POWERTECH (USA) INC.

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February 4, 2010

Department of Environment and Natural Resources
PMB 2020
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

Attention: Gary Haag, Senior Hydrologist

Groundwater Quality Program

Re: Underground Injection Control Permit Application (revised), Dewey-Burdock Project, Fall River and Custer Counties, South Dakota

Dear Mr. Haag:

This letter transmits Powertech's revised and reformatted UIC Class III permit application for the proposed Dewey-Burdock Project located in Custer and Fall River Counties. It also responds to the completeness issues raised in your August 6, 2009 letter.

Powertech is appreciative of the willingness of the Department to meet with us on several occasions to discuss various issues contained in the completeness comments. The feedback provided by you and your colleagues has been instrumental in the revision of the UIC Class III permit application.

The three overarching or primary issues in your transmittal letter are addressed below.

DENR 1. *Powertech is requesting an aquifer exemption for the entire vertical section of the Inyan Kara Aquifer (Group) within the proposed permit boundary. Based on the information contained in the application, it is unclear whether it is appropriate to exempt the entire aquifer or only a portion of the aquifer. There are portions of the Inyan Kara that will not be mined and may be suitable as sources of drinking water. Additional information concerning the suitability of the water in the non-mined areas for use as drinking water is required before the Department can make a determination about the extent of the aquifer exemption.*

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Powertech: Powertech is requesting an aquifer exemption for the entire vertical section of the Inyan Kara Aquifer that is less than 1600 feet from known uranium mineralization as shown in the application. It is important to exempt the upper subaquifer (Fall River) where it overlies the entire vertical section of mineralization in the lower Lakota subaquifer. This allows recovery of mineral resource and an adequate area to safely operate the recovery process without contaminating or threatening to contaminate underground sources of drinking water (USDW) in accordance with both EPA and DENR regulatory programs. The area within Powertech's proposed Dewey-Burdock Project boundary consists of 10,580 acres. The surface area of the requested aquifer exemption consists of 7,055 acres, or 67% of the proposed project area. The monitor well ring extends 400 feet laterally from the production site, and the requested aquifer exemption boundary extends another 1200 feet from the monitor well ring. Considering that there is evidence of uranium ore and mineralization throughout the Inyan Kara aquifer within the proposed aquifer exemption area. The vertical component of the requested aquifer exemption should cover the entire thickness of the Inyan Kara aquifer due to the necessity of having to install wells and delineation holes through the upper Fall River in order to mine the uranium in the Lakota.

Powertech has provided additional information to the revised UIC Class III application that should substantiate our request exempting that portion of the aquifer deemed necessary to operate the proposed project in a manner consistent with regulatory requirements and best management practices in use today. Powertech can not rule out any portion of the proposed aquifer exemption for potential future mining as data from previous operators indicate additional mineral resource exists throughout the area. Based on investigations and analysis of multiple completed water wells and associated pumping tests, groundwater in each of the two subaquifers is clearly hydraulically connected throughout each respective formation. It is recognized that some groundwater in the requested aquifer exemption may qualify as drinking water quality, however, the purpose of the aquifer exemption is to allow for the safe recovery of mineral resources in areas where there may be potential USDWs, so long as it is currently not being used as a drinking water source or not likely to become a drinking water source. Powertech suggests that additional information regarding water in the "non-mined" areas is unnecessary as the information presented in the revised UIC application shows that mineralization exists throughout the proposed aquifer exemption in both the Fall River and Lakota formations. Powertech's interpretation of the definition of an exempted aquifer suggests that the aquifer exemption must consist of both vertical and lateral components sufficient to allow for the safe operation of the recovery process and to prevent any contamination to surrounding USDWs.

DENR 2. *The aquifer characteristics of the Lakota Formation and Fall River Sandstone are only generally described in the application. However, the ore bodies occur in specific sandstone units within the Lakota Formation and Fall River Sandstone within the Lakota Formation and Fall River Sandstone. As these units will be mined individually, the aquifer characteristics (based on pump tests) for each receiving unit and the other sandstone units that may be affected by the mining process must be described in*

detail (thickness, groundwater movement, transmissivity or hydraulic conductivity, etc.). This information must be submitted for at least the first two mining units before the application is considered complete.

