditions (e.g., pH, temperature, etc.);
- diurnal variations in water column conditions;
- temporal occurrence of pollutant loadings from natural and human-induced activities;
- the presence or absence of salmonids; and
- the presence or absence of early life stages of aquatic life.

The following mass balance equation will be used to determine the ammonia limits for the city of Edgemont's WWTF:

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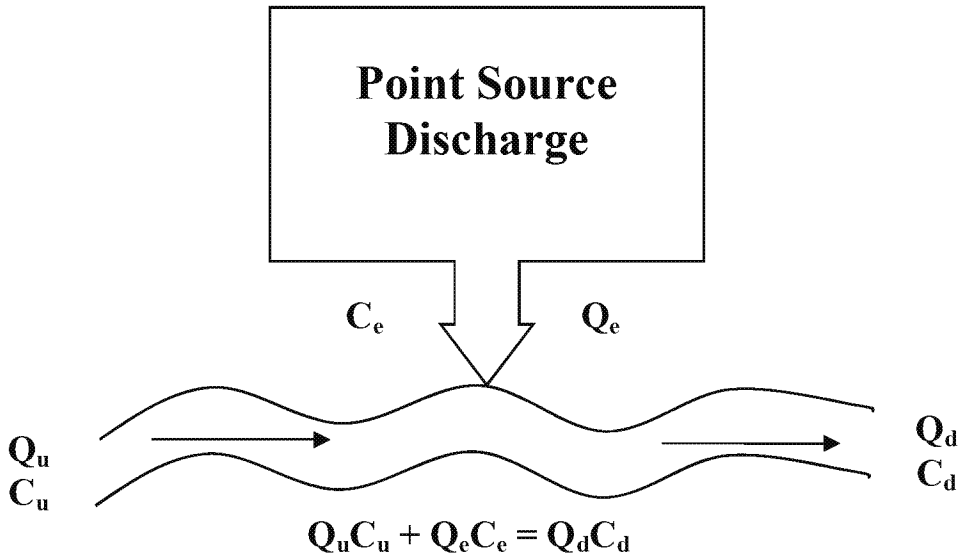
Figure 1



Where,

- Q_u = Receiving stream flow, in cubic feet per second (cfs);
- C_u = Ambient upstream ammonia concentration, in milligrams per liter (mg/L);
- Q_e = Effluent discharge flow rate, in cfs;
- C_e = Water quality based effluent limit for ammonia in mg/L;
- Q_d = Downstream flow (equal to $Q_u + Q_e$), in cfs; and
- C_d = Allowable instream ammonia concentration (based on the SD Surface Water Quality Standards), in mg/L.

Using the mass balance equation and the following information, the water quality-based effluent limits for ammonia can be determined for the city of Edgemont's WWTF's discharge into the Cheyenne River.

GEOGRAPHICAL EXTENT

The Cheyenne River is located in the Cheyenne River Basin in the southwestern portion of the state. The Cheyenne River Basin drains approximately 9,732 square miles of land within the boundaries of the state. The area is this basin is very diverse. It includes part of the Black Hills and Badlands, rangeland, irrigated cropland, and some mining areas. The Cheyenne River originates in Wyoming, flows through the southern Black Hills, and enters Lake Oahe near the center of the state. Figure 2 shows the Cheyenne River near the city of Edgemont.

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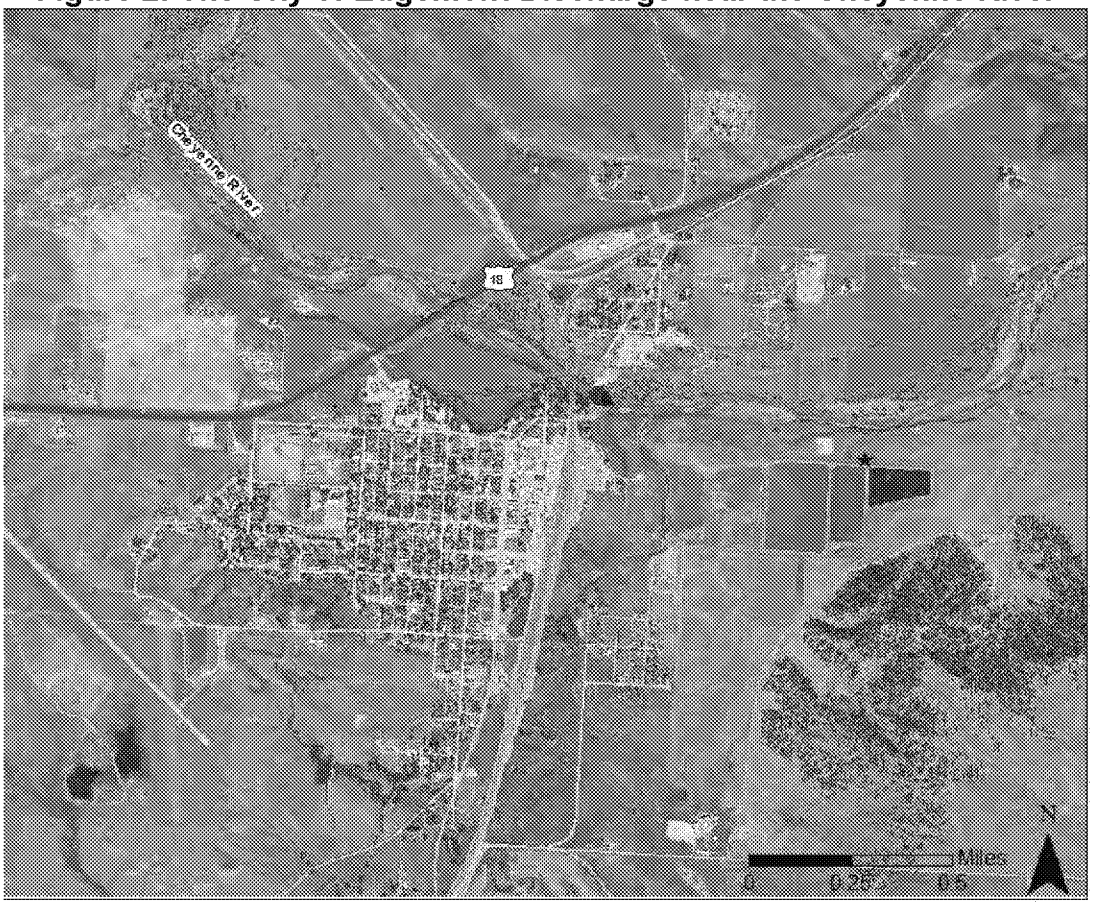
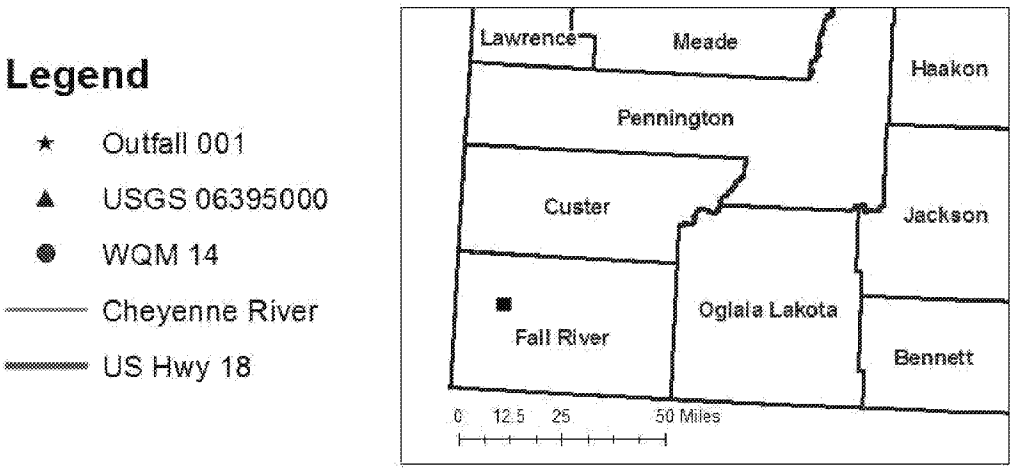
Figure 2: The City of Edgemont Discharge near the Cheyenne River





Past experience has shown that, due to the decay and transformation of organic pollutants such as ammonia, most adverse effects are generally exhibited within 10 miles of pollutant loading. While this rule of thumb can certainly vary depending on the source of the pollutant, fate and transport characteristics, hydrologic conditions, and other factors, it has generally held true in past instances. Therefore, the development of the ammonia limits for the city of Edgemont's WWTF's discharge into the Cheyenne River will be relatively narrow in spatial extent.

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ALLOWABLE INSTREAM AMMONIA CONCENTRATION (C_d)

South Dakota Surface Water Quality Standards

The SDSWQS specify the beneficial uses assigned to specific water bodies. The SDSWQS also contain specific narrative and numeric criteria that must be met to ensure the protection of each beneficial use. The Cheyenne River is classified for the following beneficial uses:

(5) Warmwater semipermanent fish life propagation waters;
(8) Limited-contact recreation waters;
(9) Fish and wildlife propagation, recreation, and stock watering waters; and
(10) Irrigation waters.

Waterbodies designated in the SDSWQS with the beneficial use classification of either coldwater permanent or coldwater marginal fish life propagation are suitable for supporting salmonids. Waterbodies with the beneficial use classifications of warmwater permanent, warmwater semipermanent, or warmwater marginal fish life propagation will likely not have salmonids. Salmonids are not expected to be present in the Cheyenne River.

The presence or absence of early life stages can be assumed based on the beneficial uses assigned to the receiving stream. Early life stages are expected to be present from March 1st through October 31st based on the SDSWQS (ARSD Section 74:51:01:48).

Allowable Instream Ammonia Levels

Based on the beneficial uses of the Cheyenne River, the following equations can be used to determine the total allowable ammonia concentration in the receiving stream (SDSWQS, ARSD Chapter 74:51:01, Appendix A):

Equation 1: Daily Maximum (Salmonids present)

$$Cd = \frac{0.275}{(1+10^{(7.204-pH)})} + \frac{39.0}{(1+10^{(pH-7.204)})}$$

Equation 2: Daily Maximum (Salmonids NOT present)

$$Cd = \frac{0.411}{(1+10^{(7.204-pH)})} + \frac{58.4}{(1+10^{(pH-7.204)})}$$

Equation 3: 30-day Average (Early Life Stages Present)

$$Cd = \left[\frac{0.0577}{(1+10^{(7.688-pH)})} + \frac{2.487}{(1+10^{(pH-7.688)})}\right] \times MIN\left(2.85, 1.45 \times 10^{0.028(25-T)}\right)$$

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Equation 4: 30-day Average (Early Life Stages Absent)

$$Cd = \left[\frac{0.0577}{(1+10^{(7.688-pH)})} + \frac{2.487}{(1+10^{(pH-7.688)})} \right] \times [1.45 \times 10^{0.028((25-MAX(T,7))}]$$

pH = the pH of the water quality sample in standard units
T = the water temperature of the sample in degrees Centigrade
MIN = use either 2.85 or the value of $1.45^{0.028*(25-T)}$, whichever is the smaller value
MAX = use either the water temperature (T) for the sample, or 7, whichever is the greater value

To develop the ammonia limits for the city of Edgemont's WWTF's discharge, equations 2, 3, and 4 will be used to determine the instream ammonia concentration, C_d, allowed in the Cheyenne River. C_d will be expressed as both 30-day average and daily maximum concentrations. The limits are determined on a monthly basis.

Instream Water Quality Monitoring

The department maintains a statewide network of fixed monitoring stations to gain a historic record of water quality for various streams around the state. This water quality monitoring (WQM) network consists of 153 monitoring stations, which are sampled at monthly, quarterly, or seasonal intervals. The goal of this sampling is to collect reliable water quality data that reflects actual stream conditions; to collect data to determine the effectiveness of controls on point and nonpoint sources of pollution; and to collect data to evaluate the appropriateness of current beneficial use designations.

Water quality samples are collected at a WQM station on the Cheyenne River. A description of the station is listed below. Figure 2 denotes the location of WQM 14.

WQM 14	At U.S. Hwy 471 bridge on NE edge of Edgemont, 700 feet upstream of Cottonwood Creek confluence (Latitude 43.305700°, Longitude -103.820820°).

Ambient water temperature, pH, and ammonia data at WQM 14 were obtained to represent instream conditions. The water quality information obtained from WQM 14 is presented in Attachment 4. The pH and temperature data are summarized in Table 1 below.

Calculation of Allowable Instream Ammonia Concentration (C_d)

The SDSWQS specify the total ammonia concentration that is allowed at a given pH and temperature. The 80th percentile of the pH and temperature at WQM 14 was determined to ensure the ammonia standards are maintained during critical conditions. This information was used to calculate the allowable instream ammonia concentrations for each month. Table 1 summarizes the allowable instream ammonia (C_d) for the Cheyenne River.

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Table 1: Allowable Instream Total Ammonia Concentrations for the Cheyenne River

Month	Temperature (°C)	pH (s.u.)	C_d, Allowable Total Ammonia (mg/L)	
			30-Day Average	Daily Maximum
January 1 – 31 (ELS absent)	0.00	7.90	4.54	10.13
February 1 – 29 (ELS absent)	0.00	8.18	3.01	5.95
March 1 – 31 (ELS present)	5.50	8.15	1.93	6.29
April 1 – 30 (ELS present)	15.12	8.20	1.72	5.73
May 1 – 31 (ELS present)	18.80	8.24	1.28	5.30
June 1 – 30 (ELS present)	22.50	8.20	1.07	5.73
July 1 – 31 (ELS present)	26.40	8.20	0.83	5.73
August 1 – 31 (ELS present)	25.00	8.20	0.91	5.73
September 1 – 30 (ELS present)	17.00	8.06	1.90	7.50
October 1 – 31 (ELS present)	11.00	8.10	2.10	6.95
November 1 – 30 (ELS absent)	5.00	8.20	2.91	5.73
December 1 – 31 (ELS absent)	0.00	8.00	3.95	8.41

AMBIENT AMMONIA CONCENTRATION (C_u)

The ammonia data at WQM 14 was reviewed to determine the ambient water quality in the Cheyenne River. The 80th percentile of the ammonia data was determined to ensure the ammonia standards are maintained during critical conditions. The ammonia data from WQM 14 is presented in Attachment 4. Table 2 below summarizes the 80th percentile ammonia data for each season. This data represents the ambient ammonia concentration for the Cheyenne River (C_u).

Table 2: Ambient Ammonia Data for the Cheyenne River

Month	Ammonia (mg/L)
January 1 – 31	0.1
February 1 – 29	0.1
March 1 – 31	0.13
April 1 – 30	0.1
May 1 – 31	0.1
June 1 – 30	0.1
July 1 – 31	0.1
August 1 – 31	0.1
September 1 – 30	0.1
October 1 – 31	0.1
November 1 – 30	0.1
December 1 – 31	0.1

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EFFLUENT DISCHARGE FLOW RATE (Q_e)

The effluent discharge flow rate, Q_e, can be determined in several different ways. If effluent data is available for the discharger, the 50th or 80th percentile of the daily flow can be used. The effluent design flow rate of the wastewater treatment facility may be used as the expected effluent flow rate in the absence of actual discharge data. Alternatively, for stabilization pond systems, it may be appropriate to develop an effluent flow rate based on expected performance.

For the purposes of developing ammonia limits for the city of Edgemont's WWTF's discharge, 2.726 cfs was used for Q_e. The 2.726 cfs is based on the 80th percentile of the daily maximum flow rate reported by the city of Edgemont on DMRs to ensure the ammonia standards are maintained during critical conditions. See Attachment 5 for more details.

Table 3 summarizes the effluent flow rate used in these calculations.

RECEIVING STREAM FLOW (Q_u)

The United States Geological Survey (USGS) maintains hundreds of flow monitoring sites in South Dakota. The receiving stream flow rate, Q_u, is determined from an analysis of stream flow data available, incorporating the flow considerations required by *South Dakota's Mixing Zone and Dilution Implementation Procedures*.

Critical conditions for ammonia presumably occur when stream flows are relatively low. Therefore, the ammonia limits will be developed for low stream flow conditions. Should it be determined that water quality standards are violated at other flow conditions, the permit would be reopened and new limits would be developed.

ARSD Section 74:51:01:30 specifies that surface water quality standards apply to low quality fishery waters when flows meet or exceed the minimum 7-day average low flow that can be expected to occur once every 5 years (7Q5), or 1.0 cfs, whichever is greater. The 7Q5 is therefore the minimum, or critical, flow for which the SDSWQS must be maintained, although all Surface Water Discharge permit limits remain in force below this minimum flow.

The seasonal 7Q5 flows were determined using data retrieved from the USGS gauging station USGS 06395000 and a Log Pearson type III statistical analysis. The seven-day averages are calculated for the entire data set. After the averages are calculated, the data is split into the selected seasons. Analysis is then done in accordance with the EPA guidance document *Technical Guidance Manual for Performing Wasteload Allocation* to determine the seasonal 7Q5 flow. A description of the station is listed below. Figure 2 denotes the location of the USGS gauging station.

USGS 06395000	Cheyenne River at Edgemont, SD (Latitude 43.305556°, Longitude -103.820556°)

South Dakota's water quality standards allow a zone of mixing for discharges. In accordance with the SDSWQS, chronic water quality criteria must be met at the end of the mixing zone; the acute criteria must be met at all times within the mixing zone. The mixing zone is therefore a

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limited portion of a water body where mixing of the effluent and receiving stream is in progress, but not complete. In some cases, the discharge will not completely mix with the entire receiving stream. There are many factors that influence the rate of mixing in a stream. A few of these factors are the flow and velocity of the receiving stream, the flow and velocity of the effluent, the slope of the stream, and other stream characteristics.

The *South Dakota Mixing Zone and Dilution Implementation Procedures* outlines an approach for modeling the mixing zone. Using these procedures, the 7Q5 is adjusted to account for the allowable ratio of flow available in the receiving stream. This adjusted flow represents the receiving stream flow rate (Q_u).

Table 3 and Attachment 6 summarize the flow data and the determination of Q_u for the Cheyenne River.

Table 3: Critical Low Flow Values for the Cheyenne River

Month	7Q5 Low Flow (cfs)	Effluent Flow (cfs)	Ratio of Effluent to 7Q5	Allowable Ratio of 7Q5	Critical Low Flow Q_u (cfs)
January 1 – 31	1.04	2.73	2.63	1.00	1.04
February 1 – 29	3.02	2.73	0.90	1.00	3.02
March 1 – 31	6.05	2.73	0.45	0.50	3.02
April 1 – 30	6.23	2.73	0.44	0.50	3.12
May 1 – 31	5.82	2.73	0.47	0.50	2.91
June 1 – 30	2.00	2.73	1.36	1.00	2.00
July 1 – 31	1.00	2.73	2.73	1.00	1.00
August 1 – 31	1.00	2.73	2.73	1.00	1.00
September 1 – 30	1.00	2.73	2.73	1.00	1.00
October 1 – 31	1.00	2.73	2.73	1.00	1.00
November 1 – 30	1.00	2.73	2.73	1.00	1.00
December 1 – 31	1.00	2.73	2.73	1.00	1.00

Since the 7Q5 value for July – December is less than 1.0 cfs, ARSD Section 74:51:01:30 states that 1.0 cfs will be used in the calculations.

DOWNSTREAM FLOW RATE (Q_d)

The downstream flow rate, Q_d, is simply the sum of the upstream flow rate (Q_u) and the effluent flow rate (Q_e). The downstream flow rate used for the calculation of the ammonia limits for the city of Edgemont's WWTF's discharge into the Cheyenne River is summarized in Table 4 below.

CALCULATION OF AMMONIA LIMIT (C_e)

Each of the variables determined above is summarized in Table 4. Using the mass balance equation, the ammonia limits for the city of Edgemont's WWTF's discharge into the Cheyenne River can be calculated as follows:

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$$Ce = \frac{(Qd*Cd)-(Qu*Cu)}{Qe}$$

The water quality-based effluent limits for ammonia for the city of Edgemont's WWTF's discharge into the Cheyenne River are presented in Table 4.

Table 4: Variables Calculated for Mass Balance Equation

Month	C_u, mg/L	C_d, mg/L		Q_e, cfs	Q_d, cfs	C_e, mg/L	
		30-day Average	Daily Maximum			30-Day Average	Daily Maximum
January 1 – 31	0.10	4.54	10.13	2.73	3.76	6.2	13.9
February 1 – 29	0.10	3.01	5.95	2.73	5.74	6.2	12.4
March 1 – 31	0.13	1.93	6.29	2.73	5.75	3.9	13.1
April 1 – 30	0.10	1.72	5.73	2.73	5.84	3.6	12.2
May 1 – 31	0.10	1.28	5.30	2.73	5.63	2.5	10.8
June 1 – 30	0.10	1.07	5.73	2.73	4.73	1.8	9.9
July 1 – 31	0.10	0.83	5.73	2.73	3.73	1.1	7.8
August 1 – 31	0.10	0.91	5.73	2.73	3.73	1.2	7.8
September 1 – 30	0.10	1.90	7.50	2.73	3.73	2.6	10.2
October 1 – 31	0.10	2.10	6.95	2.73	3.73	2.8	9.5
November 1 – 30	0.10	2.91	5.73	2.73	3.73	3.9	7.8
December 1 – 31	0.10	3.95	8.41	2.73	3.73	5.4	11.5

The city of Edgemont's WWTF's current permit contains ammonia limits. The current effluent limits were compared to the limits calculated using the information presented above. A comparison of the two limits is presented in Table 5 below.

During the months of March – October, the city's current limits are adequate to protect the beneficial use and the water quality criteria for the Cheyenne River. These limits will be continued in the draft permit, to prevent backsliding. During the remaining months, it was necessary to establish more stringent limits. The shaded values in Table 5 indicate the limits that will be draft for the city of Edgemont's WWTF's discharge.

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Table 5: Comparison of Current and Draft Effluent Limits

Month	Current Effluent Limits		Calculated Effluent Limits	
	30-Day Average (mg/L)	Daily Maximum (mg/L)	30-Day Average (mg/L)	Daily Maximum (mg/L)
January 1 – 31	7.9	18.6	6.2	13.9
February 1 – 29	7.9	18.6	6.2	12.4
March 1 – 31	1.6	2.9	3.9	13.1
April 1 – 30	1.6	2.9	3.6	12.2
May 1 – 31	1.6	2.9	2.5	10.8
June 1 – 30	1.0	1.5	1.8	9.9
July 1 – 31	1.0	1.5	1.1	7.8
August 1 – 31	1.0	1.5	1.2	7.8
September 1 – 30	1.5	2.7	2.6	10.2
October 1 – 31	1.5	2.7	2.8	9.5
November 1 – 30	7.9	18.6	3.9	7.8
December 1 – 31	7.9	18.6	5.4	11.5

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ATTACHMENT 4

Water Quality Data

WQM data was obtained from the water quality monitoring station WQM 14. The period of the data is from January 1, 2003 through November 30, 2018. This data can be obtained at https://www.waterqualitydata.us/portal/

WQM 14 Raw and Reduced Data

Note: The method detection limit was used in calculations for any "Below Detection" value.

January

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
01/23/2003	Below Detection	1	7.87	0
01/12/2006	Below Detection	0.1	8.2	0
01/08/2007	Below Detection	0.1	7.9	0
01/15/2008	Below Detection	0.1	7.5	0
01/21/2009	Below Detection	0.1	7.9	0
01/13/2010	Below Detection	0.05	7.8	0
01/25/2011	Below Detection	0.1	7.9	0
01/18/2012	Below Detection	0.1	7.8	0
01/10/2013	0.2	0.2	7.4	0
01/17/2014	Below Detection	0.1	8	0
01/16/2015	0.1	0.1	7.8	0
	Count	11	11	11
	Average	0.19	7.82	0.00
	20th Percentile	0.10	7.80	0.00
	50th Percentile	0.10	7.87	0.00
	80th Percentile	***0.10***	***7.90***	***0.00***

February

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
02/27/2006	Below Detection	0.1	7.8	0
02/26/2007	Below Detection	0.1	8	0
02/07/2008	0.1	0.1	7.6	0
02/24/2009	Below Detection	0.1	7.7	0
02/10/2010	Below Detection	0.05	8.2	0
02/22/2011	0.2	0.2	8	0
02/16/2012	Below Detection	0.1	7.9	0
02/19/2013	Below Detection	0.1	7.9	0
02/19/2014	0.6	0.6	8.5	0
02/27/2015	0.065	0.065	8.1	0
02/11/2016	Below Detection	0.05	8.3	0
02/13/2017	Below Detection	0.05	8	0
	Count	12	12	12
	Average	0.13	8.00	0.00
	20th Percentile	0.05	7.82	0.00
	50th Percentile	0.10	8.00	0.00
	80th Percentile	***0.10***	***8.18***	***0.00***

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March

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
03/09/2004	0.112	0.112	8.06	7.51
03/23/2004	Below Detection	0.1	8.14	14.04
03/15/2007	0.10	0.1	8.1	4
03/13/2008	Below Detection	0.1	8	0
03/18/2010	Below Detection	0.05	8.1	3
03/17/2011	0.30	0.3	8	5
03/12/2012	Below Detection	0.1	8.1	1
03/19/2013	Below Detection	0.1	8.2	3
03/17/2014	0.20	0.2	8.1	3
03/17/2015	Below Detection	0.05	8.2	5
	Count	10	10	10
	Average	0.12	8.10	4.56
	20th Percentile	0.09	8.05	2.60
	50th Percentile	0.10	8.10	3.50
	80th Percentile	***0.13***	***8.15***	***5.50***

April

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
04/21/2003	Below Detection	1	8.1	14.3
04/21/2004	Below Detection	0.1	7.97	15.12
04/10/2006	Below Detection	0.1	7.9	14
04/18/2007	Below Detection	0.1	8.1	16
04/16/2009	Below Detection	0.1	8.1	8
04/20/2010	Below Detection	0.05	8.2	14
04/26/2011	Below Detection	0.1	8.2	10
04/11/2012	Below Detection	0.1	8.2	13
04/29/2013	Below Detection	0.1	8.2	17
04/15/2014	Below Detection	0.1	8.3	5
04/06/2015	Below Detection	0.05	8.2	10
	Count	11	11	11
	Average	0.17	8.13	12.40
	20th Percentile	0.10	8.10	10.00
	50th Percentile	0.10	8.20	14.00
	80th Percentile	***0.10***	***8.20***	***15.12***

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May

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
05/14/2003	Below Detection	1	8.1	15.1
05/17/2004	Below Detection	0.1	7.79	13.72
05/24/2006	Below Detection	0.1	8	16
05/17/2007	Below Detection	0.1	8.4	18
05/20/2008	Below Detection	0.1	8.2	20
05/19/2009	Below Detection	0.1	8.2	22
05/17/2010	Below Detection	0.05	8.2	15
05/10/2011	Below Detection	0.1	8.3	17
05/10/2012	Below Detection	0.1	8.1	21
05/13/2013	Below Detection	0.1	8	16
05/13/2014	Below Detection	0.1	8.2	8
05/05/2015	Below Detection	0.05	8.2	13
05/18/2016	Below Detection	0.05	8.4	16
05/04/2017	Below Detection	0.05	8.2	15
	Count	14	14	14
	Average	0.15	8.16	16.13
	20th Percentile	0.05	8.06	14.49
	50th Percentile	0.10	8.20	16.00
	80th Percentile	***0.10***	***8.24***	***18.80***

June

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
06/10/2003	Below Detection	1	8	22.5
06/09/2004	Below Detection	0.1	7.9	14
06/27/2006	Below Detection	0.1	7.8	25
06/18/2007	Below Detection	0.1	8.2	18
06/12/2008	Below Detection	0.1	8.2	14
06/25/2009	Below Detection	0.1	8.2	22
06/17/2010	Below Detection	0.05	7.9	19
06/16/2011	Below Detection	0.1	8.2	19
06/13/2012	Below Detection	0.1	8	26
06/03/2013	0.4	0.4	7.7	17
06/17/2014	Below Detection	0.1	8.1	22
	Count	11	11	11
	Average	0.20	8.02	19.86
	20th Percentile	0.10	7.90	17.00
	50th Percentile	0.10	8.00	19.00
	80th Percentile	***0.10***	***8.20***	***22.50***

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July

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
07/15/2003	Below Detection	1	8	26.4
07/13/2004	Below Detection	0.1	8	26
07/31/2006	Below Detection	0.1	8	24
07/16/2007	Below Detection	0.1	8.1	29
07/09/2008	Below Detection	0.1	8.2	24
07/22/2009	Below Detection	0.1	8.1	24
07/26/2010	Below Detection	0.05	8.1	25
07/12/2011	Below Detection	0.1	8.1	19
07/16/2012	Below Detection	0.1	7.9	27
07/16/2013	Below Detection	0.1	8.2	26
07/07/2014	Below Detection	0.1	8.2	26
	Count	11	11	11
	Average	0.18	8.08	25.13
	20th Percentile	0.10	8.00	24.00
	50th Percentile	0.10	8.10	26.00
	80th Percentile	***0.10***	***8.20***	***26.40***

August

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
08/18/2003	Below Detection	1	7.9	24.2
08/24/2004	Below Detection	0.1	8.1	18
08/16/2006	Below Detection	0.1	8	24
08/16/2007	Below Detection	0.1	7.7	26
08/25/2008	Below Detection	0.1	8.1	24
08/26/2009	Below Detection	0.1	8.2	21
08/12/2010	Below Detection	0.05	8	23
08/15/2011	Below Detection	0.1	8.2	23
08/15/2012	Below Detection	0.1	8.1	22
08/20/2013	Below Detection	0.1	8	25
08/20/2014	Below Detection	0.1	8	27
08/10/2015	Below Detection	0.05	8.1	25
08/23/2016	Below Detection	0.05	8.3	21
08/22/2017	Below Detection	0.05	8.2	23
	Count	14	14	14
	Average	0.15	8.06	23.30
	20th Percentile	0.05	8.00	21.60
	50th Percentile	0.10	8.10	23.50
	80th Percentile	***0.10***	***8.20***	***25.00***

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September

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (°C)
09/26/2003	Below Detection	1	6.9	12.77
09/05/2004	0.12	0.12	7.9	18
09/14/2004	Below Detection	0.1	7.7	17
09/13/2005	Below Detection	0.1	8	16
09/27/2006	Below Detection	0.1	8	13
09/10/2007	Below Detection	0.1	7.8	18
09/25/2008	Below Detection	0.1	7.9	17
09/22/2009	Below Detection	0.1	8.1	13
09/21/2010	Below Detection	0.05	7.9	17
09/28/2011	Below Detection	0.1	8.1	15
09/25/2012	Below Detection	0.1	7.8	17
09/24/2013	Below Detection	0.1	8.1	15
09/04/2014	Below Detection	0.1	8	17
	Count	13	13	13
	Average	0.17	7.86	15.83
	20th Percentile	0.10	7.80	13.80
	50th Percentile	0.10	7.90	17.00
	80th Percentile	***0.10***	***8.06***	***17.00***

October

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (°C)
10/21/2003	0.04	0.04	8.03	7.95
10/12/2004	Below Detection	0.1	7.4	17
10/11/2005	Below Detection	0.1	8.1	11
10/26/2006	Below Detection	0.1	7.9	7
10/29/2007	0.1	0.1	7.7	8
10/21/2008	Below Detection	0.1	8.1	10
10/26/2009	Below Detection	0.1	8.1	4
10/13/2010	Below Detection	0.05	8.1	10
10/16/2012	Below Detection	0.1	7.9	11
10/31/2013	Below Detection	0.1	8.2	5
10/15/2014	Below Detection	0.1	8	10
	Count	11	11	11
	Average	0.09	7.96	9.18
	20th Percentile	0.10	7.90	7.00
	50th Percentile	0.10	8.03	10.00
	80th Percentile	***0.10***	***8.10***	***11.00***

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November

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
11/18/2003	Below Detection	0.01	8.18	4.11
11/18/2004	Below Detection	0.1	7.8	1
11/08/2005	Below Detection	0.1	8.2	6
11/15/2006	Below Detection	0.1	8	1
11/26/2007	Below Detection	0.1	8.1	1
11/12/2008	Below Detection	0.1	8.2	5
11/17/2009	Below Detection	0.1	8.2	2
11/18/2010	Below Detection	0.05	8	1
11/08/2011	Below Detection	0.1	8.2	0
11/14/2012	Below Detection	0.1	7.9	0
11/19/2013	Below Detection	0.1	8.2	2
11/05/2014	Below Detection	0.1	8.2	5
11/17/2015	Below Detection	0.05	8.4	2
11/15/2016	Below Detection	0.05	8.2	7
11/08/2017	Below Detection	0.05	8.2	2
	Count	15	15	15
	Average	0.08	8.13	2.61
	20th Percentile	0.05	8.00	1.00
	50th Percentile	0.10	8.20	2.00
	80th Percentile	***0.10***	***8.20***	***5.00***

December

Date	Ammonia Reported (mg/L)	Ammonia Used (mg/L)	pH (s.u.)	Temperature (ºC)
12/16/2003	Below Detection	0.01	7.92	-0.13
12/13/2004	Below Detection	0.1	7.9	0
12/08/2005	Below Detection	0.1	7.9	0
12/14/2006	Below Detection	0.1	8	0
12/18/2007	Below Detection	0.1	7.8	0
12/17/2008	Below Detection	0.1	7.8	0
12/10/2009	Below Detection	0.1	7.8	0
12/09/2010	Below Detection	0.05	8	0
12/12/2011	Below Detection	0.1	7.9	0
12/13/2012	Below Detection	0.1	8	0
12/18/2013	Below Detection	0.1	8.2	0
12/08/2014	Below Detection	0.1	7.8	0
	Count	12	12	12
	Average	0.09	7.92	-0.01
	20th Percentile	0.10	7.80	0.00
	50th Percentile	0.10	7.90	0.00
	80th Percentile	***0.10***	***8.00***	***0.00***

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ATTACHMENT 5

Point Source Dischargers Flow Rate

Raw and Reduced Effluent Flow Data

	Flow rate	
	30 Day Avg. (MGD)	Daily Max (MGD)
February 2010	1.29	1.29
February 2011	1.88	1.88
February 2012	1.88	1.89
February 2013	1.87	1.89
March 2014	0.28	0.28
April 2014	0.1	0.1
February 2015	0.29	0.29
March 2015	0.29	0.29
January 2016	0.72	0.72
February 2016	0.72	0.72
March 2016	0.72	0.72
April 2017	0.72	10.08*
	Average	0.90
	50th Percentile	0.72
	80th Percentile	1.76
	80th Percentile (cfs)	***2.73***

*The Daily Maximum reported for April 2017 was inconsistent with other flow rate information. The 30-Day Average of 0.72 MGD was used in the calculations for this month.

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ATTACHMENT 6

Receiving Stream Flow Data

RECEIVING STREAMFLOW DATA
USGS 06395000 Gauging Station

The data to develop the seasonal 7Q5 low flows was obtained from the USGS gauging station USGS 06395000. The period of the data is from January 1, 2003 through December 31, 2017. This data can be obtained at http://waterdata.usgs.gov/sd/nwis/sw.

