

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

William J. Froehlich, Chair
Dr. Mark O. Barnett

In the Matter of

POWERTECH USA, INC.

(Dewey-Burdock
In Situ Uranium Recovery Facility)

Docket No. 40-9075-MLA

ASLBP No. 10-898-02-MLA-BD01

April 30, 2015

MEMORANDUM AND ORDER

(Providing Parties' Proposed Questions for the Official Record)

The documents attached to this Memorandum and Order are the proposed questions submitted to this Licensing Board by the NRC Staff, Powertech, the Oglala Sioux Tribe, and Consolidated Intervenors prior to or during the evidentiary hearing in this proceeding held on August 19, 20 and 21, 2014, at the Hotel Alex Johnson in Rapid City, South Dakota. The Board issued a Partial Initial Decision in this proceeding on April 30, 2015. In accord with 10 C.F.R. § 2.1207(a)(3)(iii) the attached questions are included in the official record of this proceeding.

It is so ORDERED

FOR THE ATOMIC SAFETY
AND LICENSING BOARD

/RA/

William J. Froehlich, Chair
ADMINISTRATIVE JUDGE

Rockville, Maryland
April 30, 2015

Attachment 1

NRC Staff Proposed Questions

August 1, 2014

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|------------------------------|
| In the Matter of |) | |
| |) | |
| POWERTECH (USA) INC., |) | Docket No. 40-9075-MLA |
| |) | ASLBP No. 10-898-02-MLA-BD01 |
| (Dewey-Burdock In Situ Uranium Recovery |) | |
| Facility) |) | |

NRC STAFF'S PROPOSED QUESTIONS

Pursuant to 10 C.F.R. § 2.1207(a)(3) and the Board's scheduling order in this proceeding, the NRC Staff submits, *in camera*, its proposed questions for the Board's consideration.¹ The Staff's proposed questions are directed to the prefiled direct and rebuttal testimony of the witnesses appearing on behalf of the Oglala Sioux Tribe and the Consolidated Intervenor (collectively, "the Intervenor"). The answers to these questions should help the Board better understand how the Staff complied with the National Environmental Policy Act (NEPA) and other laws when preparing the Final Supplemental Environmental Impact Statement (FSEIS) for the Dewey-Burdock Project.²

I. Proposed Questions for Contention 1A

- A. Issue Needing Further Examination:** The Intervenor claim that the Staff failed to meet legal requirements concerning the protection of historic and cultural resources.
- B. Objective of the Examination:** To establish that the Staff reviewed impacts to historic and cultural resources consistent with the requirements of the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA).

¹ The Staff's proposed questions relate to Contentions 1 through 4. Because the Oglala Sioux Tribe, the sponsoring party, did not submit prefiled testimony on Contention 6 or Contention 9, the Staff is not proposing questions related to those contentions.

² The Staff is including citations after certain questions to clarify the evidentiary basis for the question.

C. Proposed Questions for Michael CatchesEnemy and Wilmer Mesteth:

1. Do you acknowledge that, on April 7, 2014, the NRC and other parties finalized a Programmatic Agreement for the Dewey-Burdock Project?
2. Do you acknowledge the Advisory Council on Historic Preservation (ACHP) is the federal agency charged with administering the NHPA and issuing regulations under that Act?
3. Do you agree that under the ACHP's regulations a federal agency need not identify every historic property in a project area, but must only make a "reasonable and good faith effort" to identify such properties?
4. Do you agree that, under ACHP guidance, an agency need not use any particular method to identify historic properties, but may select from a variety of methods? NRC-047 at 1–2, NRC-027; NRC-145-A and B.
5. Do you acknowledge that the ACHP regulation at 36 C.F.R. § 800.4(b)(1) states that an agency may use "background research, consultation, oral history interviews, sample field investigation, and field survey[s]" to identify historic properties?"
6. Do you acknowledge that, in the present case, the Staff obtained information on historic properties at the Dewey-Burdock site from the following sources: reviews of the archaeological, ethnographic, and academic literature; tribal consultation; archaeological and tribal field surveys; and visual and auditory analyses? Exs. NRC-008- A at 3-85 to 3-91; NRC-018-B at 11, 25-46; NRC-019; NRC-025-A; NRC-025-B; NRC-026; NRC-072; NRC-073; NRC-136-A; NRC-136-B, NRC-136-C; APP-009; APP-144.
7. Do you acknowledge that the Council on Environmental Quality (CEQ) is the federal agency charged with administering NEPA and issuing regulations under that Act?
8. Do you acknowledge that, under ACHP regulations and guidance published jointly by the ACHP and CEQ, a federal agency may use a Programmatic Agreement as a means of addressing historic properties that may be adversely affected by a federal undertaking? Ex. NRC-048.
9. Do you acknowledge that the South Dakota State Historic Preservation Office (SHPO) has substantial expertise in assessing impacts to historic properties and evaluating compliance with the NHPA?
10. Do you acknowledge that both the ACHP and the South Dakota SHPO are signatories to the Programmatic Agreement the NRC Staff prepared for the Dewey-Burdock Project?

11. Are you familiar with the ACHP's April 7, 2014 letter to the Standing Rock Sioux Tribe, in which it stated that "based on the background documentation, the issues addressed during consultation, and the processes established in the [Programmatic Agreement], the ACHP has concluded that the content and spirit of the Section 106 process has been met by the NRC"? Ex. NRC-031.
12. In your prefiled testimony you allege that certain sites of potential historic significance might not be properly evaluated for eligibility on the National Register of Historic Places before Powertech engages in ground-disturbing activities. Isn't it true, however, that Stipulation 1 of the Programmatic Agreement allows tribes to revisit unevaluated sites containing tribal features before ground-disturbing activities take place? Ex. NRC-018-A.
13. In your prefiled testimony, you allege that the Staff has not adequately considered how to mitigate adverse effects to certain historic properties. Do you acknowledge that Stipulations 4, 5, 6, 9, 10, and 14 of the Programmatic Agreement, which involve the development of mitigation and treatment plans, guarantee that tribes will continue to be involved in cultural resources decisions? Ex. NRC-018-A.

D. Proposed Questions for Dr. Louis Redmond:

1. You state that Powertech should have conducted in-depth surface and subsurface investigations at the Dewey-Burdock Project. Exs. INT-016 at 125, INT-017 at 5-6. Isn't it true that Augustana College, Powertech's contractor, performed evaluative testing—including subsurface investigation—at 43 sites in the Dewey-Burdock Project boundary during the 2007 and 2008 field seasons? Exs. APP-009, NRC-072, NRC-073.
2. Isn't it also true that Augustana College performed evaluative testing, including subsurface investigations, at 20 additional archaeological sites in 2011? Exs. NRC-136-A, NRC-136-B, NRC-136-C.
3. You claim that the FSEIS is inadequate because it relies only on the archaeological investigations and National Register eligibility determinations presented in Powertech's application. Exs. INT-016 at 125, INT-017 at 5-6. Isn't it true that the Staff obtained additional information on cultural resources, including tribal survey data, tribal eligibility recommendations, ethnographic studies, and eligibility recommendations from the South Dakota SHPO? Exs. NRC-008-A-1 at Section 3.9.3, NRC-008-A-2 at Section 4.9, NRC-018-B at 11, 25-46; NRC-019, NRC-155, APP-144.

II. Proposed Questions for Contention 1B

A. Issue Needing Further Examination: The Intervenors claim that the Staff failed to consult with interested tribes as required under the National Historic Preservation Act (NHPA)

B. Objective of the Examination: To establish that the Staff consulted with tribes extensively regarding the Dewey-Burdock Project and complied fully with the National Historic Preservation Act (NHPA).

C. Proposed Questions for Michael CatchesEnemy and Wilmer Mesteth:

1. Are you aware that the NRC Staff did not accept Powertech's application for detailed review until October 2009? Ex. NRC-015 at 1.
2. Isn't it true that the next month (November 2009) the Staff offered to meet with the Oglala Sioux Tribe in South Dakota in December 2009, but that tribal leadership was unable to attend the meeting? Ex. NRC-015 at 1.
3. Do you acknowledge that the Staff contacted the Oglala Sioux in March 2010 concerning the Dewey-Burdock application, asking the Tribe if it was interested in consulting under Section 106 of the NHPA? Ex. NRC-015.
4. Do you acknowledge the Staff also sent a follow-up letter in September 2010, which asked whether the Tribe was interested in consulting with the NRC on the Dewey-Burdock application?
5. Do you acknowledge that in June 2011 the Staff held an informational meeting on the Pine Ridge Reservation for all tribes interested in consulting with the NRC on the Dewey-Burdock Project? Exs. NRC-038-A through NRC-038-F.
6. Do you acknowledge that the Staff held a consultation meeting with interested tribes in February 2012 in Rapid City, South Dakota? Exs. NRC-044, NRC-015.
7. Do you acknowledge that members of the Oglala Sioux Tribe participated in the meeting?
8. Isn't it true that in March 2013 the Staff invited the Oglala Sioux Tribe and other tribes to discuss issues arising under the NHPA at a meeting in Rapid City, South Dakota? Ex. NRC-143.
9. Isn't it true that, in addition to these meetings, the Staff used letters, e-mails, teleconferences, and other approaches to seek information concerning historic properties of significance to the Oglala Sioux Tribe? Ex. NRC-015.

10. Do you acknowledge that in April and May 2013 the Staff arranged for tribal field surveys to identify historic properties at the Dewey-Burdock site? Exs. NRC-018-B at 11, Ex. NRC-008-B at 3-87, Ex. NRC-008-B at F-1–F-2.
11. Isn't it true that the Oglala Sioux Tribe initially agreed to participate in the field survey, but later withdrew from the survey? Ex. NRC-148.
12. The Oglala Sioux Tribe argues that the field surveys other tribes conducted at the Dewey-Burdock site in April and May 2013 lacked a scientifically defensible methodology for identifying culturally significant sites. Isn't it true, however, that different tribes may have different methodologies for identifying sites of particular significance to them?
13. Do you acknowledge that representatives of the Oglala Sioux Tribe, including President Brewer, told the Staff that only their members could identify sites of religious or ceremonial significance to them? Exs. NRC-064, NRC-066, NRC-067.
14. Do you acknowledge that, after the tribal field surveys of the Dewey-Burdock site in 2013, the NRC Staff prepared draft determinations of sites eligible for listing on the National Register of Historic Places? Exs. NRC-015, NRC-019, NRC-059, NRC-061, NRC-063.
15. Do you acknowledge that, in late 2013, the Staff distributed the findings to the Oglala Sioux and other consulting Tribes for review? Exs. NRC-015, NRC-018-B at 22, NRC-019, NRC-059, NRC-061, NRC-063.
16. Do you acknowledge that the South Dakota State Historic Preservation Office reviewed and concurred on the Staff's eligibility determinations? Ex. NRC-155.
17. Do you acknowledge that the Staff invited the consulting tribes, including the Oglala Sioux Tribe, to provide information relevant to the development of a Programmatic Agreement? Exs. NRC-024, NRC-149, NRC-150.
18. Do you acknowledge that the Staff conducted four webinars while preparing the Programmatic Agreement? Exs. NRC-149, NRC-150.
19. Do you acknowledge that the Staff provided the tribes, including the Oglala Sioux Tribe, a revised draft of the Programmatic Agreement before each webinar and requested comments on the revised drafts? Exs. NRC-149, Ex. NRC-150.
20. Mr. CatchesEnemy, do you acknowledge that, as a representative of the Oglala Sioux Tribe, you participated in the teleconferences to develop the Programmatic Agreement?

21. Do you acknowledge that the ACHP is the federal agency charged with administering the NHPA and making determinations on whether an agency has properly consulted under Section 106?
22. Do you acknowledge that the ACHP signed the Programmatic Agreement for the Dewey-Burdock Project because it found that the Staff had consulted as required under the National Historic Preservation Act? Ex. NRC-018-D.
23. Do you acknowledge that the South Dakota SHPO signed the Programmatic Agreement for the Dewey-Burdock Project, demonstrating that it found acceptable the Staff's identification of historic properties, evaluation of National Register-eligibility determinations, and consultation efforts under the National Historic Preservation Act? Ex. NRC-018-G.
24. In your prefiled testimony, you state that you are concerned tribes will not be involved in future efforts to resolve adverse impacts, evaluate unevaluated sites, and identify new sites. Do you acknowledge that the Staff prepared the Programmatic Agreement to address these very concerns?

III. Proposed Questions for Contention 2

A. Issues Needing Further Examination: Dr. Robert Moran, the Oglala Sioux Tribe's witness, alleges that Powertech failed to adequately define baseline groundwater conditions at the Dewey-Burdock site. Dr. Moran argues that, as a result, the Staff lacked sufficient information to define baseline conditions and assess impacts to groundwater as required under NEPA. Susan Henderson, the Consolidated Intervenor's witness, alleges that contamination from operations at the Black Hills Army Depot may be affecting groundwater quality in southwestern South Dakota. Although in her prefiled testimony Ms. Henderson does not challenge the Staff's NEPA analysis specifically, during the oral portion of the hearing it is possible she may allege that the Staff insufficiently considered potential contamination from the Army Depot.

B. Objective of the Examination: To establish that Powertech submitted information on baseline groundwater conditions consistent with NRC guidance and that, as a result, the Staff had sufficient information to perform the analysis required by NEPA. Also to establish that the Staff took into account possible contamination from the Black Hills Army Depot when assessing baseline groundwater conditions in the Dewey-Burdock area.

C. Proposed Questions for Dr. Moran:

1. Do you acknowledge that, in its application for an NRC license, Powertech stated that it was following guidance in Section 2.7.3 of NUREG-1569, "Standard Review Plan for In-Situ Leach Uranium Extraction License Applications" (Ex. NRC-013), to

establish preoperational baseline groundwater conditions at the Dewey-Burdock site?

2. Is it your position that, even if Powertech submitted all the information on baseline groundwater conditions identified in NUREG-1569, the NRC Staff would still lack sufficient information to conduct the review required by NEPA?
3. Do you agree that the groundwater quality data presented in Appendix 3.4-C of Powertech's Environmental Report and Appendix 2.7-G of Powertech's Technical Report RAI Responses (Exs. APP-040-Z and APP-016-M) include all chemical constituents listed in Table 2.7.3-1 of NUREG-1569, "Typical Baseline Water Quality Indicators to Be Determined during Preoperational Data Collection"?
4. In your prefiled testimony you allege deficiencies in the analytical methods Powertech used to collect and analyze groundwater samples. Isn't it true, however, that you do not specifically address the groundwater sampling methods and analytical results Powertech presents in Section 6.1.8.1 of its Environmental Report and Appendix 2.7-H of its Technical Report RAI Responses? (Exs. APP-040-C, APP-016-N, APP-016-O, APP-016-P, APP-016-Q.)
5. The NRC's Regulatory Guide 4.14, "Radiological Effluent and Environmental Monitoring at Uranium Mills" (1980) (Exh. NRC-074), provides guidance for collecting groundwater samples. In your testimony, you refer to this guidance as outdated and state that it applies only to uranium milling operations, not ISR operations. You do not, however, argue that Powertech failed to collect data consistent with the Regulatory Guide. Is that correct?
6. Do you acknowledge that Exhibits NRC-075, "Staff Assessment of Ground Water Impacts from Previously Licensed In-Situ Uranium Recovery Facilities," and NRC-076, "Historical Case Analysis of Uranium Plume Attenuation" contain findings that support the guidance in Regulatory Guide 4.14?
7. Do you acknowledge that, in their initial testimony, the Staff's experts explained why Regulatory Guide 4.14 actually provides a conservative protocol for assessing impacts related to ISR projects? (Ex. NRC-001 at A.15, A.16.)
8. Do you agree that, under the guidance in NUREG-1569, an applicant need not collect and analyze data on baseline groundwater quality as it existed *before* past uranium mining activities?
9. Do you acknowledge that, in Section 3.5.3.5 of the Dewey-Burdock FSEIS, the Staff discusses existing groundwater conditions in production zone aquifers and surrounding aquifers at the Dewey-Burdock site?

10. Do you acknowledge that the chemistry of the baseline groundwater quality samples reported in Section 3.5.3.5 of the FSEIS reflects the impacts of any groundwater contamination that may have occurred from past uranium mining activities?
11. Do you acknowledge that in Chapter 5 of the FSEIS the Staff assesses the cumulative impacts on groundwater from past, present, and reasonably foreseeable future actions, including past mining activities?
12. Do you agree that in Chapter 5 of the FSEIS the Staff takes into account cumulative impacts related to operations at the Black Hills Army Depot?
13. Do you acknowledge that Powertech's NRC license includes conditions—*e.g.*, Conditions 10.6, 10.10, 11.3, 11.4, and 12.4—requiring Powertech to provide additional data relevant to determining groundwater quality and groundwater restoration standards?
14. Isn't it true that in neither your initial testimony nor your rebuttal testimony do you challenge these license conditions as insufficiently specific?
15. Isn't it true that, while you object to the use of license conditions generally as a means of obtaining additional information on groundwater quality, in your prefiled testimony you do not allege any other deficiencies in Powertech's license conditions?
16. Do you acknowledge that in Section 7.3.1 of the FSEIS the NRC Staff describes the procedures for establishing Commission-approved background groundwater quality in wellfields at the Dewey-Burdock site?
17. Do you acknowledge that in Section 7.3.4 of the FSEIS the NRC Staff describes the procedure for establishing baseline water quality before operations begin at the Dewey-Burdock project site?
18. In your rebuttal testimony you challenge the direct testimony of several Powertech witnesses. You do not, however, address any of the direct testimony from the Staff's witnesses. Is that correct?

