

Remedy Selection Report

CCR Landfill - Hunter Power Plant Castle Dale, Utah

August 2020



Prepared For:

Hunter Power Plant
Highway 10, S of Castle Dale
Castle Dale, UT 84513

PacifiCorp

1407 West North Temple, Suite 280
Salt Lake City, Utah 84116



Prepared By:

Water & Environmental
Technologies
480 East Park Street
Butte, Montana 59701
406.782.5220

REMEDY SELECTION CERTIFICATION, HUNTER CCR LANDFILL

The undersigned hereby certify that the remedy selected to address releases from the CCR Landfill located on the Hunter Power Plant in Castle Dale, Utah, meets the requirements set forth in the Code of Federal Regulations, 40 CFR, Part 257, § 257.97 Selection of Remedy. The attached Remedy Selection Report demonstrates how the remedy will meet the specific criteria outlined in the *Final Rule*.

Dated this 20th day of August, 2020.

By: Steven M. Anderson

Its: Senior Engineer



Dated this 20th day of August, 2020.

By: David J. Erickson

Its: Principal Hydrogeologist



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ACRONYMS

ATSDR	Agency for Toxic Substances and Disease Registry
CCR	Coal Combustion Residuals
COPC	Contaminant of Potential Concern
EPA	U.S. Environmental Protection Agency
FGD	Flue Gas Desulfurization
MCL	Maximum Concentration Limit
NIH	National Institute of Health
O&M	Operations and maintenance
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SSI	Statistically Significant Increase
TDS	Total Dissolved Solids
UDEQ	Utah Department of Environmental Quality
WET	Water & Environmental Technologies

1.0 INTRODUCTION

This remedy selection report (“Report”) was prepared for PacifiCorp by Water and Environmental Technologies (WET), to comply with requirements of the Coal Combustion Residuals (CCR) Rule, 40 CFR § 257.97 - *Selection of Remedy*. When triggered, the requirements of § 257.97(a) provide that the owner/operator of a CCR unit, meet the following criteria:

- As soon as feasible, select a remedy;
- Upon selection of a remedy, prepare a final report describing the selected remedy and how it meets applicable standards;
- Obtain a certification from a qualified professional engineer that the selected remedy meets the applicable requirements; and
- Place the remedy selection report in the operating record.

1.1 Selected Remedy

The potential remedies for the CCR Landfill at the Hunter Power Plant (Plant) were assessed in the Corrective Measures Assessment completed in 2019 utilizing the criteria in § 257.96 *Assessment of Corrective Measures*. A public meeting was conducted July 23, 2019 to present the findings of the Nature and Extent investigation and Corrective Measures Assessment. Public comments were solicited during the meeting and over the ensuing 30 days.

In 2019, PacifiCorp began a full inspection of the horizontal wells to verify their function to ensure the preferred remedy in the Corrective Measures would be effective in addressing groundwater impacts. Additional groundwater samples were also collected to verify the groundwater impacts were localized and fully contained of PacifiCorp property. Based on the information from the nature and extent investigation, the corrective action assessment, and additional groundwater sampling completed in 2019, the remedy has been selected.

The remedy for the CCR Landfill at the Hunter Power was chosen based on the criteria in § 257.97 *Selection of Remedy* presented in this report. The selected remedy for the Hunter CCR Landfill is:

1. Utilize existing waste management practices that have been ongoing since 2007, and which remove free liquids from all wastes prior to their placement in the landfill, and
2. Capture groundwater through operation of horizontal wells installed beneath the landfill to collect leachate and impacted groundwater.

The waste management practices starting in 2007 and the installation of the horizontal wells in 2015 have resulted in sharp declines in groundwater elevations and improved groundwater quality. The 2019 nature and extent investigation revealed concentrations of all Appendix IV constituents are below groundwater protection standards in new wells placed at the facility

boundary, indicating the current remedy has effectively controlled the source, while preventing offsite migration.

Groundwater monitoring will continue to ensure the groundwater impacts are not expanding and are limited to PacifiCorp property. If future groundwater monitoring indicates the impacts are expanding, a groundwater collection system will be installed within the plume area.

The following sections summarize the findings of the nature and extent investigation, the assessment of corrective measures, and the general and specific requirements for the selection of remedy found in Sections § 257.97(b) - § 257.97(d) of the *CCR Rule*.

2.0 NATURE AND EXTENT OF CONTAMINATION

The nature and extent of contamination resulting from the CCR Landfill, is detailed in the Nature and Extent Report, which is available in the Hunter Power Plant operating record. The following is a summary of the nature and extent of groundwater impacts:

- The nature of the release at the Hunter Power Plant consists of those Appendix IV metals that had statistically significant increases (SSI) over groundwater protection standards during 2018 assessment monitoring: lithium and molybdenum.
- Results from the Spring 2019 sampling event, revealed lithium, molybdenum, and cobalt exhibited SSIs, although cobalt was not detected in the source material for the CCR Landfill, so it is likely from the natural Mancos Shale formation.
- Results from the fall 2019 sampling event, revealed lithium, molybdenum, cobalt, and selenium exhibited SSIs. Lithium, molybdenum, and cobalt all exhibit downward trends coinciding with decreasing water levels.
- A map illustrating the monitoring wells with Appendix IV SSIs in 2018 and also additional wells sampled as part of the nature and extent investigation is provided as Figure 1.
- The majority of the groundwater discharge is to the east/northeast of the CCR Landfill (Figure 2).
- As per Section 257.95(g)(1)(iii), three additional wells were installed along the eastern boundary of the Hunter facility in November of 2018: ELF-12, ELF-13, and ELF-14. They were placed to determine if groundwater impacts had reached and/or migrated beyond the facility boundary. All Appendix IV constituents were below groundwater protection standards, indicating the nature and extent investigation bounded the plume and it has not reached adjoining lands.

3.0 CORRECTIVE MEASURES ASSESSMENT

The Corrective Measures Assessment (PacifiCorp, 2019) was prepared for PacifiCorp by Water and Environmental Technologies (WET), to comply with requirements of the CCR Rule, 40 CFR § 257.96 - *Assessment of Corrective Measures*. The report is available on the company's website. The following is a summary of the findings of the report.

As required by the CCR Rule, various potential corrective measures for the CCR Landfill were evaluated. They were screened based on several factors, including the specific elements defined in § 257.96:

- Performance
- Reliability
- Ease of Implementation
- Potential Safety Impacts
- Cross-Media Impacts
- Exposure Control to Residual Contamination

Possible corrective measures to address residual groundwater impacts include: extraction of groundwater for re-use, discharge, or treatment, or treating impacted water in-situ. The corrective measures that were evaluated are listed below. Table 1 provides a summary of the alternatives screening completed as part of the Corrective Measures Assessment.

1. Maintain Current Operations with Groundwater Monitoring
2. Pump and Treat
3. Impermeable Barrier with Pumpback
4. Reactive Permeable Barrier
5. In Situ Injection of Reactive Compound
6. Phyto-Technologies
7. Electro-Kinetics
8. Beneficial Use of Ash
9. Closure by Removal

The Corrective Measures Assessment for the CCR Landfill concluded the current remedy implemented at the site - eliminating free liquids from wastes placed in the landfill and optimization of the existing horizontal wells to drain leachate and impacted groundwater - offers the best solution to address groundwater impacts.

This alternative meets long-term performance objectives, reliability and implementability criteria, eliminates potential cross-media impacts, offers the highest degree of source control, and eliminates the potential for exposure to contaminants of potential concern.

The reduction of impacts to groundwater relies on capture of leachate / groundwater beneath the landfill, while allowing natural processes to attenuate residual impacts to groundwater outside of the landfill footprint. Optimizing the existing horizontal wells will serve to enhance the effectiveness of the existing groundwater capture system. Optimization will include a visual inspection of the horizontal wells, followed by maintenance to remove scaling or well replacement as necessary, to ensure remedy efficacy.

