

RESPONSIVENESS SUMMARY FOR COLSTRIP UNITS 3&4 REMEDY EVALUATION REPORT

1.0 INTRODUCTION

The Department of Environmental Quality (DEQ) solicited public comment on the Plant Site Remedy Evaluation Report for the Colstrip Steam Electric Station (SES) during a public comment period that ran from October 11, 2019 to November 22, 2019. DEQ received written comments on the proposed remedies presented in the Report from 659 entities during the public comment period.

1.1 COMMUNITY INVOLVEMENT BACKGROUND

Cleanup of the Colstrip SES is regulated by the DEQ through an Administrative Order on Consent (AOC). Under the AOC, public participation is required via a 30-day comment period.

1.2 NOTIFICATION OF PUBLIC COMMENT PERIOD

Printed notices for the 30-day comment period were published in the Billings Gazette, the Miles City Star, and the Independent Press, as required by the AOC.

1.3 EXPLANATION OF RESPONSIVENESS SUMMARY

All comments received during the public comment period on the Remedy Evaluation Report have been reviewed and considered by DEQ in the decision-making process and are addressed in this Responsiveness Summary. Due to the volume of comments and given that many of them are similar in nature and subject, DEQ has summarized the comments below. However, while the comments are summarized here for brevity, DEQ considered each comment submitted in its entirety. All original comments have been compiled and scanned and are available on DEQ's Colstrip website. This Responsiveness Summary will also be posted to the website. To assist in developing responses, DEQ added its own number to comments to add clarity; similar comments may be referenced to previous response(s).

1.4 ACRONYM LIST

For ease of understanding, DEQ is providing a list of acronyms used in the responsiveness summary:

AOC – Administrative Order on Consent
BNRC – Board of Natural Resources & Conservation
COC – Contaminant of Concern
COI – Constituent of Interest
CCR – Coal Combustion Residual
DEQ – Montana Department of Environmental Quality
DNRC – Department of Natural Resources and Conservation
EHP – Units 3&4 Evaporation Holding Ponds
HELP – Hydrologic Evaluation of Landfill Performance (model)

MEIC – Montana Environmental Information Center
MNA – Monitored Natural Attenuation
MFSA – Major Facilities Siting Act
MPDES – Montana Pollutant Discharge Elimination System (permit)
MWQA- Montana Water Quality Act
NPRC – Northern Plains Resource Council
PRB – Permeable Reactive Barrier
RER – Remedy Evaluation Report

Northern Plains Resource Council

Cover Letter Comments

- 1) *In July 1976, the Montana BNRC issued a MFSA Certificate for Colstrip Units 3&4 with special conditions for siting the ponds. These conditions were expected to be followed as the power plant units and ash ponds were constructed. Two of these conditions (12c and 12d) state: "12c: That the seepage from the existing surge pond and any enlarged or additional surge ponds be monitored as specified by the State Board of Health and Environmental Science, and that every feasible engineering means be taken by the applicants to minimize such seepage; and 12d: That the sludge pond or ponds shall be completely sealed. If the conventional means such as compaction and bentonite application do not seal the pond(s), as indicated by monitoring wells the applicant shall install and operate, the extreme measures even up to complete sealing by a plastic membrane shall be taken." These conditions have never been enforced by the responsible state agencies. The owners have been allowed to operate for three decades now in direct violation of Montana water quality law and the plant's original MFSA permit, and the state's failure to decisively act has made a severe problem worse.*

Response: As Northern Plains correctly notes, the initial Certificate authorized the slurry of coal ash (wet disposal) to the coal ash disposal ponds. Also, as referenced by Northern Plains, the Conclusion of Law 12(d) of the Board of Natural Resources and Conservations "Findings of Fact, Opinion, Decision, Order and Recommendations" provides that the ash ponds were "to be completely sealed." It further provides that if the conventional means of sealing the ponds (compaction and bentonite application) do not seal the ponds, extreme measures up to complete sealing by a plastic membrane must be taken.

Despite the completely sealed language, some seepage from the ponds was expected at the time the Certificate was issued. For example, Finding of Fact 61 Indicates that seepage from the coal ash disposal ponds will be minimal and will be collected by wells and returned to the ponds. Finding of Fact 64 provides that the effluents emanating from Colstrip 1-4 are not anticipated to impair the quality of the ground and surface water of the area and will not violate applicable standards, however careful monitoring of seepage and complete sealing of sludge ponds will ensure the water quality of the area is not degraded. Finding of Fact 71 provides that monitoring wells would be constructed around the sludge ponds to ensure that any seepage from the ponds would not exceed the estimated minimum amounts around the rim and through the foundation of the dam.

Finding of Fact XXXIX of the Board of Natural Resources and Conservation and Board of Health and Environmental Sciences' "Findings of Fact and Conclusions of Law" provides that the various ponds which would be used for storage of water in the evaporation and disposal of water and waste materials emanating from Colstrip Units 1-4 would have seepage not anticipated to impair the quality of the ground water in the area.

A 1984 Stipulation to the Certificate was signed by the Board of Natural Resources and Conservation, the Department of Natural Resources and Conservation, the Department of Human Health and Human and Environmental Services, Northern Plains Resource Council,

Rosebud Protective Association, Genie Land Company, Genie May Garfield, the Montana Power Company and the Board of County Commissioners-Rosebud County. The 12(d) Stipulation does not require the sealing of the ponds. Rather, the 12(d) Stipulation required the installation of monitoring wells in the Cow Creek and South Cow Creek drainages. If the monitoring indicated that the ground water was being impacted, interception of the ground water was required. The 12(d) Stipulation provides that compliance with the stipulation constitutes compliance with Condition (12(d) of the Certificate.

Conclusion of Law 12(d) was subsequently interpreted by the Montana First Judicial Court as follows:

The clear meaning of condition 12(d), taken in the context of the Board's findings that some seepage was expected (see BNR findings 61, 64, 68, 71, and 89 and BHES finding XXXIX), is that the pond as constructed for Relators may leak in small amounts but if the leakage is detected by the monitoring wells, the Relators will have to resort to more stringent measures, up to and including the installation of a plastic liner.

Talen and/or its predecessor have monitored the area around the ponds and has installed synthetic liners when seepage was detected. However, the volume of seepage from the ponds is much greater than predicted and has impaired the quality of the ground water in the area, which is a violation of the Certificate.

In the decades preceding issuance of the AOC, DEQ worked with Talen or its predecessor to achieve compliance with the Certificate. Talen or its predecessor was proactive in its installation of capture wells to address the plume of groundwater contamination. From 2000 to 2011, PPL Montana invested \$4.2 million on ground water mitigation in the 1 & 2 STEP pond area and \$4.7 million on groundwater mitigation in the 3 & 4 EHP area. PPL Montana built and operated a \$5.6 million waste water treatment plant for the 1 & 2 STEP and a \$4.4 million waste water treatment plant for the 3 & 4 EHP. These mitigation systems capture and treat ground water. At the time the AOC was issued in August of 2012, PPL Montana had spent \$23.8 million dollars since 2000 to reline ponds and otherwise address seepage from the ponds.

While many of the systems and actions taken by PPL Montana were effective, groundwater contamination continued to expand beyond the recovery systems in certain areas. Thus, DEQ decided to take formal enforcement action under the Montana Water Quality Act and the Major Facility Siting Act by entering into the AOC with PPL Montana.

Finally, it should be noted that as a result of litigation on the AOC, PPL Montana agreed with the suing plaintiffs to convert to the dry disposal of ash within the footprint of the Units 3 & 4 ash disposal ponds. DEQ processed and approved an amendment to the Certificate allowing the dry disposal of coal ash.

- 2) *The state cannot afford a "wait and see" approach with this cleanup. It is time to address the problem head-on with aggressive source control measures that fully dry the coal ash out, and for DEQ to collect funding for the inevitable need for long-term pumping and treatment.*

Response: DEQ agrees that aggressive source control measures are necessary immediately to prevent additional seepage from entering the aquifer. This is why DEQ plans to conditionally approve the report, with a list of contingency measures that specifically address these concerns. DEQ is requesting that Talen run a pumping test as soon as possible to determine whether

technologies in addition to the underdrain may be needed to fully dewater the ponds. Although this does not provide answers regarding the underdrain right now, the contingencies that DEQ is requesting should be completed within the year, so that DEQ can re-evaluate the financial assurance and request an adjustment (if needed) by the end of 2020. In the meantime, DEQ will have financial assurance for the existing proposal.

- 3) *The RER must include a roadmap to a permanent remedy.*

Response: DEQ's conditional approval letter will outline DEQ's requirements for the next steps needed to finalize the remedy. DEQ will not grant final approval until all the conditions have been met, and data gaps—such as the performance of the underdrain—have been filled. The conditions outlined by DEQ may serve as the roadmap to finalizing the remedy; Talen will also update the Gant Chart included with the report to provide a timeline for fulfilling DEQ's requests.

- 4) *Citizen lawsuits at the EHP site from adjacent landowners resulted in land buyouts and damage payments, but did not fix the problem. The state DEQ has never required a permanent fix, only requiring proposals to expand the capture system and remove more groundwater to control the pollution.*

Response: DEQ is aware of a lawsuit brought by adjacent landowners. Because DEQ was not a party to the lawsuit, however, DEQ does not know the outcome of the litigation. DEQ is requiring a permanent fix to the groundwater through the procedure established by the AOC. Prior to signing the AOC, DEQ worked with Talen to address the groundwater contamination. PPL Montana, Talen's predecessor, spent \$23.8 million after 2000 to reline ponds and otherwise address seepage from the ponds.

- 5) *The Preferred Alternative does not provide enough details on how the source of pollution—wet coal ash—will be dried out and kept out-of-contact with groundwater over the long term.*

Response: DEQ agrees that adequate information on the underdrain has not been provided in the report, and is requesting that Talen implement a pumping test on the underdrain as part of the planned conditional approval of the report. The results will be incorporated into the model; if the pumping test shows that the underdrain will not be adequate to dewater the ponds, additional measures will be required by DEQ.

As requested by DEQ, Talen has provided preliminary information on the current and future elevation of the water table relative to the bottom of the ponds; the model does indicate that adequate separation between groundwater and the ponds will be achieved once targeted dewatering is implemented. The cross sections that Talen has provided so far are included in the fact sheet attached to this Responsiveness Summary; DEQ is requesting that additional figures and data will be provided in the revised report.

- 6) *DEQ is not limited to approving only alternatives that are provided by Talen.*

Response: DEQ agrees that the AOC provides the option for DEQ to select a “modified remedy”. Because some additional data is needed before fully approving the proposed remedy, DEQ is conditionally approving the report. This allows DEQ to request that additional studies be performed to address the data gaps (such as the operation of the underdrain, and performing a study that will support the proposed use of MNA), while still being able to obtain financial assurance for the proposed remedy. If further measures are deemed necessary through the additional studies, DEQ will request additional financial assurance be provided to cover the costs of these measures.

- 7) *While Northern Plains squarely believes that the plant’s owners should bear all clean-up costs (and if Talen could afford a \$500 million shareholder dividend in 2017, they can afford to live up to their obligations under the law), we are aware that regulated utility owners may seek to ratebase some clean-up costs.*

Response: The AOC requires Talen to provide the bonding required under the AOC. The owners of the Colstrip Power Plant, including Talen, have submitted bonds based on their pro rata share of ownership of the power plant. DEQ believes it was prudent to accept the bonds under this arrangement. DEQ concurs that the plant owners should bear all clean-up costs. Talen will be required to submit its pro rata share of the bonding requirements.

- 8) *If DEQ establishes a low bond, then NorthWestern acquires a larger share of Units 3 and/or 4, and then DEQ comes back to raise the bond after initially approving insufficient clean-up, the NorthWestern (and by extension Montana residents) could easily be on the hook for a much larger share of those costs.*

Response: DEQ is not going to establish an initial low bond that is based on the cost of implementing an insufficient remedy. Under the AOC, DEQ is required to select a remedy that will achieve the cleanup criteria for all constituents of concern identified under the AOC. For risks that are not addressed by compliance with the identified cleanup criteria, there must be a demonstration that exposures to public health, safety, or welfare and the environment will be substantially mitigated. DEQ will require submission of bonds in full for each of the three sites addressed in the AOC once it has selected a remedy for that site.

- 9) *DEQ should require, and thoroughly bond for, stringent clean-up now while all of the current owners of Units 3&4 area still at the table.*

Response: DEQ plans to conditionally approve the report, which will allow DEQ to require that additional work be performed to fill data gaps, such as the performance of the underdrain, and the feasibility of using MNA. However, conditional approval also allows DEQ to collect financial assurance for the cost of the proposed alternative. If the requested studies indicate additional measures are needed, DEQ can request that additional financial assurance be submitted.

DEQ understands the urgency for collecting financial assurance for the full amount of remediation costs. Although the AOC does not allow DEQ to request financial assurance for contingencies, DEQ anticipates many of the requested studies will be completed within the next

year, and does not anticipate that the current owners will cease ownership prior to completion of the studies.

