Table 4. Draft Cumulative Effects Analysis Specific Comments

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
C0	All	All	R	Please refer to general comment #G-15, which describes Powertech's assertion that the Draft Cumulative Effects Analysis extends well beyond EPA's regulatory requirement under 40 CFR § 144.33(c)(3), since many aspects do not relate to drilling and operation of the Class III or V injection wells. To clarify, while Powertech believe such a cumulative impact analysis should not be a part of these draft permit documents, comments are included in event EPA decides to further pursue this analysis and, in such an event, the following comments should be considered. NRC has already completed a NEPA assessment for the project, documented in the supplemental environmental impact statement (Exhibit 008), which EPA has already reviewed and provided comments. EPA's cumulative effects analysis represents duplication of these previous efforts.
C1	4	1.0	C	The statement is made that "Powertech's current design for the treatment and storage of ISR waste fluids do not appear to meet the requirements under Clean Air Act regulations found out 40 CFR part 61, subpart W." Please refer to comment #C42, which asks EPA to update the discussion on compliance with subpart W considering the final rule that was issued in January 2017 and Powertech's November 2014 commitments to modify impoundment designs to comply with the final rule. Powertech requests that EPA update this discussion based on changes in the final rule and Powertech's commitment to comply with the final rule.
C2	5	2.0	C	With regard to EPA's review of the final NRC SEIS, the statement is made that "the EPA review letter for the Final SEIS included discussion of some remaining concerns and suggestions for how to address them" (emphasis added). Powertech requests clarifying that there were only two concerns expressed in EPA's comment letter on the final SEIS and that both issues are addressed in the Draft Class III Area Permit (pond permitting requirements under subpart W and monitoring domestic well #18).
C3	6	3.1.1	C	The statement is made that "During groundwater restoration, contaminated water is pumped from the wellfield injection interval, treated with reverse osmosis, and most of the clean permeate from the reverse osmosis treatment process is reinjected." Powertech requests clarifying that reverse osmosis would only be used in the deep disposal well option.
C4	8	3.1.1	I	The statement is made that "during operations, Powertech will take over control of all Inyan Kara wells located inside the project boundary." This is inconsistent with Section 3.2.1.1 of this document, which correctly states that Powertech will remove all drinking water wells within the project boundary from drinking water use and remove all stock wells within ¼ mile of wellfields from private use. Powertech requests correcting the inconsistency.
C5	9	3.1.1	I	The statement is made that "if any [private Inyan Kara wells] are located close to an ISR wellfield and cause a breach in a confining zone … Powertech will provide an alternative water source to well owners by installing a Madison water supply well, as discussed in Section 3.2.1.1." The referenced section discusses two options for replacing a private well: installing a replacement well or alternate water supply such as a pipeline from a Madison well. A replacement well would not necessarily be installed in the Madison aquifer. For example, it could be installed in the

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				Sundance/Unkpapa aquifer. Powertech requests updating this discussion for consistency with commitments in the Class III permit application.
C6	10	3.1.2	T	**In the last paragraph on this page, Powertech requests correcting typographical errors as follows: "Table 6 is Table 2-1 in Powertech's Report to Accompany Madison Water Right Permit Application shows a different breakout of the** maximum estimated Madison usage as shown in Table 54. The maximum anticipated Madison usage is one gallon per minute more in Table ~~65~~ than in Table 54**."**
C7	11	3.1.2	T	**In the last sentence on this page, Powertech requests correcting a typographical error as follows: "Therefore, the EPA finds that the impacts from Powertech's proposed net withdrawal of** Madison ~~Inyan Kara~~ groundwater will not affect the availability of groundwater for other Madison groundwater users**."**
C8	12	3.2.1	C	**The statement is made that "The EPA reviewed the information Powertech provided about the potentiometric** surface drawdowns of the Inyan Kara Aquifers expected from the maximum gross pumping rate **of 8,500 gpm."** Since it is the net pumping rate and not the gross pumping rate that affects drawdown, Powertech requests **correcting this as follows: "The EPA reviewed the information Powertech provided about the potentiometric surface** drawdowns of the Inyan Kara Aquifers expected from the maximum net ~~gross~~ pumping rate of 170 ~~8,500~~ gpm **Powertech is requesting from the DENR Water Rights Program."**
C9	12 15	3.2.1 3.2.1.2	I	**The statement is made that "the potentiometric surface elevations are expected to recover to within one to two** feet at the locations of the pumping well after decommissioning **of the project" (emphasis added). This is** inconsistent with the permit application and Section 3.2.1.2 of this document, which correctly states that the elevations are expected to recover within one to two feet after ISR operations end, as opposed to after decommissioning, which may take years after ISR operations end depending on the length of stability monitoring, regulatory approval of successful groundwater restoration, and post-restoration groundwater monitoring, if required. This comment also applies to the similar statement on the bottom of page 15. Powertech requests **changing "after decommissioning of the project" to "after ISR operations" in both instances.**
C10	17	3.2.2	I	**The statement is made that estimated drawdown of the Madison aquifer at 551 gpm pumping is "86.8 feet at the** Dewey-**Burdock site." Powertech requests clarifying** that this is the estimated drawdown at the pumping well, not **across the project site. This is correctly stated on page 18, which indicates that the DENR "calculated the drawdown** in the Madison aquifer potentiometric surface from the Madison water supply wells to be 86.8 feet at the well locations within the Dewey-**Burdock Project Area."**
C11	19	3.3.1	C	**The statement is made that "The NRC license requires Powertech to conduct groundwater restoration to the** wellfield injection zone to restore the groundwater to pre-ISR conditions**" (emphasis added). While it would be** appropriate to characterize the NRC restoration requirements as consistent with pre-ISR conditions, the requirements in 10 CFR Part 40, Appendix A, Criterion 5B(5) are to restore the water to baseline or an MCL,