Table 1. Remedial Alternatives Screening

Regulatory Reference	257.96 (c) (1)						257.96 (c) (2)		257.96 (c) (3)
	Performance	Reliability	Implementation	Potential Impacts of Remedy	Safety Impacts	Control of Exposure	Time Required to Begin	Time Required to Complete	State & Local Permits, Public Health Requirements
Corrective Measure –Alternative:									
Maintain Current Corrective Actions	=	=	=	=	=	=	=	=	=
Pump & Treat	+	+	+	+	-	-	+	+	-
Impermeable Barrier / Pumpback System	=	-	-	-	-	-	-	+	-
Reactive Permeable Barrier	=	-	-	-	-	-	-	+	-
In Situ Injection of Reactive Compound	-	-	-	-	-	+	-	-	-
Phyto-Technologies	NV								
Electro-Kinetics	=	-	-	-	-	+	-	=	-
Beneficial Reuse	NV								
Closure by Removal	+	+	-	-	-	-	-	+	-
+ Positive - Negative = Neutral NV: Not Viable									

If groundwater monitoring indicates the groundwater impacts are not attenuating or are expanding, a supplemental pump and treat system will be implemented to augment the remedy. Of the active groundwater treatments considered, the pump and treat system offers the highest degree of short-term effectiveness, while also offering a reliable and feasible alternative when compared with the others considered. The pump and treat system alternative offers the least intrusive method to capture impacted groundwater, while providing an effective means of preventing cross-media impacts and potential impacts downgradient of the Plant.

The results of the Corrective Measures Assessment were discussed in a public meeting in Castle Dale, Utah on July 23, 2019. Though not required, PacifiCorp offered interested parties 30 days to submit written comments on the Corrective Measures Assessment. Heal Utah, Utah Clean Energy and Sierra Club submitted combined written comments. PacifiCorp evaluated the public comments as part of the preparation of this Report (Section 5.5).

4.0 SELECTION OF REMEDY-GENERAL REQUIREMENTS- § 257.97(b)

40 CFR § 257.97(b) of the CCR Rule, specifies that remedies must:

- (1) Be protective of human health and the environment,
- (2) Attain groundwater protection standards,
- (3) Control sources to prevent future releases,
- (4) Remove as much of the contaminated material that was released as feasible, and
- (5) Ensure waste management complies with applicable requirements.

The following sections describe the manner in which the selected remedy satisfies each of the five criteria.

4.1 Protective of Human Health and the Environment

The remedy selected protects human health and the environment by removing free liquids from the waste stream, containing the source of releases, avoiding significant worker exposure, and achieving groundwater protection standards in accordance with 40 CFR Part 257 requirements. As explained in more detail below, residual groundwater impacts are present outside of the CCR Landfill footprint but are contained within PacifiCorp property. Optimization of the existing horizontal well system will enhance groundwater capture, increasing the ability of the aquifer to attenuate residual concentrations of Appendix IV constituents. Finally, health and safety plans and best management practices prevent and reduce risks associated with worker exposure. Any potential for exposure resulting from implementing the remedy will be managed in accordance with applicable worker safety standards. There is minimal probability of adverse effects on health or the environment as a result of implementation of the remedy.

Appendix IV SSIs constituents do not pose a risk to human health or the environment unless a complete exposure pathway is present, whereby human, or environmental receptors regularly come into contact with the elevated concentrations.

The only potentially complete exposure routes for groundwater impacted by release from the CCR Landfill include the following:

1. Dermal exposure or ingestion of collection system water.
2. Dermal exposure or ingestion of impacted water during dust control.
3. Ingestion of impacted groundwater through wells.

Table 2 provides a summary of potential human and ecological exposure pathways and denotes which can be considered complete.

Table 2. Conceptual Site Model

Receptor:	Ingestion:	Dermal:	Inhalation:
Plant Worker		✓	
Wildlife	✓		
✓ Potentially Complete Exposure Pathway			

The constituents found in groundwater at the Hunter Power Plant, include those Appendix IV constituents that have SSIs over groundwater protection standards determined under Section 257.95(d)(2). The constituents are: lithium, molybdenum, cobalt, and selenium. Human health effects associated with these constituents are as follows (ATSDR, 2019):

- Cobalt: lung irritation, birth defects, cancer
- Lithium: None
- Molybdenum: Kidney, Liver, Lungs
- Selenium: skin irritation, impedes central nervous system

The risk of these effects is very low because the pathways for these constituents are either incomplete or can easily be addressed with engineering and procedural solutions.

4.1.1 Human Exposure

Based on the reasonably anticipated complete exposure pathways in Table 2, noted above, the following sections examine potential risks to receptors with complete exposure routes and the likelihood of contact with these constituents through those routes.

4.1.1.1 Collection System Water

Trace concentrations of Appendix IV metals are confined to facility groundwater immediately downgradient of the landfill. As a result, the potential for exposure to unsafe levels of either metal is limited to contact with groundwater. The majority of groundwater originating in the landfill, is captured in the current water collection system that consists of 4 horizontal wells designed to serve as a sump at the base of the landfill. Captured groundwater and landfill

seepage are collected in a tank, where it is re-used for dust control on the landfill. Captured water is hard-piped to the tank. As a result, contact with impacted groundwater collected by the horizontal wells is not a complete exposure route for human receptors.

4.1.1.2 Dust Control

Workers could be exposed to impacted water via dermal contact or ingestion should they come into contact with water sprayed on the landfill. However, spraying of the water is carefully controlled by operators inside closed air water trucks. Water is applied so as to not form puddles, reducing exposures from standing water after application. In addition, personnel that access the landfill are limited in number. At the concentrations present in the water, elevated risks to human health are unlikely.

4.1.1.3 Ingestion of Groundwater

There are no potable water wells downgradient of the landfill or within the impacted area of the plant. As a result, ingestion of impacted groundwater is not a complete exposure route for plant workers or visitors. CCR monitoring completed between 2015 and 2019, indicate the magnitude of impacts to shallow groundwater is limited to elevated concentrations of Appendix IV metals lithium, molybdenum, and selenium downgradient of the CCR Landfill. Cobalt also exhibited SSIs in 2019, however it was not detected in the facility source material, suggesting elevated concentrations result from a source other than CCR Landfill. Monitoring results also indicate impacted groundwater is contained within the plant boundary between the waste unit boundary, and new wells ELF-12, ELF-13, and ELF-14 along the eastern boundary of the landfill. Based on these findings, current site use, and facility water management practices, risks to human health and the environment at the Hunter Power Plant are negligible and are fully manageable with current operational procedures and continued operation of existing remedies.

4.1.2 Ecological Exposure

Only one exposure pathway is considered complete for ecological receptors, the consumption of water or soil where impacted water has been applied for dust control by wildlife (e.g. deer). As noted, water is applied carefully to prevent puddling of applied water during dust control applications. As a result, consumption of soil that has contacted water is likely the only reasonable exposure route. The concentrations of lithium, molybdenum, and selenium being applied to the soils from groundwater is a fraction of the naturally occurring concentrations found in soils. As a result, no increased impact to wildlife is expected from captured waters at the plant due to consumption by wildlife.

4.2 Attainment of Groundwater Protection Standards

Groundwater monitoring data from both the CCR and Utah DEQ mandated programs, indicate current waste management practices coupled with horizontal well groundwater capture, have reduced the quantity of leachate being formed and reduced or eliminated ongoing impacts to groundwater. Sharp declines in water levels and constituent concentrations immediately

downgradient of the CCR Landfill have been observed since 2007. Current impacts downgradient of the CCR Landfill, reflect historical releases of Appendix IV constituents prior to the implementation of enhanced waste pre-treatment to remove free liquids from landfill wastes in 2007. Because of the low permeability of the Mancos Shale aquifer, concentrations observed in downgradient wells ELF-12, ELF-13, and ELF-14 likely reflect the outer bound of the plume and will provide long-term trends on the reduction / attenuation of Appendix IV metals over time.

