POWERTECH (USA) INC.

June 16, 2017

Valois Shea
U.S. Environmental Protection Agency
Underground Injection Control Program, 8WP-SUI
1595 Wynkoop Street
Denver, CO 80202-1129

Re: Powertech (USA) Inc. Comments on Dewey-Burdock Project Draft Class V Area Permit

Dear Valois:

This letter and attachments represent Powertech (USA) Inc.'s (Powertech's) written comments on the Draft Class V Area Permit for the Dewey-Burdock Project issued for public comment in March 2017. The written comments pertain to the draft permit and Draft Class V Area Permit Fact Sheet. Table 1 includes specific technical comments. References are provided as PDF files in Attachment A.

Powertech appreciates the opportunity to provide these comments and would be happy to discuss them with EPA. We request that EPA give these comments full consideration, and we request that this be done within a reasonable time frame.

Sincerely,

John Mays
Chief Operating Officer
Powertech (USA) Inc.

Enclosures:

Table 1.	Draft Class V Area Permit Specific Comments and Recommended Permit Language Revisions
Attachment A	Exhibits

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Table 1. Draft Class V Area Permit Specific Comments and Recommended Permit Language Revisions

No.	Draft Permit		Fact Sheet			Comment and Recommended Permit Language Revision or Other Modification
	Page	Section	Page	Section	Type	
1	2	I.B	---	---	E, C	**Comment:** Why are South Dakota regulations in 40 CFR § 147.2100 referenced, when those regulations are for Class II wells? **Requested Change:** Powertech suggests changing the reference to the more general 40 CFR part 147, subpart QQ or else 40 CFR § 147.2101, which pertains to Class V wells. The requested change is shown below. UIC regulations specific to South Dakota are found at 40 CFR ~~§ 147.2100~~ part 147, subpart QQ.
2	2	I.B	---	---	I, C	**Comment:** Though it is referenced elsewhere in the draft permit, a reference to 40 CFR § 144.41 is not included here. **Requested Change:** Powertech requests adding reference to 40 CFR § 144.41 as follows. This Area Permit is issued for a period of ten (10) years unless modified, revoked and reissued, or terminated under 40 CFR § 144.39, ~~or~~ § 144.40, or § 144.41.
3	4 15	II.A.1 II.I	35	5.3.4.1	R	**Comment:** Part II of the draft permit presents a regulatory process to obtain "Limited Authorization to Inject". **Requested Change:** Powertech is not aware that a Limited Authorization to Inject (LAI) is an established regulatory process, or is warranted in any way, for the proposed operation. Powertech is not aware that EPA Region 8 has included an LAI requirement for any Class V, Class I, or Class III permit and requests clarification as to why this permit requirement is necessary to protect USDWs, or, absent such clarification, Powertech requests removal of the LAI requirement as described below. The testing procedures that are included under the LAI are routinely done in many similar well permits without a separate authorization, lack any significant potential for contamination of USDWs and are done with well casing in place. Powertech requests moving the Part II, Section A.1 requirements in entirety to Section A.2 (Information to Submit to the Director to Obtain an Authorization to Commence Injection). Similarly, Powertech requests moving the Part II, Section I requirements to Part II, Section K, where they can be identified as "Logging, sampling, and testing prior to well operation."

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4	4 20	II.A.1.c III.B Figure 3	---	---	I, C	**Comment:** Powertech is committed to completing Class V injection wells only into the Minnelusa Formation at this time and as such would not penetrate the Madison with drilling effort shown in Figure 3 of the draft permit. **Requested Change:** Powertech requests removal of Figure 3 in its entirety and removal of any requirement to collect Madison data from the drilling of Class V injection wells from the draft permit and fact sheet (see also comment #11). An example is provided below for Part II, Section A.1.c: Evaluation of the Minnelusa and Madison aquifer fluids at ~~DW. No. 1, if it is drilled to the base of the Deadwood Formation, AND at~~ the Madison water supply wells, if they are approved by the South Dakota Water Rights Program and if constructed, to confirm the injection zone formation is hydraulically isolated from the Madison aquifer at the Dewey-Burdock Project Site.
5	7	II.C Table 4	---	---	A	**Comment:** The draft permit states a "Fracture Finder" log will be run. Fracture Finder has different connotations to different people. To clarify, a micro-resistivity log would be an acceptable fracture finder log. A micro-resistivity log uses the same general principals as a normal resistivity (wireline) log, except it is a pad tool with small spacing that allows for very detailed evaluation of the wellbore face and the first 1-3 inches of the formation. It is useful to differentiate between wall cake from drilling mud, filtrate from drilling mud that has invaded the formation, and the formation fluid. It is also useful to identify zones that have significant fluid invasion (such as natural fracture intervals). For this reason, a micro-resistivity log is often referred to as a Fracture Finder log. **Requested Change:** Add "(Micro-resistivity)" after "Fracture Finder" in Table 4.
6	6-7 19-22	II.C Tables 3, 4, 5 Table 11 Figures 4-5	---	---	A	**Comment:** EPA has utilized casing sizes included in the permit application that was submitted in 2010. Since that time, market conditions and casing availability have changed; Powertech may elect to run larger production casing (7" OD versus 5 ½" OD stated in the permit application). The main reason that larger casing may be considered is to allow for installation of larger injection tubing, which will reduce friction loss and fluid velocity, both which will extend the useful life of the injection tubing. Installation of larger casing and/or tubing will have no impact on the protection of USDWs required under the Class V UIC permit.

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						Requested Change: Update the text, tables, and figures to allow for use of 7" (or similar) production casing as dictated by technical and design requirements and market conditions. One specific text revision request is included in comment #24. Additional requested changes include but are not limited to: - Table 3: Under Cement Bond Log Due Date, change to "Prior to setting 7" or 5-1/2" casing in DW. No. 3" - Table 4: Under Due Date for all but Mud Logging, change to "Prior to setting 7" or 5-1/2" casing in DW. No. 3" - Table 5: Under Cement Bond Log Purpose, change to "Cement behind the 7" or 5-1/2" casing in DW. No. 3" - Table 5: Under Casing Inspection Log Purpose, change to "Casing quality of the 7" or 5-1/2" casing in DW. No. 3" - Table 11: Under Longstring Casing for DW No. 1 alternate and DW No. 3, change to "7" or 5 ½" - Figures 4 and 5: Change to "7" or 5 ½" Longstring Casing"
7	5 12	II.B Table 2 II.E.2.a, c	32	Sec. 5.1 Table 10	R	**Comment:** The Draft permit specifies that (1) core samples shall be collected only from the lower 50 feet of the Opeche Shale and upper 50 feet of the Lower Minnelusa confining zone, rather than within the confining zones in general; (2) cores must be collected in all Class V wells; and (3) core must be collected from the Lower Minnelusa only if DW No. 1 is drilled to the Deadwood. **Requested Change:** Powertech requests that the draft permit be revised to require core from the overlying and underlying confining zones, but allow the operator to determine the core location within the respective confining zones. The 50-foot restriction in the draft permit could misrepresent the overall confining abilities of the overlying and underlying confining zones. This approach, where it is up the operator to determine the appropriate core point in the confining zones, is common for UIC permits throughout the country. The core analysis data and geologic information (geophysical logs, drill cuttings, and mud log) will be provided to EPA to demonstrate that (1) the cores were collected from a representative portion of the confining zones, and (2) the properties of the confining zone are adequate to provide isolation between the USDWs and the injection zone.

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						Further, Powertech requests the draft permit be modified to require collection of core only in the first well, rather than in each well. The overlying and underlying geologic confining units (Opeche Shale and Lower Minnelusa) are pervasive in the Dewey-Burdock area, and the intrinsic values for the formation properties are expected to be substantially similar at different locations across the site. After drilling the first Class V well (which will include core of the confining zones), geologic logs from subsequent wells will be compared to the first well to demonstrate consistency and continuity of the geologic confining units. Figures A-2, A-3, A-4, D-21 and D-22 in the permit application show consistent log character for the overlying confinement (Minnekahta and Opeche Shale) and underlying confinement (Lower Minnelusa, where logs are deep enough) over large distances (10-20 miles). New log information from the wells to be drilled at the project site will provide even more detail that will further support the regional information. Requested changes are shown below. **II.B. Collection of Drill Core in the Injection Zone and Confining Zones** 1. The Permittee shall collect drill core from the injection zone, the overlying confining zone formation and the underlying confining zone while drilling the first well under this Area Permit as described in Table 2 for the reasons stated in Table 2. Laboratory data may be supplemented by data from pressure transient testing and porosity information from the BHC Sonic log. 2. The Permittee shall compare geologic logs from subsequent wells to the first well to demonstrate consistency and continuity of the geologic confining units. ~~3~~2. The information shall be included in the Injection Authorization Data Package Report for each Class V injection well. ~~4~~3. The effective porosity and permeability of the injection zone formations shall be used as the input values in the equation used to calculate decline of injection zone pressure with distance away from the injection well described in Part II, Section F.2. **Table 2. Drill Core Collection for Laboratory Testing** TYPE OF TEST: While drilling the first ~~each~~ injection well, core samples shall be collected in the Minnelusa Injection Zone. PURPOSE: For laboratory testing to determine the porosity, effective porosity and DUE DATE: Prior to receiving ~~Limited~~ Authorization to Inject

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<table>
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<tr><td></td><td>permeability of the injection zone.</td><td></td></tr>
<tr><td>While drilling the first ~~each~~ injection well, core samples shall be collected within the ~~lower 50 feet of the~~ Opeche Shale Confining Zone</td><td>For laboratory testing to determine the permeability and hydraulic conductivity of the overlying confining zone.</td><td>Prior to receiving ~~Limited~~ Authorization to Inject</td></tr>
<tr><td>Samples shall be collected from the ~~top 50 feet of the~~ Lower Minnelusa confining zone while drilling the first injection well ~~DW No. 1, if the borehole is drilled to the base of the Deadwood Formation OR while drilling the Madison water supply wells, if they are approved by the South Dakota Water Rights Program~~.</td><td>For laboratory testing to determine the permeability and hydraulic conductivity of the underlying confining zone.</td><td>Prior to receiving ~~Limited~~ Authorization to Inject</td></tr>
</table>