Monthly 7Q5s

Month	7Q5
Jan	1.0354
Feb	3.0158
Mar	6.0496
Apr	6.2305
May	5.8171
Jun	1.9991
Jul	0.1039
Aug	0.0516
Sep	0.0708
Oct	0.0172
Nov	0.995
Dec	0.847

Calculation Statistics

Month	Standard Deviation	Skew	zfactor	kfactor
Jan	4.068874	-3.872984	-0.839527	-0.219
Feb	1.301612	-1.377495	-0.839527	-0.699
Mar	1.207279	0.748755	-0.839527	-0.853
Apr	0.993312	0.091962	-0.839527	-0.844
May	0.948493	0.171429	-0.839527	-0.847
Jun	2.098383	-0.537519	-0.839527	-0.801
Jul	4.570038	-2.406148	-0.839527	-0.52
Aug	4.502515	-2.166091	-0.839527	-0.566
Sep	4.237474	-2.511049	-0.839527	-0.5
Oct	5.438355	-2.063959	-0.839527	-0.585
Nov	2.340961	-2.108687	-0.839527	-0.577
Dec	4.039872	-3.812876	-0.839527	-0.232

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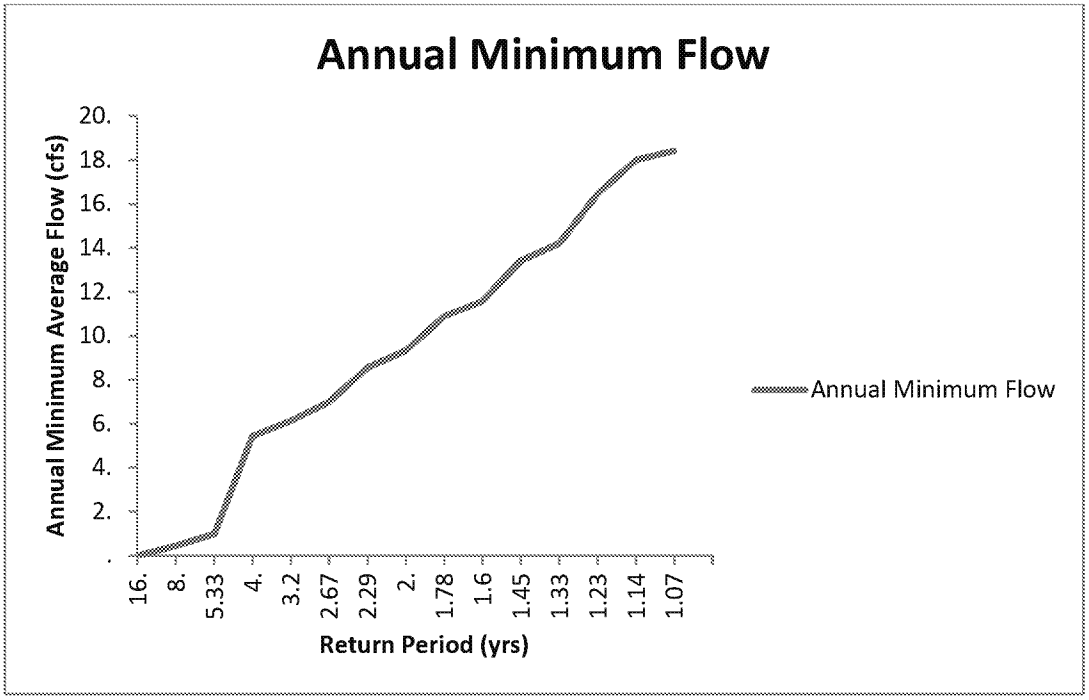
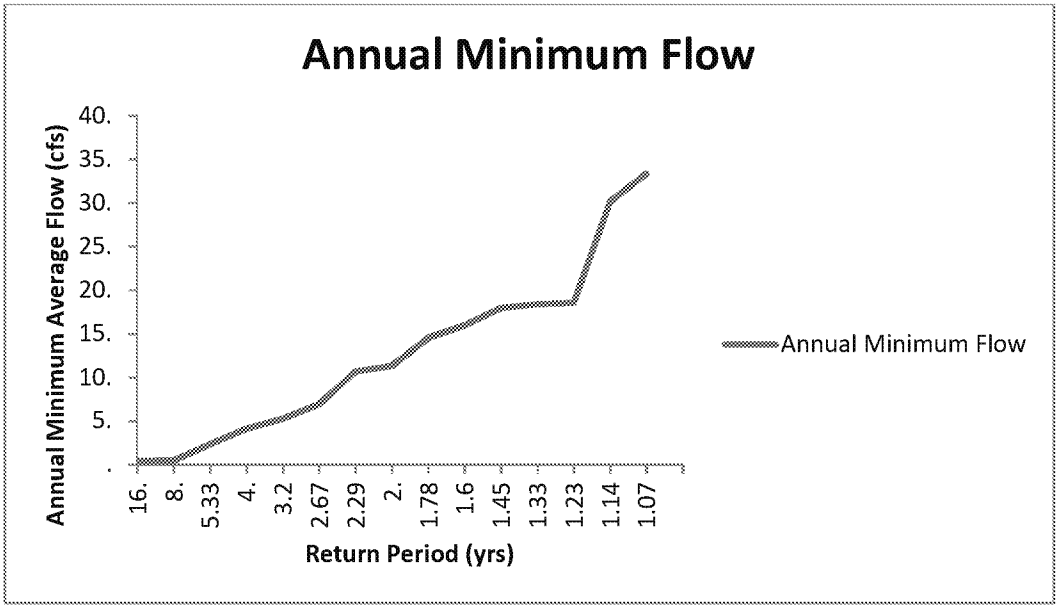
January



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2008	1	16.00	0.00	-13.82
2017	2	8.00	0.45	-0.79
2009	3	5.33	0.99	-0.01
2007	4	4.00	5.44	1.69
2010	5	3.2	6.14	1.82
2013	6	2.67	7.00	1.95
2005	7	2.29	8.56	2.15
2011	8	2.00	9.34	2.23
2006	9	1.78	10.9	2.39
2004	10	1.60	11.57	2.45
2003	11	1.45	13.43	2.60
2015	12	1.33	14.21	2.65
2016	13	1.23	16.46	2.80
2012	14	1.14	18.00	2.89
2014	15	1.07	18.43	2.91

ED_005364I_00029056-00247

February



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2008	1	16.00	0.41	-0.89
2017	2	8.00	0.51	-0.68
2009	3	5.33	2.37	0.86
2007	4	4.00	4.14	1.42
2010	5	3.20	5.27	1.66
2006	6	2.67	6.97	1.94
2004	7	2.29	10.71	2.37
2011	8	2.00	11.36	2.43
2003	9	1.78	14.57	2.68
2005	10	1.60	16.00	2.77
2013	11	1.45	18.00	2.89
2012	12	1.33	18.43	2.91
2014	13	1.23	18.57	2.92
2016	14	1.14	30.21	3.41
2015	15	1.07	33.41	3.51

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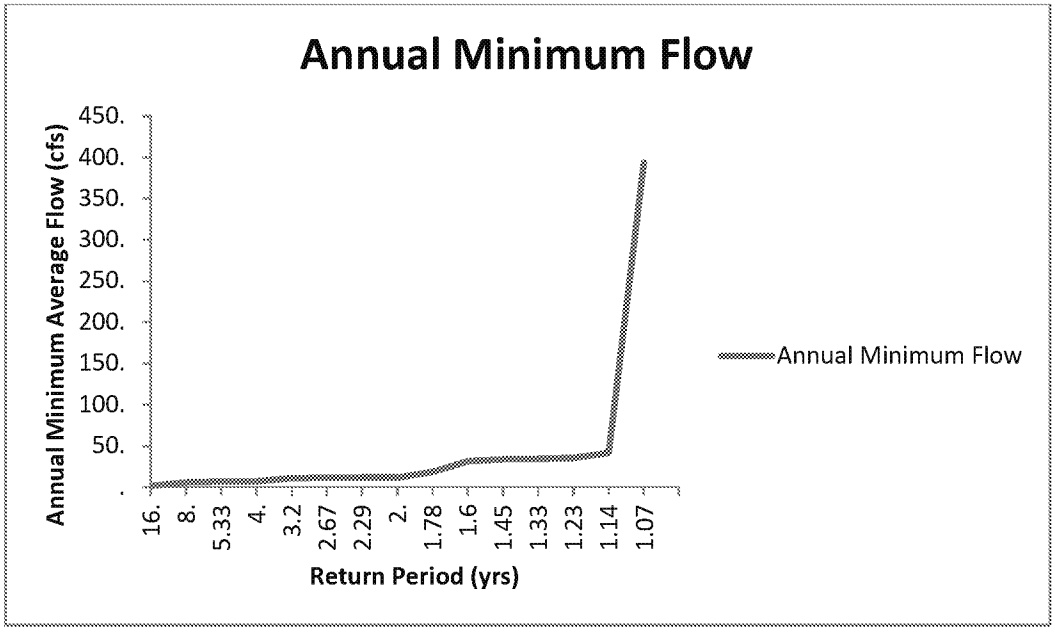
March



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2008	1	16.00	1.50	0.41
2005	2	8.00	5.73	1.75
2009	3	5.33	6.81	1.92
2007	4	4.00	7.12	1.96
2006	5	3.20	10.74	2.37
2003	6	2.67	11.57	2.45
2004	7	2.29	11.64	2.45
2010	8	2.00	11.67	2.46
2013	9	1.78	18.43	2.91
2012	10	1.60	31.43	3.45
2014	11	1.45	33.71	3.52
2015	12	1.33	34.30	3.54
2017	13	1.23	35.37	3.57
2016	14	1.14	41.34	3.72
2011	15	1.07	393.86	5.98

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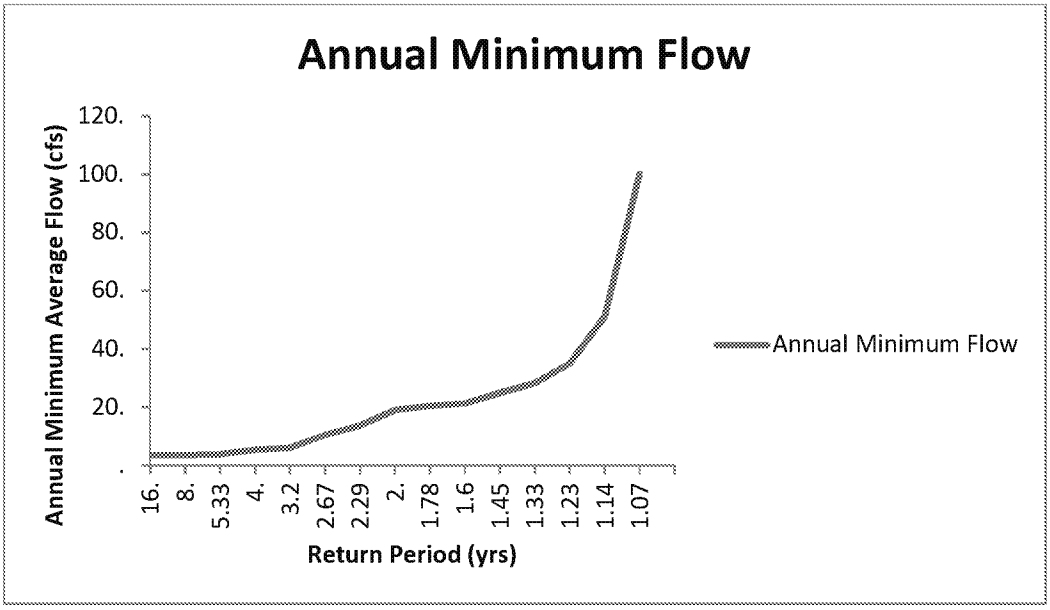
April



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2007	1	16.00	3.46	1.24
2004	2	8.00	3.51	1.26
2005	3	5.33	3.87	1.35
2008	4	4.00	5.43	1.69
2006	5	3.20	6.15	1.82
2013	6	2.67	10.49	2.35
2010	7	2.29	13.70	2.62
2015	8	2.00	19.04	2.95
2003	9	1.78	20.49	3.02
2016	10	1.60	21.31	3.06
2012	11	1.45	24.94	3.22
2017	12	1.33	28.29	3.34
2009	13	1.23	35.04	3.56
2014	14	1.14	51.17	3.94
2011	15	1.07	100.23	4.61

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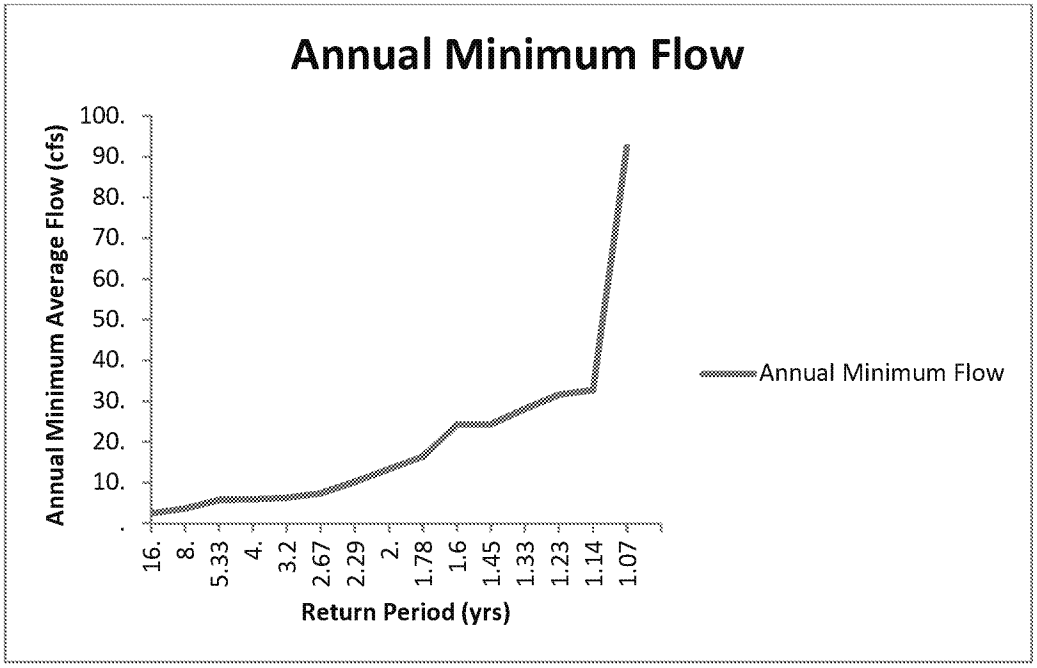
May



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2004	1	16.00	2.48	0.91
2007	2	8.00	3.60	1.28
2013	3	5.33	5.79	1.76
2008	4	4.00	5.88	1.77
2005	5	3.20	6.29	1.84
2006	6	2.67	7.44	2.01
2003	7	2.29	10.23	2.33
2012	8	2.00	13.33	2.59
2009	9	1.78	16.40	2.80
2016	10	1.60	24.23	3.19
2010	11	1.45	24.33	3.19
2017	12	1.33	28.09	3.34
2015	13	1.23	31.64	3.45
2014	14	1.14	32.76	3.49
2011	15	1.07	92.43	4.53

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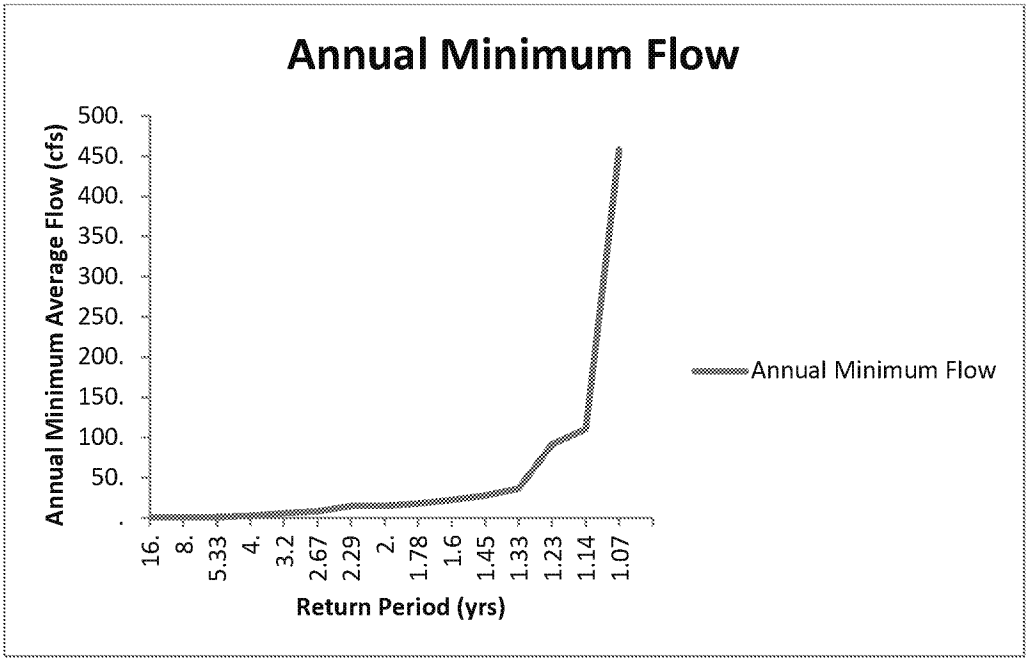
June



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2006	1	16.00	0.13	-2.06
2007	2	8.00	0.43	-0.85
2004	3	5.33	0.88	-0.12
2012	4	4.00	2.86	1.05
2016	5	3.20	6.04	1.80
2003	6	2.67	8.38	2.13
2009	7	2.29	14.70	2.69
2005	8	2.00	14.86	2.70
2017	9	1.78	18.10	2.90
2013	10	1.60	22.26	3.10
2014	11	1.45	28.10	3.34
2008	12	1.33	36.83	3.61
2011	13	1.23	91.83	4.52
2010	14	1.14	110.51	4.71
2015	15	1.07	458.43	6.13

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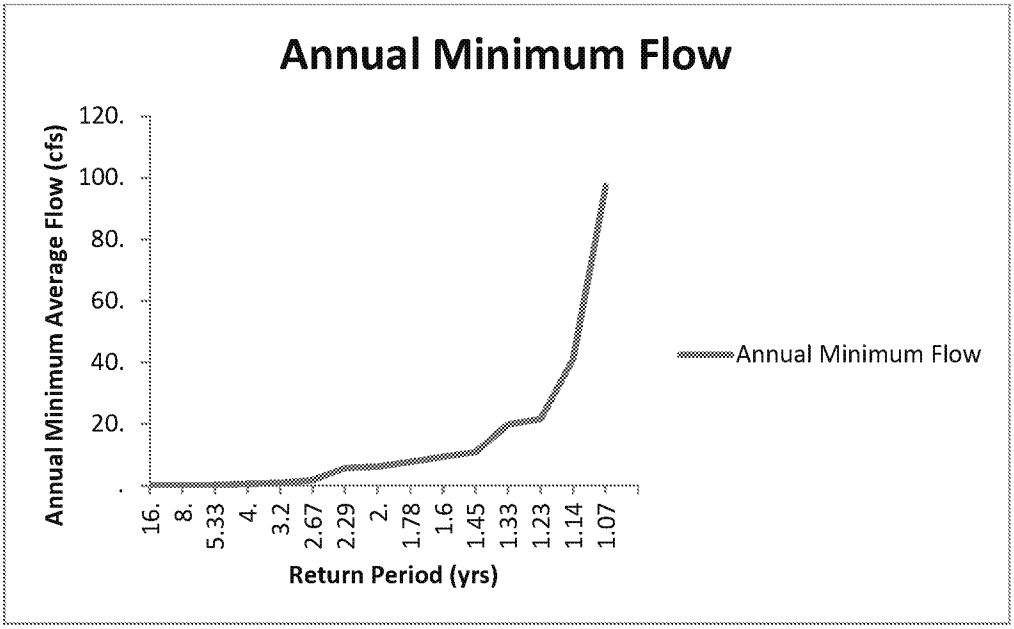
July



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2006	1	16.00	0.00	-13.82
2004	2	8.00	0.00	-6.55
2007	3	5.33	0.12	-2.13
2012	4	4.00	0.50	-0.69
2003	5	3.20	0.79	-0.24
2005	6	2.67	1.73	0.55
2016	7	2.29	5.70	1.74
2017	8	2.00	6.15	1.82
2009	9	1.78	7.67	2.04
2013	10	1.60	9.35	2.23
2014	11	1.45	10.85	2.38
2011	12	1.33	19.83	2.99
2008	13	1.23	21.61	3.07
2010	14	1.14	41.17	3.72
2015	15	1.07	97.27	4.58

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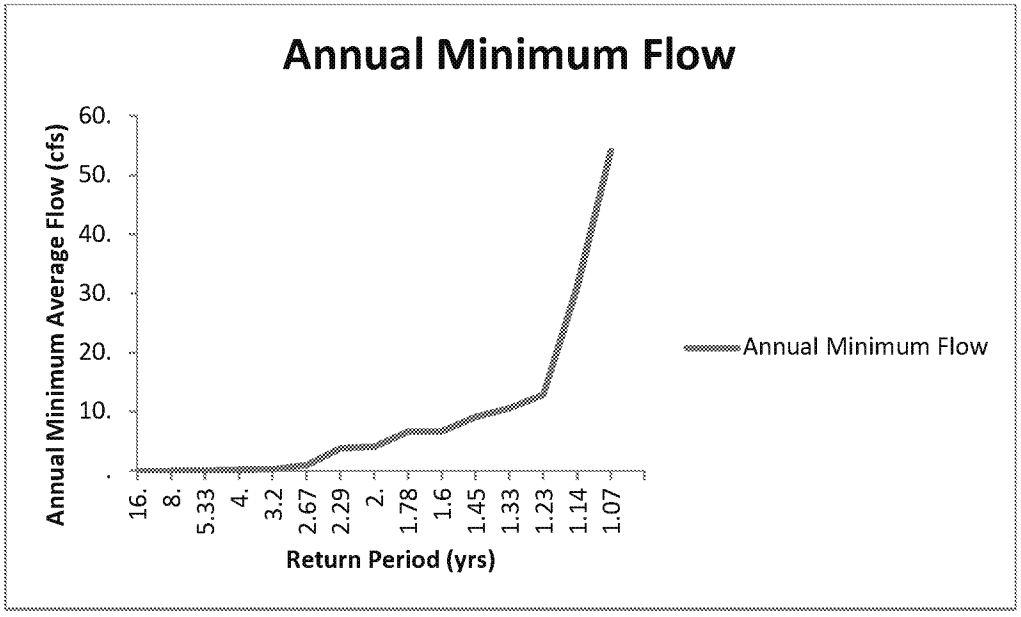
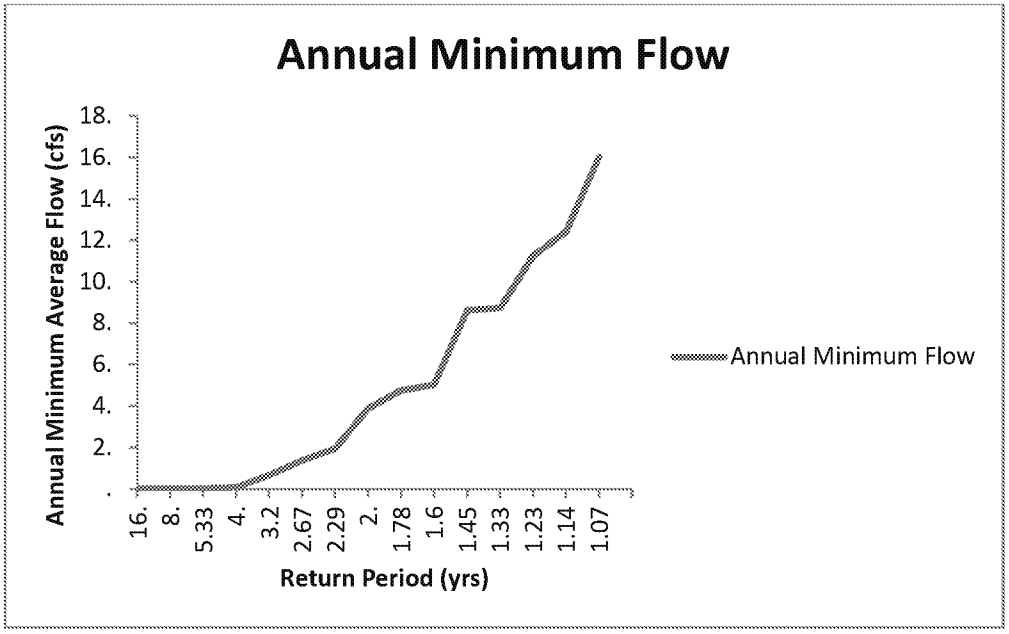
August



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2004	1	16.00	0.00	-13.82
2006	2	8.00	0.00	-5.86
2007	3	5.33	0.01	-4.61
2012	4	4.00	0.19	-1.65
2003	5	3.20	0.26	-1.36
2005	6	2.67	0.96	-0.04
2009	7	2.29	3.81	1.34
2008	8	2.00	4.10	1.41
2017	9	1.78	6.62	1.89
2010	10	1.60	6.70	1.90
2016	11	1.45	9.13	2.21
2014	12	1.33	10.63	2.36
2011	13	1.23	12.86	2.55
2013	14	1.14	31.09	3.44
2015	15	1.07	54.17	3.99

ED_005364I_00029056-00254

September



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2004	1	16.00	0.00	-13.82
2007	2	8.00	0.01	-4.94
2006	3	5.33	0.02	-3.91
2012	4	4.00	0.08	-2.47
2003	5	3.20	0.67	-0.40
2009	6	2.67	1.38	0.32
2008	7	2.29	1.95	0.67
2017	8	2.00	3.89	1.36
2010	9	1.78	4.77	1.56
2005	10	1.60	5.04	1.62
2016	11	1.45	8.63	2.16
2013	12	1.33	8.74	2.17
2011	13	1.23	11.26	2.42
2014	14	1.14	12.43	2.52
2015	15	1.07	16.04	2.78

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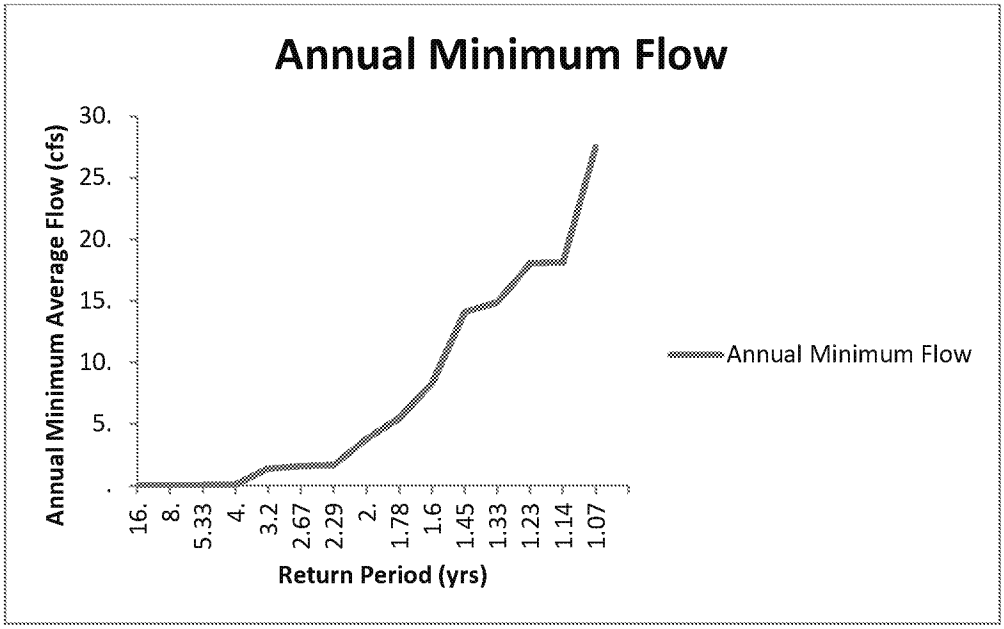
October



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2004	1	16.00	0.00	-13.82
2007	2	8.00	0.00	-13.82
2006	3	5.33	0.02	-3.91
2012	4	4.00	0.08	-2.54
2009	5	3.20	1.37	0.32
2008	6	2.67	1.58	0.45
2003	7	2.29	1.66	0.51
2010	8	2.00	3.80	1.33
2005	9	1.78	5.47	1.70
2013	10	1.60	8.31	2.12
2011	11	1.45	14.1	2.65
2017	12	1.33	14.89	2.70
2016	13	1.23	18.06	2.89
2015	14	1.14	18.11	2.90
2014	15	1.07	27.49	3.31

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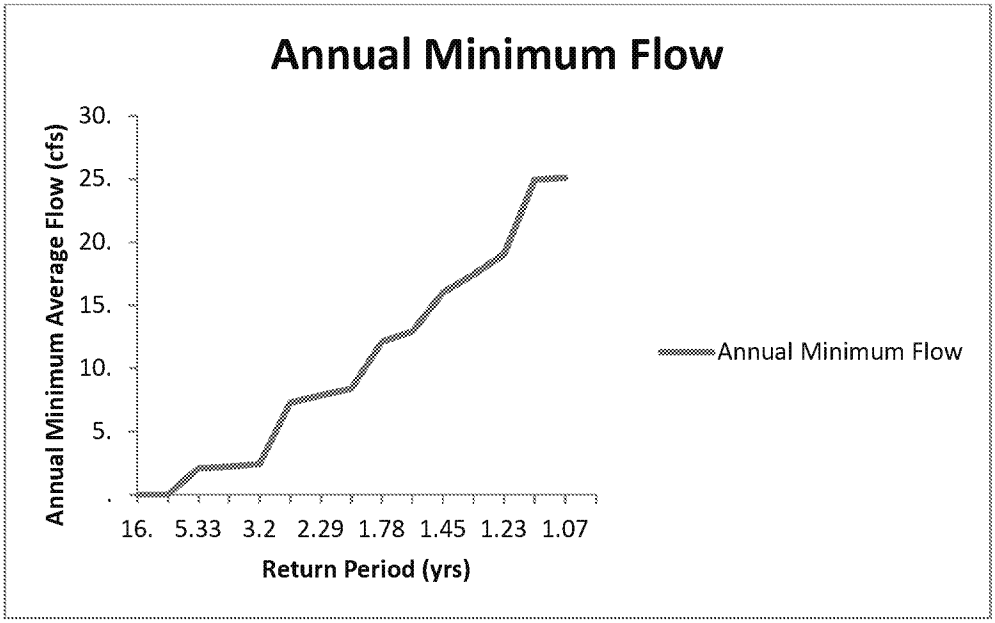
November



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2007	1	16.00	0.01	-4.61
2006	2	8.00	0.02	-3.91
2008	3	5.33	2.08	0.73
2004	4	4.00	2.23	0.80
2005	5	3.20	2.44	0.89
2003	6	2.67	7.30	1.99
2009	7	2.29	7.88	2.06
2010	8	2.00	8.41	2.13
2012	9	1.78	12.11	2.49
2014	10	1.60	12.94	2.56
2017	11	1.45	16.01	2.77
2011	12	1.33	17.46	2.86
2016	13	1.23	19.07	2.95
2015	14	1.14	24.96	3.22
2013	15	1.07	25.15	3.22

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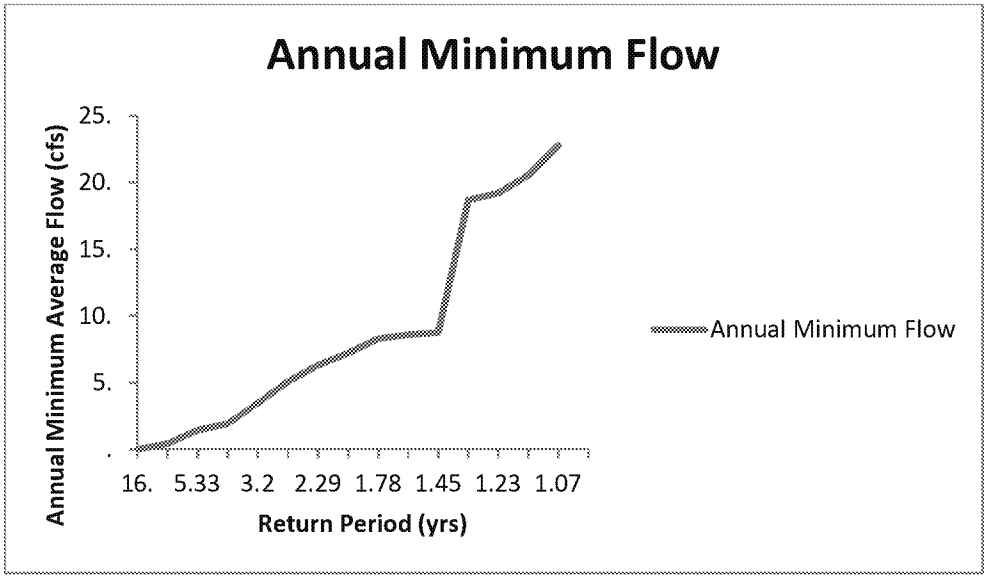
December



Year	Rank	Return Period	Annual Minimum Flow	Log Flow
2007	1	16.00	0.00	-13.82
2016	2	8.00	0.43	-0.83
2005	3	5.33	1.46	0.38
2008	4	4.00	1.93	0.66
2017	5	3.20	3.46	1.24
2006	6	2.67	5.07	1.62
2009	7	2.29	6.31	1.84
2012	8	2.00	7.21	1.98
2004	9	1.78	8.31	2.12
2010	10	1.60	8.61	2.15
2003	11	1.45	8.77	2.17
2011	12	1.33	18.71	2.93
2014	13	1.23	19.23	2.96
2013	14	1.14	20.57	3.02
2015	15	1.07	22.81	3.13

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Appendix D

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL
Scott T. Anderson
Director

April 26, 2016

Binesh Tharakan
U.S. NRC Region IV
Division of Nuclear Materials Safety
1600E. Lamar Blvd
Arlington, TX 76011-4511

RE: Transportation Incident at the White Mesa Mill Involving an 11e.(2) Shipment

Dear Mr. Tharakan:

On March 29, 2016, Energy Fuels Resources Inc.'s (EFRI) White Mesa Uranium Mill contacted the Division of Waste Management and Radiation Control to report a leaking shipment of 11e.(2) material that had arrived at its facility. The Radiation Safety Officer of the Mill described the material as a white paste like substance. The 11e.(2) shipment originated from the Cameco-Smith Ranch facility (a Nuclear Regulatory Commission (NRC) licensed facility) in Wyoming and was sent to the Mill to be disposed in the Mill's tailings cells.

The Mill's radiation safety staff documented the leak with photographs, radiological surveys and a written description. Documentation of the leak indicates that 11e.(2) material leaked onto the transport container, the transport conveyance and U.S. Highway 191 near the Mill. During transport, a winter storm with rain and snow went through Wyoming, Colorado and Utah when this incident occurred (March 28 and 29, 2016). Therefore, there is a high probability that any road contamination would have been washed away and making it impossible to determine when the leaking of the transport began.

A further description of the incident from EFRI dated April 4, 2016, including radiological survey results, is enclosed.

The following regulations are applicable to this incident:

1. 49 CFR 173.427(c)(1) – *Transportation requirements for low specific activity (LSA) Class 7 (radioactive) material and surface contaminated objects (SCO).*

(Over)

DRC-2016-006043

195 North 1950 West • Salt Lake City, UT
Mailing Address: P.O. Box 144880 • Salt Lake City, UT 84114-4880
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2. 49 CFR 173.443 - *Contamination control*
3. 10 CFR 71.43(f) – *General standards for all packages*
4. 10 CFR 71.71 - *Normal conditions of transport*

Contrary to 49 CFR 173.427(c)(1), 10 CFR 71.43(f) and 10 CFR 71.71, the Cameco-Smith Ranch Facility sent an 11e.(2) shipment to the White Mesa Mill in a roll-off container that did not contain the material under routine (normal) conditions of transport.

