

June 8, 2020

Mr. Gordon Criswell Talen Montana PO Box 38 Colstrip, Montana

RE: DEQ Comments on Revised Remedy Evaluation Report—Part One, Units 1&2 Stage I and II Evaporation Ponds

Gordon:

DEQ has reviewed the above-referenced document (the Report) and is providing conditional approval for aspects that can be implemented regardless of source control methods proposed in the upcoming Part 2 of the Report.

DEQ has requested Talen to evaluate a source removal alternative for the Stage II Ponds. Evaluation of this alternative may affect aspects of the Alternative 5 Remedy proposed in the Report; therefore, Talen provided a table showing aspects of the remedy that could be implemented, regardless of whether the Stage I and Stage II Ponds are excavated and the ash is relocated. The table is attached to this comment letter. In addition to revising the Report to reflect the changes outlined in the table, DEQ also requests the attached comments be addressed in the revised Report.

Conditional approval of the Report triggers Talen's submission of financial assurance in accordance with the Administrative Order on Consent, Article VIII. As only part of Alternative 5 is being approved, the revised financial assurance estimate has been provided by Talen, in the amount of \$16,231,270. DEQ requests this amount be submitted in the form of a surety bond within 60 days of this conditional approval.

If you have any questions, please feel free to contact me at 406-444-6797 or <u>sedinberg@mt.gov</u>.

Sincerely,

-gli

Sara Edinberg Hydrogeologist Montana DEQ

cc: Terri Mavencamp, DEQ (electronic copy) Al Hilty, Hydrometrics (electronic copy) Bob Glazier, Geosyntec (electronic copy) Cam Stringer, NewFields (electronic copy)

### **General Comments**

- Please provide animated model simulations to show predicted groundwater elevations through time for Alternative 5, in a similar fashion to the boron and sulfate concentration animations. The animations should include cross sectional views across both the Stage I Evaporation Pond (SOEP) and Stage II Evaporation Pond (STEP), as well as one cross sectional view through the entire pond system that is roughly perpendicular to the main dams and proposed horizontal well. The elevation of pond depths should also be shown on the figures.
- 2) The results of the proposed remedy assume that any exceedances of Cleanup Criteria that remain after the remedy is completed are from a lack of source control at the SOEP. This assumption cannot be verified until Part 2 of the Remedy Report (source control) is evaluated. The report neglects to discuss impacts from STEP interaction with the water table; and the report also indicates that there may be some secondary sources remaining in soil beneath the ponds that contribute to plume re-emergence. Even though the HELP model results predict the water levels in STEP A Cell and E Cell will drop to approximately 4 inches above the liner, this is not overly conservative and may not occur, especially when the capture system is shut down and groundwater in the surrounding area rebounds. The single liner installed in these two Cells may not be an effective barrier for water to enter the ash pond; Talen acknowledges in the Report that the liners have a 400-year lifespan, which indicates that the liners could fail at some time in the future. The STEP needs to be evaluated for removal scenario, as originally requested by DEQ in an August 2, 2018 comment letter to Talen.
- 3) According to pond construction documents and pond history, the Old Clearwell was constructed with the same materials as A Cell and E Cell, and received ash and/or paste until plant shutdown in January 2020. However, seepage rates from the Old Clearwell have not been accounted for in the report or the model, and dewatering prior to closure has not been proposed. Please discuss why the Old Clearwell is not treated the same as A Cell and E Cell. Based on pond history, DEQ believes dewatering of the Old Clearwell may need to be included in Alternative 5.
- 4) The text states repeatedly that the model predicts that boron and sulfate would meet the Cleanup Criteria in the Distal Area outside and within Plant Property by 2050 (targeted remediation timeframe) under Alternative 5. Although it may be true for the time/year, it can be misleading since the model also predicts both boron and sulfate plumes will reemerge later and remain above Cleanup Criteria through 2150. Please revise the statement where applicable to be clear.
- 5) Soil beneath the pond liner of STEP A Cell, E Cell and Old Clearwell Cell should be sampled when feasible during the Remedial Design/Remedial Action (RD/RA) implementation to assess if these are potential source areas to groundwater impacts. Also see General Comment #1.