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				whichever is higher, or an ACL through the rigorous ACL approval process. Powertech requests correcting this statement as follows: The NRC license requires Powertech to conduct groundwater restoration to the wellfield injection zone to restore the groundwater to meet 10 CFR Part 40, Appendix A, Criterion 5B(5) requirements ~~pre-ISR conditions~~.
C12	26	3.3.4	T	Powertech requests correcting **"Burdock pond designs" to "Dewey-Burdock pond designs".**
C13	29	Fig. 9b	T	**Powertech requests correcting "HDPA liner" to "HDPE liner".**
C14	32	Fig. 12a	T	Powertech requests correcting **"HDPA liner" to "HDPE liner".**
C15	32	Fig. 12b	T	Powertech requests **correcting "HDPA liner" to "HDPE liner".**
C16	33	Fig. 13a	T	**Powertech requests correcting "HDPA liner" to "HDPE liner".**
C17	33	Fig. 13b	T	**Powertech requests correcting "HDPA liner" to "HDPE liner".**
C18	34	3.3.4.2	E	No justification appears to be provided for the statement that a leak from a pond storing treated water will result in **"extensive impact … which will be difficult and expensive to remediate" by the time the leak is detected in the pond** detection monitoring system required by the NRC. The pond detection monitoring system required by License Condition 12.25 in SUA-1600 will be designed as an early warning system using non-hazardous indicator parameters, similar to what is done for excursion monitoring in the wellfields. Based on this requirement, the fact that the ponds with single HDPE liners overlying clay liners will only store treated water, and the fact that the ponds will be about 1 **mile away from Pass Creek, there is a low likelihood of an "extensive impact" from a pond leak.** Powertech requests revising this discussion to address these considerations.
C19	36	3.3.4.2	C	See comments #C1 and #C42. **The statement that "subpart W … requires that there be no more than two ponds,** each with a surface area of no more than 40 acres that are in operation **at any given time" is not supported by the** final subpart W rule. Powertech requests updating this discussion.
C20	37	3.5	C	Powertech requests adding to the list of mitigation measures to prevent groundwater impacts the groundwater detection monitoring plan required by NRC License Condition 12.25 (Exhibit 016 at 14-15).
C21	38	3.5	T	**Powertech requests removing "as" in "designated monitoring wells ~~as~~ during operations" in the number 8 listed at** the top of this page.
C22	38	4.0	I	In the second paragraph **in Section 4.0 and various locations throughout the document, Powertech's Large Scale Mine Permit application is incorrectly referenced as "the South Dakota DENR Large Scale Mine Permit." Since the** permit has not yet been issued pending completion of the state hearing, Powertech requests changing all references to the Large Scale Mine Permit Application, which is done correctly at some locations within the document (e.g., at the bottom of page 36).
C23	43	4.2.3	T	In the 2nd **sentence in this section, Powertech requests correcting "Table 8" to "Table 7".**
C24	43	4.2.3	T	In the 2nd to last paragraph on this page, 5th line, Powertech requests correcting a typographical error as follows: **"and 5.3**-7 provide the locations of planned ephemeral stream channels ~~diversions~~ **within the permit area."**