Contrary to 49 CFR 173.443, leakage from that container resulted in removable contamination on the outside of the container that exceeded DOT contamination limits for Alpha and an exterior dose rate greater than 0.5 mrem per hour.

This is the second incident of this type that has been reported to the Division with the first being reported on August 21, 2015. The Division requests that NRC take appropriate regulatory action with Cameco-Smith Ranch to prevent recurrence. Please find enclosed the EFRI report of the incident, photographs and shipping papers.

If you have any questions, please call Ryan Johnson at (801) 536-4255.

Sincerely,

Scott T. Anderson, Director
Division of Waste Management and Radiation Control

STA/RMJ/ka

Enclosures: Documentation Letter, dated April 4, 2016 (DRC-2016-006042)
Cameco Smith Ranch Shipping Paperwork (DRC-2016-006041)
Photographs (DRC-2016-006044)
Email from Ryan Johnson, dated March 29, 2016 (DRC-2016-006045)

c: Worthy Glover, Jr., MMHRM, CPM, Health Office San Juan Public Health Department
Rick Meyer, Environmental Health Director, San Juan Public Health Department
David Ariotti, P.E., DEQ District Engineer
Ms. Linda Gersey, U.S. NRC Region IV, Division of Nuclear Materials Safety
Ryan S. Schierman, State of Wyoming, Wyoming Department of Environmental Quality, Natural Resources Program Manager
Jennifer Opila, Colorado Department of Public Health & the Environment, Hazardous Materials & Waste Management Division, Radiation Program, Program Manager

Energy Fuels Resources (USA) Inc.
225 Union Blvd. Suite 600
Lakewood, CO, US, 80228
303 974 2140
www.energyfuels.com

April 4, 2016

Sent VIA E-MAIL AND EXPRESS DELIVERY

Mr. Scott Anderson
Director
Division of Waste Management and Radiation Control
Utah Department of Environmental Quality
195 North 1950 West
P.O. Box 144880
Salt Lake City, UT 84114-4820

Re: Transmittal of Documentation for Follow-up to Notifications Provided to the Division of Waste Management and Radiation Control ("DWMRC") for White Mesa Uranium Mill

Dear Mr. Anderson:

Attachment 1 to this letter provides Energy Fuels Resources USA Inc.'s ("EFRI's") follow-up documentation to previous notifications to DWMRC Personnel by David Turk on March 29, 2016 regarding Cameco 11e.(2) shipping issues.

Department of Transportation ("DOT") regulations in 49 CFR 171.15 require that persons in physical possession of a material during an incident provide notifications to DOT after the occurrence of any incident. Pursuant to this requirement, Greenfield Logistics made the appropriate notifications to U.S. DOT National Response Center on March 29, 2016.

If you should have any questions regarding this submittal please contact me at 303-389-4134.

Yours very truly,

Kathy Weinel

ENERGY FUELS RESOURCES (USA) INC.
Kathy Weinel
Quality Assurance Manager

CC: David Frydenlund
Harold Roberts
David Turk
Logan Shumway
Scott Bakken

ATTACHMENT 1

DOCUMENTATION FOR INCIDENT OF MARCH 29, 2016

Name of Reporter to DWMRC
Verbal Notification was provided to the Division of Waste Management and Radiation Control ("DWMRC") by David Turk White Mesa Mill Radiation Safety Officer ("RSO")
Initial written notification via e-mail was provided by David Turk White Mesa Mill RSO
This follow-up notification is provided by Kathy Weinel, EFRI Quality Assurance Manager ("QAM")

Notifications were provided to Mr. Phil Goble and Mr. Ryan Johnson of DWMRC on March 29, 2016.

Name and Address of Person Represented by Reporters
Energy Fuels Resources USA Inc.
225 Union Boulevard, Suite 600
Lakewood, Colorado 80228

For an incident located near:
White Mesa Mill
6425 South Highway 191
Blanding Utah, 84511

Phone Numbers Where Reporters Can Be Contacted
David Turk 435-678-4113
Kathy Weinel 303-389-4134

Date, Time, and Location of Incident
At approximately 0730 hours on Tuesday March 29, 2016, the staff at the White Mesa Mill (the "Mill") noted that an incoming Intermodal Container ("IMC") from Cameco - Smith Ranch was leaking a white paste like material. The IMC had traveled from the Cameco Smith-Ranch Facility in Glenrock, Wyoming overland to the Mill entrance in Blanding, Utah.

The incident involved a leaking 11e.(2) disposal shipment from Cameco – Smith Ranch in the Mill entry way. In addition, some material had spilled out of the container onto US Highway 191.

The Extent of the Injury
No injuries resulted from this incident.

Class or Division, Proper Shipping Name and Quantity of Hazardous Materials Involved
The leaked material is Class 7, UN2912, Radioactive Material, Low Specific Activity (LSA-1).

It is estimated that less than 5 gallons was present at the entrance to the Mill and on the truck and IMC.

Type of Incident and Nature of Hazardous Material Involvement and Whether a Continuing Danger to Life Exists at the Scene
The incident involved an IMC that was leaking a small amount of material. Some material had dripped from the truck and contacted the highway. The majority of the leaked material remained affixed to the IMC and transport truck. The leaking material was identified as Class 7, UN2912, Radioactive Material, Low Specific Activity (LSA-1).

At no time during the incident was there a danger to life.

The materials which were noted on the Highway 191 surfaces, as well as those on Mill property, were cleaned up following the incident by Mill Personnel.

Chronology of the Incident

- At approximately 0730 hours on Tuesday March 29, 2016, the staff at the Mill noted that an incoming IMC from Cameco - Smith Ranch was leaking a white paste like material. The IMC and truck were denied entry to the Mill facility pending investigation and approval from DWMRC.
- The RSO was notified. The RSO immediately examined the container and truck and took photographs.
- The RSO contacted Mr. Phil Goble with the State of Utah Division Of Waste Management and Radiation Control at approximately 0800 hours. The notification to Mr. Goble, included notice that a leaking 11e.(2) disposal shipment from Cameco – Smith Ranch arrived at the Mill and was sitting in the Mill entry way. Mr. Goble was also notified that there was white material that had spilled out of the container onto US Highway 191 near the entrance to the Mill property.
- After notification was given to the DWMRC, the RSO made contact with EFRI Corporate Staff. Ms. Kathy Weinel was notified via phone at approximately 0830 hours. Photographs were sent to EFRI Corporate Staff via text messaging.
- Ms. Weinel phoned the site RSO for Cameco Smith Ranch, a Mr. Travis Coleman. Mr. Coleman was not in the office and a voicemail was left.
- Ms. Weinel then contacted the Mine Manager, Mr. Craig Hiser to report the spill. This was the first notice to Mr. Hiser of an issue with the shipment as Greenfield Logistics, the shipping company, had not yet notified Smith Ranch Personnel of the incident.
- The RSO returned to the inbound shipment and took multiple photographs of the tractor, trailer and IMC and began a radiological survey of the material that was visible on US Highway 191 and EFRI entrance road.
- The white material on the asphalt highway and roadway ranged from 5,850 to 9,360 dpm/100cm^2 for alpha and 0.04 to 0.08 mrem/hr beta/gamma.
- There were four removable alpha swipes taken on the asphalt roadways. Those readings came back at 383 to 492.5 dpm/100cm^2.
- During the radiological survey, the RSO was contacted by the Greenfield Logistics dispatcher, Mr. Chris Hartley, to make sure that we were aware of the leaking container. He was told that EFRI was aware of the situation and that EFRI was in the process of gathering information and data for the report to DWMRC. Mr. Hartley was also notified that the container would not be released, because the container would need to be fully cleaned before allowing it to leave the facility. Due to the deteriorating weather conditions the cleaning process for that container was not possible at that time.
- The Mill Personnel went to the conveyance and performed a radiological survey on all components where there was visible material. The material came back with a total alpha measurement of between 35,100 to 58,500 dpm/100cm^2. The beta/gamma survey on the same material was 5.0 mrem/hr. A series of removable alpha swipes were collected. Those readings ranged from the lowest on the tires at 438.8 dpm/100cm^2 to the highest on the beam under the potential source at 2,551.3 dpm/100cm^2.
- The RSO spoke with the Greenfield driver, Mr. Doug Angell. He stated that he noticed the leaking container when he pulled onto our entrance way at 2330 hours on Monday March 28, 2016. He stated he then texted his dispatcher at that time about the leak. He also stated that on Monday March 28, 2016, while traveling near Meeker, Colorado, a deer ran in front of the truck and he had to hit the brakes hard. That was the only time during the trip that there was any sudden jarring of the load. He stated that he had filled up with fuel in Rawlins, Wyoming and, at that time, there was no leakage. It should be noted that all seals were still intact that Cameco installed prior to the container leaving their site.

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- At approximately 0945 hours on Tuesday March 29, 2016, the RSO allowed the load onto the property pursuant to approval from DWMRC Personnel. The main reason for the allowing the truck and IMC onto the Mill property was that rain was starting to fall and washing some of the material off of the container and onto the ground. In order to prevent a larger cleanup, the decision was made to move the truck and IMC to the Mill Restricted Area.
- The area on US Highway 191 and the EFRI entrance way was washed and any contaminated soil (approximately 5 to 6 cubic yards) was excavated and taken into the Mill Restricted Area and then out to Cell 3 for disposal. The cleanup area extended approximately ¼ of a mile north on US Highway 191. The area was surveyed after the rain/snow storm stopped. Data from these scans is summarized below.

Summary of Scan Results

Location	Background Units	Pre-Cleanup Results Units	Post-Cleanup Results Units
EFRI Entrance Road	212 dpm/100cm^2 and 10 μR/hr	5,850 dpm/100cm^2 and 0.04 mrem/hr	≤ Bkg and 23 μR/hr
US Highway 191 turnout	212 dpm/100cm^2 and 10 μR/hr	9,360 dpm/100cm^2 and 0.08 mrem/hr	≤ Bkg and 20 μR/hr
US Highway 191	212 dpm/100cm^2 and 10 μR/hr	5,850 dpm/100cm^2 and 0.04 mrem/hr	≤ Bkg and 10 μR/hr
Greenfield Truck	212 dpm/100cm^2 and 0.04 mrem/hr	35,100 dpm/100cm^2 and 5.0 mrem/hr	≤ Bkg and ≤ 0.04 mrem/hr
Greenfield IMC	212 dpm/100cm^2 and 0.04 mrem/hr	58,500 dpm/100cm^2 and 5.0 mrem/hr	Is still in the process of being cleaned

- The inbound IMC was dumped on Cell 3 and the then moved to the vicinity of the Old Decontamination pad in order for EFRI to perform a detailed decontamination of the unit once conditions improve. The truck was taken through the Old Decontamination wash station. The truck was released from the site at 1130 hours. All release surveys on the truck met applicable standards.
- At approximately 1830 hours on March 29, 2016, Greenfield Logistics reported the incident to DOT National Response Center. Kevin Williams at the National Response Center took the call and issued Case # 1144028. Shane Johnson of Greenfield Logistics received a call from DOT to review the details of the report. Per e-mail communications from Greenfield Logistics, DOT considers the incident report closed.
- At approximately 0900 hours on March 30, 2016, Ms. Weinel spoke with Mr. Travis Coleman. Mr. Coleman was notified that this was the second incident of this type involving this material. EFRI recommended Smith-Ranch Personnel conduct an internal investigation into this incident to prevent recurrence.
- The US. Nuclear Regulatory Commission ("NRC") requested that Cameco retrace the route of the shipment to investigate the potential for additional released material. The Cameco team obtained a detailed account of the route. In the event that additional released material was identified, Cameco's Emergency Response contractor was standing by to respond.
- On April 1, 2016 a Cameco team comprised of the Smith Ranch RSO, Mr. Travis Coleman, a Smith Ranch Health Physics Technician ("HPT"), Mr. Chris Pendleton, and Mr. Ken Vaughn, the Cameco Director of Communications traveled to the Mill in Blanding Utah. They arrived at 1830 on Friday, April 1, 2016.
- The Cameco team surveyed Highway 191 from the Mill entrance to the 4-way intersection in Blanding in ¼ mile increments. No readings above background were noted.
- On April 2, 2016, the Cameco team retraced the shipping route and surveyed at points along the road. Additional data were collected in and around Meeker, Colorado due to the Greenfield

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driver stating he had to stop quickly to avoid a deer in that area. Due to the potential for additional spillage, this area was surveyed at a higher frequency.

- Photographs are included on the CD attached to the hardcopy of this notice.

Conclusion

After final decontamination of the IMC to appropriate release standards, the IMC will be released. No further cleanup activities at the Mill, on Highway 191, or the travel way are required. EFRI has requested that Cameco Smith-Ranch personnel complete an investigation of the cause of this incident and take appropriate actions to prevent recurrence in the future. Cameco Resources has suspended all waste shipments from Smith Ranch-Highland and Crow Butte until the issue(s) that resulted in the incident are fully addressed. Cameco's investigation will address both the type of material and method of shipment (regarding no free liquid).

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Shipper No. 3/169

STRAIGHT BILL OF LADING
ORIGINAL–NOT NEGOTIABLE

Carrier No. _____

Greenfield Logistics
(Name of Carrier) (SCAC)

Date 3/28/16

on Collect on Delivery shipments, the letters COD must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

To: Consignee Energy Fuels

Street 6425 South HWY 191

City Blanding State UT Zip Code 84511

From: Shipper CAMECO RESOURCES, INC.

Street: 762 Ross Rd

City Douglas State WY Zip Code 82633

24 hr. Emergency Contact Tel. No: 905-885-8745

Route :

Vehicle: Number

No. of units & container type	HM	Basic Description Proper Shipping Name, Hazard Class, Identification Number (UN or NA), Packing Group, per 172.101, 172.202, 172.203	Total Quantity (Weight, Volume, Gallons, etc.)	Weight (Subject to Correction)	RATE	Charges (For Carrier Use Only)
1 Roll off	XX	UN2912, RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1), CLASS 7	9.9m³ (13yd³)			
		RADIONUCLIDE: RESIDUAL NATURAL URANIUM & ASSOCIATED DAUGHTER PRODUCTS				
		PHYSICAL FORM: SOLID				
		CHEMICAL FORM: NATURAL URANIUM OXIDE UO_4-$2H_2O$				
		TOTAL ACTIVITY:1.83E9Bq (.05Ci)				
		TRANSPORT INDEX: N/A AS PER 49CFR172.203(d)(5)				
		PLACARDS: RADIOACTIVE 7				
		EXCLUSIVE USE SHIPMENT: THIS VEHICLE IS ASSIGNED FOR EXCLUSIVE USE OF CAMECO RESOURCES, INC. UNDER PROVISIONS OF 49 CFR 173.427 INCLUDING EXEMPTING FROM MARKING AND LABELING REQUIREMENTS				
		DO NOT LOAD OTHER FREIGHT IN THIS VEHICLE, TRANSFER EN ROUTE				

PLACARDS TENDERED: ~~YES~~ : X NO ☐

REMIT C.O.D. TO:
ADDRESS

Note-(1) Where the rate is dependent on value, shippers are required to state specifically on writing the agreed or declared value of the property, as follows: The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____.
(2) Where the applicable tariff provisions specify a limitation of the carrier's liability absent a release or a value declaration by the shipper and the shipper does not release the carrier's liability or declare a value, the carrier's liability shall be limited to the extent provided by such provisions. See NMFL Item 172.
(3) Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation. See Section 2(e) of Item 360, Bills of Lading, Freight Bills, and Statements of Charges and Section 1(a) of the Contract terms and conditions for a list of such articles.

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked, and labeled/placard, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

ON BEHALF OF SHIPPER

Signature

COD Amt: $

Subject to Section 7 of the conditions if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of Consignor)

C.O.D. FEE:
PREPAID ☐
COLLECT ☐ $

TOTAL CHARGES: $

FREIGHT CHARGES
FREIGHT PREPAID except when box at right is checked
Check box if charges ☐ are to be collect

RECEIVED, subject to the classifications and tariffs in effect on the date of issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of this property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of the shipment.
Shipper hereby certifies that he is familiar with all the lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER: CAMECO RESOURCES, INC.	CARRIER: Greenfield Logistics
PER [signature]	PER Douglas B. Angell
DATE 3/28/16	DATE 3/28/16

Rev 3 – Apr 02, 2015
Page 1 of 1
J:\4) Radiation Protection Program\WYO-RPP-01 (Volume IV-Health Physics)\WYO -RPP-01 (Forms)\WYO-RPP-01.070 Bill of Lading-By-Product-LSA.doc

DATE 3/15/16

CONTAINER # GFLU-1560

LOCATION Selenium Plant

TOTAL YARDS 13 yd

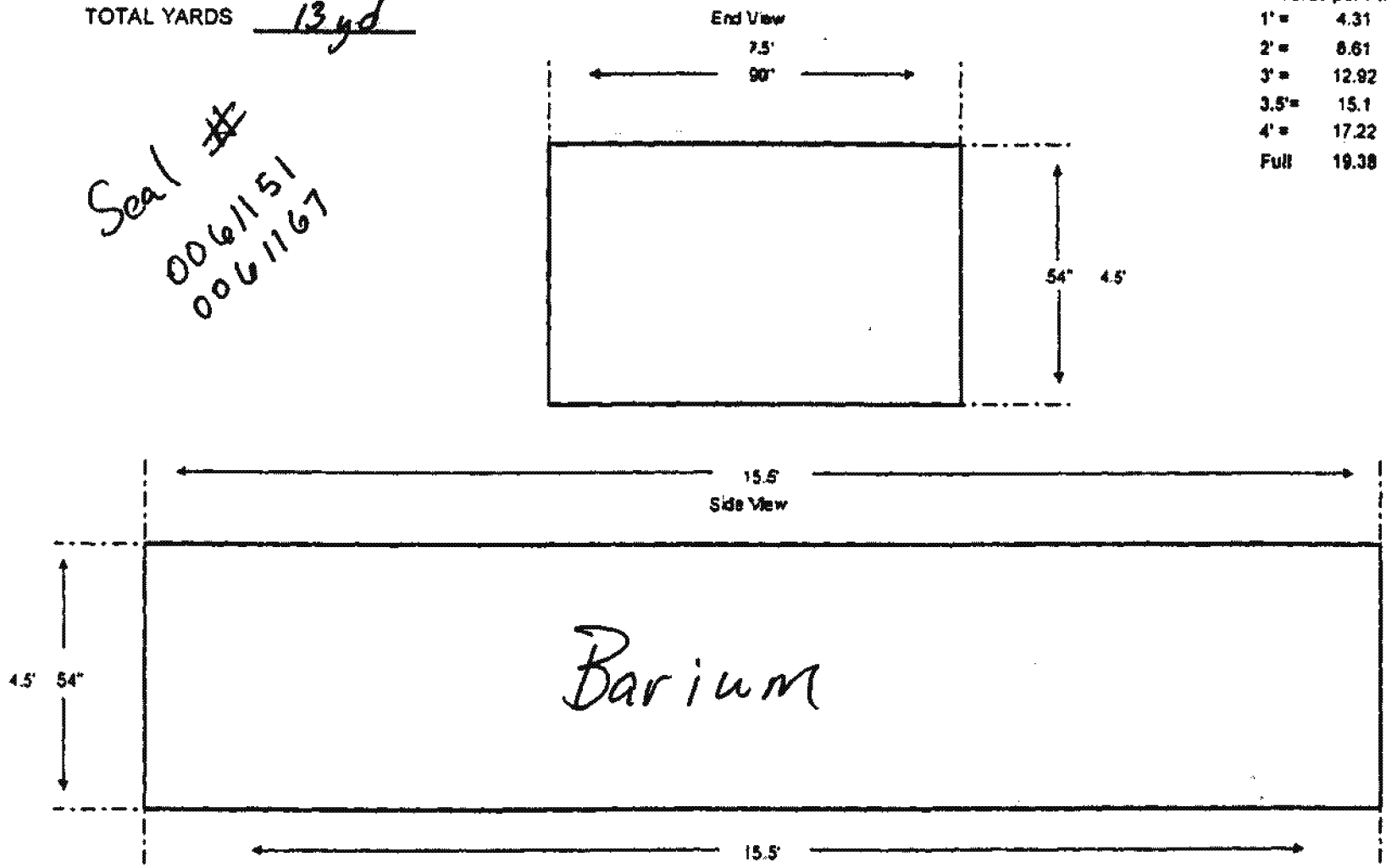
POWER RESOURCES
(dba, Cameco Resources)

Seal #
0061151
0061167

VOLUME PER VERTICAL FOOT

Yards per In.	
1" =	0.36

Yards per Ft.	
1' =	4.31
2' =	8.61
3' =	12.92
3.5'=	15.1
4' =	17.22
Full	19.38



Power Resources
Smith Ranch - Highland Uranium Project
By-product container Cubic Yard Calculation

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Cameco

CAMECO RESOURCES
Smith Ranch-Highland Operation
Mail:
P.O. Box 1210
Glenrock, WY
82637 USA

Tel: (307) 358-6541
Fax (307) 358-4533
www.cameco.com

RELEASE AUTHORIZATION FOR BY-PRODUCT MATERIAL

(Complies with D. O. T. Hazardous Material Regulations, 49 CFR Parts 100-199)

SHIPPER: Cameco Resources
Smith Ranch Highland Operation
762 Ross Road
Douglas, WY 82633
License No. SUA-1548

RECEIVER: Energy Fuels
6425 S. Hwy 191
Blanding, Utah 84511
License No. UT1900479 Amendment #4

SHIPPING DATE: 3/28/16
SRH SHIPMENT #: 3/16-8
TOTAL MAXIMUM ACTIVITY OF LOAD: 1.83E9 (0.05C)

CONTENTS:

☑ UN 2912, Radioactive Material, Low Specific Activity (LSA-1), Class 7 Shipment contains by-product material from an in-situ uranium mine.

☐ RQ, UN 2912, Radioactive Material, Low Specific Activity (LSA-1), Class 7 Shipment contains by-product material from an in-situ uranium mine.

☐ UN 2913, Radioactive Material, Surface Contaminated Objects (SCO-1), Class 7 Shipment contains by-product material from an in-situ uranium mine.

☐ RQ, UN 2913, Radioactive Material, Surface Contaminated Objects (SCO-1), Class 7 Shipment contains by-product material from an in-situ uranium mine.

By execution below, it is represented that the byproduct material being transported is properly classified, described, loaded and labeled; and, that the byproduct material is completely contained and in proper condition for transportation, according to the applicable regulations for the state and federal transportation departments.

The shipper certifies the byproduct material is not listed hazardous waste as defined in the Resource Conservation and Recovery Act, as amended, 40 CFR 261 et. seq. or comparable state laws. The byproduct material has not been mixed or commingled with hazardous waste as defined in 40 CFR 261 et. seq.. No processes are operated on the site which is RCRA-listed processes as defined in 40 CFR 261 et. seq. All of the Byproduct Material is byproduct material as defined under Section 11(e)2 of the Atomic Energy Act of 1954 as amended, 42 U.S.C. §2014(e)(2) and 10 CFR §40.4(a-i). The chemical analysis as listed in Paragraph 2(C) of the Byproduct Disposal Agreement dated June 1, 2010 has been completed for this shipment.

DATE: 3/28/16 BY: [signature]

DRIVER RESPONSIBILITY STATEMENT

I, Douglas B. Angell, driver for Greenfield Logistics

have read and understand the Driver Instructions including Emergency Procedures provided by Cameco Resources. It is understood that I will be responsible for proper care and handling of all materials in the trucks and/or trailers under my jurisdiction.

DATE: 3/28/16

SIGNATURE: Douglas B. Angell

Cameco

Cameco Resources

WYOMING OPERATIONS
BYPRODUCT MATERIAL SHIPMENT TRUCK SURVEY

METER MODEL 3
METER SN 229617
CALIBRATION DATE 5/11/15

SHIPMENT NO. 3/16-8
LOCATION: Selenium Plant
DATE: 3/28/16

RSO/RST
SIGNATURE

METER MODEL 3
METER SN 235586
CALIBRATION DATE 2/9/16

BACKGROUND 0.05 mR/hr

BACKGROUND 0 dmp/100 cm²

Swipe Survey Yes / (No)

Green Field
CARRIER NAME
3
TRACTOR NO.

1560

0.09 mR/hr Driver's Seat

4.0 Surface mR/hr 0.5 6.6' (2 Meters)

425 dpm/100 cm² Surface

0.5 6.6' (2 meters) mR/hr 5.0 Surface

425 dpm/100 cm²

5.0 Surface mR/hr 0.6 6.6' (2 Meters)

283 dpm/100 cm²

Quality Control Checklist (49CFR 173.475)
As Per SHEQ Management System Volume IV-Transportation

The container is in good condition?	✓
The container has been closed properly?	✓
The container has been filled properly?	✓
Exterior contamination/ Radiation levels below the limits?	✓

Limits
Gamma = 200 mR/hr at surface
Gamma = 10 mR/hr at 2 meters
Gamma = 2 mR/hr in cab
Alpha = 1000 dpm/100cm² for swipe survey
Alpha = 2200 dpm/100 cm² for instrument survey

0.4 6.6' (2 Meters) mR/hr 3.0 Surface

708 dpm/100 cm² Surface

Transportation Accident Response Guide (Instructions to the Driver)

1.) Introduction

Transportation accidents during the shipment of radioactive concentrates from uranium recovery facilities (yellowcake, brine, resin, byproduct, or slurry) occur infrequently on public highways and at trucking terminals. This material is classified by DOT as Radioactive (Class 7) material. Leakage or spillage of the contents from its container can be a potential health hazard to persons if they ingest or inhale the materials.

The purpose of this guideline is to provide direction for persons responding to a shipping accident involving radioactive materials, particularly when the contents have leaked from their containers. Leakage or spillage can range in severity depending on the specific accident conditions. Although this guideline addresses the worst-case situation, lesser response activities are envisioned for less severe accidents.

The guideline provides instructions to the driver and to other persons who are the first to arrive at the accident scene. These instructions request notifications be made to the shipper and the carrier. If warranted, the shipper will dispatch an initial response team to assist with accident investigation and response. The shipper will also alert a clean-up crew for possible duty and provide guidance for securing clean-up equipment and services. Clean-up methods, monitoring, sampling, release levels, and concluding activities are also described.

You are advised per these instructions to transport the items defined on the attached shipping documents under "EXCLUSIVE USE" provisions.

"EXCLUSIVE USE" (also referred to as "Sole Use" of "Full Load" as used in IAEA regulations) means any shipment:

- From a single consignor having the exclusive use of a transport vehicle or of an aircraft, or of a hold or compartment of an inland watercraft, or of a hold, compartment, or defined deck area of a seagoing vessel; and

- For which all initial, intermediate, and final loading and unloading is carried out by or under the direction of the consignor, consignee, or his designated agent.

Transportation Accident Response Guide (Instructions to the Driver)

Special remarks concerning exclusive use:

- DO NOT transfer the shipment from the originating carrier vehicle.
- DO NOT load other packages on the originating carrier vehicle.
- Deliver the shipment directly to consignor.
- Special routing may be required per attachment.

Transportation Accident Response Guide (Instructions to the Driver)

2.) Emergency Response Procedures Provided to Carrier

TO WHOM IT MAY CONCERN:

- Rescue and lifesaving may be conducted with minimal potential hazards from the cargo on this truck. If possible, avoid breathing dust from spilled cargo. **DO NOT DELAY RESCUE EFFORTS!**
- After needed rescue, lifesaving, first aid or fire fighting, please read the attached instructions in the event of cargo spillage.
- Please note that this truck is equipped with emergency equipment. It is accessible in the storage area on the neck of the trailer or is _____ (write in location if not located in the trailer neck storage area).

TO THE DRIVER: Keep these emergency procedures with your shipping papers, along with Emergency Information For Carriers Form and Guide 162 Radioactive Materials ERG 2012.

This vehicle contains radioactive materials, which may be in the form of dry uranium oxide (yellowcake, U3O8), yellowcake, **brine, resin,** slurry, or byproduct (waste) material. The color of concentrated material is yellow. The slurry is a liquid material containing solid yellowcake. The material cannot burn or explode. *In the event of an accident involving spillage of material, the following actions are recommended in the order given if appropriate:*

1. Lifesaving, Rescue, and Firefighting

This may be done with minimal potential hazards from the material. If possible, avoid breathing and/or swallowing yellowcake dust, slurry, or byproduct material. The radioactive material on the skin or clothing is relatively harmless and simple washing methods will remove it.

If you believe you may have been contaminated with the material, please remove any contaminated clothing and place in plastic bag, use soap and water to wash contaminates

from hands or exposed area, and notify the Cameco Resources Emergency Response Team (CR ERT) upon their arrival at the accident site. To avoid ingestion of the material, do not eat, drink, or smoke while near the spill.

Transportation Accident Response Guide (Instructions to the Driver)

2. *Contact the Local Law Enforcement Agency*

Tell the police of the accident with spillage of "LOW SPECIFIC ACTIVITY" (LSA) radioactive material called "yellowcake", "slurry" or "byproduct material". Ask them to notify the state health department. Give them the location of the accident site and tell them of any injured persons.

Nebraska State Police:	(308) 632-1211 or (402) 471-4545
Wyoming State Police:	1-800-442-9090
Colorado State Police:	(303) 239-4500
(Emergency Dispatch – 24 hours)	(303) 239-4501
Utah Highway Patrol:	(801) 965-4518

3. *Cover the Spilled Material*

This vehicle carries a spill kit containing gloves, disposable coveralls, shoe covers, radioactive material signs, approved dust respirators with instructions, plastic sheeting, stakes, nails, a hammer, and a knife. Put on coveralls, respirator, gloves, and shoe covers, then cover the spilled material with the plastic. Secure the edges of the plastic to the ground using the stakes, or to the vehicle floor, etc., using the nails. The radioactive material signs should be positioned to provide notice to bystanders.

Unnecessary personnel should be instructed to stand upwind of the spill and 150 feet or more from it. Undamaged containers lying on the road may be moved to the side of the road. Caution: Full drums of yellowcake are very heavy, usually weighing in excess of 500 pounds for slurry and 800 pounds for dry product.

4. *Fill Out the Attached Questionnaire*

Please obtain all of the information requested on the attached form that you can. Please relay this information to the carrier and the shipper listed below. See the final pages of these instructions for additional emergency phone numbers.

5. Telephone the Carrier and the Shipper (Call Collect)

- The carrier is:

_____

- The shipper is:

Cameco Resources
Douglas, Wyoming
(307) 358-6541
After hours
(307) 358-6541 ext. 450

The Cameco Resources phone in the Central Plant (ext. 450) is manned 24-hours per day, 7-days per week. Please read the completed questionnaire to whoever answers your call. If necessary for their understanding, read the questionnaire a second time.

6. When Help Arrives

Cooperate with all civil authorities and carrier and shipper personnel who arrive at the scene. Follow their health-safety instructions on checking for possible contamination of your clothing or body.

Please be assured that your exposure to this material will be relatively harmless if you have followed these instructions. The radiological safety personnel who will arrive will be glad to answer any questions you have about this matter.

Thank you very much.

Transportation Accident Response Guide (Instructions to the Driver)

3.) Accident Evaluation Guide

1. Name of Trucking Company:_____
2. Truck Number or Tag No:_____
3. Name of Driver:_____
4. Name of Police Department Notified:_____
5. Phone Number of Police Notified:_____
6. Place of Accident:_____
7. Is the Driver Injured?_____
8. Other Injured?_____
9. Bill of Lading Number:_____
10. Destination of Shipment:_____
11. Time of Accident:_____
12. Was There a Fire?_____
13. Is It Raining or Was Water Used to Put Out Fire or Wash Off Road?_____
14. Are Drums Outside of the Truck?_____
15. About How Many?_____
16. Are Contents of Drums or Tanks Spilled?_____
17. Has the Spill Been Covered?_____
18. Is the Spill on the Ground?_____
19. Is the Spill in Water?_____Lake?_____Stream?_____
20. Is the Spill Near a Building?_____
21. Is the Accident Area Lighted at Night?_____
22. Name of Nearest Large City?_____
23. Other Comments:_____
24. Your Name Please_____
    a. Can You Be Reached By Phone Near the Accident Site?_____
    b. Phone number: _____
    c. Home or Business Phone:_____
    d. Your Address:_____

Date:_____

Transportation Accident Response Guide (Instructions to the Driver)

<u>Shipper Notification – Cameco Resources Personnel</u> – call in order listed until one is reached)

Mine Management

		Work Phone	Home Phone
1.	Craig Hiser Mine Manager	(307)358-6541 ext. 415	(307)436-8727
2.	**Travis Coleman** RSO	(307)358-6541 ext. 431	(208)589-3870
3.	Ken Garoutte– Safety, Health, Environment and Quality Manager	(307)358-6541 ext. 476	(307)337-3383
4.	Smith Ranch Central Plant Operator 24 hours per day / 7 days per week	(307)358-6541 ext. 450	(307)259-3659 (307)473-2432

North Butte Operations

5.	**Erik Heide** Mine Manager	(307)358-6541 ext. 456	(307)259-3659

Casper Management		**Work Phone**	**Home Phone**
1.	Brent Berg President	(307)333-7735	(307)337-1775
2.	**Mike Thomas** **SHEQ Manager- DIV**	(307)333-7665	(307)277-2751

Transportation Accident Response Guide (Instructions to the Driver)

Emergency Response Telephone Number Guide

State Agencies	Telephone No.
Colorado:	
State Police - Denver	(303) 239-4500
Health Department (24 hours)	(877) 518-5608
Illinois:	
Highway Patrol General Headquarters	
Deputy Director	(217) 557-6630
Crash Report #	(217) 785-0614
Iowa:	
State Patrol Headquarters (Des Moines)	(515) 725-6090
Calls made after 4:30pm will automatically transfer to 911	
Kansas:	
Highway Patrol General Headquarters	(785) 296-6800
After hours: Dial *47 for highway help	
Dial *582 for turnpike help	
Michigan:	
Highway Headquarters	(517) 241-8000
(24 hours)	
Minnesota:	
Highway Patrol	(651) 201-7100
Dept. of Transportation-Admin. Office	
Missouri:	
General Headquarters	(573) 751-3313

Transportation Accident Response Guide (Instructions to the Driver)

Emergency Response Telephone Number Guide

State Agencies	**Telephone No.**
Nebraska:	
Highway Patrol - Scottsbluff, NE.	(308) 632-1211
Lincoln, NE.	(402) 471-4545
Health and Human Services (8 a.m. - 5 p.m. Central)	(402) 471-2168
(After Business Hours - Call Hwy. Patrol - Lincoln)	(402) 471-4545
NDEQ (8 a.m. – 5 p.m. Central)	(402) 471-2186
(After Business Hours - Call Hwy. Patrol - Lincoln)	(402) 471-4545
South Dakota:	
Division Headquarters	(605) 773-3105
Utah:	
Highway Patrol – Price, UT. (Section 9)	(801) 965-4532
Division of Radiation Control (24 hour)	(801) 536-4123
Wisconsin:	
State Patrol Division Headquarters	(608) 266-3212
Wyoming:	
State Highway Police	1-800-442-9090
WDEQ (24 hour)	(307) 777-7781
Wyo. Emergency Mgmt. Agency (Homeland Security)	(307) 777-4900
Wyoming Department of Transportation	(307) 777-4484

Transportation Accident Response Guide (Instructions to the Driver)

Federal & Canadian Agencies	**Telephone No.**
Nuclear Regulatory Commission Operations Center - Bethesda, Md.	(301) 816-5100 or (301) 951-0550 or (301) 415-0550
Department of Transportation - National Response Center	(800) 424-8802 or (202) 267-2675
Ontario: Provincial Police (24 hours)	(888) 310-1122

ON-SITE Transportation Accident Response Guide
For Pulling Unit Operators

1.) Introduction

Transportation accidents during the transport of radioactive concentrates from uranium recovery facilities (byproduct, or wellfield equipment that will be stored and reused) occur infrequently on public highways. This material is classified by DOT as radioactive material shipped as excepted package or Surface Contaminated Object SCO-1. Leakage or spillage of the contents from its container can be a potential health hazard to persons if they ingest or inhale the materials.