Powertech: The revised application provides detailed information from a total of four pump tests, two in the Fall River Sandstone and two in the Lakota Formation, that provide detailed descriptions of the areas designated for the first two mining units. Powertech performed two of the tests and TVA performed the other two. The results of the pump tests support the conclusion that while the two units are adequately separated locally by the Fuson Formation, the groundwater throughout the Fall River Sandstone is hydraulically connected and the groundwater throughout the Lakota Formation is also hydraulically connected. Pump tests will be performed for each additional well field and the detailed information on individual sand lenses provided to the Department prior to initiating mining activities.

DENR 3. *The proposed method(s) for restoration of ground water was not specifically addressed in the UIC application. Although the application briefly mentions that a ground water sweep is a commonly used method of restoration; it does not say this will be the method used at Dewey-Burdock. The Department requires a detailed description of the restoration method(s) that will be used at Dewey-Burdock and the technical basis for the methods proposed including unit specific geochemical information demonstrating the method(s) will achieve restoration requirements.*

Powertech: Powertech has provided additional information that addresses restoration of the proposed Dewey-Burdock Project in the revised UIC application. This information and the full discussion of restoration is found in Section 11.6 of the revised UIC application.

Powertech has also reviewed the technical comments and typographical errors provided with your letter and made changes to the document as appropriate. Those comments are helpful and are appreciated.

Also, as recommended in your letter, Powertech has attempted to be more specific about its proposed activities and the company has revised the statements that you indicated appear to be tentative and uncertain.

The revised UIC Class III permit application has been reorganized and reformatted to conform to the Department's application form. And, in order to expedite the Department's continued review of the application, Powertech has included reference to the applicable statute or rule being addressed in the specific sections of the application.

Powertech's responses to the completeness issues are summarized or referenced in the 14-page attachment to this letter. The Department's referenced rule is presented first, followed by the Department's comment, and then Powertech's comment follows. Also attached as an enclosure to this letter is an indexed table showing the completeness issue

(CI) numbering system used in your letter to Powertech, the section in the revised application where the CI is addressed, the title of the section and the page number(s) for the referenced section(s). These documents are provided in order to facilitate your review of the responses.

Again, Powertech appreciates the effort involved in the completeness review and the feedback regarding certain issues, technical matters and typographic errors. We certainly hope that this transmittal package and the accompanying revised UIC Class III permit application are deemed acceptable and complete by the Department. Should there be any questions as you proceed with your review, please contact Mark Hollenbeck, Project Manager, or the undersigned at your convenience.

Respectfully yours,

Richard E. Blubaugh

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Completeness Issues - Powertech Class III UIC Permit Application by SD DENR (8-4-09)

1. **74:55:01:03. Permit required for well injection-Plans and specifications required. Application for a permit shall be submitted on forms provided by the secretary.**

   The application was not submitted on the required form. The Department's form (see enclosed) must be included as part of your submittal. A link to the form can be found at the following website: http://denr.sd.gov/des/gw/UIC/UICClassIII.aspx. Those items that can not be directly completed on the form must be referenced on the form as to where they can be found in the body of the document. In addition, the application form has the requirement that the authorized representative's signature be notarized. The signature page included with the April 2009 application was not notarized.

Powertech: The required form for South Dakota's UIC Class III permit application has been completed, and/or subject matter has been referenced to the body of the document, and submitted with this revised application. The authorized Powertech representative's signature has been notarized.

2. **74:55:01:24. Designation of exempted aquifers. The board may exempt an aquifer or a portion of an aquifer and designate it as an exempted aquifer if it meets the following criteria:**

   (1) It does not currently serve as a source of drinking water; and

   (2) It cannot now and will not in the future serve as an underground source of drinking water ...

   Referring to Section 17.2 Aquifer Exemption Basis, and Figure 17.1, Aquifer Exemption Boundary, there are portions of the Inyan Kara Group that will not be mined and may be suitable as sources of drinking water. The portions of the Inyan Kara Group that are separated hydraulically from the mining zones must not be included within the aquifer exemption. The aquifer exemption must only cover sandstone units that could be potentially mined in the Lakota Formation and Fall River Sandstone and the units that are hydraulically connected to these mining zones.