II.E.2. Core Sample Collection from Confining Zones
a. During the drilling of ~~each~~ the first injection well, core samples within the ~~lower 50 feet of~~ Opeche Shale confining zone shall be collected.
b. During the drilling of the first injection well ~~DW No. 1, if it is drilled down to the base of the Deadwood~~, core samples shall be collected within the ~~top 50 feet of the~~ Lower Minnelusa Formation ~~lower~~ confining zone.
~~c. If DW No. 1 is not drilled down to the base of the Deadwood, core samples shall be collected within the top 50 feet of the Lower Minnelusa Formation during the drilling of the Madison water supply wells, if they are approved by the South Dakota Water Rights Program.~~
</td></tr>
<tr><td>8</td><td>6</td><td>II.C.5</td><td>---</td><td>---</td><td>A</td><td>Comment:
The draft permit requires performance of deviation checks in a pilot hole, and then reaming the pilot hole to enlarge the diameter.</td></tr>
</table>

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						Requested Change: The proposed Class V wells will be designed for and drilled with equipment commonly used for oil and gas wells where detailed deviation checks can be performed without the need for a pilot hole. The deviation checks discussed in 40 CFR § 146.12(d)(1) refer to a well where a pilot hole is planned, whereas no pilot hole is planned for any of the Powertech Class V wells. Powertech requests that the pilot hole requirement be removed. During drilling, deviation checks will be performed with either (1) single-shot survey tools (wireline survey tools run approximately every 1,000 feet that have an accuracy of ¼ of one degree), or (2) measurement while drilling (MWD) tools that "continuously" (every 30 feet) measure deviation to an accuracy of 1/10 of one degree). Pilot holes may be drilled in some situations where a large-diameter completion is required and very tight vertical deviation tolerances are necessary for installation of downhole pumps (e.g., municipal water supply wells where the final hole diameter is 18-36 inches and line shaft turbine pumps are used). This is a very different application from that proposed for Class V wells under this permit. A pilot hole approach would cause a large cost increase (due to drilling the pilot and subsequent reaming) and could cause hole problems due to longer exposure times for water-sensitive shales (e.g., the Morrison and Opeche). Requested changes are shown below. 5. The Permittee shall perform deviation checks on all injection well holes ~~constructed by first drilling a pilot hole, and then enlarging the pilot hole by reaming or another method~~. Such checks shall be conducted at sufficiently frequent intervals to assure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling.
9	7-9	II.D Tables 6-7 II.D.2.b-h	21-22 33-34	3.4 5.3.1 Table 12	R	**Comments:** Given the extensive sampling of the Fall River and Chilson throughout the project area (as documented in the draft Class III permit and Class III permit application), additional characterization of the water quality in these overlying aquifers is not necessary. Between 2006 and 2010, baseline water quality samples were collected from 30 Inyan Kara wells (in either the Fall River or Chilson or both) and 4 Unkpapa/Sundance wells within the AOR. Between 1 and 15 samples were collected from each well resulting in over 200 samples in all. Data from these samples are presented in Appendices N and O of the Class III permit application.

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						Further, sampling every zone above the injection zone is inconsistent with UIC regulations (40 CFR 144 and 146). The Class V permit application and the Class V fact sheet indicate that the Minnekahta is not an aquifer at Dewey-Burdock, so it should not be sampled. The fact sheet clearly states that in the project area there is no evidence of porosity in the Minnekahta and that regionally, it is only an "aquifer" near surface where dissolution has occurred (p. 21). Given this evidence, there should not be a requirement to test the Minnekahta. This requirement is inconsistent with data provided in the permit application. With regard to the Minnelusa sampling (for each Class V well), Powertech requests: (1) sampling be based on field parameters that indicate formation fluid as determined in the field; (2) duplicate analyses of two fluid samples be performed (from the same sampling run); (3) bottom-hole pressure (indicative of potentiometric surface) will be recorded in the same 1-hour pressure monitoring period; (4) use of geophysical log data to calculate formation water salinity (indicated by NaCl concentrations) for the Fall River, Chilson, Unkpapa/Sundance and Minnelusa in all Class V wells; and (5) sampling be conducted "as appropriate given the tools available" as detailed in Comments #32 and 33. It is likely that the final Minnelusa formation water samples will be collected by swabbing through tubing after the production casing is installed and the casing has been perforated. The workover rig will install a work string (e.g., 2 7/8" tubing) and a work packer will be set above the top Minnelusa perforation. Swab cups will be installed on a swabbing line run from the surface and into the injection tubing to a depth commonly on the order of 1,000 to 2,000 feet. As the swab line is pulled back up through the tubing, formation fluid will be drawn up into the tubing, and eventually to the surface. The swabbing process is performed repeatedly so that completion fluid and near-wellbore filtrate are removed from the well, followed by formation fluid. The swab fluid parameters (temperature, pH, conductivity) will be measured and evaluated to determine when true formation fluid (as compared to drilling mud filtrate) has been recovered. Once formation fluid is present at the surface, duplicate fluid samples will be collected for the required fluid analyses.

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						Requested Change: Powertech requests the overlying sampling zone include only the Unkpapa/Sundance (in the first Class V well only). Powertech requests the ability to use, as an alternative, nearby existing well data and data from any new wells which may be in place at the time of drilling of the Class V well to provide water quality data on the Unkpapa/Sundance aquifer. See also comments #4 and #11 regarding Madison aquifer data collection. Requested changes are shown below.

Table 6. Aquifers to be Tested during Injection Well Drilling

Well Drill Hole	Aquifers to be Tested
DW No. 1	~~Fall River~~ ~~Chilson~~ Unkpapa/Sundance (first well only) ~~Minnekahta Limestone~~ Minnelusa porosity zone
DW No. 3	~~Fall River~~ ~~Chilson~~ Unkpapa/Sundance (first well only) ~~Minnekahta Limestone~~ Minnelusa porosity zone
~~DW No. 1, if it is drilled to the base of the Deadwood Formation AND the Madison water supply wells, if they are approved by the South Dakota Water Rights Program.~~	~~Minnelusa aquifer~~ ~~Madison aquifer~~

Table 7. Formation Testing Program

TYPE OF TEST	PURPOSE	DUE DATE
Isolate each aquifer specified in Table 6 and measure the potentiometric surface elevation of each aquifer specified in Table 6 as it is intersected by the wellbore	To determine the potentiometric surface elevation of each aquifer, including the injection zone	Prior to receiving ~~Limited~~ Authorization to Inject
Aquifer fluid sampling and analysis: A minimum of two (2) fluid samples shall be collected from each aquifer	To characterize the water quality of each aquifer intersected by the well bore.	Prior to receiving ~~Limited~~

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						specified in Table 6 for analyses of the parameters in Table 8		Authorization to Inject
						TDS evaluation of the injection zone based on a minimum of two (2) fluids samples from the Minnelusa injection zone according to the requirements under Part II, Section D.2.f and g.	To demonstrate the injection zone is not a USDW	Prior to receiving ~~Limited~~ Authorization to Inject
						Further characterization Minnelusa Injection Zone with respect to Bicarbonate, Calcium, Carbonate, Chloride, Fluoride, Magnesium, Potassium, Sodium and Sulfate concentrations. Report results as mg/L, milliequivalents per liter and plot as STIFF diagram show in Figure 2.	To verify the Minnelusa injection zone and Madison aquifer are hydrologically separated as described in Part II, Section E.3.	Prior to receiving ~~Limited~~ Authorization to Inject
						Characterization of the Madison Formation ~~at DW No. 1, if it is drilled to the base of the Deadwood Formation AND~~ at the two Madison water supply wells, if they are approved by the South Dakota Water Rights Program and if they are constructed, with respect to Bicarbonate, Calcium, Carbonate, Chloride, Fluoride, Magnesium, Potassium, Sodium and Sulfate concentrations. Report results as mg/L, milliequivalents per liter and plot as STIFF diagram show in Figure 2.	To verify the Minnelusa injection zone and Madison aquifer are hydrologically separated as described in Part II, Section E.3.	Prior to receiving ~~Limited~~ Authorization to Inject
						Measurement of additional parameters in the Madison aquifer required for updating the drawdown	To provide the input parameters for the drawdown model that will	Prior to receiving ~~Limited~~

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						model of the Madison aquifer potentiometric surface described in Section 4.0 of the Report to Accompany Madison Water Right Permit Application submitted to the DENR Water Rights Program using site specific data, if the Madison wells are constructed. | determine the expected drawdown in the Madison aquifer at each Madison water supply well with 10~~2~~ years of pumping. | Authorization to Inject Initial Temperature Survey Log[3] | To establish baseline temperatures of formations along well bore. | Prior to receiving ~~Limited~~ Authorization to Inject **2. Aquifer Fluid Sampling Requirements** b. Before aquifer sample collection, each aquifer specified in Table 6 shall be isolated within the drill hole to prevent inflow of groundwater from other aquifers. c. Once the potentiometric surface for each isolated aquifer has been allowed to stabilize for 30 minutes, the Permittee shall collect three potentiometric surface elevation measurements a minimum of 15 minutes apart. After the potentiometric surface elevation measurements have been recorded, fluid samples shall be collected from each aquifer specified in Table 6 using the procedures in Part V, Section D.1.b and c of this Area Permit. ~~d. If the potentiometric surface of Minnekahta Formation is not above the top of the formation, the Permittee is not required to collect any fluids samples from the Minnekahta Formation. If the potentiometric surface of the Minnekahta aquifer fluid is above the top elevation of the formation, then the Permittee shall collect aquifer fluid samples to analyze for TDS and the other constituents in Table 8. If the Minnekahta Formation is not able to sustain pumping rates necessary for representative aquifer fluid samples to be collected, then the Permittee shall document sampling efforts, but is not required to collect fluids samples from the Minnekahta Formation.~~ d~~e~~. A minimum of two fluid samples from each aquifer specified in Table 6 shall be collected as appropriate given the tools available. ~~The second sample shall be collected after one drill stem volume of groundwater has been removed after the collection of the first sample.~~ e~~f~~. The two fluid samples from each aquifer specified in Table 6 shall be analyzed for the analytes listed in Table 8 using the analytical methods shown. Equivalent analytical methods