10) *The proposal lacks financial assurance for long-term pumping beyond 2070:*

- a. *Freshwater flushing is an important tool toward removing much of the contamination, but from groundwater models in the RER it is clear there will be a need for permanent pumping to control the boron plume from spreading into nearby Cow and Pony Creeks.*

Response: DEQ's comments on the previous version of the 3&4 Remedy Evaluation Report requested that Talen analyze both increasing the capacity of the capture/injection system by increasing the number of wells, and increasing the length of time that the wells are operated. Talen modeled both scenarios; the model showed that increasing the number of wells was effective in addressing the plume size, whereas running the capture/injection system for a longer timeframe essentially had no effect on the plume. DEQ is requesting that Talen include the results from that analysis in the revised report.

Additionally, the layers of the plume that need to be addressed beyond 2070 are not shallow layers that would be connected to the creeks. Most of the remaining contamination is in the Sub McKay, which would not discharge to the creeks.

- b. *New remediation technologies may be available in the future that can remove the less mobile constituents from the plume and prevent the need for perpetual pumping, but DEQ must not approve a plan that is based on that assumption.*

Response: DEQ is not relying on the emergence of future technologies to address the groundwater contamination. MNA is a widely accepted technology that may be implemented at the site in the future, if the model is correct and contamination remains above the cleanup criteria beyond the point of compliance. However, if a new technology does become available that would better address the contamination, DEQ has the authority to require Talen to evaluate and implement that technology at any time.

- c. *If prepared properly, the MNA study that Talen Energy is completing in the coming year will be helpful in evaluating if MNA is appropriate for the EHP, but with the data that is available today, DEQ must have a plan in place to control the pollution long-term.*

Response: DEQ is requiring additional studies to determine if the underdrain is adequate to achieve complete dewatering of the ponds in a timely manner. If it is not, DEQ will require additional measures to ensure the ponds are promptly dewatered. Several of the cells will be closed over the next 18 months, and the remaining cells will switch to dry stack storage. These measures remove the source of contamination by eliminating seepage from the ponds, which is the primary step needed to control pollution long-term. Talen has already begun the first stages of the MNA study, and DEQ will request

that Talen provide their continued findings in a separate report. If the MNA study does not appear to be enough to ensure the plume does not expand after the capture system shuts down, DEQ may request additional measures, such as continued pumping, be implemented.

- d. *Northern Plains believes that Alternative 5 in the RER (Source Removal) is intentionally mischaracterized in the RER as less effective than the Preferred Alternative because in-situ flushing is not included in the Alternative.*

Response: Neither Alternative 4 or Alternative 5 achieve the cleanup criteria at the point of compliance for the less mobile constituent (boron) by the end of the 30-year pumping period. Because the ash will not remain in contact with groundwater after the ponds have been dewatered (and the seepage is modeled as zero once the ponds are dewatered), Alternative 5 as presented would not achieve better results than Alternative 4 would.

- e. *DEQ is not required to approve alternatives as presented to them and could, for instance, borrow from both Alternatives 4 and 5 in crafting its requirements for an adequately protective remedy.*

Response: DEQ believes it has the discretion to approve a remedy that borrows from more than one remedial alternative proposed by Talen under the AOC. Also see response to Comment #10(d) above.

- f. *There must be several explicit contingency plans to reflect the uncertainty surrounding the location of the water table, effectiveness of the underdrain, and limitation on the HELP model used to justify meeting long-term cleanup goals.*

Response: DEQ has discussed these issues with Talen, and Talen has provided some preliminary information in the interim. The information that has been provided so far is included in the fact sheet; however, DEQ does plan on including several explicit contingency requests regarding the underdrain, the overall modeling, and the MNA study in the conditional approval.

11) *Immediate testing should be done to understand how effective the EHP underdrain is and a strong contingency should be included to pursue targeted dewatering if the underdrain does not fully drain the ponds:*

- a. *It is critical that DEQ have an understanding of the underdrain before approving it as a technology.*

Response: DEQ agrees that a better understanding of the capability of the underdrain is needed. Because of this, DEQ plans to conditionally approve the report with the requirement that Talen conduct a pumping test on the underdrain. If the pumping test

demonstrates that the underdrain will not be able to completely dewater the ponds, DEQ will require that Talen propose additional methods to dewater the ponds in a timely manner.

- b. The timeline for starting the underdrain in 2021 will result in avoidable increases in pollution and should be moved up to 2020. DEQ should require that added storage capacity be designed this winter and constructed next summer or that Talen come up with a way to temporarily store water (such as using the new Units 1&2 pond built south of town).*

Response: The time required to design, approve and construct additional storage would extend into 2021, when the ponds would have enough capacity to operate the underdrain. DEQ is requesting that a contingency measure be put in place to construct additional storage if the 2021 deadline cannot be met. Talen has provided calculations that demonstrate enough space will be available by 2021 to run the underdrain; additionally, after the pumping test is run, the results will be incorporated into the model, which will help provide a more accurate water budget for the ponds.

- 12) The proposal lacks immediate information on the water table beneath the EHP and a strong and fully-bonded contingency to excavate the ponds if the water table is in contact with coal ash long-term.*

Response: Because the report was lacking this information, DEQ requesting that Talen begin providing information to support the statements that indicate the ponds will not be in contact with groundwater once dewatering is initiated. Talen has provided preliminary cross-sections based on the groundwater model, which are shown in the fact sheet included with this Responsiveness Summary. Additional information will be included in the revised report.

- a. DEQ should request an aerial diagram of the EHP showing the difference between the water table and bottom of the EHP elevations.*

Response: DEQ has made this request as part of the conditional approval of the report; the diagrams will be included in the revised report.

- b. There is a strong risk that the EHP will continue as a source of long-term COIs if groundwater elevations are near the bottom of the ponds.*

Response: DEQ agrees that the EHP would continue to contribute COIs to the aquifer if the ponds remain in contact with groundwater. DEQ's letter to Talen dated April 22, 2019 states that "DEQ will not approve a remedy that allows a long-term source of COIs to remain in contact with groundwater". Current predictive modeling provided by Talen indicates that the ash will not remain in contact with groundwater, however if future

data differs from the model, DEQ will require Talen to take action to eliminate pond-groundwater contact.

13) *DEQ must hold standards for the cleanup consistent across all ponds at Colstrip, even if it means requiring a costly removal project at the EHP. The original MFSA permit for Units 3&4 state: "That the sludge pond or ponds shall be completely sealed. If the conventional means such as compaction and bentonite application do not seal the pond(s)...then extreme measures even up to complete sealing by a plastic membrane shall be taken." The extreme measures outlined in the original permit should be upheld by the DEQ to avoid permanent pollution to the region's aquifer.*

Response: DEQ agrees that the cleanup standards identified under the AOC apply to all ponds at Colstrip, even if it requires a costly removal project at the EHP. Also see the response to Comment #1.

14) *High sulfate levels in the coal ash ponds must be controlled to safeguard water quality for downstream livestock producers. Concentrations over 3,000 ppm negatively impact conception rates, decrease weight gain result in polioencephalomalacia or "brain softening", and lead to death in cattle.*

Response: DEQ agrees that high sulfate levels must be prevented from entering the aquifer, and existing high levels from historic seepage must be mitigated. Cleanup criteria for sulfate, as designated in the Cleanup Criteria and Risk Assessment Report, is either the background concentration for the individual aquifer, or a risk-based level of 3,000 ppm. This risk-based level was based on consumption by calves and accounts for health-related issues that may occur from ingesting high levels of sulfate.

15) *While sulfates and boron are used as an indicator pollutant in Talen's submission, the list of contaminants ultimately contained in coal ash is long and many of them pose meaningful threats to waters and its uses in southeastern Montana.*

Response: Sulfate and boron were used as indicator parameters because the extent (volume and concentration) of sulfate and boron is the greatest among the list of parameters designated in the Cleanup Criteria & Risk Assessment Report and in the AOC. DEQ feels that using parameters with the largest volume and highest concentrations of contamination is a conservative measure that best represents the nature and extent of contamination at the site, and demonstrates where other contaminants could migrate if no further action were taken. This information allows DEQ to better target remedial efforts in areas that are or could be impacted by pond contaminants to prevent risks posed by the full list of COCs.

16) *We respect that DEQ staff, more than anyone, wants to approve a permanent remedy that meets federal and state standards and does not want this remediation plan to end up in the courts. Northern Plains agrees and urges the DEQ to evaluate how this RER complies with the CCR Rule.*

Response: In July of 2012, DEQ issued the AOC as an enforcement action under Montana's Major Facility Siting Act and Water Quality Act in order to permanently address the groundwater contamination under state law. The AOC defines the "cleanup criteria" that must be achieved by the remedy selected by DEQ. The CCR rules are federal law that were adopted in 2015. The AOC does not serve as an enforcement mechanism for the CCR rules.

17) *When the ponds were proposed and under construction, landowners raised concerns that the reservoir would not hold water and that storing wet coal ash in a scoria hillside would create an enormous and expensive pollution problem. The Colstrip owners dismissed these concerns with testimony from licensed hydrologists, geologists, and engineers who argued that the ponds would be sealed, and leakages minimized. State agencies assured our members that if the ponds did leak, extreme measures would be taken to correct the problem. Today, the aquifer continues to receive 400,000 gallons of polluted water each day. The RER is the latest proposal from the company to resolve the problem and, in our opinion, does not qualify as an "extreme" approach by any means, and indeed fails to meet basic protective standards or comply with the AOC.*

Response: Please see the responses to Comments #1 and #16.

18) *The AOC assigns clear authority to the DEQ Director under Article XII to reserve the decision-making authority on the final remedy. Northern Plains believes DEQ will need to assert this authority in order to protect the permanent health and well-being of the surrounding community members, businesses, and the environment.*

Response: Article XIII of the AOC provides a dispute resolution process in the event that a dispute arises between Talen and the DEQ staff administering the AO. Under the dispute resolution process, Talen's environmental management representative and DEQ's staff will first confer in an attempt to resolve the dispute informally. If that is unsuccessful, the dispute is elevated to the level of Talen's representative that is senior to its environmental management representative and DEQ's division administrator. In the event that Talen's representative and DEQ's administrator are unable to resolve the dispute, DEQ's Director is to issue a final decision.

Kirk Engineering Comments

19) Radium in groundwater should be characterized under AOC authority.

Response: DEQ discussed the radium exceedances with Talen on October 23, 2019. Based on Talen's original analysis of Appendix IV constituents under the Coal Combustion Residual (CCR) Rule, radium had been listed as having a statistically significant level ("Notification of Statistically Significant Levels of Appendix IV Constituents above Groundwater Protection Standard per §257.95(g)", June 21, 2019). Based on this original determination, DEQ concurred that radium should be listed as a Contaminant of Concern (COC) under the Administrative Order on Consent (AOC) as well. (Please note that, for the purposes of this discussion, the terms "COC" and "COI" are used interchangeably.) However, Talen performed an Alternate Source Demonstration, as part of CCR Rule reporting, that resulted in radium not being listed as a COC under the CCR Rule; the Alternate Source Demonstration concluded that radium exceedances are likely from a source other than the ponds. The Notification has since been updated to reflect the results of the demonstration.

DEQ has reviewed the Alternate Source Demonstration in addition to the data provided in the Cleanup Criteria & Risk Assessment (CCRA) report. DEQ agrees that a significant portion of wells exceed the DEQ-7/MCL, which was the original reason for listing radium as a Contaminant of Potential Concern (COPC). DEQ also agrees that additional background samples should be collected throughout the area to provide a larger background data set under the AOC; Talen will to update the Water Resources Monitoring Plan (the sampling plan followed under the AOC) to include new COCs and COPCs determined under the CCRA. DEQ believes this update will help provide a more robust data set for radium and other constituents that are currently only sampled in CCR Rule wells.

As part of the Plant Site CCRA, DEQ requested that Talen sample fly ash and paste (prior to disposal in the ponds) for radium to determine if the fly ash is a source of radium. Results from these samples indicated that radium concentrations in the paste and pond water were well below EPA Remediation Goals for Radioactively Contaminated CERCLA Sites and US Department of Energy Preliminary Remediation Goals. This discussion is also included in the CCR Rule Alternate Source Demonstration.

The pond and paste data indicate that the ponds may not be the source of the radium exceedances in groundwater. However, because radium data (including background data) is still limited, DEQ is requiring that radium remain a COPC until a broader data set is collected. If the additional data indicates that the ponds are a source, DEQ has the authority to require that radium be listed as a COC. Regardless of whether radium is listed as a COC or COPC, it will be addressed as part of the remedy selection due to the current uncertainty of radium source and fate and transport mechanisms at the 3&4 area.

20) Monitored Natural Attenuation (MNA) should follow EPA's guidelines.