Based on current downward trends in both water levels and the concentrations of the majority of constituents of concern, the selected remedy is expected to reduce concentrations in groundwater to levels below groundwater protection standards within 18 years. The 18 year estimate includes an estimated 15 years to reach attainment, and three consecutive years of downgradient water concentrations below groundwater protection standards.

The selected remedy will include maintaining current waste management practices and optimizing the current horizontal well capture system through maintenance or replacement, as necessary. Implementation of an active pump and treat system could reduce the time to reach attainment, although water quality and aquifer conditions downgradient of the landfill suggest a pump and treat system would have limited effectiveness over time, as water levels are reduced to levels where the shale aquifer will eventually not produce sufficient water for it to be recovered. If the horizontal well capture system does not reduce concentrations per the schedule, an additional pump and treat technology will be evaluated.

4.3 Source Control and Removal of Contaminated Material

The existing remedy and preferred alternative to address groundwater impacts for the CCR Landfill, are to continue free-liquid removal from wastes, and to optimize the horizontal well network to provide source control. Both measures limit or eliminate interactions between groundwater and landfill liquids, while capturing water that does interact and storing it in a closed system until its use for dust suppression. Water used for dust suppression evaporates quickly in the arid climate and any infiltration into the clay soils is minimal, thus providing a negligible risk to underlying groundwater resources. Available groundwater monitoring data indicates impacted groundwater has not migrated offsite and is contained upgradient of new wells placed at the plant boundary in 2019. Based on these findings, the current remedy is providing adequate source control to prevent additional releases that could affect offsite groundwater. Continued adherence to current waste management practices coupled with groundwater capture / source control, will continue to improve the quality of groundwater until attainment has been reached.

4.4 Waste Management

Waste is not planned for removal from the landfill as part of the existing remedy, so no new requirements are under consideration to support the selected remedy. Current waste management

practices at the CCR Landfill comply with the provisions of the Resource Conservation and Recovery Act (RCRA) and all other applicable Utah and Federal standards.

5.0 SELECTION OF REMEDY EVALUATION FACTORS- § 257.97(c)

The remedy selection process included consideration of the evaluation factors set forth in 40 CFR § 257.97(c). The following sections explain how the selected remedy will meet these criteria.

5.1 Short and Long-Term Effectiveness and Protectiveness

The groundwater capture system at the CCR Landfill has operated since 2015. Existing groundwater monitoring data shows reductions in contaminant loading in facility groundwater and indicates the capture system has contained groundwater impacts to an area immediately downgradient of the waste unit boundary. Although concentrations of Appendix IV constituents exceeded their groundwater protection standards beyond the unit boundary, they are below protection standards at new downgradient wells ELF-12, ELF-13, and ELF-14. The new well data indicates the implementation of the existing remedy provides sufficient short-term source control to prevent migration of impacted groundwater offsite. The CCR Landfill is underlain by the Mancos shale, which is a natural source of salts, selenium and trace metals (Hettinger 2002). As a result of its natural degradation, groundwater quality is generally poor with Mancos monitoring wells exhibiting TDS values in excess of 10,000 mg/l characteristic of Class IV Groundwater, also referred to as Saline Groundwater. Because of this classification, groundwater at the facility is not used as a potable water source.

As noted, current waste management practices were implemented in 2007. Current waste management practices have been incorporated into plant operational procedures and will continue to be followed throughout the life of the plant. The existing horizontal well network will also be optimized by first inspecting the wells, and then performing the necessary maintenance to remove any scale, etc. If the inspection indicates well replacement is necessary to support the remediation goals, new horizontal wells will be installed.

Available data suggests the current remedy is providing sufficient protectiveness, to contain leachate / groundwater while past releases attenuate in the isolated area downgradient of the landfill. Optimization of the current horizontal well network will serve to enhance leachate/groundwater capture, reducing the time needed to reach groundwater attainment criteria outlined in the *Final Rule*. With routine maintenance of the horizontal wells to address scaling, parts wear, and related issues, the remedy can be maintained for the life of the landfill operation and beyond, while providing long-term protectiveness to the environment. If performance monitoring suggests the optimized remedy cannot meet the remediation schedule, a pump and treat system will be designed and implemented to supplement the existing system and achieve the remediation objectives.

5.2 Degree of Certainty of Success

Available water levels and environmental data indicate that the current remedy elements, offer the best balance of source containment while reaching groundwater attainment of all the alternatives considered at the CCR Landfill. The reduction of impacts to groundwater that occurred following implementation of waste management and groundwater capture, coupled with planned horizontal well optimization, will rely on natural processes to decrease or attenuate residual concentrations of contaminants in groundwater downgradient of the landfill, while continued reductions in water levels across the plant take place.

This approach has been effective since the source of leachate has been reduced or eliminated from the waste stream. The addition of a pump and treat system as a potential supplement to the remedy, offers additional assurances that if the waste management practices and groundwater capture via the optimized horizontal wells will not result in groundwater attainment within the specified schedule, active treatment of groundwater will be implemented to ensure the time needed to reach attainment complies with the schedule.

Semi-annual groundwater monitoring data, including water chemistry and water levels, will be used to evaluate whether the optimized horizontal well system is containing the groundwater plume and that the plume area is receding sufficiently to reach the projected schedule. If contaminant loading suggests insufficient capture and the plume is expanding or removal is not occurring quickly enough to reach the scheduled milestones, a pump and treat system will be implemented.

5.2.1 Risk Reduction

As noted in Section 4.1, risks of exposure from groundwater at the Plant are low to negligible, given current water management practices and uses at the Plant. Safe work practices and other health and safety planning associated with waste removal will minimize risks to workers performing the action. Workers will be properly trained and outfitted with all necessary PPE to ensure exposures are minimized.

Risk reductions have taken place at the plant first with the removal of free liquids from the process waste streams in 2007, followed by the installation of horizontal wells used to capture landfill leachate and/or groundwater that interacts with landfill contents in 2015. Process changes coupled with groundwater capture, have resulted in decreased water levels, and reductions in contaminant loading in the impacted aquifer as summarized in Section 1.1. Continued adherence to waste management practices and leachate / groundwater capture, will result in incremental reductions in contaminant concentrations entering the aquifer over time. Natural attenuation will also reduce contaminant loading / distribution across the facility while the source remains contained. The expected incremental reductions in contaminant concentrations should result in attainment with groundwater protection standards prior to landfill closure.

5.2.2 Residual Risks

The *Final Rule* also requires that remedy selection consider the potential for exposure of humans and environmental receptors to wastes remaining after active remediation. The current remedy has reduced the quantity of leachate formation through elimination of free-liquids entering the waste stream. The horizontal wells capture groundwater that interacts with landfill contents and stores it in a closed system prior to its use for dust control. Available data suggests groundwater containing residual concentrations of lithium, molybdenum, and selenium are contained upgradient of the plant boundary. No potable water wells are present on the facility downgradient of the landfill. Based on these factors, residual risks associated with the current remedy are low to negligible. Continued capture of groundwater will result in attenuation of residual concentrations over time, reducing the already low risks posed by impacted groundwater at the site.

5.2.3 Long-Term Monitoring and O&M

Semi-annual monitoring will continue until the concentration of Appendix IV constituents are below groundwater protection standards for three (3) consecutive years. Once groundwater protection standards are met, long-term groundwater monitoring will continue at the CCR Landfill throughout its active life. Following landfill closure, groundwater monitoring will be completed throughout the post-closure care period (30 years).

The horizontal well system will be maintained throughout active operations and the post-closure care period. The horizontal well system will require routine maintenance in order to remove scale from the capture wells, system piping, and to replace failing parts over time. These maintenance activities are currently built into the plant operations plan and will be adhered to throughout the life of the capture system operations.