Powertech: The aquifer within the project area to be considered for the exemption includes the lateral extent of the interconnected sands of the Lakota and Fall River subaquifer units of the Inyan Kara within the production zone, and a buffer zone that will allow a reasonable length of time to contain and recover any potential excursions from the well fields. This portion of the Inyan Kara being recommended for exemption cannot now and will not in the future serve as a source of drinking water based on regulatory criteria. See Section 13.2.

Further, two additional major protective reasons to consider one vertical exemption are the clarity of water rights for future wells and the necessity of monitoring during operations and restoration. See Section 13.2.2. Exempting only part of the Inyan Kara aquifer would compromise protection against an excursion to a USDW. Wells must be completed through the upper Fall River to reach the lower Fall River and Lakota sands and that establishes the potential for mineralized water to escape into the upper Fall River. The aquitards are laterally

discontinuous. The sand units that overlay and underlay the ore bodies are minor, and likely would not qualify for aquifer designation or USDW status without inclusion of the major sands of the Inyan Kara.

The DENR definition of "Exempted aquifer," is an aquifer or portion of an aquifer that meets the criteria in the definition of "underground source of drinking water" but which has been exempted according to § 74:55:01:24; the EPA definition is– An aquifer, or a portion of an aquifer, that meets the criteria for a USDW, for which protection under the SDWA has been waived by the UIC Program. Under 40 CFR Part 146.4, an aquifer may be exempted if it is not currently being used — and will not be used in the future — as a drinking water source, or it is not reasonably expected to supply a public water system due to a high total dissolved solids content. Without an aquifer exemption, certain types of energy production, mining, or waste disposal into USDWs would be prohibited. EPA makes the final determination on granting all exemptions.

Based on the information provided in this application and the definition of an exempted aquifer, Powertech believes its proposed aquifer exemption boundary is adequately justified. Refer to figures 10-1 and 13-1.

3. **74:55:01:25. Information considered for permit issuance. Prior to issuance of a permit for the construction of a new well the secretary shall require the following:**
   (6) Certification of applicant form.

   The applicant must submit a certification of applicant form (see enclosed). In addition, while not specifically mentioned in the regulations, the Department also requires the applicant to submit a consent to inspect form (see enclosed).

Powertech: The "certification of applicant" form and the "consent to inspect" form are completed and included with this application.

4. **74:55:01:26. Information required in permit application. The permit application shall include, but not be limited to, a technical report which includes the following:**

   (1) A physical description and analysis of the region and site, contour (topographic) maps that accurately locate and identify the permit area and show the location of any public highways, tribal reservation boundaries, dwellings, utilities, and easements within the permit area and adjacent lands in relation to all proposed affected lands and proposed activities associated with the in situ leach operation, including all processing facilities, chemical storage areas, production areas, and roads. The map shall also clearly illustrate the location of monitoring wells.

Powertech: Exhibits 4-1 through 4-5 present the required information. Monitoring well locations and easements are shown on Exhibit 4-1.

4. 74:55:01:26. Information required in permit application.

(7) A list and map of all known existing water wells, producing wells, injection wells, abandoned wells, and exploration holes, giving location, depth, producing intervals, type of use, condition of casing, plugging procedures and date of completion for each well or drill hole within the permit area and on adjacent lands to the extent such information is available in public records and from a reasonable inspection of the property.

Plugging procedures and dates of completion were not listed or addressed for these wells or holes. In many cases, the depths of holes or condition of casing were not listed or addressed for these wells or holes.

Powertech: To the extent such information is available in public records and from a reasonable inspection of the property, plugging procedures, dates of completion, depth of holes and condition of casing for known exploration holes and abandoned wells are addressed in Section 7.6.1, specifically Table 7.6-1.

4. 74:55:01:26. Information required in permit application.

(8) Current land use and zoning within a one-mile radius of the mine permit boundary.

The current land use was given for an area measured from the center of the Proposed Action Area (PAA). The current land use must be given for all land within one mile of the proposed mine boundary. The land uses must be shown on a map and must be listed section by section.

Powertech: Section 4.3.3, Population and Land Use, addresses current land use. Powertech believes that Exhibit 4-6 accurately depicts current land use for all land within a one mile area of the proposed mine boundary and as a representation of land use section by section.