D. Proposed Questions for Ms. Henderson:

1. Are you aware that in the FSEIS the Staff responded to a public comment on potential groundwater contamination from the Black Hills Army Depot? Ex. NRC-008-B-2 at E-236 to 2-237.
2. Are you aware that the NRC reviewed two reports from the U. S. Army Corps of Engineers to determine whether proposed operations at the Dewey-Burdock Project could mobilize contamination from the Army Depot and subsequently harm public

health or the environment? Ex. NRC-008-B-2 at E-236 to 2-237 Ex. NRC-135 at 28-30 and Figure 2.3-1 at 31.

3. Are you aware that the Staff found the Dewey-Burdock Project will have no effect on site conditions at the former Army Depot due to the isolation of the Inyan Kara aquifers and the lack of significant groundwater contamination at the Army Depot? Exs. NRC-135 at 28-30, NRC-008-B-2 at E-236 to 2-237.
4. Are you aware that, in response to a comment on the DSEIS, the Staff reviewed how groundwater pumping at the Dewey-Burdock Project might affect existing groundwater contamination at the former Army Depot and revised text in SEIS Section 5.5.2? Exs. NRC-008-A-2 at 5-32 to 5-33, NRC-008-B-2 at E-236 to 2-237.

IV. Proposed Questions for Contention 3

A. Issue Needing Further Examination: Dr. Robert Moran, the Oglala Sioux Tribe's witness, and Dr. Hannan LaGarry, the Consolidated Intervenor's witness, allege that Powertech did not provide sufficient hydrogeological information to determine whether they will be able to contain fluids associated with ISR operations. Dr. Moran and Dr. LaGarry allege that, as a result, the Staff lacked sufficient information to make the findings required by NEPA.

B. Objective of the Examination: To establish that Powertech submitted hydrogeological information consistent with applicable NRC guidance. Through this information and the Staff's independent review of additional information, the Staff was able to assess the level of hydrogeological confinement at the Dewey-Burdock site and make the findings required by NEPA.

C. Proposed Questions for both Dr. Moran and Dr. LaGarry:

1. In your prefiled testimony you state that abandoned boreholes may provide pathways for ISR solutions to migrate outside the zone of production. Do you acknowledge that Powertech has committed to locating, and properly plugging and abandoning, any historical exploration boreholes that may potentially affect the control and containment of wellfield solutions? Exs. NRC-008-A-1 at Sections 3.4.1.2, 3.5.3.2; NRC-008-A-2 at Section 4.5.2.1.1.2.2; NRC-008-B-2 at Section E5.21.10, pp. E-149 to E-150.
2. In your prefiled testimony you refer to *regional* structural features such as the Dewey Fault Zone and the Long Mountain Structural Zone. You suggest that features associated with these zones may provide pathways for ISR solutions to migrate outside the production zone. Isn't it true, however, that you do not refer to any publications identifying site-specific faults or fracture systems within or adjacent to the Dewey-Burdock site?
3. In your prefiled testimony you argue that Powertech needs to provide additional hydrogeological data on specific wellfields in the Dewey and Burdock areas. Do you

acknowledge that Condition 10.10(A) of Powertech's license (Ex. NRC-012) requires Powertech to submit 11 categories of hydrogeologic information to the NRC for review and evaluation before it can operate in wellfields?

4. Do you acknowledge that, under License Condition 10.10(B), Powertech must submit the same hydrologic information for NRC review *and approval* before beginning operations in Burdock wellfields 6, 7, and 8?
5. Do you acknowledge that, while you object to the use of license conditions generally as a means of obtaining additional information on hydrogeological confinement, in your prefiled testimony you do not allege any specific deficiencies in License Condition 10.10?
6. In your rebuttal testimony you challenge the direct testimony of several Powertech witnesses. You do not, however, directly address any of the testimony from the Staff's witnesses. Is that correct?

D. Proposed Questions for Dr. Moran:

1. In your prefiled testimony you refer to breccia pipe features identified in United States Geological Survey (USGS) Professional Paper 763 as being northwest of the Dewey-Burdock site. Isn't it true, however, that you do not refer to any publication identifying breccia pipe features within or adjacent to the Dewey-Burdock site?
2. Do you agree that, according to the USGS Report introduced as Exhibit NRC-081, there is no evidence of breccia pipes at the Dewey-Burdock site?
3. In your prefiled testimony you conclude that satellite images included in Exhibit OST-005 potentially show that faults and fractures may be present at the Dewey-Burdock site. You do not state, however, that your conclusion has been verified through ground studies, isopach maps, structure maps, cross-sections, or published information. Is that correct?
4. You also state in your prefiled testimony that Exhibit OST-005 includes a satellite image of a possible sinkhole. You do not, however, state that your conclusion has been verified by ground studies or other evidence, such as structure maps, pumping test data, or published information. Is that correct?

V. Proposed Questions for Contention 4

- A. Issues Needing Further Examination:** Dr. Robert Moran, the Oglala Sioux Tribe's witness, alleges that the FSEIS does not fully consider the quantity of groundwater that will be used during all phases of the Dewey-Burdock Project. Dr. Moran also argues that the FSEIS lacks other necessary information on groundwater consumption.

B. Objective of the Examination: To establish that in the FSEIS the Staff fully considered groundwater consumption related to the Dewey-Burdock Project. Also to establish that in his prefiled testimony Dr. Moran fails to address new groundwater data that the Staff reviewed and evaluated when preparing the FSEIS.

C. Proposed Questions for Dr. Moran:

1. Do you acknowledge that the Staff presents a water balance for the Dewey-Burdock Project in Section 2.1.1.1.3.3 of the FSEIS, with Figure 2.1-14 providing a graphic illustration of the projected water balance? Ex. NRC-008-A-1 at 2-34 to 2-36.
2. Isn't it true that the water balance presented in the FSEIS includes detailed information on proposed production rates, aquifer bleed rates, reinjection rates, makeup water rates, and liquid waste disposal rates for the operations and aquifer restoration phases of the Dewey-Burdock Project? Ex. NRC-008-A-1 at 2-34 to 2-36.
3. You state that in the FSEIS the Staff failed to provide measured data for all water inputs and outputs related to all mine operations. Isn't it true that, until the Dewey-Burdock Project begins operations, Powertech cannot provide *measured data*, but only proposed data, for all water inputs and outputs?
4. Do you acknowledge that in the FSEIS the Staff reviewed additional data on groundwater inputs and outputs presented in Powertech's water rights applications? Ex. NRC-008-B-2 at pp. E-28 to E-30.
5. Do you acknowledge that the Staff also evaluated additional data on groundwater inputs and outputs contained in reports Powertech submitted to the South Dakota Department of Environment and Natural Resources? Ex. NRC-008-B-2 at pp. E-28 to E-30.
6. Are you aware that Section 4.5.2.1.1.2.2 of the FSEIS contains new data on consumptive water use indicating that the Inyan Kara Aquifer can sustain projected net extraction rates over Powertech's estimated eight years of operations? Ex. NRC-008-A at p. 4-62.
7. Isn't it true that the Staff also discusses these results of the Inyan Kara groundwater simulations in its responses to public comments in Sections E5.21.1 and E.5.21.9 of the FSEIS? Ex. NRC-008-B-2 at pp. E-28 to E-30, E-146 to E-149.
8. In your prefiled testimony (Supplemental Declaration at paragraphs 30 and 37) you argue that the Staff's Draft SEIS lacked specific information on how the Dewey-Burdock Project may affect domestic and stock wells outside the project boundary. Isn't it true, however, that you do not specifically address the Staff's drawdown

estimates in FSEIS Section 4.5.2.1.1.2.2, which replaced the estimates in the DSEIS? Ex. NRC-008-A-2. At pp. 4-59 to 4-62.

Respectfully submitted,

/Signed (electronically) by/
Michael J. Clark
Michael J. Clark
Counsel for the NRC Staff

/Signed (electronically) by/
Patricia A. Jehle
Patricia A. Jehle
Counsel for the NRC Staff

Dated at Rockville, Maryland
This 1st day of August 2014

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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| |) | ASLBP No. 10-898-02- MLA-BD01 |
| |) | |
| (Dewey-Burdock In Situ Uranium Recovery |) | Date: August 1, 2014 |
| Facility) |) | |

CERTIFICATE OF SERVICE

Pursuant to 10 C.F.R. § 2.305, I certify that counsel for the NRC Staff served the Staff's Proposed Cross-Examination Questions *in camera* with the Board via the NRC's Electronic Information Exchange (EIE) on August 1, 2014.

***/Signed (electronically) by/
Patricia A. Jehle***

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Question for Dr. Redmond, Mr. Catches Enemy, or Mr. Mesteth

Ex. NRC-047 at Page 3

The ACHP has published a guidance document titled

"Meeting the Reasonable and Good Faith Identification Standard in Section 106 Review" (Ex. NRC-047)

Page 3 of this document states that a reasonable and good faith identification effort does not require:

1. The approval of a THPO or other consulting party
2. Identification of every property within the APE (area of potential effects)
3. Investigations outside of, or below, a properly documented APE
4. Ground Verification of the entire APE

Do you agree that an agency need not take these steps in order to comply with Section 106?

(Alternatively) In your testimony today, aren't you arguing that the NRC Staff had to take some of these steps that the ACHP say aren't required?

NRC Staff

NRC Staff

For the NRC Staff

The Intervenor's witnesses claim that the Staff did not include information from the April-May 2013 tribal field surveys in the Final EIS. Did you?

For Dr. Moran and Dr. LaGarry:

NRE Staff

Do you agree that the net inward hydraulic gradient Powertech must maintain under License Condition ^{10.7} reduces the likelihood of fluids migrating away from the production zone?

License Condition 10.7

Staff

For Staff's witnesses

NRC Staff

In the SER, did the Staff evaluate whether operations at the Dewey-Burdock Project could mobilize contamination from the Black Hills Army Depot?

Did the Staff consider its findings in the SER when preparing the Final EIS?

Staff

Attachment 2

Powertech Proposed Questions

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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**POWERTECH (USA), INC. PROPOSED CROSS-EXAMINATION QUESTIONS FOR
CONSOLIDATED INTERVENORS AND THE OGLALA SIOUX TRIBE
WITNESSES**

I. INTRODUCTION

Pursuant to 10 CFR § 2.1207(a) and the Atomic Safety and Licensing Board’s (Licensing Board) Scheduling Order dated February 20, 2014, Powertech (USA), Inc. (Powertech) hereby submits its Proposed Cross-Examination Questions for the Licensing Board to ask the Consolidated Intervenor’s (hereinafter “CI”), and the Oglala Sioux Tribe’s (hereinafter the “Tribe”) witnesses. This proceeding involves consideration of initial and rebuttal position statements, written initial and rebuttal testimony, and exhibits for now seven (7) admitted contentions (Contentions 1A/B, 2, 3, 4, 6, and 9) regarding Powertech’s currently active NRC combined source and 11e.(2) byproduct material license for the Dewey-Burdock *in situ* leach uranium recovery (ISR) Project in the State of South Dakota. These admitted contentions were proffered on behalf of CI and the Tribe. As directed by the Licensing Board, these proposed cross-examination questions have been submitted *in camera*. Powertech respectfully requests

that the Licensing Board strongly consider asking CI's and the Tribe's expert witnesses the following questions.

II. PROPOSED CROSS-EXAMINATION QUESTIONS

While there are seven (7) admitted contentions in this proceeding and as will be shown below, Powertech is proposing cross-examination questions for only five (5) of these contentions: (1) Contention 1A regarding legal requirements for evaluations of historic and cultural resources, (2) Contention 1B regarding Tribal consultation under the National Historic Preservation Act (NHPA) Section 106 process, (3) Contention 2 regarding the adequacy of "baseline" groundwater quality data, (4) Contention 3 regarding the adequacy of hydrogeologic confinement and migration of recovery solution analyses, and (5) Contention 4 regarding the adequacy of groundwater quantity analysis. Powertech does not offer any proposed cross-examination questions on Contention 6 regarding the adequacy of mitigation measures analysis or Contention 9 regarding the adequacy of connected actions analyses, as neither CI nor the Tribe offered any testimony regarding these Contentions.

Prior to offering its proposed cross-examination questions, Powertech would like to note for the record that there have been several legal issues addressed in all parties' initial and rebuttal position statements. In the event that the Licensing Board deems it appropriate to address such issues with legal argument at the scheduled evidentiary hearing, Powertech respectfully requests that the Licensing Board provide all parties with advance notice of its intent to conduct oral argument or to receive additional argument on such issues prior to the evidentiary hearing date.

A. **CONTENTION 1A: Alleged Failure to Meet Applicable Legal Requirements Regarding Protection of Historical and Cultural Resources**

CONTENTION 1B: Alleged Failure to Involve or Consult All Interested Tribes as Required by Federal Law

For Contentions 1A and 1B, Powertech has identified several areas within the scope of these two (2) Contentions that should be subject to additional Licensing Board scrutiny, in addition to the legal and factual arguments presented in its and NRC Staff's initial and rebuttal statements of position, initial and rebuttal written testimony, and exhibits. For these Contentions, Powertech has prepared its cross-examination questions as follows: (1) identify the issue needing further examination, (2) the objective of the cross-examination question(s), and (3) the proposed line of cross-examination questioning is presented.

Prior to addressing its specific cross-examination questions, Powertech notes that there are several legal issues associated with compliance with the Section 106 Tribal consultation process, including but not limited to, the role of the Advisory Council on Historic Preservation (ACHP) in the review of a federal agency's Section 106 process and the legal meaning of its execution of the Dewey-Burdock ISR Project's programmatic agreement (PA). To the extent that the Licensing Board requests additional legal argument on such issues, Powertech counsel is prepared to offer such legal argument at the Licensing Board's request.

1-1: Issue Needing Further Examination:

Dr. Redmond's credentials as an expert witness on United States-based reviews of National Historic Preservation Act (NHPA) assessments of historic and cultural resources

Objective of the Examination:

To determine whether Dr. Redmond's doctorate is from an accredited institution

Proposed Line of Questioning (Dr. Redmond):

1. According to your resume, your Ph.D. is a distance learning degree from Canbourne University in London. Is this institution accredited by the government of the United Kingdom as having degree-awarding powers?
2. What was the subject of your doctoral dissertation?
3. Are you aware of any instances where people have had Canbourne University professional degrees declared to be not accredited?
4. If not, are you aware of at least two instances in the State of Texas where such degrees were actually declared illegal and removed from reference?
5. Whether you are or are not aware of these instances, is it not true that you have offered no evidence in the record to demonstrate that your Canbourne University degree is fully accredited and provides you with the credentials to offer expert testimony on United States-based assessments of historic and cultural resources?

1-2: Issue Needing Further Examination:

The claim that the Level III archaeological surveys performed by Augustana College within the Dewey-Burdock Project area do not meet State of South Dakota professional standards

Objective of the Examination:

To determine whether the appropriate authority accepted the results of the Augustana surveys

Proposed Line of Questioning (Dr. Redmond):

1. In your testimony you note that Level III archaeological survey standards for work in the State of South Dakota are established by the State Historic Preservation Office (SHPO) is that not correct?

2. It is not true that the South Dakota SHPO reviewed the Augustana reports, concurred with the NRC and BLM National Register of Historic Places (NRHP) eligibility and effect determinations based on the information in those reports, and signed a Section 106 agreement document based in part on the information in those reports?
3. Is it not true that reliance by the South Dakota SHPO on the Augustana reports indicate that the SHPO found those reports to meet the agency's standards for archaeological survey work?

1-3: Issue Needing Further Examination:

Under what circumstances testing, including subsurface, of archaeological sites is required/appropriate

Objective of the Examination:

To determine whether all needed testing of archaeological sites for the initial phase of Section 106 compliance was completed

Proposed Line of Questioning (Dr. Redmond):

1. You have raised concerns about archaeological sites in the project area having been recommended as not eligible to the NRHP without those sites having been subjected to subsurface testing. Dr. Hannus has testified that only sites located on bedrock or in other settings with no testable soils were recommended as ineligible without testing (Exhibit APP-003, ¶¶ A.16, A.20). Is this not standard archaeological practice?
2. You have also raised concerns about a number of sites in the project area being classified as "undetermined" in terms of their NRHP eligibility. You have argued that all such sites should have been tested prior to NRC and the United States Bureau of Land Management (BLM) making their decisions on this project because classifying them as unevaluated is tantamount to saying that they are ineligible to the NRHP, leaving them unprotected from mining activities. Is it not the case, however, that the terms of the programmatic agreement for this project commit NRC, BLM, and Powertech to protecting unevaluated sites in place, to evaluating through testing any such sites that may be impacted in the future, and to resolving any adverse effects on those sites as the phased ISR process continues?

1-4: Issue Needing Further Examination:

Have NRC and BLM complied with the requirements of Section 106 of the NHPA for Section 106 Tribal consultation?

Objective of the Examination:

To establish what entity has authority to determine this issue and what the decision of that entity was relative to Dewey-Burdock ISR Project compliance

Proposed Line of Questioning (Mr. Catches Enemy, Mr. Mesteth):

1. The Tribe's initial position statement notes that the Advisory Council on Historic Preservation (ACHP) "has exclusive authority to determine the methods for compliance with the NHPA's requirements" (page 7). Do you or do you not agree with that statement?
2. Given that the signing or execution statement for the Dewey-Burdock ISR Project PA says that execution of this agreement document "is evidence that" NRC and BLM have met the requirements of Section 106, and given that the ACHP signed this programmatic agreement, does that not indicate that the recognized authority has determined that NRC and BLM have appropriately completed the Section 106 process?