5.2.4 Short-Term Risks During Remedy Implementation

The CCR Rule requires that remedy selection consider potential short-term threats to human health and the environment associated with implementation of the remedy. These issues were addressed in Section 4.0 of the *Corrective Measures Assessment for the Hunter CCR Landfill* (PacifiCorp, 2019) which is housed in the facility operating record. The assessment notes, “The current system has already been implemented, so no adverse impacts to the environment are expected due to its continued operation. Some short term risks are possible during remedy optimization, if: a) new horizontal wells are required, or b) a pump and treat system is deemed necessary following the performance monitoring period.

These risks relate to well drilling and the drill cuttings generated during this process, as well as process water used to support well installation. Best management practices such as silt fencing and water containment as necessary, to minimize impacts from these activities. Current facility infrastructure is available to dispose of drill cuttings and to contain and process any water generated. Safety concerns for plant personnel and personnel performing remedy optimization activities, will be managed in accordance with project and plant health and safety procedures. No

additional risks to the public are expected, since all work will be performed within the controlled footprint of the Hunter Power Plant. As discussed above, exposure to impacted media is minimal and is being addressed under the current corrective measures and safe work practices.

5.2.5 Time to Full Protection

PacifiCorp has site-specific performance monitoring data that indicates the current remedy is providing adequate source control to prevent impacts from migrating off of the plant site. Once optimized, the system will continue to reduce impacts within the existing plume to attainment levels. Based on the current data, the groundwater is expected to meet groundwater protection standards within 18 to 23 years.

If groundwater monitoring indicates the optimized horizontal well system will not meet the remediation schedule shown in Table 3 below or if the plume is expanding, a supplemental pump and treat system will be designed and implemented to ensure remediation is achieved.

5.2.6 Potential for Exposure of Humans and Environment

Potential risks to humans and the environment are described in detail in Section 4.1 of this report. Because the affected groundwater and soil are contained on the facility, risks to human health and the environment are considered minimal and manageable. Elevated risks to human or wildlife health would not be expected at the concentrations of Appendix IV constituents present in the water. The only complete exposure pathway for plant workers is via direct contact with captured groundwater used for dust suppression, personnel performing remedy optimization and collecting environmental samples. Direct contact is minimized by proper administrative controls, health and safety planning, training of personnel, use of sealed cabs in vehicles, and the use of personal protective equipment (i.e. safety glasses, gloves). Little or no impact on wildlife is expected from captured waters at the plant, as the only complete exposure pathways for wildlife would include ingestion of water from dust control activities or soil sprinkled with tank water.

5.2.7 Long-Term Reliability

The practice of removing free liquids from the process waste stream prior to placing it in the CCR Landfill, is built into plant operating procedures and occurs without the need for special steps by plant workers, long-term operations and maintenance, or other factors that might add variability to its effectiveness. For these reasons, this process can be maintained throughout plant operations and is fully reliable.

The groundwater capture system relies on horizontal wells placed beneath the landfill, to capture leachate and any groundwater that contacts the waste. Groundwater and leachate have much the same geochemical characteristics. These characteristics result in scale build-up in wells, piping, and pumps the longer the system is operating. The caustic nature of the material also can result in corrosion of metals parts over time. To ensure the long-term reliability of the existing remedy,

regular inspections and maintenance of the system will be conducted, along with monitoring of the quantities of water captured, to develop a regular schedule for system maintenance or repair. Qualified plant personnel will be assigned to perform both the inspection and maintenance activities to ensure the system remains fully operational for the life of the landfill and post-closure care. Regular maintenance will be planned to minimize potential impacts to groundwater during down time (e.g. during dry months).

5.2.8 Need for Remedy Replacement

During remedy optimization, horizontal wells may need to be replaced in order to achieve the remediation objectives for the CCR Landfill. Once optimized, elements of the system will require repair or replacement from time to time, due to the generally caustic nature of the captured liquids. These may range from periodic acid flushing of piping systems to remove scale, to replacement of piping and/or pumps due to failure. The same will also be true if a pump and treat system is installed. Regularly scheduled inspections and maintenance will minimize the amount of downtime the system will experience. This schedule will also prevent the need for a full system replacement that could require months in order to install and bring it online. If a complete system replacement is ever deemed necessary, the new system will be designed and installed while the existing system is operating and implemented in parallel with the deactivation of the current system, to ensure groundwater capture is always occurring and system interruption is minimal.

5.3 Source Control Effectiveness

The current horizontal well network provides source control by reducing interactions between groundwater and landfill contents and capturing water that does interact and storing it in a closed system until its use for dust suppression. The optimized system will enhance groundwater/leachate capture ensuring effective source control over the long term. Available groundwater monitoring data indicates impacted groundwater has not migrated offsite and is contained upgradient of new wells placed at the plant boundary in 2019. Based on these findings, the current remedy is providing adequate source control to prevent additional releases that could impact offsite groundwater. Continued adherence to current waste management practices coupled with optimized groundwater capture / source control, will continue to improve the quality of groundwater over time, until attainment has been reached. If performance monitoring indicates the optimized system will not meet the remediation schedule, a pump and treat system will be installed.

5.4 Implementability

The current groundwater capture system has been implemented and fully operational since 2015. PacifiCorp operates other horizontal well networks to capture impacted groundwater, and has the necessary in-house and contractor personnel available to support the optimization of the existing system, and to perform the necessary long-term inspections and maintenance to ensure proper operation throughout the life of the system. Materials and drilling vendors are readily available,

to support well maintenance or replacement as needed during the optimization phase and over the life of the system.

5.5 Community Concerns

On July 23, 2019, PacifiCorp held a public meeting in Castle Dale, UT to present and discuss the current site conditions and both potential and preferred remedial actions at the Plant. The meeting was held as part of the CCR Rule requirements to gather public input and incorporate that information into the final remedy selection. Though not required, PacifiCorp offered interested parties the opportunity to submit written comments on remedial actions. HEAL Utah, Utah Clean Energy, and the Sierra Club submitted written combined comments.

The comment letter is attached. The comments consisted of several general statements/concerns:

1. The commenters made several comments regarding the nature and extent description of the release in the Corrective Measures Assessment. The commenters stated the nature and extent of impacts to surface water should be evaluated.

PacifiCorp followed the criteria set forth in the CCR Rule for the Corrective Measures Assessment and presented a summary of the findings of the Nature and Extent Investigation in the report. A Nature and Extent Report is in the plant's operating record. As noted in the Corrective Measures Assessment, PacifiCorp has been monitoring groundwater at the Plant site and around the landfill since 2003 under the direction of the Utah DEQ. PacifiCorp sampled wells downgradient of the Landfill for the CCR constituents and utilized existing data from ongoing groundwater monitoring to define the plume. PacifiCorp installed three new wells at the property boundary to define the extent of groundwater impacts. These wells indicate the impacts are confined to the plant boundary. The information gathered from both the DEQ and CCR monitoring programs enabled PacifiCorp to define the extent of the impacted groundwater and to establish that it has not migrated offsite nor to any surface waters.

2. The commenters stated that the only remedy that satisfies the CCR Rule is removal of the waste.

PacifiCorp has chosen to close the unit in place with a final cover system as allowed by the CCR rules.

3. The commenters noted the significance of adjacent federal land (BLM) and asked how PacifiCorp and BLM will comply with the National Environmental Policy Act if adjacent BLM lands are impacted by implementation of corrective measures and related compliance activities.

Current data indicates groundwater impacts are contained on PacifiCorp property. Implementation of corrective measures is occurring on PacifiCorp property and does not impact adjacent BLM lands or water resources.

4. Commenters felt that PacifiCorp should take steps to ensure necessary funding is available for corrective measures.

PacifiCorp manages its budgets and planning process in accordance with prudent utility practice and applicable law, which is sufficient to implement the remedy. Financial assurance or other funding mechanisms are not required by the CCR regulations

6.0 SCHEDULE

A project schedule for the implementation of closure by removal for the Ash Pond has been developed that considers the factors outlined in 40 CFR § 257.97(d), including the nature and extent of the release, the reasonable probability of the remedy achieving compliance, the availability of disposal capacity and treatment, potential risks, and the resource value of the aquifer.

