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Groundwater Remedy Selection and Design Semiannual Progress Report

Coal Combustion Residual Rule Compliance

Facility
Healy Power Plant
2.5 Mile Healy Spur Road
Healy, Alaska

February 28, 2020

This semiannual progress report is the third report following the completion of the *Corrective Measures Assessment* in August 2018. This report documents GVEA's progress towards selecting and designing the remedy for the groundwater impacts associated with the four coal combustion residuals (CCR¹) units at the Healy Power Plant near Healy Alaska. This report has been documented in GVEA's facility operations records to satisfy the requirements under §257.105(h)(12) of the CCR Rule and posted to GVEA's CCR Website in accordance of §257.107(h)(9).

At the Healy Power Plant, groundwater concentrations of constituents listed in appendix IV of the CCR Rule have been detected at statistically significant levels above the groundwater protection standard. Accordingly, corrective measures are to be assessed and taken to prevent further releases, to remediate any releases, and to restore affected areas to their original conditions in accordance with the CCR Rule. Because the ponds are unlined, GVEA must cease placement of CCR into the ponds and either retrofit or close the ponds in accordance with the CCR Rule. GVEA intends to close the ponds rather than retrofit them because location requirements in the CCR Rule restrict GVEA's continued use of these ponds even if they were retrofitted with a liner. Closure of the ponds will involve removing coal ash from within the waste boundary of each of the four CCR units and backfilling excavations as previously outlined in the *Closure and Post-Closure Plan*.

In August 2018, GVEA completed an assessment of corrective measures to address the monitored groundwater impacts associated with the CCR units at the Healy Power Plant. As part of the assessment process alternatives were developed and screened against threshold criteria to determine whether corrective measures would meet the remedial objectives and whether they should be retained or eliminated from further consideration. Upon completing a detailed evaluation, source removal and disposal of CCR material from the four CCR units was identified as the preferred corrective measure to effectively address groundwater impacts associated with the CCR units. As stated in the *Corrective Measures Assessment Report*, source removal and disposal would be the primary corrective measure taken since the unlined ponds must also be closed and removed in accordance with the CCR Rule. Furthermore, by closing the ponds, the source of highly alkaline water will be eliminated; resulting in lower (ambient) pH levels in the down gradient groundwater, thereby minimizing the mobilization of naturally-occurring metals in groundwater and eliminating exceedances of the GWPS.

¹ CCR is defined under the CCR Rule as fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.

Source removal, the primary corrective measure to address groundwater impacts, cannot be completed until an alternative disposal² option is fully implemented and operating to manage CCR material from Unit 1.

At this time, GVEA does not have a fully implemented alternative process in-place to manage Unit 1's CCR waste streams at the facility and must continue to use the CCR units to generate and contribute power to GVEA's cooperative member owners. In 2019, GVEA determined that the preferred alternative process to manage Unit 1's CCR is to convey the CCR material from the Unit 1 plant to the Unit 2 coal ash handling systems. In Unit 2, wet slag and bottom ash is collected in an intermediate storage silo, while dry fly ash is collected in a separate intermediate storage silo. Within an enclosed building, CCR material is loaded from the silos directly into trucks for transport and final disposal at the Usibelli Coal Mine. Modifications to both the Unit 1 and Unit 2 coal ash handling systems are in-progress; modifications that will allow the reliable redirection of all the Unit 1 CCR material from the ponds to the Unit 2 silos.

In pilot testing conducted in 2019, fly ash from Unit 1 has successfully been routed to the Unit 2 silo, which accounts for 80% of the Unit 1 total ash. This new conveyance system for Unit 1 fly ash will continue operating to the greatest extent possible in 2020 while additional controls upgrades and insulating of transport lines is completed to increase the reliability of the system. The batch system for offloading fly ash from the Unit 2 silo will be upgraded in 2020 to increase the reliability of handling the larger amount of fly ash material. Also in 2020, upgrades to the Unit 2 slag and bottom ash handling system will be completed during an extended outage that will allow for the transport of the Unit 1 slag and bottom ash over to Unit 2 bottom ash system during times when Unit 2 is operating. Slated for completion in 2021 are additional upgrades that would allow Unit 1 slag and bottom ash to be handled on the Unit 2 side during Unit 2 outages. Once the new coal ash handling systems for both fly ash and slag and bottom ash are complete and operating reliably, GVEA can start final corrective actions and closure of the CCR units.