The purpose of this guideline is to provide direction for persons responding to a shipping accident involving radioactive materials, particularly when the contents have leaked from their containers. Leakage or spillage can range in severity depending on the specific accident conditions.

The guideline provides instructions to the driver and to other persons who are the first to arrive at the accident scene. These instructions request notifications be made to the shipper and the carrier. If warranted, the shipper will dispatch an initial response team to assist with accident investigation and response. The shipper will also alert a clean-up crew for possible duty and provide guidance for securing clean-up equipment and services.

TO WHOM IT MAY CONCERN:

* Rescue and lifesaving may be conducted with minimal potential hazards from the cargo on this truck. If possible, avoid breathing dust from spilled cargo. **DO NOT DELAY RESCUE EFFORTS!**

* After needed rescue, lifesaving, first aid or firefighting, please read the attached instructions in the event of cargo spillage.

Lifesaving, Rescue, and Firefighting

This may be done with minimal potential hazards from the material. If possible, avoid breathing and/or swallowing material that may be adhered to byproduct material or wellfield equipment. The radioactive material on the skin or clothing is relatively harmless and simple washing methods will remove it. If you believe you may have been contaminated with the material, please notify first responders upon their arrival at the accident site. To avoid ingestion of the material, do not eat, drink, or smoke while near the spill.

This vehicle contains radioactive materials, which may be in the form of natural uranium and associated daughter products. The color of the material may be red/orange or white/yellow. The material cannot burn or explode. *In the event of an accident involving spillage of material, the following actions are recommended in the order given if appropriate:*

Contact Supervisor

Contact your supervisor and give them the location of the accident site and tell them of any injured persons. The supervisor will communicate with the SHEQ Department and the RSO or their designees. Depending on the severity of the situation the Emergency Response Team may also be initiated.

Initial response

In the event of spilled radioactive materials, clean-up methods, monitoring, sampling and release levels will be performed under the direction of the RSO or designee. Addition requirements may also be applicable as per SHEQ Management System volume VIII.

Cameco

Cameco Resources

WYOMING OPERATIONS
EMERGENCY INFORMATION FOR CARRIERS

Approvals
Operations: _____
Project RSO: T Coleman
Revision Date: 1/7/2016

THIS VEHICLE CONTAINS: (CHECK THE APPROPRIATE DESCRIPTION OF THE CARGO)

☐ URANIUM ORE CONCENTRATE (U_3O_8 or Yellowcake). The color may be black, greenish brown or yellow, with a dry granular to powdery texture.

☑ SOLID WASTE BYPRODUCT MATERIAL FROM THE PROCESSING OF URANIUM- Material may vary from white sludge to contaminated pipe, pumps and assorted trash.

☐ ION EXCHANGE RESIN CONTAINING ADSORBED URANIUM ON RESIN SURFACE

IN THE EVENT OF AN ACCIDENT INVOLVING SPILLAGE THE FOLLOWING ACTIONS ARE RECOMMENDED:

1. LIFESAVING

   A. USE FIRST AID TREATMENT- according to the nature of the injury.
   B. RADIOACTIVE MATERIAL- degree of hazard will vary from little to moderate.
   C. AVOID SWALLOWING OR BREATHING DUST. DO NOT EAT, DRINK OR SMOKE NEAR THE SPILL
   D. LOW LEVEL RADIOACTIVE MATERIAL ON THE SKIN OR CLOTHING IS RELATIVELY HARMLESS
   E. REMOVE AND ISOLATE SUSPECTED CONTAMINATED CLOTHING AND SHOES AS SOON AS POSSIBLE AND WASH AFFECTED SKIN AREAS WITH SOAP AND WATER - DO NOT EAT, DRINK OR SMOKE UNTIL FREE OF CONTAMINATION.

2. FIRE FIGHTING

   A. DO NOT MOVE DAMAGED CONTAINERS; MOVE UNDAMAGED CONTAINERS OUT OF THE FIRE ZONE
   B. **SMALL FIRES:** DRY CHEMICAL, CO_2, WATER SPRAY OR REGULAR FOAM.
   C. **LARGE FIRES:** WATER SPRAY, FOG OR REGULAR FOAM.

3. SPILL OR LEAK

   A. **DO NOT TOUCH DAMAGED CONTAINERS OR SPILLED MATERIAL.**
   B. COVER DRY (POWDER) SPILL WITH PLASTIC SHEET OR TARP, TO MINIMIZE SPREADING
   C. **ISOLATE AREA OF SPILL**
   D. KEEP UNNECESSARY PEOPLE AT LEAST 150 FEET UPWIND OF SPILL; GREATER DISTANCES FOR PEOPLE DOWNWIND

Cameco

Cameco Resources

WYOMING OPERATIONS
EMERGENCY INFORMATION FOR CARRIERS

NOTIFICATIONS

1. **NOTIFY** LOCAL LAW ENFORCEMENT AGENCY GIVING THEM SPECIFIC DETAILS REGARDING THE ACCIDENT AND REQUEST THEY NOTIFY THE STATE HEALTH DEPARTMENT AND TELL THEM CARGO IS:

   ☐ URANIUM ORE CONCENTRATE (U_3O_8 OR YELLOWCAKE). "LOW SPECIFIC ACTIVITY" (LSA) RADIOACTIVE MATERIAL

   ☑ SOLID WASTE BYPRODUCT MATERIAL FROM THE PROCESSING OF URANIUM "LOW SPECIFIC ACTIVITY" (LSA) RADIOACTIVE MATERIAL OR SURFACE CONTAMINATED OBJECT (SCO-1)

   ☐ ION EXCHANGE RESIN CONTAINING ABSORBED URANIUM ON RESIN SURFACE "LOW SPECIFIC ACTIVITY (LSA-1) RADIOACTIVE MATERIAL

2. **NOTIFY** ONE OF THE FOLLOWING CAMECO RESOURCES PERSONNEL AT (307) 358-6541 DURING BUSINESS HOURS OR CALL IN THE ORDER LISTED UNTIL ONE IS REACHED.

TRAVIS COLEMAN	**RADIATION SAFETY OFFICER**	**OFFICE (307)358-6541 ext.431**
KEN GAROUTTE	**SHEQ MANAGER**	**HOME (307)337-3383**
CRAIG HISER	**MINE MANAGER**	**HOME (307)436-8727**

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel, and the public during transportation accidents. Packaging durability is related to potential hazards of material.
- Undamaged packages are safe; contents of damaged packages may cause external and/or internal radiation exposure.
- Low radiation hazard when material is inside container. If material is released from package or bulk container, hazard will vary from low to moderate. Level of hazard will depend on the type and amount of radioactivity, the kind of material it is in, and/or the surfaces it is on.
- Some material may be released from packages during accidents of moderate severity. This poses little risk to people.
- Released radioactive materials or contaminated objects usually will be visible if packaging fails.
- Some exclusive use shipments of bulk and packaged materials will not have "RADIOACTIVE" labels. • Placards, markings, and shipping papers provide identification.
- Some packages may have a "RADIOACTIVE" label and a second hazard label. The second hazard is usually greater than the radiation hazard; so follow this Guide as well as the response Guide for the second hazard class label.
- Some radioactive materials cannot be detected by commonly available instruments.
- Runoff from control of cargo fire may cause low-level pollution.

FIRE OR EXPLOSION

- Some of these materials may burn, but most do not ignite readily.
- Uranium and Thorium metal cuttings or granules may ignite spontaneously if exposed to air (see Guide 136).
- Nitrates are oxidizers and may ignite other combustibles (see Guide 141).

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- **Priorities for rescue, life-saving, first aid, and control of fire and other hazards are higher than the priority for measuring radiation levels.**
- **Radiation Authority must be notified of accident conditions, and is usually responsible for radiological decisions.**
- **Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions. • Stay upwind. • Keep unauthorized personnel away.**
- **Detain or isolate uninjured persons or equipment suspected to be contaminated; delay decontamination and cleanup until instructions are received from Radiation Authority.**

PROTECTIVE CLOTHING

- **Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection.**

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.

EMERGENCY RESPONSE

FIRE

- Presence of radioactive material will not change effectiveness of fire control techniques.
- Move containers from fire area if you can do it without risk.
- Do not move damaged packages; move undamaged packages out of fire zone.

Small Fires

- Dry chemical, CO_2, water spray or regular foam.

Large Fires

- Water spray, fog (flooding amounts).
- Dike fire-control water for later disposal.

SPILL OR LEAK

- Do not touch damaged packages or spilled material.

Liquid Spills

- Cover with sand, earth or other noncombustible absorbent material.
- Dike to collect large liquid spills.
- Cover powder spill with plastic sheet or tarp to minimize spreading.

FIRST AID

- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured person.
- Apply artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes.
- Injured persons who contacted released material may be a minor contamination problem to contacted persons, equipment and facilities.
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

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Cameco

Safety Data Sheet

Uranium Peroxide Hydrate

1. Product and company identification

Product name	:	Uranium Peroxide Hydrate
Common name	:	UO_4, peroxide yellowcake, yellowcake, peroxide uranium ore concentrate, uranyl peroxide
Material uses	:	Concentrate produced from the milling of the uranium ore for processing at a refinery
MSDS #	:	Cameco 141 E
Supplier/Manufacturer	:	Rabbit Lake Operation c/o Cameco Corporation 2121 11th Street West Saskatoon, Saskatchewan Canada S7M1J3 Tel: (306) 633 2141 Fax: (306) 633 2248
		Cameco Resources Crow Butte Operation 86 Crow Butte Road Crawford, NE 69339 USA Tel: (308) 665-1393 Fax: (308) 665-2341
		Cameco Resources Smith Ranch Highland P.O. Box 1210 Glenrock, Wy 82637 USA Tel: (307) 358 6541 Fax: (307) 358 4533
MSDS authored by	:	KMK Regulatory Services Inc.
In case of emergency	:	1 905 885 8745

2. Hazards identification

Emergency overview

Physical state	:	Solid (Powder)
Color	:	Yellow
Odor	:	No odor

GHS Label Elements

Pictogram	:	
Signal word	:	DANGER
Hazard statements	:	Toxic by inhalation and ingestion Danger of cumulative effects May damage kidneys
Precautionary measures	:	Do not breathe dust. Do not ingest. Do not get on skin or clothing. Use only with adequate ventilation. Do not eat, drink or smoke when using this product. Avoid contact with eyes. Keep container closed. Wash thoroughly after handling.
OSHA/HCS status	:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)
Routes of entry	:	Dermal contact, via cuts abrasion or open wounds. Eye contact. Inhalation. Ingestion.

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Potential acute health effects

Inhalation	:	Harmful if inhaled. Kidney damage can occur due to chemical toxicity. Dissolution halftime of $UO_4.xH_2O$ is fast for the synthetic lung fluid solubility test. Dust inhalation can result in an internal dose from alpha, beta and gamma radiation.
Ingestion	:	Harmful if swallowed. Kidney damage can occur due to chemical toxicity.
Skin	:	Skin dermatitis may result from skin contact.
Eyes	:	Irritating to eyes.

Potential chronic health effects

Chronic effects	:	May cause target organ damage, based on animal data. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
Carcinogenicity	:	Not listed as a carcinogenic material by IARC or OSHA. Soluble and insoluble compounds of uranium are listed as potential occupational carcinogens by NIOSH, and confirmed human carcinogens by ACGIH, based on evidence from epidemiological studies.
Mutagenicity	:	No known significant effects or critical hazards.
Teratogenicity	:	No known significant effects or critical hazards.
Developmental effects	:	No known significant effects or critical hazards.
Fertility effects	:	No known significant effects or critical hazards.
Target organs	:	May cause damage to following organs: kidneys

Over-exposure signs/symptoms

Inhalation	:	Adverse symptoms may include the following: respiratory tract irritation, coughing
Ingestion	:	Chemical toxicity is largely shown in kidney damage that may not be reversible
Skin	:	Prolonged contact can result in dermatitis
Eyes	:	Adverse symptoms may include the following: pain or irritation watering redness
Medical conditions aggravated by over-exposure	:	Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
Uranium Peroxide Hydrate	19525-15-6	>95

Canada

Name	CAS number	%
Uranium Peroxide Hydrate	19525-15-6	>95

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health of the environment and hence require reporting in this section.

4. First aid measures

Eye contact	:	Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention.

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Skin contact	:	In case of contact, immediately flush skin with plenty of water for at least 20 minutes.
Inhalation	:	Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention immediately.
Ingestion	:	Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical doctor or poison control center immediately.
Protection of first-aiders	:	No action shall be taken involving any personal risk or without suitable training. If it is suspected that dust is present, It may be dangerous to the person providing aid to give mouth-to mouth resuscitation. Rescuer should wear and appropriate mask or self-contained breathing apparatus. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
Notes to physician	:	No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product	:	Not flammable

Extinguishing media

Suitable	:	CO_2, dry chemical, foam, alcohol-type foam, water fog
Not suitable	:	None known.
Special exposure hazards	:	Possible presence of radioactive uranium dust. No action shall be taken involving any personal risk or without suitable training.
Hazardous thermal decomposition products	:	Uranium peroxide hydrate decomposes to produce uranium trioxide (UO_3) powder and oxygen (O_2) gas at high temperatures. Steam will be generated from water of hydration.
Special protective equipment for fire-fighters	:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-shield operated in positive pressure mode.
Special remarks on fire hazards	:	Uranium peroxide hydrate decomposes to produce uranium trioxide (UO_3) powder and oxygen (O_2) gas at high temperatures. The O_2 gas will increase the explosive limit range and rate of burning for flammable and combustible materials in the vicinity.

6. Accidental release measures

Personal precautions	:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
Environmental precautions	:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers by covering with a suitable cover. Drums of the material are to be shipped to the nearest Cameco Corporation facility or other licensed repository that can handle the material. Forward any contaminated clothing or equipment in separate marked drums. Inform the relevant authorities if the product has caused environmental pollution in sewers, waterways soil or air.

Methods for cleaning up

Small Spill	:	Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: See Section 1 for emergency contact information and Section 13 for waste disposal.

Large Spill : Move containers from spill area. Cover suitably to prevent dispersal by wind and precipitation. Prevent entry into sewers, water courses, basements or confined areas. Approach release from upwind. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: See Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. In extremely rare occurrences, sealed drums of uranium peroxide can become pressurized with oxygen gas from decomposition. If signs of pressurization are observed (bulging lids and/or bottoms), do not handle the drums until they are evaluated by qualified uranium fuel cycle personnel who will determine safe handling procedures.

Storage : Uranium peroxide concentrates is shipped from the uranium mill to the refinery in a 200 L sealed steel drum. Store in accordance with radiation protection regulations in sealed containers. Store in original container away from extreme heat, incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. In extremely rare occurrences, sealed drums of uranium peroxide can become pressurized with oxygen gas from decomposition. If signs of pressurization are observed (bulging lids and/or bottoms), do not handle the drums until they are evaluated by qualified uranium fuel cycle personnel who will determine safe handling procedures.

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits	
Uranium peroxide hydrate	ACGIH TLV (United States, 3/2012)	TWA: 0.2 mg/m3, (as U) 8 hours STEL: 0.6 mg/m3, (as U) 15 minutes
	OSHA PEL (United States, 6/2010)	TWA: 0.25 mg/m3, (as U) 8 hours
	NIOSH REL (United States, 6/2009)	TWA: 0.2 mg/m3, (as U) 10 hours STEL: 0.6 mg/m3, (as U) 15 minutes

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m3	Other	ppm	mg/m3	Other	ppm	mg/m3	Other	Notations
Uranium peroxide hydrate, as U	US ACGIH 3/2012		0.2			0.6					
	AB 4/2009		0.2			0.6					
	BC 4/2012		0.2			0.6					
	ON 7/2010		0.2			0.6					
	QC 9/2011		0.2			0.6					

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Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures	:	If this product contains ingredients with exposure limits, personal, workplace, atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.
Engineering measures	:	Use only with adequate ventilation. Use process enclosures or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. This may require HEPA filtration of exhaust air.
Hygiene measures	:	Wash hands, forearms and face thoroughly after handling, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location. Contamination monitoring may be required for activities with direct exposure.

Personal protection

Respiratory	:	Use a properly fitted particulate filter respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Hands	:	Chemical resistant impervious gloves complying with an approved standard should be worn at all times when handling. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining the protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. Recommended : Rubber or neoprene for normal industrial use
Eyes	:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles
Skin	:	Personal protective equipment for body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: long sleeved coveralls
Environmental exposure controls	:	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state	:	Solid (Powder)
Flash point	:	Not applicable
Burning time	:	Not applicable
Burning rate	:	Not applicable
Auto-ignition temperature	:	Not applicable
Flammable limits	:	Not applicable
Color	:	Yellow
Odor	:	Odorless
Taste	:	Not applicable

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Molecular weight	:	338 g/mole
Molecular formula	:	$UO_4.2H_2O$
pH	:	Not applicable
Boiling/condensation point	:	Decomposes
Melting/freezing point	:	Decomposition temperature: 160 to 230 °C (320 to 446 °F)
Critical temperature	:	Not applicable
Specific Gravity	:	4 to 4.4
Vapor pressure	:	Not applicable
Volatility	:	Not applicable
Odor threshold	:	Not applicable
Evaporation rate	:	Not applicable
SADT	:	Not applicable
Viscosity	:	Not applicable
Ionicity (in water)	:	Not applicable
Dispersibility properties	:	Not applicable
Solubility	:	Negligible
Partition coefficient (log K_{ow})	:	Not applicable
Physical/chemical properties comments	:	Not applicable

10. Stability and reactivity

Chemical stability	:	The product is stable under normal* conditions. * Normal conditions in an operating environment: pressure 0.9 bar to 1.1 bar, oxygen 21% v/v, temperature from 0 to 30 °C
Conditions to avoid	:	Avoid extremely high temperatures.
Incompatible materials	:	Strong mineral acids such as nitric, sulphuric or hydrochloric acids.
Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Uranium peroxide hydrate decomposes to produce uranium trioxide (UO_3) powder and oxygen (O_2) gas at temperatures at high temperatures.
Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

Acute toxicity

Uranium is a nephrotoxin (a kidney poison). Studies indicate that long term exposure may result in kidney impairment. While an LD_{50} of 70 mg/kg has been estimated for soluble uranium salts[Kathren and Burklin (2008)], but insoluble uranium compounds were found to be practically non-toxic, indicating LD_{50} for insoluble salts such as uranium peroxide hydrate should be much higher.

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Chronic toxicity

There is no data available

Irritation/Corrosion

Skin : There is no data available

Eyes : There is no data available

Respiratory : There is no data available

Sensitizer

Skin : There is no data available

Respiratory : There is no data available

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Uranium peroxide hydrate	A1	-	-	+	-	-

Mutagenicity

There is some evidence of genetic effects from radiation in animal studies, however there has been no evidence reported in human studies.

Teratogenicity

There is no data available

Reprodcutive toxicity

There is limited available data on the reproductive toxicity in humans.

IDLH : 10 mg U/m³

12. Ecological information

Ecotoxicity :

Aquatic ecotoxicity

Green algae LOEC 70-170 µg/L; mussels EC_{50} 380- 600 µg/L (Warne et al. 2009)

Persistence/degradability

Sediments act as sinks for insoluble uranium compounds.

13. Disposal considerations

Waste disposal : Scrap uranium peroxide hydrate should be recycled through an appropriate licenced facility. Contaminated uranium peroxide hydrate must be disposed of as radioactive waste, rather than as hazardous chemical waste. It is recommended to consult local state and federal regulations and Cameco corporation to determine appropriate disposal routes for uranium peroxide hydrate waste.

Disposal should be in accordance with applicable national, regional and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and SECTION 8. EXPOSURE CONTROL/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information

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DOT Classification	UN2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1) (non fissile or fissile excepted)	7	-		
TDG Classification	UN2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1) (non fissile or fissile excepted)	7	-		
IMDG Class	UN2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1) (non fissile or fissile excepted)	7	-		Emergency schedules (EmS) F-1, S-S
IATA-DGR Class	UN2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1) (non fissile or fissile excepted)	7	-		

PG*: Packing group Exemptions to the above classification may apply. AERG : 162

15. Regulatory information

United States

HCS Classification	:	Toxic material Carcinogen Target organ effects
U.S. Federal regulations	:	TSCA 8(a) CDR Exempt/Partial exemption: Not determined United States inventory (TSCA8b): Not determined
Clean Air Act Sction 112 (b) Hazardous Air Pollutants (HAPs)	:	Not listed
Clean Air Act Section 602 Class I Substances	:	Not listed
DEA List II Chemicals (Precursor Chemicals)	:	Not listed
DEA List II Chemicals (Essential Chemicals)	:	Not listed

SARA 302/304
Composition/information on ingredients

No products were found

SARA 304 RQ : Not applicable

SARA 311/312

Classification : Not applicable

Composition/information on ingredients

No products were found.

State regulations

Massachusetts	:	This material is not listed
New York	:	This material is not listed
New Jersey	:	This material is not listed
Pennsylvania	:	This material is not listed
California Prop. 65	:	No products were found

Canada

WHMIS(Canada)	:	Class D-1B: Material causing immediate and serious toxic effects (Toxic) Class D-2A: Material causing other toxic effects (Very Toxic)

Canadian lists

Canadian NPRI	:	This material is not listed.
Canadian ARET	:	This material is not listed.
CEPA Toxic substances	:	This material is not listed.
Alberta Designated Substances	:	This material is not listed.
Ontario Designated Substances	:	This material is not listed.
Quebec Designated Substances	:	This material is not listed.
Canada Inventory	:	This material is listed or exempted.

International regulations

International lists : Australia inventory (AICS): Not determined.
China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined. Philippines Inventory (PICCS): Not determined.
Taiwan inventory (CSNN): Not determined.

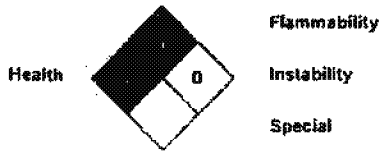
16. Other information

Hazardous Material Information System (U.S.A) :

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing

significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868. The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A) :



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of Issue	:	01 October 2015
Date of previous issue	:	12 December 2013
Version	:	3
Revised Section(s)	:	2, 16

Notice to reader

To the best of our knowledge the information contained herein is accurate. However, neither the above named supplier, no any of the subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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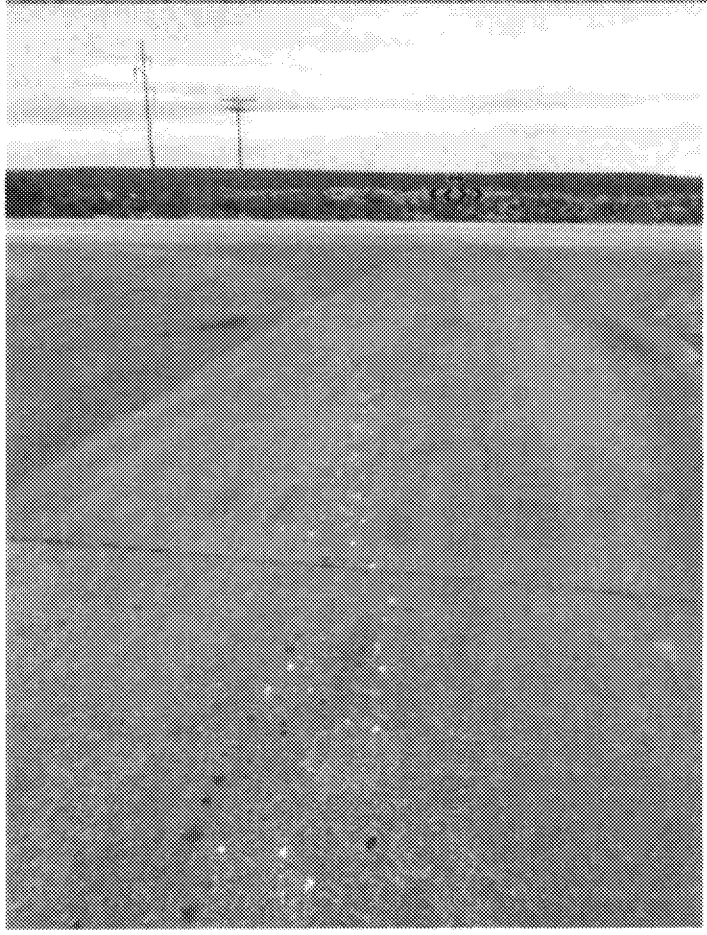