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
C25	48 70	4.5 6.0	C	**The statement is made that "Powertech will use a phased approach to wellfield development beginning with wellfield 1 in the Dewey and Burdock Areas." See** comment #F8 in Table 2, which describes how this statement is inconsistent with Section 10.10 (p. 10-13) of the Class III permit application, which states that Powertech may develop either the Burdock or Dewey area wellfields first, followed by those in the other area. Pow**ertech's current** plans include developing Burdock area wellfields prior to those in the Dewey area (Exhibit 026). This comment also applies to a similar statement on page 70. Powertech requests updating the text on p. 48 as follows: Powertech will use a phased approach to wellfield development beginning with wellfield 1 in the Dewey and Burdock Areas. ~~The Burdock B-WF1 wellfield and Dewey D-WF1 wellfield will be constructed during the initial construction phase of the project.~~ Alternately, Powertech may develop either the Burdock or Dewey wellfields first, followed by those in the other area. Similarly, Powertech requests updating the text on p. 70 as follows: Powertech anticipates that the initial construction of processing facilities, infrastructure (e.g., pipelines, access roads, power lines, and storage ponds), and the two initial wellfields is expected to be completed within two years. Powertech will develop the wellfields in a progressive manner, beginning with Dewey and Burdock wellfields #1. Alternately, Powertech may develop the wellfields and processing facilities in either the Dewey or Burdock area first, followed by those in the other area.
C26	51	4.6	T	In the last sentence in this section, Powertech requests changing the reference from Section 5.4 to Section 4.8, which lists mitigation measures for surface water quality impacts.
C27	52	4.7.1	I	The statement is made that the 243 acres of land disturbance anticipated under the deep well liquid waste disposal option includes **"initial wellfields." Powertech requests correcting this to "all wellfields" for consistency with Table** 10 and Section 6.0.
C28	52	4.7.1	T	In the 3rd paragraph, 4th **line, Powertech requests correcting a typographical error as follows: "... measures to ensu**re that injection zone fluids will be vertically confined and injection will not result **in the migration of ..."**
C29	55	4.8	T	**In list item #5, Powertech requests correcting a typographical error as follows: "Maintain natural contours as much** as possible, stabilizing slopes and avoiding unnecessary off-road travel with vehicles;~~ maintaining natural contours as much as possible, stabilizing slopes and avoiding unnecessary off-road travel with vehicles.~~**"**
C30	55	5.0	C	In the 2nd **paragraph, the statement is made that "To mitigate impacts from spills and leaks and to prevent long** term impacts, the DENR NPDES permit will require Powertech to develop an Emergency Preparedness Program **under the project Environmental Management Plan."** Powertech requests correcting this statement to reflect that the Environmental Management Plan is a requirement of the NRC license rather than the DENR NPDES permit. This comment also applies to similar statements on pages 62, 67 and 74.

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
C31	68	6.0	T	In the 1st paragraph, 9th line, Powertech requests correcting "2.394 acres" to "2,394 acres".
C32	70	6.0	T	In the 1st paragraph, last line, Powertech requests correcting "Table 7" to "Table 11".
C33	71	6.0	T	In the last line in this section, suggest correcting "there should be there should be".
C34	71	7.0	T	In this last line of the 1st paragraph in this section, Powertech requests correcting "there should be ~~there should be~~".
C35	76	7.4.1	I	In the 2nd paragraph, the statement is made that "Powertech estimates the maximum volume of liquid wastes injected into the deep injection wells during aquifer restoration will be 155 gpm (see Section 3.1.1 of this document)." The reference to Section 3.1.1 is for estimated Inyan Kara water consumption during concurrent operations and aquifer restoration, rather than the maximum injection volume. The correct maximum volume of liquid waste injection during concurrent operations and aquifer restoration is 232 gpm, as stated on page 144 (3rd paragraph) of this document. That amount is consistent with Figure 7.1 of the Class III permit application and Table 5.3-2 of the Large Scale Mine Permit Application. Powertech requests correcting this statement as follows: Powertech estimates the maximum volume of liquid wastes injected into the deep injection wells during aquifer restoration will be 232 ~~155~~ gpm (see Section 15.3.1~~.1~~ of this document).
C36	76	7.4.2	C	In the 1st paragraph in this section, the statement is made that "Powertech estimates that typical liquid waste flow rates during groundwater sweep under the land application option during aquifer restoration will be approximately 507 gpm as shown in Table 5, Section 3.1.2 of this document." Similar to the last comment, the reference to Section 3.1.2 is for estimated Madison usage, not wastewater disposal requirements under the land application option. Figure 7.1 of the Class III permit application and Table 5.3-2 of the Large Scale Mine Permit Application show that the maximum anticipated liquid waste flow rate during concurrent operations and aquifer restoration under the land application option is 582 gpm. Powertech requests correcting this statement as follows: Powertech estimates that typical liquid waste flow rates during groundwater sweep under the land application option during aquifer restoration will be approximately 582 ~~507~~ gpm as described ~~shown~~ in ~~Table 5,~~ Section 15.3.1~~.~~2 of this document.
C37	79	7.6	E	In bullet #e, Powertech requests clarifying that "Table 5.4-3" refers to the DENR Large Scale Mine Permit Application in the following statement: "The concentrations of metals and metalloids, including arsenic and selenium, are anticipated to be low as shown in Table 5.4-3."
C38	79	7.7	T	In the 2nd line under Section 7.7, Powertech requests correcting "Section 7.2" to "Section 7.6".
C39	80	8.1	C	The statement is made that "The Class III injection, production and monitoring wells will have casing screen." As described under comment #29 in Table 1, Section 11.2 of the Class III permit application specifies that the well screen assembly and filter sand may or may not be used. The omission of well screen and filter sand would only be done where the screened interval was sufficiently competent; therefore, there would be no impacts to geology with or without the well screen. Powertech requests deleting this sentence.