- 6) The Monitored Natural Attenuation (MNA) and Permeable Reactive Barrier (PRB) feasibility studies should also include boron and sulfate besides these less mobile constitutes of interests since both boron and sulfate plumes will re-emerge and remain above Cleanup Criteria through 2150 within and outside of Talen's property after the capture system is shut down under the selected Alternative. Also clarify the timeline for completion of the MNA studies.
- 7) Talen proposes to use treated process water/groundwater as a source of injection water for in situ flushing after 2022. Please note the treated process water/groundwater will need to be tested for its Constituent of Interest (COI)/Contaminant of Concern (COC) concentrations and compatibility to groundwater at Units 1&2 area prior to injection. Approval will also be required from DEQ. Talen should develop a sampling/monitoring frequency in the RD/RA work plan.
- 8) More than a dozen private domestic wells are present downgradient of SOEP/STEP. Most of the wells appear to no longer be in use; however, according to the report, the unused residential wells are not planned to be abandoned. Please clarify to indicate whether these wells are to be abandoned by Talen. In addition, the report indicates that a private well PW704 was abandoned and replaced. Please provide more details on the location and construction detail of this new well.
- 9) Please change the term "PCC" to "CC" since the Cleanup Criteria and Risk Assessment (CCRA) has been approved by DEQ.
- 10) The animated simulations of the plume included in the Report pause for several seconds during year 2050. DEQ received several public comments indicating that the animations end in 2050; please shorten amount of time the animation pauses for better clarity in the timespan simulated in the animation.
- 11) As the PRB is a contingency measure, please provide a section that describes the instance in which installation of a PRB would be required.
- 12) Water collected by the capture system was formerly used in the Units 1&2 plants, and is now being disposed of in the new Capture Well Storage Pond located at the plant site. Since this pond is designed to hold a limited amount of capture water, please provide a discussion of the future disposal options that Talen plans to pursue.
- 13) The report indicates that the injection wells may use water from either Castle Rock Lake or treated capture water. Please clarify if significant differences in treatment method are required for the different water sources, and which source(s) will be used in the future.

### **Specific Comments**

- 1) Page xi, Executive Summary, *Results of Revised Remedy Evaluation Part I*, 2<sup>nd</sup> paragraph, last sentence: Please see General Comments #1 and #2.
- 2) Page xii, Executive Summary, *Preferred Remedial Alternative Part I*, 2<sup>nd</sup> paragraph, 1<sup>st</sup> sentence: Please include a description of the additional sampling that has taken place regarding assessment of soils beneath the SOEP ponds and the addition of this information to the model.
- 3) Page xii, Section E.S., *Preferred Remedial Alternative*, *Part 1*, third and fourth paragraph: See General Comment #4.
- 4) Page xiii, Executive Summary, *Implementation of the Preferred Remedial Alternative*, 4<sup>th</sup> bullet: Please see General Comment #3.
- 5) Page xiv, Executive Summary, *Implementation of the Preferred Remedial Alternative*, 3<sup>rd</sup> paragraph, 3<sup>rd</sup> sentence: Please clarify if this residence's well is routinely sampled, why they are not on city water, and if Talen would provide a city water connection if the well were to become impacted in the future.
- 6) Page xv, Executive Summary, *Proposed Approach for the Revised Remedy Evaluation Report Part 2*, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: The fate and transport modeling should be updated regardless of whether the source strength is less than or greater than currently assumed.
- 7) Page xv, Executive Summary, *Proposed Approach for the Revised Remedy Evaluation Report Part 2*, sentence after bullets: The sentence states that "if the updated modeling results indicate no need for additional source control, Part 2...will discuss No Further Action". Per DEQ's previous request in the letter dated August 2, 2018, an excavation scenario should be modeled for the SOEP/STEP ponds regardless of model results. Additionally, as stated in the previous comments, MDEQ will not approve a remedy which leaves a long-term source in place if it is in contact with groundwater. This would be a source of COIs that would pose a long-term risk to groundwater.
- 8) Page 3, Section 1.2, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: Figure 6-57 of Appendix D shows the water table within the SOEP in year 2070, after capture system shutdown; however, no data is provided to support this sentence, which states that the water table will "rise and resaturate the ash". Also see General Comment #1.
- 9) Page 14, Section 2.3.1, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: Please update this sentence to reflect the new data regarding the clay liner at the SOEP.
- 10) Page 14, Section 2.3.1.1, 3<sup>rd</sup> bullet: Please clarify whether the single HDPE liners were installed during initial construction, or if they were added at a later date (i.e., is ash present below these liners?).
- 11) Page 18, Section 2.3.2.1, 1<sup>st</sup> sub-bullet: The bullet states that capture well 966A is screened across the flyash/alluvium at the bottom of the SOEP. Please clarify if this well is screened across both these units. If so, consideration should be given as to whether this well is or could act as a conduit between the flyash and the alluvium.
- 12) Page 27, Section 2.5.3.1, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: Please clarify if/how the upgradient areas of groundwater impacts are related to the ponds.
- 13) Page 27, Section 2.5.3.2, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: According to the CCRA Report, cobalt was detected in CCR wells at levels above the RSL, which is why cobalt was flagged as a COC. Please edit this paragraph accordingly.