1-5: Issue Needing Further Examination:

Whether approval by Tribe's or other Tribes should have been required before a Section 106 agreement document could be finalized

Objective of the Examination:

To establish when Tribes are required signatories for a Section 106 agreement and whether that requirement applies in this case

Proposed Line of Questioning (Mr. Catches Enemy, Mr. Mesteth):

1. According to 36 CFR § 800.6(c)(1), the required signatories for Section 106 agreement documents such as the Dewey-Burdock programmatic agreement are the Advisory Council on Historic Preservation, the federal agency or agencies, and the State Historic Preservation Officer – with the Tribal Historic Preservation Officer

being a required signatory in lieu of the SHPO on tribal land. Is this or is this not correct?

2. According to 36 CFR § 800.16(x), “Tribal land” is defined as “all lands within the exterior boundaries of any Indian reservation and all dependent Indian communities.” According to this definition, do you agree that there is no tribal land in the Dewey-Burdock ISR Project area?
3. Therefore there is no requirement that the Tribe or any of the tribes approve this project or be a signatory to the agreement, is that correct?

1-6: Issue Needing Further Examination:

Does the phased approach to identification and evaluation of historic properties adopted by NRC and BLM enable the agencies to take into account the effects of the Dewey-Burdock ISR Project on historic properties?

Objective of the Examination:

To determine whether phased identification and evaluation are allowed under the Section 106 regulation and whether provisions have been made for currently unevaluated and potentially unidentified properties

To probe expert witness knowledge of existing Commission precedent regarding the legality of phased identification for historic and cultural resources in the NHPA Section 106 process

Proposed Line of Questioning (Mr. Catches Enemy, Mr. Mesteth):

1. Does not the Section 106 regulation at 36 CFR § 800.4(b)(2) not specifically allow federal agencies to carry out identification and evaluation of historic properties in a phased manner?
2. Does not the Dewey-Burdock PA not provide for protection of unevaluated sites until such time as they may need to be evaluated because future construction or operation activities could affect those properties?
3. Does not the Dewey-Burdock PA provide for future identification and evaluation of historic properties that may be affected by construction of the utility lines into the project area?

4. Do not the Dewey-Burdock PA, the NRC license conditions, the memorandum of agreement (MOA) Powertech has executed with the South Dakota State Archeologist, and the State burial statute all require Powertech to protect in place and report to appropriate authorities any *unanticipated discoveries* of historic properties or human remains during construction or operation of the Project?
5. Are you familiar with the Commission's legal ruling in 2005 and 2006 in *In the Matter of Hydro Resources, Inc.* (LBP-05-26 & CLI-06-11)?
6. If not, are you aware that LBP-05-26 and CLI-06-11 specifically endorsed the use of phased identification for evaluation of historic and cultural resources at proposed ISR project sites?
7. If so, is it not true that you cannot reconcile your testimony with the express Commission legal mandate in LBP-05-26 and CLI-06-11 endorsing phased identification for ISR projects?

1-7: Issue Needing Further Examination:

Did NRC and BLM make an adequate effort to identify historic properties of religious and cultural significance?

Objective of the Examination:

To determine whether the Tribe had the opportunity to identify properties of religious and cultural significance to the Tribe that might be affected by the Dewey-Burdock ISR Project

Proposed Line of Questioning (Mr. Catches Enemy, Mr. Mesteth):

1. Did NRC not offer the Tribe the opportunity to examine the entire Dewey-Burdock ISR Project license area for properties of religious and cultural significance to the tribe in whatever way the Tribe considers to be culturally appropriate during April and May of 2013?
2. Did the Tribe not initially agree to participate in this identification effort to be funded by Powertech?

3. Did the Tribe not subsequently withdraw the tribe's agreement to participate in this identification effort?

B. CONTENTION 2: Alleged Failure to Include All Necessary Information for Adequate Determination of Baseline Groundwater Quality

For Contention 2, Powertech has identified several areas within the scope of this Contention that should be subject to additional Licensing Board scrutiny, in addition to the legal and factual arguments presented in its and NRC Staff's initial and rebuttal statements of position, initial and rebuttal written testimony, and exhibits. For this Contention, Powertech has prepared its cross-examination questions as follows: (1) identify the issue needing further examination, (2) the objective of the cross-examination question(s), and (3) the proposed line of cross-examination questioning is presented.

Powertech specifically notes that there is a substantial legal issue regarding allegations on the adequacy of "baseline" groundwater quality sufficient to justify an initial licensing decision for the Dewey-Burdock ISR Project, including but not limited to the legal difference between groundwater quality requirements to determine 10 CFR Part 40, Appendix A, Criterion 7 "baseline" groundwater quality in a license application and the determination of Criterion 5 "Commission-approved background" post-license issuance. To the extent that the Licensing Board requires additional legal argument regarding these issues, Powertech's counsel is prepared to offer such argument at the evidentiary hearing or in advance if necessary.

2-1: Issue Needing Further Examination:

Tribe Witness Dr. Moran's experience with 10 CFR Part 40, Appendix A, Criterion 7 baseline groundwater quality characterization for uranium ISR facilities

Objective of the Examination:

To establish that Dr. Moran does not have direct, professional experience in many of the aspects of licensing or operating a uranium ISR facility about which he has provided testimony

Proposed Line of Questioning (Dr. Moran):

1. Is it not true that, for an NRC or Agreement State ISR application for a source and byproduct material license before the NRC, you have never:
 - a. Performed baseline groundwater characterization for an NRC or Agreement State ISR license application?
 - b. Designed or conducted an aquifer pumping test for an NRC or Agreement State ISR license application?
2. Is it not true that you have never worked at a commercial-scale uranium ISR facility?

2-2: Issue Needing Further Examination:

The phased nature of baseline groundwater quality data acquisition and analysis

Objective of the Examination:

To establish that Dr. Moran is challenging NRC regulations by insisting that detailed, pre-operational *baseline* groundwater quality data should be collected for each ISR well field prior to license issuance

Proposed Line of Questioning (Dr. Moran):

1. You have stated that “license conditions that delay collection of these necessary hydrogeologic and water quality data/information until after NRC permit approval ensures that much of the detailed information will never become public or face careful review by other agencies and the public in a NEPA process” (Exhibit OST-018 at 4). Is it not true that NRC license conditions and federal regulations prohibit an ISR *license applicant* from installing and sampling a complete ISR well field in order to obtain 10 CFR Part 40, Appendix A, Criterion 5 *Commission-approved background* water quality for that well field?

2. If not, do you disagree that an ISR license applicant is prohibited by federal regulations at 10 CFR 40.32(e) from constructing a complete ISR well field monitoring well network prior to license issuance?
3. Or do you disagree that Commission-approved background water quality and upper control limits (UCLs) for each well field cannot be established until after constructing a complete ISR well field monitoring well network?
4. Is it not true that in your testimony you do not criticize whether the Safety Evaluation Report (SER) and/or the FSEIS adequately described the *procedures* that will be followed per SUA-1600 license conditions to establish *Commission-approved background* water quality and UCLs for each well field after license issuance?
5. If not, then do you disagree with the statement on page 7-8 of the FSEIS that, “The applicant’s proposed well spacing, sampling frequency, and parameters for *Commission-approved background* production zone sampling are consistent with NUREG-1569”?
6. If you disagree, what specific portion of NUREG-1569 regarding this issue do you feel has not been satisfied?
7. Are you aware of the Licensing Board’s and the Commission’s decisions in *Hydro Resources, Inc.* regarding “baseline” versus “Commission-approved background” groundwater quality at ISR projects?
8. If so, is it not true that your testimony cannot be reconciled with the Commission’s express mandate regarding “baseline” versus “Commission-approved background” groundwater quality determination and the process by which this is done?

2-3: Issue Needing Further Examination:

Lack of evidence of past contamination from historical uranium mining or activities at the Black Hills Army Depot (BHAD) and lack of relevance to pre-operational groundwater quality characterization for the Dewey-Burdock ISR Project

Objective of the Examination:

To establish that no evidence has been provided to support Dr. Moran’s or Ms. Henderson’s testimony that the groundwater within the Dewey-Burdock ISR Project license area has been contaminated by historical uranium mining or activities at the

BHAD; also to establish that the required baseline analyses for an ISR license application are based on current conditions as opposed to those conditions that existed prior to historical mining

Proposed Line of Questioning (Dr. Moran):

1. Your rebuttal testimony (Exhibit OST-018 at 1) continues to put forth your opinion that, “Analysis of impacts from past mining and other contamination are critical to assessing the baseline water quality, and potential impacts of future mining activity at the proposed site.” NRC staff and Powertech have stated their opinion that baseline studies are done to characterize the existing environment with respect to pre-operational water quality and that Powertech has performed site-wide groundwater quality characterization as part of its license application in conformance with NRC regulations and Commission-approved guidance. Is it your opinion that NRC guidance and regulations are inadequate or that Powertech did not satisfy the guidance criteria?
2. Have you submitted any evidence to support your conclusion that activities at the BHAD have impacted groundwater quality the Dewey-Burdock ISR project area (Exhibit OST-001 at 16)?
3. Do you agree that the Dewey-Burdock Project is some 14 miles north of the BHAD, as stated on page E-237 of the FSEIS?
4. Is it not true that the Dewey-Burdock ISR Project is located upgradient from the BHAD and that NRC Staff’s statement in the FSEIS that the Project aquifer is separated by approximately 1,000 feet of aquitard is accurate?
5. Do you disagree with NRC Staff’s assessment in the FSEIS “that proposed operations at the Dewey-Burdock ISR Project will have no effect on site conditions at the former BHAD [Black Hills Army Depot]” (FSEIS page E-237)?
6. In light of the distance to the BHAD and NRC staff’s determination that the Dewey-Burdock ISR Project will have no impact on site conditions at the BHAD, is it still your opinion that the BHAD has impacted groundwater quality at the Dewey-Burdock Project 14 miles away?
7. Have you submitted any evidence or calculations to support your conclusion that historical mining operations within the Dewey-Burdock ISR Project license area have impacted pre-operational baseline groundwater quality?

8. Do you disagree with Powertech's conclusion that a comparison between the Tennessee Valley Authority (TVA) data collected between 1979 and 1984 and Powertech data collected between 2007 and 2008 shows very similar water quality?
9. If historical mining impacted groundwater quality across the Dewey-Burdock ISR Project license area, why would the changes in groundwater quality have stopped prior to 1979 such that the quality remained relatively stable after that date?

Proposed Line of Questioning (Ms. Henderson):

1. Is it your contention that the 85 open mine pits described in your initial written testimony (Exhibit INT-007 at 4) occur within the Dewey-Burdock license area?
2. Have you submitted any evidence supporting your statement that “[m]ost have deep pools of radioactive water in them” (Exhibit INT-007 at 4)?
3. Have you submitted any evidence supporting your statement under this contention that “the Wind Cave Structure extends under the 21,000 acre former Black Hills Army Depot” (Exhibit INT-007 at 4)?
4. Have you submitted any evidence supporting your opinion that the historical uranium mines have contaminated the 4,000-foot Madison well at Igloo (Exhibit INT-007 at 5)?

2-4: Issue Needing Further Examination:

Dr. Moran's challenge of Regulatory Guide 4.14 with respect to baseline groundwater quality characterization

Objective of the Examination:

To demonstrate that Dr. Moran is challenging the adequacy of NRC regulations and regulatory guidance, which is outside the scope of this proceeding

Proposed Line of Questioning (Dr. Moran):

1. In your Supplemental Declaration dated January 24, 2013 you assert that use of Regulatory Guide 4.14 in baseline groundwater quality evaluations for an ISR facility “is inappropriate” since “it refers only to uranium mills, not ISL operations.” Are you aware that NUREG-1569 and the SER repeatedly reference Regulatory Guide 4.14?

2. Do you believe that NRC Staff's reliance on Regulatory Guide 4.14 for ISR facilities is inappropriate?
3. If so, do you disagree with NRC Staff's testimony which states that Regulatory Guide 4.14 has been re-evaluated regarding its continuing relevance and that it is conservative as applied to ISR operations which are conducted in Safe Drinking Water Act (SDWA) exempted aquifers classified as not capable of now nor ever in the future of serving as a public source of drinking water versus a conventional uranium mill which can be located on top of a pristine drinking water source?
4. Do you feel that NRC guidance including NUREG-1569 and Regulatory Guide 4.14 not credible? Are you aware that these were issued by the Commission after public comment? Did you provide comments?

C. CONTENTION 3: Alleged Failure to Include Adequate Hydrogeological Information to Demonstrate Ability to Contain Fluid Migration and Assess Potential Impacts to Groundwater

For Contention 3, Powertech has identified several areas within the scope of this Contention that should be subject to additional Licensing Board scrutiny, in addition to the legal and factual arguments presented in its and NRC Staff's initial and rebuttal statements of position, initial and rebuttal written testimony, and exhibits. For this Contention, Powertech has proposed its cross-examination questions as follows: (1) identify the issue needing further examination, (2) the objective of the cross-examination question(s), and (3) the proposed line of cross-examination questioning is presented.

Powertech specifically notes that there is a substantial legal issue regarding allegations on the adequacy of "baseline" hydrogeologic characterization sufficient to justify an initial licensing decision for the Dewey-Burdock ISR Project, including but not limited to the legal difference between site-wide information that a license applicant must provide in conformance with Chapter 2 of NUREG-1569 and well field-specific information that a licensee must provide for each well field after license issuance but prior to operations. To the extent that the Licensing

Board requires additional legal argument regarding these issues, Powertech's counsel is prepared to offer such argument at the evidentiary hearing or in advance if necessary.

3-1: Issue Needing Further Examination:

Dr. Moran's misconception that overlying and underlying confining units must be completely impermeable in order for ISR operations to be performed safely

Objective of the Examination:

To determine whether Dr. Moran has any evidence to support his conclusion that the targeted production zones are unable to contain fluids

Proposed Line of Questioning (Dr. Moran):

1. You offer the opinion that the "the targeted production zones involve 'leaky aquifers'" (Exhibit OST-018 at 5). Is it your opinion that the confining layers must be absolutely impermeable in order for the ISR process to work or only "relatively impermeable" when compared to the ore-bearing sandstones?
2. Do you disagree with Powertech's expert testimony that there is no such thing as a one hundred percent confining layer in nature and, if so, what evidence have you offered in the record to support such an opinion?
3. Do you agree with Mr. Demuth's assertion that "[i]f there were a strong hydraulic connection between ... two aquifers ... the water level elevations [at a given point] would be similar" (Exhibit APP-013 at ¶ A.32)?
4. Do you disagree with Mr. Demuth's conclusion that potentiometric water level differences of 9 to 40 feet between wells completed in the Fall River and Chilson aquifers indicates hydraulic separation between these aquifers at these locations?
5. Do you disagree with the statement in the FSEIS that prior to operating each well field Powertech will be required to "design and implement pumping tests to evaluate and confirm ... hydraulic isolation between the production zone and overlying and underlying aquifers" (FSEIS at E-31)?

3-2: Issue Needing Further Examination:

Dr. Moran's misconception that the need to conduct additional pumping tests for individual well fields demonstrates a deficiency in the hydrogeological information provided in the license application

Objective of the Examination:

To establish that Dr. Moran is challenging NRC regulations by insisting that pump testing should be conducted for each ISR well field prior to license issuance

Proposed Line of Questioning (Dr. Moran):

1. You have cited testimony from Mr. Demuth that "results of ... pumping tests will be provided to NRC and EPA Staff for review and will have to demonstrate adequacy of the monitoring network prior to operating each wellfield" as evidence that "the hydrogeological information provided in the Dewey-Burdock ISR Project documents is inadequate to reliably characterize hydrogeological conditions ..." (Exhibit OST-018 at 3-4). Do you disagree that such pump tests will provide the necessary information to demonstrate adequate aquifer confinement?
2. NRC Staff evaluated the results of pumping tests conducted prior to license issuance in Section 2.4.3.4 of the SER and concluded in SER Section 2.4.4 that Powertech's characterization of site-wide groundwater hydrology is acceptable. Can you point to specific sections of NRC guidance documents such as NUREG-1569 that would require more pumping tests prior to license issuance than were conducted by TVA and Powertech for the Dewey-Burdock ISR Project?
3. So, do you or do you not agree that the procedures for determining necessary confinement within each ISR well field are adequate?

3-3: Issue Needing Further Examination:

Dr. Moran's assertion that historical reports covering broad geographic regions provide more reliable information than the more recent, site-specific data in the license application

Objective of the Examination:

To show that the use of historical, regional reports to draw conclusions about site-specific conditions in the Dewey-Burdock ISR Project license area is inappropriate

Proposed Line of Questioning (Dr. Moran):

1. You have stated that it is your expert opinion based on regional reports such as Keene 1973 that “long-term, all of the relevant D-B water-bearing zones are hydrogeologically-interconnected.” Do you disagree with Mr. Lawrence’s assertion that the Keene study encompasses an area of approximately 800 square miles and that only half of the Dewey-Burdock ISR Project license area (sixteen (16) square mile total license area) is inside the Keene study area (Exhibit APP-066 at ¶ A.5)?
2. Is it not true that the 1973 report covering a vastly larger area with only hundreds of data points cannot provide more credible information on the Dewey-Burdock license area than Powertech’s data from thousands of boreholes within the license area?
3. Could not the Fall River and Chilson aquifers be hydrologically connected at some location within the larger area covered by the Keene 1973 report but hydrologically isolated from each other within the Dewey-Burdock ISR Project area?
4. Are you aware of the Licensing Board’s and the Commission’s decision’s in *Hydro Resources, Inc.* (ASLBP No. 95-706-01-ML) regarding excursions and that they serve as early warnings of recovery solution migration and not as confirmation of contamination of adjacent, non-exempt underground sources of drinking water (USDW)?