Table 3 provides the planned schedule for remedy implementation. It reflects the proactive interim measures taken at the CCR Landfill including removal of free-liquids from the waste stream in 2007 and installation of horizontal wells and collection of leachate s which has been fully operational since 2015.

Groundwater monitoring under both the UDEQ and CCR programs is ongoing. The current groundwater capture system has been implemented and fully operational since 2015. Optimization of the existing system is ongoing in 2020. Addition of a pump and treat system will be completed if groundwater monitoring indicates that the plume is expanding or attainment of groundwater protection standards will not be completed in an acceptable timeframe, as provided in the remedy implementation schedule in Table 3.

6.1 Aquifer Resource Value

The CCR Landfill is underlain by the Mancos shale, which is a natural source of salts, selenium and trace metals (Hettinger 2002). As a result of its natural degradation, groundwater quality is generally poor with Mancos monitoring wells exhibiting TDS values in excess of 10,000 mg/l characteristic of Class IV Groundwater, which is also referred to as Saline Groundwater. Water quality may degrade in the downgradient direction due to dissolution of shale constituents and may vary widely from monitoring well to monitoring well due to varying consolidation of the shale (UDEQ 2015).

The Mancos has a relatively low permeability as indicated by the aquifer testing results shown in Table 4. Mean hydraulic conductivities in the shale vary from 0.1 ft/day to 1 ft/day and most wells provide limited, low quality water. Many monitoring wells at this site do not provide enough water to allow for purging before environmental sampling.

Table 3. Hunter Power Plant - Remediation Schedule

Calendar Year:	2019				2020				2021				2022				2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041			
Remedial Activity Description	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4																						
State Directed Corrective Action ¹	Ongoing Monitoring & Maintenance																→																					
Site Characterization ²																																						
Corrective Measures Assessment																																						
Public Meeting																																						
Remedy screening																																						
Remedy Selection/Selected																																						
Remedial Implementation ³																																						
Performance Monitoring																																						
Remedial modifications/upgrades																																						
Compliance Monitoring																																						
Routine Monitoring																																		→				
Operations/Monitoring/Maintenance																																		→				

1 - Waste management changes implemented in 2007
2 - Site Characterization began in 2003
3 - Horizontal Drains installed in 2015

Table 4. Hunter Power Plant - Slug Test Results

Calculated Hydraulic Conductivity	ELF-2	ELF-4	ELF-8	ELF-11
	1.77E-05	4.41E-04	2.85E-02	9.26E-05
			2.32E-02	1.72E-04
			2.86E-02	1.72E-04
# of Measurements:	1	1	3	3
Mean Conductivity (cm/sec):	1.77E-05	4.41E-04	2.68E-02	1.45E-04
Mean Conductivity (ft/day):	0.1	1	76	0.4
Slug testing was conducted on a facility-wide subset of wells to characterize site-wide hydrogeologic characteristics. Not all of the slug test wells appear on every site-specific map.				

Because of the limited quantity and poor quality of the groundwater in the Mancos shale, current and future use of the water is very limited without treatment. At this arid, high desert site, alternate water supplies are scarce as evidenced by the lack of points of diversion on Figure 3. This map indicates all points of diversion within 5 miles of the plant on a geologic map.

The map contains very few points of diversion within the Mancos Shale, because of its limited quantity and poor quality. Most points of diversions are located within the Quaternary alluvium along Canyon creek, Cottonwood Creek or Rock Canyon Creek. Many of the purple “Underground” diversions near the landfill, are monitoring wells for the plant site.

6.2 Potential Impacts to Wildlife, Crops or Structures

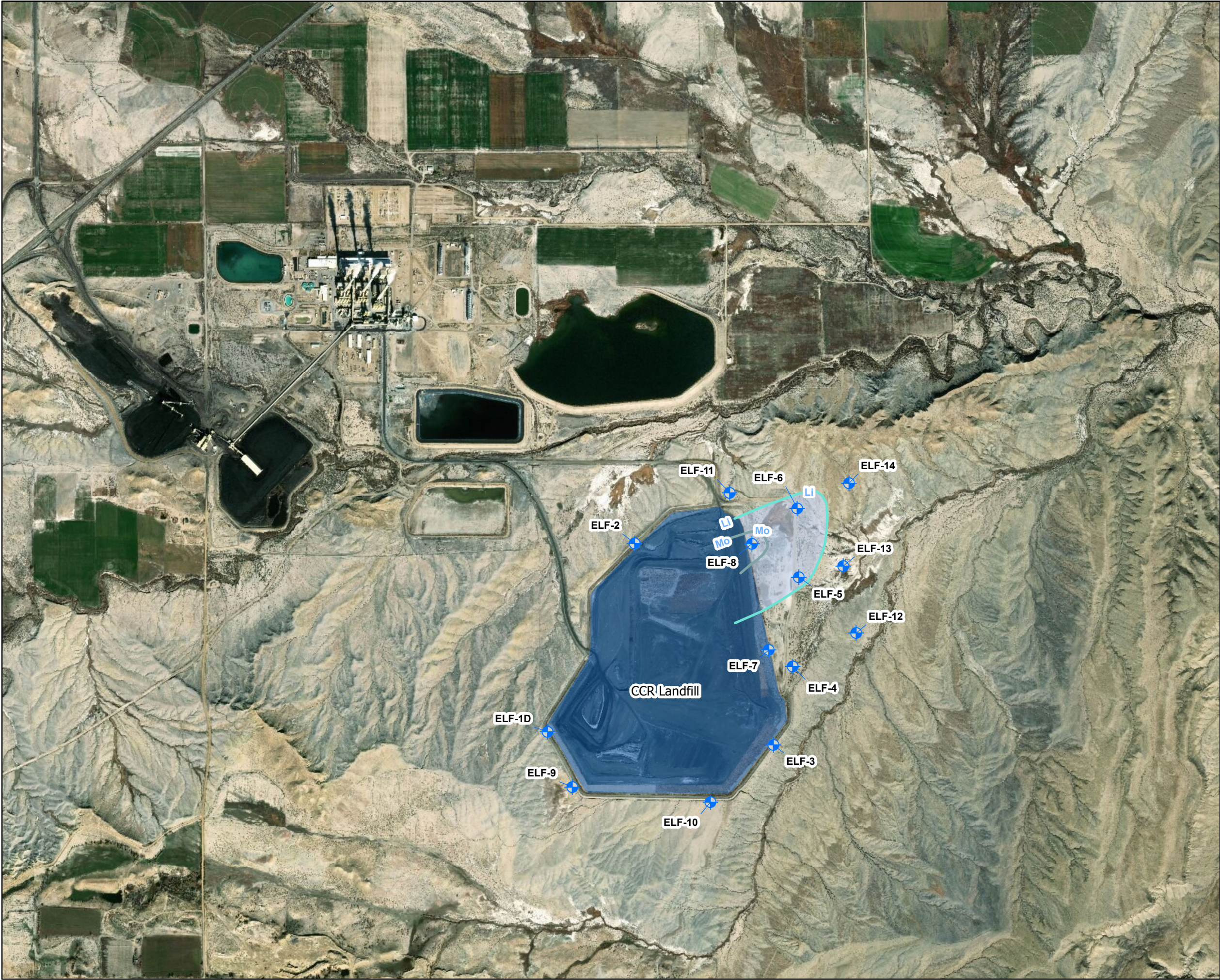
Little or no impact on wildlife is expected from captured waters at the plant, as the only complete exposure pathways for wildlife would include ingestion of water from dust control activities. Should they occur, exposures to wildlife (e.g. deer) are not expected to pose significant risks to their long-term health.