- 14) Page 27, Section 2.5.3.1, 3<sup>rd</sup> paragraph, 1<sup>st</sup> sentence: Figures 2-8 and 2-9 of Appendix D-2 are showing groundwater impacts in Coal related units; Figures 2-15 and 2-16 show groundwater impacts in Sub-McKay. Please revise.
- 15) Page 28, Section 2.5.3.2, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: Please add text describing why there is limited sampling of manganese (two monitoring events). Manganese is not a Coal Combustion Residual (CCR) Rule constituent, so sampling is not related to the CCR Rule timeline.
- 16) Page 28, Section 2.5.3.2, 3<sup>rd</sup> paragraph, 3<sup>rd</sup> sentence: The text indicates, "concentrations at upgradient well 371D slightly exceed the PCC, indicating that local upgradient groundwater concentrations entering the SOEP/STEP area exceed the PCC." However, there appears to be visible ash in the 371D area, as shown on Figure 1-2 of Appendix D. Please clarify and edit as appropriate to remove the misleading statement that upgradient groundwater has concentrations in excess of PCC.
- 17) Page 28, Section 2.5.3.2: Please add text to this section indicating that the Water Resources Monitoring Plan will be updated to include additional sampling for COCs that have limited data.
- 18) Page 29, Section 2.6.1, 2<sup>nd</sup> paragraph, 4<sup>th</sup> sentence: Figure 6-58 is included in Appendix D-6, not D-7. Please revise.
- 19) Page 30, Section 2.6.2, 3<sup>rd</sup> paragraph: The model accounts for some seepage from the lined (STEP) cells into the groundwater. If the cells are dewatered, it is possible that advective groundwater flow could seep back into the ponds and re-saturate the ash, creating a long-term source of COCs. Also see General Comment #2.
- 20) Page 34, Section 2.6.5, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: The Revised CCRA is discussed in Section 2.2.2, not Section 2.2.1. Please revise.
- 21) Page 34, Section 2.6.5, 1<sup>st</sup> paragraph, last sentence: Please revise this sentence. Radium was not confirmed as a COC, but will remain a COPC while additional data is collected under the AOC Water Resources Monitoring Plans in addition to the Federal CCR Rule groundwater monitoring program.
- 22) Page 35, Section 3.1, 3<sup>rd</sup> paragraph, 5<sup>th</sup> sentence: Please include a description of the elevation of the water table in the vicinity of D cell in 2023 and into the future, and how this might affect the closure/removal of D cell. Also see General Comment #1.
- 23) Page 35, Section 3.1, 3<sup>rd</sup> paragraph, 7<sup>th</sup> sentence: It is unclear from the report where unsaturated zones beneath the STEP ponds is located. Also see General Comment #1.
- 24) Page 35, Section 3.1, 3<sup>rd</sup> paragraph, 9<sup>th</sup> sentence: Please provide an explanation of how secondary sources were accounted for in the modeling without site-specific data.
- 25) Page 35, Section 3.1, 3<sup>rd</sup> paragraph, last sentence: Although the Units 1&2 CCRA indicated that no further action was necessary for soil or sediment, DEQ has requested in previous comments on the Units 1&2 Remedy Evaluation Report that soils beneath the ponds be sampled to assess their potential to act as a secondary source. Since Talen has sampled soils beneath the SOEP pond, these results should be included in future model updates.
- 26) Page 39, Section 4.1: Solid matrix samples should be collected from each unit when feasible during the RA implementation for leaching tests to assess each Matrix diffusion process/scenario and its long-term effect to the remediation timeframe.
- 27) Page 42, Section 4.2, 3<sup>rd</sup> paragraph, last sentence: This sentence states that "precipitation might be reversed for carbonate minerals if the groundwater pH decreases in the future".

Please elaborate on this statement; would a decrease in pH be likely due to elimination of pond seepage, which has higher pH than background groundwater?