Response: Through discussions with DEQ, Talen has indicated that they intend to consult both the 2007 EPA MNA guidance as well as the 2015 EPA MNA guidance. DEQ agrees that MNA may

be appropriate for the site based on contaminant and aquifer properties. DEQ previously requested that Talen move up the date of the MNA studies; Talen originally proposed starting MNA studies toward the end of the pumping period, however DEQ requested that the MNA studies start immediately. Talen will now start the studies during the remedial design phase. DEQ will not approve the use of MNA until the studies have been completed and show strong evidence that MNA will be effective for all lower-mobility constituents.

21) The underdrain should be used to begin dewatering at the EHP as soon as possible.

Response: DEQ agrees that Talen should begin dewatering the EHP as soon as possible. DEQ is requesting that a pumping test be run as soon as possible to determine the capacity of the underdrain. This information will be included in the model. Based on conversations with Talen, DEQ is aware that the pumping test may need to be re-run once the additional wells are installed in clinker within the barrier wall, as these wells are thought to impact the capacity of the underdrain (also see response to Comment #34 below).

Talen plans to continue running the forced evaporation past 2019; this has been corrected in the revised report. Although current water management activities are projected to eliminate wastewater and provide space for underdrain water in 2021, Talen is also testing a wastewater elimination process called Ecovap to help remove water from the ponds if needed. This process utilizes evaporation matrices (panels) to capitalize on natural resources such as sun, wind, and gravity to speed up wastewater evaporation.

Although Alternative 1 modeling indicates that no further action would result in boron spreading beneath the EHP, outside the cutoff wall, and into deeper layer 5, the underdrain would not prevent spreading of existing contamination within the aquifer; instead, the underdrain would prevent additional mass discharge from entering the aquifer. Regarding construction of additional storage, the time required to design, approve and construct additional storage would extend into 2021, when the ponds would have enough capacity to operate the underdrain. DEQ is requesting that a contingency measure be put in place to construct additional storage if the 2021 deadline cannot be met.

22) A Permeable Reactive Barrier (PRB) may miss contaminants in the bedrock aquifer.

Response: PRB is a technology that was recommended for evaluation by DEQ during the remedy evaluation at the Plant Site, where fractured bedrock is not as prevalent. Although this technology cannot be used effectively in some areas at the 3&4 EHP (specifically the Sub McKay), DEQ believes that other areas could benefit from the technology, especially given the fact that none of the remedial alternatives evaluated in the report meet the cleanup criteria at the point of compliance (edge of the ponds). Talen has acknowledged that the PRB is intended only for the alluvial tributaries next to the EHP and not in the deep Sub McKay bedrock.

DEQ will not approve the use of this technology until feasibility studies have been completed during the RD/RA. Details regarding the feasibility studies will be provided in the RD/RA Work Plan. Additionally, if a PRB is not found to be effective (or necessary in the alluvium), DEQ can request other remediation measures under the AOC.

23) *RER approval should be phased while contingency measures are further evaluated.*

Response: DEQ agrees that RER approval will be phased while contingency measures are further evaluated, and while the approved portions of the remedy are optimized through the remedial design process.

DEQ will not approve the PRB or MNA contingency measures until feasibility studies evaluate the effectiveness of these measures. However, DEQ is approving the evaluation process, and financial assurance will be obtained to cover these feasibility studies.

24) *The mass discharge and liquid percolation rates from individual cells need to be accurately portrayed.*

Response: DEQ agrees the seepage rates should be refined, and use of a potentiometric surface or water table map would help with this refinement. DEQ believes that C Cell contributes the most seepage of the cells at the EHP due to its presence in the center of the pond, and the understanding that the floor of the EHP is not flat, meaning C Cell is located in the deepest part of the pond and has the greatest amount of head. That said, DEQ agrees seepage from other cells should continue to be assessed, and if seepage rates are greater than currently believed, the model should be updated to represent this. The pumping test on the underdrain will also help assess the effectiveness of the underdrain on dewatering cells other than C Cell. DEQ will request additional measures be taken if seepage is shown to be greater than currently believed, and if the underdrain will not capture the additional seepage. The upgraded capture system will also be designed to intercept any additional seepage that may be occurring from other cells, and this capture system will be monitored and adjusted accordingly during remedy implementation based on updated model results and field observations.

Regarding the divider dikes, the surface area of the dikes is relatively small compared to the rest of the pond, and much of the precipitation that falls on these dikes drains into the surrounding ponds. The divider dikes will be capped with geosynthetic liners, which will be connected to the liner/cover geosynthetics of the cells on either side of the dike, so these will not be a source of infiltration from precipitation in the future.

25) *The HELP modeled seepage estimates are unreliable.*

Response: The HELP model, as well as the fate and transport model, are intended to be used for qualitative, comparative purposes, in order to demonstrate which remedial technologies will be most effective at the site. That said, the model will be updated as more data is collected (in the remedial design phase), and as the remedy is implemented, which can be used to compare the modeled results to actual observations.

Regarding the assumption that the cells are free draining, the primary objective of the HELP model is to predict seepage rates after the cells are closed and capped, and after injection/capture begins; i.e., when the cells are separated from groundwater and are free draining. Initial seepage rates for the cells were calculated in the Site Characterization Report using site data; these rates were used to set up the initial conditions in the HELP model. Regarding residual saturation in the cells, please see the response to Comment #24 above.

Note that DEQ has discussed implementing targeted dewatering in the EHP in the event that the underdrain is demonstrated not to be effective. Targeting dewatering will be one of the contingencies requested by DEQ; the need for this will be determined after the pumping test is completed on the underdrain.

26) *The calculated mass flux from the individual cells are unreliable.*

Response: Mass flux is based on seepage rates from the cells; please see the response to Comment #25 above. The model will continuously be updated as new data becomes available, including additional geochemical data collected from the ponds.

27) *Talen's remedy should not be approved by DEQ until the results of the MNA study show that residual contaminant plumes will not spread.*

Response: DEQ is planning to conditionally approve the report, so that additional data (such as for the MNA study) can be collected, and DEQ can still obtain financial assurance. The current report proposes that MNA studies be conducted between 2021-2023 (during remedial design and implementation), and financial assurance is being provided to cover those costs. This is consistent with EPA's 2015 MNA guidance. DEQ will not provide final approval until the contingencies listed in the comments (including the use of MNA) submitted to Talen have been addressed.

28) *Talen should provide financial assurance for perpetual pump and treat of groundwater.*

Response: DEQ previously requested that Talen evaluate running the capture/injection system for a longer duration. Model results indicated this scenario did not make a difference in the effectiveness of Alternative 4. DEQ is requesting the results from this modeling be included in the Remedy Evaluation and continued pumping be added as a contingency. However, financial assurance for contingencies, such as perpetual pump and treat, is not within the scope of the AOC.

29) *Predictive modeling should evaluate uncertainties in the model parameters.*

Response: Because of the complexity of the site and uncertainty of concentrations within the cutoff wall, the approach of the fate and transport modeling was to develop a decision-making tool that could generally reproduce observed COC concentrations in groundwater and allow for comparison of the relative effectiveness of remedial alternatives.

Regarding the sensitivity analysis, one was performed on several parameters during the initial creation of the groundwater model in the Site Characterization Report. The model was not re-calibrated for all parameters during the remedy design. Through discussions with Talen, the results of the source seepage were not changed because this condition is much better known than most other conditions, so it was best to leave the initial conditions set to observed values.

The groundwater model will be periodically updated as new data becomes available, especially as the remedy is implemented and changes in the groundwater become apparent and can be compared to model predictions.

30) *The modeled boron retardation factor should be accurately constrained.*

Response: Through discussions with Talen, the variability of retardation among the differing geologic units was assessed, but given the lack of data, simulating this parameter with a variable distribution would add unnecessary complexity and not improve the model's ability to support decision making.

Talen performed the concentration gradient exercise described in the comment, and in general the estimated retardation was similar or slightly lower than that determined using breakthrough.

Even if there is uncertainty in the retardation factor, it is still useful for comparing the relative performance of the various alternatives. As data continues to be collected, the boron retardation factor may be able to be constrained further.

31) *Model calibration should include parameters other than source concentration.*

Response: Please see responses to comment #29.

32) *Pond leachate concentrations need to be accurately sampled and characterized.*

Response: Talen sampled the underdrain in the summer of 2019. The results were similar to concentrations previously measured in the ponds. These results are attached to this Responsiveness Summary. DEQ is requiring that these samples be included in the model update during the remedial design. Additional samples will be collected during remedy implementation, when wells are installed within the pond perimeter.

Talen attempted to calibrate the model using a single source concentration, however this resulted in a poor match to observed concentrations.

The NewFields (2019) report states in Sections 8 and 9 that model predictions are not sensitive to the range of changes tested for source concentrations.

33) *Modeling should use a dual porosity model to accurately predict contaminant transport*

Response: According to discussions with Talen, although there is evidence of fracturing at the site, outside of the clinker, the Site Characterization Report indicates that fractures are not well connected. This evidence was based on geophysical studies performed in the 3&4 area in 2005. In the clinker, abundant fractures and rubble zones cause the unit to behave as a relatively porous media. Because of these conditions, dual porosity models are not needed.

34) *The modeled underdrain flows appear to be too low.*

Response: Based on discussions with Talen, pumping rates are low because the alternatives also include capture wells screened in clinker within the cutoff wall. During remedy design, the balance between pumping rates of the underdrain and clinker capture wells will be optimized to provide the maximum dewatering. However, pumping rates are expected to be lower in the future due to the use of paste technology, which results in very little standing water remaining. Talen will also to complete another pumping test on the underdrain to better assess current seepage rates.

35) *The model should be calibrated to data from underdrain test pumping.*

Response: Talen will to complete another pumping test on the underdrain and on well 1003R. The results of this test will be incorporated into the model as part of the remedial design. Also see response to comment 26 above.

36) *The sensitivity of the modeled water table elevation should be tested and reported.*

Response: Talen has provided a series of cross sections depicting the water table through time (current water table, during capture/injection, and 20 years after the capture/injection system has shut down). These cross sections indicate that the ash in the pond is currently saturated, but that the water level will drop below the bottom of the ponds during capture/injection, and will continue to drop after capture/injection ceases. DEQ has also requested aerial water table surface maps be provided that demonstrate changes in groundwater elevation during and after pumping; these maps will be included in the revised report.

37) *The modeled water table elevation under the EHP needs to be reported.*

Response: Please see the response to comment 28 above.

38) *The model should be further calibrated when additional data from remedial measures is available.*

Response: Talen will update the model whenever new data or information becomes available.

39) *The groundwater quality data tables referenced on page 24 of the RER to be from Appendix F in Appendix D6 of the NewFields report is missing from the report*

Response: DEQ will request replacement pages for discrepancies such as this.

40) *The remedial alternative recharge barrier was not retained in the evaluation in Table 5-1 but is retained in the report text.*

Response: The recharge barrier should not be retained in any of the remedial alternatives in the text; DEQ will ensure this alternative is removed.

41) *NewFields Table 6-12 for Alternative 4 shows the underdrain is not pumped. According to the report text, the underdrain is pumped for this alternative.*

Response: The underdrain was simulated as drain package cells in the model. In Alternative 4, underdrain cells turn on in stress period 4 (the year after the North Horizontal well). Therefore, the water table is already drawn down below the underdrain and no water flows to the underdrain. So, although the underdrain was simulated to be active, no groundwater extraction occurred. The pumping rates of the underdrain and other wells installed within the cutoff wall will be evaluated and optimized during remedial design based on the requested pumping tests and other available data.

42) *The executive summary states on page xiv, "Some areas around the EHP would contain boron and low mobility constituents above the PCC after 2050, but plume expansion is controlled." It's not clear this will be the case. The boron plume is still expanding after 2050 in the model in layers 3, 4, and 5. Also, the model uses a retardation factor which only serves to slow the expansion of the residual boron plume. It is not possible to state the plume is controlled without the MNA study and thermodynamic geochemical modeling.*

Response: DEQ agrees additional work is needed to determine the feasibility of using MNA to control the plume after pumping ceases. Talen will implement a study; if the study shows MNA does not appear to be a viable alternative, DEQ will request additional actions be taken to ensure the plume is stable.

43) *Section 7.4.2.1 Performance starts with the statement, "By implementing the injection/capture system and cell upgrades/closures, Alternative 4 would achieve the PCC in most areas within the CSES property by 2050, with the exception of two small areas at the southern and east edges of the EHP which reach the PCC by 2070." This is incorrect, areas of boron exceedance surround the EHP and do not meet the PCC by 2070. In 2069, model layers 2, 3, and 4 has boron outside of the EHP boundary in the 30 – 80 mg/L color class, which is much over the 4 mg/L PCC. We can assume that other low mobility contaminants will also exceed the PCC after 2070 because they will be harder to flush from the aquifer than boron.*

Response: DEQ is requesting that the statement be revised.