The CCR Rule also mandates an examination of potential damage to physical structures should the implementation of remedies take substantial time. No impacts to facility structures have been observed due to the trace levels of metals found in captured landfill seepage / impacted groundwater at the plant. Based on this, no long-term damage to plant operations or structures are expected to occur in the future.

7.0 REFERENCES

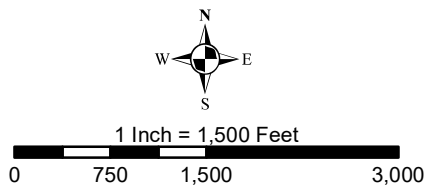
- ATSDR, 2019. Agency for Toxic Substances and Disease Registry, Public Health Statements, Lithium & Molybdenum. <https://www.atsdr.cdc.gov/phs/index.asp>
- Hettinger, R.D. and Kirschbaum, M.A. 2002. Stratigraphy of the Upper Cretaceous Mancos Shale (Upper Part) and Mesaverde Group in the Southern Part of the Uinta and Piceance Basins, Utah and Colorado, USGS Geologic Investigation Series I-2764.
- NIH, 2015. Sodium Chloride Toxicity and the Cellular Basis of Salt Tolerance in Halophytes, Annals of Botany, U.S. Department of Health and Human Services, National Institutes of Health, Timothy J. Flowers, Rana Munns, and Timothy D. Colmer. February 2015.
- PacifiCorp, 2019. Corrective Measures Assessment for the Hunter Power Plant, CCR Landfill, Water & Environmental Technologies, June 2019.
- Utah Department of Environmental Quality, 2015. Groundwater Discharge Permit UGW150001, Statement of Basis, PacifiCorp Hunter Plant, Castle Dale, UT. September 2015.

FIGURES



Legend

- MasterWells
- Mo - Molybdenum
- Li - Lithium
- Groundwater Plume
- CCR Landfill



HUNTER POWER PLANT

Appendix IV - SSIs

Job#: PERCM52

Date: 2/22/2019

FIGURE 1

Path: M:\PERC_CCR\Hunter\2019\ApplIV_Figure2.mxd, Author: jslocum

Legend

ELF-6 - Well ID
 5,561.74 - Water Level Elevation (ft.)

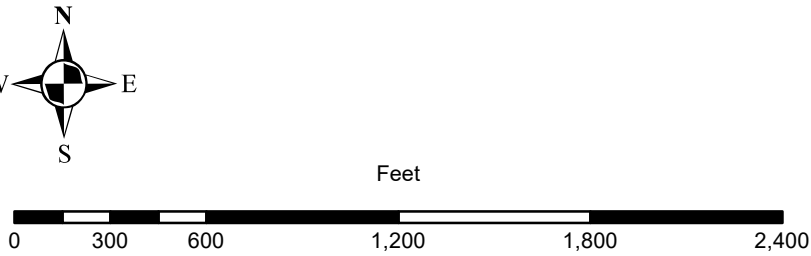
CCR Well

CCR Well - For Water Quality Only

Groundwater Elevation Contour
 (Contour Interval = 5 ft.)



Measurement Date: 05/30/2018



HUNTER POWER PLANT

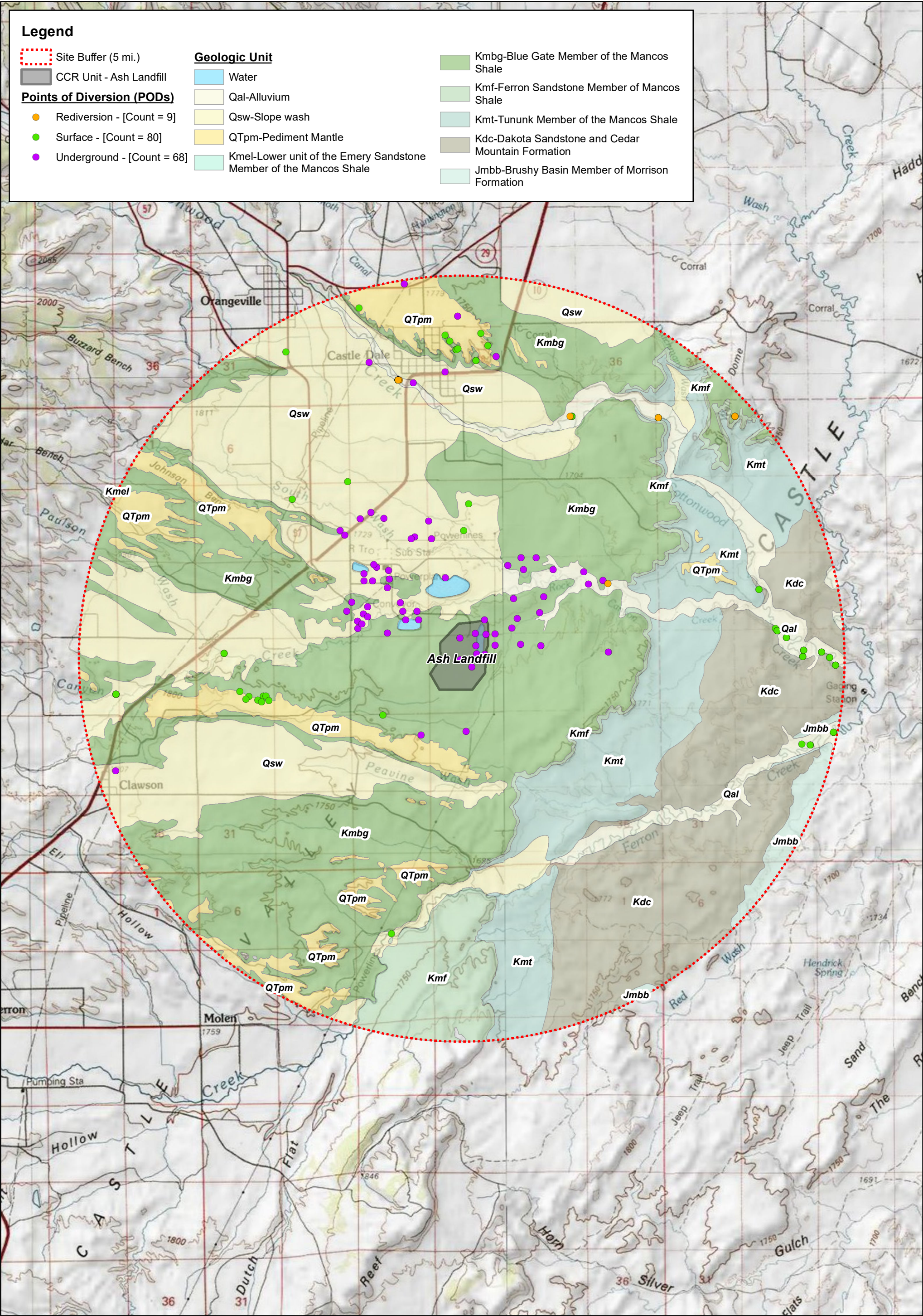
Groundwater Elevation Map
CCR Landfill

Job#: PERCM053

Date: 8/13/2018

Path: M:\PERC_CCR\2018_May_Sampling\2018_May_All Sites_ODPs.mxd, Author: brutherford

Figure 2



ATTACHMENT A:

Comment Letters

HEAL Utah* Utah Clean Energy* Sierra Club

August 26, 2019

Jeff Tucker
Principal Engineer
PacifiCorp
1407 W. North Temple Rm 210
Salt Lake City, UT 84116
Submitted via electronic mail to: jeff.tucker@pacificorp.com

Dear Mr. Tucker,

On behalf of our thousands of members and constituents in Utah, including Utahns who live, work and/or recreate near PacifiCorp's Hunter and Huntington coal-fired power plants, HEAL Utah, Utah Clean Energy, and Sierra Club submit the following comments on the company's proposed corrective measures assessments ("CMA") for coal combustion residuals ("CCR") facilities.