- 28) Page 44, Section 4.3, 1<sup>st</sup> bullet: Reduction of potassium mass discharge is also needed in Coal-Related strata at transect B-B' (24%) as listed in Table 6 of Appendix G; and reduction of sodium mass discharge is also needed in coarse-grained alluvium at transect B-B' (41%), and in Sub-McKay at transect D-D' (14%) as listed in Table 8 of Appendix G. Please clarify and revise.
- 29) Page 45, Section 4.3, 1<sup>st</sup> bullet (Transect D-D'), second sentence: The text indicates no reduction in the mass discharge of magnesium is necessary. However, it is not consistent with the prior statement in this bullet that indicated magnesium reduction is required. Please revise.
- 30) Page 55, Section 6.3, 1<sup>st</sup> paragraph, 7<sup>th</sup> sentence: Please include updated information regarding the shutdown of Units 1&2, including how long E Cell received paste for, and whether E Cell and/or the Old Clearwell were completely filled at the time of shutdown.
- 31) Page 55, Section 6.3, 1<sup>st</sup> paragraph, 10<sup>th</sup> sentence: Please indicate if D Cell will be backfilled as part of closure. Also see General Comment #1.
- 32) Page 56, Section 6.3, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: Please see General Comment #6.
- 33) Page 58, Section 6.5, 2<sup>nd</sup> paragraph: The sentence states that the horizontal well beneath the STEP was not included because it resulted in desaturation of shallower model layers, trapping mass in the vadose zone and causing plume re-emergence. However, the purpose of the clean water injection system is to remove trapped mass within the aquifer solids and prevent plume re-emergence. Additionally, plume re-emergence shown in the model further supports the possibility of soils beneath the pond acting as a secondary source. Please see General Comment #5.
- 34) Page 59, Section 6.6: See General Comment #2.
- 35) Page 72, Section 7.2.1.4, 3<sup>rd</sup> paragraph, 5<sup>th</sup> and 10<sup>th</sup> sentences: Please clarify where the water from D Cell will be discharged to; if applying for a discharge permit will be necessary, please indicate when this will be initiated.
- 36) Page 73, Section 7.2.1.4, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: Please see General Comment #3.
- 37) Page 82, Section 7.3.1.3, last paragraph, last sentence: Please see General Comment #3.
- 38) Page 88, 7.3.2.4, 2<sup>nd</sup> paragraph, 2<sup>nd</sup> sentence: Please describe how secondary sources were accounted for when site-specific data was not available at the time this report was submitted.
- 39) Page 91, Section 7.4.1.1, 1<sup>st</sup> paragraph, last sentence: Figure 6-55 is included in Appendix D-6, not D-7. Please revise.
- 40) Page 92, Section 7.4.1.1, 2<sup>nd</sup> paragraph: Please see Specific Comment #33.
- 41) Page 95, Section 7.4.1.4, last paragraph, 7<sup>th</sup> sentence: Please see Specific Comment #30.
- 42) Page 96, Section 7.4.1.4, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: Figure 6-57 is included in Appendix D-6, not D-7. Please revise.
- 43) Page 103, Section 7.4.2.6, 1<sup>st</sup> bullet in the second set of bullets: This should be 16 new vertical or angled capture wells in Alternative 4, not 11. Please revise.
- 44) Page 105, Section 7.5.1.1, 1<sup>st</sup> paragraph, 3<sup>rd</sup> sentence: The text states the Fate and Transport model predicts boron plumes reemerge around 2090 in the off-site Distal area after the capture system is shut down under Alternative 5. However, as depicted in Table 7-1, the boron plumes re-emerge in 2150 in the Distal area outside of Plant property. Please reconcile the inconsistency and revise as necessary.