44) *Section 7.4.2.1 also states, "By 2119, the model simulations for Alternative 4 show that the footprint of the isolated areas with boron concentrations above the PCC are relatively the same as in 2050, except to the north of the EHP, where the extent of the boron plume in shallow Sub-McKay is slightly larger." This prediction is highly reliant on the model accuracy including the retardation factor which we discuss is quite poorly defined. We should not consider the model accurate enough to state it will be "slightly larger".*

Response: DEQ agrees that the model should not be used for predictive simulations, but rather to compare the relative treatment performance of different remedial alternatives. The

performance of the model will be based on monitoring data, and operation of the capture/injection system will be adjusted accordingly.

The prediction does not appear to be highly reliant on the retardation factor based on the sensitivity analysis. Also see response to comment #30.

45) *In the revised RER, Geosyntec deleted the statement, "The potential long-term need for institutional controls might raise community concerns" from Section 7.4.2.8. The obvious long-term need for ICs is very much a community concern.*

Response: DEQ recognizes that long-term ICs might raise community concerns. However, ICs are not intended to be a permanent measure, and will not be used as a substitute for additional remedial measures that might be required to attain the cleanup criteria. Rather, ICs are intended to serve as an interim measure to prevent exposure during the remediation process. DEQ is requesting that Talen include additional language in the Report to better describe the use and intent of ICs.

Underdrain Comments, Kuiper & Associates

46) *The final EHP Sub-Drain System Plan drawing from 1984 notes that “This drawing has been prepared in accordance with the Montana State DNRC Report Entitled ‘Colstrip 3—4 Fly Ash Pond Seepage Control Options’.” This is contradictory to Geosyntec’s response to MDEQ’s March 2019 Specific Comment 61 and 81 where they suggest that “...the underdrain system was intended to be operated to intercept the cell seepage after it was full.”*

Response: DEQ will request clarification regarding the reference to the 1984 Plan.

47) *The RER EHP Report suggests that the underdrain system is both reliable and easy to implement. This conclusion should be questioned as the underdrain system has not been operated or implemented as intended for the past 35 years, and therefore should not be considered either reliable or easy to implement.*

Response: Through discussions with Talen, DEQ learned the underdrain has been turned on several times in the past for maintenance. Therefore, the underdrain is already in place and known to operate, making it easy to implement. What is not well known is the performance of the underdrain under sustained conditions, and the effectiveness the underdrain will have on fully dewatering the ponds. DEQ is requiring Talen to run a pumping test on the underdrain as soon as possible to better quantify the effectiveness of the underdrain, and determine if additional measures are needed to fully dewater the ponds.

48) *Responses to DEQ’s comments from May 2019 indicate that the “constituent mass in the ash pore water is not likely an important factor in controlling plume expansion because new seepage is captured by the underdrain system. It is well documented that underdrain systems, even when properly implemented and operated, do not result in complete capture of seepage.*

Response: If the pumping test required by DEQ indicates that new seepage will not be captured by the underdrain, DEQ will require additional measures be taken to intercept pond seepage.

49) *The report would be made more understandable and provide missing information critical to understanding the recommendations if it included a water mass balance for each alternative showing the anticipated closure cover infiltration assumptions and resulting seepage, underdrain pumping rates, wells pumping rates, injection rates, and ultimate water management and treatment requirements from present until at least 2050.*

Response: The required pumping test is intended to better quantify pumping rates for the underdrain, as well as optimize pumping rates for other wells installed within the cutoff wall. The entire capture/injection system will be optimized during the remedial design phase, and the model will be updated to reflect the new data. These processes will help quantify an accurate water budget for future water management requirements.

50) *While seepage rates from the HELP model are useful as a tool and in particular for comparative purposes, like all mathematical models, it is highly uncertain, and therefore should not be used for predictive purposes.*

Response: The HELP model, as well as the fate and transport model, are intended to be used for qualitative, comparative purposes, in order to demonstrate which remedial technologies will be most effective at the site. That said, the model will be updated as more data is collected (in the remedial design phase), and as the remedy is implemented, which can be used to compare the modeled results to actual observations.

51) *We [Kuiper & Associates] were unable to reconcile the information provided in the NewFields 2019 Fate and Transport Model Development and Remedial Alternative Analysis with respect to underdrain rates, which seemed to suggest significantly less than the 130 gpm suggested in Appendix J-1 of the report.*

Response: Based on discussions with Talen, pumping rates are low because the alternatives also include capture wells screened in clinker within the cutoff wall. During remedy design, the balance between pumping rates of the underdrain and clinker capture wells will be optimized to provide the maximum dewatering. However, pumping rates are expected to be lower in the future due to the use of paste technology, which results in very little standing water remaining. Talen will also complete another pumping test on the underdrain to better assess current seepage rates.

52) *The proposed use of the underdrain system makes sense, however the information provided in the RER EHP Report is inadequate and does not provide confidence given the extent to which the underdrains are being relied upon to accomplish source control that makes other actions such as well pumping, and the performance of the cell covers less onerous.*

Response: DEQ agrees and is requiring Talen run a pumping test to quantify the effectiveness of the underdrain. Additional measures will be required if needed.

53) *We [Kuiper & Associates] recommend that additional data on the underdrains including pump tests of longer duration and seasonally be performed unless continuous pumping can be implemented more expediently.*

Response: DEQ agrees and is requiring Talen to perform a pumping test on the underdrain as part of the conditional approval of the report.

54) *The results of a sensitivity analysis for the mass balance should be included that considers what might happen if assumptions used in the modeling, such as cover infiltration, underdrain performance or precipitation, don't occur as predicted. An adaptive management plan should be developed based on the sensitivity analysis.*

Response: The model will be updated once the pumping test is run to evaluate water management practices at the ponds, and will aid in optimizing the capture/injection system. DEQ anticipates the model update will be included as part of the remedial design; an adaptive management plan could be included in the design.

Letter from Clint McRae (2014)

DEQ is in general agreement with the comments expressed in Clint McRae's February 6, 2014 letter except as noted below.

Regarding Mr. McRae's comments regarding the "completely sealed" provision of the Certificate, please see DEQ's response to comments submitted by the Northern Plains Resource Council. DEQ does not believe that it has operated in bad faith in regard to addressing the ground water contamination emanating from the ash disposal ponds. The seepage from the ash disposal ponds is greater than that predicted in the Certificate. Pumping back contaminated groundwater to the ponds and lining the ponds with plastic liners as required by the Certificate are not sufficient to address the groundwater contamination. DEQ worked extensively with PPL Montana, an entity that was very proactive in attempting to deal with seepage from the ash disposal ponds. While its efforts were successful in some areas, the ground water contamination continued to expand in other areas. This is a situation in which there was not an apparent easy answer to addressing the ground water contamination. It was for these reasons that DEQ has taken an enforcement action under the Montana Water Quality Act and the Major Facility Siting Act by executing the AOC. DEQ is unclear as to Mr. McRae's assertion that the 12(d) Stipulation has been superseded.

DEQ is aware that area residents sued PPL Montana in regard to the groundwater contamination. DEQ was not a party to that litigation and is unaware of the terms of the settlement agreement that was reached. Nor is DEQ aware of the lawsuit referred to by Mr. McRae between two impacted landowners.

DEQ disagrees with Mr. McRae that it crafted the AOC with PPL Montana behind closed doors with no public involvement. DEQ and PPL Montana met during the normal course of business to negotiate the terms of the AOC. DEQ believed that it was important to obtain input from the public before signing the AOC. DEQ sent a copy of the proposed AOC to interested parties on DEQ's interested party list and solicited comment on the proposed AOC. Mr. McRae was one of the interested parties that submitted comment on the proposed AOC. On April 12, 2012, DEQ issued its responses to comments received on the proposed AOC, including those comments that had been received from Mr. McRae.

When the terms of the AOC were negotiated, DEQ believed that the AOC should provide meaningful public participation. DEQ identified key points in the AOC process at which the public would be invited to participate. These points included Talen's submission of Site Reports; Cleanup Criteria and Risk Assessment Reports; Remedy Evaluation Reports; Final Remedial Action Reports; and Facility Closure Plans. DEQ has worked to establish public meetings that better involve the community and allow for open comments and questions. Although the AOC provides for specific public comment periods for key documents, DEQ is happy to receive comments and questions from the public at any time. DEQ believes that it has and will continue to provide meaningful public participation in addressing ground water contamination under the AOC.

In regard to the pump back wells pumping in excess of 35 gpm, please see DEQ's response to the timeline compiled by the Rosebud Protective Association.

Rosebud Protective Association Timeline

DEQ is in general agreement with the timeline compiled by the Rosebud Protective Association except as noted below.

DEQ disagrees that it held “closed door meetings” with PPL Montana to develop the AOC. DEQ and PPL Montana met during the normal course of business to negotiate the terms of the AOC. DEQ believed that it was important to obtain input from the public before signing the AOC. DEQ sent a copy of the proposed AOC to interested parties on DEQ’s interested party list and solicited comment on the proposed AOC. On April 12, 2012, DEQ issued its responses to comments received on the proposed AOC. DEQ signed the AOC in August of 2012.

DEQ also takes issue with the assertion that the AOC is an agreement that will legally allow the coal ash ponds to leak. As stated in DEQ’s response to comments received from Northern Plains Resource Counsel, seepage of the ponds was anticipated under the Certificate, the 12(d) Stipulation, and the ruling issued by the First Judicial District Court. The Certificate has been violated because the seepage of the ponds has been greater than expected and has resulted in groundwater contamination. The AOC was executed as an enforcement action by DEQ under the Montana Water Quality Act and the Major Facility Siting Act to address the groundwater contamination. DEQ has determined that the point of compliance will be at the edge of the ash disposal ponds.

DEQ also disagrees that the pump back wells are “exempt wells” subject to a 35 gpm limit. A person is required to obtain a permit from the Department of Natural Resources and Conservation (DNRC) under Section 85-2-101, *et seq.*, MCA, prior to appropriating surface or ground water for a beneficial use. “Beneficial use” is defined as a use of water for the benefit of the appropriator, other persons, or the public, including, but not limited to agricultural, stock water, domestic, fish and wildlife, industrial, irrigation, mining, municipal, power and recreational uses. The purpose of the ground water pump back systems at Colstrip is to remediate the release of impacted water into the ground water system. Because the purpose of the ground water capture wells is not for a beneficial use, Talen is not required to obtain a water use permit from the DNRC. This remains true, even if some of the impacted water that has been captured and returned to the pond is commingled with other water in the pond and circulated to the power plant for use. DEQ consulted with DNRC to verify that a water use permit from DNRC is not required.

NPRC Member Comments

55) *Ponds at the 3&4 Area should be dried out and arrangements made for them to be continuously monitored and pumped as needed in perpetuity.*

Response: DEQ is requiring that the ash be dewatered. Talen's proposed plan is to use the existing underdrain to dewater the ash in place. However, DEQ is requiring that a pumping test be run on the underdrain to ensure that it is capable of fully dewatering the ash. If the pumping test indicates the underdrain is not adequate, DEQ will require additional dewatering measures be put in place. Long-term monitoring will be required at the site as part of the proposed Monitored Natural Attenuation contingency, and post-closure care monitoring is required under the Federal Coal Combustion Residual Act after the ponds are closed.

56) *The companies should be held responsible for the cleanup. Future generations should not have to pay for perpetual pollution. Adequate bonding should be secured now.*

Response: The AOC requires that Talen submit financial assurance to cover the costs of remediation. DEQ currently holds almost \$171 million in surety bonds that cover the costs of remediation at the Plant Site Area, and closure of ponds in all three areas. The proposed plan is estimated to cost \$107 million; however, DEQ and Talen re-evaluate the financial assurance on an annual basis to account for any additional requirements or changes to the remediation plan based on the progress of cleanup.

57) *Ash should be dewatered permanently and stored "high and dry" above the water table.*

Response: DEQ agrees that dewatering the ash is a key component of the remedy. Dewatering measures are included as part of the remedy, utilizing the existing underdrain system as well as some additional wells within the footprint of the pond. If pumping tests on the underdrain indicate it will not be sufficient to dewater the ash, DEQ will required additional measures to ensure the ash is fully dewatered.

The proposed plan includes dewatering the ash in-place, and capping the ponds to prevent infiltration of precipitation. Modeling indicates that once the ponds are fully dewatered, the water table will decrease in elevation, and the ponds will no longer be in contact with groundwater. Therefore, storing the ash "high and dry" can be achieved in this area without excavating and relocating. Please also refer to the fact sheet included with this Responsiveness Summary, which shows the modeled elevation of the water table in 2020 (current), 2040 (during pumping), and 2070 (20 years after the capture system shuts down).

58) *Cap-in-place is inadequate; ash should be fully dried, excavated, and stored in a lined landfill above the water table.*

Response: Although cap-in-place may not be appropriate in areas where the ash will remain in contact with groundwater, the ponds in the 3&4 will have adequate separation from

groundwater once the ponds are dewatered. DEQ is requiring aggressive dewatering measures to ensure the ponds are promptly dewatered and separation from groundwater is achieved.