4. 74:55:01:26. Information required in permit application.

(9) A list of occupied dwellings within a one-mile radius of the mine permit boundary.

The list of occupied dwellings is given for a 10 kilometer radius measured from the approximate center of the Proposed Action Area (PAA) and located by a compass direction. The occupied dwellings must be given for all land within one mile of the proposed mine boundary, not the center of the PAA. The location of the occupied dwellings for this area must be shown on a map and must be listed section by section.

Powertech: Exhibit 4-1 and Table 4.3-2 present all occupied dwellings within a one mile radius of the proposed permit boundary. The nearest occupied dwelling is 0.9 miles to the WSW of the project area is the only occupied dwelling within one mile of the proposed mine boundary.

4. 74:55:01:26. Information required in permit application.

(10) A site monitoring plan to include:
(a) Ground water quality for both production zones and nonproduction zones.

With the expansion of the proposed mine area in September 2008, two additional, upgradient baseline wells were required for the Dewey area (Township 6, Range 1, Section 17 or 18). These wells have not been drilled, but they must be included in the state required ground water baseline plan.

Powertech: See Section 12.1.1 for a description of the site monitoring plan and Exhibit 4-1 for location of the two additional monitoring wells. They are included in the ground water baseline plan and monthly sampling commenced December 2009.

4. 74:55:01:26. Information required in permit application.

(11) A description of the proposed method of operation, including;
(b) A description of the proposed mining solution and the chemical reactions that may occur during in situ leach mining operations as a result of injection of the mining solution.

The results of leaching tests done on representative samples of the ore body must be submitted. The results must include water quality analyses to check what parameters are liberated by chemical reactions.

Powertech: In accordance with ARSD 74:55:01:26, Powertech has provided a description of the proposed method of operation, including a description of the proposed mining solutions and chemical reactions that may occur during in situ leach mining. Preliminary leach test results may be useful but there is the potential for high variability to exist from one well field to another. Detailed data from each well field will be obtained and submitted in its own specific document that will include well field water quality results from leach testing of core obtained within the designated well field. Refer to Section 10.1.1 for further discussion of this item. See Table 11.6-1 for the estimated preliminary post-mine water quality.

4. 74:55:01:26. Information required in permit application.

(12) Discussion and illustration of the estimated injection schedule, including:
(a) A map showing the wellfields and proposed sequence for injection into the wellfields.

Only two wellfields are depicted, the application needs to show all the other proposed wellfields. Note: ore bodies in separate sandstone units that overlie or underlie each other may need to be shown as separate wellfields.

No sequence for mining well fields was included (Section 17.3 Project Schedule and Figure 17.6 were not detailed enough). Note: ore bodies in separate sandstone units that overlie or underlie each other will need to be added to the mining sequence separately. Also note: the department understands that the plans for wellfields and the sequence of mining would be conceptual and subject to change based new drilling information and on real world mining and ground water

restoration experience.

Powertech: The proposed well fields are shown on Exhibit 10-1. Ore bodies in separate sandstone units that overlie or underlie each other are shown as separate well fields. The sequence for mining the well fields and the projected schedule are included as Figure 10.6-1. The sequencing and schedule are conceptual and subject to change based on well field specific information and actual operating experience.

4. 74:55:01:26. Information required in permit application.

(12)(b) An estimated time schedule for injection into each wellfield.

No time schedule for mining each wellfield was included (Section 17.3 Project Schedule and Figure 17.6 were not detailed enough). Note: the department understands that the schedule for mining each wellfield would be conceptual and subject to change based on real world mining and ground water restoration experience.

Powertech: Figure 10.6-1 shows the time schedule for the proposed well fields. As noted, the schedule is conceptual and subject to change based on real world experience during operations and groundwater restoration.

4. 74:55:01:26. Information required in permit application.

(12)(c) Expected changes in pressure, native ground water displacement, and direction of movement of mining solution.

These items are not specifically addressed in the U1C application; please address the requirements in this section.

Powertech: These items are addressed is Section 10.7.1

4. 74:55:01:26. Information required in permit application.

(12)(d) The procedures to ensure that the installation of recovery, injection, and monitor wells will not result in hydraulic communication between the production zone and overlying or underlying stratigraphic horizons.