- 45) Page 105, Section 7.5.1.1, 1<sup>st</sup> paragraph, last sentence: Figure 6-55 is included in Appendix D-6, not D-7. Please revise. Also see Specific Comment #42.
- 46) Page 107, Section 7.5.1.1, 1<sup>st</sup> line: The text states the pumping rate would exceed the injection rate by 18 to 41 gpm, however, based on the Table 6-11 of Appendix D-8, it should be 42-62 gpm. Please update these estimates to reflect the revised capture/injection rates based on the changes to the well configurations identified in the attached Table.
- 47) Page 108, Section 7.5.1.2, 1<sup>st</sup> paragraph, last sentence: Dewatering of STEP A Cell and E Cell will significantly reduce the seepage from these two ponds, however, water levels in these two ponds should be monitored long term for potential rebound, especially after the capture system is shut off. See General Comment #2.
- 48) Page 109, Section 7.5.1.3, 1<sup>st</sup> paragraph, 4<sup>th</sup> sentence: Please provide additional details on dewatering the ash in A and E Cells. How will the horizontal wells be installed without disrupting the liners?
- 49) Page 110, Section 7.5.1.3, 1<sup>st</sup> paragraph, 4<sup>th</sup> sentence: Please clarify where the water from D Cell will be discharged to; if applying for a discharge permit will be necessary, please indicate when this will be initiated.
- 50) Page 110, Section 7.5.1.4, 4<sup>th</sup> paragraph, 3<sup>rd</sup> sentence: Figure 6-57 is included in Appendix D-6, not D-7. Please revise.
- 51) Page 110, Section 7.5.1.4, 4<sup>th</sup> paragraph, last sentence: According to Figure 6-57, the predicted thickness of saturated fly ash is 35 feet near the center of the SOEP Main Dam. Please revise.
- 52) Page 111, Section 7.5.2.1, 1<sup>st</sup> paragraph, 3<sup>rd</sup> sentence: Please see General Comment #2.
- 53) Page 112, Section 7.5.2.1, last paragraph, last sentence: this sentence is incomplete. Please revise.
- 54) Page 117, Section 7.5.2.5, 5<sup>th</sup> bullet: Please indicate how long stormwater management will be needed, what will trigger the cessation of the need for stormwater management, and how B Cell will be closed.
- 55) Page 120, Section 7.5.2.8, 2<sup>nd</sup> paragraph, last sentence: Based on the Table 6-11 of Appendix D-8, the total pumping rate would exceed the total injection rate by "42 to 62" gpm under Alternative 5. Please reconcile the inconsistency and revise as necessary. Please update these estimates to reflect the revised capture/injection rates based on the changes to the well configurations identified in the attached Table.
- 56) Page 121, Section 8.1, 2<sup>nd</sup> paragraph, last sentence: For clarity please delete the second half of this sentence starting with "... but Alternative 4...."
- 57) Page 124, Section 8.3, 2<sup>nd</sup> paragraph, last sentence: D Cell did not receive any ash or paste; please edit. See General Comment #2.
- 58) Page 127, Section 8.5, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: Please clarify three dewatering pipes are planned to be installed for each pond (i.e., STEP A Cell and E Cell) after pond closure.
- 59) Page 127, Section 8.5, 2<sup>nd</sup> paragraph, 1<sup>st</sup> sentence: The text is confusing. Please add "groundwater exceeding" before PCC to make it flow.
- 60) Page 127, Section 8.5, 2<sup>nd</sup> paragraph, last sentence: The MNA and PRB feasibility studies should also include boron and sulfate. See General Comment #6.
- 61) Page 127, Section 8.6, last paragraph: See Specific Comment #7.
- 62) Well 375D is depicted twice on Figures 2-3, 2-4, and 4-1. Please remove one of the labels on each of these figures.