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
C40	82	8.2.2	T	In the last paragraph in this section, 3rd line, **Powertech requests correcting "injection-induced" to "injection-induced seismicity".**
C41	83	8.4	E	**Powertech requests clarification on the statement that "Post**-restoration monitoring must have demonstrated that **no ISR contaminants have crossed the aquifer exemption boundary" with respect to potential impacts to geology.** Any potential impacts to groundwater quality outside of the exempted aquifer would seem to be classified as groundwater impacts rather than geology impacts.
C42	102	10.3.3	C	**Powertech requests updating the statement that "EPA is considering revisions to 40 CFR Part 61, subpart W" in light** of the final rule release in January 2017. It is also suggested to update the discussion to reflect the provisions in the final rule, especially that there are no longer maximum size limits or maximum number of impoundments for non-conventional impoundments such as would be constructed at the Dewey-Burdock Project. Powertech requests clarifying for the public the determination in the final rule that radon emissions from non-conventional impoundments that maintain a minimum liquid level are nearly indistinguishable from background. Since Powertech will treat the wastewater to remove radium and its byproducts, radon emissions from treated water storage ponds will be minimal. Powertech also requests updating the discussion to recognize its November 2014 commitments regarding modifications to the pond designs to comply with final subpart W provisions (Powertech 2014; Exhibit 032). In response to a request from EPA staff, Powertech committed to modifying the single-lined wastewater storage and treatment impoundments in the Burdock area to minimize the potential for contamination to **reach alluvial groundwater. That letter also documents NRC staff's determination that the existing pond designs** are adequately protective of human health and the environment and the NRC license conditions related to pond leak detection monitoring, routine pond inspections and development of a standard operating procedure (SOP) for **potential pond releases. In addition, Powertech requests that EPA document Powertech's commitment in its** November 2014 letter to submit an application to EPA for approval to construct wastewater storage and treatment impoundments at least 60 days prior to construction of the impoundments. This application was not submitted previously to EPA due to the risk that it would further delay the UIC permitting process, which has already taken more than 8 years yet is incomplete, and due to the uncertainty in the provisions of the final subpart W rule, which was not released until January 2017.
C43	103	10.4	T	In the numbered list at the top of this page, it appears that the sentence beginning **"The presence of Class I areas"** should be bullet #3.
C44	103	10.4	C	**In the paragraph above Section 10.4.1, the statement is made that "The peak year accounts for the time when all** four ISR project life-cycle phases (construction, operations, aquifer restoration, and decommissioning) are occurring **simultaneously and represents the highest amount of emissions the project will generate in any one year." If post-**restoration groundwater monitoring is required for this project, it would delay decommissioning by many years if not decades, such that the decommissioning phase would not overlap with any of the other project phases.

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				Therefore, this worst-case scenario would not occur. Powertech requests updating this discussion if post-restoration groundwater monitoring is required.
C45	104	10.4.1	C	In the 1st paragraph, the statement is made that "the NRC … did not use the most recent regulatory-approved version of the [AERMOD and CALPUFF] model software platforms." The AERMOD version used by IML Air Science (IML) in the project modeling was updated by IML's software vendor, Lakes Environmental, multiple times after the original modeling protocol was developed. As a practical matter, any model version is likely to be out of date by the time an EIS is published. This is particularly true when follow-up model runs are required. The important consideration is that the versions of AERMOD and its associated software tools were current and mutually compatible when the model was implemented, and that to preserve comparability the model was not changed mid-stream. Powertech requests updating the discussion to document that the versions of AERMOD and its associated software tools were current and mutually compatible when the model was implemented.
C46	104	10.4.1	C	In the 2nd paragraph, the statement is made that "EPA did not find that NCR [*sic*] provided sufficient information to support the use of dry depletion in the AERMOD analysis." Precedent has been established by state and federal agencies for using the dry depletion option in AERMOD to model short-term impacts from fugitive dust emissions. For example, a coal lease application in Utah triggered PM_{10} modeling that included a refined analysis using deposition and plume depletion (IML 2013; Exhibit 033). Page 9 of Appendix K in the Alton Coal Lease DEIS states, "deposition was only considered for assessing the final PM_{10} modeled ambient air impacts. Deposition was not considered for any other pollutants …" Page 10 states, "the primary pollutants of concern are fugitive dust." (BLM 2015; Exhibit 034). The Colorado Department of Public Health and Environment (CDPHE) uses dry depletion to model PM_{10} impacts from fugitive dust sources at mining facilities seeking air quality construction permits (IML 2013; Exhibit 033). Recent projects for which this option was used include the Lafarge Gypsum Ranch Pit, Oxbow Mining's Elk Creek Mine, and Bowie Resources' Bowie N.2 Mine. The Wyoming Department of Environmental Quality stated that it would accept the use of plume depletion algorithms in AERMOD as long as an applicant justifies the inputs, including particle size, particle density and mass fraction (IML 2013; Exhibit 033). Both Colorado and Wyoming operate EPA-approved air permitting and enforcement programs. A recent modeling analysis was triggered by high fugitive dust impacts in the Salt River area of Arizona. Maricopa County was reclassified as a serious PM_{10} nonattainment area on June 10, 1996. The primary sources of particulate pollution in this area are "fugitive dust from construction sites, agricultural fields, unpaved parking lots and roads, disturbed vacant lots and paved roads" (IML 2013; Exhibit 033). Cited among the "general characteristics that make AERMOD suitable for application in the Salt River Study area" is the claim that "gravitational settling and dry