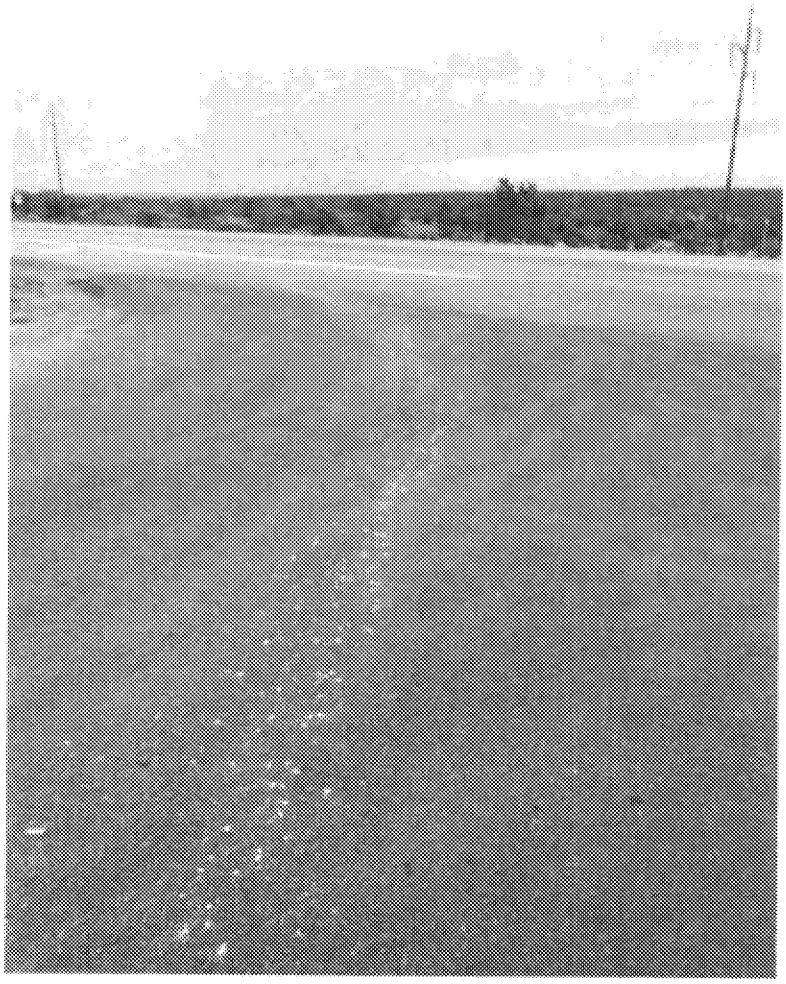

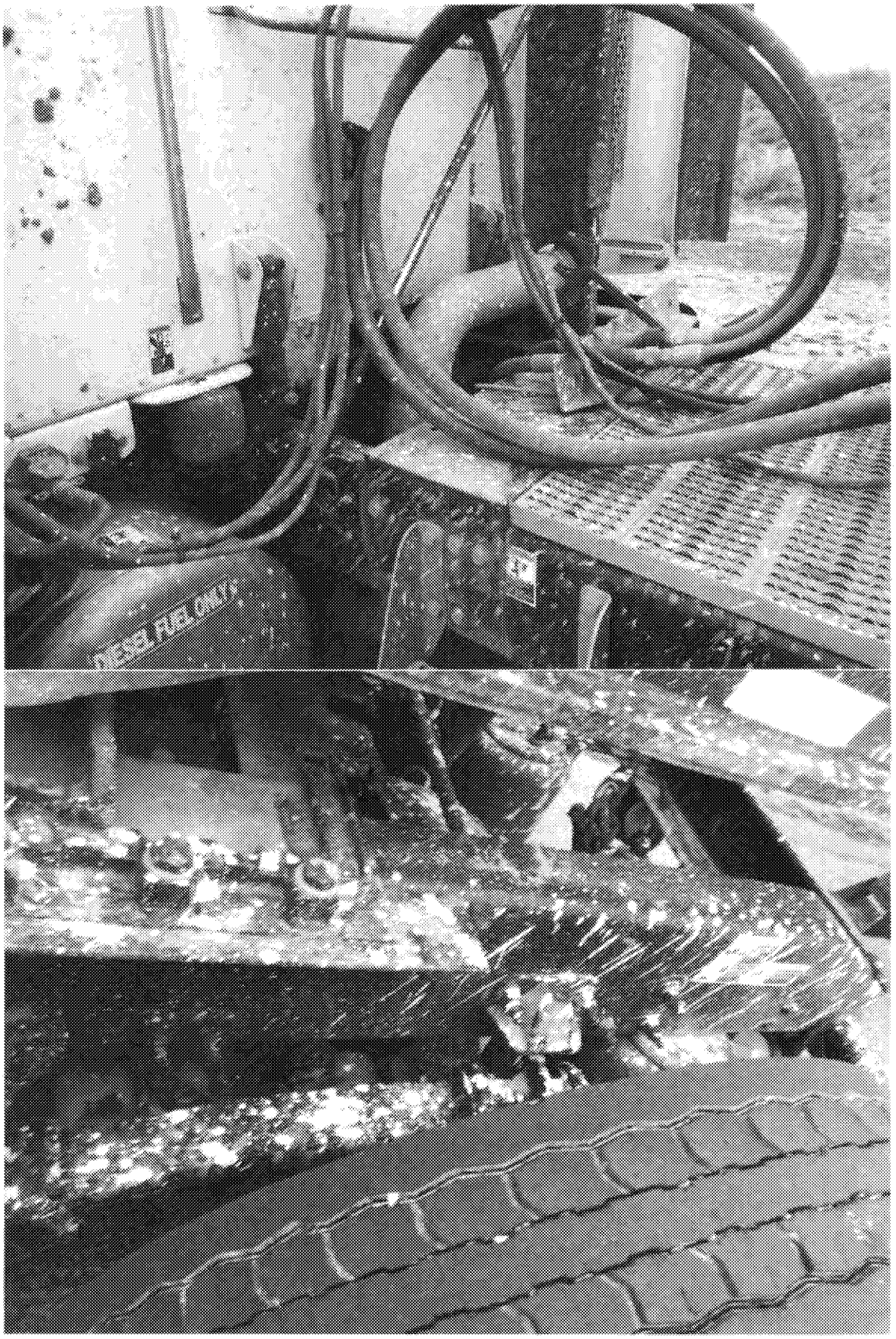
RESERVE

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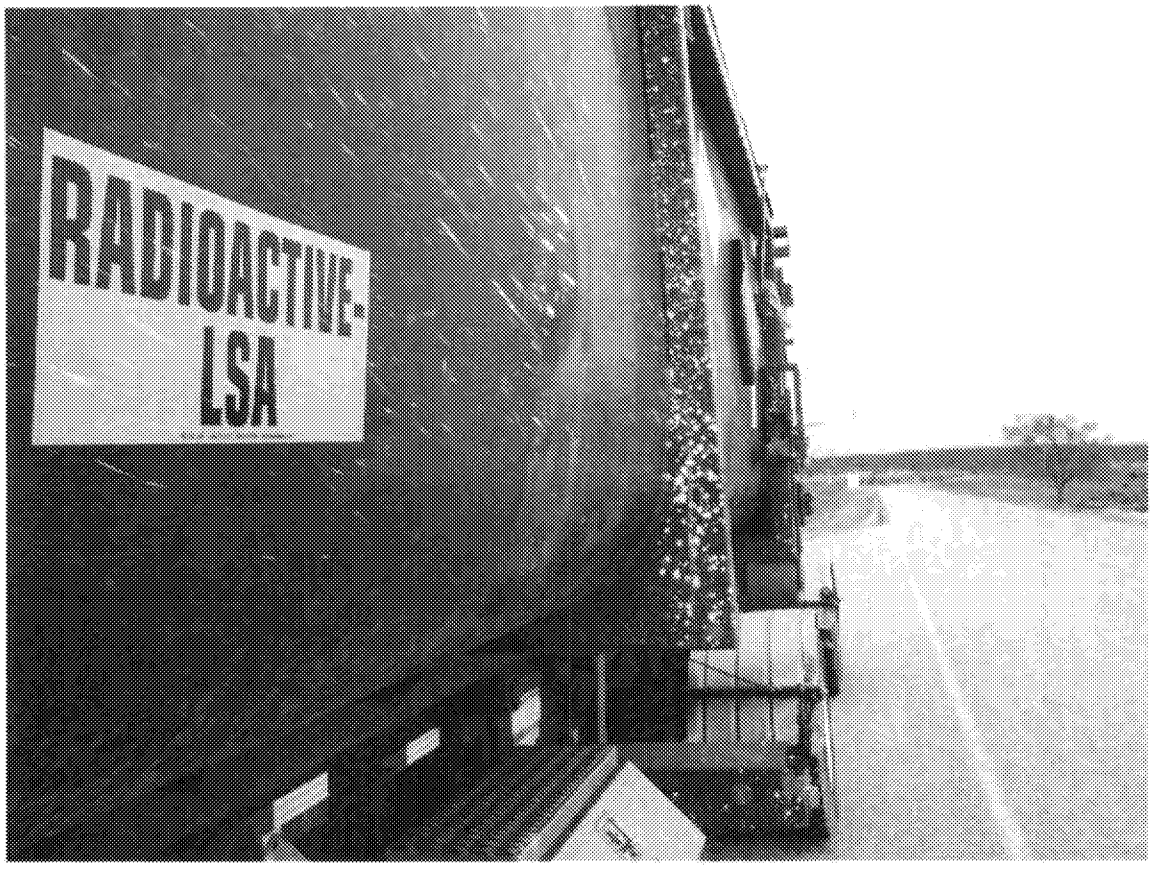
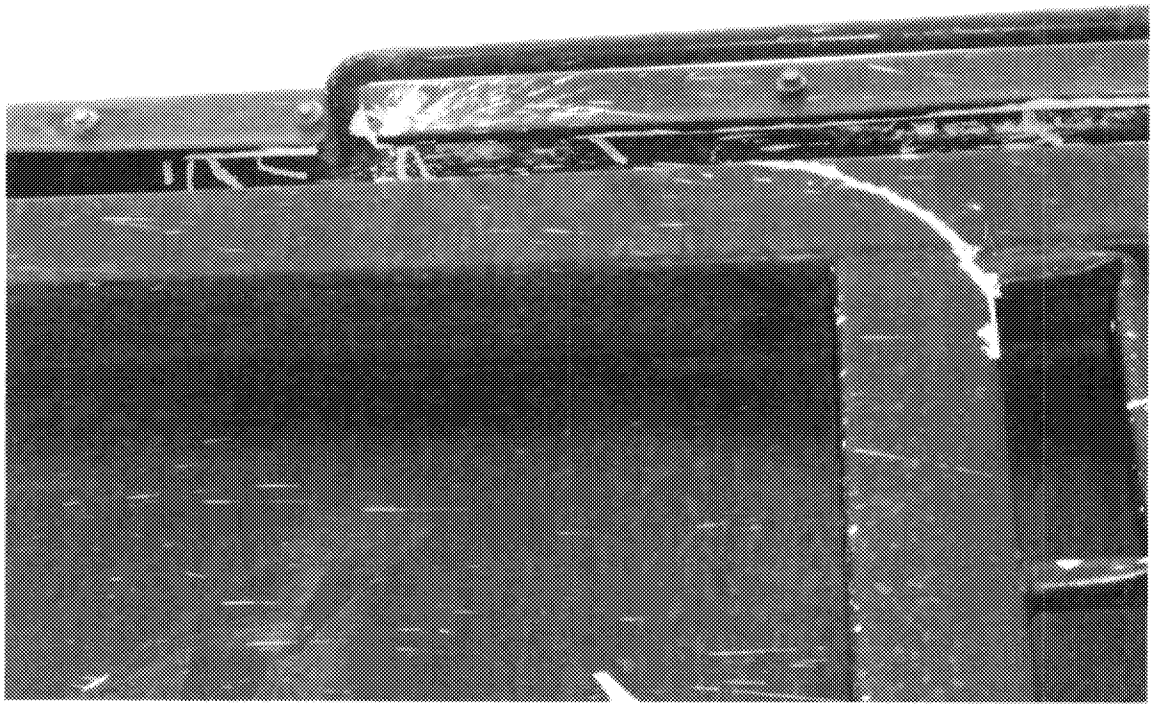
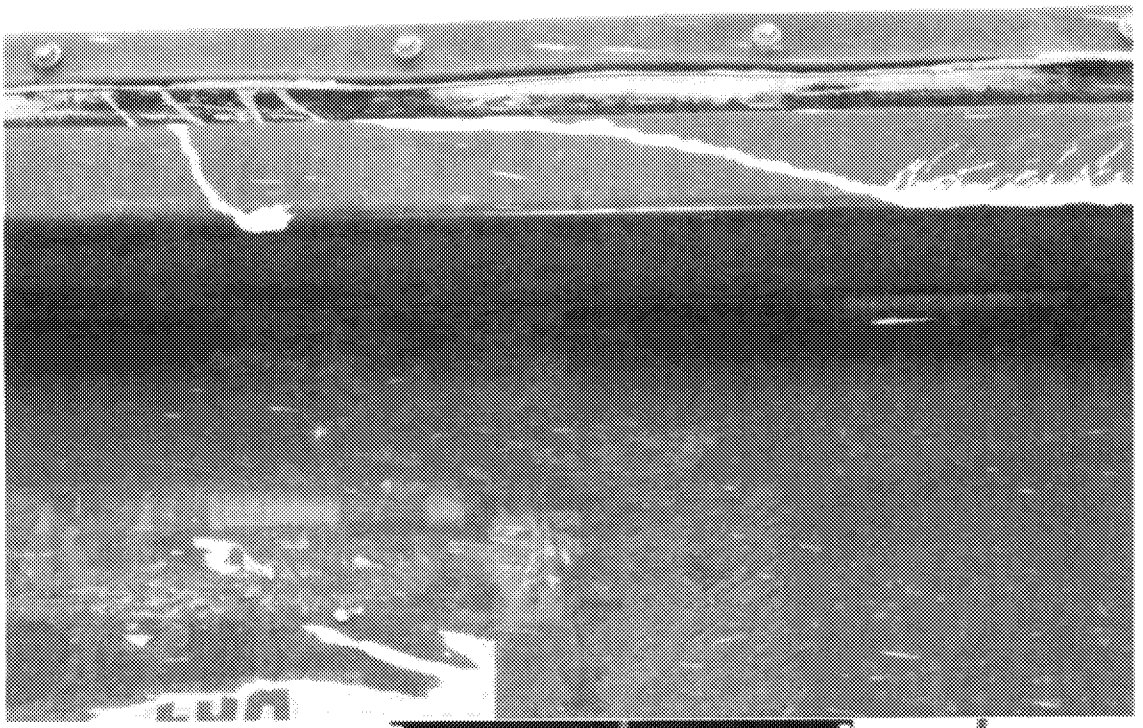
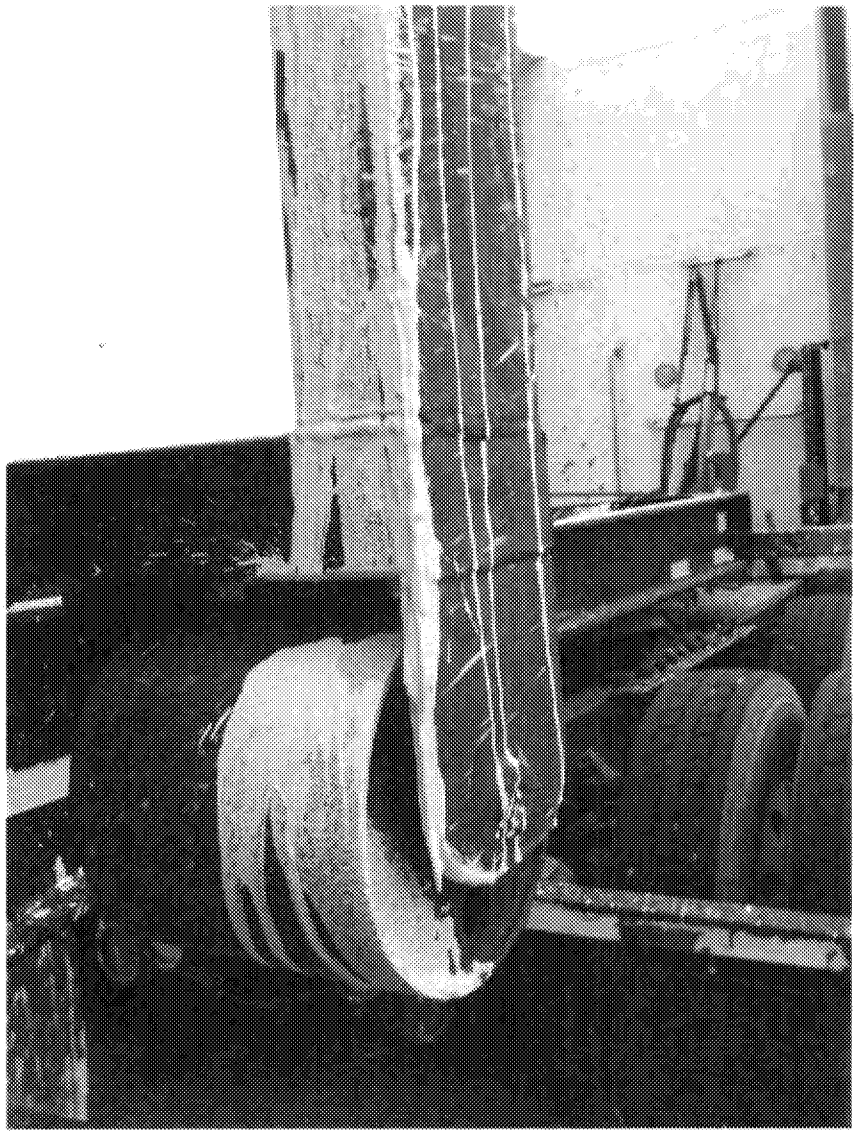
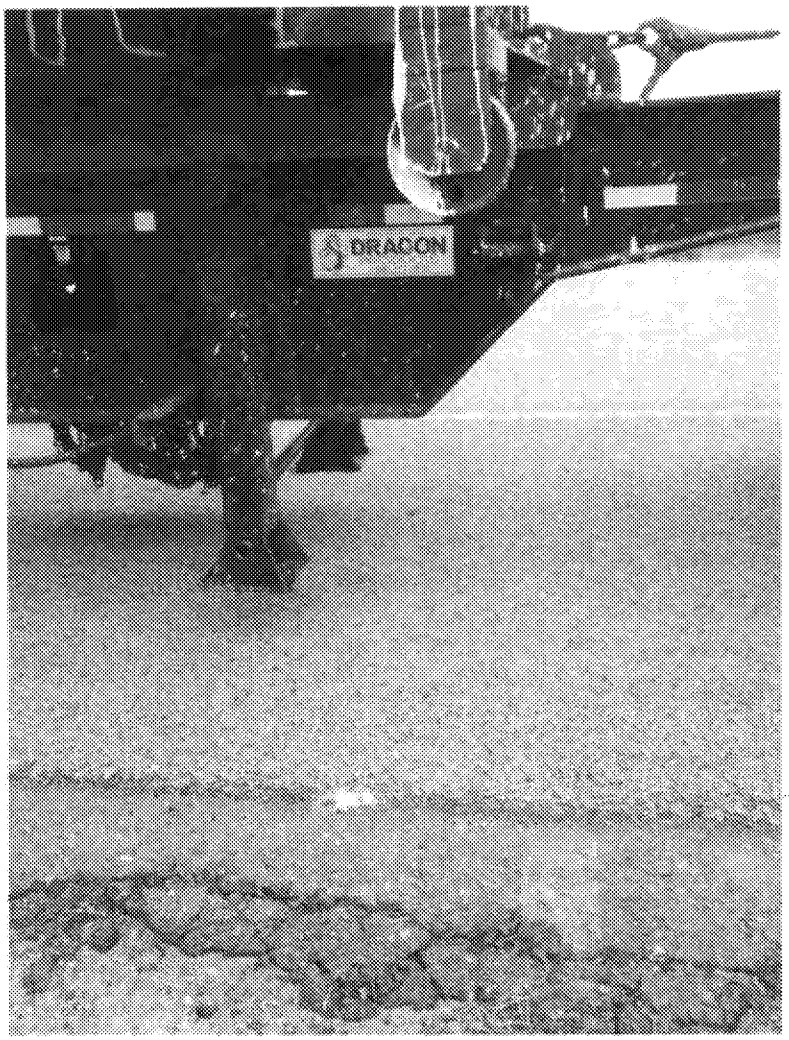
1500


RADIOACTIVE-
LSA

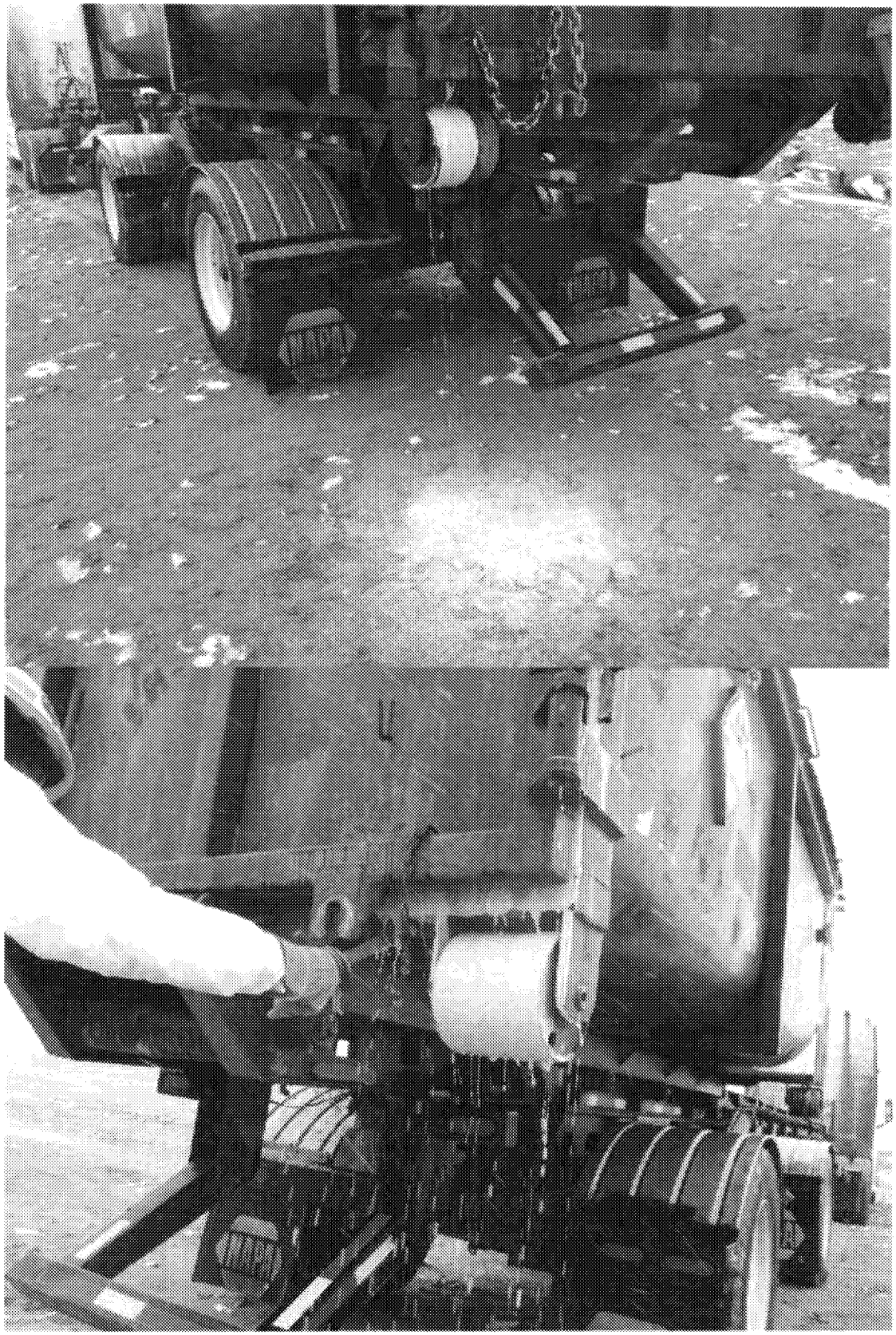


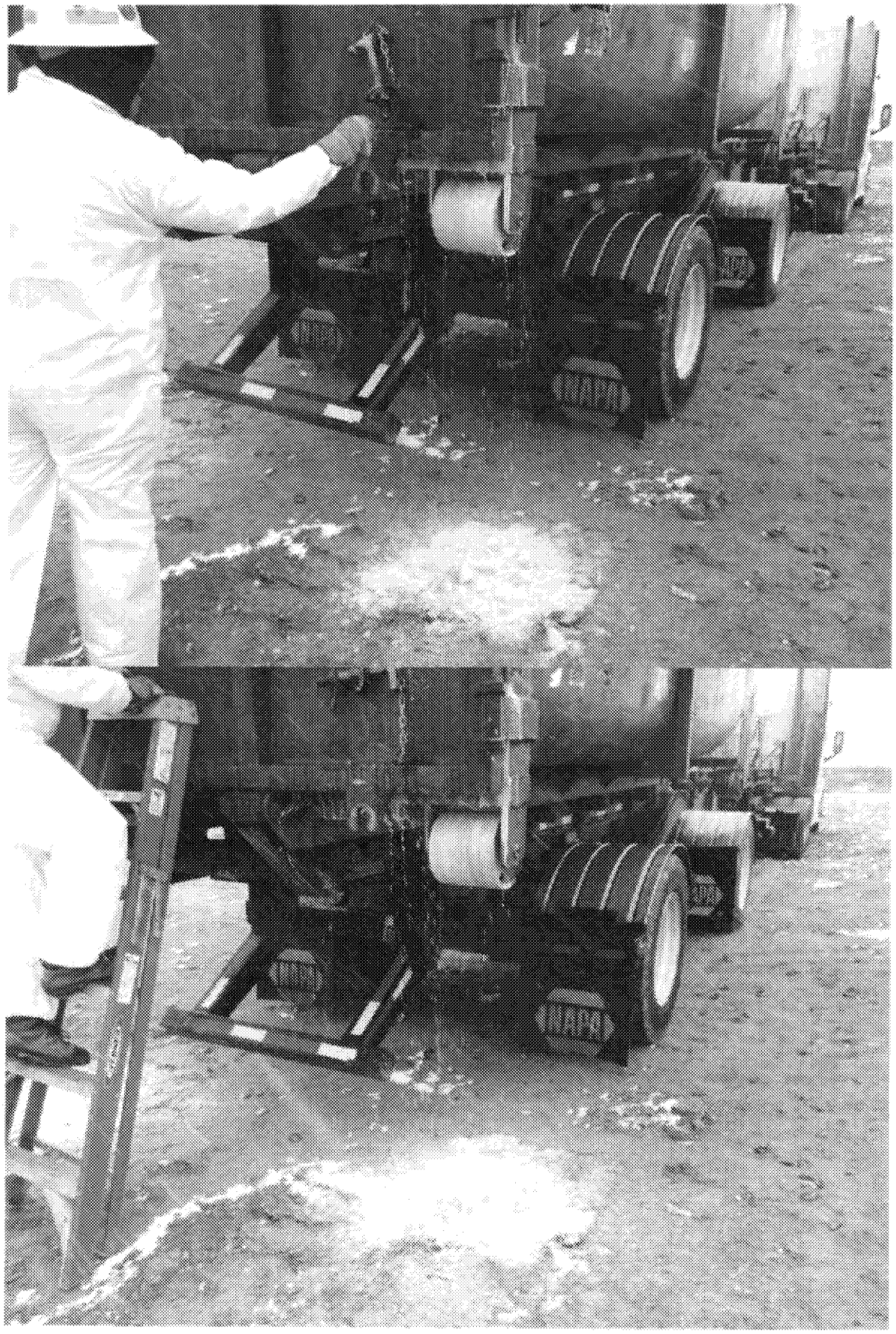


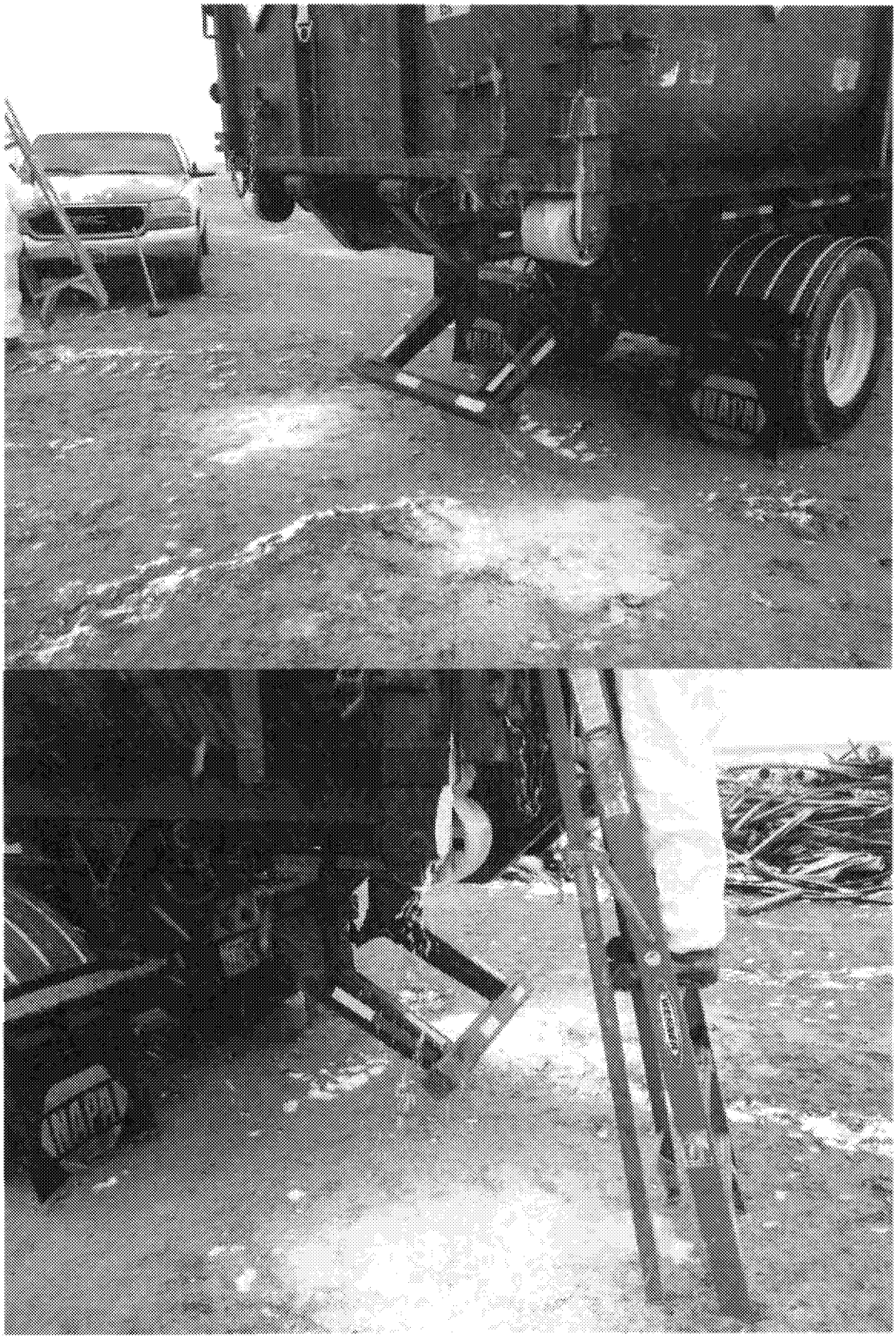


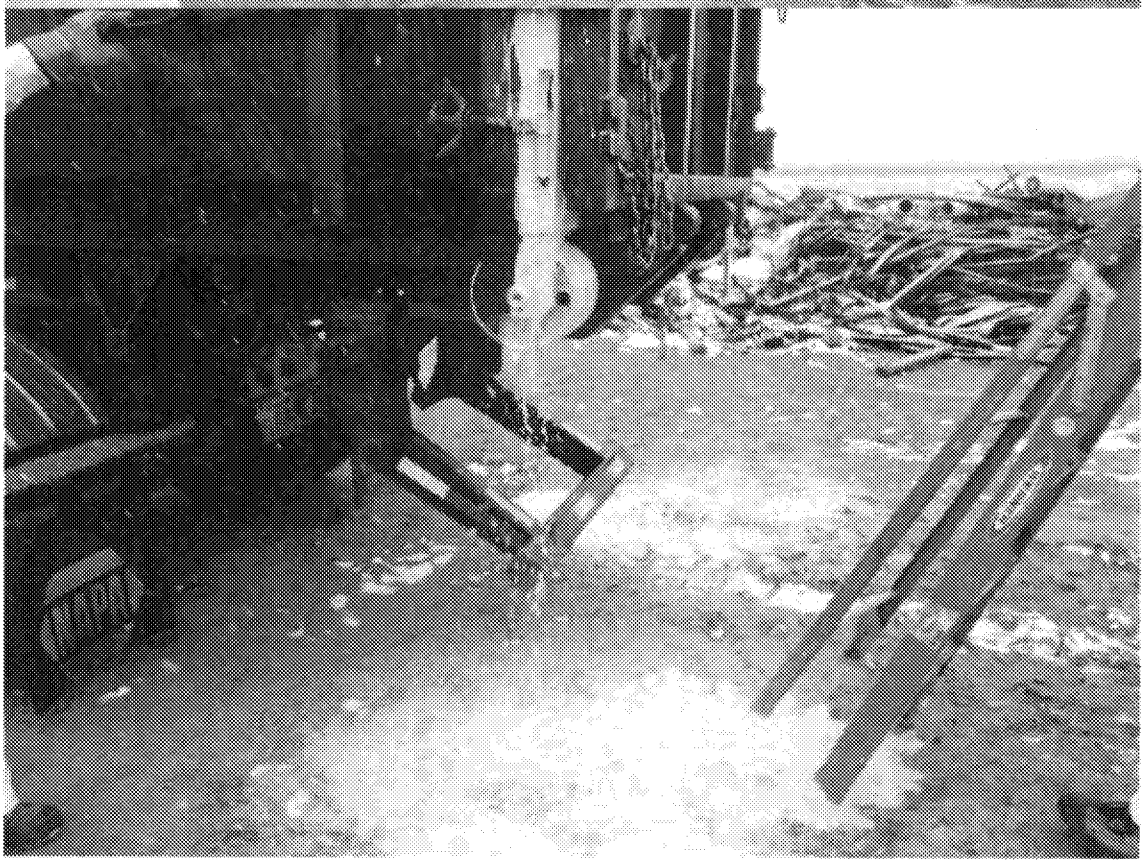

DRACON

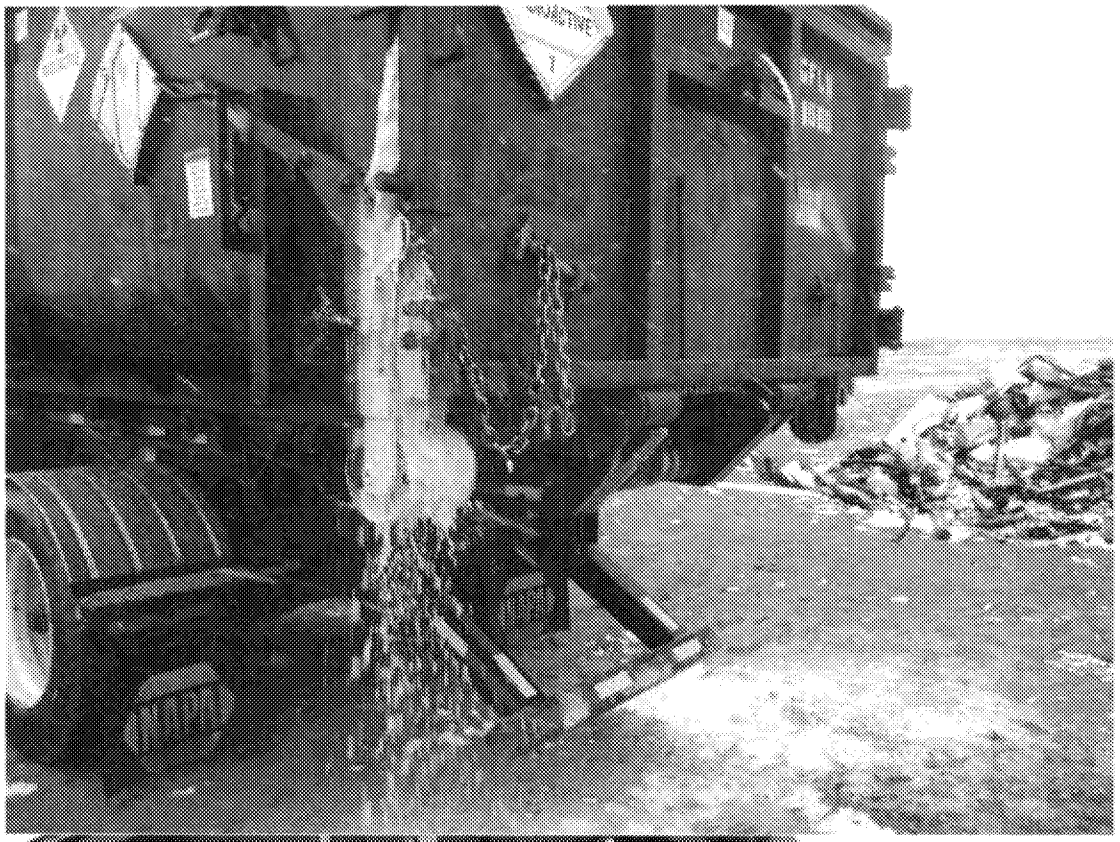
RADIOACTIVE
7

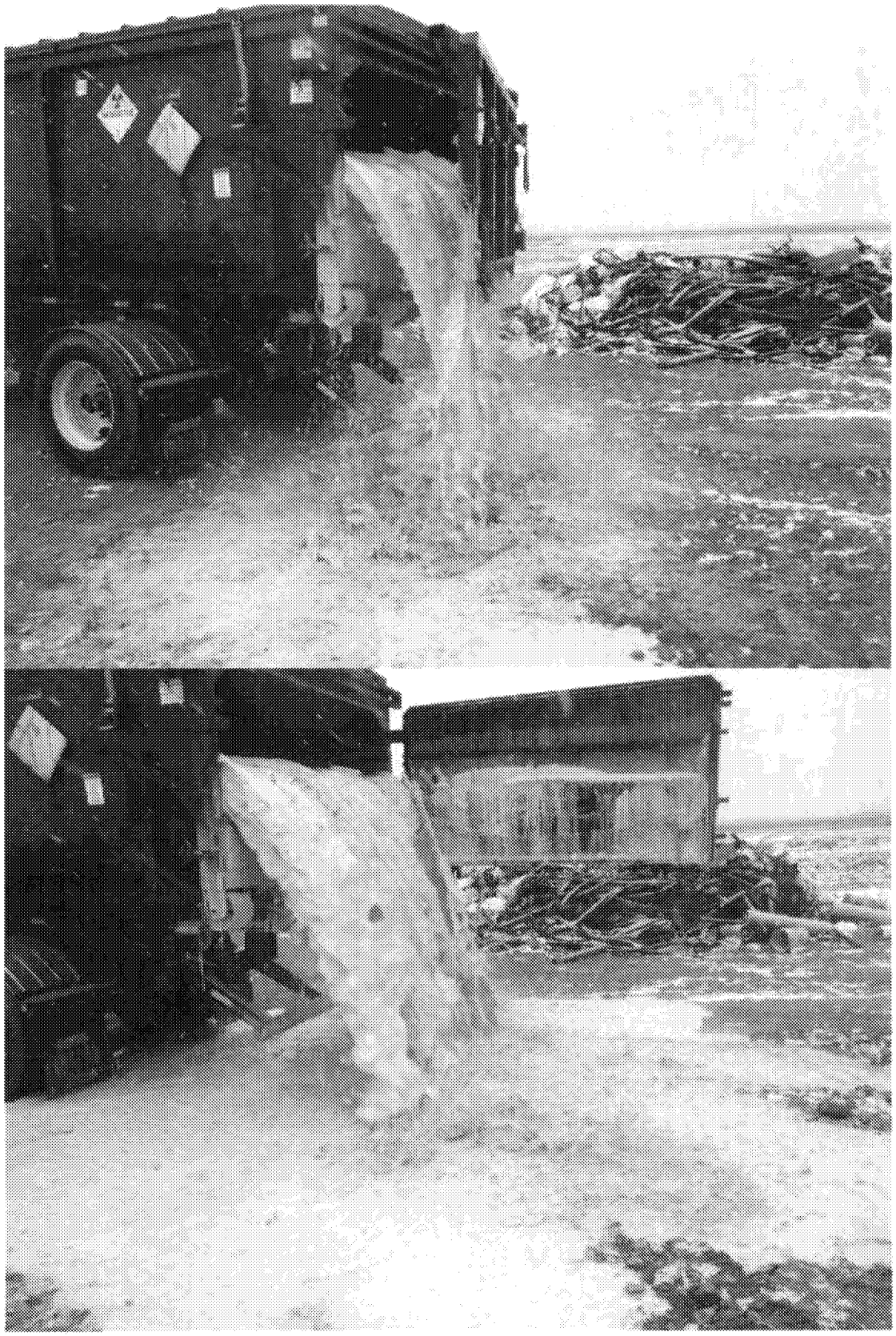


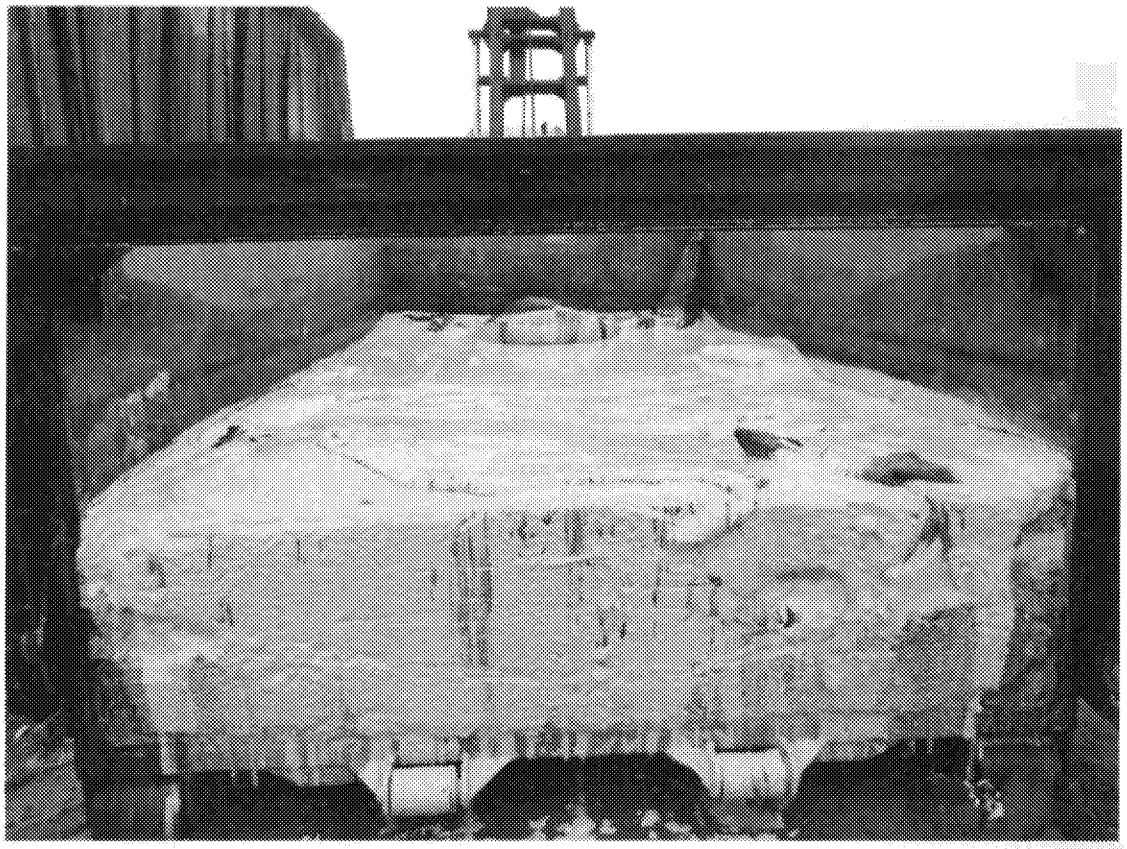












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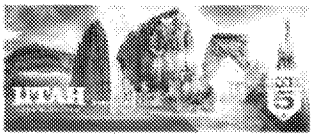

Ryan Johnson <rmjohnson@utah.gov>

Notification of leaking 11e.(2) shipment arriving at the White Mesa Uranium Mill

1 message

Ryan Johnson <rmjohnson@utah.gov> Tue, Mar 29, 2016 at 2:07 PM
To: Linda.Gersery@nrc.gov, ryan.schierman@wyo.gov
Cc: "Goble, Phillip" <pgoble@utah.gov>, Scott Anderson <standerson@utah.gov>

Linda,

This morning the RSO of the White Mesa Uranium contacted the Utah Division of Waste Management and Radiation Control (DWMRC). He informed the DWMRC that a 11e.(2) shipment arrived at their facility with evidence that some of the contents had leaked from the shipping container. This shipment originated from the Cameco-Smith Ranch in Wyoming, with the contents of the shipment to be disposed of in White Mesa's tailing cells.

We are notifying you of this incident because Cameco-Smith Ranch is an NRC licensed facility (NRC RML SUA 1548). This is the second incident that the DWMRC is aware of with 11e(2) shipments originating from the Cameco-Smith Ranch facility in Wyoming. The last incident occurred on August 20, 2015. We will send you more information when the Mill send us their formal report on the incident

--
Ryan Johnson, P.G.
Environmental Scientist/Health Physicist
Utah Division of Waste Management and Radiation Control

Disclaimer:

Statements made in this e-mail do not constitute the official position of the Director of the Division of Waste Management and Radiation Control. If you desire a statement of the Director's position, please submit a written request to this office, on paper, including documents relevant to your request

Appendix E

ED_005364I_00029056-00334

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

August 25, 2017

EA-16-156

Mr. Brent Berg, President
Cameco Resources
Power Resources, Inc.
550 N. Poplar Street
Casper, WY 82601

SUBJECT: CONFIRMATORY ACTION LETTER CLOSURE - POWER RESOURCES, INC.