## **Appendix D Comments**

- 1) Page *iii*, Alternative 2: Based on the pond closure plan, D Cell will not be capped with geomembrane. Please revise.
- 2) Page *iii*, Alternatives 3& 4: Pumping rates are planned to be increased at eight (not seven) existing capture wells under these alternatives. Please revise.
- 3) Page v, Alternative 5, last paragraph: These areas are thought to be caused by the SOEP source, according to the main text. Therefore, areas exceeding Cleanup Criteria may also be partially addressed by controlling the outstanding source.
- 4) Page viii, Conclusion, 2<sup>nd</sup> through 4<sup>th</sup> paragraphs: Descriptions on the Lithium, Cobalt, Manganese, and Selenium data and delineation are not consistent with data depicted in Figures 1&2 of Appendix K. Please reconcile the inconsistencies and revise as necessary.
- 5) Page 3, Section 2.1.1, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: Figures 2-22 through 2-24, as well as the plume figures for Selenium were generated based on 2017 data. The text should state new sample data were collected and available for Lithium, Cobalt, Manganese, and Selenium and are depicted in Figures 1&2 of Appendix K to avoid confusion. Please revise text accordingly.
- 6) Page 4, Section 2.1.1.2, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: Total Dissolved Solid (TDS) impacted groundwater is depicted on the Figure 2-10, not 2-9. Please revise.
- 7) Page 4, Section 2.1.1.1, 1<sup>st</sup> paragraph: Please add discussion on the new Selenium data collected (as presented in Appendix K).
- 8) Page 5, Section 2.1.1.4, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: See Specific Comment #4 for Appendix D.
- 9) Page viii, Model Limitations, 2<sup>nd</sup> paragraph, last sentence:
- 10) Page 4, Section 2.1.1.1, 1<sup>st</sup> paragraph, last sentence: Please see General Comment #1.
- 11) Page 5, Section 2.1.1.4, 1<sup>st</sup> bullet: Please clarify that C Cell, although permitted, was not constructed.
- 12) Page 10, Section 4.1, 3<sup>rd</sup> paragraph: Please see General Comment #3.
- 13) Page 17, Section 5.3, 2<sup>nd</sup> bullet: It appears both sulfate and boron isoconcentration contours were generated for Layers 2 and 6. Please add boron to the text.
- 14) Page 19, Section 6, 3<sup>rd</sup> paragraph, last sentence: Please re-phrase this sentence. DEQ's comments on the first draft of the Plant Site Remedy Evaluation requested that Talen evaluate measures to shorten the remedial timeframe. This was based on a 50-year pumping period that did not include the addition of clean water injection wells or pond dewatering. DEQ agreed that the revised timeframe of a 30-year pumping period with the injection wells and pond dewatering at the Plant Site could be considered a reasonable timeframe for achieving cleanup criteria. However, if additional measures are needed to control the plume after the proposed pumping period ends in 2050, DEQ will require Talen to implement those measures, which could include extending the pumping period beyond 2050.
- 15) Page 20, Section 6.1, Alternative 2: Based on the pond closure plan, D Cell will not be capped with geomembrane. See Specific Comment #1 for Appendix D.
- 16) Page 20, Section 6.1, Alternatives 3& 4: Pumping rate are planned to be increased at eight (not seven) existing capture wells under these alternatives. See Specific Comment #2 for Appendix D.

- 17) Page 21, Section 6.2.2, 1<sup>st</sup> paragraph, last sentence: Changes to the SOEP will be addressed in Part 2 of the Report, and therefore are not included in Alternative 5. Please edit the sentence as necessary.
- 18) Page 21, Section 6.2.2, 1<sup>st</sup> paragraph, last sentence: The seepage rate of 14 gpm is not consistent with the seepage rate of 12.1 gpm for SOEP presented in Appendix J-2. Please reconcile the inconsistency and revise as necessary.
- 19) Page 22, Section 6.2.2, last paragraph, last sentence: See above comment on the seepage rate of 14 gpm for SOEP.
- 20) Page 22, Section 6.2.3, 1<sup>st</sup> sentence: Five remedial alternatives are presented, not seven. Please correct as needed.
- 21) Page 23, Section 6.2.3.2, Alternatives 3&4 and 5: Pumping rate are planned to be increased at eight (not seven) existing capture wells under these alternatives. See Specific Comment #2 for Appendix D.
- 22) Page 24, Section 6.2.3.2, 1<sup>st</sup> paragraph, last sentence: Please clarify if the injection wells were simulated with raw or treated Surge Pond water. If treated, please explain how concentrations were simulated for treatment.
- 23) Page 24, Section 6.3, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence: Please see Specific Comment #14 for Appendix D.
- 24) Page 28, Section 6.4.6, 2<sup>nd</sup> paragraph, 2<sup>nd</sup> sentence: It is unclear why only boron re-emerges from the SOEP beyond the POC after the capture/injection system shuts down. Because Alternative 5 assumes no source control at the SOEP, it seems that sulfate should also reemerge (and likely to a larger extent than boron) since sulfate is assumed to be much more mobile than boron.
- 25) Page 29, Section 6.6, last sentence: Please clarify why the amount of saturated ash in the SOEP is smaller in Alternative 5 versus Alternatives 2 4 when no source control or other actions for the SOEP are simulated in any of these alternatives.
- 26) Page 33, Section 7.3, Boron, 4<sup>th</sup> bullet: Please see General Comment #2.
- 27) Page 34, Section 7.4 1<sup>st</sup> bullet: Please see General Comment #2 and Specific Comment #23.
- 28) Page 38, Section 10.0, 3<sup>rd</sup> bullet: Please clarify that the Water Resources Monitoring Plan will be modified to include additional sampling of CCR Rule COCs identified in the CCRA as part of AOC monitoring.
- 29) Page 39, Section 10.0, 2<sup>nd</sup> through 4<sup>th</sup> bullet: Figures 2-22 through 2-24, as well as the plume figures for Selenium were generated based on 2017 data. The text should state new sample data were collected and available for Lithium, Cobalt, Manganese, and Selenium and depicted in Figures 1&2 of Appendix K to avoid confusions. See Specific Comments #4 and #5 for Appendix D.
- 30) Figure 6-57 shows the depth of saturated CCR at the SOEP is 5 ft greater in Alternatives 4 and 5 versus 2 and 3 (30 vs 35 ft contour at the deepest part of the SOEP). However, Figure 6-58 shows the saturated volume being the same in all of these alternatives. Please clarify; f the depth of saturation is thicker, then the volume should be greater.