To support the selection of a final remedy and to assist in the effective implementation of corrective actions, GVEA completed a leachability study in 2019 to further characterize the site and assess whether other potential sources are contributing to groundwater impacts at the site. Results of the study indicate that elevated pH values of the pond water and groundwater affects the leaching potential of the metals present in coal ash and site soils. Testing at the natural pH for both coal ash and site soils demonstrated the leaching potential is minimal and leached metal constituents in these conditions were detected below their representative groundwater protection standards.

² It should be noted that the CCR ponds at the Healy Power Plant are used for the interim collection of fly and bottom ash from Unit 1 and are not used as final disposal facilities. The CCR material is dredged from the ponds and transported back to Usibelli Cole Mine for permitted disposal.

The results of the study suggest that if the high pH water source of the ponds were eliminated, the groundwater pH would return to neutral pH, and thus mobilization of naturally-occurring metals in site soils would be reduced.

Due to the additional time needed to complete modifications to the Unit 1 and Unit 2 ash handling systems, GVEA is investigating the implementation of an interim corrective measure to address groundwater impacts associated with the ponds. Because elevated pH values of both the pond water and the down gradient groundwater affects the leaching potential of the metals present in coal ash and site soils, GVEA has developed interim plans to minimize the leaching of metals from the coal ash and site soils by addressing the high pH of the ponds and subsequently down gradient groundwater. GVEA is considering one of two alternative interim corrective measures to implement in 2020. One measure is to install a neutralization system designed to neutralize the sluiced Unit 1 coal ash to a target pH of 8.5 prior to discharge to the ponds. Another alternative interim measure is the installation of a geomembrane liner along the sidewalls and bottom of the Recirculating Pond and Ash Pond to prevent migration of high pH pond water and leaching of contaminants into groundwater.

To progress towards closure of the CCR units and the selection of a final remedy, the following steps are planned:

1. The completion and implementation of upgrades to the Unit 1 and Unit 2 coal ash handling systems for both fly ash and slag/bottom ash.
2. The completion of a water efficiency assessment of Unit 1 and Unit 2 water and wastewater streams to identify opportunities to reuse/save water use at the plant and identify alternative capacity (i.e., diversion to another unit) to manage non-CCR waste streams currently cycled through the ponds. There are non-CCR wastes, including Unit 1 boiler blowdown and pyrites from coal crushing/milling, which are discharged intermittently to the ponds. The plant generates blowdown to control the natural buildup of impurities in the boiler system. Pyrites (i.e., mill rejects) are generated prior to combustion process as part of the coal crushing process and combined with the bottom ash in the sluice conveying system, and are thus not a CCR waste on their own.
3. The evaluation, design and construction necessary to implement an alternative system for managing Unit 1's non-CCR waste streams that are currently entering the ponds.
4. The modification of the 2018 *Corrective Measures Assessment Report* to incorporate the results of the 2019 leachability testing study, a discussion of interim corrective measures as an option to minimize impacts to groundwater until a final remedy is selected and implemented, and any updates necessary to update the assessment based on the new data,

5. The collection of additional data to further characterize the site; data that will assist with remedy selection could include a contaminant transport assessment or a bench-scale treatability study which may be warranted based on the outcome of the revised corrective measure assessment.
6. Holding a public meeting prior to remedy selection to discuss the results of the updated *Corrective Measures Assessment Report*, the leachability testing study, and the current plans to implement an interim corrective measure to address groundwater contamination.
7. The final remedy selection and preparation of the *Remedy Selection Report*.
8. The final closure of CCR units and final corrective action for groundwater.