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						may be used after prior approval by the Director. Analytical results shall be reported in the units listed in Table 8. ~~g. In addition to the two samples collected under Part II, Section D.2.f, a minimum of three more samples shall be collected from the injection zone aquifer and analyzed for TDS only. One drill stem volume of groundwater shall be removed between the collection of each sample.~~[4] ~~fh.~~ The Permittee shall include the following information in the Injection Authorization Data Package Report submitted to the Director: i. Methods for aquifer isolation; ii. Sample collection methods; iii. Methods for insuring fluid sample is representative of the aquifer conditions; and iv. Methods for drilling fluid tracer sampling, field testing and analysis.
10	9	II.D.2.a	33	5.3.1	R, A	**Comment:** The draft permit requires use of a tracer (typically ammonium nitrate) to differentiate between drilling mud/filtrate and formation fluid. When the permit application was submitted (2010), it was common to use ammonium nitrate and it could be readily obtained. Since that time, it has become difficult to obtain due to Homeland Security concerns. Further, as far as Powertech is aware, the vast majority of sampling for Class V and Class I wells throughout the country has been conducted without the use of a tracer, and fluid samples from those wells have been approved by EPA and various state agencies. **Requested Change:** Powertech requests this permit requirement for a drilling mud tracer be removed and that this determination can be made using field sampling parameters and through observation of these parameters until they reach stability per Table 14. Measurement of field parameters has been proven to be sufficient to demonstrate that representative samples of formation fluid are obtained. The requested change is indicated below. The requirement in Part II, Section D.2.c to collect samples according to the procedures in Part V, Section D.1.b and c will necessitate measurement of field parameters without having to make additional modifications to address this comment. **2. Aquifer Fluid Sampling Requirements** ~~a. The drilling program for each well shall include the addition of a tracer in the drilling fluids. The tracer used for this purpose shall be such that the Permittee is able to analyze for the presence of the tracer in aquifer fluids samples using field testing methods. The tracer shall also be included as an analyte for laboratory testing of formation fluids to verify that no drilling fluid residual is present in the formation fluid samples.~~

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11	4 5 8 11	II.A.1.c Table 2 II.C.3 Table 7 II.E.1.d	16 17 33- 35	3.3.1 3.3.2 5.3.1 Tables 12&13 5.3.3	A	**Comment:** The Draft permit requires that Powertech characterize the Madison (which underlies the Lower Minnelusa confining zone and the Minnelusa injection zone) if DW No. 1 is drilled to the Deadwood, and in future water supply wells drilled under a South Dakota Water Rights permit. The confinement between the Minnelusa and Madison is clearly evident in geologic cross sections provided in the permit application and discussion found in the South Dakota DENR Report to the Chief Engineer on Water Permit Application No. 2685-2 (Exhibit 001). In the Dewey-Burdock Project area, there is no question about the continuity of the Lower Minnelusa confining zone that will isolate the Minnelusa injection zone from the Madison. **Requested Change:** As described in comment #4, Powertech requests removal of any requirement to collect Madison data from the drilling of Class V injection wells. In reference to potential Madison wells, Powertech requests that in all instance where the terms "if they are approved by the State of South Dakota" be further modified to "if they are approved by the State of South Dakota and if constructed". This would not necessitate the construction of the Madison wells as a condition of the Class V permit. Due to the requirement to conclude the State of South Dakota hearing prior to Madison well construction, Powertech would not want installation or operation of the Class V wells contingent on approval of a State of South Dakota water rights permit. Powertech anticipates that it will drill one or more Madison wells within the project area, and for any wells completed will collect data as listed in this section. An example of the requested text change for Part II, Section A.1.c is provided below (see also comment #4, which requests moving the Part II, Section A.1 requirements). **II.A. Injection Authorization Data Package Report** **1. Information to Submit to the Director to Obtain a Limited Authorization to Inject for Testing Purposes** For each injection well, the Permittee shall provide the following information, further described in Sections B through H, to the Director for evaluation. After evaluating the information, the Director will determine if it is appropriate to issue a written Limited Authorization to Inject to authorize the Permittee to commence injection activity for testing purposes only. c. Evaluation of the Minnelusa and Madison aquifer fluids ~~at DW. No. 1,~~ if ~~it is drilled to the base of the Deadwood Formation, AND at~~ the Madison water supply wells~~, if they~~ are approved by the South Dakota Water Rights Program and if they are constructed, to provide

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						additional confirmation that the injection zone formation is hydraulically isolated from the Madison aquifer at the Dewey-Burdock Project Site.
12	8 13	II.D Table 7 II.E.3.b.i II.F.2.a	31	4.4.4	C	**Comment:** Since the Class V permit duration is 10 years, it would be appropriate to model the drawdown in the Madison aquifer for 10 years rather than 12 years as required in the permit. A shorter duration for drawdown modeling is also warranted because the drawdown in the Madison is expected to be minimal with little change over time (Exhibit 001 at 9-10). Similarly, it would be more appropriate to calculate the injection zone formation pressures resulting from 10 years of injection activity rather than 12 years. **Requested Change:** In Table 7 and elsewhere, Powertech requests changing the modeling requirement for the Madison aquifer from 12 to 10 years. Powertech also requests removing the requirement to submit this information prior to receiving a limited authorization to inject and revising this to be submitted with a request for the final authorization to inject. Powertech requests revising Part II, Section E.3.b.i to remove the requirement for testing of the Madison aquifer should these wells not be approved by South Dakota DENR or not be constructed. Representative requested revisions are provided below. **II.E.3.b. Calculation of Potentiometric Surface Drawdown at the Madison Water Supply Wells** i. ~~After the testing of the Madison aquifer has provided the information on the potentiometric surface and other parameters required, t~~The Permittee shall generate a drawdown model of the change in the potentiometric surface of the Madison aquifer that can be expected to result from 10~~2~~ years of pumping the Madison aquifer at each of the Madison water supply wells. If available, the drawdown model shall use information on the potentiometric surface and other parameters for the Madison aquifer from Madison water supply wells at the Dewey-Burdock Project Site. Otherwise, regional data sources shall be used. **II.F. Injection Zone Pressure and Maximum Injection Rate Calculations** **2. Calculation of Injection-Induced Injection Zone Pressure** a. For each injection well, the Permittee shall calculate the injection zone formation pressures resulting from 10~~2~~ years of injection activity at the injection rate needed to dispose of the maximum anticipated volume of treated ISR waste fluids versus distance away from each injection well. Cumulative effects of injection from multiple wells shall be considered as applicable.

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13	11-12	II.E.1.e	17	3.3.2	A, R	**Comment:** The Formation Integrity Test (FIT) requirement is unnecessary and could cause impairment of the lower confinement due to testing to or above fracture pressure. **Requested Change:** As discussed previously, Powertech is committed to collection of core from the Lower Minnelusa in the first well. Analysis of that core, combined with geophysical logs across the Lower Minnelusa, will provide adequate demonstration of the integrity of the Lower Minnelusa confining zone. Lab testing of permeability from cores is superior to results obtained by FIT because it represents an actual measurement of the formation as opposed to indirectly measuring through FIT. The suitability of the Lower Minnelusa as a confining zone is also evidenced by regional hydrogeologic data collected by South Dakota DENR observation locations, as referenced in the fact sheet, and is supported by South Dakota DENR (Oil and Gas Program) who authorized the Barker Dome Class II injection wells completed in the Minnelusa and located immediately northeast of the project area. The permit file for the Ozark #3 Coffing Class II injection well, which is 3.5 miles east-northeast of the project area, is provided as Exhibit 006. Powertech requests removing the draft condition in Part II, Section E.1.e.
14	10 33	II.D Table 8 V.D.2 Table 16	35	Table 13	I, C	**Comment/Questions:** a. Are analyses for metals and radionuclides total or dissolved fractions? b. Why are the analytical methods different from those listed in the draft Class III permit (e.g., alkalinity, bicarbonate, sulfate, etc. have different methods in Table 8 of the draft Class III permit)? c. What would be the process for obtaining approval of alternate analytical methods? **Requested Change:** a. In Tables 8 and 16, metals and radionuclide samples should be analyzed for dissolved fractions to provide analytical results that represent the soluble (mobile) metals rather than suspended (particulate) metals. Dissolved analyses generally are preferred for most RCRA, CERCLA, and SDWA programs and consistent with permit requirements for UIC wells in other EPA regions and states. This would also be consistent with NRC requirements under the approved license, SUA-1600, for the Dewey-Burdock Project. b. In Table 8, Powertech requests that analytical methods be changed to be consistent with the Class III permit, Table 8. This would also make the laboratory analytical methods consistent with NRC license requirements (specifically with Table 6.1-1 of the approved NRC license

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						application). This will bring a consistency for data collected across the project. Further, Powertech request that total analysis may be left as an alternative method if needed.
15	13	II.F.1	33 41	5.3.1 Table 12 6.0	A, R	**Comment:** The requirement for determination of the potentiometric surface for all overlying aquifers is unwarranted, especially given that the critical pressure rise calculation is only required for the Unkpapa/Sundance (first overlying) aquifer. **Requested Change:** Powertech requests that this condition be limited to the first overlying aquifer (Unkpapa/Sundance). Please see comment #9 regarding the Minnekahta formation. Potentiometric data for the Inyan Kara and Unkpapa/Sundance aquifers have already been collected through existing well data. Powertech requests the ability to use, as an alternative, nearby existing well data and data from any new wells which may be in place at the time of drilling of the Class V well to provide potentiometric data on the Unkpapa/Sundance aquifer. Mapping of the potentiometric surfaces for the Inyan Kara aquifer, represented for the Fall River and Chilson, are presented in the Figures 5.2 and 5.3, respectively, of the Class III permit application. These potentiometric surface maps are based upon a number of observations and well locations and are mapped across the well sites for DW No. 1 and 3. In addition, potentiometric surface data for the Unkpapa/Sundance aquifer is presented in the Class III permit application (Figure 2.5 in Appendix J). Requested changes are provided below. **II.F. Injection Zone Pressure and Maximum Injection Rate Calculations** **1. Calculation of Critical Pressure Rise in the Minnelusa Injection Zone** After the depths have been determined to the top and bottom of the injection zone and the Unkpapa/Sundance ~~each~~ aquifer at each injection well location based on drillhole log, and the potentiometric surface~~s~~ has~~ve~~ been measured for the Unkpapa/Sundance ~~each~~ aquifer intersected by the injection well, the Permittee shall calculate the critical pressure rise that is needed within the injection zone to move fluids into a USDW along a hypothetical pathway through the confining zone. For the Minnelusa injection zone, this would be the critical pressure rise needed to move injection zone fluids into the Unkpapa/Sundance and Madison USDWs, respectively, at DW No.1 and DW No. 3. Representative potentiometric surface data for the Unkpapa/Sundance and Madison aquifers from wells within the Dewey-Burdock Project Site may be used, and regional data may be used for the Madison aquifer if the Madison water supply wells are not constructed.