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				deposition are handled well." Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
C47	104	10.4.1	C	In the 2nd **paragraph, the statement is made that "The dry d**epletion option may be appropriate to use in AERMOD when sufficient data are available to determine the particle size distribution and other particle information **reasonably well for each source." Powertech asserts that sufficient justification was provided** in the IML 2013 modeling (Exhibit 033), as summarized below. The original PM_{10} particle size distribution was obtained from the modeling protocol for the Rosemont Mine in Arizona (IML 2013; Exhibit 033). The modelers for the Rosemont project acquired this distribution from AP-42 Section 13.2.4 and applied it to fugitive dust emissions from haul roads. Because Section 13.2.4 applies to aggregate handling and storage piles, other sources were consulted to validate the use of this particle size distribution for haul road dust. A study by Watson, Chow and Pace referenced in a New Jersey Department of Environmental Protection report found that 52.3% of the particulate from road and soil dust is less than 10 µm in diameter. Of this particulate 10.7% was found to be smaller than 2.5 µm in diameter and the remaining 41.6% fell between 10 and 2.5 µm. Assuming that fugitive dust particle sizes follow a lognormal distribution, these two data points were transformed into a multi-point particle size distribution for comparison to the original particle size distribution. The geometric mass mean diameter for the original distribution is 6.47 µm, while the mean diameter for the lognormal distribution **is 5.76 µm. EPA's AP**-42 Section 13.2.2 and supporting studies characterize PM_{30} from unpaved road dust (the dominant source at Dewey-Burdock) as 30.6% PM_{10} and 3.06% PM2.5. Again, assuming a lognormal particle size distribution, the mean diameter would be 6.77 µm. CDPHE has approved a mean coarse particle diameter for road dust of 6.25 µm (Trinity 2016; Exhibit 035). Since these values are clustered around the original PM_{10} size distribution, it was retained for both CALPUFF and AERMOD dry deposition modeling. As stated above, the mass mean diameter of PM_{10} particles with the chosen size distribution referenced above is 6.47 µm, or approximately 65% of the top diameter. Applying this ratio would yield about 1.5 µm for the mean $PM_{2.5}$ particle size. Hence, the choice of 1 µm mean particle size diameter for $PM_{2.5}$ was conservative in that it increases atmospheric entrainment and decreases settling. In contrast to PM_{10} modeling, the plume depletion option had only a minor effect on modeled $PM_{2.5}$ impacts. Aluminosilicate clay minerals that characterize soil dust in the project area typically have particle density near 2.65 **g/cm3. As indicated in IML's final report (IML 2013; Exhibit 033), the Environmental Science Division of Argonne National Lab states, "A typical value of 2.65 g/cm**^{3} has been suggested to characterize the soil particle **density of a general mineral soil. Aluminosilicate clay minerals have particle density variations in the same range."** Another study of fugitive dust from unpaved road surfaces, by Watson and Chow, also cites 2.65 g/cm^3 for soil

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				particle density (IML 2013; Exhibit 033). In a more recent analysis, the CDPHE-approved particle density for road dust is 2.655 g/cm^3 (Trinity 2016; Exhibit 035). Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
C48	104	10.4.1	E	In the 2nd **paragraph, the statement is made that "dry depletion should have been applied to all receptors within the model domain." Using the dry depletion option, IML modeled all receptors with predicted 24**-hour PM_{10} impacts in the initial modeling run that, when added to background, were greater than the NAAQS of 150 µg/m^3. This threshold was chosen to demonstrate ultimate compliance of all initially high receptors. The regulatory default settings were used to screen potential problem receptors, and the dry depletion option was used to refine the model results only for those receptors. Since the dry depletion option has the effect of reducing (never increasing) predicted impacts, it was deemed unnecessary to apply this option to receptors already demonstrated to be below the NAAQS threshold. The predicted concentrations would only have decreased beyond those obtained under the regulatory default option. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
C49	104	10.4.1	E	In the 3rd **paragraph, the statement is made that "the approach used by NRC will not account for the diesel engine** exhaust PM_{10} **particles that will not settle out as quickly as the mechanically generated fugitive dust emissions."** Most of the non-fugitive sources of particulate emissions at Dewey-Burdock are diesel engines. EPA is correct that some error may be introduced by including combustion sources of PM_{10} in the dry depletion runs. Most particulate matter in diesel exhaust falls within the $PM_{2.5}$ category and exhibits a much slower deposition rate than PM_{10}. Nonetheless, fugitive sources are dominant at Dewey-Burdock, where diesel exhaust constitutes only 1% of the total PM_{10} emissions. For this reason, and to avoid further complicating the final model run, IML grouped all PM_{10} sources together. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
C50	110	10.4.2.1	E	With regard to the 24-hour PM_{10} modeling results, the statement is made in the 1st **paragraph that "the top 3 values are of interest regardless of when they occurred." For compliance demonstration, the standard design** value is the 4th high concentration over a 3-year period. This value is shown in Table 6-1 (IML 2013; Exhibit 033) and should not be confused with the yearly statistics also presented in that table. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
C51	111	10.4.2.2	T	**In the second line, Powertech requests correcting the reference to "Table 11a", which does not appear in this** section.
C52	111	10.4.2.4	E	In the 1st **paragraph in this section, the statement is made that "IML and NRC determined there is evidence and** precedent that supports excluding ground-level, fugitive PM_{10} emissions from the assessment of project impacts on **visibility at Wind Cave ... However, EPA did not support this approach for the SEIS." As stated in the final report (IML** 2013; Exhibit 033) and acknowledged by EPA, even without excluding coarse particulates, the 98th percentile of the