# TABLE 1RECOMMENDED REMEDY COMPONENTS FOR MDEQ APPROVALUNITS 1 & 2 SOEP/STEP REVISED REMEDY EVALUATION - PART 1 REPORT

### Colstrip Steam Electric Station Colstrip, Montana

| Category                   | Revised Alternative 5 [2]  | Is the Deserver and a left of MDEO Assessment this Demode Common and 2 [2]   |
|----------------------------|--|--|
| [1]                        | Source Control, Freshwater Flushing with Increased Capture, and Dewatering A Cell and E Cel  | Is it Recommended that MDEQ Approve this Remedy Component? [5]   |
| Source Control<br>Upgrades | STEP A Cell is closed and capped in 2020 with a Type IV alternate cover system in accordance with the  | No, some of the additional source control options that will be evaluated for the   |
|                            | Facility Closure Plan.   | STEP may include removing this cell.   |
|                            | Old Clearwell is closed and capped in 2022 with a Type IV alternate cover system in accordance with the  | No, some of the additional source control options that will be evaluated for the   |
|                            | Facility Closure Plan.   | STEP may include removing this cell.   |
|                            | STEP E Cell is closed and capped in 2022 with a Type IV alternate cover system in accordance with the Facility<br>Closure Plan.  | No, some of the additional source control options that will be evaluated for the   |
|                            |  | STEP may include removing this cell.   |
|                            | STEP D Cell is removed and reclaimed in 2022 in accordance with the Facility Closure Plan.   | No, some of the additional source control options that will be evaluated for the   |
|                            |  | STEP may include removing this cell.   |
|                            | Dewatering system installed in STEP A Cell in 2020, and ash is dewatered after capping.  | Yes, even if source removal is selected, the ash in STEP A Cell would need to be   |
|                            |  | dewatered.   |
|                            | Dewatering system installed in STEP E Cell in 2021, and ash is dewatered after capping.  | Yes, even if source removal is selected, the ash in STEP E Cell would need to be   |
|                            | Heitz 1 & 2 Elevah Shumer and Cleannater Datum Dingling and Marth 1 & D. Durin Dand and decomposition of in  | activation and a second design of the second s |
|                            | onits 1 & 2 Flyash shurly and Clearwater Return Fiperine and Notur TAD Drain Fond are decontinissioned in  | ries, Generating Onits 1 and 2 were shut down in early January 2020. As such, the  |
|                            | 2022.  | No some of the additional source control options that will be evaluated for the  |
|                            | Post-closure care for the capped STEP cells.   | STEP may include modifying the planned cell closures presented in the Facility   |
|                            |  | Closure Plan   |
|                            | Results of leaching studies (conducted in 2019-2020) are used to establish long-term source strength for ash in  |  |
|                            | SOEP.  | Yes. Already done.   |
|                            | Update Facility Closure Plan.  | No, some of the additional source control options that will be evaluated for the   |
|                            |  | STEP may include modifying the planned cell closures presented in the Facility   |
|                            |  | Closure Plan.  |
|                            | Pumping rates are increased at 8 existing vertical capture wells (2024D-2, 375D, 376D, 922A, 966A, 976D,   | Ves this can be done now   |
|                            | EAP-205, and EAP-208) in 2020.   |  |
|                            | 8 new vertical or angled capture wells (w14, w15, w16, w17, w18, w20, w21, and w22) are installed beneath  | No, these wells are located beneath STEP A Cell and STEP E Cell, and their   |
|                            | STEP A Cell and STEP E Cell to increase capture in deeper alluvium and shallow Sub-McKay bedrock (model  | locations may interfere with additional source control options that may be   |
| Capture                    | layer 4) in 2021.  | implemented in those cells.  |
|                            | 3 new vertical capture wells (w10, w11, and w13) are installed north of SOEP to increase capture in deeper alluvium and shallow Sub-McKay bedrock (model layer 4) in 2021. | Yes, these wells are located north of SOEP and their locations would not likely  |
|                            |  | interfere with additional source control options that may be implemented in that   |
|                            | 5 now vertical contine walls (w2, w4, w5, w9, and w0) are installed north of 20ED to increase contine in   | pond.<br>Nog these wells are leasted parth of SOED and their leastions would not likely  |
| Ungrades                   | middle to deeper alluvium interburden and McKay Coal (where present) and shallow Sub-McKay bedrock   | interfere with additional source control options that may be implemented in that   |
| opgrades                   | (model layers 3 and 4) in 2021   | nord   |
|                            | 1 new horizontal capture well is installed beneath SOEP Main Dam in 2020, and begins pumping in 2021.  | No. some of the additional source control options that will be evaluated for the   |
|                            |  | SOEP and STEP may make this well obsolete  |
|                            | Construction of the New Groundwater Capture Storage Pond is completed at the Plant Site in 2020.   | Yes, this was constructed in 2019.   |
|                            | MNA demonstration studies are conducted in 2021-2023.  | Yes.   |
|                            | Institutional controls/point of use controls are implemented.  | No, some of the additional source control options that will be evaluated for the   |
|                            |  | SOEP and STEP may make institutional controls/point of use controls obsolete.  |