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16	13	II.F.2.c	26, 30	4.4.2.1 Table 9	I, R	**Comment:** There is no evidence whatsoever that (a) oil/gas wells or (b) the Dewey Fault are potential conduits for flow from the Minnelusa injection zone to the first overlying aquifer. This characterization is supported by the permit application and the South Dakota DENR Report to the Chief Engineer on Water Permit Application No. 2685-2 (Exhibit 001 at 9, paragraph 1). Powertech believes that EPA may have misinterpreted the data provided in the application. **Requested Change:** Reference to either oil/gas wells or the Dewey Fault as conduits for vertical flow out of the injection zone within the project area should be removed because of the following: a. Earl Darrow #1 was properly plugged and abandoned with records included in the application. b. There are no data supporting the Dewey Fault as a conduit to flow between the aquifers. c. In the Class V fact sheet, Madison/Minnelusa well pairs at Hell Canyon shown on page 20 are 2 miles northwest of the Dewey Fault. These wells exhibit a difference in potentiometric surface, indicating confinement and hydrogeologic isolation between the Madison and Minnelusa in proximity to the fault. Further, the potentiometric surface of the Madison is well above (i.e., higher than) that in the Minnelusa by approximately 35 feet at this location. These data indicate that if a conduit for flow existed (which certainly does not up to the Dewey Fault or there would be little head difference), flow would be from the Madison into the Minnelusa. Powertech requests removal of the permit condition in Part II, Section F.2.c and removal of language in the draft permit and fact sheet indicating that either oil and gas test wells or the Dewey Fault act as a conduit between the Minnelusa and overlying or underlying aquifers.
17	14	II.F.3.a	29	Sec. 4.4.2.2	R, C	**Comment:** There is no explanation or evidence for the 1,000-foot offset restriction around the pre-existing offset area surrounding plugged oil and gas wells. Powertech has already (conservatively) requested an offset from those wells, even though plugging records clearly indicate that wells are property plugged. There is no basis for EPA to add another 1,000 feet to the offset requested in the permit application. Because of records to the contrary, the Earl Darrow #1 well does not serve as a potential conduit for flow, and there are no other oil and gas test wells penetrating the Minnelusa or deeper in the project area. **Requested Change:** Powertech requests removing the 1,000-foot offset requirement as shown below.

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						II.F.3. Calculation of Maximum Injection Rate for Each Class V Injection Well a. After the Permittee has calculated the critical pressure rise for each injection zone and the injection-induced injection zone pressure according to distance from each injection well using the injection rate needed to dispose of the maximum volume of treated ISR waste fluids and 10~~2~~ years of injection activity, the Permittee shall calculate a maximum injection rate for each injection well. ~~The maximum injection rate shall be determined such that the critical pressure in each injection zone is not exceeded 1,000 feet away from the nearest potential breech in confining zones, as discussed in Sections 4.4.2, 5.4.3 and 7.7.2 of the Class V Area Permit Fact Sheet.~~ This maximum injection rate shall ensure that no injection zone fluids move out of the injection zone through a pathway through the confining zones.
18	14	II.H.1	---	---	I	**Comment:** For consistency with regulatory requirements and for internal consistency, references to EPA or EPA Region 8 program should be changed to "the Director" wherever reference is made to EPA in its role as UIC program Director. **Requested Change:** **II.H. Initial Demonstration of Mechanical Integrity** **1. Prior Notification Requirement** Before conducting the initial mechanical integrity tests on each Class V injection well, the Permittee shall notify the ~~EPA Region 8 UIC program~~ Director a minimum of 30 days prior to testing date to give the ~~EPA~~ Director an opportunity to witness the test.
19	14 15	II.H.3 II.I.1.g	39	Sec. 5.5.2	I, C	**Comment:** It is requested that all permit conditions reflect consistency with permit condition Part II, Section H.3, which states the Cement Bond Log shall demonstrate 80% bonding through confinement zones (as opposed to applying the requirement to all casing above the injection zone). This is supported by industry references (Fitzgerald and others; SPE Paper 12141; Exhibit 002). **Requested Change:** Requested revisions are presented below. **II.I. Evaluation of the Injection Authorization Data Package Reports for Limited Authorization to Inject** 1. The Director will evaluate the information provided in the Injection Authorization Data Package Reports and may issue a written Limited Authorization to Inject for testing purposes only. The Director will issue Limited Authorization to Inject only after finding:

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						g. The well construction completion report demonstrates that each injection zone is isolated from USDWs by well casing and cement, meeting the requirements of Part III, Section D, and that there is a bond between at least 80% of the well casing and cement through confinement zones as demonstrated by the cement bond log;
20	16	II.J.4.a	36, 37	5.3.4.2	I, C, A	**Comment:** The requirement to monitor pressure within the injection zone may be problematic if a perforated interval were near the top of the injection zone, as it is ill advised to run tools below perforations. **Requested Change:** Change the permit language to allow for monitoring pressure within 50 feet of the top of the injection zone. This will allow for suspension of downhole gauges above perforations to mitigate risk of tool loss in the well. The requested change is shown below. **II.J.4. Step Rate Test and Determination of Maximum Allowable Injection Pressure** **a. Fracture Pressure:** The Permittee shall run an injection Step Rate Test for each well to determine the site-specific pressure at which fractures form in the injection zone at each injection well location. During the Step Rate Test, the Permittee shall monitor pressure within 50 feet of the top of the injection zone, as well as surface injection pressure. The Step Rate Test results shall be submitted to the Director for evaluation.
21	16 24 25 25 25 25 26 28-29 29 29 30 36 37 38 40 43	II.I.4.c III.H.2 III.J.2 III.J.2.e III.J.3 III.J.5 III.L.3 V.A.1 V.B.2 V.B.3 V.C.5.a V.E.3 Table 18 VI.A VII.C VII.D.11	---	---	I	**Comment:** For consistency with regulatory requirements and for internal consistency, references to EPA or EPA Region 8 program should be changed to "the Director" wherever reference is made to EPA in its role as UIC program Director. **Requested Changes:** - Page 16, Part II, Sec. I.4.c: "The MAIP permit limit for each injection well will be included in the Authorization to Commence Injection approval document issued by the Director~~EPA~~. - Page 24, Part III, Sec. H.2: "The Permittee shall submit to the Director~~EPA~~ an as-built final wellhead schematic diagram as part of the well construction completion report. - Page 25, Part III, Sec. J.2: "Prior to constructing an additional well under this Area Permit, the Permittee shall seek authorization to construct by submitting the following materials to the Director~~EPA~~:" - Page 25, Part III, Sec. J.2.e: "a list of all wells penetrating the Confining Zone within the Area of Review (AOR) of the new well including cementing records and cement bond logs any new wells within the AOR not previously evaluated by the Director~~EPA~~."

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	45 46	VIII.A.2 VIII.J				- Page 25, Part III, Sec. J.3: "Once the Director~~EPA~~ has confirmed that the proposed injection well meets permit conditions, the Director~~EPA Region 8~~ will authorize construction by written communication to the Permittee." - Page 25, Part III, Sec. J.5: "The Permittee shall construct a requested injection well within one year of the Director~~EPA~~ construction authorization date as described in Section K." - Page 26, Part III, Sec. L.3: "…and shall provide this and any other record of well workover, logging, or test data to the Director~~EPA~~ in the next Quarterly Monitoring Report." - Page 28-29, Part V, Sec. A.1: "The falloff testing report should be submitted to the Director~~EPA~~ no later than 60 days following the test. Failure to submit a falloff test report will be considered a violation of the Area Permit and may result in an enforcement action. Any exceptions should be approved by the Director~~EPA~~ prior to conducting the test." - Page 29, Part V, Sec. B.2: "… the Permittee shall immediately cease injection and report to the Director~~EPA~~ within twenty-four (24) hours according to Part VII, Section D.11.e of this permit. Injection shall not resume until the Permittee has obtained approval to recommence injection from the Director~~EPA~~." - Page 29, Part V, Sec. B.3: "For any seismic event occurring between two and fifty miles of the permit boundary, that event will be recorded and reported to the Director~~EPA~~ on a quarterly basis." - Page 30, Part V, Sec. C.5.a: "Before conducting the regularly scheduled mechanical integrity tests on each Class V injection well, the Permittee shall notify the Director~~EPA Region 8 UIC program~~ a minimum of 30 days prior to the testing date to give the Director~~EPA~~ an opportunity to witness the test. The Director may allow a shorter notification period if it would be sufficient to enable the Director~~EPA~~ to witness the mechanical integrity test." - Page 36, Part V, Sec. E.3: "The Permittee shall notify the Director~~EPA~~ as to the location where injection well records are maintained. The Permittee shall notify the Director~~EPA~~ if this location changes." - Page 37, Table 18: "REPORT DUE TO THE DIRECTOR~~EPA~~" - Page 38, Part VI, Sec. A: "**Requirement for Director~~EPA~~ Approval before Plugging and Abandonment of Class V Deep Injection Wells**." - Page 40, Part VII, Sec. C: "In accordance with 40 CFR part 2 and 40 CFR § 144.5, information submitted to the Director~~EPA~~ pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page