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				annual 24-hour average changes in haze index is less than the contribution threshold of 0.5 dv. Still, IML conducted a final model run excluding coarse PM_{10} for several reasons: • CALPUFF predicted that 70% of visibility impairment at Wind Cave from the Dewey-Burdock Project was caused by coarse PM_{10}. This goes against visibility modeling results obtained by various agencies including South Dakota DENR. Aerosols of sulfate and nitrate, organic carbon, and fine particulates ($PM_{2.5}$) are generally the significant contributors to visibility impairment. • To test the reasonableness of the modeled impact of coarse particulates on visibility at Wind Cave, IML used CALPUFF to model the impact of PM_{10} coarse emissions from Dewey-Burdock at three test receptors (IML 2013; Exhibit 033). The receptors were placed 40, 80, and 116 km from the project, respectively. CALPUFF predicted higher relative contribution from coarse PM_{10} as the distance from the project to the receptor increased. This outcome defies common sense and exposes the fallacy of modeling visibility without accounting for near-field deposition of coarse PM_{10}. • **Notwithstanding EPA's challenge to the evidence and precedent appearing in the final report, the modeling** protocol does cite NEPA precedent for excluding fugitive dust emissions from visibility impact modeling. This approach was followed in the Atlantic Rim EIS (IML 2013; Exhibit 033), which cited supporting documentation from the Western Regional Air Partnership (WRAP). • A 2005 study (VISTAS 2005; Exhibit 036 at p. 3-**13) states, "$PM_{2.5}$** particles, which have a mass median diameter around 0.5 **µm, have an average net deposition velocity of about 1 cm/minute … On the other hand, coarse particles … have an average deposition velocity of about 1 m/minute, which is significant, even for emissions from elevated stacks." It seems** unreasonable to model the long-range transport of both species as if they behaved the same. Regarding exclusion of coarse particulates from stationary sources: It should be noted that stationary sources at Dewey-Burdock are combustion sources with negligible emissions compared to mobile sources and fugitive dust sources. Moreover, particulates from stationary combustion sources are 97% $PM_{2.5}$ (IML 2013; Exhibit 033) and were already accounted for since only coarse PM_{10} was omitted from the final visibility model run. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
C53	113	10.5	T	In the 6th **line of this sentence, Powertech requests changing "in this SEIS" to "in the NRC SEIS".**
C54	114	10.6	T	The last **sentence in this section appears incomplete: "If Powertech does not implement one or more of these measures properly …"**

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

<table>
<tr><th rowspan="2">No.</th><th colspan="2">Draft Cumulative Effects Analysis</th><th rowspan="2">Type</th><th rowspan="2">Comment and Requested Modification</th></tr>
<tr><th>Page</th><th>Section</th></tr>
<tr><td>C55</td><td>114</td><td>10.6.1</td><td>E</td><td>In the 2nd paragraph in this section, the statement is made that “the Dewey-Burdock project has not been shown to greatly effect [sic] regional cumulative air quality.” This should be expected, given the comparison between project emission levels and regional emissions. Since fugitive PM_{10} emissions from Dewey-Burdock constitute the largest single pollutant, and since EPA’s analysis takes issue with the degree of conservatism in modeling fugitive PM_{10} impacts on air quality and visibility, the following table may lend some perspective:

<table>
<tr><th>Area Encompassed</th><th>Fugitive Emission Sector(s)</th><th>PM_{10} Emissions (tons/year)</th></tr>
<tr><td>State of Wyoming</td><td>Unpaved Road Dust</td><td>421,044</td></tr>
<tr><td>State of Wyoming</td><td>Mining Dust</td><td>93,331</td></tr>
<tr><td>State of Wyoming</td><td>Crops and Livestock Dust</td><td>39,112</td></tr>
<tr><td>State of South Dakota</td><td>Crops and Livestock Dust</td><td>333,119</td></tr>
<tr><td>State of South Dakota</td><td>Unpaved Road Dust</td><td>77,273</td></tr>
<tr><td>Dewey-Burdock Permit Area and County Road</td><td>All Fugitive Dust Sources (max. year)</td><td>458</td></tr>
</table>
Source: EPA 2017; Exhibit 037