The procedures to ensure installation of wells will not result in hydraulic communication between stratigraphic horizons were not specifically addressed in the UIC application; please address the requirements in this section.

Powertech: The procedures that ensure installation of wells will not result in hydraulic communication between stratigraphic horizons are addressed in Section 11.1.1.

4. 74:55:01:26. Information required in permit application.(12)(e) The procedures used to verify that the injection and production wells are in communication with monitor wells completed in the receiving strata and employed for the purpose of detecting

excursions.

The procedures to verify that the injection and production wells are in communication with monitor wells were not specifically addressed in the UIC application; please address the requirements in this section.

Powertech: The procedures to verify that the injection and production wells are in communication with monitor wells are described in Section 11.2.1. The pumping test is designed to demonstrate hydraulic connection between the mining zone and the monitoring wells in the same strata.

4. 74:55:01:26. Information required in permit application.

(12)(f) A subsidence analysis, using established geotechnical principles, that estimates, based upon the proposed in situ leach operation, the effect of subsidence upon overlying aquifers.

A subsidence analysis was not addressed in the UIC application; please address the requirements in this section.

Powertech: Individual sand grains are not affected by this process, therefore the integrity of the lithologic unit is unchanged. As a result of the chemical and physical stability of these host sandstone units, there will be no subsidence within overlying sedimentary units. Refer to Section 5.6.

4. 74:55:01:26. Information required in permit application.

(12)(g) A spill contingency plan to include reporting, response, assessment, and remedial actions. (Reference 74:55:01:26(12)(g)).

A spill contingency plan was not included in the UIC application; please address the requirements in this section.

Powertech: Refer to Section 11.3 for a description of the spill contingency plan and discussion of response, assessment, remedial actions and reporting.

4. 74:55:01:26. Information required in permit application.

(13) For uranium in situ leach mines, site-specific background radiological data including the results of measurements of radioactive materials occurring in important species, soil, air, and in surface and ground waters that could be affected by the proposed operations.

The preoperational radiological monitoring plan was not approved by the department. (Also, reference the department's February 11,2008 comment letter to Dan Hoyer, RESPEC, regarding the Baseline Sampling Plan for Dewey-Burdock In Situ Uranium Project (January 28,2008). The issue of the department approving the preoperational radiological monitoring plan was discussed in item no. 1 under 4.0 Radiological Sampling Plan in the letter.) Did the NRC approve of the

preoperational radiological monitoring plan, or comment on the data submitted to it?

Powertech: This item is addressed in Section 12.1.1.1. The NRC does not approve preoperational baseline characterization plans. The Dewey-Burdock site characterization plan, including the preoperational radiological monitoring plan, was presented to the NRC. The NRC made comments and Powertech modified the plan accordingly.

4. 74:55:01:26. Information required in permit application.

(15) An assessment of impacts that may reasonably be expected as a result of the mining operation to water resources and water rights inside the permit area and on adjacent lands, and the steps that will be taken to mitigate these impacts.

An assessment of impacts to water resources and water rights was not included in the UIC application; please address the requirements in this section.

Powertech: Section 11.5 provides an assessment of impacts to water resources and water rights and related mitigation.

4. 74:55:01:26. Information required in permit application.

(16) A well maintenance plan to ensure:
(a) Wells are sufficiently covered to protect against entrance of undesirable material into the well.

Referring to Section 11.2, Well Completion, well covers were not specifically addressed in the UIC application; please address the requirements in this section.

Powertech: Section 7.5.1.3 addresses the well coverings.

4. 74:55:01:26. Information required in permit application.

(16)(b) The wells are marked and can be clearly seen.

Referring to Section 11.2, Well Completion, well marking was not specifically addressed in the UIC application; please address the requirements in this section.

Powertech: Refer to Section 7.5.1.4 for a discussion of well markings.

4. 74:55:01:26. Information required in permit application.

(17) To the extent that existing information or data is available, a determination of whether existing water wells, former producing wells, former injection wells, former monitor wells, abandoned wells, and exploration holes in the proposed production area have been appropriately plugged, and if not, a plan for re-plugging these wells.