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						containing such information. If no claim is made at the time of submission, the Director~~EPA~~ may make the information available to the public … ” - Page 43, Part VII, Sec. D.11: “Before written Authorization to Commence Injection is issued … and shall be submitted to the Director~~EPA~~ at the following address … After written Authorization to Commence Injection is issued … and shall be submitted to the Director~~EPA~~ at the following address:” - Page 45, Part VIII, Sec. A.2: “The Permittee, when periodically requested to revise the plugging and abandonment cost estimate discussed above, must submit 3 current independent plugging and abandonment cost estimates for the Director~~EPA~~ to accurately determine the likely cost to plug the well(s).” - Page 46, Part VIII, Sec. J: “The demonstration of financial responsibility shall be submitted to the Director~~EPA~~ …. Any well construction activities are prohibited until financial responsibility has been approved by the Director~~EPA~~.”
22	16 17	II.J Table 10 II.J.2.a	36	Table 14	I, C	**Comment:** The permit requirement limits Part II MIT logging to Radioactive Tracer (RAT) logs. Few vendors run RAT logs, and it may be difficult for those vendors to get a license to bring RAT tools into South Dakota. Temperature logs should also be considered. **Requested Change:** EPA Guidance No. 37 indicates that Part II MIT may be demonstrated by cement bond log showing 80% bond through an appropriate interval, <u>or</u> radioactive tracer survey, <u>or</u> temperature survey. Further, 40 CFR § 146.8 (general UIC) clearly indicates that a temperature log alone may be used. It states that other or alternate tests may be allowed by the Director/Administrator or may be required if the results are unsatisfactory. Powertech is committed to running a cement bond log and a temperature log to demonstrate Part II MIT. This process is commonly used on Class I wells in EPA Region 8 pursuant to 40 CFR § 146.14(b). Powertech requests the following change to provide flexibility in the event that RAT tools cannot be located. **Table 10. Formation Testing Involving Injection** TYPE OF TEST: Step Rate Test PURPOSE: Initial test to determine site specific fracture gradient and fracture pressure to use for calculating MAIP permit limit for each well. Injection pressures shall be monitored at surface and bottom hole to determine friction loss for each well.

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<table>
<tr><th rowspan="2">No.</th><th colspan="2">Draft Permit</th><th colspan="2">Fact Sheet</th><th rowspan="2">Type</th><th rowspan="2">Comment and Recommended Permit Language Revision or Other Modification</th></tr>
<tr><th>Page</th><th>Section</th><th>Page</th><th>Section</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>Initial Radioactive Tracer Survey or Temperature Log</td><td>Baseline assessment of ability of the cement behind the longstring casing to prevent movement of injected fluids out of the approved injection formation.</td></tr>
</table>

II.J.2. Initial Radioactive Tracer Survey or Temperature Log
a. After the Step Rate Test has been run to identify injection zone fracture pressure, the Permittee shall conduct an initial radioactive tracer survey or temperature log for each injection well while injecting at a pressure below the injection zone fracture pressure but not below the MAIP permit limit.
</td></tr>
<tr><td>23</td><td>19-20</td><td>III.B Table 11 Figures 3-4</td><td>43</td><td>Table 16</td><td>I, C</td><td>
Comment:
The DW No. 1 Alternate surface casing and cement interval in Table 11 are inconsistent with Figure 4.
Requested Change:
Surface casing in the table should be corrected to an approximate depth of 970 feet as shown below. Also, as described in comments #4 and #11, Powertech requests removal of Figure 3 and its listing in Table 11.

Table 11. Well Casing and Cement Summary
<table>
<tr><th></th><th colspan="2">Burdock</th><th>Dewey</th></tr>
<tr><td></td><td>~~DW No.1 (Figure 3)~~</td><td>DW No.1 ~~alternate~~ (Figure 4)</td><td>DW No.3 (Figure 5)</td></tr>
<tr><td>Conductor Casing (in)</td><td>~~13 3/8"~~</td><td>13 3/8"</td><td>13 3/8"</td></tr>
<tr><td>Depth (ft)</td><td>~~60'~~</td><td>60'</td><td>60'</td></tr>
<tr><td>Surface Hole (in)</td><td>~~12 1/4"~~</td><td>12 1/4"</td><td>12 1/4"</td></tr>
<tr><td>Depth (ft)</td><td>~~Top of Minnelusa (~1,615')~~</td><td>50' below base of Sundance aquifer (~970~~1,615~~')</td><td>50' below base of Sundance aquifer (~1,305')</td></tr>
<tr><td>Surface Casing (in)</td><td>~~9 5/8"~~</td><td>9 5/8"</td><td>9 5/8"</td></tr>
<tr><td>Cement Interval (ft)</td><td>~~From top of Minnelusa to surface (0' – ~1,615')~~</td><td>From 50' below base of Sundance aquifer to surface</td><td>From 50' below base of Sundance aquifer to surface</td></tr>
</table>
</td></tr>
</table>

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						(0 - ~9701~~,615~~') | (0 - ~1,305')
						Longstring Hole (in) | ~~8 1/2"~~ | 8 1/2" | 8 1/2"
						Depth (ft) | ~~Near base of Minnelusa (~2,765')~~ | Up to ~250' below base of Minnelusa Porosity injection zone (~2,455') | Up to ~250' below base of Minnelusa Porosity injection zone (~2,790')
						Longstring Casing (in) | ~~7"~~ | 5 1/2" | 5 1/2"
						Cement volume | ~~120% of calculated volume between exterior of casing and surrounding annulus.~~ | 120% of calculated volume between exterior of casing and surrounding annulus. | 120% of calculated volume between exterior of casing and surrounding annulus.
						Cement Interval (ft) | ~~From base of Minnelusa to surface (0' - < ~2,765')~~ | Up to ~250' below base of Minnelusa Porosity injection zone to surface (0' - ~2,455') | From ~250' below base of Minnelusa Porosity injection zone to surface (0' - ~2,790')
						Open Hole (ft) | ~~6 1/4"~~ | n/a | n/a
						Total Depth (ft) | ~~At Precambrian basement (~3,195')~~ | Up to 250' below base of Minnelusa Porosity injection zone (~2,455') | Up to 250' below base of Minnelusa Porosity injection zone (~2,790')
24	19	III.B	41 42	6.0 6.1	I, A	**Comment:** The permit does not provide for reasonable and expected, normal, minor changes in well construction. Due to potential conditions in the field and minor variations in geology at different locations, it is not possible to dictate exact intervals and casing depths, packer depth, tubing depth, or perforations before a well is drilled. As such, some flexibility is required for well construction. This type of flexibility is common for Class V and Class I wells regulated by EPA and various states. In addition, as described in comment #6, Powertech may use 7" or similar production casing as dictated by technical and design requirements and market conditions. **Requested Change:** Add a statement in Part III, Section B as follows:

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Table 1. Draft Class V Area Permit Specific Comments and Recommended Permit Language Revisions (cont.)

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	Page	Section	Page	Section	Type	
						PART III. WELL CONSTRUCTION REQUIREMENTS **B. Approved Well Construction Plans** The details of the approved well construction plans are summarized in Table 11 and Figures 3 or 4 and 5. It is understood that minor changes in well construction may be necessary and are customary. The permittee has the flexibility to make such changes during well construction as warranted as long as the resulting Class V well construction is consistent with Federal UIC regulations and Part III of this permit. Allowable changes include, but are not limited to, use of 7-inch (or similar) production casing.
25	23	III.D	---	---	I, C	**Comment:** Depth intervals discussed in this section are inconsistent with other sections of the draft permit and should be indicated as approximate for the reasons discussed in the previous comment. Part III, Section D.5 discusses cementing from ~200 feet below base of Minnelusa porosity zone. This is inconsistent with other parts of the draft permit, which indicate that wells may be drilled up to 250 feet below this zone. **Requested Change:** The following changes are requested to make the draft permit internally consistent and to provide some flexibility during well construction. Throughout the permit, Powertech requests changing specific depths to "approximately" to allow for minor changes in the field without requiring a minor modification or approval from EPA (for example, Part III, Sec. D.3 shown below). Powertech requests removing Sections D.6.c and D.7, since field conditions will dictate cement volumes and casing centralizer spacing. It is inappropriate for EPA to specify these construction specifications, since Powertech will demonstrate Part II MIT in accordance with the permit and UIC regulations. **III.D. Casing and Cement** 3. The surface casing shall extend to approximately 50 feet below the lowermost USDW intersected by the well and must be cemented by recirculating the cement to the surface from a point approximately 50 feet below the lowermost USDW intersected by the well. 4. The Permittee shall isolate all USDWs by placing cement between the outermost casing and the well bore; 5. The Permittee shall isolate the injection zone by placing sufficient cement to fill the calculated space between the casing and the well bore: a. For DW No. 1: ~~from base of Minnelusa Formation to surface (if drilled to top of Precambrian Basement) or~~ from ~2500' below base of Minnelusa porosity injection zone to surface, depending on drill hole depth; and

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						b. For DW No. 3: from ~2500' below base of Minnelusa porosity injection zone to surface, depending on drill hole depth. 6. The Permittee shall use cement: a. Of sufficient quantity and quality to withstand the maximum operating pressure; and b. Which is resistant to deterioration from formation and injection fluids~~; and~~ ~~c. In a quantity no less than 120% of the calculated volume necessary to cement off a zone.~~ ~~7. A float shoe shall be used with a float collar one or two joints up from the bottom of the casing and centralizers shall be placed at a minimum of one on every fifth casing joint.~~
26	24	III.H.1	---	---	I, C	**Comment:** A stab fitting or threaded fitting are both suitable. See comment #24 for more detailed discussion on Powertech's request for more flexibility during well construction. **Requested Change:** Powertech requests the following change: **H. Sampling and Monitoring Devices** 1. The Permittee shall install and maintain in good operating condition at the wellhead: c. One-half (1/2) inch stab or threaded fittings, isolated by shut-off valves and located at the wellhead at a conveniently accessible location, for the attachment of a pressure gauge capable of monitoring pressures ranging from normal operating pressures up to at least 500 psi above the Maximum Allowable Injection Pressure (MAIP) specified in Part IV, Section H: i. on the injection tubing; and ii. on the tubing-casing annulus;
27	25	III.K	7	2.0	I, E	**Comment:** The draft permit does not clearly state that "additional wells" would be wells after the first four wells authorized by this permit are installed (e.g., Sec. K.1, K.2). There should be no time requirement for well construction, either for the initial wells (DW No. 1-4) or "additional" wells. The proposed requirements do not seem to consider that there are a number of permits and regulatory approvals needed prior to construction, including State of South Dakota hearings and additional Section 106 NHPA consultation required under the NRC license. Additionally, economic factors outside of Powertech's control may contribute to a delay in the onset of construction. **Requested Change:** Recognizing that EPA's primary concern is that additional wells could be constructed in the project vicinity prior to operations, Powertech proposes to replace the requirement to commence