3-4: Issue Needing Further Examination:

CI witness Dr. LaGarry’s understanding of the ISR licensing process

Objective of the Examination:

To establish that Dr. LaGarry does not understand the ISR licensing process and the need to provide contingency plans to deal with potential excursions

Proposed Line of Questioning (Dr. LaGarry):

1. You state that, “It appears by their testimonies that Demuth and Lawrence concede that there will be excursions, which Powertech will try to correct as they mine and fix

them once they become apparent” (Exhibit INT-020 at 1). Can you cite the specific locations in their testimonies where these experts concede this point?

2. Do you question the advisability of including a plan to deal with possible excursions?
3. Are you aware of the Licensing Board’s and the Commission’s decision’s in *Hydro Resources, Inc.* (ASLBP No. 95-706-01-ML) regarding excursions and that they serve as early warnings of recovery solution migration and not as confirmation of contamination of adjacent, non-exempt underground sources of drinking water (USDW)?
4. Are you aware of the NRC Staff’s 2009 report to the Commission regarding excursion monitoring at ISR project sites and the fact that no contamination to adjacent, non-exempt USDWs from licensed ISR operations have occurred (Exhibit NRC-075)?
5. Is it not true that your testimony cannot be reconciled with the information provided in this report, including the explicit conclusion that excursions at past and present ISR project sites has not resulted in contamination of adjacent, non-exempt USDWs?

3-5: Issue Needing Further Examination:

CI witness Dr. LaGarry’s understanding of the Commission’s ISR licensing process under 10 CFR Part 40, Appendix A

Objective of the Examination:

To establish that Dr. LaGarry does not understand the ISR licensing process and the need to design each well field based on detailed drilling and hydrogeologic testing

Proposed Line of Questioning (Dr. LaGarry):

1. Your testimony asks, “Why is the Dewey-Burdock area so hydro-geologically identical to other mines to permit an evaluation of whether the ‘standard’ plans will work there?” (INT-020 at 1). Was NUREG-1910 not developed for precisely the reason that there are relative similarities between ISR geologic and hydrologic conditions at ISR projects nationwide? Can you provide a specific reference to a standard plan? Do you consider a procedure that has been used successfully at other ISR operations to be a standard plan?
2. Did you read in the FSEIS that well field delineation results and pumping test data will be included in well field hydrogeologic data packages, which will be submitted

for review and evaluation to the NRC (FSEIS at 2-18)? Did you understand that these well field hydrogeologic data packages will be similar to those from other existing ISR projects, albeit reflecting site-specific conditions?

3. Do you understand that in order to develop the necessary data for well field hydrogeologic data packages, Powertech has to be permitted to install complete well fields and monitor well networks for pump tests to demonstrate adequate confinement and detailed hydrological data for UCLs?

3-6: Issue Needing Further Examination:

CI witness Dr. LaGarry's understanding of Powertech's plans for wastewater disposal

Objective of the Examination:

To establish that Dr. LaGarry does not understand that wastewater disposal at the Dewey-Burdock Project will be either through deep disposal wells (preferred, assuming permits are obtained and adequate capacity is available) or land application (permitted under a groundwater discharge permit pending with South Dakota Department of Environment and Natural Resources (SDDENR)).

Proposed Line of Questioning (Dr. LaGarry):

1. Please provide a specific reference to your statement that, "I note that Technical Report (APP-015-A) describes "periodic releases of water from storage ponds" (Exhibit INT-020 at 2).
2. Isn't it true that this is a change index that shows that this statement in the original Technical Report was deleted from the revised Technical Report?

3-7: Issue Needing Further Examination:

CI witness Dr. LaGarry's understanding of Powertech's evidence that the Inyan Kara is a confined aquifer in areas where ISR will take place

Objective of the Examination:

To establish that Dr. LaGarry does not understand all the evidence presented to demonstrate that the Inyan Kara is a confined aquifer

Proposed line of Questioning (Dr. LaGarry):

1. You state that "Demuth and Lawrence specifically refute my 2010 assertion presented in this case that the Inyan Kara is unconfined by using cross sections based on e-logs" (Exhibit INT-020 at 3).

- a. Is it your professional opinion that e-logs were the only evidence provided in the application that the Inyan Kara is a confined aquifer?
 - b. Can e-logs alone provide evidence of aquifer confinement?
 - c. What about e-logs combined with pump test analyses and potentiometric data in the application?
 - d. Do these analyses and data, together with the e-logs and geologic cross sections, not provide evidence of confinement of the Inyan Kara?
2. Your testimony states that, “However, the FSEIS concedes that the units are unconfined for the specific reasons I laid out in the most recent 2014 opinion in my Opening Testimony. Lawrence defers to Demuth on the use and interpretation of the cross sections supplied by Powertech based on e-logs. These are contradicted by the FSEIS which concedes that the upper confining layer thins to 0” (Exhibit INT-020 at 3).
- a. Is it your testimony that the Inyan Kara is entirely unconfined within the license area, or just in the upper part of the Inyan Kara (Fall River) and just in certain areas?
 - b. Are you aware that the application states that Powertech does not propose ISR in the Fall River in areas where the Fall River is geologically unconfined (FSEIS at 3-36)?

D. CONTENTION 4: Alleged Failure to Adequately Analyze Groundwater Quantity Impacts

For Contention 4, Powertech has identified several areas within the scope of this Contention that should be subject to additional Licensing Board scrutiny, in addition to the legal and factual arguments presented in its and NRC Staff’s initial and rebuttal statements of position, initial and rebuttal written testimony, and exhibits. For this Contention, Powertech has proposed its cross-examination questions as follows: (1) identify the issue needing further examination, (2) the objective of the cross-examination question(s), and (3) the proposed line of cross-examination questioning is presented.

4-1: Issue Needing Further Examination:

Tribe Witness Dr. Moran's experience with numerical groundwater modeling

Objective of the Examination:

To establish that Dr. Moran does not have direct, professional experience in numerical groundwater modeling about which he has provided testimony

Proposed Line of Questioning (Dr. Moran):

1. Is it true that for an application for an NRC or Agreement State source and byproduct material license to NRC you have never constructed a numerical groundwater flow model?
2. Is it not true that you have never developed and run a digital groundwater flow model for any purpose?

4-2: Issue Needing Further Examination:

Tribe witness Dr. Moran's understanding of the ISR process water balance

Objective of the Examination:

To establish that Dr. Moran does not understand the purpose of a process water balance to estimate the amount of water required for the process or the amount of wastewater that will require disposal

Proposed Line of Questioning (Dr. Moran):

1. You continue to offer the opinion that, "... the FSEIS does not contain a water balance" (Exhibit OST-018 at 8). Can you explain specifically what is missing in terms of required elements of a process water balance from Exhibit APP-016-B at 69 (PDF page 93), which is a figure approved by NRC Staff entitled *Typical Project-wide Flow Rates During Uranium Recovery and Aquifer Restoration*? This figure is also shown on page 2-36 in the FSEIS as Figure 2.1-14.
2. How can "measured data" be provided in a water balance for a facility that has not yet been constructed? Can any facility provide measured data before it is built?
3. You state that "My testimony is based on the conclusion that such evaporation and any other categories of water loss not accounted for in the FSEIS estimate will increase the total volumes of water used by the D-B project" (Exhibit OST-018 at 7).

- a. Can you explain why the figure referenced in the preceding question and the accompanying explanation in the FSEIS do not account for all water to be used in the ISR process, including “evaporation and any other categories of water loss ...?”
 - b. Where would the evaporation occur?
 - c. If the outflow in the water balance is equal to the amount of water pumped from the respective aquifers, how can water be unaccounted for? Where would it come from?
4. You state that the 2% of the diverted water that will be disposed of as liquid waste “clearly neglects the fact that much of the water from either aquifer will have been contaminated, and that the water undergoing land application will be lost via evaporation / evapotranspiration. In either case, this water is no longer available for present or future uses within the exempted aquifer zone. Clearly, the SEIS underestimates the volumes of water that are lost or contaminated through these processes” (Exhibit OST-1 at 27).
- a. Are you aware that the amount of water that will be consumed by evaporation or evapotranspiration can only come from the bleed stream that is included in the water balance?
 - b. Do you have reason to dispute Powertech’s modeling results and SDDENR’s conclusion that show that water levels in the Inyan Kara will recover within about one year after operations cease in a particular wellfield?
 - c. If water quality is restored in the exempted recovery zone (as required) and water levels recover (as indicated by the modeling), is it not incorrect to state that “volumes of water that are lost or contaminated through these processes?”

4-3: Issue Needing Further Examination:

Tribe witness Dr. Moran’s understanding of the amount of water to be consumed

Objective of the Examination:

To establish that Dr. Moran throws around statements like “The applicant will use and contaminate tremendous quantities of ground water” (Exhibit OST-1 at 26) without justifying such statements or placing them into the perspective of water availability, annual recharge or impacts to other water users

Proposed Line of Questioning (Dr. Moran):

1. Because about 98% of the water will be recirculated, the *net* diversion rate from the Inyan Kara will not exceed 170 gpm. Do you consider 170 gpm to be a “vast” or “tremendous” amount of water compared to water in storage in this aquifer or annual recharge to this aquifer?

2. Do you disagree with the South Dakota DENR’s findings that there is a reasonable probability that water is available, that annual recharge will not be exceeded, that it is unlikely that there will be unlawful impacts on other water users, and that area springs and caves are unlikely to be affected? Have you done independent studies to refute any of these statements?
3. Powertech’s water rights, if approved, will allow the *net* diversion of up to 274.2 acre-feet per year from the Inyan Kara. Powertech has indicated that one of the intervenors in this case, Mr. Dayton Hyde, has a permit to divert up to 278 acre-feet per year, or slightly more than Powertech’s net diversion. Do you consider Mr. Hyde’s permitted use of this water to be vast or tremendous?

4-4: Issue Needing Further Examination:

Tribe witness Dr. Moran’s understanding of the effect of the ISR process on the host aquifer

Objective of the Examination:

To establish that Dr. Moran does not understand that the ISR process relies on full saturation of the host aquifer and will not result in “dewatering” of the host sands

Proposed Line of Questioning (Dr. Moran):

1. Your written testimony refers to changes in water quality “resulting from long-term dewatering of the various sand and shale formations” (Exhibit OST-1 at 24). Are you aware that the ISR process relies on the movement of lixiviant through the host sand to dissolve uranium and, accordingly, the process relies on a fully saturated ore zone?
2. Would your opinion change if you were told that not only are the host sands not dewatered, but they remain fully saturated aquifers throughout the recovery and restoration operations?

4-5: Issue Needing Further Examination:

Tribe witness Dr. Moran’s understanding of the inherent incentives to minimize net water withdrawals during ISR operations

Objective of the Examination:

To establish that Dr. Moran does not understand that Powertech has no incentive to use “tremendous quantities of ground water” (Exhibit OST-018 at 7) and every incentive to minimize the amount of water that requires disposal

Proposed Line of Questioning (Dr. Moran):

1. Do you agree that the only *net* use of water from the ISR process is the production and restoration bleed?
2. Is it your understanding that all water removed from the Inyan Kara except the bleed will be re-injected?
3. Are you aware that it is only the bleed stream that will require disposal, either by deep well injection or land application?
4. Are you aware that both disposal methods entail significant costs and regulatory procedures, giving Powertech considerable incentive to minimize the quantity of water requiring disposal?

III. CONCLUSION

Powertech respectfully requests that the Licensing Board strongly consider asking each of the aforementioned questions of CI's and the Tribe's expert witnesses.

Respectfully Submitted,

**/Executed (electronically) by and in
accord with 10 C.F.R. § 2.304(d)/
Christopher S. Pugsley, Esq.**

Dated: August 1, 2014

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**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|-------------------------|
| In the Matter of: |) | |
| |) | |
| |) | Docket No.: 40-9075-MLA |
| POWERTECH (USA), INC. |) | |
| |) | Date: August 1, 2014 |
| |) | |
| (Dewey-Burdock In Situ Uranium Recovery |) | |
| Facility) |) | |
| <hr/> | | |

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **“POWERTECH (USA), INC.’S PROPOSED CROSS-EXAMINATION QUESTIONS FOR CONSOLIDATED INTERVENORS’ AND THE OGLALA SIOUX TRIBE’S WITNESSES”** in the above captioned proceeding have been served via the Electronic Information Exchange (EIE) this 1st day of August 2014, which to the best of my knowledge resulted in transmittal of the foregoing to those on the EIE Service List for the above captioned proceeding.

Respectfully Submitted,

**/Executed (electronically) by and in
accord with 10 C.F.R. § 2.304(d)/
Christopher S. Pugsley, Esq.**

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1225 19th Street, NW
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COUNSEL TO POWERTECH

Dated: August 1, 2014

Question for Dr. Sebastian:

What is the definition of the Area of Potential Effect (APE)?

PT

Question for NRC staff:

When evaluating the potential ^{long-term} impacts from spills did the NRC staff also consider decommissioning surveys to verify that the site meets the specified conditions for release for unrestricted use?

PT

Question for H. Demuth and E. Lawrence:

Do you agree with the characterization of the license area as "unique" with respect to the presence of historical exploration drilling?

Question for Mike Fosha:

Did the Level III arch. survey meet or exceed the state standards for these surveys?

Question for NRC Staff:

Is it required as part of a licensee's pre-operational inspection that NRC staff verify compliance with license conditions before operations may commence?

Does this also include evaluation of BMPs?

PT

Question for Ms. Yilma

Would you please elaborate on the specific way the field surveys were carried out to identify TCPs?

How much time was actually spent in the field and was the entire 10,000+ acre site evaluated or only the ~2,500-acre Area of Potential Effect (APE)?

PT

Question for Dr. Sebastian:

Does use of a Section 106
Programmatic Agreement assume
that identification of all
historic properties has been completed?

PT

Question for Dr. Sebastian:

What is the purpose of the
execution statement in the PA
- Exhibit NRC-018-A at 14?

PT

Attachment 3

Oglala Sioux Tribe Proposed Questions

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
POWERTECH (USA) INC.,) Docket No. 40-9075-MLA
) ASLBP No. 10-898-02-MLA-BD01
(Dewey-Burdock In Situ Uranium Recovery)
Facility) August 1, 2014

Oglala Sioux Tribe’s Cross Examination Questions
Confidential - For Review by Board Only

In accordance with 10 C.F.R. § 2.1207 and this Board’s Order of June 2, 2014, Intervenor Oglala Sioux Tribe (“OST” or “Tribe”) hereby submits this cross examination questions for use by the Board in the upcoming hearing. Background information for the person conducting cross-examination is indicated by italics.

Issue: Contention 1A

Objectives: To establish that NRC Staff did not rely on accepted methodology and ignored unique perspectives and information held by the Sioux Tribes while basing the NEPA analysis on Powertech’s and individual tribes’ inadequate cultural resources surveys.

Questions to be Posed to NRC Staff witnesses: H. Yilma, K. Jamerson; K. Hsueh, H. Luhman:

1. You testify that “[t]he Staff conducted its own independent analysis to determine eligibility determinations of archeological and tribal sites and used this analysis when making its cultural resources impact determination.” Ex. NRC-151 at 6.

Q. Did this analysis include any additional ground surveys other than that conducted by Augustana College and individual tribes as described in the FSEIS?

2. You testify that “[i]n 2011, Powertech conducted subsurface testing on these sites and provided eligibility recommendations to the NRC. The NRC utilized this additional testing to make its own eligibility recommendation.” Ex. NRC-151 at 6.

Q. Did these subsurface tests consist solely of shovel tests and soil cores?

3. You testify that “[t]he NRC staff reviewed comparative information on costs and methodologies used in on-the-ground tribal surveys conducted by other federal agencies that followed ACHP guidance. The NRC staff used this comparative information when reviewing the tribal survey proposals submitted by two tribes and by Powertech.” NRC-151 at 7.

Q. Was any competitive bidding proposal sent out to identify the contractor for the Kadramas, Lee, & Jackson proposed survey?

Q. Did NRC Staff ever resolve the differences between the Makoche Wowapi/Mentz-Wilson Consultants, LLP proposal and the applicant’s proposal? *See NRC-018-B at 19-20 (Tribes rejected KLJ’s unsolicited proposal due to objections to the methodology proposed, and NRC unilaterally rejected Makoche/Wowapi proposal after consulting with Powertech due to cost, and NRC Staff failed to conduct any additional efforts to identify a mutually-agreeable consultant/methodology.)*

4. Q. Do the Sioux Tribes possess unique information about cultural resources in the project area?

5. You testify that “the Staff invited each tribe to participate in a site survey and choose an identification method appropriate for identifying sites of significance to the tribe.” NRC-151 at 8.

Q. Was there any methodology used to determine which Tribes participated in the survey?

Q. Was the survey based on completely self-selecting in terms of which Tribes participated?

Q. NRC Staff did not ensure a so-called “representative sample” of cultures or Tribes?

6. You testify that “[t]he Standing Rock Sioux, Rosebud Sioux, Sisseton-Wahpeton Oyate, and Yankton Sioux Tribes also rejected the Staff’s approach to the tribal surveys.

However, seven tribes participated in the field surveys, and the Staff later published the results of the field investigations for public comment.” NRC-151 at 8.

Q. How many Tribes submitted written reports? *Answer – 3. See NRC-018-B at 22 (“Between June 24, 2013 and July 25, 2013, the Cheyenne and Arapaho, Northern Arapaho, and Northern Cheyenne Tribes submitted survey reports to the NRC. The NRC staff received field notes from the Crow Tribe; however, NRHP eligibility recommendations for identified sites were not provided.”).*

Q. Did any Sioux tribes submit any reports?

7. You testify that part of the criteria for the tribal surveys was visiting and assessing “known burial sites.” NRC-151 at 9.