# TABLE 1RECOMMENDED REMEDY COMPONENTS FOR MDEQ APPROVALUNITS 1 & 2 SOEP/STEP REVISED REMEDY EVALUATION - PART 1 REPORT

#### Colstrip Steam Electric Station Colstrip, Montana

| Category               | Revised Alternative 5 [2]   | Is it Recommended that MDEQ Approve this Remedy Component? [3]  |
|------------------------|---|---|
| [1]                    | Source Control, Freshwater Flushing with Increased Capture, and Dewatering A Cell and E Cel   |   |
| Freshwater<br>Flushing | 31 new vertical injection wells are installed north of SOEP and east of STEP for freshwater flushing with water from Surge Pond in 2021.  | Yes, these wells are located north of SOEP and east of STEP and their locations would not likely interfere with additional source control options that may be implemented in that pond.       |
|                        | 13 new vertical or angled injection wells are installed beneath SOEP and STEP for freshwater flushing with water from Surge Pond in 2021. | No, these wells are located beneath SOEP and STEP, and their locations may<br>interfere with additional source control options that may be implemented in those<br>cells.                     |
|                        | Freshwater flushing pilot test is conducted in 2021.  | Yes.  |
|                        | New freshwater flushing system is installed in 2021.  | Yes.  |
| Injection/             | Flushing/capture system stops pumping at the end of 2050.   | No.   |
| Capture                | Post-pumping period is modeled until 2150.  | No.   |
| Contingency<br>Plan    | PRB feasibility studies are conducted in 2021-2023 with emphasis on boron beneath STEP Main Dam and north of the SOEP.                    | Yes.  |
| Water<br>Management    | New stormwater management pond constructed north of STEP A Cell in 2020.  | No, some of the additional source control options that will be evaluated for the STEP may make this pond obsolete.  |
|                        | Continue to manage clearwater from the paste plant in STEP B Cell until 2022.   | No. Generating Units 1 and 2 were shut down in early January 2020. As such, the<br>paste plant is no longer operating and producing clearwater.   |
|                        | STEP B Cell is prepared for post-closure stormwater management in 2022 per the Facility Closure Plan.                                     | Yes, STEP B Cell is still planned to be drained and cleaned, and may be used to<br>manage stormwater in some of the additional source control options that will be<br>evaluated for the STEP. |

Notes:

CCR Coal-Combustion Residual

ISS In Situ Stabilization/Solidification

MDEQ Montana Department of Environmental Quality

MNA Monitored Natural Attenuation

PRB Permeable Reactive Barrier

RAA Remedial Action Alternative

SOEP Stage I Evaporation Pond

STEP Stage II Evaporation Pond

[1] The source areas at the SOEP/STEP Site include the SOEP, and STEP Cells (A Cell, B Cell, Old Clearwell, D Cell, and E Cell).

[2] Alternative 5 is the preferred RAA identified in the Revised Remedy Evaluation Report – Part 1 for the Units 1 & 2 SOEP/STEP area. Additional source control actions will be evaluated to address re-saturation of ash in the SOEP and plume re-emergence after flushing/capture system is shut down in 2050.

[3] Components of Revised Alternative 5 that are recommended for MDEQ approval are not anticipated to be significantly impacted by additional remedy components that will be evaluated in the Revised Remedy Evaluation Report - Part 2 to supplement Revised Alternative 5.