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						construction within a specified timeline with a requirement to present an annual Area of Review (AOR) update to EPA until construction commences. The AOR update will include an annual review of wells drilled within the AOR (well name/API or DENR number; depth; completed interval; well construction information; evidence that USDWs were isolated and, if the well is deep enough, that the Minnelusa injection zone was isolated). This type of AOR update will provide EPA with information to assure that there are no new AOR issues (potential pathways for flow from the injection zone to a USDW) that have occurred since issuance of the permit. This approach has been used successfully for years by the TCEQ in Texas for regulation of Class V and Class I (radioactive waste) UIC wells. This and other requested changes to address these comments are provided below. **III.K. Postponement of Construction** 1. The Permittee shall present an annual Area of Review (AOR) update to the EPA until construction of the Class V injection wells commences. The AOR update shall include identifying the location, depth, completion interval, and, if applicable, evidence that the Minnelusa injection zone was isolated for any new wells within the permit area ~~commence construction of at least one of the originally proposed Class V injection wells within one year of the Effective Date of the Permit. Authorization to construct and operate shall expire if construction of at least one of the originally proposed Class V injection wells has not commenced within one year of the Effective Date of the Permit, unless the Permittee has notified the Director and requested an extension prior to expiration. Notification shall be in writing, shall state the reasons for the delay and shall provide an estimated date for which well construction will commence. Once Authorization has expired under this part, the complete permit process including opportunity for public comment shall be required before Authorization to construct and operate can be reissued.~~ 2. To obtain authorization for additional wells beyond the four wells authorized by this Area Permit for injection into the Minnelusa injection zone, the Permittee shall follow the permit requirements under Part II of this Area Permit. ~~3. If an additional well is added to this Area Permit, the Permittee shall commence construction of the well within one year of authorization of the additional well. Authorization for construction of the additional well expires after one year from date of issuance, unless the Permittee has notified the Director and requested an extension prior to expiration.~~

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						~~4. After the authorization for well construction has expired, the Permittee shall reapply for authorization to construct an additional well according to the procedures listed in Section J of this Part.~~
28	26 27	III.L.4 IV.F.3	45	7.3	I, C	**Comment:** The Draft permit states that minor modifications, such as adding perforations within the already approved injection zone, would be a major modification. This is an overly restrictive condition. It is common for many UIC well classes that perforations are added within the approved injection zone due to physical plugging, friction loss, or additional porosity discovered through data analysis. In all these examples, additional perforations would help inject more fluid at a lower injection pressure but would not affect fluid containment described in the permit application or specified in the Permit. There is no requirement in 40 CFR 144 or 146 to conduct MIT after adding additional perforations assuming the packer and tubing are not removed. If tubing and packer were removed to add perforations, Part I MIT would be necessary once the tubing and packer were replaced. **Requested Change:** Powertech requests the following changes. **III.L. Workovers and Alterations** 4. Any modification to well construction that is substantially different from the approved well construction plan is allowed only as a major modification of this Area Permit according to 40 CFR § 144.39 and § 124.5. **IV.F. Approved Injection Zone and Perforations** 3. Additional injection perforations may be added once the following requirements are met: a. The new perforations remain within the approved injection zone, b. The top perforation is no higher than the approved top of the injection zone ~~c. The Permittee has received approval from the Director as a major modification of this Permit in accordance with Part III, Section C.2 of this Permit; and~~ ~~d. The Director approves the addition of perforations as a major modification of this Area Permit according to 40 CFR § 144.39 and § 124.5.~~ ~~c~~e. After the addition of perforations, the Permittee shall follow the requirements for well Workovers and Alterations under Part III, Section L if the tubing and packer are removed to add the perforations.

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29	28	IV.K.1	50	7.8	I, C	**Comment:** There are several waste streams identified in the Waste Analysis Plan included with the permit application that are not included in the list of waste fluids in the draft permit (e.g., restoration bleed [whether or not it is processed through RO], yellowcake wash water, bleed from effluent and precipitation circuits, sumps, membrane cleaning solutions, groundwater sweep solutions, and plant washdown water). **Requested Change:** Powertech requests adding the waste streams above, which were included in the permit application, to the permit text. All of these fall into the category of waste fluids generated by the ISR process, which is already described in the draft permit. Further, Powertech requests that EPA update the description of the injectate in both the draft permit and fact sheet to make it clear that only waste fluid generated by the Dewey-Burdock Project would be injected into the Class V wells (as opposed to waste fluid from any other ISR project). Requested changes are provided below. **IV.K. Approved Injectate** 1. Injection fluid is limited to waste fluids from the ISR process generated by the Dewey-Burdock Project. These waste fluids include groundwater produced from well construction, laboratory waste fluids, well field production bleed, ~~and~~ concentrated brine generated from the reverse osmosis treatment of groundwater produced from wellfield during groundwater restoration, restoration bleed not processed by reverse osmosis, yellowcake wash water, bleed from effluent and precipitation circuits, sumps, membrane cleaning solutions, groundwater sweep solutions, and plant washdown water. The groundwater pumped from any portion of the Inyan Kara aquifers for the purpose of remediating an excursion is also approved for injection into the Class V ~~Class V~~ injection wells.
30	29 34-35	V.B.2 Tables 17A and 17F	52-55 56	8.1.2.1 8.1.2.2	I, C	**Comment:** The draft permit has overly restrictive language related to change of operations if seismic events occur. Because low-frequency seismic events (e.g., <2.0 magnitude [MMI scale]) can occur regularly, the reference to "any" seismic event could preclude operations entirely for many days. Except for the BOR Paradox permit, where injection above fracture pressure is specifically authorized by EPA, a seismic monitoring requirement and associated operations limitation is uncommon for Class V permits. Likewise, it is uncommon for Class I permits, except for the City of Sterling wells despite the fact that there was little if any seismic risk. We are not aware of any

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						historical induced seismic event from a Class V well operated below fracture pressure. Further, information provided in the permit application (Figures F-3 and F-4) shows that the project site is located in an area of low seismic risk, so there is not an existing concern regarding seismic issues. **Requested Change:** The requested changes shown below are similar to the Stop Light approach successfully employed by the Colorado Oil and Gas Conservation Commission (COGCC) (Exhibit 003). For example, the Exhibit 003 approach dictates response levels as follows: Green Light – Continue operations (<M2.5 ([MMI scale] within 2.5 mi) Yellow Light – Modify operations (>M2.5 & < 4.4 within 2.5 mi) Red Light – Suspend operations (> M4.5 within 2 mi) **B. Seismicity** 2. For any seismic event with greater than 4.5 magnitude (MMI scale) reported within two miles of the permit boundary, the Permittee shall immediately cease injection and report to EPA within twenty-four (24) hours according to Part VII, Section D.11.e of this permit. Injection shall not resume until the Permittee has obtained approval to recommence injection from the EPA. **Table 17. Monitoring, Recording and Reporting Requirements for Well Operating Parameters** A. CONTINUOUS MONITORING MONITOR: Seismic events with greater than 2.0 magnitude (MMI scale) within a two (2) mile radius of the Area Permit boundary, gathered from USGS Earthquake Hazard Program website or through personal communication. **Table 17. Monitoring, Recording and Reporting Requirements for Well Operating Parameters** F. QUARTERLY MONITORING REPORT: Summary of monthly reviews of seismic events with greater than 2.0 magnitude (MMI scale) within a fifty (50) mile radius of the Area Permit boundary.
31	30	V.C.6.b	---	---	C, A	**Comment:** The Draft permit states that "USEPA certified" gauge should be used for annuls pressure test. Powertech is not aware of such a certification program. As in EPA regions across the country

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						(including Region 8), a digital pressure gauge, which is calibrated annually using a deadweight tester, will be used and certification will be provided in testing reports. **Requested Change:** Change to "calibrated and certified" gauge as shown below. **V.C.6. Mechanical Integrity Test Methods and Criteria** **b. Internal Mechanical Integrity: TCA Pressure Mechanical Integrity Test Procedure** The Permittee shall conduct the following internal mechanical integrity test to verify there are no leaks in the well tubing, casing or packer. iv. Install ~~USEPA~~ calibrated and certified gauge on "bleed" type valve. The annulus may need to be pressurized and bled off several times to ensure an absence of air.
32	31	V.D.1.b-c	---	---	R, A	**Comment:** The low-flow sampling requirement is not applicable to this type of Class V well. Sampling methods specified in Part V, Section D.1.b and c are inconsistent with deep injection wells and oil/gas equipment that will be required to install the wells. The requirement for fluid sampling by swabbing 3 volumes during drilling and producing fluid via submersible pump should be removed. **Requested Change:** Sampling will be conducted "as appropriate given the tools available," commonly by swabbing or drill stem testing (DSTs). See comment #9 for anticipated sampling procedures for the Minnelusa. In the case of a drill stem test (DST) that might be used to sample the Sundance/Unkpapa, a packer or packers would be used on the end of the drill string to seal around or above the zone to be sampled. A valve in the bottom hole assembly would be opened allowing formation fluid to fill the drill pipe to a level dependent on reservoir pressure. The pipe would be tripped out of the hole, and formation fluid would be sampled at surface. This is an often used and viable option for collecting reservoir data and fluid samples. Assuming the formation has reasonable porosity and permeability, sufficient fluid will be produced such that wellbore fluid (mud), mud filtrate, and formation fluid are all recovered by the DST. The formation fluid will be the last fluid recovered and will be present in the bottom of the testing string and in the fluid sampling chamber (typically 1-2 gallons of volume). Fluid samples will be transferred from the sample chamber, and if necessary, the first joint of drill pipe above the sample chamber, into the sample bottles that are then sent to the laboratory for analysis.