Q. Could there also be unknown burial sites within the Project Area?

8. You testify that NRC Staff published a “supplemental cultural resource report.” Ex. NRC-151 at 9.

Q. Did this supplemental report incorporate any written reports from any Sioux tribes?

9. You testify that “[t]he Staff incorporated comments received on the FSEIS and the cultural resources supplement in its revisions to the Programmatic Agreement.” NRC-151 at 9.

Q. Did NRC Staff make any changes to the PA based on the written comment letters submitted in February 2014 by the Oglala Sioux Tribe and Standing Rock Sioux Tribe (Ex. NRC-016)?

Issue - Contention 1B

Objectives: To establish that NRC Staff conducted a National Historic Preservation Act (NHPA) Section 106 process, including adoption of the Programmatic Agreement, that was not in good faith or reasonable. To establish that the post-NEPA, post-licensing actions in the Programmatic Agreement cannot excuse the NRC Staff’s failure to meet federal law and trust responsibilities.

Questions to be Posed to NRC Staff witnesses H. Yilma, K. Jamerson; K. Hsueh, H. Luhman:

10. You testify that, with regard to the Programmatic Agreement (PA), “the Staff included specific stipulations to ensure that Powertech manages cultural resources properly and allows interested Tribes the opportunity to participate in protecting such resources.” NRC-151 at 10.

Q. Do these stipulations include any specific particular mitigation measures that have been identified and analyzed for effectiveness for this site?

11. Q. Are there still unevaluated historic or cultural sites or properties with the area of potential affects?

12. Q. Is it true that over 30% of the sites within the APE are unevaluated? *See NRC 018-A at 5 (2.(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.”)

13. You testify that, regarding the PA,” Stipulation 3 sets forth the mechanisms for the protection and evaluation of *unevaluated properties* within the area of potential affects (APE).”

Q. Isn't it true that these mechanisms to develop plans in the future do not include specific proposals to resolve these adverse effects? *Answer – yes. See Ex. NRC-018-A at 5 (“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.”).*

14. Q. With respect to these unevaluated properties, what kind of analysis and review and mitigation is proposed for cultural sites that NRC Staff determines are not eligible for the National Register of Historic Places? *Answer – none. See NRC-018-A at 6 (“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.”).*

15. You testify, with regard to the PA, that “Stipulation 4 describes how the assessment of effects will be conducted.” NRC-151 at 11.

Q. Does this description of how the assessment of effects will be conducted include specific measures that have been analyzed in the FSEIS? *Answer – no. See NRC-018-A at 6 (Stipulation 4) (“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.”).*

16. You testify that “[i]n Stipulation 6, the Programmatic Agreement describes the procedure Powertech must follow for the future identification of cultural resources when installing power transmission lines in connection with the Dewey-Burdock Project.”

Q. Is there a specific plan described or in currently place to evaluate the cultural resources in the paths of power transmission lines reviewed?

Q. Isn't it true that the specific plan will be developed at some later date? *Answer – yes. See NRC-018-A at 8-9 (“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 and cultural significance with the involvement of the Tribes. The proposed plan should also include report preparation requirements and schedules for the identification efforts.”).*

17. You testify that “[t]he Oglala Sioux, Northern Cheyenne, Cheyenne River Sioux, and Standing Rock Sioux Tribes requested that the Programmatic Agreement include specific steps to ensure the tribes would be allowed to participate in the resolution of adverse

effects, particularly in the development of mitigation and treatment plans.” NRC-151 at 12.

Q. What provisions in the PA are in place to require inventory and analysis of cultural resources where those resources do not rise to the level of inclusion in the National Register of Historic Places? *Answer – none. See Ex. NRC 018-A at 6 (“(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.”).*

18. You testify that “the Tribes also received assurances that unevaluated sites in the Dewey-Burdock area will be treated as eligible for the NRHP until an eligibility determination can be completed.” NRC-151 at 12.

Q. What protections, provisions, or procedures are included in the PA for sites that are not deemed worthy of listing in the National Register of Historic Places? *Answer – none. See Ex. NRC 018-A at 6 (“(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.”).*

Issue – Reliability of Powertech and NRC Witness Testifying as to Contentions 2-4, 6

Objective: To establish the admissibility, credibility and weight to be given to witnesses based on questions regarding area of testimony, reliability, bias, and preparation.

Each witness should be subjected to each line of questioning in order to

Questions to be posed to Mr. Demuth, Mr. Lawrence, Mr. Fritz, Mr. Prikryl, Mr. Lancaster.

Line of Questioning A: Delineate the Scope of Testimony

19. You do not have a doctorate in any field you intend to testify, is that correct?

Line of Questioning B: Past Testimony was Proven Unreliable in the Field

20. You have testified in NRC proceedings about other ISL projects, isn't that correct?
21. Have the groundwater in the target zone in any of the projects you've testified on been returned to baseline?
22. For the ISL projects you've worked on that have ceased production, all have required adoption of Alternate Concentration Limits, isn't that correct?
23. Did your previous NRC testimony assert that groundwater would be returned to baseline?
24. Did your testimony regarding restoration prove accurate?
25. You don't assert that groundwater can be returned to baseline in your present testimony, isn't that correct?
26. Have any excursions occurred in any of the other projects you've consulted upon?
27. Did you predict any of those excursions?
28. You do not claim that excursions will not occur for the current project, isn't that correct.
29. For any project you've worked on at the licensing phase, has the groundwater baseline been challenged during enforcement proceedings as unreliable?

Line of Questioning C: Witness Credibility and Bias (Powertech Only)

30. Establish whether witnesses has financial and other loyalties to granting Powertech's license
 - a. Do you have a financial stake in Powertech or Azarga?
 - b. Does your employer have a financial stake in Powertech or Azarga?
 - c. Do you have a contract to carry out post-licensing work?
 - d. Does your employer have a contract to carry out post-licensing work?
 - e. If the license is denied, your contracts will be cancelled, isn't that correct.

31. Establish that witness has an interest in establishing weak baseline for later enforcement defense.
 - a. Your work includes defending ISL companies against NRC enforcement actions, isn't that correct.
 - b. An accurate and reliable baseline is critical to carrying out later enforcement actions, isn't that correct?
 - c. An unreliable baseline can be used as a defense against later violations, isn't that correct.

Line of Questioning D: Witnesses Ignored and/or Were Denied Access to Contrary Information

32. Who determined the scope of your work on this project?
33. Did you negotiate with Powertech?
34. Did Powertech put you on a budget that was smaller than what you initially requested?
35. When you reached the end of your budget, you stopped working, isn't that correct?
36. The data you present is limited by Powertech's budget, isn't that correct?
37. You did not participate in data gathering, isn't that correct?

Line of Questioning E: Confront Witness with technical authorities ignored or not relied upon.

38. Are you familiar with the TVA pump test analysis and data discussed by Dr. Moran?

If not, stop the questioning at "No."

39. Isn't it true that the TVA materials characterize these aquifers as leaky?
40. Powertech didn't provide you with the resources to do the type of pump tests carried out by TVA, isn't that correct.
41. The TVA reports indicate that post-licensing pump tests will provide information that contradicts that information on which your analysis is based, isn't that correct.
42. The TVA pump tests were carried out without NRC licenses, isn't that correct?

Issue – Aspects of Contentions 2-4 & 6 Involving Biased and Incomplete Data

Objective: To establish the events and circumstances surrounding Powertech's acquisition of "additional quality data" through an agreement formalized on May 9, 2014, shortly after the license in this proceeding issued in April 2014. The circumstances suggest that the formal agreement for acquisition of the data, which Powertech did not disclose in these proceedings, was deliberately delayed to avoid disclosure and use by the parties in litigating the safety and environmental contentions. To confirm the role of Powertech principles and witnesses in the acquisition and disclosure of the data.

Further, to establish when and whether or not Powertech has provided this data to its witnesses and to impeach the credibility, reliability, and usefulness of Powertech, Powertech data, and Powertech's witnesses regarding existing environmental conditions, project impacts, and potential mitigation measures.

Questions Posed to Mr. Demuth, Mr. Lawrence, and Mr. Fritz and Powertech

Principles:

43. Present witness with the Powertech Press Release dated July 16, 2014. Ex. OST-019.

44. Are you aware of the "additional quality data" referenced in the July 16, 2014 press release.

If not, stop the questioning at "No."

45. The subsequent line of questions for these witnesses is dynamic and cannot be predicted based on information in Powertech's sole control. Questioning should be carried out to establish timing and occurrence of events surrounding acquisition and use of the "additional quality data." The line of questions should include timing of witnesses first learning of the data, whether and when the witness reviewed the data, the witness' knowledge of the data, and the witness' description of events connected to omission of

the data from the witnesses' analysis and testimony. The line of questions might involve the content of the "additional quality data" and whether the data is relevant to establishing environmental conditions, project impacts, and potential mitigation measures. Should the Board questioning warrant, the Tribe's attorneys should be allowed to carry out follow-up questioning.

46. What was your involvement in Powertech's acquisition of "additional quality data" from TVA, as announced by Powertech on July 9, 2014?
47. Have you reviewed this data? Follow-up with when, why, what was done in response, etc.
48. Do you know of any other relevant data or sources of data that may have been excluded from your review in preparation for testifying in these proceedings?

Respectfully Submitted,

/s/ Jeffrey C. Parsons

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Attorneys for Oglala Sioux Tribe

Dated at Lyons, Colorado
this 1st day of August, 2014

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|------------------------------|
| In the Matter of |) | |
| |) | |
| POWERTECH (USA) INC., |) | Docket No. 40-9075-MLA |
| |) | ASLBP No. 10-898-02-MLA-BD01 |
| (Dewey-Burdock In Situ Uranium Recovery |) | |
| Facility) |) | |

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing Cross-Examination Questions in the captioned proceeding were served via the Electronic Information Exchange (“EIE”) – In Camera Submission to the Board only on the 1st day of August 2014.

/s/ signed electronically by _____

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- Did the FSEIS incorporate written reports or survey results from ~~any~~ Sioux Tribes?

- Is it true that over 30% of the sites within the Area of Potential Effect are unevaluated?
see NRC OIB-A at 5

- The PA defers additional consultation to the future. What makes NRC staff believe that future efforts will be any more effective than past efforts?

-

OST - INT

- Is NRC staff aware of the sacredness of eagles and other wildlife to the Lakota people?

INT & OST

Attachment 4

Consolidated Intervenor Proposed Questions

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|--------------------------------|---|------------------------------|
| In the matter of |) | |
| |) | |
| POWERTECH (USA) INC. |) | Docket No. 40-9075-MLA |
| |) | ASLBP No. 10-898-02-MLA-BD01 |
| (Dewey-Burdock In Situ Uranium |) | |
| Recovery Facility) |) | |

**CONSOLIDATED INTERVENORS REGARDING POWERTECH
AND NRC STAFF INITIAL AND REBUTTAL TESTIMONY**

In accordance with an Order from the Atomic Safety and Licensing Board (Board), these proposed questions for the Board to ask witnesses on behalf of Powertech and the NRC Staff are submitted on behalf of the Consolidated Intervenors.

PROPOSED QUESTIONS

1. Proposed Questions for Powertech Witnesses

A. Purpose

The purpose of the questioning is to:

- i) Establish that Powertech Witnesses have a financial bias or interest in their respective presentation of their testimony to the Board.
- ii) The NRC Staff depended on data submissions and conclusions/opinions from PT upon which to conduct its analysis of

- the environmental safety of the propose ISR mines and processing plants.
- iii) Powertech witnesses from Petrotek were hired to change the language in permit and license applications and submissions to overcome SD Department of Environment and Natural Resources rejection of PT Applications due to their failure to show PT could protect water resources.
 - iv) That Petrotek did no knew testing but reinterpreted and/or ignored historic pump and other test results to contend initially contend that the Fall River and Lakota aquifers were hydrologically isolated and then in response to historical data reflecting the leaky nature of the Fuson aquitard between the aquifers, that nevertheless they are somehow still hydrologically isolated enough to do the proposed ISR mining;
 - v) That PT, with the concurrence of NRC staff, used flawed models which left out site characteristics which might interfere with the desired findings
 - vi) That rather than seeking hard and detailed data after sufficient pre-license testing to describe the respective site hydrogeology at Dewey and at Burdock, PT created, and NRC staff accepted PT assumptions and models based on those assumptions to improperly claim hydrologic isolation of the to be mined aquifers, or at least good enough to issue a license and then see what happens.
 - vii) That PT and NRC staff failed to give detailed evidence of a geohydrological site identical to the proposed D-B site where ISR operations successfully contained mining fluids in the mined aquifer.
 - viii) That PT and the NRC Staff failed to address repeated history of ISR mining of environmental events including spills, leaks, and excursions of mining solutions, some of which remain unresolved.
 - ix) That the claims in the FSEIS and Staff issued license conditions caveat protection of the environment upon compliance with license conditions and applicable law, including prompt reporting and remediation of excursions, leaks, spills, and reclamation schedules, which have been repeatedly violated by ISR operations, including those where PT's Petrotek and WWC witnesses have worked.
 - x) That most of the hydrogeologic site characterization pump testing will not be done until after PT receives its NRC license

- xi) That significant additional hydrogeologic data will likely be obtained through post-license, rather than pre-license testing
- xii) That PT, post FSEIS and post NRC Staff issuance of a license, acquired the drilling logs and maps regarding the thousands of exploration boreholes in the immediate area.
- xiii) That this newly acquired data will provide significant detailed information related to the hydrogeology of the Burdock area proposed to be mined
- xiv) This data has yet to be submitted to the NRC for analysis or inclusion in the FSEIS, leaving the FSEIS additionally insufficient in the requirements of its NEPA analysis, coupled with the further additional failure to include and address cultural resource protection issues in §106 of the National Historic.
- xv) That the FSEIS failed to include potential environmental impact of faults and fractures in the project area identified as existing by Drs. Hannan LaGarry and Robert Moran.
- xvi) That the FSEIS failed to include the potential environmental impact of brachia pipes known to be in the immediate area.
- xvii) That the work of the NRC staff through the FSEIS and the issuance of a license was paid by PT;
- xviii) That the FSEIS failed to acknowledge and discuss the real potential problem of a toxic plume flowing outside permit boundaries upon mine closure.
- xix) That the FSEIS failed to address the potential complications in containment and reclamation resulting from the mining of an oxidized core.
- xx) That the FSEIS was pre-maturely released and released without inclusion and prior resolution of §106 of the NHPA issues, in violation of NEPA.
- xxi) That the NRC Staff improperly failed to consider the reasoned requests from the Oglala Sioux Tribe and other Lakota Tribes, as to the extent and cost of a full cultural resource survey and thereby denied meaningful input from the Tribes substantially and historically connected to the area PT wants to ISL mine.

Proposed Cross-Examination of Powertech Witnesses

- Have you previously provide sworn testimony in support of Powertech's agency license or permit applications regarding this proposed project, including:
 - 7/31-8/1/13 Depositions, PT's Large Scale Mining Permit Application, SD Department of Environment and Natural Resources?
 - September, 2013 SD DENR Board of Minerals and Environment Hearing on PT's LSM Permit Application?
 - October, 2013 SD DENR Water Management Board Hearing on Madison and Inyan Kara Water Appropriation and Waste Disposal Permit Applications?
 - June 2014 Written Testimony for NRC Safety and Licensing Board:
 - Hal DeMuth (Exhibit APP-013)
 - Errol Lawrence (Exhibit APP-037)
 - Jack Fritz (Exhibit APP-046)

Work Experience:

Agree: Most of Petrotek's work involves oil/gas mining operations?

DeMuth's previous ISR work experience has included:

- CAMECO - CROW BUTTE [Depos.DeMuth:7]
 - Single aquifer being mined?
 - If double, does a hydrological connection exist between the two?
 - If so, what is the natural and/or human cause(s) of the hydrological connection?
 - Duties performed re mine? What well-fields?
 - period performing duties.

DeMuth [Depos.DeMuth:7] & Lawrence [Test.Lawrence:4, A.3] worked at

- SMITH RANCH HI-LAND [7/31/13 DENR, Depos:7]
 - Single aquifer or double?
 - If double, does a hydrological connection exist between the two?
 - If so, what is the natural and/or human cause(s) of the hydrological

Mr. Fritz: Regarding Powertech's Application, neither your nor WWC are an independent, disinterested 3rd party expert?

- Agree that you and your company Petrotek (or WWC) were hired by Applicant to make sure the NRC Staff and the staff of other federal and state agencies for which permits or license are required, accept applications as complete, answer agency staff questions, and get the respective applications approved by the respective agencies?

Agree: Paid a substantial compensation for work to date?

- Agree: Hired by Applicant to additionally prepare for and testify at a South Dakota Department of Environment and Natural Resources permit application deposition and/or at hearings for each of the Department's Boards, the Board of Minerals and the Environment and the Water Management Board?

- Agree: Hired by Applicant to provide testimony and opinions at this NRC hearing in favor of the sufficiency and reliability of Applicant's Application, the FSEIS, and other submittals to the NRC Staff about the proposed ISR uranium mines in the Dewey and the Burdock areas of Fall River County?

- Agree: If NRC License approved, hope or expect that Petrotek (or WWC) will be hired to design and/or construct well-fields? If so,
- Who within Powertech have you had such discussions regarding such possible employment?
- Agree work includes up to 1,400 wells, interconnecting pipelines, monitoring systems, and two processing plants?
- Agree testified: "great number of future pump tests for this project" (Depos.DeMuth:127)

If this Board approves the license issued by the NRC Staff,

- How much money do you expect Petrotek expect to make on this project?