Dear Mr. Berg:

The purpose of this letter is to inform you of the U.S. Nuclear Regulatory Commission's (NRC's) decision to close the Confirmatory Action Letter (CAL) issued to Power Resources, Inc. (PRI) on August 30, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession ML16238A359).

As you know, the NRC issued the CAL to PRI based on the occurrence of repetitive transportation incidents, which included failures to accurately determine the radioactive material content for barium sulfate sludge shipments and describe the physical and chemical form of the material on shipping papers, and failures to effectively package barium sulfate sludge in a manner that would ensure the radioactive contents would not leak from the container while under routine transport conditions. The CAL documented several actions you agreed to perform, which included performing a root-cause analysis to identify specific causes for the inadequate packaging and transportation of barium sulfate sludge, assessing the radioactive material present in the barium sulfate sludge shipments, developing a corrective action plan and a corresponding schedule to restore compliance and prevent recurrence, and providing the NRC with a copy of the independent review performed of your transportation program.

The NRC reviewed your initial response to the CAL dated October 24, 2016 (ADAMS Accession ML16357A774), and your addendum to the CAL response dated July 24, 2017 (ADAMS Accession ML17216A343). The NRC conducted a transportation-specific inspection on November 15-17, 2016, which was documented in NRC Inspection Report 040-08964/2016-003, dated April 3, 2017 (ADAMS Accession ML17079A564). In addition, the NRC performed an in-office review of your corrective actions associated with the CAL and documented this review in a letter to you dated June 29, 2017 (ADAMS Accession ML17151B102).

As part of our assessment, the NRC reviewed the root-cause analysis performed by your staff and your independent expert's review of PRI's transportation program, both provided in response to the CAL, and found them to be adequate in addressing methods to eliminate excess liquid in the barium sulfate sludge and pond sediment shipments. During the NRC transportation-specific inspection conducted in November 2016, the NRC verified that your analytical methodology and

calculational models used to determine the radioactive material content in the barium sulfate sludge had been revised to adequately calculate the radioactive material content.

Power Resources, Inc.'s recent changes to its transportation program associated with the package selection process, waste classification, and its pre-transportation packaging process have been reviewed and determined to be adequate, as documented by the revised procedures to ensure appropriate waste classification, packaging, and labeling. The NRC has determined that PRI's corrective action plan, schedule to restore compliance, and changes made to prevent recurrence were adequate by establishing a written program along with appropriate package testing to ensure the safe transport of barium sulfate sludge and pond sediment to disposal facilities.

In summary, based on our independent assessment of your corrective actions, the NRC has determined that PRI has satisfied the actions described in the CAL. Therefore, the NRC considers the CAL closed. As such, PRI, may resume shipments of barium sulfate sludge material in accordance with its license. The NRC will continue to assess the effectiveness of these corrective actions during future inspections.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions concerning this matter, please contact Mr. Ray L. Kellar, Chief, Fuel Cycle and Decommissioning Branch at 817-200-1191.

Sincerely,

/RA/

Scott A. Morris
Deputy Regional Administrator

Docket: 040-08964
License: SUA-1548

cc:
D. Pavlick, Cameco Resources

S. Anderson, Director,
Utah Department of Environmental Quality

S. Ramsey, Manager
Wyoming Department of Homeland Security

R. Schierman, Manager
Wyoming Department of Environmental Quality

CONFIRMATORY ACTION LETTER CLOSURE - POWER RESOURCES, INC., DATED - AUGUST 25, 2017

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ADAMS ACCESSION NUMBER: ML17229B615

☒SUNSI Review: By: BDB | ADAMS: ☒ Yes ☐ No | ☐ Non-Publicly Available ☒ Publicly Available | ☒Non-Sensitive ☐ Sensitive | Keyword:

OFFICE	C:FCDB	TL:ACES	RC	D:DNMS	DRA	
NAME	RLKellar	MCHay	KSFuller	MRShaffer	SAMorris	
SIGNATURE	/RA by LEBfor/	/RA/	/RA/	/RA/	/RA/	
DATE	8/15/17	8/22/17	8/22/17	8/22/17	8/25/17	

OFFICAL RECORD COPY

Appendix F

Energy Fuels Resources (USA) Inc.
225 Union Blvd. Suite 600
Lakewood, CO, US, 80228
303 974 2140
www.energyfuels.com

Div of Waste Management
and Radiation Control

OCT 15 2019

DRC-2019-012708

October 9, 2019

SENT VIA E-MAIL AND EXPEDITED DELIVERY

Mr. Ty L. Howard
Director
Division of Waste Management and Radiation Control
Utah Department of Environmental Quality
195 North 1950 West
P.O. Box 144880
Salt Lake City, UT 84114-4820

Re: Volume and Procedural Modification Request for 11e.(2) Byproduct Material Disposal, Radioactive Materials License UT1900479, White Mesa Uranium Mill, Blanding Utah

Dear Mr. Howard:

The Nuclear Regulatory Commission ("NRC") regulations in 10 CFR 40 Appendix A, Criterion 2, focuses on avoiding proliferation of small disposal sites and thereby reduce perpetual surveillance obligations at in-situ uranium recovery ("ISR") operations and other small remote uranium extraction sites. Accordingly, ISR facilities do not have permanent 11e.(2) disposal facilities on site. Instead, upon final closure ISR facilities are decommissioned to free-release (clean closure) standards. In order to accomplish this, as a condition of their licenses they are required to enter into and maintain a contract for the disposal of their 11e.(2) byproduct materials at an existing off-site licensed 11e.(2) byproduct disposal facility, such as the White Mesa Mill (the "Mill"). In response to Criterion 2 referenced above, and to accommodate the license requirements of ISR facilities under this program, the Mill has received and disposed of 11e.(2) byproduct material from ISR facilities since 1993 under Section 10.5 of the Mill's Radioactive Materials License ("RML"), UT1900479. In order to better accommodate the operational requirements of ISR licensees, and based on the Mill's experience to date, EFRI would like to request three changes to the current RML conditions for 11e.(2) byproduct disposal activities as delineated below. In addition, since 1993 in-situ leach ("ISL") facilities are now referred to as ISR facilities; therefore references should be changed accordingly.

Section 10.5 of the Mill's RML states:

"In accordance with the licensee's submittal to the NRC dated May 20,1993, the licensee is hereby authorized to dispose of byproduct material generated at licensed in-situ leach (ISL) facilities, subject to the following conditions:

A. Disposal of ISL waste is limited to 5000 cubic yards from a single source."

Energy Fuels Resources (USA) Inc. ("EFRI") hereby requests that the RML Section 10.5.A be modified to read as follows:

A. Disposal of 11e.(2) material from ISR facilities is limited to a total of 10,000 cubic yards ("cy") per year from all sources provided that:

   i. the licensee may exceed this amount in any year if required to accept ISR waste from any facility in connection with the final reclamation/decommissioning of the facility; and

   ii. the licensee may accept an unlimited amount of 11e.(2) byproduct material from any facility owned or operated by the licensee or an affiliate of the licensee.

This volume change reflects the original volume contemplated by the NRC in its RML, Amendment 33. Further, this volume change allows for the receipt of reclamation items from ISR facilities as necessary, without the delays associated with the submission of individual volume change requests.

To conservatively assure that sufficient disposal capacity is available, the annual tailings capacity evaluation will use 20,000 cy (unless there are any facilities that are going into final reclamation, in which case this amount will be increased accordingly, if necessary) for future receipts. This conservatism will be incorporated into the calculation as noted in Section 2.6 of the Standard Operating Procedure ("SOP"). The annual tailings capacity evaluation will include this amount converted from cubic yards to dry tons. This conservatism provides assurance that any 11e.(2) byproduct materials from ISR facilities will be accounted for prior to receipt.

Section 10.5 D of the Mill's RML states that:

"All disposal activities shall be documented and records thereof maintained on-site. The documentation shall include descriptions of the ISL waste and the disposal locations, as well as all actions required by this License condition."

Section 10.5.E of the Mill's RML states that:

"ISL Disposal Requirements. The licensee shall perform ISL disposal activities in accordance with the current Director approved Standard Operating Procedure (SOP) for ISL disposal. Said plan includes the following minimum provisions:

> (3) Such ISL byproduct material shall be segregated from any mill material and equipment disposed of in the cells pursuant to License Condition 10.4, and the ISL byproduct material from each in-situ leach source shall be segregated from the byproduct material from all other in-situ leach sources;"

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EFRI hereby requests a change to the above requirements in 10.5.D and 10.5.E.(3) to remove the location documentation and waste segregation stipulations to read as follows:

D. All disposal activities shall be documented and records thereof maintained on-site. The documentation shall include the information required in the Director-approved SOP.

E. ISR Disposal Requirements. The licensee shall perform placement activities of 11e.(2) byproduct material from ISR facilities in accordance with the current Director-approved SOP. Said SOP includes the following minimum provisions:

(3) Such ISR byproduct material shall be disposed of in the cells pursuant to License Condition 10.4;

The proposed change would allow more expeditious and efficient placement of 11e.(2) byproduct materials with no adverse effects. It is important to note that the liner protection elements in 10.5.E would remain in effect and thereby continue to be protective of the liner.

Redlined revised SOPs for 11e.(2) byproduct material disposal and tailings capacity evaluations are included in Attachments A and B for Division of Waste Management and Radiation Control ("DWMRC") approval.

If you should have any questions regarding this letter, please contact me.

Yours very truly,

Kathy Weinel

ENERGY FUELS RESOURCES (USA) INC.
Kathy Weinel
Quality Assurance Manager

CC: Scott Bakken
Mark Chalmers
David Frydenlund
Paul Goranson
Garrin Palmer
Harold Roberts
Logan Shumway
Terry Slade

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Attachment A

1.0 Purpose

Energy Fuels Resources (USA) Inc. ("EFRI") receives 11e.(2) byproduct material ("byproduct material") from uranium in-situ ~~leach~~ recovery ("ISR") operations for disposal under License Condition 10.5. The following procedure applies to acceptance, handling, and disposal of byproduct material at the White Mesa Mill (the "Mill").

2.0 Prior to Shipment of Byproduct Material

All byproduct material must be approved for disposal by the Mill Radiation Safety Officer ("RSO"), or his designee, prior to shipment to the Mill. The byproduct material must conform to Titles 10 and 49 of the U.S. Code of Federal Regulations ("CFR") and the Shipper must certify that the byproduct material does not contain hazardous waste as defined in the Resource Conservation and Recovery Act ("RCRA").

Information regarding the byproduct material to be disposed of should be received prior to receipt of the shipment at the Mill, and shall include:

1. The volume of material in cubic feet or yards, or quantity of drums and their size.

2. A description of the material (e.g. sludge, process materials, filter media, pipe, etc.)

3. A description of the shipping container (i.e. end dump trailer, intermodal container, side dump container, etc.)

4. Results of analysis for U-Nat, Ra-226, Th-230 and Pb-210 on all sludges and soils and other material that is suited to sample collection. If a representative sample of the material was taken in connection with a previous shipment of material, then the results of that previous representative sample may be relied upon, and may be referred to or restated in the documentation that accompanies the shipment of the material. For byproduct material which is not suited to sample collection (i.e. metals, process equipment, filter media, pipes, etc.) the Shipper will determine the range, the average and the total activity, measured in millirem/hour (mr/hr) at a range of one meter, for each shipment.

5. A copy of the completed shipping manifest that will accompany the shipment and the anticipated shipping date.

The Environmental Coordinator or their designee will verify, prior to receipt of any shipment of byproduct material, that the disposal of such byproduct material will not cause the Mill to exceed the limits ~~of 5,000 cubic yards~~ of byproduct material ~~from a single source~~, set out in Mill License condition 10.5A.

3.0 Designated Disposal Area

The Environmental Coordinator, or their designee will designate from time to time one or more designated disposal areas (each a "Designated Disposal Area") being a general area within a tailings cell for the disposal of byproduct material. Each Designated Disposal Area must meet the following

criteria:

1. The Designated Disposal Area must be in an active tailings cell (i.e., a tailings cell that is not fully covered with interim cover);

2. The Designated Disposal Area must be on a tailings beach area of the cell or on an area of the cell that is underlain by tailings sands;

3. There must be at least 4 feet of tailings sands under the Designated Disposal Area;

4. The Designated Disposal Area must be located at least 12 feet from the sides or dikes of the tailings cell;

5. Survey information or other document review will be maintained to confirm that the elevation of the Designated Disposal Area once filled with byproduct material must not exceed the plane or grade of the elevation of the uppermost flexible membrane liner of the tailings cell;

~~6.~~1. ~~Detailed engineering drawings must have been prepared and kept on file at the Mill that demonstrate for each Designated Disposal Area that:~~

~~a) There are at least 4 feet of tailings sands under the bottom of the Designated Disposal Area; and~~

~~b)~~a) ~~The bottom of the Designated Disposal Area is located at least 12 feet from the sides or dikes of the tailings cells; and~~

~~c) Each disposed ISL byproduct material has been segregated from any mill material and equipment disposed of in the cells and the ISL byproduct material from each in-situ leach source will be segregated from the byproduct material from all other in-situ leach sources;~~

~~7.~~6. ISL~~L~~R wastes will be disposed in cells that have received prior written approval from the Director for this purpose.

~~8. Prior written approval must have been obtained from the Director of the Utah Radiation Control Board (the "Director") for each Designated Disposal Area, under Mill License condition 10.5C, and evidence of such approval must be on file at the Mill.~~

~~9.~~7. ~~Byproduct material from each ISL facility is disposed in Designated Disposal Areas specific to that ISL facility.~~ Designated Disposal Areas include either trench areas or tailings beach areas. The procedures for placement are not dependeant on which area the byproduct material is placed in. The above procedures are the same for both trench areas and tailings beach areas.

~~Detailed engineering drawings must have been prepared and kept on file at the Mill that demonstrate for each Designated Disposal Area that:~~ When a new Designated Disposal Area is needed, EFRI will delineate the usable area within the cell footprint with stakes, fencing, bollards or other material(s) such that it is clear that the area meets requirements in items 3 and 4 above.

~~There are at least 4 feet of tailings sands under the bottom of the Designated Disposal Area; and~~

~~The bottom of the Designated Disposal Area is located at least 12 feet from the sides or dikes of the tailings cells; and~~

4.0 Notification to Director

EFRI shall notify the Director in writing at least 7 calendar days prior to the proposed scheduled date for disposal of any byproduct material. Written evidence of this notification will be kept on file at the Mill.

5.0 Byproduct Material Receiving

1. When each truck driver enters the restricted area for the first time, the scale house operator will provide hazard training for the driver. The driver will be provided with the Safety Training Form (Attachment 1). All drivers will be required to read the Safety Training Form and sign and date the Safety Training Form indicating that they understand and agree to follow EFRI's safety rules and procedures while on company property. The scale house operator will sign the Safety Training Form as the instructor for EFRI. Completed Safety Training Forms will be turned in to the Safety Department for future reference.

2. The onsite transportation expert shall inspect all copies of the Shipping Manifest and the transporter's Bill of Lading to ensure that the shipment is destined for the Mill and confirm with the Environmental Coordinator, or their designee that the shipment has been approved for receipt.

3. Record the inbound date and both the truck and trailer numbers on the Scale house Weight Ticket (SWT).

4. Enter the loaded weight of the truck and trailer on the SWT.

5. The scale house operator will contact the Environmental Department so that the shipment can be escorted by Environmental personnel to the Designated Disposal Area specified by the Environmental Coordinator.

6. Prior to transporting material to the Designated Disposal Area (pending on weather), the driver will be instructed to open or untarp the load. The Environmental personnel and the transportation expert will visually inspect, to the degree possible, the byproduct material to ensure that the material matches the material description on the shipping manifest. Any discrepancies between the byproduct material received and the manifest information will be reported to the Environmental Coordinator.

a. Any byproduct material suspected of not conforming to Section 2.0 of this SOP will not be transported to the disposal site, unless a determination is made by the Environmental Coordinator that the material in question conforms to Section 2.0 of this SOP.

b. Barrels containing soil or sludges shall be checked to determine if they are full prior to transporting them for disposal. Barrels not completely full shall be documented and shall be filled with tailings or soil prior to disposal. (License Condition 10.5.B).

c. If weather conditions exist that makes the opening of the conveyance impossible at the untarping station, the Environmental personnel may take the conveyance to a suitable location in which to inspect the load. A suitable location will be one where the load may be viewed where employees are safely out of the way when the conveyance doors are opened and where if material was to fall out of the conveyance, that contamination issues will not be incurred. An example area could the tails impound area near the disposal site.

6.0 Byproduct Material Unloading

1. The Environmental Coordinator will specify the specific location within the broader Designated Disposal Area for disposal of the shipment. ~~In designating the specific location within the broader Designated Disposal Area for disposal of the shipment, the Environmental Coordinator will ensure that all byproduct material will be segregated from any Mill material and equipment disposed of in the cell pursuant to Mill license condition 10.4, and that the byproduct material from each ISL source will be segregated from the byproduct material from all other ISL sources.~~

2. Environmental personnel will escort the shipment to the designated location in the Designated Disposal Area for unloading of the byproduct material.

3. Proposed Methods and Procedures to Fully Protect the Liner While Accessing Tailings Cells for Disposal of IS~~L~~RL Byproduct Material and Mill Equipment

   a. The shipment will be transported to the Designated Disposal Area only on established roadways onto the tailings cells.
   b. At no time will a shipment be transported over or in a manner that will damage unprotected dikes, liners, other structures or settlement monitors associated with any of the tailings cells.
   c. There must be at least 4 feet of tailings sands under the Designated Disposal Area ~~(documentation of the disposal area must be completed and on file prior to any disposal activities)~~;
   d. The Designated Disposal Area must be located at least 12 feet from the sides or dikes of the tailings cell (active areas will be marked as noted above~~documentation of the disposal area must be completed and on file prior to any disposal activities~~);
   e. No travel into the disposal area will be allowed unless the disposal cell liner is covered by at least 18 inches of soil or fill material at the point of access.

4. If the 7 calendar day notice referred to in Section 4.0 above has not been given, or the 7 days have not lapsed, then the shipment may be, but is not required to be contained in the shipping container (that is, the container-bin or trailer) on site until the required 7 day notice has been given and the 7 calendar days have lapsed.

5. If the shipment is determined to be acceptable, the following procedures will be followed:

   a) If the 7-day notice has been given under Section 4.0 above and the 7 calendar days have lapsed, the byproduct material will then be unloaded in the designated area. If such notice has not been given or if such 7 day period has not lapsed, then the byproduct material will be unloaded in an area of the tailings cell that is not covered with interim cover and from which the material can be removed if necessary. Once the required notice has been given and the required 7 days have lapsed, the byproduct material will then be placed into the designated area.

   b) If the material is in a self-unloading container, the driver will be instructed to unload ensuring all personnel are clear of the trailer and the immediate area. Byproduct material will be dumped from the transport in a safe manner to minimize dust. If the material requires unloading by a fork truck, a ramp will be installed and unloading will proceed.

   c) After unloading, the Environmental personnel will visually inspect the unloaded byproduct material to ensure that there is no newly discovered material which does not match the material description on the shipping manifest. Any discrepancies between the byproduct material received and the manifest information will be reported to the Environmental Coordinator. Any byproduct material suspected of not meeting the requirements set forth in Section 2.0 of this SOP will be kept segregated from other waste material until a determination is made of its acceptability for disposal.

   d) After unloading, a photo of the unloaded material will be taken which is attached to the shipping documentation for verification of shipment contents.

   ~~e) The location of the shipment of the byproduct material will be documented on the plat of each Designated Disposal Area illustrating the disposal area within the Designated Disposal Area where the byproduct material will be disposed of.~~

   ~~f~~e) Beta-gamma measurements will be taken at several locations around the unloaded material. This information will be recorded on the Radiation Department's copy of the shipment documentation. The measurement range in mrem/hr at 2 meters, and the average measurement, measured in mrem/hr at 2 meters, shall be recorded.

   ~~g~~f) Measurements using a photoionization detection meter ("PID") will be taken at several locations around the unloaded material to ensure that there are no organics present. The information will be recorded on the Environmental Department's copy of the shipment documentation. If organics are detected, the Environmental Coordinator must be advised, and no compaction or covering activities relating to the shipment shall occur until specifically instructed by the Environmental Coordinator. The Environmental Coordinator and Safety Coordinator will determine if any additional safety precautions are required to be taken by workers or otherwise as a result of the

detection of the organics, and will implement any such precautions. The Environmental Coordinator will also contact EFRI corporate regulatory personnel and the shipper to verify that the detected organics are 11e.(2) byproduct material from the shipper's ISR~~L~~ facility. Once the Environmental Coordinator has verified that the organics are byproduct material compaction and covering activities will proceed.

~~h~~g) A breathing zone sample will be taken periodically during unloading and cover activities. If the gross alpha exceeds 25% of the applicable DAC, then the RSO will be notified, and all other unloading activities of byproduct material from that particular ISR~~L~~ site will require the use of respiratory protection, until further notice by the RSO.

~~i~~h) After unloading the byproduct material, replace the tarp or close the trailer, unless the trailer is being decontaminated for unrestricted release.

~~j~~i) Direct the driver back to the scales for an empty weight.

~~k~~j) The scale house operator will record the empty weight on the appropriate SWT.

~~l~~k) Shipment and disposal activities will be documented as described in Section 10, below.

7.0 Covering of Byproduct Material

1. After the byproduct material has been accepted by the Environmental Coordinator, or their designee, the byproduct material will be spread within the designated area within the Designated Disposal Area to facilitate compaction and covering.

2. The byproduct material will be compacted with at least four passes of the construction equipment prior to placing an additional layer.

3. Free volumes in the byproduct material will be minimized by filling, sectioning, or crushing. Random fill or tailings sands will be used to fill voids in and around the byproduct material.

4. All contaminated equipment shall be dismantled, crushed, or sectioned to minimize void spaces. Barrels containing waste other than soil or sludges shall be emptied into the disposal area and the barrels crushed. Barrels containing soil or sludges shall be verified to be full prior to disposal. Barrels not completely full shall be filled with tailings or soil.

5. A one foot thick, or thicker, cover comprised of native soil will be placed over the byproduct material working area. The fill and cover material will be compacted with at least one pass of the construction equipment.

6. The Environmental Coordinator or their designee will inspect the placement of the byproduct material prior to covering to physically verify that the procedures in this Section 7.0 have been adequately performed.

8.0 Decontamination and Release of Trailers and Trucks

All trailers and trucks will be decontaminated after unloading prior to leaving the Mill. Shippers or transporters will notify EFRI whether a specific trailer is to be released for restricted or unrestricted use. Any trailers that are to be released for restricted use will be decontaminated according to the requirements contained in DOT Part 49 CFR 173.428 or 173.443. Any trailers that are to be released for unrestricted use will be decontaminated according to the requirements found in Table 2 of the Nuclear Regulatory Commission's (NRC's) Regulatory Guide 8.30 Rev. 1 "Health Physics Surveys in Uranium Recovery Facilities" or NRC document- "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material" issued May 1987. Trailers requiring repair will be decontaminated for unrestricted release, to facilitate repairs by the transporter at the transporter's own site. Trailers may be repaired without undergoing full decontamination if repaired within the restricted area of the Mill.

For the appropriate decontamination procedures, refer to the following Standard Operating Procedures for the appropriate conveyance:

End Dump Trailer	SOP PBL-9
Intermodal Container	SOP PBL-2
Standard Container Trailer	SOP-PBL-2

9.0 Hazard Identification and Safety

1. Required Personal Protective Equipment (PPE)

   In all areas of the Mill covered by this procedure, hard hats, safety glasses and steel-toed shoes are required at a minimum. These must be worn in the restricted area of the Mill. Prior to disposal, the RSO will determine what level of respiratory protection, if any, will be required.

2. Industrial Hazards and Safety

   d) Use caution when the trailers are backing to the unloading area.

   e) Ensure that all personnel within 50 feet of the area where an end dump trailer is about to dump its load are aware that unloading is about to commence. Move at least 25 feet away from the rear of the trailer during the initial unloading operation.

   f) Drivers must use caution during the unloading process and be aware of any overhead hazards.

   g) Do not place any part of your body inside the trailer when the trailer is being tipped and the tailgate is open. Only work around the tailgate after it has been properly blocked open.

   h) Use caution when entering or exiting equipment. Be sure to use the ladders and hand rails. **Do not jump off the equipment.**

i) Always use a ladder when entering and/or exiting the interior of a trailer.

3. Mobile Equipment

a) Only trained and authorized persons may operate mobile equipment.

b) All mobile equipment shall be inspected by the operator and any safety defects corrected before the equipment is used. If safe to do so, the equipment may be driven to the shop for repairs. Otherwise, the equipment must be towed or repaired at the location.

c) Audible backup alarms shall be in operating condition.

d) Walk around any piece of equipment before starting or moving it. Make certain no one is in a dangerous position and there are no obvious defects or hazards.

e) Use caution when entering or exiting equipment. Be sure to use the ladders and hand rails. **Do not jump off the equipment.**

f) Seat belts shall be used at all times when equipment is in motion.

g) Equipment shall be operated at a reasonable speed consistent with road and weather conditions, subject to a maximum speed limit of 15 mph.

h) Keep the cabs of equipment clean. Loose items that could jam controls or create other hazards are not allowed.

i) Report all accidents to your supervisor regardless of how minor they are. If property damage or personal injury is involved, do not move the equipment until your supervisor has released it.

j) All gasoline engines must be shut off when refueling.

k) Keep equipment clear of edges, drop offs, and unstable banks. Maintain adequate berms where required.

10.0 Documentation

1. a) Documentation of Shipments

For each shipment of byproduct material the following records will be maintained in the Mill's Environmental Department files:

- Shipper's Manifest and Bill of Lading.
- Laboratory/activity analysis of the byproduct material performed by the Shipper.
- Completed SWT.
- 7-day notice to Director.
- Photo of the byproduct material.

- Byproduct material radiological scan information.
- Breathing zone monitoring data, if applicable.
- Equipment release forms.

All documents and photographs should be dated and the Shipper's Manifest and or Bill of Lading number indicated on the document.

b) Documentation of Disposal

Byproduct material disposal will be documented on the Disposal Documentation Form provided in Attachment 2. Attachment 2 may be accompanied by photographs, a written description or both. Attachment 2 or other written description will include:

- How the material was placed in the tailing cells;
- If void spaces in the drums/barrels containing soil or sludge were filled with tailings sands;
- How the area was compacted;
- Document that materials placed on tailings are no more than 4 feet thick and subsequent lifts no more than 2 feet thick ~~(this information will be obtained for each ISL disposal area and maintained by the engineering department)~~;
- Document that there are 4 feet of tailings under the bottom of each disposal area and the bottom of each disposal area is located at least 12 feet from the sides or dikes of the tailings area ~~this information will be obtained for each ISL disposal area and maintained by the engineering department)~~;
- Document that the elevation of the material will not exceed the plane or grade of the elevation of the uppermost flexible membrane liner of the cell.
- Confirmation that the shipment was properly covered; and
- Where settlement markers were placed. The Mill will maintain a plat of each Designated Disposal Area, which illustrates the location of each shipment of byproduct material.

2. The Mill will maintain on file a copy of the Director's written approval of each Designated Disposal Area.

An annual summary of the amounts of byproduct material disposed of in each calendar year shall be sent to the Director on or before November 1 of the calendar year. (License Condition 10.5F). [summary due same year]

11.0 Training

An annual basis, all onsite personnel that are involved in the receiving or disposing of this material shall be trained in the activities associated with this procedure. This training shall be documented and maintained on file.

ATTACHMENT 1
SAFETY TRAINING FOR DELIVERY PERSONNEL

Welcome to Energy Fuels Resources (USA) Inc.'s, White Mesa Mill. In order to assure your safety while on our property, we would like to acquaint you with the safety rules and procedures, which you will be required to follow while on our property.

1.0 General Safety

1. Approved hard hats and safety glasses are required at all times except when inside the cab of your truck.

2. This is a smoke free facility. No smoking is allowed on the property. Eating anything, drinking, chewing candy, gum or tobacco is also not allowed in the Mill Restricted Area due to radiation hazards.

3. Maintain a safe speed at all times when driving in the Mill Restricted Area. The maximum speed limit is posted at 15 mph. Energy Fuels Resources (USA) Inc.'s equipment has the right of way on the ore pad and Mill roadways.

4. Be aware of the possibility of a truck turning over while dumping. Ensure that the truck is on level ground and brakes are set prior to dumping.

5. Check for potential overhead hazards prior to dumping.

6. If material is hung up in the trailer bed, it is not permissible to work in the bed while it is in the dump position. If it is necessary to get in the bed of the trailer to free a hang up, the bed must be lowered.

7. Be aware of slippery conditions on the ore pad during periods of inclement weather.

8. Be aware of the potential for ice build-up on and around the decontamination pad during periods of cold weather.

9. Use caution when entering or exiting equipment.

2.0 Radiation Safety

1. All drivers are required to scan for alpha radiation prior to leaving the Mill Restricted Area.

2. All equipment, i.e. trucks and trailers, will be scanned for radiation prior to leaving the Mill's Restricted Area.

_____	_____
Driver (Printed)	Scale House Operator
_____	_____
Driver (Signature)	Date

ATTACHMENT 2
11e.(2) BYPRODUCT MATERIAL DISPOSAL DOCUMENTATION FORM

Date: _____

Name of employee receiving the load: _____

Generator of the Byproduct Material: _____

Shipper's Manifest or Bill of Lading number: _____

Was the State of Utah given notice to the receipt/disposal activities associated with this load? Yes or No

Who gave and when was the notification given?

_____

_____

Description of byproduct material disposal area/activities:

_____

_____

_____

Has each drum been inspected to identify the presence of any void spaces? _____

Have all drums with void spaces been filled with tailings sands or soil? _____

Which tailings cell was the material placed in? _____

Was the material placed on a tailings beach area of the cell or on an area of the cell that was underlain by tailings sands?

_____

_____

~~Was the material segregated from any Mill material or equipment disposed of in the cell?~~

~~Was the material segregated from byproduct material from other ISL sources disposed of in the cell?~~

Manifest or BOL #: _____

Have the thickness and placement measurements been verified and documented for the disposal area by the engineer, specifically:

	Engineer's or Environmental Coordinator's Initials
Was the material placed in a cell approved by the ~~executive Secretary~~Director for IS~~L~~R waste disposal? _____ Documentation of approval _____	
~~Was the ISL material segregated from disposed Mill material and other ISL material? _____~~ ~~Refer to plat(s) used to confirm. _____~~	
Was the maximum lift thickness above tailings less than 4 feet thick?_____	
Was the maximum lift thickness of subsequent lifts less than 2 feet thick? _____	
Has 4 foot of tailings sands been maintained under each disposal area?_____ ~~Refer to drawings used to confirm_____~~	
Is the bottom of each disposal area at least 12 feet from the sides or dikes of the tailings cell?_____ ~~Refer to drawings used to confirm._____~~	
Will the elevation of the material exceed the plane or grade of the elevation of the uppermost flexible membrane liner of the cell? _____ How was this confirmed (e.g., survey or review) _____	

-How was the area compacted? Was each lift compacted by heavy equipment (such as a Cat D-6) at least 4 times prior to placement of subsequent lifts?

_____

_____

Were void spaces filled with tailings?

_____

_____

_____

Was the shipment properly covered?

_____

_____

Manifest or BOL #: _____

Are additional settlement monitors required to be placed ~~for this generator~~?

_____

_____

If required, where were the settlement markers placed?

_____

_____

_____

Radiological receipt survey measurements:

_____

_____

Breathing Zone:

1. Was a Breathing Zone Sample collected? Yes or No
2. If yes, what were the results of the sampling?

   _____

   _____

Was a photograph taken during the unloading activities? Yes or No

Attachment B

ED_005364I_00029056-00356

1.0 Purpose:

The State of Utah Division of Waste Management and Radiation Control ("DWMRC") license for the White Mesa uranium mill ("Mill") is a Performance-Based License ("PBL"). The PBL allows Energy Fuels Resources (USA) Inc. ("EFRI") to evaluate and implement certain changes in the licensed operation without applying for and receiving a formal amendment to the DWMRC license. The following procedure outlines the steps to follow when accepting additional conventional ore or alternate feed materials, to ensure that the currently permitted capacity of the Tailings Management System is not exceeded. This Standard Operating Procedure (SOP) is in conformance with the Mill's DWMRC License.

2.0 Tailings Capacity Determination Procedure:

Whenever the Mill is considering receiving conventional ore, 11e.(2) material, or an alternate feed, the capacity of the Mill Tailings Management System will have to be evaluated to ensure that sufficient volume is available to store the projected incremental volumes of tailings material, as well as the projected volumes of waste material from final reclamation of the Mill facility, based on the approved Reclamation Plan. This evaluation will be performed on an annual basis by the Mill Manager, or his designee, and approved by the President and CEO of EFRI, or his designee. The Tailings Capacity Determination will be completed by ~~December 1~~January 31 ~~of each calendar year~~ utilizing the volumes of conventional ore, 11e.(2) material and alternate feed materials projected to be received in EFRI's approved operating budget for the ~~following~~ that year.

The procedure for determining whether there is sufficient capacity is described as follows and documented on the attached Tailings Capacity Form.

2.1 For the initial evaluation, the base volume ("BV") available will be based on the remaining capacity in the active tailings cell, as determined by the Mill Manager from land surveys and production records ~~(copies of which are attached)~~. For each subsequent evaluation, the previous evaluation will produce a current remaining tailings capacity value, which will become the new BV for each active tailings cell.

2.2 Mill Management will maintain a Tailings Capacity Evaluation Record ("TCER") book, in which all evaluation forms and supporting calculations will be maintained. Refer to the TCER to obtain the BV value to be used in each subsequent evaluation.

2.3 The volume of tailings discharged to the active tailings cells between the date of the BV and the evaluation date will be estimated based on the Mill's production reports.

2.4 The amount of 11(e).2 in-situ waste material deposited into the tailings system between the date of the BV and the evaluation date will be summarized. The quantities of material will be listed by supplier and will be based on the Scale House Weigh Tickets from each shipment.

2.5 The BV, minus the quantities in items 2.3 and 2.4 above, will become the current tailings capacity. This number will be used as the BV (item 2.1 above) for the subsequent evaluation.

2.6 The amount of alternate feed material or conventional ore committed to be processed and deposited into the tailings system will be summarized. The maximum projected quantities of material will be listed by supplier and stated in dry tons, i.e. less the estimated moisture content. ~~Maximum~~Annual calculations will use 20,000 cy of 11(e).2 materials converted from~~stated in~~ cubic yards to dry tons. In instances where the Mill will accept more material to accommodate decommissioning/reclamation of an ISR facility, the volume will be estimated based on projections from the supplier.

2.7 The sum of the quantities estimated in item 2.6 above will be subtracted from the current tailings capacity calculated in item 2.5 above, to determine the remaining capacity available.

2.8 The remaining available volume in each of the active tailings cells will be converted to an equivalent volume in dry tons using a factor of 86 dry pounds cubic foot of available storage, or 2,322 dry pounds per cubic yard (1.16 dry tons per cubic yard). This factor was calculated in the Tailings Capacity Evaluation prepared in May of 2000. The factor was subsequently confirmed from drilling conducted in preparation of the Tailings Data Analysis Report, MWM, April 2015.