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						Requested changes are shown below. **V.D. Monitoring Methods, Parameters and Frequency** **1. Monitoring Methods** a. Monitoring observations, measurements, samples, etc. taken for the purpose of complying with these requirements shall be representative of the activity or condition being monitored. ~~b. During drilling, before an aquifer fluid sample is collected for laboratory analysis, the formation shall be swabbed a minimum of three times.~~ b~~c~~. Aquifer fluid shall be produced from the well using methods appropriate given the tools available ~~a submersible pump, swabbing or wireline testing equipment~~. Aquifer fluid sampling shall occur after the open-hole section has been drilled, but prior to conducting any injection testing. ~~The submersible pump is the preferred method to be used and shall be used, if possible. If a submersible pump is able to be used, the Permittee shall use the Standard Operating Procedure for Low-Stress (Low Flow) / Minimal Drawdown Ground-Water Sample Collection and measure the f~~Field parameters listed in Table 14 shall be measured at the surface as fluid is ~~pumped out of~~ withdrawn from the well to determine when collection of a representative sample is possible. When the field parameters meet the stabilization criteria in Table 14, indicating that the water quality indicator parameters have stabilized, then sample collection can take place.
33	32	V.D.1 Table 14 V.D.1.f-i	---	---	I, R, C	**Comment:** The NRC license requires analysis of three field parameters (pH, specific conductance and temperature) during monitor well sampling. The approved NRC license application also specifies a stability criterion of 10% for each of these constituents. For consistency with the NRC license, Powertech suggests changing Table 14 to list these three constituents along with the 10% stabilization criterion for each. These are reliable indicators of formation fluid and are much more stable than ORP, turbidity, or DO. Analysis of ORP, turbidity and dissolved oxygen are not included in the NRC license requirements. Powertech requests omitting these constituents from Table 14 for that reason and since these constituents are not common indicator parameters for the relatively deep, bedrock aquifers that will be monitored. For example, the EPA guidance document cited under Part V, Sec. D.1.c indicates that "Oxidation-reduction potential may not always be an appropriate stabilization parameter." ORP, turbidity and dissolved oxygen are appropriate for surface water or shallow groundwater sampling where the water would be expected to have seasonal variation in turbidity levels and

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<table>
<tr><th rowspan="2">No.</th><th colspan="2">Draft Permit</th><th colspan="2">Fact Sheet</th><th rowspan="2">Type</th><th rowspan="2">Comment and Recommended Permit Language Revision or Other Modification</th></tr>
<tr><th>Page</th><th>Section</th><th>Page</th><th>Section</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>varying dissolved oxygen and ORP concentrations. They are not appropriate for deep bedrock aquifers where oxygen is absent and turbidity is only related to well development and does not affect dissolved constituent concentrations.

Powertech also requests modifying Part V, Sections D.1.f, h and i for flexibility as shown below.
Requested Changes:
Following are the suggested revisions to Table 14 and Part V, Section D.1.f.

Table 14. Field Parameters to be Monitored and Stabilization Criteria to Meet before Sample Collection
<table>
<tr><th>Parameter</th><th>Stabilization Criteria</th></tr>
<tr><td>pH</td><td>± ~~0.1~~ 10% pH units</td></tr>
<tr><td>Specific conductance</td><td>± ~~3~~10% µS/cm</td></tr>
<tr><td>Temperature</td><td>± 10% °C</td></tr>
<tr><td>~~Oxidation-reduction potential~~</td><td>~~± 10 millivolts~~</td></tr>
<tr><td>~~Turbidity~~</td><td>~~± 10 % NTUs when turbidity is greater than 10 NTUs~~</td></tr>
<tr><td>~~Dissolved oxygen~~</td><td>~~± 0.3 milligrams per liter~~</td></tr>
</table>
V.D. Monitoring Methods, Parameters and Frequency
1. Monitoring Methods
f. Injection pressure, annulus pressure, injection rate, and cumulative injected volumes shall be observed and recorded under normal operating conditions, and all parameters shall be observed ~~simultaneously~~ at the same general time to provide a clear depiction of well operation.
g. Pressures are to be measured in pounds per square inch (psi).
h. Fluid volumes are to be measured in standard oilfield barrels (bbl) or gallons (gal).
i. Fluid rates are to be measured in barrels per day (bbl/day) or gallons per minute (gpm).</td></tr>
<tr><td>34</td><td>36</td><td>V.E.2</td><td>4</td><td>1.0</td><td>I, E</td><td>Comment:
Powertech is uncertain why 40 CFR part 146 subpart G regulations are referenced as those regulations refer to Class I hazardous waste injection wells.</td></tr>
</table>

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						Requested Clarification: Please explain the basis for reference to 40 CFR part 146 subpart G, which pertains to Class I hazardous waste injection wells. This permit is not for a Class I hazardous waste injection well, and permit conditions prohibit injection of hazardous waste.
35	37-38	V.G	44 58	6.5, 8.1.5	I, C	**Comment:** Powertech will operate a manned facility. Why are there automated monitoring and shut-off requirements that would apply whether the facility is manned or unmanned? In addition, the monitoring requirements in Part V, Section G.6.h through k apply regardless of manned or remote operations. **Requested Change:** Powertech requested the addition of a qualifier to indicate that automatic monitoring guidelines must be followed only if the facility is unmanned. In addition, Powertech requests moving the requirements in Part V, Section G.6.h through k to Part V, Section D.4 (Page 36).
36	38	VI.A	---	---	I, R	**Comment:** This requirement prohibits Powertech from plugging and abandoning any Class V deep injection well until after receiving written authorization from the Director, who will not approve the plugging and abandonment of any Class V deep injection wells until all Class III wellfields have been decommissioned. **Requested Change:** Powertech is committed to completing groundwater restoration and understands fully that wastewater disposal capacity is a necessity to effective completion of this requirement. However, Powertech has submitted permit applications for two methods for wastewater disposal including deep well disposal and land application. Powertech's Groundwater Discharge Plan application, which requests use of land application of treated wastewater from the project, has been recommended for approval by the South Dakota DENR and is currently pending a State Hearing. Because there is a separate option for wastewater disposal, Powertech requests that EPA update this requirement accordingly to allow for the possibility that land application may provide the necessary wastewater disposal capacity for groundwater restoration and that it may be possible that no deep wells are used for this purpose. Requested changes are provided below. **PART VI. PLUGGING AND ABANDONMENT** **A. Requirement for EPA Approval before Plugging and Abandonment of Class V Deep Injection Wells** The Permittee shall not commence plugging and abandonment of a Class V Deep injection well until after receiving written authorization from the Director. The Director will not approve the

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						plugging and abandonment of all~~any~~ Class V deep injection wells until all Class III wellfields have been decommissioned by the NRC unless land application or another alternate method of disposing treated wastewater is available. At least one Class V deep injection well shall remain active or temporarily abandoned until all Class III wellfields have been decommissioned unless land application or another alternate method of disposing treated wastewater is available.
37	44	VII.D.11.i	---	---	R	**Comment:** Suggest not using the "NRC" acronym for National Response Center, since it is used elsewhere in the document for U.S. Nuclear Regulatory Commission.
38	45	VIII.A.1	---	---	E	**Comment:** Specifically, what is meant by "EPA's model language" with respect to the various acceptable forms of financial assurance? **Requested Change:** Powertech requests clarification of "EPA's model language."
39	46	VIII.J	61	10.2	I, A	**Comment:** The proposed provision would require an updated financial responsibility cost estimate to be submitted within 21 days of the Effective Date of the Final Permit and a demonstration of financial responsibility within 30 calendar days of the Effective Date of the Final Permit. As described in comment #27, there are a number of permits and regulatory approvals needed prior to construction, and economic factors may contribute to a delay in the onset of construction. **Requested Change:** Powertech proposes to provide EPA with an updated financial responsibility cost estimate at least 90 days prior to initial construction of any Class V injection wells within the permit area. This is consistent with License Condition (LC) 9.5 in NRC license SUA-1600, which requires Powertech to provide an updated financial assurance estimate at least 90 days prior to beginning construction activities associated with any planned expansion or operational change that was not included in an annual financial assurance update (Exhibit 004 at 3-4). Powertech proposes to provide EPA with demonstration of financial responsibility at least 90 days prior to commencing Class V injection well operations. This is also consistent with LC 9.5, which requires Powertech to submit the financial assurance instrument for NRC staff review and approval 90 days prior to commencing operations. Requested changes are shown below. **VIII.J. Updated Cost Estimate and Timing for Demonstration of Financial Responsibility** An updated cost estimate shall be submitted at least 90 days prior to construction of any Class V injection well within the permit area~~within 21 days of the Effective Date of the Final~~

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						~~Permit~~. The demonstration of financial responsibility shall be submitted to the Director~~EPA~~ at least 90 days ~~within 30 calendar days of the Effective Date of the Final Permit and~~ before the commencement of operation of any Class V injection well ~~construction activities~~. Any well ~~construction~~ operational activities are prohibited until financial responsibility has been approved by the Director~~EPA~~.
40	48	App. A Fig. A-1	---	---	I, A	**Comment:** Appendix A, Figure A-1 Preliminary Wellhead Schematic depicts an impractical tree configuration which in inconsistent with the permit application and industry standards. **Requested Change:** Powertech requests that the attached proposed wellhead schematic (Exhibit 005) replace that in the draft permit as it satisfies all capabilities for monitoring and sampling requirements.
						Typographical Errors
41	4	II.A.1.a	---	---	T	**Error & Suggested Correction:** Section uses "and is" causing a seemingly unintended reference to the injection zone instead of the confining zone. Change "and is" to "which is" to properly reflect zone intended.
42	11	II.E.1.a	---	---	T	**Error & Suggested Correction:** Section refers to "Minnelusa porosity zone injection zone" but elsewhere it is referred to as the "Minnelusa porosity injection zone." Change "Minnelusa porosity zone injection zone" to "Minnelusa porosity injection zone".
43	17	II.J.2	---	---	T	**Error & Suggested Correction:** Correct section to J.5.
44	17	II.K.1.b	---	---	T	**Error & Suggested Correction:** Section indicates that the MAIP calculation method is in Part II, Sec. J.4.b. Correct this to Part II, Sec. J.4.c.
45	19	Table 11	---	---	T	**Error & Suggested Correction:** Regarding cement interval for DW No. 1 (Figure 3), suggest removing "<".
46	27	IV.F.2	---	---	T	**Error & Suggested Correction:** In the 4th sentence, remove "the" in "top of the each."
47	28	IV.K.1	---	---	T	**Error & Suggested Correction:** Remove duplicate "Class V Class V".
48	34	Table 17.C	---	---	T	**Error & Suggested Correction:** Correct "for wells NOT actively injection well" to "for wells NOT actively injecting".