- re Mr. Fritz: How much money do you expect WWC to make

- on this project?
 - Would you personally expect to work on? If so,
 - Estimate number of billable hours - you personally would expect on such a project, at what rate per hour?
 - Would you personally receive a bonus regarding construction contract?
 - Would DeMuth's employee and Applicant's other Petrotek witness, Errol Lawrence?
- Agree: That if this Board were to approve the Staff issued license, that this would further your and Petrotek's (or WWC's) reputation for getting ISR permits approved by the NRC.
 - Agree: Such approval of your work would likely produce future business with other foreign uranium mining companies?
 - You certainly hope so?
- Therefore, do you agree that you and your company stand to significantly benefit financially from any approval by this Board of the Staff-issued license?
- How is this Board to be assured that your testimony and opinions are not influenced by potential and substantial financial gain?
- On p. 40-41 of PT's Initial Statement, DeMuth is used as a legal authority on the "fact" that PT has followed the NRC's process correctly. When did DeMuth get a law degree which might make him legally competent to render such an opinion?

B. HEARING CONTENTIONS

Contention 2. The FSEIS Fails to Include Necessary Information for Adequate Determination of Baseline Ground Water Quality

- Agree: Water flow varies in speed and at times direction within the Fall River and Chilson (Lakota) aquifers?
- What testing done to map details?
 - Agree that there can be a dramatic difference in flow rate within the same aquifer within a few feet of each other?

- Where and what is the minimum flow rate in the Fall River and the Chilson aquifers in both the Dewey and the Burdock proposed ISR permit boundaries?

- Where located and what is the maximum flow rate in the Fall River and the Chilson aquifers in both the Dewey and the Burdock proposed ISR permit boundaries?

- Has a site specific map been created which reflects the varying flow rates and directions of each part of the Fall River and Chilson aquifers within each part of the proposed ISR mines.

Agree: Water quality varies greatly throughout the proposed ISR mining and related operations near Dewey and near Burdock?

- What studies base answer on?

- Where located and what are the highest levels of heavy metals in the Fall River and the Chilson aquifers in both the Dewey and the Burdock proposed ISR permit boundaries?

- Where located and what are the lowest levels of baseline heavy metals in the Fall River and the Chilson aquifers in both the Dewey and the Burdock proposed ISR permit boundaries?

- DeMuth testified that a baseline water quality will be determined after completion of well-field construction but prior to operation of each well-field. Test.DeMuth:9, A:17.

- Would you agree that the vast majority of pump-test water quality data will be collected and analyzed after, rather than before the issuance of the license in this Application?

- Would you agree that hydrological information obtained during PT's proposed post-license, provides additional geohydrologic information than known by the limited recent pump tests conducted to obtain and submit such information for NRC Staff analysis?

- Would you agree that despite the potential location and impacts of natural and man-created hydrologic on the groundwater quality revealed by such proposed post-licencing testing, while required by §5 of NUREG-1569, "is not required to assess potential impacts to groundwater."

- Would you agree that additional pump tests within a given area provide

greater and more accurate hydrologic and geologic data?

- DeMuth, Lawrence, and Fritz in their testimony, consistently referred to a “well-field” in his answers. When you use the term “well-field”, did you mean seven (7) wells (6 injection, one central extraction) or such a well-pattern be simply a small component of one of up to eight (8) larger well-fields Applicant would like to construct?

- If you are talking about conducting baseline testing once one of the 8 larger well-fields are constructed, would you agree that due to the geographic size of such a proposed accumulation of wells, that baseline readings may well vary from one part of the well-field to another?

- If your answer is “no,” what do you base that conclusion on?

- Provide five (5) examples where post-well-field construction has been completed and upon conducting pump tests to ascertain site specific geohydrology, where the NRC or a state agency has permanently shut down ISR mining plans due to previously unidentified features with resulting reasonably unsurmountable environmental safety concerns?

- What is the cost in today’s dollars for the construction of a well-field to be completed to reach the point of the proposed baseline water quality testing?

- Is PT prepared to suffer a complete loss of the cost of well-field construction should the NRC then determine the geohydrology of the specific well-field area will not support containment of mining solutions or is PT confident that NRC will never permanently prohibit ISR mining at that stage?

- Provide reference to the Application of the FSEIS where Powertech or the NRC staff have determined which of any varying mineral level within a well-field will be considered the “baseline” upon which containment of mine solutions, recovery from excursions, and/or reclamation would be based.

- What independent collection of baseline water quality data otherwise submitted by Powertech in pursuit of this license application proceeding was done by NRC staff? What are the future plans for on-site and independent monitoring by the NRC of ground water quality/quantity during each of the phases of the

construction, operation, excursion/spill/leak cleanup, aquifer restoration, site closure of the proposed PT ISR mines and processing plants?

- Pt contends that the “phased approach” to baseline groundwater quality data is “commonly” used at ISR facilities. Test.DeMuth A:23. Where and under what circumstances has it not been used in the last 20 years?

- Of the examples DeMuth gave in Answer 23 of the three “recent[]” NRC staff approval of such a phased baseline groundwater quality data collection, which has the same geohydrology as the D-B proposed mine sites?

- By what reasoning did PT plan to do water quality testing twice monthly during an excursion as opposed to weekly or daily? Test.DeMuth A:21. What is the practical difference in the ability to monitor the success and efforts by PT at remediation of an excursion between PT proposed testing schedule of twice monthly and the NRC Staff’s licence condition of collection “every 2 weeks (NRC,200b)”? Test.DeMuth A:21

- What procedures exist under the Application or the FSEIS for independent monitoring of the accuracy of water quality data submitted to the NRC prior to and during operation, and recovery of the proposed ISR wellfields?

- To the challenge by Intervenors to the credibility of the baseline groundwater quality data submitted by Powertech, how was that the credibility challenge “refuted by the testimony of Petrotek employee Errol Lawrence and the concurrence by the Powertech funded NRC staff?

Agree: That at the time Applicant began preparing its NRC, SD DENR, and other agency permit applications, John Putnam lived at the proposed ISR mining site and drank water from a well providing Inyan Kara water?

- Were/are there other water wells used for drinking within proposed project area at time Applicant began its efforts to obtain permits for ISR uranium mining and processing?

- What was the total number of drinking and livestock water wells within the proposed project area at that time?

Agree: Applicant chose not to protect the water quality and integrity of those wells but has since purchased them for well-closure or continued other use.

Contention 3. The FSEIS Fails to Include Adequate Hydrogeological Information to Demonstrate Ability to Contain Fluid Migration and Assess Potential Impacts to Groundwater.

a. Hydrogeological Site Information.

- Agree that in preparing Powertech's NRC application, the "sight characterization" must be drafted in a way "to **demonstrate** that suitable hydrologic conditions are present to safely conduct uranium ISR." Opening Testimony of Hal DeMuth, p. 3, A.5.

- Agree this means that the Application provides "sufficient information on confining units to **demonstrate** that ISR solutions can be confined to the production zone"? [Test.DeMuth:3-4, A.6]

- Agree that in his deposition before the SD DENR, DeMuth testified:
"It was **our primary role to demonstrate that there was isolation**
- "**between the proposed zones**" - to be mined "**such that that mining could be conducted** "in accordance with **NRC requirements**"
[Depos.DeMuth:26]

- Agree the site characterization should include the "project area and surrounding region, including its geology, groundwater hydrology and groundwater quality in the various aquifers"? [Depos.DeMuth:3]

- Agree: Historical pump tests have shown the existence of variance in flow-rate and sometimes the flow direction, as well as water quality, varies within different parts of each of the aquifers at the locations PT wants to mine?

- Agree: That Applicant has not presented an actual demonstration that the varying conditions existing throughout the various and respective parts of each of the aquifers proposed to be mined mining area can be mined by ISR processes in an environmentally safe manner?

- Are there any kinds of as yet unidentified hydrological or hydrogeological site characteristics which would cause you to have environmental safety concerns PT specifically and the ISR industry in general, could not resolve with today's technology? If so, please elaborate and give examples.

- Agree that PT has not submitted and the FSEIS does not reflect evidence by way of detailed example, where an ISR mine site with the same site characteristics as the D-B proposed mines, has contained mining solutions during mining and reclamation?
 - Did you not instead, on behalf of PT, submit to the NRC Staff computer models and conclusory and promissory statements of license condition compliance?

 - Agree that the LSM Application - groundwater models were "completed under my supervision" with the primary work being done by Errol Lawrence (Depos.DeMuth:14)

- Do you agree that anticipated drawdown from project mining operation was "evaluated in detail...numerical modeling" (Depos.DeMuth:16)
 - Do you agree that historical testing resulted in dramatically greater estimates of draw-down resulting from a uranium mining operation in D-B?

- Agree: Petrotek "did not do the actual pump test work", but "evaluate[d] the work of others" [Depos.DeMuth:10]

- Do you agree, the purpose of pre-licence pump tests is to provide data to determine the hydrology & geology of an area to develop site characteristics? [Depos.DeMuth:39].
 - Do you agree longer pump tests "in some cases" give "better" information about hydro-geology than shorter tests? (Depos.DeMuth:37)
 - TVA (Boggs) in 1979 and 1982 did longer and shorter tests than

Night-Piesol in 2008?

- Agree that at least “theoretically,” a longer pump test it would better to demonstrate the existence of leakage” (Depos.DeMuth:38)

- Agree, “[a] longer pump test will give the reviewer the ability to look at data from a larger radius of influence” (Depos.DeMuth:38)

- Agree this is “because the pressure transient will go out farther” and thus “you’ll be able to evaluate data from - larger area” (Depos.DeMuth:38)

- Agree TVA pump tests concluded that “because of...apparent decrease in transmissivity of...Lakota during latter stages of test...believed that **Lakota parameters computed from the late data are more representative of aquifer properties under a long-term pumping** situation”

- [Boggs & Jenkins, 1979 “Analysis of Aquifer Tests Conducted at the Proposed Burdock Uranium Mine, Burdock, SD,” ABSTRACT, p. 17]

- (LSMP Applic. Appendix 3.4-E)

- Further agree that increasing pumping pressure (gpm) “gives you add’l data”? (Depos.DeMuth:120).

Would you agree you testified that while the type of data collected from post-license monitoring wells may be similar to those collected in pre-license sight characterization wells, the former is to provide data to be used to determine the potential safety and environmental related issues, while the latter is related to excursion monitoring and reclamation progress? Test.DeMuth:7, A-13 and A-14.

- Isn’t this testimony contrary to later testimony where DeMuth stated that the license requirements of producing “hydrogeological characterization” would be required before each “wellfield” could begin operation.” Test.DeMuth:28, A.55.

- Agree with DeMuth’s Written Testimony that PT could not do further pump tests to get more hydrogeological site data because of NRC regulations barred further pump tests until after the source materials license is issued? Test.Demuth:7, 13

A.29.

- Agree claimed additional testing was barred by NUREG 1569(2)?
- Do you further agree your testimony did not cite or quote any language of NUREG 1569(2) which prohibited additional pump-tests to obtain additional site characterization evidence?
- Do you agree there is no such prohibition in the language of NUREG 1569(2)?

- Agree further pump tests would have provided additional data to the agencies charged with determining whether site characteristics provide an environmentally safe location to permit ISR mining in one of the region's four main aquifers?

- Agree that what was provided in the Application and subsequent submissions was an effort to reach the minimum the NRC Staff would accept in terms of site characteristics to issue a materials source license, contending the details and safety of this ISR mining would be determined post-license, after an entire well-field was constructed?

- Identify five ISR mines where well-fields were constructed and then after more detailed tests, were permanently barred from operating due to previously undetected site characteristics?

- Would you agree that if faults or fractures exist under or near PT's proposed ISR sites, as determined to separately to exist by Drs. Moran and LaGarry, were found by the Board to exist, that this should raise serious environmental safety concerns about the ability of PT to effectively and simultaneously contain both contaminated aquifers? Please explain and support your answer.

- Does deliniation drilling involve many boreholes in geographic and geologic proximity?
 - Agree purpose is to detail map geological units, deposits, such as the U PT wants to mine at D-B?

- What data expect to be provided re the site geology and hydrology from the drilling logs and maps generated from the borehole drilling?

- Would they also provide chemistry data?
- Agree TVA drilled some 4,000 boreholes mostly in the immediate area where Applicant wants to ISL mine uranium?
- What data obtained from the drilling logs and maps regarding the 4,000 boreholes at the D-B site would be different from the data obtained from “detailed delineation drilling” and geologic maps required by §5 of NUREG 1569?
 - Did PT also obtain lab analysis data of core samples obtained during this drilling operation?
 - What would such lab data to defining a site characteristic?
- Agree such drilling logs and maps for thousands of boreholes would provide useful hydrogeologic information to the NRC, EPA, and the SD DENR for determination as to the ability of the site characteristics and PT to contain mine fluids, permit recovery of excursions, and the feasibility of reclamation of the water resource to be mined?
- Agree that Knight-Piesold concluded after its 2008 pump tests at the site:

Whether the shale interbeds in the Lakota aquifer are sufficiently thick and continuous to serve as vertical confinement for ISR operations will probably need to be evaluated by analyzing cores from borings as well fields are drilled?

K-P 7.1.2 Conclusions, p. 7-2, Appendix 3.4-F of the September 2012 PT Large Scale Mining Permit Application.

- Agree with Knight-Piesold’s conclusion that: “Hydraulic communication through the Fuson member between the Lakota and Fall River aquifers is evidenced by the drawdown at the Fall River observation well 11-17, indicating that leakage was established through underlying the Fuson formation” K-P 7.1.2 Conclusions, p. 7-3, Appendix 3.4-F of the September 2012 PT Large Scale Mining Permit Application.
- Agree that before Petrotek hired by PT, the SD DENR twice rejected PT’s Applications as incomplete and insufficient to show it could protect ground water

resources?

- Agree a primary environmental safety issue was one of hydrological confinement of the Chilson (Lakota) from the Fall River aquifer?

- Agree with Bogg's conclusion that "**Hydrologic conditions in...site region**" are "**complex due to hydrologic boundaries (e.g., aquifer outcrop zone & Dewey Fault) & heterogeneity of the aquifer system.**"

- [Boggs, J.Mark, 1983 "Hydrogeologic Investigations at Proposed Uranium Mine Near Dewey, SD," RECOMMENDATIONS, p. 22]

- Would you further agree with Bogg's findings that: "Under such conditions **simple analytical methods cannot be applied with an acceptable level of confidence**"

- [Boggs, J.Mark, 1983 "Hydrogeologic Investigations at Proposed Uranium Mine Near Dewey, SD," RECOMMENDATIONS, p. 22] (LSMP Application Appendix 3.4-E)

- Agree the hydrogeological models submitted by PT constituted simple analytical methods?

- Agree a lot more pumptesting needs to be done to more accurately describe the hydrogeology of the Dewey and the Burdock areas? If not, why not?

- Agree that after Petrotek re-wrote applications, the aquifers were conclusively stated to be "Isolated Sufficiently" from one another to allow for the proposed ISR to operate in an environmentally safe manner? Test.DeMuth:14, 3.2.

- Agree DeMuth used terms like hydraulic "isolation" and hydraulic "separation" between Fall River and Chilson aquifers regarding differing potentiometric water level elevation? Test.DeMuth:15, A.32.

- Also agree to testifying the prior to operating any well-field, PT will have to "demonstrate" that the production zone is "hydraulically isolated" from

the other ore zone, as well as unreclaimed open-pit mines at the site?
Test.DeMuth:29, A.56.

- Agree Petrotek/WWC used language in submissions to agencies:

See, e.g.,”

*** “The test results do **not support a leaky confining zone (Fuson Shale)**”

- PT Application for SD Large Scale Mining Permit, §3-72 (3.4.2.3.1 - 2012 Summary of TVA Pumping Tests)

Similarly,

- “**Chilson thru-out...permit area is physically & hydraulically isolated from overlying Fall River Formation by Fuson Shale**”

- SD Large Scale Mine Permit Application, p. 3-71 (3.4.2.2.5 - Hydraulic Isolation of Aquifers)

- Was DeMuth or Lawrence or Fritz the drafter for PT for this part of the LSMP Application?

- Did this refer to Dewey or Burdock sites, or both?

- Agree DeMuth testified at his 2013 Deposition that the groundwater model created and submitted to agencies for the D-B site was based on an “**assumption ...they are isolated**” (Depos.DeMuth:116, 139).

- Agree: If can’t actually show site geohydrology and PT operational plans cannot contain mine solutions in aquifers being mined, whether approved by Staff or not, Board should not approval license?

- The groundwater model containing this assumption, submitted to:

- NRC Staff?

- SD DENR (both Water Management Board & Mining Board)?

- EPA?

- So the “demonstration” provided the NRC Staff was not based upon hydro-geologic conditions of a “leaky” aquitard between the Fall River and Lakota aquifers - at both Dewey and Burdock sites?

- Lawrence's testimony at A.80-A.84 describes the "confining properties" of the Fuson Shale with respect to historical and recent aquifer pump tests.
Test.DeMuth:15, A.32; Test.Lawrence:24-36, A.80-A.84.

- Agree that the concept that the Fall River and the Lakota aquifers are hydrologically isolated from each other is contrary to the conclusions of all hydrologists who have conducted and analyzed pump tests in the areas PT wants to mine?

Example, agree Boggs:

**** "aquifer test results indicate...Fuson member...is a LEAKY aquitard

- "separating the Fall River & Lakota aquifers"

- [Boggs & Jenkins, 1979 "Analysis of Aquifer Tests Conducted at the Proposed Burdock Uranium Mine, Burdock, SD," ABSTRACT, p. 31]

- Agree this was for testing in Burdock areas?

- Do you also agree with Lawrence's testimony at A.84 attributing any leaking characteristics shown by the Boggs pump tests "is attributed to one improperly installed well completed in both the Fall River and Chilson aquifers."

Test.Lawrence:64, A.84; Test.DeMuth:15, A.32..

- Is this Well 668? SD Large Scale Mining Permit, Application, 3-78 (3.4.2.3.2 - Pump Test Conclusions).