As discussed below, we have significant concerns about the company's analysis and proposed corrective measures.

INTRODUCTION & OVERVIEW OF REGULATORY REQUIREMENTS

At the outset, it is important to remember that the corrective measures are only required under the federal CCR Rule because pollutants at the company's coal combustion residuals facilities have exceeded groundwater protection standards and baseline water conditions. 40 C.F.R. §§ 257.95-257.97.

Specifically, the federal rules require PacifiCorp to assess corrective measure options and to select a remedy. This remedy must:

- (1) Be protective of human health and the environment;
- (2) Attain the groundwater protection standard as specified pursuant to § 257.95(h);
- (3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in appendix IV to this part into the environment;
- (4) Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems; and
- (5) Comply with standards for management of wastes as specified in § 257.98(d).

40 C.F.R. § 257.97.

SUMMARY OF COMMENTS

Review of the CMAs dictates that closure-by-removal and pump-and-treatment of groundwater should be selected as the ultimate remedy for CCR landfills. Closure-by-removal and pump-and-treat are the only remedies that meets the requirements of the federal CCR Rule for those CCR facilities. They are also the only remedies that provide certainty in achieving pollution cleanup objectives set forth in the CCR Rule.

Given the extent of the pollution, and the inability to prevent further pollution into the future, PacifiCorp must also halt plans to construct new ash landfills, or expand existing landfills.

Additionally, PacifiCorp must do more to better characterize the nature and extent of the release of pollution.

Finally, PacifiCorp must take immediate steps to ensure funding is available to complete corrective measures, particularly if a plant closes before corrective measures are completed.

COMMENTS ON CORRECTIVE MEASURES ASSESSMENTS

I. Hunter CCR Landfill Corrective Measures Assessments

PacifiCorp operates a 230 acre CCR landfill which is subject to EPA's CCR regulations. After dewatering and treatment, the Flue Gas De-sulfurization (FGD) waste, fly ash and bottom ash are disposed in the CCR landfill. In addition, for decades PacifiCorp has disposed of wastewater from the plant by land applying the wastewater on so-called "research farms" directly adjacent to Rock Canyon Creek. The CMA states, "[t]he results of detection monitoring revealed statistically significant levels above background for the following Appendix III constituents: boron, calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS)." CMA, p. 1. The CMA also states, "[a]s a result, the CCR Landfill monitoring program was transitioned to assessment monitoring in 2018. The results of two rounds of sampling completed between February and May of 2018, revealed Appendix IV constituents - lithium and molybdenum exceeded the groundwater protection standards established for the CCR Landfill." *Id.*

The Hunter plant and CCR landfill are surrounded by public BLM land that is used for recreation, cattle grazing, and agricultural use. Discharges of toxic compounds from the CCR landfill can adversely impact these uses and the users of the public lands.

PacifiCorp operated the CCR landfill for decades before conducting background groundwater quality monitoring. As such, PacifiCorp's groundwater monitoring results likely reveals contamination from its operation of the CCR landfill for decades prior to monitoring. It also appears that PacifiCorp's historic disposal practice was to dispose of CCR and FGD wastes in a wet form without dewatering. This is evident from the following statement in the CWA: "[t]hese improvements include improved operational practices which eliminated the liquid content in CCR materials prior to their placement in the landfill." CMA, p. 7. Apparently, wet

CCR and FGD material was disposed of onsite from commencement of operations at Hunter through at least 2007. CMA, p. 12. The CMA should identify the years and quantity of CCR and FGD materials disposed of in the CCR landfill in a wet form. The CMA should also provide sampling and analytical results for the wet material disposed of in the CCR landfill.

Table 3 of the CMA provides data of constituents found in material leaching from the CCR landfill. The CMA should provide more detail on how this data was collected. For example: where was the sample collected? how was it collected? was the sample collected in an area of the landfill where wet disposal of CCR and FGD material occurred?

The CMA also fails to provide adequate support that the upgradient (background) and downgradient wells accurately reflect conditions at the site. The CMA fails to evaluate whether wet CCR and FGD materials have left the site boundary and may be impacting surface and groundwaters further downstream of the site.

The CMA also fails to provide upgradient and downgradient surface water sampling results for Rock Canyon Creek, South Wash, Cottonwood Creek, and the unnamed tributary identified on p. 3 of the CMA. Because there is extensive public land used for recreational and agricultural purposes in close proximity to Hunter and the CCR landfill, exposure to surface waters is highly likely. These surface waters can be impacted by migrating groundwater, and well as surface waters that have been in contact with contaminated soils that have historically migrated off-site of the plant and CCR landfill. In addition to groundwater sampling, the CMA must evaluate impacts to surface waters.

The CMA also makes the following conclusory statements: “The remaining contamination is in the vadose zone and aquifer and is expected to attenuate over time since the contamination source has been eliminated. There is no additional seepage from the landfill to groundwater.” CMA at p. 11. These statements are completely unsupported. The CMA must provide all evidence and assumptions supporting these conclusions.

PacifiCorp is presently attempting to purchase BLM lands along Rock Canyon Creek for the purpose of expanding the Hunter plant and CCR landfill operations. PacifiCorp’s CMA makes clear that it has contaminated the land upon which the plant and CCR landfill is located. Given this contamination, PacifiCorp should abandon its plans to purchase public lands because such land will inevitably be contaminated by PacifiCorp’s waste disposal practices.

The CMA also fails to provide a map showing all public lands (BLM, Forest Service, SITLA, etc) in relation to the Hunter plant and CCR landfill. Please provide such a map to show the proximity of public lands to the contaminated facilities.

A. Compliance with requirements to characterize the nature and extent of the release, 40 C.F.R. § 257.95(g)

The Federal CCR Rule requires a complete assessment of the nature and extent of the pollutant plume and release. Such an assessment must do the follow to comply with 40 C.F.R. § 257.95(g) and its requirement to “Characterize the nature and extent of the release and any

relevant site conditions . . . [in a manner] sufficient to support a complete and accurate assessment of the corrective measures necessary to effectively clean up all releases from the CCR unit”:

- Install additional monitoring wells as necessary, including “at least one additional monitoring well at the facility boundary in the direction of contaminant migration”; and
- Collect data on the nature and estimated quantity of material released, including data collected through monitoring well sampling.

In spite of these requirements, our review of the CMAs shows that PacifiCorp has not finished a “complete” assessment of the nature and extent of the release. We ask PacifiCorp to supplement its analysis with additional data collected from monitoring wells and other sampling locations.

B. Compliance with requirements to control the source of release and remove contaminated material from the environment, 40 C.F.R. § 257.97(b)(3)-(b)(4)

The Federal CCR Rule requires a selected remedy to, at a minimum (1) be protective of human health and the environment; (2) attain groundwater protection standards identified in the CCR Rule; (3) “reduce or eliminate, to the maximum extent feasible, further releases of constituents” listed in appendix IV of the CCR Rule; (4) “[r]emove from the environment as much of the contaminated material that was released from the CCR unit as is feasible”; and (5) comply with waste management standards required by the federal rules.

For the CCR facility at Hunter, in order to meet the afore-mentioned requirements, the CCR landfill should be closed by excavating all CCR material and placing that material in a lined offsite landfill. Closure in place does not satisfy the requirements of 40 CFR § 257.97(b)(3)-(b)(4). Specifically, leaving the waste in place in an unlined landfill will continue to cause release of the constituents, in violation of the CCR Rule’s requirements to reduce or eliminate – “to the maximum extent feasible” – further releases of constituents.

Additionally, closure and removal of the CCR waste will be the most cost-effective solution for the long-term. It is the only remedy that complies fully with the CCR Rule requirements to prevent additional release of pollutants and to remove as much of the contaminated waste as possible.

None of the other alternatives listed in the CMA comply with the CCR Rule.