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Table 1. Draft Class V Area Permit Specific Comments and Recommended Permit Language Revisions (cont.)

No.	Draft Permit		Fact Sheet			Comment and Recommended Permit Language Revision or Other Modification
	Page	Section	Page	Section	Type	
49	39	VI.D.5	---	---	T	**Error & Suggested Correction:** Suggest removing "in" in "to surface in using".
50	46	VIII.B	---	---	T	**Error & Suggested Correction:** In the 1st paragraph below numbered list, it appears "(a)", (b), or (c)" should be changed to "(1), (2), or (3)".
51	46	VIII	---	---	T	**Error & Suggested Correction:** Part VIII, Sections J and K should be changed to Sections C and D.
						Fact Sheet Only
52	---	---	4, 12	1.1, 2.2	I, R	**Comment:** Waste generated on site will be 11e.(2) byproduct material regulated by NRC, not hazardous waste according to RCRA. The references stating that Powertech will treat fluid to below hazardous standards implies that hazardous fluid exists on site. Language in the draft permit already prohibits injection of hazardous waste into the Class V wells. **Requested Change:** Remove repeated references that characterize site waste as hazardous because this is not accurate; it is 11e.(2) byproduct material. This comment also applies to similar statements on page 1 and elsewhere in the Draft Cumulative Effects Analysis.
53	---	---	24-29	4.4.1 4.4.2 4.4.2.1 4.4.2.2 4.4.3	R, C, A	**Comment:** Assignment of 10% porosity to Minnelusa based on Greene (1993) data is incorrect and leads to a greatly exaggerated and inaccurate Radius of Fluid Displacement (ROFD) calculation. The well reference by Greene is located west of Rapid City approximately 53 miles distant from the site and near the outcrop of the Minnelusa. There are local data that would be more representative including the following: API 40-04720085; DENSITY POROSITY IN MINNELUSA AVERAGES 19% API 49-4522030; NEUTRON-DENSITY POROSITY AVERAGES 16% API 40-03320023; NEUTRON-DENSITY POROSITY AVERAGES 20% API 49-04521646; NEUTRON-DENSITY POROSITY AVERAGES 16% API 49-04522160; NEUTRON-DENSITY POROSITY AVERAGES 16% API 49-04522108; NEUTRON-DENSITY POROSITY AVERAGES 17% API 49-02720471; NEUTRON-DENSITY POROSITY AVERAGES 17% API 49-02720391; NEUTRON-DENSITY POROSITY AVERAGES 16%

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Table 1. Draft Class V Area Permit Specific Comments and Recommended Permit Language Revisions (cont.)

No.	Draft Permit		Fact Sheet			Comment and Recommended Permit Language Revision or Other Modification
	Page	Section	Page	Section	Type	
						Requested Change: Refer to log data from well with API No. 047-20085, which is within the project area. The average density porosity is 19% in the Minnelusa in the project area. Powertech requests that EPA recalculate ROFD accordingly in the fact sheet.
54	---	---	25	4.4.1	I, T, R	**Comment:** EPA states they calculated a lower critical pressure rise than Powertech for movement of fluid from the Minnelusa to Madison; therefore, less pressure is needed to move Injection zone fluids "upward into the Minnelusa" aquifer. **Requested Change:** Revise to "downward into the Madison".
55	---	---	24 28 38	4.4.1 4.4.2.2 5.4	R, C, A	**Comment:** Critical Pressure Rise calculations performed by EPA are incorrect. Cone of Influence (COI) data for Minnelusa-Madison are incorrect. EPA interpreted Figure D-10 from the Class V permit application to indicate that the potentiometric surface of the Madison at ground surface (Dewey Area) and 15 feet below ground surface (Burdock Area). As noted in the application (pp. 2-4 & 2-5), this map was based on little (if any) local data. In fact, it shows the contours approaching the project area are "inferred". Powertech used local data from the City of Edgemont wells to estimate the potentiometric surface of the Madison to be approximately 200 feet above ground surface, an estimate which is reasonable. The critical pressure rise was properly calculated on this basis in Tables 1 and 2 of the Class V permit application. It is noted that data now available for the closest state Madison observation well at Hell Canyon and shown in page 20 of the fact sheet, located approximately 9 miles away on the northwest side of the Dewey Fault, if extrapolated to the project area, indicate that the potentiometric surface of the Madison would be at least 50 to 100 feet above ground surface. Further, EPA incorrectly used maximum drawdown at the pumping well from the South Dakota DENR Report to the Chief Engineer on Water Permit Application No. 2685-2 (86.8 feet at Madison well at pumping rate of 551 gpm; Exhibit 001) and subtracted that depth from ground surface. Using this extreme scenario (which is 3.4 times the maximum rate needed by Powertech if Class V wells are drilled), the calculated drawdown at locations 1,000 feet distant from the pumping well is less than 35 feet after 20 years of continuous pumping at 551 gpm. In addition, as noted in the report, the calculation uses a transmissivity of 3,000 ft^2/d, which is likely low for the area. It states that other local data indicate transmissivity values for the Madison as high as 7,393 ft^2/d; therefore, drawdown could be even less.

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No.	Draft Permit		Fact Sheet			Comment and Recommended Permit Language Revision or Other Modification
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						The report states that 551 gpm produced from the Madison is maximum usage rate in the event that Class V wells were not used for disposal. It goes on to state that the use of disposal wells would reduce the need for Madison fluid to approximately 160 gpm. In either case, the report states that Madison drawdown would not be significant or impact the area. The report notes that drawdown measured in wells near high capacity municipal wells in Spearfish, Sturgis and Rapid City has been only a few feet or tens of feet. Powertech notes that the seven high capacity wells in the Spearfish area that are documented by the state produce 500-2,200 gpm per well or 6,980 gpm in total (South Dakota DENR December 2013 evaluation of Spearfish public water system, Exhibit 007 at 4). **Requested Change:** 1) Powertech requests that EPA recalculate Critical Pressure Rise and Cone of Influence using Edgemont data provided in the Class V permit application for the potentiometric surface of the Madison (pp. 2-4 & 2-5; Tables 1 & 2) and a porosity of 19%. 2) Powertech requests that EPA revise the drawdown to coincide with data from Exhibit 001 (e.g., no significant drawdown in Madison or 0 feet). 3) Powertech requests that the revised calculations be presented in a revised fact sheet.
56	---	---	31	Sec. 4.5	R	**Comment:** EPA stated that Class I standards were applied "due to the nature of the activity." Did EPA apply such standards to the BOR Class V well? Why is "activity" such a concern when the water will be treated to below 10 CFR Part 20 standards for release of radionuclides to the environment such that it cannot be classified as hazardous or radioactive material due to the permit conditions? Indeed, under regulation, the injectate should be classified as 11e.(2) byproduct material. **Request:** Powertech requests explanation of the "nature of activity" and regulatory basis for the statement and application of Class I standards or removal of such references. Powertech requests that statements describing the injectate be classified appropriately as "byproduct material."
57	---	---	32	Table 11	R	**Comment:** Why is this Table included in Class V when these confining zones apply to Class III? **Requested Change:** Powertech requests removing Table 11.

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No.	Draft Permit		Fact Sheet			Comment and Recommended Permit Language Revision or Other Modification
	Page	Section	Page	Section	Type	
58	---	---	---	---	C	**General Comment:** Powertech requests that based upon the included information that EPA update and issue with any subsequent documents all of the calculations within the fact sheet and draft permit and related documents using representative values of porosity and potentiometric surface. This includes calculation for: a.) Critical Pressure Rise b.) Diffusivity calculations c.) Radius of Fluid Displacement

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Attachment A

Exhibits

List of Exhibits (All exhibits provided as PDF files)

Exhibit 001	Report to the Chief Engineer on Water Permit Application No. 2685-2, Powertech (USA) Inc., November 2, 2012.
Exhibit 002	Fitzgerald, D.D., B.F. McGhee and J.A. McQuire, Guidelines for 90% Accuracy in Zone-Isolation Decisions, Society of Petroleum Engineers Paper 12141, Journal of Petroleum Technology, November 1985.
Exhibit 003	Groundwater Protection Council (GWPC), Induced Seismicity and the O&G Industry, January 23, 2013, figure modified by the Colorado Oil and Gas Conservation Commission. Original presentation retrieved June 2017: http://www.gwpc.org/sites/default/files/event-sessions/Bull_Jeff.pdf.
Exhibit 004	NRC (U.S. Nuclear Regulatory Commission), Source and Byproduct Materials License SUA-1600, Amendment 1, issued to Powertech (USA) Inc., November 1, 2016. Available from the NRC ADAMS document server under Accession No. ML16202A174: https://www.nrc.gov/reading-rm/adams.html.
Exhibit 005	Figure A-1 (Revised). Proposed Wellhead Schematic, Dewey-Burdock Disposal Wells, Petrotek Engineering Corporation, April 2017.
Exhibit 006	SD DENR (South Dakota Department of Environment and Natural Resources), Permit File for the Ozark #3 Coffing Class II Injection Well, API No. 40-033-05113. Retrieved June 2017: http://cf.sddenr.net/sdoil/index.cfm?index=New+Search.
Exhibit 007	SD DENR, Spearfish Public Water System Evaluation, December 5, 2013. Retrieved June 2017: https://www.cityofspearfish.com/document_center/PublicWorks/2013%20DENR%20Public%20Water%20System%20Evaluation.pdf.

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