- Dewey or Burdock area?

- What testing done to confirm only one improper well installation was cause of problem?

Didn't Boggs conclude source of leaking between aquifers included: "(2) direct connection...via **numerous** old unplugged...boreholes"

- [Boggs & Jenkins, 1979 "Analysis of Aquifer Tests Conducted at the Proposed Burdock Uranium Mine, Burdock, SD," ABSTRACT, p. 31]

- What tests did PT do to show source of leakage was only one well?

- What testing done that confirmed that Well 668 is was a leaking well?
- Agree in an earlier deposition DeMuth testified this leakage was caused by a **“packer failure”**? (Depos.DeMuth:31).
- Agree DeMuth later backed tracked a bit and admitted: **“I cannot definitively say**
 - **“I know that there was a packer issue”** and only that this **“may** have been” the cause of detected leakage? (Depos.DeMuth:123)
 - What is the source for the conclusion that there was a “packer” issue?
 - If it wasn’t the cause of the detected leakage - would could be?
 - Agree don’t know?
 - Agree nothing in Boggs 1979 and 1982 analysis reports of the TVA testing indicated a packer problem?
- Do you agree with the assertion Lawrence (A.84) that any leaking characteristics could also have been **“improperly abandoned boreholes in one isolated area”**?
 - where is this “isolated” area”?
 - If in the Burdock area, how explain conclusions of Boggs regarding leakage found in the Dewey area?
- **“There is evidence that hydraulic communication between the FR & Lakota aquifers occurred during the Dewey test”**
 - [Boggs, J.Mark, **1983** “Hydrogeologic Investigations at Proposed Uranium Mine Near Dewey, SD,” CONCLUSIONS, p. 21] (SD LSMP Applic. Appendix 3.4-E)

Agree neither PT nor NRC Staff agreed with Boggs that leakage observed at site, in addition to being caused by unplugged boreholes:

- “believed to be the result of

“(1) gen. leakage through the primary pore space

- “**& naturally occurring joints & fractures** of...Fuson shale”

- [Boggs & Jenkins, 1979 “Analysis of Aquifer Tests Conducted at the Proposed Burdock Uranium Mine, Burdock, SD,” ABSTRACT, p. 31]

- Burdock sites?

- Agree that Boggs also found “evidence that hydraulic communication between the Fall River & Lakota aquifers occurred during the Dewey test.”?

- [Boggs, J.Mark, **1983** “Hydrogeologic Investigations at Proposed Uranium Mine Near Dewey, SD,” CONCLUSIONS, p. 21]

- Agree DeMuth testified before SD BME on 9/23/13 that the Fuson shale constitutes a “confining unit” between the Fall River and Chilson aquifers, varying from a minimum of 20 feet to a maximum of 80 feet within the proposed project area? Test.DeMuth:14, A31.

- Agree no continuity of thickness by PT figures? Agree, thickness statement only an “estimate”? Test.Errol Lawrence, p. 17, A.39.

- Agree, PT refers to the “continuity” of the three major confining units across the project area, as described in testimony of Errol Lawrence (Ex APP-037 at A.39).

- PT presented other diagram: Cross Section A-A’ (Exhibit APP-016G, p. 5) which showed unbroken confining units

- Agree, such a diagram, like models sent to NRC Staff, reflect opinion that the “Chilson aquifer is geologically confined throughout the entire license area by the overlying Fuson Shale confining unit...”? Test.DeMuth:5, A.9.

- Agree a diagram or illustration shows whatever the drafter includes?

- In EX APP-017 at 1, agree that the Applicant provided a conceptual diagram of a 2 aquifer system” where the intervening layer between shallow aquifer and deeper aquifer was “geologically confined”? Test.DeMuth:4.

Agree: D-B project area involves an oxidized core?

SEE: PT Supplemental Exhibit 3.1-1 submitted to NRC.

- Shown by Inyan Kara wells having high levels of heavy metals in water?

- see: LSMP Application, p. 3-23 (3.2.4) “Native **arsenic & selenium**...found adjacent to the uranium in the **oxidized portion of the front**...”

This would have been a change from the Inyan Kara originally having a reducing environment, such as existing when the uranium sought to be mined was deposited? [PT Statement of Position, IV-A, p. 20]

- Doesn't an oxidized core, especially one bordering the southwestern boundary of the permit site raise issues of potential “oxidized” down-gradient zones and their impact on subsequent natural attenuation capacities? PT Supplemental Exhibit 3.1-1 submitted to NRC.

- Where in the FSEIS or PT submissions was this potential reclamation issue analyzed?

What are the potential natural causes of the oxidation of this formerly reduced environment?

- What about fractures or faults in the D-B project area not identified by Applicant or NRC Staff, yet observed by Dr. Robert Moran or Dr. Hannon LaGarry?

- What Exhibit(s) reflect modeling of either the Dewey or Burdock sites to include the presence of faults or fractures?

- What potential impacts does an oxidized core in the ore zone have on any aspect of the mining, waste disposal, and/or reclamation at the D-B site?

Would potential human created causes of the oxidation of this formerly reduced environment include improperly plugged boreholes?

- What site characterization data can be obtained from borehole drilling logs and maps?

If delineation drilling boreholes has been conducted in the proposed ISR well-field areas and drilling logs and maps are known to exist, what additional data can be obtained? Agree it could be significant?

- What site characterization data can be obtained from borehole drilling logs and maps?

- Agree that some 4,000 boreholes exist in the area from delineation drilling on behalf of TVA?

- What is the number of boreholes that have been located by Applicant? How has this been accomplished?

- What site characterization testing has been done regarding hydrological connections between the Lakota aquifer and the unreclaimed open pit mines, water possibly through any number of these boreholes?

- What is the estimated number of boreholes which have yet to be located?

- Agree that existence of boreholes allowing direct hydrological connection between the Fall River and the Lakota aquifers can affect the ability to contain mine solutions from excursions? How so?

- Would you agree that such detailed data from 4,000 boreholes would significantly add to the details of the site characterization, including the hydrogeology of the respective proposed ISR mining sites? Explain your answer.

Agree such detailed data could change the conclusions, possibly significantly, of any analyst as to the feasibility of and likely hydrogeologic issues confronting any effort to ISR mine the D-B area as proposed? Explain your answer.

- Agree that PT acquired this borehole data on or about July 16, 2014?

- Why did PT wait until after the license and the FSEIS were issued to obtain and submit this historical data?

- Who would be able to answer this question?

- When was the NRC Staff notified that PT was acquiring the drilling

logs and maps for the thousands of boreholes at the site?

- How was this notice give?

- Did you ask for these drilling logs and maps:

- To complete your work on the PT Application to the NRC?

- To complete your work on 2012 PT Applications to the SD DENR Water Management Board and Board of Minerals and Environment?

- Explain why or why not.

- If PT just acquired the drilling logs and maps for the thousands of exploration boreholes in the D-B project area, explain why PT in its Large Scale Mining Permit Application, which you helped to draft and oversee, stated to the SD DENR Mining Board that it concluded the Fuson Shale was “continuous & no less than 20' thick throughout ...entire permit area” based upon **PT’s borehole & geophysical logs for 1000s of exploration holes.** LSMP Applic., p. 3-71 (3.4.2.2.5 - Hydraulic Isolation of Aquifers)

- When, where, and how did you first become aware of the existence of these just purchased drilling logs and maps?

- Have you seen this data? If so,

- When did you first see it?

- Have you analyzed this data?

- Have you written a report thereon? Where is it?

- If not, is someone else employed by Petrotek analyzing this data? If so, who?

- If Petrotek has not been hired or otherwise involved in the analysis of this newly obtained drilling logs and maps, who was?

- If you do not know the answer to any of these questions, who would?

- When would you expect such an analysis report to be disclosed to the NRC Staff and/or Intervenors?

- Where in the Application or other submissions to the NRC or submissions

to other agencies, did PT divulge that the submitted application and data did not contain the borehole drilling logs and maps known at the time by PT to exist?

- When did PT become aware of the existence of such data?
- When did PT negotiations to acquire such data for use in preparing and submitting such site characterization?
- Who at PT negotiated the drilling log data and map purchase?

- If you have no knowledge of the answers to any of these questions, who would?

- Agree that Applicant created models and submitted feasibility conclusions and promises to the NRC based upon them? If yes, do you further agree that the NRC staff conducted their FSEIS analysis and issued a license based upon such models and data submitted by PT to the Staff?

- Are you aware of any other source of data or analysis used by NRC Staff other than what was submitted by PT?
- Upon what do you base your answer?

- Agree that Applicant created models and submitted to the NRC Staff in support of PT's baseline and containment feasibility conclusions, without Applicant having secured and submitted the recently purchased borehole drill logs and maps for the thousands of boreholes drilled for TVA and possibly other prior uranium operations within the D-B area?

- Agree that the FSEIS and license were issued prior disclosure to the NRC Staff for analysis or the Intervenors in these proceedings, of PT's recently purchased of the borehole drill logs and maps within the proposed D-B area?

- Could improperly or unplugged boreholes in the proposed project area be a source for the current oxidized state of the aquifers PT wants to mine?

- Abandoned and unreclaimed open pit and deep shaft mines in the proposed project area:

- Could they also include oxidation from rain water through the unreclaimed one mile open pit mine and other smaller abandoned open pit mines within

the D-B site, at least regarding the top of the Fall River aquifer, down to which the mine was dug?

- What testing has been done regarding hydrological connections between the water at the bottom of each of the open pit mines and the Fall River aquifer?

- What testing could be done?

- Why would such a hydrological connection not be important to consider?

- What testing has been done regarding hydrological connections between the water at the bottom of unreclaimed shaft mines and the Fall River aquifer?

- What Exhibit(s) reflect modeling of the site including the impact of the abandoned and unreclaimed open pit or deep shaft mines in the D-B project area?

- What testing has been done regarding hydrological connections between the Lakota aquifer and the unreclaimed open pit mines, possibly through fractures created during blasting operations to construct the pit and operate the mine?

- Agree extent of utility and reliability of modeling is dependent upon the quality and details of the information incorporated into each respective model:

- Agree the Models Petrotek developed for Applicant and submitted to the NRC shows uniform thickness which is an isolating confining unit between Fall River and the Chilson?

- How different was this model from real world?

- Agree Model not contain faults, fractures, boreholes, or breccia pipes into or through the Fuson?

- Agree, Boggs concluded, based upon the his pump tests:

- “**...braccia pipe features**

- “**lie within the Dewey & Long Mountain structural zones**”
(Figure 1 - p. 2 Boggs)”

- [Boggs, J.Mark, 1983 “Hydrogeologic Investigations at Proposed Uranium Mine Near Dewey, SD,” p. 4]

- (Large Scale Mine Permit, Applic. Appendix 3.4-E)

- That would include the proposed D-B site, wouldn't it?

- Agree Model not contain data to test the impact of permeability of the Fuson based upon long time (years) of constant and significant stress during the proposed ISR operations involving some 1400 wells on the two aquifers?

- What models were submitted by PT to the NRC which considered the oxidized nature of the core environment re impact on hydro-geology, containment of mining solutions, ability to restore ground water as close to baseline as technologically feasible?

Did your prior or ISL work experience for other companies involve simultaneous mining of two aquifers with an oxidized core in one or both?

- If so

- When?

- What mine(s) involving what aquifers?

- What were your job responsibilities at this mine or each mine?

- Is there any difference in the potential ability to contain mining fluids between pumping the aquifers to be mined at 4,000 gpm vs 8,000 gpm? Explain.

- What other impacts would be different by doubling the amount of Inyan Kara water being used per minute than the 4,000 gpm submitted to NRC Staff?

- Was the PT Application to the NRC amended to include a doubling to up to 8,000 gpm of the maximum volume of water being pumped at one time by PT's proposed D-B ISR mining project?

- If you know, why was this not formally done?

- If you do not know why, who would?

Contention 4. The FSEIS Fails to Include Adequately Analyze Ground Water Quantity Impacts.

Do you agree that the NRC Staff in the FSEIS and DSEIS relied upon PT submitted figure of using up to 4,000 gpm of Inyan Kara water during its

operations?

- Do you agree that PT never amended its application to advise NRC staff that its water usage would be twice what previously submitted?
- Do you agree that PT in documents to the SD DENR in 2012 stated it would up to 8,000 gpm of Inyan Kara water would be used in the D-B project?
- Why was PT's NRC Application not amended?
- What is the maximum gpm of Inyan Kara water discussed and analyzed in the FSEIS for this project? Have the cite?

Do you agree that PT at one point hired RESPEC to do its ground water quantity impact studies? Do you agree that the drawdown calculated by RESPEC in the Inyan Kara was substantially greater than the drawdown figures submitted to the NRC?

- Agree you contend that despite using up to 8,000 gpm of Inyan Kara water, that only a small amount of Inyan Kara water will be "used" by PT's proposed mining and processing operations at D-B site? Test.DeMuth:22, A.4.3. Is this because the overall volume of Inyan Kara water will be pumped back into the aquifer?
 - Would you agree that after mining and reclamation were complete, that the water in the Inyan Kara will not be returned to baseline? In fact, heavy metal levels, including Arsenic and Uranium, will likely be much higher than baseline?
 - Agree that USGS has concluded that ISL mining has a recognized tendency "to contaminate the groundwater." See, "Consideration of Geochemical Issues in Groundwater Restoration at Uranium In-Situ Leach Mining Facilities," NUREG/CR-6870 (USGS), p. iii.
 - Agree that DeMuth testified there is not "any mention in the DSEIS or FSEIS of a commitment to restore groundwater to 'pre-mining conditions'"? Test.DeMuth:31, A.61.
 - Why won't PT guarantee restoring Inyan Kara mined water to all baseline levels?
 - Is it because it cannot be done - at this site?
 - technologically it can't be done and maintained?
 - too expensive?
- If water is more contaminated after mine closure than before, how is this

water not “used”.

- What is the total volume of the water at the D-B sites within the proposed portions of the Fall River and Lakota aquifers to be mined into which PT’s lixiviant will be circulated and the uranium mined therefrom?

- PT has committed itself to providing Madison aquifer water to well water users near the proposed mines and processing plants whose wells become contaminated or lose pressure as a result of PT’s ISR operation?
 - Assuming PT has to so provide water to all well water users within 1.2 miles of the proposed ISR operation for at least the possible 20 year operation, what is the volume of Madison water which would be needed to replace all current uses?

Contention 6: The FSEIS Fails to Adequately Describe or Analyze Proposed Mitigation Measures.

- What “information provided by the applicant” to the NRC Staff “reasonably assured” Staff that PT will “implement an appropriate CAB and excursion sampling program.” Test.DeMuth A:21.
 - What was provided NRC Staff by PT which will guarantee that PT will actually engage in sufficient recovery efforts to return an aquifer to baseline levels or a minimally higher CAB?
 - What guarantees can PT give that it will not only collect accurate and timely samples during an excursion, but will do all that is financially and technologically feasible re remediation and excursion?

- Do you agree that excursions occur at all operating ISL mines? If yes, do you agree that some are not remediated for several months? Do you agree that some have never been remediated? Where has this occurred or is occurring?

- How long do you believe the NRC should reasonable give PT to remediate an excursion before shutting down its entire mining and processing operation until remediation of the excursion is complete? How long should the NRC give PT to remediate an excursion before voiding its license for non-compliance?

- Is it correct that the FSEIS describes the mitigation measures which will “protect ground water resources,” including an evaluation of the apparent effectiveness of the measures, which includes “compliance” with regulations, “adherence to license conditions” and the “proven effectiveness” of such measures. Test.DeMuth:23, A.5.1.

- Do you agree that at many ISL mines, lack of compliance with regulations and license conditions by ISL companies has been an issue for state agencies in Wyoming and Nebraska, as well as the NRC?

- If not, how do you explain violation notices at Crow Butte and Smith Ranch which include unreported or long-delayed reporting of leaks and spills, and long-term problems with containing some excursions?

- Do you agree that at some ISR facilities, there are excursions which have yet to be brought under control? What are the problems with such excursions being brought under control?

- Wasn't there a recent dramatic increase in required bond by the State of Wyoming for the Smith-Highland Ranch ISR operation due to years of delay in reclamation, while still continuing to mine through other well-fields?

- In your example of NRC staff study of “excursions” at ISR facilities, do you agree that you stated that “excursion events are **not necessarily** environmental impacts.” Test.DeMuth:26, A.53. Does this not suggest that they usually are?

- Agree with DeMuth's statement (Test.DeMuth:26, A.53) that “for **most** of those events, the licensees were able to control and reverse them.” This certainly means, does it not, that there have been and are as yet, out of control excursions?

- Where has this occurred to your knowledge?

- Agree that DeMuth made a similar acknowledgment that not all excursions have been and are under control and being reversed was testified to shortly thereafter? Test.DeMuth:27, A.54.

- NUREG/CR-6733 is cited by PT as the basis for claiming that so far, there have been “no reports” of extraction fluids being detected off-site. However, the NUREG “assumed” that technology and bonds must be sufficient and that monitoring requirements were also “assumed” to be followed. DeMuth:26, A.53.

- It is true, is it not, that this NUREG also suggests, that if monitoring

requirements were insufficient in reality (rather than proposals or plans) to preclude systematic or human errors in monitoring, there “might result in off-site excursions of uranium ISL fluids”?

- Wasn't there a violation notice issued by the Wyoming DEQ on March 5, 2013 for failure to correct or remedy issues at the Smith Highland ISR mine including:

- a continuing excursion beyond monitoring well rings at Wellfield F.