59) Cap in place allows coal ash to leach to groundwater and is a long-term risk for the land and human taxpayers.

Response: Coal ash is known to leach at Colstrip, due to saturation of ash from disposal practices and because ponds that have not yet been closed are exposed to precipitation. However, several measures will be taken in the proposed remedial process to ensure leaching is eliminated, and further impacts to groundwater will be stopped. Aggressive dewatering of ash in the ponds will dry out the ash in place, preventing further seepage and ensuring that the water table is well below the bottom of the ponds. Capping the ponds with protective HDPE (plastic) liners will prevent any infiltration from precipitation, which would otherwise cause the ash to become re-saturated. The cap will be monitored during the 30-year post-closure care period required by the federal CCR Rule, and will continue to be monitored for cap integrity as part of normal custodial care for a closed landfill. Financial assurance will be secured for post-closure care. By implementing both measures in a timely manner, the risk to groundwater will be eliminated.

60) Local communities do not deserve to live with groundwater contamination.

Response: DEQ agrees that no community should live with long-term groundwater impacts. DEQ requires that the proposed cleanup plan in the Colstrip area will not leave lasting impacts to groundwater.

61) Cleanup should be done right the first time.

Response: DEQ agrees that cleanup should be done right the first time. Because the proposed remedy achieves adequate separation between the bottom of the ponds and the groundwater, DEQ believes the remedy will be effective in preventing additional groundwater contamination from pond seepage. The majority of contamination at the 3&4 area is the result of existing contamination from current and historic seepage. The capture/injection system proposed to remediate the existing contamination has been demonstrated to work in other areas in Colstrip. The system will be optimized during the design phase, and financial assurance may be adjusted based on any changes. Additionally, dewatering of the ponds using the underdrain system needs to be better tested; if DEQ determines additional means are needed to fully dewater the ponds, DEQ will require the Remedy Report be updated and additional financial assurance provided.

62) Create jobs through permanent cleanup and use the skills of the existing workforce.

Response: DEQ recognizes the importance of utilizing the existing skilled workforce in Colstrip to complete remedial measures, and supports job creation wherever possible. However, DEQ does not have regulatory authority to mandate Talen's hiring procedures.

63) *The ash ponds at Colstrip are toxic and life-threatening.*

Response: DEQ required that Talen assess the risk posed by the ponds in the AOC process by submitting a *Cleanup Criteria & Risk Assessment Report* for each of the three areas. No contaminants were identified in soil or surface water; however, six constituents were identified as a risk in groundwater. The groundwater is being addressed through the AOC process; and although the ponds at the 3&4 area will continue to operate until the plant closes, additional measures are being taken to ensure the ponds will not continue to impact groundwater. These measures include dewatering the ponds, and switching to dry stack storage by July 2021.

64) *Don't leave contamination behind for wildlife or the river.*

Response: The proposed remedy mitigates exposure to wildlife and the creeks. Groundwater contaminants from the 3&4 area were not found to pose unacceptable risks to Cow Creek or South Fork Cow Creek in the 3&4 CCRA. Source control of the ash at the 3&4 ponds will prevent the possibility of future impacts to the creeks.

Two man-made surface water structures designed to contain groundwater seeps impacted by the ponds have been identified at the site. The seeps are no longer active, but residual water in these structures was studied and results indicated concentrations of COCs were above risk-based levels for ecological receptors; therefore, DEQ is requiring that the structures be removed to mitigate impacts to wildlife or livestock.

65) *Start using the underdrain under the 3&4 ponds to prevent further spread of the pollution plume.*

Response: DEQ is requiring Talen run a pumping test on the underdrain in early 2020 to better characterize the amount of water the underdrain is capable of pumping. Currently, Talen does not have storage space for water that would be pumped from the underdrain. Talen has provided estimates of the pond water budget that indicate there will be adequate storage for water from the underdrain by 2021. Because of the permitting and construction logistics of building a new pond to store water from the underdrain, it's unlikely a new pond could be constructed and operational before 2021, when the underdrain is scheduled to be turned on. If the pumping tests in early 2020 indicate there will not be adequate space for the underdrain water by 2021, DEQ will require Talen pursue other methods to store the water, which could include a new storage pond.

66) *Reservoirs and a treatment plant should be built for the polluted water.*

Response: Currently, water from the 3&4 ponds is treated using a Vibratory Shear Enhanced Processing system and is re-used at the plant. Upon plant shutdown, Talen will be required to find another means to dispose of treated water, such as applying for an MPDES permit.

67) *Please plan ahead now for the coming closure of these plants and the changes in the energy economy.*

Response: Although DEQ was not involved in the decision to close the plants, DEQ is working to ensure groundwater contamination is addressed, the ponds are properly closed, and the ash will not continue to be a source of groundwater contamination in the future.

DEQ encourages the investigation of future ventures that may become feasible in Colstrip, such as recycling coal ash or finding other beneficial uses for the ash.

68) Ensure that wind erosion of coal ash is eliminated.

Response: Talen was required to submit a “Fugitive Dust Plan” under the Federal Coal Combustion Residual Rule (CCR Rule) that addresses elimination of wind erosion. Talen uses a paste process, which removes most of the free water in the ash slurry and causes the ash to harden into a concrete-like substance. This process minimizes dusting conditions. Additionally, the caps that are installed after the ponds are closed are designed to prevent surface runoff, including erosion from precipitation.

69) The resolve to this problem should be researched to find any possible valuable minerals, a viable use for the waste, any radioactive danger, the possibility of mixing waste with municipal sewage for potting soil, fertilizer, or other possibilities. The use of wind and solar power should be researched to augment the operation of the plant.

Response: DEQ and Talen are interested in methods that could be used to recycle the coal ash or otherwise use the ash beneficially. At this time, a viable alternative has not been identified, but DEQ is hopeful an opportunity may be presented in the future that could result in reusing ash from all ponds at Colstrip.

Regarding radioactivity, DEQ previously requested that additional data be collected to determine whether the ponds are a source of radium. The study required sampling of the pond water and of the ash. Pond water samples were below DEQ-7 groundwater standards, and ash samples were consistent with national background. Please also see the response to comment #19 for additional details on the study.

Because the ash will be dewatered to prevent future seepage and eliminate any contact with groundwater, the ponds will not pose any risk to water sources.

70) Montana’s legacy of allowing the coal ash ponds at Colstrip to leak and pollute the groundwater needs to stop.

Response: Please see the response to Comment #1.

71) Water is our most valuable resource and should be protected for ranchers, farmers, and future generations of Montanans.

Response: DEQ agrees water must be protected for all Montanans. Part of the remedial process under the AOC required a risk assessment to determine the risk posed by the groundwater contamination in Colstrip. Many of the pond constituents identified in the risk assessment do

not have groundwater quality standards; in those cases, cleanup criteria were developed based on any known risks to human or ecological/livestock health; or background groundwater concentrations were used. The use of these cleanup criteria are designed to preserve the groundwater for future uses.

72) *Water in the Colstrip area has changed for the worse over the years. We used to have frogs and some fish in the creek. They are all gone, and cattle have bad water. Our conception rate has decreased over time.*

Response: Thank you for your comment. DEQ is enforcing protective cleanup standards that are based on protection of livestock, wildlife, and humans.

73) *DEQ's website doesn't work and should be updated.*

Response: DEQ updates the Colstrip web page every time new documents are submitted by Talen, or when other documents become available (such as fact sheets or presentations by DEQ). New documents are identified with a "New" flag for clarity. DEQ's website works best in Google Chrome; DEQ is aware the website does not work well on mobile phones. Some of the documents are very large and require downloading a compressed (zipped) file due to the size.

74) *Please approve a Remedy Evaluation Report that:*

- a. *Fully dewater all ponds with aggressive pumping, including wells drilled into the ash itself and horizontal capture wells beneath the underdrain.*

Response: DEQ agrees the ponds should be completely dewatered. DEQ is requiring Talen perform a pumping test on the underdrain system to better quantify its effectiveness on dewatering the ponds. Talen is also proposing to install wells within the perimeter of the slurry wall to help dewater the ponds and capture pond seepage, and horizontal wells along the dam on the north side of the ponds. If these methods are not effective in completely dewatering the ponds, DEQ will require additional methods to ensure the ponds are fully dewatered.

- b. *Turn the 3&4 ash pond underdrain on immediately to release the head pressure on the bentonite liner.*

Response: DEQ is requesting the underdrain be used as soon as possible. This will be contingent on the results of the pumping test that will determine if additional measures are needed to dewater the ponds. Talen currently does not have the space to store additional water that would be pumped by the underdrain; however, Talen has stated through discussions with DEQ that space will be available by 2021. If it becomes evident that space will not be available by 2021, DEQ may require additional storage means be provided so the underdrain can be turned on.

- c. *Contains strong contingency measures in light of strong uncertainty surrounding Talen's models, including excavation if contamination continues after dewatering.*

Response: DEQ plans to provide conditional approval of the report, which will require certain contingencies be fulfilled prior to final approval. These contingencies include running a pumping test on the underdrain and proposing additional dewatering methods if necessary; completing a study that will determine the effectiveness of using MNA after the pumps are turned off (if MNA is determined not to be effective, additional actions, such as continued pumping, may be required), and providing additional detail on the water table elevation beneath the ponds. Talen has provided preliminary cross sections that demonstrate separation of groundwater and the bottom of the ponds after dewatering is implemented; these cross sections are included in the fact sheet attached to this report.

- 75) *Wet impoundments should be phased out; existing ponds should be cleaned up and closed.*

Response: The ponds at the 3&4 area that are scheduled to remain in operation are required to switch to dry stack storage no later than July 1, 2021. The remaining ponds will be dewatered and capped, eliminating future seepage from the original wet impoundments.

- 76) *Owners should be required to provide health care coverage for those affected health-wise from coal ash. These toxins can cause cancer, heart damage, lung disease, respiratory distress, kidney disease, reproductive problems, gastrointestinal illness, birth defects, and impaired bone growth in children.*

Response: DEQ is not aware of any claims regarding health impacts in the Colstrip area resulting from pond seepage. DEQ encourages people who believe they have been affected by coal ash to report their health concerns to DEQ and the Department of Public Health and Human Services.

- 77) *A comprehensive plan to clean up the ash ponds will provide good jobs to Colstrip workers who have, or will, lose their jobs when Units 1&2 close.*

Response: Although DEQ does not have regulatory authority over Talen's hiring procedures, DEQ agrees that Talen should use the existing workforce for the remediation work at all of the ponds.

- 78) *The federal government is allowing more time to clean up fly ash and less treatment of fly ash waste water. This is going in the wrong direction.*

Response: The CCR Rule is the federal rule that governs the operation and remediation of coal ash ponds; Talen is required to comply with this rule, however the rule is enforced by citizen lawsuits. The cleanup at Colstrip is being regulated by an Administrative Order on Consent,

which was an enforcement action taken by DEQ in 2012, prior to implementation of the federal CCR Rule. The AOC mandates deadlines and requirements for cleanup plans and is enforced by the Montana Water Quality Act and the Major Facility Siting Act; therefore, cleanup decision will not be affected by changes in the federal rule.

79) The ponds are too big to cap in place. The pollution plume will continue to expand and damage the water table for Colstrip and surrounding farmers and ranchers.

Response: The key component of preventing plume expansion is eliminating the source; in this case, seepage from the ponds. DEQ is requiring Talen to completely dewater the ponds, which will prevent seepage into the groundwater. Additionally, Talen will cap the ponds with CCR Rule-compliant caps, which will prevent infiltration from precipitation. Talen is in the process of implementing dry disposal technology for the disposal of coal ash from Colstrip Units 3 & 4, so the ash will no longer be stored wet. These measures will eliminate seepage and create a separation between the bottom of the ponds and the top of the water table, which will eliminate the source. However, Talen must still address existing groundwater contamination from historic pond seepage.

80) Talen needs to give some of the water rights from the Yellowstone to the City of Colstrip so that the town can continue into the future. The groundwater is most likely already contaminated and replacing the Yellowstone water with groundwater for the city is not an option.

Response: DNRC is the regulatory agency that mandates water right issues. Talen has stated that Castle Rock Lake (the storage reservoir for the Yellowstone River Water) will remain in existence; some of that water will be required for groundwater remediation under the proposed plan. However, DEQ does not regulate water rights and cannot require Talen to give water rights to the city.

81) Annual adjustment of the bond is not adequate.

Response: Regardless of what the remedial strategy is, the financial assurance is required to be reviewed on an annual basis under the AOC. Because DEQ will be strictly enforcing the timeline of remedial actions proposed by Talen, adjustments will likely be made as capital expenses are covered (capping ponds, installing wells, etc.).