I. INTRODUCTION

This is the Oglala Sioux Tribe's response to the Environmental Protection Agency (EPA) requesting the Tribe's position on the applicability of tribal treaty rights to the Dewey Burdock In Situ Uranium Project in the Southern Black Hills. To understand what Sioux treaties, pertain to the Dewey Burdock Project, it is first important to understand the legal background of each treaty, the identity of each the tribe that signed them, and the applicability of the treaties (or acts implementing them) to the Project.

II. THE OTECI SAKOWIN (SIOUX NATION)

First, it is important to understand that the Oteci Sakowin ("Sioux Nation") is comprised of seven divisions: (1) Medawakanton; (2) Sisseton; (3) Wahpakoota; (4) Wahpeton; (5) Yankton; (6) Yanktonai; and (7) Teton.[i]

Secondly, it is important to understand that the Teton Division of the Sioux Nation is comprised of seven distinct, sovereign bands: (1) Blackfeet; (2) Brule; (3) Hunkpapa; (4) Miniconjou; (5) No Bows; (6) Oglala; and (7) Two Kettle.[1] Members of these Teton bands currently reside on the following Indian reservations in North and South Dakota and Nebraska:

TETON BAND	RESERVATION
Blackfeet	Cheyenne River Reservation (S.D.)
Brule	Rosebud Reservation and Lower Brule Reservation (S.D.)
Hunkpapa	Standing Rock Reservation (N.D. & S.D.)
Minneconjou	Cheyenne River Reservation (S.D.)
No Bows	Cheyenne River Reservation (S.D.)
Oglala	Pine Ridge Reservation (S.D. & Neb.)
Two Kettle	Cheyenne River Reservation (S.D.)

Also, members of the Teton bands also reside on the Fort Peck Reservation in Montana.

III. IDENTIFICATION OF SIOUX BANDS THAT HAVE ABORIGNAL RIGHTS AND/OR TREATY RIGHTS TO THE BLACK HILLS

There are three Sioux treaties that recognized aboriginal tile of the Sioux tribes to the Black Hills, and that are relevant to Sioux claims to cultural resources, water rights and fishing rights, and other rights, in the Black Hills.

A. Aboriginal rights to the Black Hills

Exclusive use and occupation "for a long time" prior to the loss of the property

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[1] *Sioux Nation v. United States*, 24 Ind. Cl. Comm. 147, 162 (1970).

by a tribe is sufficient to give aboriginal title.[2] That a 'long time' ran during the period of Untied States sovereignty over [an] area . . . is irrelevant insofar as the perfecting of Indian title is concerned.[3] "For a long time" can be from time immemorial or for a given number of years, even "20 to 50 years under appropriate circumstances."[4] So, it is undisputed that the Teton Sioux bands held aboriginal Indian title to the Black Hills under federal law, since they occupied the Black Hills "for a long time" prior to and subsequent to an assertion of United States dominion over the area under the Louisiana Purchase.[5]

B. Treaty rights to the Black Hills.

The three treaties that are pertinent to the Oglala Sioux Tribe's land claims and/or usufructuary rights in the Black Hills, and in particular, the Dewey-Burdock Project Area. The treaties are as follows:

(1) **1825 TREATY**:[6] Only **Oglala and Yanktonai bands** were parties to the 1825 Treaty referenced below;
(2) **1851 FORT LARAMIE TREATY:**[7] Only the **Teton and Yankton bands** were parties to the 1851 Fort Laramie Treaty that recognized their title to sixty million acres west of the Missouri River;
(3) **1868 FORT LARAMIE TREATY**:[8] Only the **Teton Bands, Yanktonai (Cuthead) bands, and Santee Sioux** (primarily those removed from Minnesota after the 1862 conflict) were parties to the 1868 Fort Laramie Treaty.

So, based on the last treaty, the 1868 Fort Laramie Treaty, the following current federally recognized Sioux tribes have treaty rights to the Black Hills (Great Sioux Reservation):

TETON SIOUX

(1) Blackfeet (based on 1851 and 1868 treaties)
(2) Brule (based on 1851 and 1868 treaties)
(3) Hunkpapa (based on 1851 and 1868 treaties)
(4) Miniconjou (based on 1851 and 1868 treaties)

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[2] *Sac and Fox Tribe v. United States*, 383 F.2d 991, 998 (Ct. Cl. 1967) (Citing *Sac and Fox Tribe v. United States*, 315 F.2d 896, 903 (Ct. Cl. 1963), c*ert denied* 375 U.S. 921 (1963)).
[3] *Sioux Nation v. United States*, 23 Ind. Cl. Comm. 419, 423 (1970).
[4] United States Indian Claims Commission Final Report (Aug. 13, 1946 – September 30, 1978, p. 129 (*Citing* United States v. Seminole Indians, 180 Ct. Cl. 375 (1968), aff'g 13 Ind. Cl. Comm. 326 (1964); *Fox Tribe v. United States*, 179 Ct. Cl. 8 (1967).
[5] It is also important to note that the Teton and Yanktonai Divisions (bands) also claim title to the fourteen million acres of non-treaty (aboriginal title) lands between the Missouri River and James River in North Dakota and South Dakota. See *Sioux Nation v. United States*, 23 Ind. Cl. Comm. 419 (1970).
[6] 7 Stat. 252.
[7] 11 Stat. 749.
[8] 15 Stat. 635.

(5) No Bows; (based on 1851 and 1868 treaties)
(6) Oglala (based on 1851 and 1868 treaties)
(7) Two Kettle (based on 1851 and 1868 treaties)

SANTEE SIOUX

(8) Santee (based on 1868 Treaty)

YANKTON SIOUX

(9) Yankton (based on 1851reaty)

YANKTONAI SIOUX

(10) Cuthead Yanktonai (based on 1868 Treaty)

IV. THE 1825 TREATY WITH THE OGLALA AND SIOUNE BANDS

The United States and the Oglala Band entered into a treaty of friendship and protection with the Sioune[9] and Oglala bands on July 5, 1825, 7 Stat. 252. By Article 2 of the 1825 Treaty, the United States brought the Oglala Band and Sioune Band (Yanktonai Cuthead Band) and their members under its protection and the Oglala and Sioune Bands became protectorate sovereign bands of the Sioux Nation of the United States under the 1825 Treaty.[10]

IV. THE 1851 AND 1868 FORT LARAMIE TREATIES

A. The 1851 Fort Laramie Treaty

The United States, the seven bands of the Teton Division, and the Yankton Division of the Sioux Nation entered into a treaty on September 17, 1851, 11 Stat. 749,[11] at Fort Laramie. Article

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[9] The Sioune are Yanktonai Sioux. Yanktonai Sioux Chief Wah-e-ne-ta (the Rushing Man) signed the 1825 Treaty on behalf of the Yanktonai Sioux.

[10] Article 1 of the 1825 Treaty provided that "[i]t is admitted by the Sioune and Ogallala bands of Sioux Indians, that they reside within the territorial limits of the United States, acknowledge their supremacy, and claim their protection. The said bands also admit the right of the Unite States to regulate all trade and intercourse with them." Article 2 of the treaty further provided that "[t]he United States agree to receive the Sioune and Ogallala bands of Sioux into their friendship, and under their protection, and to extend to them, from time to time, such benefits and acts of kindness as may be convenient, and seem just and proper to the President of the United States."

[11] The Yankton Sioux Division of the Sioux Nation was also a party to 1851 Fort Laramie Treaty. *Sioux Nation v. United States*, 24 Ind. Cl. Comm. 147 (1970). The Indian Claims Commission ruled

5 of the 1851 Treaty ***recognized***[12] and defined the territory and reserved rights of the Sioux bands[13] as follows:

> commencing the mouth of the White Earth River, on the Missouri River; thence in a southwesterly direction to the forks of the Platte River; thence up the north fork of the Platte River to a point known as the Red Bute, or where the road leaves the river; thence along the range of mountains known as the Black Hills, to the head-waters of the Heart River; thence down Heart River to its mouth; and thence down the Missouri River to the place of beginning.

Article 5 of the 1851 Treaty further provided that:

> It is, however, understood that, in making this recognition and acknowledgement, the aforesaid Indian nations do not hereby abandon or prejudice any rights or claims they may have to other lands; and further, that ***they do not surrender the privilege of hunting, fishing, or passing over any of the tract of county heretofore described***. (emphasis supplied).

The 1851 Treaty ***recognized*** the seven Teton bands' aboriginal Indian title to the ***sixty million acres*** described in the treaty.

B. The Powder River War of 1866-1868 and the culmination of the war by the 1868 Fort Laramie Treaty.

Unconsented encroachments on 60 million acres, 1851 Treaty territory by the United States and its citizens resulted in the Powder River War of 1866-1868 between the United States and the Teton Sioux bands (and their allies, the Cheyenne and Arapahoe). Peace was concluded between the United States and the Teton bands by Fort Laramie Peace Treaty on April 29, 1868, 15 Stat. 635. The 1868 Treaty provided for a mutual demobilization without terms of surrender on either side.[14]

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that the 1851 Treaty was a multi-lateral treaty by which the United States recognized the aboriginal territory of not only the seven Teton bands, but also the aboriginal territories of the other signatory tribes, including the Crow, Cheyenne, Arapahoe, Assiniboine, Hidatsa (also known as the Gros-Ventre), Mandan and the Arikara tribes. The Commission ruled that article 5 of the 1851 Treaty recognized the Oglala band and other Teton bands' joint and several aboriginal Indian title to the entire sixty-million-acre area west of the Missouri River. *Sioux Nation v. United States*, 23 Ind. Cl. Comm. 419, 424 (1970).

[12] Recognition of aboriginal title in an Indian treaty brings the territory under the protection of the Fifth Amendment to the United States Constitution, *Tee-Hit-Ton Indians v. United States*, 348 U.S. 272 (1955).

[13] *United States v. Winans*, 198 U.S. 371 (1905)

[14] The Teton Sioux bands, and other signatory bands to the 1868 Fort Laramie Treaty, were never militarily "conquered" by the United States and since 1868 have lived at peace with the United

Article 2 of the 1868 Treaty established a designated territory (within the 1851 Treaty territory boundaries) for the seven Teton bands and other Sioux bands. This territory is commonly referred to as the "Great Sioux Reservation," and is described in article 2 of the 1868 Treaty as follows:

> Commencing on the east bank of the Missouri River where the forty-sixth parallel of north latitude crosses the same, thence along low-water mark down said east bank to a point opposite where the northern line of the State of Nebraska strikes the river, thence west across said river, and along the northern line of Nebraska to the one hundred and fourth degree of longitude west from Greenwich, thence north on said meridian to a point where the forty-sixth parallel of north latitude intercepts the same, thence due east along said parallel to the place of the beginning; and in addition thereto, all existing reservations on the east bank of the said river shall be, and the same is, set apart for the absolute and undisturbed use and occupation of the Indians herein named . . . . and the United States now solemnly agrees that no persons except those herein designated and authorized so to do, and except such officers, agents and employees of the Government as may be authorized to enter upon Indian reservations in discharge of duties enjoined by law, shall eve be permitted to pass over, settle upon, or reside in the territory.[15]

Article 2 of the 1868 Treaty also contained the following language after the description of the boundaries of the Great Sioux Reservation:

> . . . and ***henceforth they will and do hereby relinquish all claims or right in and to any portion of the United States or Territories, except such as is embraced within the limits aforesaid, and except as hereafter provided.*** (emphasis supplied).

The words "except as hereafter provided" in Article 2 referred to Articles 11 and 16 of the 1868 Treaty. Article 11 provided in pertinent part as follows:

> ***. . . the tribes who are parities to this agreement hereby stipulate that they will relinquish all right to occupy permanently the territory outside their reservation as herein defined***, but yet reserve the right to hunt on any land north of North Platte, and on the Republican Fork of the Smoke Hill River, so long as the buffalo may range thereon in such numbers as to justify the chase Art. 11. (emphasis supplied)

States under Article 1 of the Treaty, which provided that "[f]rom this day forward all war between the parties to this agreement shall forever cease. The government of the United States desires peace, and its honor is hereby pledged to keep it. The Indians desire peace, and they now pledge their honor to maintain it."

[15] It should be noted that Article 12 of the 1868 Treaty provided that no future cessions of territory **within the Great Sioux Reservation** would be of "any validity or force . . . unless executed and signed by at least three-fourths of all the adult male Indians, occupying or interested in the same . . . ." Under article 12, the United States and Teton bands agreed to limit their sovereign powers to cede and to accept cessions of land for the protection and peace of both parties.

Article 16 of the provided in pertinent part as follows:

> The United States hereby agrees and stipulates that the country north of the North Platte River and east of the summits of the Big Horn Mountains shall be held and considered to be unceded Indian territory, and also stipulates and agrees that no white person or persons shall be permitted to settle upon or occupy any port of the same, or without the consent of the Indians first had and obtained to pass through the same . . . . Art. 16.

As noted above, the Oglala Sioux Tribe has repudiated and rejected any cession, voluntary or otherwise, of the remaining 34 million acres of its 1851 Treaty territory located outside the boundaries of the Great Sioux Reservation established by Article 2 of the subsequent 1868 Treaty in Docket 74.

V. THE 1877 BLACK HILLS ACT

After the defeat of General George Crook at the Battle of the Rosebud and Lt. Col. George A. Custer at the Battle of the little Bighorn in Montana in 1876, who were legally hunting in the Bighorn Mountains and Yellow Stone River Country in Montana under Article 11[16] of the 1868 Treaty and militarily attacked in violation of Article 1 of the Treaty, many Sioux bands moved back to the Great Sioux Reservation.

By the Act of February 28, 1877, 19 Stat. 254, Congress purported to ratify and confirm an agreement between commissioners on behalf of the United States and the Teton and other bands of the Sioux Nation (and the Northern Cheyenne and Arapaho tribes).[17] The purported agreement provided for the cession of over 7.3 million acres of territory in the western part of the Great Sioux Reservation, that included the Black Hills. No such agreement existed in fact or in law. When the United States could not obtain the requisite three-fourths adult male signatures required by Article 12 of the 1868 Treaty, Congress unilaterally enacted the 1877 Agreement into law and the agreement became an Act of Congress that confiscated the Black Hills portion of the Great Sioux

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[16] Article 11 of the 1868 Treaty provided in part that he Sioux bands "reserved the right to hunt on any lands north of North Platte [River], on the Republican Fork of the Smokey Hill river, so long as the buffalo may range thereon in such numbers as to justify the chase." Article XVI of the Treaty further provided that "[t]he United States hereby agrees and stipulates that the country north of the North Platte River and east of the summits of the Bid Horn mountains shall be held and considered to be unceded Indian territory. . . ." The Sioux bands were thus recognized with having an expanded hunting right to hunt in the Bighorn Mountains and Yellow Stone River country in 1876.

[17] In 1871, Congress quit entering into treaties with Indian tribes because the House of Representatives wanted to have a say in the treaty making process, which only required ratification by the Senate. 25 U.S.C. § 71. Thereafter, agreements with Indian tribes were called agreements and required approval of both houses of Congress.

Reservation without the consent of the Sioux bands that are signatory to the 1868 Treaty.[18]

Article 8 of the 1877 Black Hills Act is applicable to any type of mining activity in the Black Hills Portion of the Great Sioux Reservation, including In Situ uranium mining in the Dewy-Burdock area of the Black Hills, which provides in pertinent part that:

> . . . Congress shall, by appropriate legislation, secure to them an orderly government***; they shall be subject to the laws of the United States, and each individual shall be protected in his rights of property, person and life***. (emphasis added).

The words "they shall be subject to the laws of the United States" was interpreted by the Supreme Court to mean subject to the trust responsibility laws of the United States.[19] In this regard, it is important to note that federal courts have held that "[t]he existence of a trust duty between the United States and an Indian or *Indian tribe* can be inferred from the provisions of a statute, treaty or other agreement, reinforced by the undisputed existence of a general trust relationship between the United States and the Indian people,"[20] and that ***all government agencies have "fiduciary" responsibilities to tribes, and must always act in the interests of the beneficiaries***.[21] (emphasis added). "All government agencies" include the Bureau of Land Management (BLM), the Nuclear Regulatory Commission (NRC), and the Environmental Protection Agency (EPA).

VI. THE 1889 SIOUX ACT THAT ESTABLISHED THE PINE RIDGE INDIAN RESERVAION AND OTHER SIOUX RESERVATONS.

By the Act of March 2, 1889, 25 Stat. 888, Congress conditionally provided for the creation of six smaller reservations within the balance of the Great Sioux Reservation. These six smaller reservations are the Pine Ridge Indian Reservation, the Rosebud Indian Reservation, the Standing Rock Indian Reservation, the Cheyenne River Indian Reservation, the Lower Brule Indian Reservation and the Crow Creek Indian Reservation. The 1889 Act was expressly conditioned upon the acceptance of and consent to its provisions in the manner required by article 12 of the

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[18] The 1877 Act also provided in Article 1 that "the said Indians do hereby relinquish and cede to the United States all the territory lying outside the said reservation, as herein modified ad described, including all privileges of hunting and article 16 of said treaty is hereby abrogated." This language not only violated Article 12 of the 1868 Treaty, but also Section12 of the Trade and Intercourse Act of June 20, 1834, 4 Stat. 730 (codified at 25 U.S.C. § 177), which provided that "[n]o purchase, gran, lease, or other conveyance of lands, or of any title or claim thereto, from any Indian nation or tribe or Indians, shall be of any validity in law or equity, unless the same is made by treaty or convention entered into pursuant to the Constitution."

[19] *Ex Parte Crow Dog*, 109 U.S. 556, 568-69 (1883) ("They were nevertheless to be subject to the laws of the United States, not in the sense of citizens, but, as they had always been, as wards subject to a guardian . . .").

[20] *Blue Legs v. U.S. Bureau of Indian Affairs*, 867 F.2d ,1094, 1100 (8th Cir. 1989).

[21] *Covelo Indian Community v. FERC*, 895 F.2d 581 (9th Cir. 1990).

1868 Fort Laramie Treaty and Section 28 of the Act, i.e., the signatures of three-fourths of the adult male members of the Sioux bands that were signatory to the 1868 Treaty.[22]

VII. INDIAN CLAIMS COMMISSION AND COURT OF CLAIMS CASES

The original Sioux treaty land claims were filed as Docket 531 in the Court of Claims under a 1920 Special Jurisdictional Act.[23] The Black Hills Claim or the claims, Docket 531 (7), was dismissed by the court in 1942.[24]

The Sioux land claims were refiled in the Indian Claims Commission in 1950 under the 1942 Indian Claims Commission Act in 1950 as Docket 74. Docket 74 was bifurcated into two claims by the Indian Claims Commission in 1960, Dockets 74-A and 74-B.

> DOCKET 74-A: It involved claims for compensation based on a "cession" of 48 million acres of Sioux territory under Article 2 of the 2868 Fort Laramie Treaty, i.e., ***34 million acres*** of 1851 treaty lands west of the Missouri River and ***14 million acres*** of non-treaty lands east of the Missouri River[25] located outside of the exterior boundaries of the Great

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[22] In Oglala Sioux Tribe v. United States Army Corps of Engineers, *Oglala Sioux Tribe v. US Army Corps of Engineers*, 537 F. Supp. 2d 161 (D.D.C. 2008), the Oglala Sioux Tribe provided evidence to the United States District Court for the District of Columbia in a boundary dispute (and not a land claim) that the United States has never obtained the requisite three-fourths adult male signatures to lawfully implement the 1889 Act under Article 12 of the 1868 Treaty, and under Section 12 of the Act itself, and that the Act was void *ab initio* under Section 28 of the Act if it is proven that the requisite three fourths adult male signatures were not obtained by the Government and that: "upon failure of such proof . . . this act becomes of no effect and null and void." The District Court never-the-less dismissed the action for lack of standing.

For purposes of the Dewey-Burdock In Situ Uranium Project, it is important to note that the Cheyenne River, whose head waters flow from eastern Wyoming into western South Dakota, abuts the Pine Ridge Indian Reservation that was established under hew 1889 Act, and that the riverbed where it abuts the reservation is within the exterior boundaries of the Pine Ridge Indian Reservation and is presently considered trust property held in the name of the United States in trust for the tribe. As trust property, the United States has a trust responsibility to protect the water and riverbed from any pollution caused by uranium mining, or otherwise, within the drainage area of the Cheyenne River and its tributaries.

[23] Act of June 3, 1920, 41 Stat 738.

[24] The Black Hills Claim (Docket C-531 [7]) was dismissed by the Court of Claims on the basis that the court was not authorized by the 1920 special jurisdictional act to question whether the compensation afforded the Sioux by Congress in 1877 was an adequate price for the Black Hills, and that the Sioux claim in this regard was moral claim not protected by the Just Compensation Clause of the Fifth Amendment. *Sioux Nation v. United States*, 97 Ct. Cl. 613 (1942).

[25] See *Sioux Nation v. United States*, 23 Ind. Cl. Comm. 419 (1970). "After finding that the Teton and Yanktonai divisions possessed aboriginal title to the 14-million-acre area, the Indian Claims Commission determined that "[b]y the Treaty of April 29, 1868, 15 Stat. 635, which was proclaimed

Sioux Reservation as it exited after the passage of the 1877 Act, i.e., the Great Sioux Reservation minus the Black Hills portion of the reservation after the Black Hill were confiscated in1877).

DOCKET 74-B (later changes to Court of Claims Docket 178-78 when it was refiled in the Court of Claims under a special jurisdictional act in 1978): It involved claims based on an unconstitutional taking of ***7.3 million*** aces (the Black Hills)[26] portion of the Great Sioux Reservation in violation of the Just Compensation Clause of the Fifth Amendment to the United States Constitution.

These two territories are delineated on the Indian Claims Commission's map (at 38 Ind. Cl. "Comm. 469, 531 (1976)), and attached hereto as Exhibit "A."

After examining the history behind the Sioux claims based on a cession under the 1868 Treaty -- advanced by the Claims attorneys and not the Oglala Sioux Tribe -- the Indian Claims Commission found that: "The Indian Peace Commission presented the proposed treaty to the Sioux Bands in a series of councils held in the spring of 1868 . . . At these councils, after hearing an explanation of the terms of the treaties, the Sioux generally voiced these sentiments; 2--*they were unwilling to cede any of their lands* ...." And that "it is clear that, based on the representations of the United States negotiators, the Indians cannot have regarded the 1868 Treaty as a treaty of cession. ***Nowhere in the history leading up to the treaty negotiations themselves is there any indication that the United States was seeking a land cession or that the Sioux were unwilling to consent to one. On the contrary, the evidence is overwhelming that the Sioux would never have signed the treaty had they thought they were ceding any land to the United States***. *Sioux Tribe v. United States*, 42 Ind. Cl. Comm. 214 (1978).

The Indian Claims Commission then concluded that "as a matter of law that the goods and services promised by the United States under the 1868 treaty were not intended by the Sioux (or by the government negotiators) to be consideration for any Sioux Lands. The history of this case makes it clear that this treaty was an attempt by the United States to obtain peace on the best terms possible. *Ironically, this document, promising harmonious relations, effectuated a vast cession of land contrary to the understanding and intent of the Sioux*."[27] Id. (emphasis supplied)

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on February 24, 1869, the subject lands of the Tetons and Yanktonai were ceded to the United States..." Id. The boundary of the aboriginal title area is described at 23 Ind. Cl. Comm. 424-425.

[26] Court of Claims Docket 178-78 also involved the taking of three rights-of-way across the Great Sioux Reservation and placer (surface) gold stolen by trespassing miners prior to the 1877 when the Black Hills were considered part of the Great Sioux Reservation.

[27] Historical evidence introduced in Docket 74 showed that: (1) the Indians would fight to the death to retain the Power River Country, 42 Ind. Cl. Comm. at 241, (2) Two lance, a Two Kettle, indicated that his people did not want to give up their land, 42 Ind. Cl. Comm. at 241, (3) One Horn stated that the Sioux would never cede their country, 42 Ind. Cl. Comm. At 248, (4) Sitting Bull announced that he had no intention of selling any land to the whites, 42 Ind. Cl. Comm. at 249, (5) General Sanborn added that the government understood "when you tell us that you don't want to receive any present, that you don't wish to be thought of as selling your land" and that "[w]e are not going to give you the goods in exchange for any land . . . . ," 42 Ind. Cl. Comm. At

The Oglala Sioux Tribe does not agree to the "cession" of Sioux lands in Docket 74 and passed two resolutions to withdraw from Docket 74 so as not to be a party of the fraud by the Federal Government and claims attorneys being perpetuated on Tribe and its members. See Tribal Council Resolutions Nos. 83-160 and 84-47. In addition to being contrary to the rule of statutory construction that "Indian treaties are to be interpreted in the sense in which they would naturally be understood by the Indians and any ambiguity is to be resolved to their favor," see Choctaw Nation v. Oklahoma, 397 US 620 (1970); Winters v. United States, 207 US (1908); and United States v. Shoshone Tribe of Indians, 304 US 111 (1938), the Tribe's position in withdrawing from Docket 74 is well-stated in its petition for a writ of certiorari in Cheyenne River Sioux Tribe v. United States, 806 F.2d 1046 (Fed. Cir. 1986), cert. denied sub nom. Oglala Sioux Tribe v. United States, --- U.S. ----, 107 S. Ct. 3184, 96 L. Ed. 2d 673 (1987), cert. denied sub nom. Oglala Sioux Tribe v. United States, --- U.S. ----, 107 S. Ct. 3184, 96 L. Ed. 2d 673 (1987), and in Judge Newman's subsequent dissenting opinion in the Oglala Sioux Tribe's Motion for Relief from Judgement in *Oglala Sioux Tribe and Rosebud Sioux Tribe v. United States*, 862 F2d 275, (Fed. Cir. 1988). It is also worthy of notice that the Oglala Sioux Tribe has continuously rejected the Indian Claims Commission award in Docket 74 from 1978 to the present time. The Oglala Sioux Tribe has exhausted its federal judicial remedies in the United States Judicial System, and still claims title to the 34 million acres of 1851 Treaty lands outside the Great Sioux Reservation on the basis that the Sioux tribes never legally ceded these lands under the 1868 Treaty and ownership of these lands still be resolved legislatively through government-to-government obliteration with the U.S. Congress.

One cannot understand land claims litigation unless one knows the legal history of the tribes involved in the litigation. It is therefore important to understand that, since time immemorial, the seven Teton bands, along with certain other Sioux bands, jointly and severally, have exclusively used and occupied the following territories in the Missouri River Basin:

(1) West of the Missouri River, approximately ***sixty million acres*** of land in what are now the States of North Dakota, South Dakota, Nebraska, Montana and Wyoming recognized in Article 5 of the 1851 Fort Laramie Treaty; and
(2) East of the Missouri River, approximately ***fourteen million acres*** of non-treaty (aboriginal title) land in what are now the States of North Dakota and South Dakota recognized by the Indian Claims Commission.[28]

These two territories are delineated on the Indian Claims Commission map cited at 38 Ind. Cl. "Comm. 469, 531 (1976), and attached hereto as Exhibit "A."

VIII. OST AUTHORITY TO ENFORCE ITS TREATY AND STATUTORY RIGHS TO PROTECT THE TRIBE AND ITS MEMBERS RIGHTS UNDER FEDEAL

251, and (6) after the terms concerning the extent of Sioux territory and the provisions keeping out white people were read to him Red Cloud finally signed the treaty, 42 Ind. Cl. Comm. At 252.
[28] *Sioux Nation v. United States*, 23 Ind. Cl. Comm. (1970).

The Oglala Band of the Teton Sioux is a sovereign band of Indians with attendant powers that reorganized the "Oglala Sioux Tribe of the Pine Ridge Indian Reservation" ("OST") by adopting the benefits of the Indian Reorganization Act ("IRA") of June 18, 1934, 25 U.S.C. § 5101 *et seq.*, and a Constitution and Bylaws under Section 16 of the Act, 25 U.S.C § 5123). Under Article III, Section 1 of the Tribal Constitution provides that the governing body of the Oglala Sioux Tribe is the "Oglala Sioux Tribal Council."

The Oglala Sioux Tribe's federally approved Tribal Constitution specifically empowers the Tribal Council to:

(1) "To negotiate with the Federal, State, and local governments, on behalf of the tribe, and to advise the representatives of the Interior Department on all activities of the Department that may affect the Pine Ridge Indian Reservation" under Article IV, Section 1 (a);
(2) To protect and preserve the property, wild life and natural resources – gases, oil, and other materials, etc. – of the tribe . . ." under Article IV, Section 1 (m); and
(3) "To adopt laws protecting and promoting the health and general welfare of the Oglala Sioux Tribe and its membership" under Article IV, Section 1 (w), and

The Oglala Sioux Tribe presently enjoys all of the rights and privileges guaranteed under its existing treaties with the United States in accordance with 25 U.S.C. § 71 and Section 4 of the Act of June 15, 1935, 49 Stat. 378 (codified at 25 U.S.C. § 5128.

IX. EPA HAS A FIDUCIARY DUTY TO PROTECT THE OGLALA SIOUX TRIBE FROM THE HARMFAUL EFFECTS OF URANIUM DEVELOPMENT WIHTIN ITS TREATY TERRIITIES AND PROTECT THE PROPERTY, PERSONS AND LIVES OF OGLALA SIOUX TRIBAL MEMBERS UNDER ARTICLE 8 OF THE1877 ACT.

As a federal agency of the United States Government, the EPA has a fiduciary duty to protect the Oglala Sioux Tribe and its members from any adverse impacts resulting from uranium mining in the Dewy-Burdock project area of the southern Black Hills. Adverse impacts include, but are not limited to, the following:

(1) Failure to comply with tribal treaties and federal statutes, including the protection of tribal fisheries in the Cheyenne River form its headwaters in Wyoming to its confluence with the Missouri River, as provided in Article 5 of the 1851 Treaty and federal case law, and protection of the property, persons and lives of tribal members under Article 8 of the 1877 Black Hills Act against contamination of the environment in which tribal members reside. This also includes ensuring clean water for fish habitant in the river to protect the Tribe's rights to fish in the river under Article 5 of the 1851 Treaty. [29]

[29] There is also a corresponding 1851 Treaty right to maintain the Cheyenne River and its tributaries inhabitable for the Oglala Sioux Tribe's fisheries in the river and its tributaries, i.e., water rights

(2) Failure to protect the Tribe and its members from ground water contamination that affects the spiritual significance of sacred site and burial sites (both currently known and those yet to be discovered) by competent surveys, i.e., you can't make a holy place unholy by disturbing its natural conditions, including the ground water under these sites by polluting the waters with toxic uranium extraction chemicals and injection wells;
(3) Failure to protect the Tribe and its members from surface water contamination, in that ground waters at the uranium site will eventually percolate into the Cheyenne River and its tributary streams and creeks. Not only are tribal fisheries going to be adversely impacted, but, pollution in the river will eventually flow onto the river and river bed of the Cheyenne River where it abuts the Pine Ridge Indian Reservation;[30] and affects agricultural on the reservation, and the health and welfare of tribal members residing on the reservation by contamination of ground water wells and the river itself from ;
(4) The destruction of the Tribe's Winters Doctrine Water Rights and aboriginal water rights in the Cheyenne River and its tributary streams and creeks. Winters Doctrine

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that impose a duty on EPA and other concerned federal agencies, to protect both the Tribe's water rights and fishing rights from contaminates from uranium mining (or otherwise) that will negatively impact and/or destroy the Tribes fishing rights in the river. See, e.g., *United States v. Adair,* 723 F.2d 1394, 1408-1415 (9th Cir. 1983) (*"Adair II"*), *cert. denied sub nom*, *Oregon v. United States,* 467 U.S. 1252, 104 S. Ct. 3536, 82 L. Ed. 2d 841 (1984).(off-reservation treaty right to fish implied reservation of water to support tribal fisheries); *Dep't of Ecology v. Yakima Reservation Irrigation Dist.*, 850 P.2d 1306, 1317 (Wash. 1993) (Washington Supreme Court recognized that tribes with treaty language . . . reflecting a reservation of aboriginal rights to fish also have water rights for instream flow habitat protection). Also see *United States v. Alpine Land & Reservoir Co.*, 788 F. Supp. 2d 1209 (D. Nev. 2011) ("the Tribe retains a *Winters* right . . . to water to maintain the fishery"), citing *Nevada v. United States*, 463 U.S. 110 (1983). Also see *Hopi Tribe v. U.S.*, 782 F.3d 662, 669 (Fed. Cir. 2015) (In some circumstances, [the Winters Doctrine] may also give the United States the power to enjoin others from practices that reduce the quality of water feeding the reservation); Judith V. Royster, *Water Quality And The Winters Doctrine*, 107 Water Resources Update 50 (1997), http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1291&context=jcwre (A tribe may receive the quantity of water called for under its Winters rights, but the quality of the water may make it unusable for the purposes for which it was intended . . . * * * If the water provided at the reservation border is so degraded that it cannot be used for irrigation, then the water right is essentially meaningless).

[30] The Oglala Sioux Tribe's off-reservation and on-reservation Winters Doctrine and aboriginal ground and surface water rights in the Cheyenne River and its tributaries are trust property. This includes the ground waters in the Dewey-Burdock Project Area that feeds the Cheyenne River. See generally, Robert T. Anderson, *Indian Water Rights and the Federal Trust Responsibility*, 46 Nat. Resources J. 399 (2006) ("Indian reserved water rights are trust property with legal title held by the United States"); 55 Fed. Reg. 9223 (Mar. 12, 1990) ("Indian water rights are vested property rights for which the United States has a trust responsibility, with the United States holding legal title to such water in trust for the benefit of the Indians").

water rights are vested, Fifth Amendment property rights held in trust by the Federal Government;

(5) Failure to comply with NEPA, the National Historic Preservation Act of October 15, 1966, P.L. 89-665, 80 Stat. 915, *as amended*, 16 U.S.C. § 470 *et seq.* ("NHPA"),, and the Native American Graves Protection and Repatriation Act of November 16, 1990 (25 U.S.C. §§ 3001 *et seq.*) ("NAGPRA"), and other environmental statutes and cultural resources statutes.;

(6) Failure to conduct complete, competent cultural surveys as required by federal law to protect cultural resources, spiritual sites, and rock features, and human remains, o[31] n both federal and private lands[32] in the project area; and

(7) Failure to engage in meaningful government-to-government consultations as required by Executive Order 175 and Section 106 of the NHPA.

X. CONCLUSION

The Oglala Sioux Tribe and other 1851 Treaty and 1868 Treaty signatory tribes have never had government-to-government consultations with EPA for the Dewey-Burdock In Situ Uranium Project under Executive Order No. 13175 as implement by President Obama's November 5, 2009 memorandum, or under Oglala Sioux Tribal Council Ordinance No. 11-10, under applicable federal environmental laws, including Section 106 of the NHPA, and under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), adopted by the General Assembly on Thursday, 13 September 2007, and supported by the December 6, 2010 declaration of President Obama. The following articles of UNDRIP regarding consultations with the Oglala Sioux Tribe are applicable to the Dewey-Burdock Project:

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[31] The Oglala Sioux Tribe claims ownership (along with other 1851 Treaty signatory Sioux tribes) of all Native American burial sites and human remains, and an ownership interest in all cultural items, associated funerary objects, unassociated funerary objects, sacred objects, cultural patrimony, including stone features, i.e., stone rings, stone effigies, stone alignments, rock cairns located on federal lands under NAGPRA, and a right of access to sacred sites located on federally held lands within the Dewy-Burdock Project Area under the American Indian Religious Freedom Act ("AIRFA"),42 U.S.C. § 1996.