Although corrective actions are discussed in Section 4.3, it is a requirement for the application that a determination whether existing and former wells have been properly plugged. The

department realizes that a determination may not be possible for all holes until additional pump tests are done, however, based on field work to date, a determination of identified wells can be made as to whether they need replugging or not.

Powertech: Section 7.3.1 addresses this issue. The majority of exploration holes at Dewey-Burdock were drilled in 1970 and 1980. The state of South Dakota had plugging rules in effect at the time these holes were drilled and plugged and the holes were plugged according to the state's requirements. It is Powertech's determination that improperly plugged wells or holes do not presently exist within the proposed production area. Additional well field specific pump tests will be used to verify this determination.

4. 74:55:01:26. Information required in permit application.

(18) The proposed methods to restore ground water quality, based on the geochemistry of the production zone and the chemistry of the injection solutions, to include:

(a) A proposed restoration table for all ground water quality restoration values.

A restoration table was not specifically addressed in the application. Table 17.2, Crow Butte Post Mining Water Quality Data Summary, was included as Powertech expects a similar baseline and post-production water quality results. Although the water quality may be similar between Crow Butte and Dewey - Burdock, the geologic formations are different. The restoration table must be based on Dewey - Burdock baseline ground water quality data for the Lakota Formation and Fall River Sandstone. Variations in local baseline water quality must be addressed on the restoration values table (i.e. differences in water quality between the Dewey and the Burdock areas, and differences between the Lakota Formation and Fall River Sandstone).

Powertech: According to ARSD 74:55:01:26(18), the department shall develop a ground water restoration table with assigned ground water quality restoration values that are the compliance requirements for restoration of the production and nonproduction zones. The restoration values shall be based on pre-mining baseline conditions.

Pre-mining baseline clearly refers to well field specific baseline pre-mining water quality as restoration and restoration table values are most pertinent to the well fields. Before the well field specific pre-mining baseline water quality can be assessed, it must be obtained via specific well field testing and sampling. Therefore, it is not appropriate at this point in the permitting process to prepare restoration tables that are intended to set standards for restoring well field groundwater. The well field specific baseline information will be provided and upon consultation with the regulatory agencies an appropriate restoration table(s) will be developed before any mining activities occur.

4. 74:55:01:26. Information required in permit application.

(18)(b) An estimated time schedule for achieving ground water restoration, to be

carried to completion within five years in accordance with applicable restoration tables.

The schedule presented in Figure 17.4, Proposed Groundwater Reclamation Schedule, is general in nature. An estimated time schedule for the restoration of each wellfield is required.

Powertech: The estimated time schedule for achieving groundwater restoration, to be completed within five years, is included as Figure 10.6-1.

4. 74:55:01:26. Information required in permit application.

(19) A plan for the disposal of drill cuttings.

Referring to Section 11.1, Well Construction Materials, first paragraph, it states that drill cuttings will be returned to mud pits as TENORM (Technologically-Enhanced, Naturally - Occurring Radioactive Materials). A plan for disposal of drill cuttings must be submitted, and must include the appropriate TENORM guidelines.

Powertech: The plan for disposal of drill cuttings is described in Section 7.2.1, and includes the appropriate SD DENR requirements in ARSD 74:29:11:15.

4. 74:55:01:26. Information required in permit application.

(20) The estimated costs for:
(a) Ground water reclamation as computed in accordance with established engineering principles, including:

(i) Facilities, materials, and chemicals used for ground water restoration.

(ii) Ground water restoration in the production zone.

(iii) Water treatment.

(iv) Capping, plugging, and sealing of all wells.

(v) Personnel working on reclamation-related activities.

(vi) Collecting and analyzing samples from surface and ground water monitoring sites.

The cost estimated in Section 17.4, Financial Assurance, is general in nature. Detailed costs must be included. Note: there is a reference to detailed costs in Appendix I, however, no Appendix I was included with the application.

Powertech: The estimated costs for groundwater reclamation are presented in Section 14.1, specifically in Tables 14.2-1 and 14.2-2. The details are included in Appendix L.

4. 74:55:01:26. Information required in permit application.

(21) Contingency plans to cope with all shut-ins or well failures so as to

prevent the migration of mining solutions into underground sources of drinking water.

Contingency plans to cope with shut-ins or well failures were not specifically addressed in the UIC application; please address the requirements in this section.