Exhibit INT-22: WDEQ Notice of Violation, Docket No. 5131-13, p. 1, ¶3;

- “failure to maintain the infrastructure and operational controls needed to prevent an excursion of lixiviant from leaving the monitor well ring...Failure to, at times, properly operate and maintain all facilities and systems of treatment and control.” Exhibit INT-22: WDEQ Notice of Violation, Docket No. 5131-13, p. 1, ¶4;

- “failed to maintain an operational bleed.” Exhibit INT-22: WDEQ Notice of Violation, Docket No. 5131-13, p. 1, ¶5;

- Other than promising to do so, how can the Board be convinced that PT will in fact comply with performance of all license and permit conditions and applicable laws and regulations?

- What is the longest lasting excursion at an ISL mine you are aware of?

- Are there excursions at ISL mines that are currently not under control?

- At which mine(s)?

PROPOSED QUESTIONS FOR NRC STAFF WITNESSES:

Haimanot Yilma, Kellee Jamerson, Thomas Lancaster, James Prikyl, and Amy Hester

1. Do you agree that the data and filings submitted by Powertech (PT) were the basis for the contents and conclusions contained in the FSEIS?
2. Did you or anyone on the NRC Staff conduct independent testing for determination of the site characteristics, including the hydrogeology of the Dewey-Burdock (D-B) sites? If no, why not? If yes, what testing was done.

3. What is the total number of ISR inspectors in the current employment of the NRC? How often would you expect an NRC staff inspector to visit the proposed D-B mining site during each year? What are the total number of NRC licensed ISR mining operations currently under license within the United States?
4. Would you agree that the NRC staff do not have sufficient number of ISR inspectors to be on-site at the D-B mine every day? Every week? Every month? Every year?
5. Exhibit NRC 026; e-mail between Yilma and WY SHPO. Do you agree that the e-mail expressed the hope that there will be no impacts in Wyoming as a result of the proposed D-B ISR project? What about the potential impacts on cultural resources that cross the border? Was this ever looked into?
6. Exhibit NRC 031; letter from ACHP, which did the Programatic Agreement, to W. Young at SRST indicating that the PA will protect cultural resources. What proof was submitted by PT or is contained in the FSEIS or the PA that such protection will be guaranteed?
7. Would you agree that neither the PA, nor the NRC staff license requires that PT hire and keep on site Tribal Historic Preservation officers from all or any of the surrounding Tribes to ensure identification and protection of currently unidentified cultural resources which only they may be able to respectively identify? If not, how will PT employees be able to comply with the PA if they don't know what to look for upon coming across a potential cultural resources?
8. Exhibit NRC 047 includes the ACHP's definition of a "reasonable and good faith" for compliance with the Section 106 process. Has NRC Staff done each of the following? If so, when and with who? If not, do you agree that such is a failure of good-faith compliance with the NHPA and NEPA?
 - a. Oral history interviews about the proposed D-B site conducted with all impacted tribes? Exhibit NRC-047, bottom of p. 1
 - b. Research of the respective Tribal laws? *P.Ibid, p. 2, #1*

- c. Describe in detail how the people who did the work were qualified to do so re the specific cultural sites and resources of each of the potentially impacted Tribes.
 - d. Describe how they had “demonstrated familiarity” with the cultural resources which might be present? What papers have they published on this area? What training have they attended? Who taught them? Were there cultural experts from each of the Bands of the Lakota? The Arapaho? The Northern Cheyenne.? The Chippewa? The Crow? If not, why was this not deficient compliance with the purpose of the NHPA to truly protect cultural resources from federally approved actions?
9. Exhibit NRC 048; CEQ handbook on NEPA and Section 106;
- a. Would you agree that on p. 5 of the CEQ handbook, there is stated the requirement that a “Complete Section 106 and the appropriate NEPA review” must be completed “...before issuing a final agency decision”? Would you agree that this was not done here by NRC Staff?
 - b. Would you agree that on p. 15 (and footnote) of the CEQ handbook, it states that under NEPA, tribes should be invited to be cooperating agencies in preparing the EIS when “tribal interests” are involved? Would you agree that this was not done here? If you disagree, which interested Tribes and who from that Tribe participated in the preparation of the EIS?
 - c. Would you agree that on p. 16 of the CEQ handbook, that consultation is required if there may be cultural or religious significance to an area, even if the process doesn’t deal with tribal land? Doesn’t the footnote on p. 16 support Interenors arguments that this was not done in a proper manner?
 - d. Would you agree that on p. 28 of the CEQ handbook, it states that if a need arises to resolve adverse effects, typically a signed PA or MOU should be developed, involving the effected Tribes? Would you agree that several Lakota Tribes with a strong interest in the D-B mine site, have a strong cultural interest in the site?
 - e. Would you agree that on p. 28 of the CEQ handbook,; the PA or MOU “should be included in the final EIS or ROD”; note that this should be a signed PA or MOU, per the last item?

10. Exhibit NRC 076 is a historical case analysis of underground uranium plumes, 2001. Is this the latest research on the issue? How is this article's focus on UMTRA sites, nuclear waste storage, and natural uranium ore applicable to ISL mining?
 - a. Would you agree that on p. 25 of NRC 076, there is reference to an "anomalous long outlier" with the longest then known uranium plume was a German ISL facility (4 km. long plume)(acid ISL). Would you agree that this appears to be the only research on the topic of length of plumes from ISL: What other research has been done on such plumes?
 - b. Are you aware of a current study being conducted at the Smith Ranch regarding such plumes?
 - c. Would you agree that on p. 26 of the Exhibit, there is reference to the Crow Butte having post-operation to have "caused [U] to be orders of magnitude larger in monitoring groundwater wells" than before operation.
 - d. Would you agree that on p. 30 of the exhibit (on computer cop - (p. 24 on paper) there is the statement: "Even the subsequent restoration/stabilization activity of groundwater quality at this site shows U [sic] concentrations that exceed MCL limits further beyond the monitoring well network." Do you agree that this indicates contaminated water ostensibly reclaimed by the ISR operation, contained such high MCL levels that got beyond the monitoring wells? See, Exhibit NRC 076, p. 37, fn 90.
 - e. Were you aware of this? What other similar events are you aware of? If you are not, who within the NRC staff would have such information?
11. Do you agree that in Exhibit NRC 077, there is a 46-page letter to Pt asking for more information and saying they'll stop work on the Pt application until they get the information?
12. Exhibit NRC 084A is a Union Carbide Corp geochemical survey of D-B area from 1980:
 - a. Do you agree that on p. 12 of NRC-084A, it states that the Uranium in the area is associated with high values of arsenic and selenium?

What planning has been done to consider the potential impacts on the project by the substantial presence of arsenic and selenium ? What has this been planned to ensure such high levels of these heavy-metals do not leave the mine sites after closure? Do you agree that some of the processes which can remove uranium from solution in a reduce are, can also cause an increase release of Arsenic ?

- b. Do you agree that on p. 24 of NRC-084A (computer p. 12 on paper) it states: “Breccia pipes and collapse structures are numerous in the project area...”? Do you agree that on the same page, it states that the Inyan Kara is recharged from below by the Minnelusa aquifer through “collapse and breccia pipes and along fault zones”? With the new borehole drilling logs and maps which PT has just purchased, do you know whether they reveal any breccia pipes or collapse structures? Have you or anyone else on the NRC staff received and reviewed this new data?
 - c. Do you agree that on p. 26 (computer; p. 23 on paper) of the Exhibit, there are further references to breccia pipes in the project area?
 - d. Do you agree that on p. 26 (computer and p. 23 on paper) of the Exhibit, it states that in uranium areas, “permeability of channel sandstones allows rapid flow of large volumes of aqueous solutions through these fluvial units”? It further states, does it not, that movement is slowed by interfingering units within the sandstone (reducing zones)? Would you agree that while quick movement of solutions is good for ISL, but not for safety? Why not? Agree that historical studies show ground water movement at a much higher rate than Pt claimed to the NRC staff the current rates are? What independent studies or tests were conducted by the NRC Staff to ascertain what the flow rates actually are in the various parts of the proposed D-B mining area?
13. Exhibit NRC 086 is a USGS document on subsidence features in northern Black Hills, 2001.
- a. Would you agree that on p 3-4 of the Exhibit, it shows examples of subsidence features from 10 miles east of Newcastle and says “the upper part of the Minnelusa should be continually collapsing, even today”; How are collapsed or collapsing structure to be dealt with by Pt and by the NRC in the project area?

14. Would you agree that Exhibit NRC 090 provides the DENR Staff's recommendation for Inyan Kara water permit based upon numbers provided by PT? What independent study was done about the accuracy and reliability of this SD DENR study?
15. Exhibit NRC 091 is an NRC assessment of groundwater impacts from ISL mining in 2009. Would you agree that the study looked at only 3 facilities and found that only over 60% of constituents were restored to "pre-operational concentrations." Would you agree that despite some 60 subsequent excursions, a few of which "continued for several years," that the NRC staff concluded : "None had resulted in environmental impacts." One of the excursions was caused by an overlying aquifer which was impacted by a mechanical integrity failure in one case. Are you of the opinion that excursions have no environmental impacts? What should be done by the NRC to prevent excursions? See, also, Exhibit NRC 075)
16. Would you agree that Exhibit NRC 093 shows EPA communication to the NRC on D-B FEIS, 3/10/14. Would you further agree that the letter rated the DSEIS "EC-2." Would you agree this translates to "Environmental Concerns – Insufficient Information." *Ibid*, pp. 2-3.
17. Would you agree that in Exhibit NRC 095, the NRC responding to EPA's 3/10/14 letter, states that the NRC does not have authority over Subpart W
18. In Exhibit NRC 096 the Department of the Interior's comments on the DSEIS expressed that there needs to be more on wetlands protection. Subsequent to that letter, did the NRC Staff or Pt seek to include this water quality issue in the FSEIS?
19. Do you agree that in Exhibit NRC 100; Yilma to Hseuh' report on 12/9/10 report on meetings with other agencies and people re: DSEIS? If yes,
 - a. On p. 8 of the Exhibit, USGS says: "all units (both aquifers and aquitards) have secondary porosity due to fracturing". How does the NRC Staff plan to deal with this issue other than it doesn't exist.

- b. Do you agree that on p. 10 of this Exhibit, the USFS express concerns, some important and not addresses in the EIS – includes cultural concerns
 - c. On p. 11 of the Exhibit; Pt says abandoned U mines are “hydrologically isolated” from production zone aquifers. Would you agree that this is not what the Petrotek study on drawdown showed – it showed connection with the Triangle pit; this is a water quantity question
20. Exhibit NRC 10 is a statewide assessment for WY on black-footed ferret. Would you agree there is significant prairie dog complex across the state line from D-B (exact location unclear), which includes siting of a ferret? Where is this study contained in the DEIS.
21. Exhibit NRC 125 (p.7) of the Draft Sage Grouse conservation objectives report 2012/ Were you aware of the draft regarding the D-B Management Zone –including important information on sage grouse, Shows D-B as in Management Zone and as “general habitat” for grouse. (C-1 0) highest risk category). On p. 32 of the report, it says to avoid impacts as much as possible in C-1 areas. How and where does the FSEIR discuss this? How has PT planned to do this
22. Exhibit NRC 129 is a memorandum from the Department of the Interior Fish and Wildlife Service to Hseuh. On p. 1, it recommends, does it not, that there are lots of wetlands that should be “completely” avoided, or impacts should be minimized; or the wetlands should be replaced? What has the NRC staff required in a license condition regarding protecting these wetlands? While the memorandum frames this as a wildlife issue (whooping crane, black-footed ferret; sage grouse), should not it also involve a water quality issue? If not, why not? If so, what has NRC Staff or PT done to assess and ameliorate such issues?
23. Exhibit NRC 138 is Keene’s paper on groundwater resources in western Fall River County, 1973;
- a. Do you agree that on p. 31 (paper)/ p. 39(computer) of the Exhibit, Keene states that the Inyan Kara aquifer is fed by the Minnelusa through faults and breccia pipes, quoting Bowles, 1968. Do you

agree that PT and the NRC Staff have addressed the potential environmental safety concerns of the D-B project as though no such faults or fractures exist? If such faults and fractures existed, how would that change the FSEIS? How would it change the NRC staff's determination of license issuance? If it would not change the staff's position whether to grant a license, would the Staff add or remove any license conditions? If so, what? If not, why not?

24. On pp. 37 and 38 (paper)/pp. 45 and 46 (computer) of the Exhibit, Keene describes the general water quality of the Inyan Kara as good. Where does the FSEIS describe and/or map the sections of the project area Inyan Kara aquifer where the water is of good quality? Where in the FSEIS does it state and show where the water is not of drinkable quality?
25. In Exhibit NRC 141, PT's Supplement to its NRC application, August 2009; pp. 2-6 (paper)/p. 18 (computer), the company claimed to have used over 1000 drill hole logs to map D-B area's geological structure. To do this, they selected some logs based on their appearing "most representative." How did the NRC Staff determine whether PT's choices of what is "most representative" was an accurate selection? How was this defined?
 - a. How many drill hole logs were actually used?
 - b. What is different about the drill log data from the thousands of boreholes drilled PT used to create it's August 2009 Supplement to the NRC and the drilling logs for the thousands of boreholes PT just purchased?
26. In Exhibit NRC 144, on p. 1, the SRI Foundation's overview of places of traditional religious and cultural significance, states that the BLM, Indians don't care what tribe made an artifact. What is the basis for this statement by the BLM? Is this position shared by SRI and/or the NRC Staff? If so, what is the basis for such a statement or position?
 - a. On p. 2 (paper) of the Exhibit; SRI says many tribes consider Black Hills sacred. If the author believes this, how can an ISR mine not violate this sacredness?
 - b. On p. 5 (paper) of the Exhibit, there is a discussion regarding burials, where the author says "Respectful treatment and minimal disturbance of these places are of paramount importance" and cairns may mark

graves.” If the author believes this how can there be any justification for digging and other heavy equipment operations be justified in an area like D-B where there are lots of cairns and known burials? How would this not be a violation of NHPA, NEPA and the traditional religious and ceremonial ways of the Tribes who have used the D-B area for these purposes?

27. On p. 5 of Powertech’s Initial Statement, the BLM is cited as a great resource and cooperating agency. Would you agree that information from the BLM is not included in either the presentation of testimony at the NRC Hearing, nor included in the FSEIS?
 - a. Would you agree this is because the BLM has indicated that for the D-B proposed ISR mines and plants, it is not operating under the NRC’s wing in the license/permit process?

28. On p. 21 of Powertech’s Initial Statement, it states that water must be “relatively fresh” for ISL to work. Is water that is as tainted with uranium and other contaminants, as Pt says it is in the D-B area, appropriate for ISL? How so?

29. On p. 24 of Powertech’s Initial Statement, PT contends that “logic dictates” that reduction will prevent the movement of contaminants. Whose logic dictates this? What is it based upon? Does this include all contaminants dissolved into the aquifer by the ISR mining process?

30. On p. 25 of Powertech’s Initial Statement, PT talks about mines being returned to “unrestricted use.” How many mines has this happened? Please list five ISR mines where the entire mine-field has been returned to and remains for “unrestricted” use?

31. On p. 30 of Powertech’s Initial Statement, the Assistant State Archeologist, who is not a PhD, is presented as an expert who can comment on how good Augustana’s study is. He further states on p. 31 that D-B has been “fully inventoried”. Doesn’t he admit in his report that many of the sites have not been evaluated? Has he ever been to the site? When and for how long was he on-site? What is his expertise in Lakota cultural resources? Does he even have a Master’s degree and, if so, what is it in?

32. On p. 32, last paragraph of Powertech's Initial Statement, it states that "some of the limited identified physical portions of the archeological record were evaluated in the study." Which of the "some" were evaluated? How much is this "some" of the total sites his field workers found?
33. On p. 33 of Powertech's Initial Statement, first full paragraph, it states that a particular site was determined not to be a burial. How was this done? Did they dig up the site to confirm there wasn't a body?
34. On p. 40-41 of Powertech's Initial Statement, Demuth is used as a legal authority on the "fact" that Pt has followed the NRC's process correctly; when did he get a law degree?
35. On p. 55 of Powertech's Initial Statement, it says that no 11(e) materials will be disposed on site? What about the radium settling ponds?
36. On p. 57-60 of Powertech's Initial Statement, Contention 9 – I'm not sure if this responds to our argument.
37. Would you agree that a substantial portion of citations in the FSEIS cite Pt's application?
38. What is the longest lasting excursion that has ever existed at an ISL mine?
 - a. Is that excursion under control?
39. Are there currently excursions at ISL mines that are not yet under control?
 - a. At what ISR sites?

Dated this 1st day of August, 2014.

Respectfully submitted,

/s/ Bruce Ellison

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Attorney for Consolidated Intervenors

- Did the FSEIS incorporate written reports or survey results from ~~any~~ Sioux Tribes?

- Is it true that over 30% of the sites within the Area of Potential Effect are unevaluated?
see NRC OIB-A at 5

- The PA defers additional consultation to the future. What makes NRC staff believe that future efforts will be any more effective than past efforts?

-

OST - INT

- Is NRC staff aware of the sacredness of eagles and other wildlife to the Lakota people?

INT & OST

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
POWERTECH (USA) INC.) Docket No. 40-9075-MLA
(Dewey-Burdock In Situ Recovery Facility))
)

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **MEMORANDUM AND ORDER (Providing Parties' Proposed Questions for the Official Record)** have been served upon the following persons by Electronic Information Exchange, and by electronic mail as indicated by an asterisk.

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POWERTECH (USA) INC., DEWEY-BURDOCK IN SITU RECOVERY FACILITY
DOCKET NO. 40-9075-MLA

MEMORANDUM AND ORDER (Providing Parties' Proposed Questions for the Official Record)

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[Original signed by Clara Sola]
Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 30th day of April, 2015