[32] The Federal Government has a fiduciary duty to protect the Sioux tribes' under the legal principles recognized in *Charrier v. Bell*, 496 So. 2d 601 (La. App. 1 Cir. 1986) *cert. denied*, 498 So. 2d 753 (La. 1986) (Tunica-Biloxi Tribe retained ownership of cultural items discovered on privately held lands) and *Black Hills Inst. of Geological Research v. South Dakota Sch. of Mines*, 12 F.3d 737, 742-744 (8th Cir. 1993) (Black Hills III) (Because the [dinosaur] fossil was trust property that was removed from the Indian trust land without the knowledge or consent of the United States, it remained the property of the United States. Likewise, the tribe's cultural resources located on private lands are still trust property held in trust for the tribes by the United States, were not conveyed to the present non-Indian occupants under the Homestead Act or otherwise; the United States and its agencies therefore have a fiduciary duty to protect these cultural resources on private lands to the same extent that it had a duty to a dinosaur fossil removed from trust land in the *Black Hills Inst., supra.*

Article 19: States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing **. . . *administrative*** measures that may affect them.

Article 32: States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.

Accordingly, the Oglala Sioux Tribe requests that the EPA engage in government-to-government consultations under the above-referenced legal authority to address all the concerns of the Tribe as articulated above.

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ORDINANCE NO. 11-10

ORDINANCE OF THE OGLALA SIOUX TRIBAL COUNCIL
OF THE OGLALA SIOUX TRIBE
(An Unincorporated Tribe)

ORDINANCE OF THE OGLALA SIOUX TRIBAL COUNCIL ESTABLISHING PROCEDURES FOR GOVERNMENT-TO-GOVERNMENT CONSULTATION BETWEEN THE OGLALA SIOUX TRIBE AND THE UNITED STATES GOVERNMENT, AND OTHER GOVERNMENTS.

WHEREAS, the Government-to-Government relationship between the Oglala Sioux Tribe was established in the United States Constitution, Article 6 (Supremacy Clause); the Treaty of July 2, 1825, United States-Oglala Band of Sioux Nation, 7 Stat. 252; Rev. Stat. § 2116, 25 U.S.C. § 177 (*codifying* section 12 of the Trade and Intercourse Act of June 30, 1834, ch. 161, 4 Stat. 730); the Treaty of September 17, 1851, United States-Teton Division of Sioux Nation, *et al.*, 11 Stat. 749; the Treaty of April 29, 1868, United States-Sioux Nation,15 Stat. 635; Rev. Stat. § 2079, 25 U.S.C. § 71 (*codifying* the Act of March 3, 1871, ch. 120, § 1, 16 Stat. 566), the Indian Reorganization Act of June 18, 1934, ch. 476, 48 Stat. 984, 25 U.S.C. § 461 *et seq.*, the Indian Self-Determination and Education Assistance Act of January 4, 1975, P.L. 93-638, 88 Stat. 2203, 25 U.S.C. § 450, *et seq.*, and other Congressional enactments, and

WHEREAS, the 1851 Treaty recognized title in the Oglala Band to 60 million acres of territory currently in the States of North Dakota, South Dakota, Nebraska, Montana and Wyoming for the Oglala Sioux Tribe and other Sioux tribes, and

WHEREAS, a permanent homeland was established within the 1851 Treaty territory for the "absolute and undisturbed use and occupation" of the Oglala Sioux Band and other Sioux bands, which homeland has been referred to as the "Great Sioux Reservation" and comprises substantially all of present day South Dakota west of the east bank of the Missouri River, and

WHEREAS, the Indian Claims Commission also found that the Oglala Band and other Sioux bands held aboriginal (non-treaty) title to 14 million acres east of the Missouri River in the States of North Dakota and South Dakota, and

WHEREAS, uncontested encroachments on the 1851 Treaty territory by the United States and its citizens resulted in the Powder River War of 1866-1868 between the United States and the Oglala band and other bands of Sioux Indians. as a result of which, peace was concluded between the United States and the Oglala Band and other Sioux bands by treaty on April 29, 1868, 15 Stat. 635 ("1868 Fort Laramie Treaty," which treaty was duly ratified by the United States on February 16, 1869 and proclaimed by the President on February 24, 1869, and

WHEREAS, the 1868 Treaty provided for a mutual demobilization of the United States and Oglala Band and other Sioux bands without terms of surrender on either side, and as a result thereof, the Oglala Band and other Sioux bands were never militarily conquered by the United States, and the Oglala Band has abided by the 1868 Treaty and resided on its reservation in accordance of the terms of the treaty since 1868, except for incidences in Montana in 1876 where the Oglala Band and other Sioux bands were legally exercising its 1868 Treaty, Article 11, hunting rights and yet had to defend themselves from attack by the United States Cavalry in violation of Articles 1 and 11 of the 1868 Treaty, and

WHEREAS, subsequent to ratification of the 1868 Treaty, no aboriginal or treaty territory of the Oglala Band was ever acquired by the United States in accordance with 25 U.S.C. § 177 or Article 12 of the 1868 Treaty, and all acquisitions of Oglala Band's territory was either confiscated by the United States or acquired with the requisite consent of the Band, and

WHEREAS, the "Oglala Band" reorganized in 1936 as the "Oglala Sioux Tribe of the Pine Ridge Indian Reservation" under Section 16 of the 1934 Indian Reorganization Act of June 18, 1934, ch. 576, 48 Stat. 987, 25 U.S.C. § 476, by adopting a constitution and bylaws approved by the Secretary of the Interior, and presently enjoys all of the rights and privileges guaranteed under its existing treaties with the United States in accordance with 25 U.S.C. § 478b

WHEREAS, as a result of its unique government-to-government relationship with the United States, and because the Oglala Band (now Oglala Sioux Tribe) is one of the few militarily unconquered Sioux tribes in the United States and all of its territory now in the possession of the United States was acquired without its consent, the Oglala Sioux Tribe still possesses very strong aboriginal rights within all the territory that comprised its aboriginal homeland, and as a result thereof, the Tribe has both a domestic and international rights to government-to-government consultations with the United States on the formulation of federal policies, or on all federal actions or undertakings that adversely affect its aboriginal and treaty territories, and

WHEREAS, the Executive Branch of the united States Government has recognized the right of government-to-government consultations with Indian Tribes in:

a. President Clinton's Memorandum of April 29, 1994, which, among other things, directed agencies to:

(i) "ensure that the department or agency operates within a government-to-government relationship with Federally-recognized Trial government,"

(ii) "consult, to the greatest extent practicable ad to the extent permitted by law with Tribal governments prior to taking actions that affect Federally recognized tribes, to be open and candid so that all interested parties may evaluate for themselves the potential impact of relevant proposals," and

(iii) "assess the impacts of Federal government plans, projects, programs, and activities on tribal trust resources to assure that Tribal government rights and concerns are considered during the development of such plans, projects, and activities."

b. President Clinton's Executive Order No. 13084 of May 19, 1998, which directed federal agencies to respect tribal self-government and sovereignty, tribal rights, and tribal responsibilities whenever they develop policies "significantly affecting Indian tribal governments,"

c. President Clinton's Executive Order No. 13175 of November 6, 2000, which directed all federal agencies to establish consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, and

d. President Barak Obama Memorandum of November 5, 2009, to the heads of the Executive Department and federal agencies to submit plans of actions that the agencies will take to implement the policies and directives of President Clinton's Executive Order 13175,

and

WHEREAS, Congress has also mandated government-to-government consultation with Indian tribes, which have been implemented in statutes, orders, regulations, rules, policies, manuals, protocols and guidance, most of which are described in a document issued by the White House- Indian Affairs Executive Working Group (WH-IAEWG), dated January, 2009, and entitled "List of Federal Tribal Consultation Statutes, Orders, Regulations, rules, Policies, Manuals, protocols and guidance," and

WHEREAS, the Oglala Sioux Tribe has never enacted legislation (ordinances) establishing procedures for government-to-government consultation between the Tribe and the United States, and believes that such procedures are necessary to establish a clear process for documenting the nature and results of consultations between the Tribe and the United States and its agencies, now

THEREFORE BE IT ORDAINED, that the following sections relating to government-to-government consultations are hereby adopted for the Oglala Sioux Tribe.

Section 1. Title. This ordinance shall be known and referred to as the Oglala Sioux Tribe Consultation and Coordination Ordinance of 2001.

Section 2. Definitions. The following words and phrases used in this Election Code shall have the following meanings:

"Consultation" and/or "government-to-government" consultation shall mean the formal process of cooperation, negotiation, and mutual decision making between the Oglala Sioux Tribe and the United States Government, and other governments. It is the process through which sovereign governments develop a common understanding of technical and legal issues and use this understanding to formulate mutually agreeable decisions.

Section 3. Scope. This ordinance is intended to extend to:

a. All of the aboriginal homeland of the Oglala Sioux Tribe, including, the 60 million acre territory Sioux territory described in Article 5 of the 1851 Ft. Laramie Treaty; the territory and the expanded hunting rights territory described in Articles 2, 11 and 16 of the 1868 Ft. Laramie Treaty;

b. All of the aboriginal title (non-treaty) Sioux territory comprising 14 million acres located east of the Missouri River in the present states of North Dakota and South Dakota; and

c. All undertakings and actions that adversely affect the Oglala Sioux Tribe's aboriginal, treaty or statutorily recognized rights and interests within its aboriginal and treaty recognized territories.

Section 4. Purpose. The primary purpose and intent of this ordinance is to:

a. Establish a clear process for documenting the nature and results of government-to-government consultations between the Oglala Sioux Tribe and Federal Government and its agencies;

b. Provide a consistent, orderly process to government-to-government consultation to make and ensure that government-to-government consultations are meaningful and effective, and

c. Be applicable, to the fullest extent possible, for documenting the nature and results of government-to-government consultations between the Oglala Sioux Tribe and other Indian tribes, inter-tribal organizations and state governments and agencies.

Section 5. Authority. This ordinance is adopted pursuant to the Oglala Sioux Tribe's inherent sovereignty and Article IV, Section 1 (a) of the Amended Constitution of the Oglala Sioux Tribe, which empowers the Tribal Council "(a) To negotiate with the Federal, State, and local governments, on behalf of the tribe, and to advise and consult with representatives of the Interior Department on all activities of the Department that may affect the Pine Ridge Indian Reservation."

Section 6. Principles and guidelines. All government-to-government consultations between the Oglala Sioux Tribe and the Federal Government, and State or other tribal governments, shall be conducted with the Oglala Sioux Tribe under the following principles and guidelines:

a. The Oglala Sioux Tribe is a sovereign government with attendant powers;

b. All treaties between the Oglala Sioux Tribe and the United States must be honored and enforced to the fullest extent possible;

c. The Oglala Sioux Tribe has never been militarily conquered by the United States, and has existed in a peaceful relationship with the United States since 1868, pursuant to Article I of the 1868 Ft. Laramie Treaty; and

d. The Oglala Sioux Tribe and its territories are not possessions of the United States.

Section 7. Procedures. All consultation between the Oglala Sioux Tribe and the Federal Government, and State or other tribal governments, must:

WHEN CONSULTATION IS REQEUSTED BY THE FEDERAL GOVERNMENT OR OTHER GOVERNMENTS

a. Occur through a formal meeting with the Oglala Sioux Tribal Council. Neither the Executive Committee nor any Executive Committee member or staff member of the Tribe shall be authorized to engage in government-to-government consultations with any government or governmental agency;

b. Accomplish the goals and objectives described in Section 8.

c. Be initiated by serving a formal written request for government-to-government consultation with the Secretary of the Oglala Sioux Tribe. The request for consultation should describe the impending, proposed project or activity that may or may not affect the Oglala Sioux Tribe's interests in its aboriginal or treaty territory and/or rights or interests therein. This include the Tribes aboriginal and treaty territory both within and outside the exterior boundaries of the Pine Ridge Indian Reservation;

d. It shall be the duty of the Tribal Secretary to immediately notify all members of the Executive Committee and Tribal Council of each request for consultation;

e. Upon receipt of a request for consultation, the Tribal President, or council members under established procedures, shall call a special council meeting for the purpose of responding to the request for consultation. The Tribal Council shall:

(i) Request by resolution a policy-level meeting, initiating government-to-government consultations;

(ii) Authorize the Tribe's technical staff (and when appropriate the Tribe's attorneys) to meet with the responding government's technical staff to discern and define the issues that are subject to the request for consultation including how the proposed governmental undertaking or activity affects the tribe's aboriginal, treaty, statutory or other interests;

(iii) Schedule a special council meeting in which the Tribe's technical staff (and when appropriate the Tribe's attorneys) can fully brief the Tribal council on the issues that are subject to consultation, with recommendations and opinions;

(iv) Schedule a follow-up special council meeting in which the Tribe through the Tribal council shall engage in formal government-to-government consultation based on the recommendations and opinions of its staff (and attorneys); and

(v) Pass a resolution fully articulating the Tribe's formal decision, which decision shall be consistent with the provisions of this ordinance.

WHEN CONSULTATION IS REQEUSTED BY THE OGLALA SIOUX TRIBE

a. Be initiated by passing a tribal council resolution requesting government -to-government consultation, which resolution shall be executed and sent by the Tribal President to appropriate official of the Federal Government or tribal or state government with which consultation is desired;

b. Follow the procedure described in Subsections 7.e. (i) through (v) above; and

c. Accomplish the same objectives described in Section 8.

Section 8. **Objectives.** All government-to-government consultations should ensure the following results:

a. Tribal officers and officials proceed in a dignified, orderly manner, keeping in mind that the Oglala Sioux Tribe is engaging in the consultations as a sovereign government that maintains government-to-government relations with the United States Government and other governments. Tribal officials engaging in consultation should dress in appropriate attire during the consultation proceedings, and conduct themselves in a professional, dignified, and diplomatic manner;

b. Tribal officers and officials fully understand the issues to be discussed prior to engaging in and consultation proceeding; this includes an understanding of tribal history, federal treaties and federal statutes, regulations and rules, that will be discussed at each consultation;

c. Ensure that the Tribe's interest are fully protected, including interests in all tracts of land located within the Tribe's aboriginal and treaty territories, and interests therein, as well as tribal cultural resources, human remains, and any other tribal patrimony;

d. Ensure compliance with federal treaties, statutes, regulations and rules and tribal policies (e.g., policy that the Black Hills Are Not For Sale and tribal land claims must include restoration of federally held lands to the Tribe);

Section 9. **Documentation.** Following any governmental-to-government consultation between the Oglala Sioux Tribe and the Federal government, or other governments, the Tribal Council shall:

a. Achieve a bi-lateral decision between the Tribe and the United States, or other government;

b. Adopt a resolution documenting the nature and results of the consultation and bilateral decision;

c. Direct the Tribal Secretary to file a copy of the resolution and all backup documentation with the Tribal Records Department.

Section 10. **Representations.** Neither the Federal Government nor any agency thereof, nor any other government, shall legitimately represent to any other government or governmental entity, nor to any third party, that they have consulted with the Oglala Sioux Tribe unless they fully comply with the terms and conditions of this ordinance.

Section 11. **Effective Date.** This ordinance shall become effective immediately.

Section 12. **Repeal of inconsistent ordinances.** All previously enacted ordinances are hereby repealed to the extent that they are inconsistent with this ordinance.

C-E-R-T-I-F-I-C-A-T-I-O-N

I, as undersigned Secretary of the Oglala Sioux Tribal Council of the Oglala Sioux Tribe, hereby certify that this Ordinance was adopted by a vote of: 13 For; 1 Against; 0 Abstain; and 0 Not Voting, during a SPECIAL SESSION held on the 7th day of JUNE, 2011.

RHONDA J. TWO EAGLE
Secretary
Oglala Sioux Tribe

A-T-T-E-S-T:

JOHN W. YELLOW BIRD-STEELE
President
Oglala Sioux Tribe

RESOLUTION NO. 18-88

RESOLUTION OF THE OGLALA SIOUX TRIBAL COUNCIL
OF THE OGLALA SIOUX TRIBE
(An Unincorporated Tribe)

RESOLUTION OF THE OGLALA SIOUX TRIBE REQUESTING THAT THE UNITED STATES PLACE A MORATORIUM ON ALL PROPOSED ACTIVITY IN CONNECTION WITH THE PROPOSED DEWEY-BURDOCK IN SITU RECOVERY URANIUM PROJECT UNTIL THE UNITED STATES COMPLETES ALL REQUIRED FEDERAL LAWS, INCLUDING THE NATIONAL ENVIRONMENTAL PROTECTION ACT AND THE NATIONAL HISTORIC PRESERVATION ACT, AND UNTIL THE UNITED STATES ENGAGES IN MEANINGFUL GOVERNMENT-TO-GOVERNMENT CONSULTATION WITH ALL SIXTEEN (16) TRIBES OF THE GREAT SIOUX NATION AND OTHER AFFECTED INDIAN TRIBES, NOT JUST THE OGLALA SIOUX TRIBE, AND ALLOWS ALL AFFECTED INDIAN TRIBES TO THE OPPORTUNITY, ACCESS, TIME, AND RESOURCES TO COMPLETE THOROUGH, ACCURATE ARCHAEOLOGICAL, CULTURAL, AND HISTORIC PRESERVATION SURVEYS PRIOR TO COMPLETION OF THE SECTION 106 PROCESS UNDER THE NATIONAL HISTORIC PRESERVATION ACT, TO ENSURE PROPER PROTECTION OF THE BLACK HILLS AND SACRED LANDS IN AND AROUND THE BLACK HILLS, ALL OF WHICH ARE WITHIN THE TREATY PROTECTED TERRITORY OF THE GREAT SIOUX NATION UNDER THE FORT LARAMIE TREATIES OF 1851 AND 1868.

WHEREAS, the Oglala Sioux Tribe organized under Section 16 of the Indian Reorganization Act of 1934 on December 14, 1935 (25 U.S.C. § 5123) by adopting a federally approved Constitution and By-laws, and under Article III of the Tribal Constitution, the Tribal Council is the governing body of the Oglala Sioux Tribe, and

WHEREAS, under Article IV, Section 1(a), of the Tribal Constitution, the Tribal Council is vested with the power to negotiate with the United States on behalf of the Tribe and its members, and

WHEREAS, the proposed Dewey-Burdock In Situ Recovery Uranium Project is within the treaty protected territory of the Great Sioux Nation under Fort Laramie Treaties of 1851 and 1868, and

WHEREAS, the Tribal Council enacts this Resolution to request that the United States place a moratorium on all proposed activity in connection with the proposed Dewey-Burdock In Situ Recovery Uranium Project until the United States complies will all federal laws, including the National Environmental Protection Act and the National Historic Preservation Act, and until the United States engages in meaningful government-to-government consultation with all sixteen (16) Tribes of the Great Sioux Nation to ensure proper protection of the Black Hills and sacred lands in and around the Black Hills, all of which are within the treaty protected territory of the Great Sioux Nation under the Fort Laramie Treaties of 1851 and 1868, and

WHEREAS, existing archaeological, cultural, and historic preservation surveys are inadequate; inadequate time and resources have been allotted to complete such surveys on the proposed project area, which is in excess of 10,500 acres; additional time and resources are

needed to continue the process and to protect and prevent desecration of our sacred lands and resources; and all affected Tribal Nations must have the opportunity, access, time, and resources to participate in and complete thorough and accurate archaeological, cultural, and historic preservation surveys prior to completion of the Section 106 process under the National Historic Preservation Act, and

WHEREAS, all sixteen (16) Tribes of the Great Sioux Nation, and all other affected Indian Tribes, must be afforded an opportunity to engage in meaningful government-to-government consultation with the United States before the project proceeds any further; now

THEREFORE BE IT RESOLVED, that the Oglala Sioux Tribal Council of the Oglala Sioux Tribe does hereby requests that the United States place a moratorium on all proposed activity in connection with the proposed Dewey-Burdock In Situ Recovery Uranium Project until the United States complies will all federal laws, including the National Environmental Protection Act and the National Historic Preservation Act, and

BE IT FURTHER RESOLVED, that the Oglala Sioux Tribal Council hereby requests that the United States place a moratorium on all proposed activity in connection with the proposed Dewey-Burdock In Situ Recovery Uranium Project until the United States engages in meaningful government-to-government consultation with all sixteen (16) Tribes of the Great Sioux Nation, and other affected Indian Tribes, to ensure proper protection of the Black Hills and sacred lands in and around the Black Hills, all of which are within the treaty protected territory of the Great Sioux Nation under the Fort Laramie Treaties of 1851 and 1868, and

BE IT FURTHER RESOLVED, that the Oglala Sioux Tribal Council hereby requests that the United States and the Nuclear Regulatory Commission allow all affected Tribal Nations the opportunity, access, time, and resources to participate in and complete thorough and accurate archaeological, cultural, and historic preservation surveys prior to completion of the Section 106 Process under the National Historic Preservation Act, and

BE IT FURTHER RESOLVED, that the Oglala Sioux Tribal Council hereby requests that the United States make all pertinent information relating to the proposed Dewey-Burdock In Situ Recovery Uranium Project available and known to the public because it is a matter of extraordinary public importance and our sacred lands and resources are under attack.

C-E-R-T-I-F-I-C-A-T-I-O-N

I, as the undersigned Secretary of the Oglala Sioux Tribal Council, of the Oglala Sioux Tribe hereby certify that this Resolution was adopted by a vote of: 14 For; 0 Against; 0 Abstain; and 0 Not Voting; during a REGULAR SESSION held on the 27TH day of JUNE, 2018.

DONNA M. SALOMON
Secretary
Oglala Sioux Tribe

A-T-T-E-S-T:

TROY S. WESTON
President
Oglala Sioux Tribe

RECEIVED
JUL 23 2018
BUREAU OF INDIAN AFFAIRS
ABERDEEN AREA

RESOLUTION NO. 18-89

RESOLUTION OF THE OGLALA SIOUX TRIBAL COUNCIL
OF THE OGLALA SIOUX TRIBE
(An Unincorporated Tribe)

RESOLUTION OF THE OGLALA SIOUX TRIBAL COUNCIL OF THE OGLALA SIOUX TRIBE REQUESTING THE NUCLEAR REGULATORY COMMISSION TO REQUIRE POWERTEC (USA) TO INCREASE THE AMOUNT OF FUNDS NEEDED TO COMPLETE AN ADEQUATE CULTURAL RESOURCES SURVEY OF THE DEWEY-BURDOCK IN SITU URANIUM MINING PROJECT IN THE SOUTHERN BLACK HILLS.

WHEREAS, the Oglala Sioux Tribe organized under Section 16 of the Indian Reorganization Act of 1934 on December 14, 1935 (25 U.S.C. § 5123) by adopting a federally approved Constitution and By-laws, and under Article III of the Tribal Constitution, the Tribal Council is the governing body of the Oglala Sioux Tribe, and

WHEREAS, under Article IV, Section 1(a), of the Tribal Constitution, the Tribal Council is vested with the power to negotiate with the United States on behalf of the Tribe and its members, and

WHEREAS, under Article IV, Section 1(w), of the Tribal Constitution, the Tribal Council is vested with the power to adopt laws protecting and promoting the health and general welfare of the Oglala Sioux Tribe and its members, and

WHEREAS, the Black Hills are within the aboriginal and treaty guaranteed homeland of the Oglala Sioux Tribe, and other Sioux tribes, and is also an acknowledged Sacred territory of the Sioux tribes, *see* Treaty of 1851, 11 Stat. 749 (Sept. 17, 1851), and the Treaty of 1868, 15 Stat. 635 (Apr. 29, 1868), and

WHEREAS, the Black Hills were confiscated by the United States in the Act of February 28, 1877 (19 Stat. 254) in violation of Article 12 of the 1868 Treaty, and provided in Article 8 that the Sioux tribes would be subject to the laws of the United States and "each individual Sioux Indian would be protected in his rights of property, person and life", and

WHEREAS, the Supreme Court interpreted the "subject to the laws of the United States," in the 1877 Act as being "subject to the laws of the United States, not in the sense of citizens, but, as they had always been, as wards subject to a guardian, which acknowledged a trust responsibility between the United States and the Oglala Sioux Tribe, see *Ex Parte Crow Dog*, 109 U.S. 556-568-69 (1883), and

WHEREAS, protection of the persons and lives of each tribal member includes a federal trust obligation to protect the ground waters in the southern Black Hills from contamination within the Cheyenne River water shed that includes all the ground waters in the Southern Black Hills, which ground waters will ultimately flow into the Cheyenne River including that part of the Cheyenne River that constitutes the river bed of the river that abuts and is located within the exterior boundaries of the Pine Ridge Reservation, and

WHEREAS, In Situ uranium mining in the southern Black Hills will contaminate the ground waters and Cheyenne River and will adversely affect the persons and lives of tribal members residing on the reservation and surrounding communities, and the United States and its agencies must fulfill its trust responsibility to the Oglala Sioux Tribe and prevent such contamination from happening, and

WHEREAS, in addition to protect the person and lives of individual tribal members of the Oglala Sioux Tribe, the Tribe also has many cultural resources in the southern Black Hills that are the property of the Tribe, and human remains of ancestors that must be protected in the area referred to as the "Dewey-Burdock" area under NEPA, NHPA, NAGPRA, ARPA, and other applicable federal laws including Article 8 of the 1877 Act, and

WHEREAS, the Nuclear Regulatory Commission (NRC) has approved an Economic Impact Statement (EIS) and has issued a Record of Decision (ROD) for the Dewey Burdock In Situ Uranium Mining Project for Powertec (USA) to engage in extensive In-Situ uranium mining in the Dewey-Burdock area of the southern Black Hills in South Dakota, but the cultural resources survey completed for the EIS is inadequate and must now be completed in consultation with the Oglala Sioux Tribe as required by federal law and regulations, and

WHEREAS, Powertec has approved a budget of $10,000 (ten thousand dollars) to complete the cultural resources survey which is woefully inadequate to comply with federal laws and regulations, and tribal laws, and

WHEREAS, the Oglala Sioux Tribe Natural Resources Department and Tribal Historic Preservation Office has come up with a budget of $2,178,665.69 (two million, one hundred seventy-eight thousand, six hundred sixty-five dollars and sixty-nine cents) to adequately complete the cultural sources survey on the Dewey-Burdock 10,500-plus acres involved in Powertec In Situ uranium mining project; now

THEREFORE BE TT RESOLVED, that the Oglala Sioux Tribal Council of the Oglala Sioux Tribe does hereby requests the Nuclear Regulatory Commission to require Powertec (USA) to provide the $2,178,665.69, determined by the Oglala Sioux Tribal Natural Resources Department and Historic Preservation Office, to adequately complete the cultural resources survey for the Dewey-Burdock 10,500-plus acres for the cultural resources survey and that such a survey be completed prior to any further activity in the affected area, and

BE IT FURTHER RESOLVED, that the Oglala Sioux Tribal Council adopts this Resolution to ensure full compliance will all applicable laws and does so without waiving its opposition to any uranium mining that is not conducted in full compliance will all applicable laws and treaties, including the Fort Laramie Treaties of 1851 and 1868, and

BE IT FURTHER RESOLVED, that the Oglala Sioux Tribe is opposed to any uranium mining and without waiving its opposition requests compliance with all laws including this.

C-E-R-T-I-F-I-C-A-T-I-O-N

I, as the undersigned Secretary of the Oglala Sioux Tribal Council, of the Oglala Sioux Tribe hereby certify that this Resolution was adopted by a vote of: 14 For; 0 Against; 0 Abstain; and 0 Not Voting; during a REGULAR SESSION held on the 27TH day of JUNE, 2018.

DONNA M. SALOMON
Secretary
Oglala Sioux Tribe

A-T-T-E-S-T:

TROY S. WESTON
President
Oglala Sioux Tribe

Dewey-Burdock 10,500 acres tribal cultural survey				
Activity	# Units	Unit	Cost	Totals
Record Search with SD State Historical Society	1	Each	$130.00	$130.00
Fieldwork Authorization	0	Hours	$50.00	$0.00
Record Search Time & Mapping	1	Days	$400.00	$400.00
Field Work Preparation	5	days	$400.00	$2,000.00
Field Inventory 10 meter intervals	400	Days	$500.00	$200,000.00
Site Recording & Evaluation Estimated 200 sites	200	Days	$500.00	$100,000.00
Field Mileage	20000	Miles	$0.535	$10,700.00
Lodging & Per Diem	400	Nights	$195.00	$78,000.00
Report preparation	200	Days	$400.00	$80,000.00
Tribal Elder + Support personnel Costs, Fees/Gifts			$0.00	$500,000.00
Oral History Research & Interviews	365	Days	$400.00	$146,000.00
Oral History Report Preparation	180	Days	$400.00	$72,000.00
Oral History Mileage	18000	Miles	$0.535	$9,630.00
Oral History Per Diem	90	Nights	$195.00	$17,550.00
Materials and Supplies, Equipment			$0.00	$100,000.00
Project Management	365	Days	$500.00	$182,500.00
Sub Total				$1,498,910.00
Indirect Costs/Tribal Overhead	45.35			$679,755.69
Total				**$2,178,665.69**

RESOLUTION NO. 18-89XB

RESOLUTION OF THE EXECUTIVE COMMITTEE
OF THE OGLALA SIOUX TRIBE
(An Unincorporated Tribe)

RESOLUTION OF THE EXECUTIVE COMMITTEE OF THE OGLALA SIOUX TRIBE REQUESTING THE NUCLEAR REGULATORY COMMISSION TO REQUIRE POWERTEC (USA) TO INCREASE THE AMOUNT OF FUNDS NEEDED TO COMPLETE AN ADEQUATE CULTURAL RESOURCES SURVEY OF THE DEWEY-BURDOCK IN SITU URANAUMIN MINING PROJECT IN THE SOUTHERN BLACK HILLS.

WHEREAS, the Black Hills are within the aboriginal and treaty guaranteed homeland of the Oglala Sioux Tribe, and other Sioux tribes, and is also an acknowledged Sacred territory of the Sioux tribes, and

WHEREAS, the Black Hills was confiscated by the United States in the Act of February 28, 1877 (19 Stat. 254) in violation of Article 12 of the 1868 Treaty, and provided in Article 8 that the Sioux tribes would be subject to the laws of the United States and "each individual Sioux Indian would be protected in his rights of property, person and life," and

WHEREAS, the Supreme Court interpreted the "subject to the laws of the United States," in the 1877 Act as being "subject to the laws of the United States, not in the sense of citizens, but, as they had always been, as wards subject to a guardian. . . .," which acknowledged a trust responsibility between the United States and the Oglala Sioux Tribe, see *Ex Parte Crow Dog*, 109 U.S. 556-568-69 (1883), and

WHEREAS, protection of the persons and lives of each tribal member includes a federal trust obligation to protect the ground waters in the southern Black Hills from contamination within the Cheyenne River water shed that includes all the ground waters in the Southern Black Hills, which ground waters will ultimately flow into the Cheyenne River including that part of the Cheyenne River that constitutes the river bed of the river that abuts and is located within the exterior boundaries of the Pine Ridge Reservation, and

WHEREAS, In Situ uranium mining in the southern Black Hills will contaminate the ground waters and Cheyenne River and will adversely affect the persons and lives of tribal members residing on the reservation and surrounding communities, and the United States and its agencies must fulfill its trust responsibility to the Oglala Sioux Tribe and prevent such contamination from happening, and

WHEREAS, in addition to protect the person and lives of individual tribal members of the Oglala Sioux Tribe, the Tribe also has many cultural resources in the southern Black Hills that are the property of

the Tribe, and human remains of ancestors that must be protected in the area referred to as the "Dewey-Burdock" area under NEPA, NHPA, NAGPRA, ARPA, and other applicable federal laws including Article 8 of the 1877 Act, and

WHEREAS, the Nuclear Regulatory Commission (NRC) has approved an Economic Impact Statement (EIS) and has issued a Record of Decision (ROD) for the Dewey Burdock In Situ Uranium Mining Project for Powertec (USA) to engage in extensive In-Situ uranium mining in the Dewey-Burdock area of the southern Black Hills in South Dakota, but the cultural resources survey completed for the EIS is inadequate and must now be completed in consultation with the Oglala Sioux Tribe as required by federal law and regulations, and

WHEREAS, Powertec has approved a budget of $10,000 (ten thousand dollars) to complete the cultural resources survey which is woefully inadequate to comply with federal laws and regulations, and tribal laws, and

WHEREAS, the Oglala Sioux Tribe Natural Resources Department and Tribal Historic Preservation Office has come up with a budget of $2,178,665.69 (two million, one hundred seventy eight thousand, six hundred sixty five dollars and sixty nine cents) to adequately complete the cultural sources survey on the Dewey-Burdock 10,500 acres involved in Powertec In Situ uranium mining project, and

WHEREAS, Article IV, Section 1 (a) of the Tribal Constitution empowers the Tribal Council to "[t]o negotiate with the Federal, State, and local governments, on behalf of the tribe, and to advise the representatives of the Interior Department on all activities of the Department that may affect the Pine Ridge Indian Reservation" under Article IV, Section 1 (a), and Article IV, Section 1 (w) of the Tribal Constitution empowers the Tribal Council "[t]o adopt laws protecting and promoting the health and general welfare of the Oglala Sioux Tribe and its membership" under Article IV, Section 1 (w), and

WHEREAS, Article XIII, Section 6 of the Tribal Constitution also empowers the Tribal Executive Committee "to act on behalf of the Tribal Council when the Tribal Council is not in session" and to "be in charge of all routine matters that arise during such recess . . . and such other matters as may be delegated to it by the Tribal Council . . . . and shall adopt resolutions that are not inconsistent with resolutions or ordinances adopted by the Tribal Council,"

WHEREAS, the Tribal Council has delegated authority to the Tribal Executive Committee to act on its behalf and pass the instant resolution pursuant to Article XIII, Section 6 of the Tribal Constitution; now

THEREFORE BE IT RESOLVED that the Executive Committee of the Oglala Sioux Tribe requests the Nuclear Regulatory Commission to require Powertec (USA) to provide the $2,178,665.69 determined by the Oglala Sioux Tribal Natural Resources Department and Historic Preservation Office to adequately complete the cultural resources survey for the Dewey-Burdock 10,500 acres for the cultural resources survey which will allow Powertec to engage in In-Situ uranium mining in the Southern Black Hills, and

BE IT FURTHER RESOLVED, that this Resolution is passed based upon emergency status and contingent upon receiving a budget.

C-E-R-T-I-F-I-C-A-T-I-O-N

I, as undersigned Secretary of the Oglala Sioux Tribe hereby certify that this Resolution was adopted by the vote of: 3 For; 0 Against; 0 Abstain; and 0 Not Voting; during a REGULAR SESSION held on this 14TH day of JUNE, 2018.

DONNA M. SALOMON
Secretary
Oglala Sioux Tribe

A-T-T-E-S-T:

TROY S. WESTON
President
Oglala Sioux Tribe

RECEIVED
JUN 15 2018

Dewey-Burdock 10,500 acres tribal cultural survey				
Activity	# Units	Unit	Cost	Totals
Record Search with SD State Historical Society	1	Each	$130.00	$130.00
Fieldwork Authorization	0	Hours	$50.00	$0.00
Record Search Time & Mapping	1	Days	$400.00	$400.00
Field Work Preparation	5	days	$400.00	$2,000.00
Field Inventory 10 meter intervals	400	Days	$500.00	$200,000.00
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Oral History Mileage	18000	Miles	$0.535	$9,630.00
Oral History Per Diem	90	Nights	$195.00	$17,550.00
Materials and Supplies, Equipment			$0.00	$100,000.00
Project Management	365	Days	$500.00	$182,500.00
Sub Total				**$1,498,910.00**
Indirect Costs/Tribal Overhead	45.35			$679,755.69
Total				**$2,178,665.69**