Since Wyoming is situated generally upwind from Wind Cave National Park, fugitive dust from this state may be more relevant than dust from South Dakota. Projected maximum fugitive PM_{10} emissions from Dewey-Burdock represent 0.08% of the emissions from Wyoming’s three largest sectors, and 0.11% of the emissions from South Dakota’s two largest sectors. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.</td></tr>
<tr><td>C56</td><td>114</td><td>10.6.2</td><td>T</td><td>In the number list, it appears that “Implement fuel saving practices such as minimizing vehicle and equipment idle time” should be item #1.</td></tr>
<tr><td>C57</td><td>117</td><td>11.3</td><td>C</td><td>Powertech requests that EPA provide an estimate of the greenhouse gases added by the proposed post-restoration groundwater monitoring, if required. As described in Attachment A-3, post-restoration groundwater monitoring could require decades or hundreds of years of additional sampling, which would also involve mechanical integrity testing and providing electrical power and maintenance within the Central Processing Plant and Satellite Facility. It does not appear that greenhouse gas emissions associated with the post-restoration groundwater monitoring period have been considered.</td></tr>
<tr><td>C58</td><td>119</td><td>11.3.1</td><td>E</td><td>In the first paragraph, the statement is made that “the year one facility construction does not appear to be distinguishable in the estimation of CO_2 emissions related to electrical power consumption during the construction phase.” Powertech notes that the GHG emissions from year 1 construction amount to about 0.2% of the cumulative,</td></tr>
</table>

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				project GHG emissions. For clarity, however, most of the electricity consumed during the Dewey-Burdock construction phase will be for facilities construction, where utility power will be available. Wellfield construction will involve primarily mobile and earth-moving equipment to drill wells and install piping and power lines. Electricity use in the wellfields will correspond mainly to the operations phase. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
C59	119	11.3.2	T	In the first paragraph in this section, 5th **line, Powertech requests correcting "whither" to "either".**
C60	121	Tables 33-34	T	It appears that metric tons and short tons are switched in several rows (i.e., those where the metric tons are higher than the short tons). Powertech recommends correcting these tables.
C61	122	11.4	E	In the 4th paragraph, the statement is made that the NRC SEIS does not include any information about GHG emissions during the uranium enrichment phase. Enrichment is downstream from the Dewey-Burdock Project. IML considered the analysis of this phase beyond the scope of the SEIS just as it did the analysis of an ultimate use for the enriched uranium (i.e., nuclear power plants). EPA acknowledges, and many studies support the net reduction in life-cycle GHG emissions achieved by nuclear power when it displaces fossil fuel power. Notably, the GHG reporting rule does not include uranium enrichment facilities or nuclear power plants among the 41 industrial sectors required to report. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
C62	130	12.1	T	In lines 4-**6, it appears that references to "Table 29" should be changed to "Table 36".**
C63	133	12.2	C	In the 1st paragraph, the statement is made that Powertech proposes to store, use, and receive shipments of anhydrous ammonia (NH_3). Powertech does not propose to use ammonia at the Dewey-Burdock Project. Figure 3.2-6 in the approved NRC license application shows that sodium hydroxide will be used in the precipitation circuit instead. Table 3.2-1 in the approved NRC license application, which lists the process-related chemicals and quantities planned for the project, likewise does not include ammonia. Powertech requests removing mention of anhydrous ammonia from this paragraph.
C64	133	12.3	T	In the 2nd paragraph in this section, 1st **line, Powertech requests correcting "Table 30" to "Table 38".**
C65	134	12.5	C	**The statement is made that "Because the Dewey Road is a** county road, presumably it is maintained by Custer and **Fall River Counties." These counties do maintain their respective portions of the Dewey Road. Moreover, Powertech** executed an agreement with Fall River County to provide equipment, materials, and/or financial assistance to cover a portion of the total road maintenance cost for Fall River County roads used by Powertech during construction and operation (Powertech 2007; Exhibit 038). Powertech requests revision of the text to reflect this commitment.
C66	135	13.1	C	In the 1st sentence in this section, the statement is made that NRC evaluated the impacts of transporting **"yellowcake slurry." Slurry is an intermediate product in the yellowcake production cycle that is dried to produce** the final yellowcake p**roduct. This is described in Section 3.2.3.1 of the SER: "The CPP will also contain 2 vacuum**