C. Compliance with the National Environmental Policy Act

Given the amount of federal land and minerals at and near the Hunter plant and CCR facilities, please explain how PacifiCorp and the BLM are complying with requirements under the National Environmental Policy Act. For example, will implementation of corrective measures result in impacts to public lands or resources through well drilling, pump and treat systems, impacts to federal groundwater, traffic, or other activities?

II. Huntington CCR Landfill Corrective Measures Assessments

The Huntington Plant has two CCR landfills, the “old” and “new” CCR landfills. PacifiCorp constructed its CCR landfill in a valley containing an intermittent stream flowing to Huntington Creek (“Duck Pond drainage”). Huntington Creek runs immediately adjacent to the power plant. PacifiCorp filled the upper reaches of the valley and stream with CCR and FGD materials. Like the Hunter plant, PacifiCorp used to dispose of CCR and FGD waste at Huntington in a liquid form both on the CCR landfill and on the grounds of the power plant. The CMA should identify the years, and quantity of CCR and FGD materials disposed of in the CCR landfill in a wet form. The CMA should also provide sampling and analytical results for the wet material disposed of in the CCR landfill.

In addition, for decades PacifiCorp has disposed of wastewater from the plant by land applying the wastewater on so-called “research farms” directly adjacent to Huntington Creek. PacifiCorp used to operate an outfall that collected leached wastewater from below the research farms and discharged the wastewater directly into Huntington Creek. Because of the risk of contamination to surface and groundwater, the State of Utah ordered PacifiCorp to discontinue its surface application of wastewater on the research farm.

As historical documents and the CMA detail, the Huntington plant CCR has had significant releases of pollutants. In fact, the groundwater is so polluted that, “[t]he 2016 [groundwater discharge] permit required PacifiCorp to place an environmental covenant on the property that restricts use of groundwater for any purpose to address the potential risk associated with use of impacted groundwater.” CMA at p. 7.

There is a county park immediately above the Huntington plant that is used for both day use and camping. There are also federal public lands (BLM, Forest Service) in the vicinity of, and downstream of, the Huntington plant. There are significant agricultural diversions from Huntington Creek just downstream of the plant. Water is also diverted downstream of the plant for the Huntington Lake State Park, which allows surface contact with the waters.

The CMA states, “[d]etection monitoring was conducted between September 2015 and October 2017. The results of detection monitoring revealed statistically significant levels above background for the following Appendix III constituents: boron, calcium, fluoride, pH, and sulfate. As a result, the CCR Landfill monitoring program was transitioned to assessment monitoring in 2018. The results of two rounds of sampling completed between February and May of 2018, revealed Appendix IV constituents - chromium, cobalt, lithium, and selenium were at statistically significant levels above the groundwater protection standards established for the CCR Landfill.” CMA, p. 1.

The CMA fails to provide adequate support that the upgradient (background) and downgradient wells accurately reflect conditions at the site. The CMA fails to evaluate whether wet CCR and FGD materials have left the site boundary and may be impacting surface and groundwaters further downstream of the site.

Further, the reported groundwater sampling and monitoring results (CMA, Table 2) is

deficient because it does not include constituents that can be used to “fingerprint” CCR contamination such as boron. The CMA must produce data for CCR fingerprinting compounds such as boron. The CCR landfill is a source of boron. CMA, Table 3. PacifiCorp must develop a statistically significant method for determining boron contamination, as well as identify a groundwater standard.

Table 3 of the CMA provides data of constituents found in material leaching from the CCR landfill. The CMA should provide more detail on how this data was collected. For example: where was the sample collected? how was it collected? was the sample collected in an area of the landfill where wet disposal of CCR and FGD material occurred? Was it collected from the “old” landfill?

PacifiCorp has been ordered to discontinue its practice of land applying wastewater on the research farm. The CMA must include a detailed description of PacifiCorp’s future practice for managing wastewater it currently land applies on the research farm.

A. Compliance with requirements to control the source of release and remove contaminated material from the environment, 40 C.F.R. § 257.97(b)(3)-(b)(4)

Like the Hunter CCR facilities, PacifiCorp must select closure by removal for the Huntington CCR facilities to meet the requirements of the Federal CCR Rule, including 40 C.F.R. § 257.97(b) (described above). When combined with groundwater treatment actions, closure by removal is the most protective solution - required by 40 C.F.R. § 257.96(c)(1).

None of the other alternatives satisfy the CCR Rule, because the alternatives contemplate closure in place in an unlined landfill. Leaving the polluting waste in an unlined landfill will lead to more releases of harmful constituents, and will not create a long-term remedy that complies with the requirements of the CCR Rule. Nor will the proposed remedy by the most cost-effective solution for the long-term as additional remediation and cleanup will be required if pollution releases keep occurring.

III. ENSURING ADEQUATE FUNDING FOR CORRECTIVE MEASURES

Effective remedies, fully compliant with the CCR Rule will take significant time and resources to implement. For example, the CMAs disclose that pumping and treating groundwater contaminated by the Hunter and Huntington facilities may take years to attain groundwater protection standards.

Under the CCR Rule, PacifiCorp must adequately ensure that funds will be available to achieve any selected remedy identified in the CMA. Please explain how this requirement is being met, especially for facilities that may close (and fully depreciate under utility commission approved schedules) before completion of the corrective actions. Additionally, as PacifiCorp knows cost-sharing of these measures will be complicated once Oregon, Washington, and California ratepayers exit from the coal plants. Separately, we have asked the PacifiCorp IRP team to analyze CCR Rule compliance as part of the IRP to ensure that there is transparency and

disclosure to ratepayers and utility commissions about anticipated costs of compliance, and who will share in those costs.

CONCLUSION

For the forgoing reasons, our organizations urge PacifiCorp to select closure-by-removal as the remedy for all identified CCR facilities. In addition, pump and treat of groundwater should continue after all material is removed and the water quality is restored to “true background” conditions. Thank you for your time and consideration of these comments, and we look forward to a complete response.

Sincerely,

s/ Noah Miterko

Noah Miterko
HEAL Utah
824 400 W #11
Salt Lake City, Utah 84101

Hunter Holman
Utah Clean Energy
1014 2nd Avenue
Salt Lake City, Utah 84103

Gloria Smith
Sierra Club
2101 Webster St., Suite 1300
Oakland, CA 94612

**Powder River Basin Resource Council * Sierra Club * Earthjustice
HEAL Utah * Utah Clean Energy**

August 12, 2019

PacifiCorp
Attn: Jeff Tucker
1407 West North Temple
Salt Lake City, UT 84116
Via electronic mail to: jeff.tucker@pacificorp.com

RE: request for comment period extension for PacifiCorp Corrective Measures Assessments for coal combustion residuals facilities at Wyoming and Utah power plants

Dear Mr. Tucker,

On behalf of the undersigned organizations and our thousands of members in Wyoming and Utah, we ask PacifiCorp to extend the comment period for its proposed Corrective Measures Assessments for coal combustion residuals facilities in Wyoming and Utah.

Our organizations only discovered the Wyoming comment period through a routine search of legal notices August 2, 2019. Our organizations discovered the Utah comment period only through reading a news story on community meetings. None of our organizations received personal notice from PacifiCorp on the comment period and community meetings, in spite of long-standing stakeholder engagement in a variety of regulatory forums and frequent communication with PacifiCorp staff.

Since we learned about the comment periods, we have been busy looking through the assessments. We have identified some gaps in the information provided by the company as well as the need for expert analysis on our part. The plans cover five large power plants with multiple CCR facilities and reviewing all of the plans at the same time is proving impossible to do within the thirty day comment period offered by PacifiCorp. Additionally, the current comment period falls in August, a time when many of our staff and experts have scheduled vacation time.

We ask PacifiCorp to extend the comment deadline by at least thirty days to September 25, 2019.

Thank you for your consideration of this request and we look forward to your reply.

Sincerely,

Shannon Anderson
Powder River Basin Resource Council

Michael Shea
HEAL Utah