Powertech: Contingency plans to cope with shut-ins or well failures is addressed in Sections 7.1.1.1, 7.1.1.4 and Section 11.4.

5. **74:55:01:31. Well construction requirements. Injection and production wells shall be generally constructed as follows:**

   (2) ...The casing shall be of sufficient strength and diameter to prevent casing collapse during installation, convey liquid at a specified injection/recovery rate and pressure, and allow for sampling ....

   No specifications on the PVC pipe are given.

Powertech: Well construction materials proposed for the Dewey-Burdock Project are described in Section 7.1.1. This discussion includes specification information on PVC casing that is proposed for use at the project.

6. **74:55:01:34. Determining information on the water-bearing injection zone. The following information concerning the production zone shall be determined:**

   (1) Fluid pressure.

   Fluid pressure of the receiving strata was not specifically addressed in the DIC application; please address the requirements in this section.

Powertech: See Section 6.2.2.7 Fluid Pressure of Receiving Strata. Refer to the potentiometric levels shown on Figures 2.3 and 2.4 of the Pump Test Report (Appendix B) for the respective receiving strata and subtract the elevation of the ore to determine the fluid pressure of the respective production zone.

6. **74:55:01:34. Determining information on the water-bearing injection zone.**

   (4) Other physical and chemical characteristics of the injection zone rock and formation fluids including: geochemistry of the production zone and the aquifer upgradient and down-gradient of the production zone, to include oxidation-reduction conditions and common ions, and the direction and velocity of ground water movement through the producing zone.

   Physical characteristics of the receiving strata fluids were not specifically addressed in the UTC application; please address the requirements in this section.

Powertech: Physical characteristics of the receiving strata are addressed in Section 5.4.2 of the Geology Section, and the physical properties of the receiving strata for the Fall River formation and the Lakota formation are specifically addressed in Sections 10.9.1 and 10.9.2, respectively. Also, this information is discussed in detail in Appendix B, Pump Tests.

6. **74:55:01:34. Determining information on the water-bearing injection zone.**

(5) Compatibility of injected fluids with formation fluids.

Compatibility of injected fluids with formation fluids was not specifically addressed in the UIC application; please address the requirements in this section.

Powertech: Compatibility of injected fluids with formation fluids is specifically addressed in Section 10.3.2.

7. **74:55:01:35. Establishment of baseline water quality in new mining areas. Before mining a new area or section in a production zone, the operator shall submit a baseline ground water quality sampling plan to include an adequate number of wells and samples to characterize baseline water quality in production and nonproduction zones in and adjacent to the new mining area. The plan shall provide geochemical, lithologic, and mineralogical descriptions of the receiving strata and any aquifers that may be affected by the injection of mining solution.**

The mineralogical description in Section 17.2.3.2, Mineralogy of the Uranium Ore, includes only uranium minerals. The mineralogical description must, for the receiving strata, provide a list of the major minerals of the strata, the ore minerals, and notable minor minerals that may be affected by the leaching solution. As the ore bodies occur in different sandstone units within the Lakota Formation and Fall River Sandstone, and as these units will be mined individually, each receiving unit and the other sandstone units that may be affected by the mining process must have geochemical, lithological and mineralogical descriptions. This must be done for each mining unit.

Powertech also needs to provide more geochemical information, including the potential of acid rock drainage (ARD) during in situ leaching.

Powertech: Section 5.5 presents the lithology and mineralogy of the receiving strata. Acid rock drainage potential is addressed in Section 5.5.6.

8. **74:55:01:35. Establishment of baseline water quality in new mining areas. The plan shall address aquifer characteristics for the water saturated portions of the receiving strata and aquifers that may be affected by the mining process. Characteristics may include aquifer thickness, velocity and direction of ground water movement, storage coefficients or specific yields, transmissivity or hydraulic conductivity, and the directions of preferred flow under hydraulic stress in saturated zones of the receiving strata. The plan shall include potentiometric maps of the ground water surface in the receiving strata and overlying and underlying**

aquifers. The extent of hydraulic connection between the receiving strata and overlying and underlying aquifers and the hydraulic characteristics of any influencing boundaries in or near the proposed production areas shall be determined and described.