DEQ agrees that relying on contingencies for future remedial plans is not ideal. However, Talen has demonstrated that the groundwater will not remain in contact with the ponds as the ponds are dewatered and capped. Additional studies on dewatering mechanisms will be completed within the year; therefore, annual adjustments are not a long-term solution for completing the remedy.

82) Once the groundwater is polluted, Montana's ratepayers end up on the hook for what is actually NW Energy's mess.

Response: The AOC requires the plant operator to post financial assurance based on the remedial actions and closure plans approved by DEQ. Since Talen is currently the operator, Talen is responsible for providing the financial assurance (the AOC is transferrable in the event the operator changes). Talen has an agreement between the owners requiring the owners to provide portions of the financial assurance based on the percentage of their ownership at Colstrip; however, DEQ is not involved in this agreement.

Northern Cheyenne Tribe Comments

83) *DEQ should take strong measures to protect against environmental harm from the Units 3&4 ponds including removal of the coal ash, recycling any usable coal ash, and storing the remainder in a properly lined landfill.*

Response: DEQ agrees that strong measures need to be taken to prevent further seepage and environmental damage from the ponds. Because the ponds in the 3&4 area will be above the water table once dewatering is initiated, excavation is not recommended for these ponds. Dewatering the ponds will prevent future seepage and eliminate the contact between the bottom of the ponds and the aquifer, while capping with CCR Rule-compliant HDPE liners will prevent precipitation from infiltrating the ponds.

DEQ is interested in methods that could be used to recycle the coal ash. At this time, a viable alternative has not been identified, but DEQ is hopeful that an opportunity may be presented in the future that could result in recycling ash from all ponds at Colstrip.

84) *The RER should include financial assurance to cover the costs of long-term and likely perpetual pumping at the EHP to control the spread of contaminants offsite, including, for instance, through the endowment of a trust fund.*

Response: Talen's obligations that are subject to the second phase of bonding are tied to the remedial measures selected by DEQ under Article VI, requiring Talen to submit bond in an amount that ensures implementation of the remedial measures selected by DEQ. DEQ would have authority to require a bond for perpetual water treatment or for excavation of the ponds if the process described in Article VI of the AOC results in selection of a remedy that requires perpetual water treatment or excavation of the ponds.

DEQ has accepted financial assurance in the form of surety bonds. In the event that DEQ causes forfeiture of the surety bonds and there remains long-term remedial requirements, including monitoring, the cash proceeds would be invested in an account that earns interest.

85) *The Tribe provided a copy of the report, "The Northern Cheyenne Tribe and its Reservation" (2002), which is an important resource that DEQ is encouraged to rely upon in granting the Tribe's requests.*

Response: Thank you for describing the cultural importance of ground water to the Northern Cheyenne and the Tribe's efforts to maintain its homeland and surrounding natural environment. DEQ found of interest the fact that the Tribe has decided 1) not to develop on-Reservation coal resources; 2) to resist development of off-Reservation resources in the Tribe's traditional homeland; 3) to classify its air shed as "Class 1" under the federal Clean Air Act; and 4) its actions in regard to the development of coal bed methane development surrounding the Reservation. These steps indicate the Tribe's desire and efforts to protect the environment of the Reservation and adjacent lands.

86) *The Tribe incorporates by reference the technical analysis and findings prepared by Kirk Engineering & Natural Resources, Inc., in addition to an underdrain review prepared by Kuipers & Associates, and strongly encourage that they be given substantial consideration and weight.*

Response: Please see responses to the comments from Kirk Engineering and Kuiper & Associates.

87) *In July 1976, the Montana BNRC issues a MFSA Certificate for Colstrip Units 3&4 with special conditions for siting the ponds. These conditions were expected to be followed as the power plant units and ash ponds were constructed. Two of these conditions (12c and 12d) state: "12c: That the seepage from the existing surge pond and any enlarged or additional surge ponds be monitored as specified by the State Board of Health and Environmental Science, and that every feasible engineering means be taken by the applicants to minimize such seepage; and 12d: That the sludge pond or ponds shall be completely sealed. If the conventional means such as compaction and bentonite application do not seal the pond(s), as indicated by monitoring wells the applicant shall install and operate, the extreme measures even up to complete sealing by a plastic membrane shall be taken." These conditions have never been enforced by the responsible state agencies. The owners have been allowed to operate for three decades now in direct violation of Montana water quality law and the plant's original MFSA permit, and the state's failure to decisively act has made a severe problem worse.*

Response: In regard to the history of the coal ash disposal ponds, the Certificate requirement that ash disposal ponds be completely sealed, and the assertion that the Colstrip Power Plant has been allowed to operate in violation of the Montana Water Quality Act, please see DEQ's response to comments received from the Northern Plains Resource Council (Comment #13 and the response to comments from Clint McRae and the Rosebud Protective Association).

88) *Citizen lawsuits at the EHP site from adjacent landowners resulted in land buyouts and damage payments, but did not fix the problem. DEQ has never required a permanent fix, only requiring proposals to expand the capture system and remove more groundwater to control the pollution.*

Response: DEQ is aware that there was a lawsuit brought by adjacent residents against PPL Montana regarding groundwater contamination emanating from ash disposal ponds. DEQ was not a part to that lawsuit and, therefore, does not know the terms of the settlement agreement.

89) *The Northern Cheyenne Tribe does not support Alternative 4. Alternative 4 is deficient because it does not include:*

a. *Financial assurance for long-term pumping beyond 2070.*

Response: DEQ previously requested that Talen evaluate running the capture/injection system for a longer duration. Model results indicated that this scenario did not make a difference in the effectiveness of Alternative 4. DEQ is requesting that the results from

this modeling be included in the Remedy Evaluation, and that continued pumping be added as a contingency.

- b. *Immediate testing to understand how effective the EHP underdrain is and a strong contingency to pursue targeted dewatering if the underdrain does not fully drain the ponds.*

Response: DEQ agrees and is requesting a pumping test be run on the underdrain as part of the conditional approval of the report. If additional dewatering measures will be necessary to fully dewater the ponds, DEQ will require Talen to implement additional technologies (for example, targeted dewatering through well points) and provide financial assurance for the additional measures. The groundwater model will also be updated with the new information collected from the pumping test. This information will be included in the Remedial Design Report, which will be made available to the public on DEQ's website.

- c. *Immediate information on the water table beneath the EHP and a strong and fully-bonded contingency to excavate the ponds if the water table is in contact with coal ash long-term.*

Response: DEQ agrees that information is needed regarding the depth of the water table below the ponds, now and in the future. DEQ requested that Talen provide cross-sections based on modeling that demonstrate that the water table will remain below the bottom of the ponds during and after operation of the capture/injection system. Additional information will be provided in the revised report.

The AOC does not allow for collection of financial assurance for contingencies such as excavation. However, current modeling indicates that the ponds will have adequate separation from the groundwater once dewatering is implemented. If the additional studies on the underdrain and other dewatering measures demonstrate that separation between groundwater and the bottom of the ponds will not be achieved, DEQ can request that excavation be performed and financial assurance be submitted to cover those costs. DEQ anticipates that these studies will be completed within the year.

90) *DEQ is not limited to approving only alternatives provided by Talen Energy.*

Response: DEQ agrees that the AOC provides the option for DEQ to select a "modified remedy". Because some additional data is needed before fully approving the proposed remedy, DEQ is conditionally approving the report. This allows DEQ to request that additional studies be performed to address the data gaps (such as the operation of the underdrain, and performing a study that will support the proposed use of MNA), while still being able to obtain financial assurance for the proposed remedy. If further measures are deemed necessary as determined by the additional studies, DEQ will request additional financial assurance be provided to cover the costs of these measures.

91) *Alternative 4 will result in pollution levels exceeding preliminary clean-up criteria 100 years after they have begun their remediation efforts.*

Response: DEQ is requiring Talen to implement an MNA study, which will provide evidence for the stability of the plume after the capture system is shut down. Although some areas may still exceed cleanup criteria at the time of shutdown, if the plume is stable, concentrations will naturally decrease over time. MNA would include a strict sampling schedule to monitor the plume as concentrations decrease. If the study shows that concentrations would not decrease, it is within DEQ's authority to require further remedial action.

92) *As written, the RER does not meet key standards contained in the 2015 Coal Combustion Residual ("CCR") Rule, and DEQ must consider this to ensure the AOC remedy is executed and that water and its uses are protected. Specifically, the CCR Rule requires that free liquids be fully drained from ponds prior to capping and that the base of existing CCR impoundments be 5 feet above the upper limit of the uppermost aquifer. At minimum, contingencies are needed to fully dewater the ponds if the underdrain is not effective and to require source removal of coal ash at the EHP if the water table will be within 5 feet of the impoundment long-term. Furthermore, these contingencies must be fully bonded to be considered actually in-place. Anything else provides uncertainty, risk, and prolongs consideration of the problem to a time when owners may not exist or agency leadership may seek to undermine the goals of the AOC and state and federal law.*

Response: 40 CFR 257.102(d)(2)(i) requires the owner or operator of a CCR surface impoundment to eliminate free liquids from the impoundment by removing liquid wastes or solidifying the remaining wastes and waste residues prior to installing the final cover system. 40 CFR 257.60, requires existing and new CCR surface impoundments to have a separation distance of five feet from the surface impoundment base to the upper limit of the uppermost aquifer, or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations. Talen Montana made the demonstration of compliance with these provisions within the time required by the CCR rules. Talen's demonstration documents can be found at the link entitled "CCR Rule Compliance Data and Information" at the bottom of its home page at talenenergy.com/plant/colstrip-units-3-4.

DEQ issued the AOC as an enforcement action under Montana's Major Facility Siting Act and Water Quality Act. Neither of these laws provide DEQ with an authority to require financial assurance from a regulated entity. Talen agreed to provide financial assurance as required by Article VIII of the AOC to cover 1) current and continuing remedial actions including monitoring; 2) implementation of the remedies selected under Article V; and 3) implementation of the facility final closure plan. DEQ does not have the authority to require financial assurance under the CCR rule, which in itself does not require owners and operators of existing and new CCR impoundments to submit financial assurance to ensure compliance with the CCR rules.

93) *DEQ should require that Talen hire Northern Cheyenne as employees and contractors for the coal ash pond work. The plan should include a preference for Tribal members to be notified of employment and contracting opportunities at the earliest possible time. The plan should require that those Tribal members who apply for the coal ash pond work be given a hiring preference. The plan should require cultural sensitivity training and other programs to support Tribal members and foster long-term employment.*

Response: DEQ recognizes that operation of the Colstrip Power Plant has provided employment opportunities for members of the Northern Cheyenne Tribe. However, DEQ does not have regulatory authority to ensure that Tribal members are provided notice of employment opportunities associated with remediation and closure of the coal ash disposal ponds or be granted an employment preference when filling those positions.

Montana Environmental Information Center Comments

94) *DEQ must reject Talen's proposed remedy and instead follow the requirements of the 2012 AOC, and require Talen to implement a modified remedy, designed by DEQ, that will effectively and permanently remove contaminants from the area and meet the cleanup criteria at the actual point of compliance (the edge of the ponds) for all constituents of concern (not just the two pollutants modeled by Talen, boron and sulfate).*

Response: The AOC does not require a remedy "that will effectively and permanently remove contaminants from the area." That language is not found in the AOC. The remediation alternative selected by DEQ must satisfy the Cleanup Criteria established under the AOC. Cleanup standards have been established for contaminants (characterized as "constituents of concern" in the AOC) in ground or surface water, contaminants in ground or surface water that may impact an ecological receptor, and contaminants in soil. The selected remediation alternative must achieve compliance with standards for all contaminants, not just boron and sulfate. Although the AOC does not specify that the point of compliance is the edge of the ponds, that is the point of compliance being used by DEQ in evaluating and selecting the remediation that will be required under the AOC.

95) *Talen explicitly admits in its evaluation of each alternative remedy that each alternative fails to meet the cleanup criteria for cleanup. This failure...means that Talen forfeits its right to create a viable Remedy Report. DEQ cannot approve Talen's Alternative 4 and instead must design a remedy that will succeed.*

Response: Although DEQ has the right to select a modified remedy under the AOC, the AOC does not provide specific provisions under which Talen would forfeit its right to create the Remedy Report. DEQ plans to provide conditional approval of the Report, which allows DEQ to obtain financial assurance for the proposed remedy, as well as for the additional studies that will be required to determine if additional measures might be necessary.

Although none of the alternatives meet the cleanup criteria at the conclusion of the modeled timeline (through 2119), this is due to the difficult nature of remediating existing groundwater contamination. This is evident through Talen's analysis of excavating the ash (Alternative 5), which does not achieve the cleanup criteria. Additional measures to address this existing contamination may become more evident as Talen moves through the feasibility studies (MNA, PRB); or in the event that a new technology becomes available in the future, DEQ would require that Talen analyze that technology to determine its effectiveness at this site.