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				dryers for drying yellowcake slurry into its final powder form" (Exhibit 014 at p. 96). Powertech requests removing the word "slurry" since yellowcake slurry will not be shipped from the Dewey-Burdock Project site.
C67	135	13.1	I	In the 2nd line, Powertech requests changing "radioactive wastes" to "byproduct material" for consistency with other sections of this document (e.g., Section 12.2).
C68	140	14.3	E	A discussion is included about traditional subsistence practices such as hunting and wild plant gathering. Powertech suggests mentioning that the entire Dewey-Burdock permit area is either private land or BLM-managed federal land for which no public access roads exist. Therefore, there is no plausible use of lands within the proposed permit area for "traditional subsistence practices and the procurement of animals and plants for ritual, ceremonial, medicinal and other traditional needs." Powertech requests the addition of text to indicate that there is no public access to lands within the proposed permit area.
C69	144	15.3.1	C, I	In the 1st paragraph, the statement is made that the maximum liquid byproduct material quantity requiring disposal in the deep well injection option will be 197 gpm. As described in comment #C35 and as correctly listed in the 3rd paragraph in this section, the correct maximum volume of liquid waste injection during concurrent operations and aquifer restoration is 232 gpm. Powertech requests correcting the maximum liquid waste generation rate in the deep disposal well option from "197 gpm" to "232 gpm".
C70	144	15.3.1	C	In the 2nd paragraph, the statement is made that "Powertech proposed the construction of two Minnelusa injection wells, DW No. 1 in the Burdock Area and DW No. 3 in the Dewey Area." This does not appear to be consistent with the Class V permit application or Draft Class V Area Permit, both of which discuss up to four Minnelusa injection wells. Powertech requests updating the discussion to account for the four Class V injection wells included in the Class V Area Permit.
C71	144	15.3.2	C	In the 1st paragraph in this section, the statement is made that the maximum production of liquid byproduct material in the land application option will be 547 gpm. As described in comment #C36, the correct maximum volume of liquid waste injection during concurrent operations and aquifer restoration is 582 gpm. Powertech requests correcting the maximum liquid waste generation rate in the land application option from "547 gpm" to "582 gpm".
C72	145	15.3.4	C	Powertech requests clarifying that the 66 cubic yards of solid byproduct material is an annual estimate during operations. This comment also applies to Section 15.4.4.
C73	146	15.4.1	C	The statement is made that "Powertech proposes to manage aquifer restoration wastewater (i.e., liquid byproduct material) by treating the wastewater by reverse osmosis and reinjecting the treated water (i.e., permeate) back into the aquifer production zone undergoing restoration as described in SEIS Section 2.1.1.1.4.1" (emphasis added). Powertech requests clarification that the water withdrawn from the wellfields during groundwater restoration is not wastewater; it is treated by reverse osmosis (in the deep disposal well option), and the resulting reject is treated and disposed as wastewater. The water withdrawn from the wellfield and the treated water (permeate),

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Table 4. Draft Cumulative Effects Analysis Specific Comments (cont.)

No.	Draft Cumulative Effects Analysis		Type	Comment and Requested Modification
	Page	Section		
				while still considered 11e.(2) byproduct materials under NRC regulation, are not wastewater. Powertech requests modifying this sentence as follows: Powertech proposes to manage water pumped from the ISR wellfields during aquifer restoration ~~wastewater~~ (i.e., liquid byproduct material) by treating the ~~waste~~water by reverse osmosis and reinjecting the treated water (i.e., permeate) back into the aquifer production zone undergoing restoration as described in SEIS Section 2.1.1.1.4.1.
C74	146	15.4.2	E	In the 11th **line in this section, the statement is made that "The NRC, the DENR and the EPA will require liquid** byproduct material be treated prior to injection and treatment systems be approved, constructed, operated, and monitored to ensure rel**ease standards ... are met." Powertech is not aware that EPA has any permit requirements** for the land application of treated wastewater and requests clarification on this statement or removal of EPA from the list of agencies authorizing land application.
C75	147	15.5.1	C	Regarding the statement that Powertech expects to install 4,000 injection and production wells, please refer to comment #E1 in Table 3, which describes how Powertech currently estimates that approximately 1,461 injection wells and 869 production wells will be required over the life of the project.
C76	148	15.5.2	E	**Powertech requests explanation of the reference for the statement that "The NRC will update this evaluation as** part of the pre-operational analysis for the Dewey-Burdock Project Site, and certify that binding contractual arrangements and commitments for providing capacity for the proposed Dewey-Burdock ISR Project have been **made with one or both of these landfill options prior to beginning construction."**
C77	149	15.5.4	T	In the 2nd **paragraph, last line, Powertech requests correcting "Section 14.3.1" to "Section 15.3.1".**
C78	149	15.6	C	**The statement is made that "Powertech will be required to have an agreement in place with White Mesa Mill for** the disposal of solid by-product waste**." Although White Mesa Mill has been identified as the preferred location for** disposal of solid byproduct material, the NRC license does not require an agreement with any particular 11e.(2) byproduct material disposal facility. The requirements in NRC License Conditions 12.6 and 9.9, as stated on page 150 of this document, require Powertech to submit to the NRC a disposal agreement with a licensed disposal site before beginning operations and to maintain an agreement throughout operations. Powertech requests revising this sentence as follows: Before the NRC will authorize commencement of ISR operations, Powertech will be required to have an agreement in place with a facility that is licensed by the NRC or an NRC Agreement State to receive byproduct material, such as the White Mesa Mill ~~for the disposal of solid by-product waste~~.
C79	150	15.6	T	In the last paragraph in this section, 3rd line, Powertech requests dele**ting "76" in "76 License Condition 9.9 ..."**
C80	150	16.0	T	In the 1st paragraph in this section, 7th **line, Powertech requests correcting "Table 32" to "Table 39".**

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