The general aquifer characteristics of the Lakota Formation and Fall River Sandstone are generally described in Section 8 (Attachment I). However, the ore bodies occur in different sandstone units within the Lakota Formation and Fall River Sandstone. As these units will be mined individually, the aquifer characteristics for each receiving unit and the other sandstone units that may be affected by the mining process must have aquifer characteristics described (thickness, ground water movement, transmissivity or hydraulic conductivity, etc. The hydraulic connection between these sandstone units must be determined and described.

Powertech: Based on the 2008 pump tests results, both the Lakota and Fall River Formations behave as single, confined aquifers. This issue is addressed further in Section 6.2.2.6.1. Groundwater monitoring and pump test results are addressed in Sections 6.2.3.3.1, 13.2.4 and in Appendix B, Pump Tests.

9. 74:55:01:45.01. Ground water restoration table.

Referring to Section 17.2.6, Groundwater Restoration Method, Powertech must develop a proposed restoration table based on Dewey - Burdock ground water baseline data. As the Dewey - Burdock area is quite large; Powertech must also develop different restoration tables for specific areas or aquifers (i.e., the Dewey area, Burdock area, Lakota Formation, Fall River Sandstone, etc.).

Powertech: Powertech is willing to develop groundwater restoration tables in conjunction with DENR as stated in our response to Completeness Issue 4(18)(a), above. However, additional well field specific data is required. Also it is our understanding from ARSD 74:55:01:26(18) that DENR sets the restoration table values.

10. 74:55:01:46. Production area operational monitoring requirements. The monitoring plan included in the permit shall describe the procedures for operational monitoring of the quantity and quality of mining solution and ground water in the production area and shall, at a minimum, include provisions for:

(2) Monitoring injection pressure and either flow rate or volume twice a month, or metering and recording daily injected and produced fluid volumes.

Section 14.5.2, Wellhead Pressure, does not list a monitoring frequency for flow or volume; please address the requirements in this section.

Powertech: The monitoring frequency for flow is addressed in Sections 9.6, 9.7.1 and 10.9.4.3, and will be daily unless prohibited by inclement weather or unforeseen circumstances.

10. 74:55:01:46. Production area operational monitoring requirements.

(3) Monitoring the fluid level in the injection zone twice a month.

Fluid level monitoring was not addressed in the application; please address the requirements in this section.

Powertech: Fluid level monitoring in the injection zone will be monitored and recorded at least twice per month. See Sections 9.7.2, 9.9, and 10.9.4.3.

10. 74:55:01:46. Production area operational monitoring requirements.

(6) A minimum of quarterly monitoring of Department specified wells within one-quarter mile of the production site to detect migration of recovery fluids from the production zone.

Quarterly monitoring of wells within one-quarter mile of the production site was not addressed in the application; please address the requirements in this section.

Powertech: Section 9.6.1 addresses the Monitoring Network. Overlying and underlying wells within the production zone and monitor wells in the monitoring well ring, which is only 400 feet from the production site, will be monitored every two weeks for the express purpose of detecting potential migration of recovery fluids. Powertech is willing to consult with the Department to identify wells within one-quarter mile of the production site that may be monitored quarterly. However, at this time, it is not clear that there is any protective benefit to quarterly monitoring within one-quarter mile when there is a complete monitoring system that is monitored every two weeks within 400 feet of the production site.

11. 74:55:01:59. Requirements for plugging wells, drill holes and the repair and conversion of wells. The requirements for plugging drill holes and repair, conversion, and plugging of wells are as follows:

(1) A plan for drill hole plugging and well repair, plugging, and conversion shall be included in the permit application and constitutes a condition of the permit.

Referring to Section 11, Construction Details, well conversion was not specifically addressed in the application; please address the requirements in this section.

Powertech: Well conversion is addressed in Section 7.1.1.1. Powertech does not plan to convert any of its injection or production wells to water supply wells.

12. 74:55:01:59.03. Corrective actions for improperly sealed wells.

The procedures to ensure installation of wells will not result in hydraulic communication between strata were not specifically addressed in the UIC application; please address the requirements in this section.

Powertech: Powertech's corrective action plan to ensure installation of wells so that there is no hydraulic communication between strata due to improperly sealed wells is described in Section 4.4.