96) *Boron is an indicator of many pollutants, indicating that many other pollutants will likely not only remain in the aquifer for 100 years, but that they will spread.*

Response: Boron was selected to represent less mobile constituents in groundwater, because boron has moderate to low mobility, and has the greatest extent of exceedances in groundwater. Other constituents at the site have lower mobility than boron, but because the

extent of exceedances was much smaller than that of boron, these constituents were not selected to be used in the model. The low mobility of the other constituents is part of the reason that the extent of exceedances is so much smaller. The MNA studies will be focused on these low-mobility constituents, and will better define how these constituents will act throughout the course of remediation. Additionally, DEQ has requested that Talen update its Water Resources Monitoring Plan to include additional monitoring for these constituents. This update is expected to happen in early 2020.

97) *DEQ should reject Talen's false proposition that a cleanup plan for one layer of strata will be sufficient for all subsurface strata, especially when Talen readily admits that pollutants behave differently in different subsurface strata.*

Response: DEQ acknowledges that contaminants will move differently in the different layers of strata, most significantly between the alluvium and the Sub-McKay. Some of these differences are apparent based on the current modeling, which does account for different hydraulic properties between the layers. The clean water injection/capture system technology does appear to be effective in speeding up the cleanup timeframe in all layers, however there will be some differences in the construction and placement of the wells based on the geology of the various layers. Details regarding well construction will be discussed, and the system will be optimized during the remedial design phase. Additionally, results from the MNA study will better characterize fate and transport of the various constituents in the different layers, and monitoring requirements may be adjusted based on the results of these studies. Finally, some technologies have been acknowledged to be more effective in various layers; for example, the PRB is only being considered for the alluvium in the vicinity of the creeks, because a PRB is not believed to be effective in tighter bedrock such as the Sub McKay.

98) *DEQ should significantly modify Talen's request, require dewatering and excavation of the coal ash impoundments, require secure long-term management and storage of the excavated material, and require a plan to effectively remove the remaining subsurface contamination. DEQ must establish milestones and an automatic increase to the bond in order to address measures and contingencies that eventually must be implemented.*

Response: Based on additional model information provided by Talen, the water table will drop well below the bottom of the ponds once in-situ dewatering removes water residing in and above the ash. The water table will remain below the bottom of the ponds after injection/capture ceases in 2050. Please refer to the fact sheet attached to this Responsiveness Summary for further discussion and figures. Because the ponds will not interact with the groundwater, excavation is not necessary at the 3&4 area. However, aggressive dewatering is necessary to eliminate the contact between the ponds and groundwater. Talen is proposing to use the existing underdrain to dewater the ponds, as well as installation of capture wells within the slurry wall. Because the underdrain has not been used extensively, DEQ is requiring Talen to run a pumping test in early 2020 to better characterize the capability of the underdrain to dewater the ponds. If the test indicates that the underdrain will not be sufficient, DEQ will require Talen to use additional methods (such as well points within the ash) to fully dewater the

ponds in a timely manner. The bonds will be updated to reflect any changes in the dewatering methods.

- 99) *Any cleanup plan should have better monitoring, better contingency plans, and bonding sufficient to guarantee that DEQ does not have the annual burden for 100+ years of determining that bonding must increase to address the inevitable failures in Talen's proposals.*

Response: As discussed above, Talen will be updating the Water Resource Monitoring Plan to include additional monitoring for COIs that were identified in the Risk Assessment. DEQ is including a list of required contingencies in its comment letter on this report, along with a timeline for completion of additional studies that are needed. Bonding will be updated to reflect any changes that may be required by DEQ.

- 100) *DEQ must be very clear in any decision-making documents that any bond imposed on Talen and the other plant owners will be adjusted based upon increased obligations that result from required and/or essential additional feasibility analyses, calibrations, uncertainty analyses, demonstration studies, and results from the use of untested equipment, such as the underdrain.*

Response: DEQ agrees bonds provided for the remedy in the 3&4 area are not final, and may need to be updated based on new information or requirements from DEQ. The financial assurance will be re-evaluated on an annual basis, as provided in the AOC, and will be increased as needed.

- 101) *There is no certainty that the other pollutants from the ash ponds, including such pollutants as chromium, radium, selenium, cobalt, manganese, TDS, potassium, lithium and other pollutants, will behave in an identical fashion as boron and sulfate in the groundwater. DEQ should either force the consideration of those pollutants in addition to boron and sulfate or, at a minimum, be extremely conservative in its remedy selection and bonding requirements.*

Response: The constituents identified as COCs in the Risk Assessment, as well as the "regulated substances" identified in the AOC, will be monitored as part of the remedy; Talen is updating the Water Resource Monitoring Plan in early 2020 to address this, and to provide additional data for COCs that may have a shorter monitoring history (these are mostly COCs that are currently only monitored as part of CCR Rule monitoring). The COCs (especially the less mobile ones) will also be studied in-depth as part of the MNA study, to better determine how these COCs move in the various layers, and identify attenuation mechanisms in the aquifers. Also see response to Comment #96.

- 102) *DEQ should require extensive testing for these pollutants to establish both the existing base level for each pollutant in each geological stratum as well as estimate each pollutant's predicted movement and level. DEQ should require extensive testing for each pollutant in each stratum on a regular basis to determine that the cleanup criteria at the edge of the impoundments is met.*

Response: DEQ agrees and has requested that Talen update the Water Resources Monitoring Plan to include additional monitoring, especially for COCs that were identified in the Risk Assessment.

- 103) *The 2012 AOC anticipated the eventuality that the Colstrip plant operator would submit an insufficient remedy proposal. DEQ created, and Talen agreed to, the tools created within the AOC for this circumstance. Accordingly, the AOC states that “The Department shall take action on the Remedy Evaluation Report per Article XII and shall select a remedy or a modified remedy as part of that Department action.”*

Response: DEQ agrees that it has the authority to select a remedy proposed by Talen with modifications made by DEQ.

- 104) *MEIC endorses and incorporates by reference the comments and concerns of Kirk Engineering, submitted by the Northern Plains Resource Council.*

Response: Please refer to the responses to NPRC’s comments.

- 105) *If DEQ allows Talen to rely on a PRB as a component of the selected remedy, the PRB feasibility study should be done before a final remedy is chosen.*

Response: DEQ plans to provide conditional approval of the remedy to allow Talen to perform the feasibility studies (MNA and PRB) before final approval is given.

- 106) *Talen’s proposal to re-evaluate the capture system every year for the first three years of operation and then every five years thereafter is insufficient to guarantee the effectiveness of the system, especially considering the failures of prior operating history. In addition, this proposal also violates the terms of the AOC, which requires an annual review of the financial assurance by DEQ.*

Response: DEQ will require re-evaluation of the capture system based on the progress of the remedy. Annual monitoring and reporting will be required by DEQ, which will include evaluating pumping rates, geochemical data, pond chemistry, model updates and other data as needed. Annual review of remedial progress will support the annual review of financial assurance. DEQ will request that Talen clarify these requirements in the revised report.

- 107) *In order to assure compliance with the law, Talen must submit annually, and DEQ must review, an analysis of the critical components of the cleanup requirements in order to adjust cleanup requirements and the bond.*

Response: The AOC (Section VI, Part D) requires Talen to “provide an Annual Progress Report if implementation of the remedy exceeds one year and periodic status reports as requested by the Department”. DEQ will enforce this requirement, and may request additional reporting, such as during the feasibility studies and other remedy implementation.

108) *Water volume, treatment, and disposal have always been a significant issue for plant operations. Even though Talen brings huge volumes of water into the plant for its operations, the owners have chosen to avoid acquiring a Montana water pollution discharge permit (MPDES) for the disposal of the inevitable wastewater. The enormous volume of waste water has resulted in Talen's use of groundwater as its primary waste disposal mechanism despite Talen's claim that the facility remains a "closed-loop system". DEQ should not be constrained in its remedy selection by Talen's desire to avoid applying for an MPDES permit from DEQ.*

Response: Talen's Certificate of Environmental Compatibility and Public Need (Certificate) provides that the power plant is to be a "closed loop water system." Finding of Fact 65 of the Board of Natural Resources and Conservation provides as follows:

That the units as proposed will use a closed loop water system which system does not discharge effluents from the plants into ground water or surface water or large evaporation ponds and therefore will have no effect on the ground or surface water in the area.

Finding of Fact XXIX of the Board of Natural Resources and Conservation and Board of Human Health and Environmental Sciences provides as follows:

A closed loop water system (a system which does not discharge effluents from the plants downstream or into other waters) was adopted from Colstrip Units 1-4 so that there would be no discharge from the plants into the Yellowstone River or other state waters.

Because the Certificate does not allow discharges to surface water, it did not require the operator to obtain an MPDES permit. Selection of a remedy that requires an MPDES permit would require amendment to Talen's certificate. DEQ does not have the authority to unilaterally amend the Certificate.

Despite being licensed as a "closed loop system," some seepage from the ponds into groundwater was expected. For example, Finding of Fact 61 of the Board of Natural Resources and Conservation provides as follows:

That seepage from the waste disposal ponds will be minimal and will be collected by wells and returned to the ponds.

Finding of Fact XXXIX. Of the Board of Natural Resources and Conservation and Board of Human Health and Environmental Sciences provides as follows:

The various ponds which will be used for storage of water in the evaporation and disposal of water and waste materials emanating from Colstrip Units 1-4 will have seepage not anticipated to impair the quality of the ground water in the area.

The seepage into groundwater from the ash disposal ponds has turned out to be greater than predicted, resulting in the ground water contamination that the AOC is intended to remediate.

109) *Talen's proposal to decrease wastewater volumes, pump contaminated water from the underdrain, and eliminate water discharges will fail. When the plant closes it will no longer be available to use the wastewater in facility operations. The loss of the reuse of the wastewater, combined with a lack of an MPDES permit, underscore the need to immediately build a treatment system for the contaminated pumped groundwater.*

Response: Currently, there is no official proposed shutdown date for Units 3&4. At the time the report was submitted, the shutdown date had been estimated at 2037; therefore, Talen proposed constructing a new water treatment plant at that time. In light of more recent circumstances, if a shutdown date is proposed, DEQ will require Talen to update the schedule to reflect the new date. Please see the response to Comment #108 regarding the MPDES permit.

- 110) *\$110 million is woefully inadequate to guarantee cleanup, especially in light of the fact that several uncertainties and deficiencies still exist, including that: the underdrain has never been used, the PRB feasibility analysis could take years and has never been tested; the PRB will not work in the layer of subsurface in which the pollutants reside and in locations where they are expected to migrate; the MNA is undeveloped; other pollutants besides boron and sulfate have not been analyzed; levels of some pollutants are expected to increase in some areas over time, the fate and transport model has admittedly not been rigorously calibrated; a model uncertainty analysis has not been conducted; and not all areas will meet the cleanup criteria after 100 years. All of these admissions or deficiencies show that DEQ must require a much higher bond than Talen's proposed sum of \$110 million.*

Response: DEQ acknowledges that aspects of the proposed Alternative require further study. For this reason, DEQ plans to provide conditional approval of the report, to ensure that some financial assurance can be obtained immediately. As Talen fulfills the contingencies requested by DEQ, the financial assurance will be updated accordingly. Please also see responses to NPRC's KirK Engineering comments.

- 111) *The AOC requires nothing less than a stronger, more robust and adequate cleanup plan and bond than what has been proposed by Talen. The AOC gives DEQ the authority to do so:*
- "To ensure the operation and maintenance of remedial and closure actions carried out under this order, PPLM [Talen] shall provide financial assurance in the amount required by the Department and by any one method or combination of methods approved by the Department, and such approval shall not be unreasonably withheld, including but not limited to insurance, third-party guarantee, performance or other surety bond, or letter of credit. Such financial assurance shall be subject to annual review by the Department, with a comprehensive review at least every five years. The amount of the assurance may be increased or decreased based on the projected costs for the operation and maintenance of remedial and closure actions.*
- "Any disagreement between the parties with respect to the amount of the financial assurance will be subject to the dispute resolution per Article XIII. The Department shall make available, through its website or similar means, the basis and/or calculations used to determine the amount of the financial assurance.*
- "The parties agree that provision of the financial assurance will be addressed in phases, with the first phase addressing obligations for current and continuing remedial actions including monitoring, a second phase to incrementally address obligations resulting from actions taken pursuant to the process described in Article VI, and a third phase to address the Facility Closure Plan and amendments thereto addressed in Article IX. The parties agree that the first phase of financial assurance will be addressed by the parties upon execution of this AOC."*

As stated below, it is critical that DEQ impose a bond that will suffice for the entire cleanup process, including worst case scenarios of cleanup requirements (especially as additional studies are necessary to determine what the cleanup requirements will be). Any bond must also include financing for perpetual water treatment.

Response: Neither the Montana Water Quality Act or the Major Facility Siting Act give DEQ independent authority to requiring bonding at the Colstrip facility. DEQ's bonding authority is derived from the provisions of the AOC, which the commenter correctly quotes. As indicated, the second phase of bonding addresses "obligations resulting from actions taken pursuant to the process described in Article VI" of the AOC. Article VI is entitled "Investigation and Remediation" and lays out the process by through which DEQ selects, and Talen is required to implement, remediation measures that satisfy the Cleanup Criteria identified under the AOC. Thus, Talen's obligations that are subject to the second phase of bonding are tied to the remedial measures selected by DEQ under Article VI. Requiring Talen to submit bond in an amount that ensures implementation of the remedial measures selected by DEQ. DEQ would have authority to require a bond for perpetual water treatment only if the process described in Article VI results in selection of a remedy that requires perpetual water treatment. The bond required under the AOC will be subject to annual review by DEQ, with a comprehensive review at least every five years. The amount of the bond maybe increased or decreased based upon the projected costs for the operation and maintenance of remedial and closure actions.

112) Since boron is representative of many other contaminants and Talen's Remedy Report acknowledges that the plume will expand over time, DEQ must insist on financing for perpetual treatment of water.

Response: Please see the response to previous comments on perpetual water treatment (Comment #28 and #84).

113) There are potential scenarios being considered now that would leave NorthWestern as the only remaining owner at the plant. Such a scenario could leave Montanans on the hook for cleanup costs beyond the initial bonding required by DEQ after remedy selection.

Response: DEQ is aware of NorthWestern's interest in continuing operation of Units 3&4. However, the AOC is an agreement between DEQ and the operator; financial assurance provided by the separate owners is based on an agreement between the operator (Talen) and the owners. The AOC is transferrable if the operator were to change; however, DEQ is not aware of any plans for change in operation.

114) The state should impose adequate cleanup requirements and bonding immediately as a means to relieve any pressure the state could eventually face to declare the site a Superfund site, so it can apportion liability to all current owners.

Response: DEQ will require financial assurance, as stated in the AOC, upon conditional approval of the Report. The financial assurance will be adjusted on an annual basis to reflect any changes or additions to the plan. Also see response to Comment #7.

115) *DEQ must only provide preliminary or interim approval until all additional studies are complete, and all cleanup and contingency methods are identified, analyzed, subjected to public scrutiny, and eventually approved.*

Response: DEQ plans to provide conditional approval for this report. This ensures that DEQ can require that financial assurance be provided while Talen continues to evaluate the contingencies requested by DEQ.

MEIC Member Comments

116) Any cleanup plan must:

- a. *Require dewatering, excavation, and permanent storage of coal ash waste in a properly lined, monitored and licensed landfill.*

Response: Current modeling indicates that the ponds will have adequate separation from the groundwater once dewatering is implemented. Capping the ponds with CCR Rule-compliant caps, and switching to dry storage methods will prevent additional precipitation from infiltrating the ash. DEQ requested preliminary information demonstrating the separation of the ponds from groundwater, which can be found in the fact sheet included with this Responsiveness Summary. Additional descriptions and images will be included in the revised report. If any of the studies on the underdrain and other dewatering measures demonstrate that separation between groundwater and the bottom of the ponds will not be achieved through dewatering of the ash, DEQ can request that excavation be performed and financial assurance be submitted to cover those costs.

- b. *Require modeling and annual testing of all pollutants (not just boron and sulfate), including radium, in all subsurface geologic layers where contaminants occur now or are expected to move.*

Response: DEQ is requiring that all COIs identified in the AOC, risk assessment, and CCR Rule be sampled at least annually (some wells are monitored more frequently). Talen will update the Water Resources Monitoring Plan in early 2020 accordingly. Some COIs do not currently have enough data to include in a fate and transport model, but as additional data becomes available, more modeling can be completed.

- c. *Financial assurance (bonds) must be designed for the worst-case scenario.*

Response: Talen's obligations that are subject to the second phase of bonding are tied to the remedial measures selected by DEQ under Article VI, requiring Talen to submit bond in an amount that ensures implementation of the remedial measures selected by DEQ. DEQ cannot require Talen to submit bonds for contingencies or theoretical scenarios. If future data supports implementing additional measures, DEQ can require Talen to submit financial assurance at that time. Financial assurance and remedial progress will be evaluated annually as part of the requirements under the AOC.

- d. *Be contingent on completion of all required and necessary studies, analyses, and data collection, not promises to do the analysis later.*

Response: DEQ will only provide conditional approval of the report until the requested contingencies have been completed.

- e. *Collect samples from more than just the surface of the ash ponds.*

Response: Through discussions with Talen, Talen will collect additional samples from within and beneath the ponds to assess potential secondary sources that may be present beneath the ponds. Talen also collected samples from the underdrain during summer 2019; sample results were similar to the composition of water in the ponds. As the underdrain pumping tests are run, additional samples can be collected to assess leachate composition over time.

- f. *Provide accurate and detailed information about the level of the groundwater under the ash ponds.*

Response: Please see the response to Comment #116 (a) above, as well as the fact sheet included with this responsiveness summary.

- g. *Post a bond for the perpetual treatment of water.*

Response: Please see the response to Northern Plains' comment on perpetual water treatment (Comments #28 and #84).

- h. *Continuously monitor cleanup efforts and annually review and adjust cleanup requirements and bonds.*

Response: The AOC provides for annual reviews of remedy progress and financial assurance adjustments. DEQ will enforce this requirement under the AOC.

Other Public Comments

117) *The ash ponds for Units 3&4 have massively leaked ever since they were constructed in the early 1980s. They were supposedly lined to contain the effluent and were surrounded by monitoring wells to tell the company if the pollution began to spread, and spread it did until there were over 1200 wells telling the company that leakage was a massive problem. Neither DEQ nor the corporate owners had any remedy other than trying to pump the polluted water back into the pond, and yet the polluted water continued to spread.*

Response: Please see the response to Northern Plains Resource Council's comment regarding the MFSA Certificate (Comment #1).

118) *The companies that manufacture the liners do not have a guarantee on those liners that would stand up for more than 30 years, if that long.*

Response: Talen has provided documentation from the manufacturers indicating the life expectancy is up to 400 years. However, because the ponds in the 3&4 area will not be in contact with groundwater once dewatering is initiated, and dewatering will prevent future seepage, the proposed remedy is not reliant on the integrity of synthetic liners.

119) *Talen should not be allowed to exit the scene without fully addressing the groundwater contamination created by their coal ash.*

Response: Talen is held responsible under the AOC, and is required to put forth financial assurance to cover remedial costs. DEQ is requiring Talen to provide financial assurance in the form of bonds, which allow DEQ to collect the bonds in the event Talen does not complete the remedy as approved.

120) *Without responsible cleanup of these coal ash ponds, Colstrip has a strong risk of becoming yet another one of Montana's Superfund sites.*

Response: Colstrip is being regulated under an AOC, which was an enforcement action taken by DEQ in 2012. The AOC is enforceable under the Montana Water Quality Act and the Major Facility Siting Act. Additionally, the federal CCR Rule (although not regulated by DEQ) provides other enforceable requirements for remediation and operation of coal ash ponds. Because of the multiple enforceable regulations governing the remediation at Colstrip, DEQ does not believe Superfund will be necessary.

121) *The ponds leak close to 200,000,000 gallons per year, and Talen is paying to import water to the town of Colstrip from the Yellowstone River because of contaminated groundwater from the ponds.*

Response: Talen has held water rights to the Yellowstone river since the 1970s, when Units 1&2 were constructed. The water is primarily used for plant operations; however, a small portion of the water is leased to the city as drinking water. Talen has provided municipal water connections to several residences whose wells have been impacted by the ponds. However, Talen's use of Yellowstone River water was not historically due to groundwater impacts.

- 122) *Any remediation plan should have a verifiable, contractual liability goal of making the site behave as a closed-loop system, with Colstrip able to use its historic drinking water supply and pond-leakage non-existent.*

Response: Because the AOC is enforceable under the Major Facility Siting Act—the permitting mechanism for Colstrip that mandated the closed-loop system—the remediation plan selected under the AOC will require that the groundwater meet cleanup criteria at the point of compliance (downgradient edge of the ponds) and eliminate future adverse effects to groundwater.

- 123) *All of the proposed plans have time-horizons far too long—they appear designed to outlive the company and allow it to avoid cleanup costs via bankruptcy. They push most contaminant cleanup until 2070. The citizens of Colstrip and all Montana citizens deserve a timely cleanup plan, one that will resolve the issues within 20 years.*

Response: Talen is required to provide financial assurance to DEQ for the duration of the remedy. Although modeling of the site is performed through 2120, active remediation (i.e., operating the capture/injection system) is proposed to run for 30 years. Additional monitoring will be required after the system is turned off to ensure the plume is stable and will continue to shrink. However, seepage from the ponds will completely cease well before the capture system is turned off; the most difficult aspect of remediation at the 3&4 ponds is existing contamination from historic pond seepage.

- 124) *Monitoring should include groundwater sites downstream, not just the ash ponds themselves.*

Response: Talen has an extensive monitoring network that covers areas downstream of all ponds.

- 125) *The law must be structured so the capitalist beneficiaries fully bond and fully execute their proper share of remediation.*

Response: Financial assurance is required under the AOC; DEQ has required that the financial assurance be provided in the form of bonds. In the event that Talen does not complete the remediation, Talen would forfeit the bonds to DEQ so that DEQ can complete the remediation.

- 126) *No matter what cap is placed on top of the pond, polluted water will continue to spread down into the ground and into the region's aquifer. Pumping the groundwater back into the ponds as is currently being done cannot be done in perpetuity.*

Response: Although cap-in-place may not be appropriate in areas where the ash will remain in contact with groundwater, the ponds in the 3&4 will have adequate separation from groundwater once the ponds are dewatered. DEQ is requiring aggressive dewatering measures to ensure that the ponds are promptly dewatered and separation from groundwater is achieved. Capping the ponds with protective HDPE (plastic) liners will prevent any infiltration from precipitation, which would otherwise cause the ash to become re-saturated.

Regarding captured groundwater management, Talen currently re-uses the captured groundwater in the plant process. When Units 3&4 shut down, Talen will need to use other means to dispose of groundwater, which may include applying for a discharge permit. Talen has already proposed to build a water treatment plant, and will provide financial assurance for the plant.

127) *Bipartisan legislatures in North Carolina, South Carolina, Illinois, and Virginia have all passed laws mandating that coal ash ponds having contact with the water table be excavated. Montana needs to join that list of responsible states.*

Response: DEQ does not have the regulatory authority to pass a bill of that nature. However, in a letter to Talen dated April 22, 2019, DEQ states that “DEQ will not approve a remedy that allows a long-term source of COIs to remain in contact with groundwater”.

128) *Dilution, covering-up, and walking away are not options that are decent or ethical.*

Response: Please see previous comments regarding capping in place. Regardless of the remedial option chosen (excavation vs. leave in place), capping will be required, and long-term maintenance will be necessary to monitor erosion of the cap. Talen is providing financial assurance for future long-term monitoring.

Regarding the capture/injection system, the injection wells are not designed to dilute the contaminants. The capture wells are strategically placed downgradient of the injection wells and will be operated at higher pumping rates than the injection wells. This ensures that all injected water, plus impacted groundwater, are pumped out of the aquifer. The injection wells are designed to force-flush the less mobile contaminants out of the aquifer material. Less mobile contaminants (such as boron) tend to stick to aquifer materials, and if not removed, become a long-term secondary source of contamination. The injection wells help remove these contaminants, which in turn reduces the cleanup timeframe.

129) *Please recycle the fly ash if possible.*

Response: DEQ is interested in methods that could be used to recycle the coal ash. At this time, a viable alternative has not been identified, but DEQ is hopeful that an opportunity may be presented in the future that could result in recycling ash from all ponds at Colstrip.

130) *Thorough cleanup involves:*

- a. *Full dewatering of all coal ash starting in 2020.*

Response: DEQ agrees that the coal ash must be aggressively dewatered. Talen has stated that storage space will not be available to run the underdrain until 2021. DEQ is requesting that Talen run a pumping test on the underdrain in the interim to determine if additional dewatering measures will be needed to ensure the ash is completely dewatered.

- b. *Removal of coal ash that is polluting or in contact with groundwater and storage in a lined landfill above the water table.*

Response: DEQ agrees that coal ash that is in contact with the groundwater should be removed; DEQ stated in a letter to Talen dated April 22, 2019, that “DEQ will not approve a remedy that allows a long-term source of COIs to remain in contact with groundwater”. The ponds at the 3&4 area will not remain in contact with water once the ash is dewatered. Because of this, DEQ is requiring that aggressive dewatering measures be implemented as soon as possible to eliminate any continued seepage from saturated ash.

- c. *Strong contingency plans to protect taxpayers from funding cleanup should the initial remediation strategies fall short.*

Response: DEQ plans to conditionally approve the report so that strict contingencies can be required. The report will not receive final approval until the contingencies are complete. However, DEQ is able to require financial assurance be submitted upon conditional approval for the proposed remedy and any studies that support the contingencies.