

2018 Annual Inspection Report

for Compliance with the Coal
Combustion Residuals Rule
(40 CFR Part 257)

Hayden Station

*13125 U.S. Highway 40
Hayden, Colorado 81638*

January 18, 2019



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Certification

Hayden Station - CCR Unit 2018 Annual Inspection for Compliance with the Federal Coal Combustion Residuals Rule

I hereby certify that the Coal Combustion Residuals (CCR) unit (i.e. the landfill) at Hayden Station meets the inspection and operation standards specified in 40 CFR Part 257.84(b) of the Federal CCR Rule. The Hayden Station is owned by the Public Service Company of Colorado (PSCo), an Xcel Energy Company.

I am duly licensed Professional Engineer under the laws of the State of Colorado.



Brian Brown, PE

Colorado PE License 0041644

License renewal date October 31, 2019

1 Introduction

On April 17, 2015 the U.S. Environmental Protection Agency (EPA) published regulations under Subtitle D of the Resources Conservation and Control Act (RCRA) meant to control the safe disposal of coal combustion residuals (CCR) generated by coal fired electric utilities. The rule defines a set of requirements for the disposal and handling of CCR within CCR units (defined as either landfills or surface impoundments). Hayden Station has one CCR unit: a landfill. As specified in 40 CFR 257.84(b), *“Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards.”*

This is the fourth annual inspection report for the existing Hayden CCR landfill. This report must be completed and placed into the facility operating record no later than January 18, 2019

The requirements of the annual inspection include:

- A review of available information regarding the status and condition of the CCR unit - §257.84 (B)(1)(i),
- A visual inspection of the CCR unit to identify signs of distress or malfunction - §257.84 (B)(1)(ii),
- An inspection report that includes the following:
 - Changes in geometry since the last inspection - §257.84 (B)(2)(i)
 - Approximate volume of CCR in unit at time of inspection - §257.84 (B)(2)(ii)
 - Appearance of actual or potential structural weakness of the CCR unit - §257.84 (B)(2)(iii)
 - Any other changes which may have affected the stability or operation of the CCR unit since the last inspection - §257.84 (B)(2)(iv)

2 Site Inspection

In accordance with §257.84(b)(ii), a site inspection of the Hayden CCR unit was conducted by an independent Professional Engineer on November 26th, 2018. This site inspection was performed in advance of the CCR submittal deadline to ensure that the inspection was completed prior to snow covering the ground given the high elevation of this facility. The visual site inspection was conducted by Brian Brown, a Colorado Professional Engineer of HDR Engineering Inc. Review of the associated paper work and inspection reports was conducted by Brian Brown and Mark Stewart, an Xcel Energy Environmental Analyst for the Hayden Station.

The weather during the site visit was sunny with temperatures ranging from 45 to 55 degrees Fahrenheit. The site was partially covered with a thin layer of snow.

3 Review of Available Information

Numerous documents pertaining to the site operation and structural integrity were reviewed including:

1. Engineering Design and Operation Plan (EDOP) (DRAFT EDOP dated November 2013, prepared by Walsh Environmental Scientists and Engineers, LLC.). Document included an Existing Conditions Plan, a Site Development Plan, and a Final Closure Plan. Xcel Energy Environmental Analyst reported no change in document and still operating under this document. Document not reviewed again since the document is unchanged. A revision to the EDOP is in progress and has been reviewed by the Colorado Department of Public Health and Environment (CDPHE). Final approval is expected in early 2019.
2. CDPHE reportedly made two site visits to the landfill area; one in May of 2018 and another in July of 2018. Neither site visit generated a formal report and the CDPHE inspector reportedly had no issues with the landfill and contact water pond inspection areas observed.
3. Curt Stovall of the CDPHE provided written approval of the Revised Perimeter Berm Interim Construction Requirements by letter dated October 3, 2017. This document established requirements for constructing perimeter berms until the revised Engineering Design and Operations Plan is approved by the CDPHE. The revised EDOP incorporates the approved perimeter berm requirements, which were followed in 2018. This document was not reviewed as part of this inspection but is still in place since the EDOP has not been accepted by the CDPHE.
4. Weekly CCR Landfill Inspection Forms (per Section 257.84(a)).
5. November 2018 As-Built Survey with updated topography with the most recent field work dates of November 8 and November 12, 2018, performed by Four Points Surveying and Engineering.
6. Records of annual ash tonnage delivered to the CCR landfill from the generation facility from October 2017 through October 2018.

Review of the above documents did not contain any indications of operation, safety, or structural concerns regarding the CCR landfill.

4 Visual Inspection

Brian Brown completed a site inspection covering the entire landfill area. As the CCR rule pertains only to the CCR landfill itself, this report does not address existing topsoil stockpiles and native earth excavations that lie east of the landfill (located on native ground).

The site inspection included an evaluation of the following landfill features:

1. landfill side slopes and toe of slope;
2. landfill side slope benches;
3. new and lined contact storm water pond;
4. upper water quality pond (northwest pond);
5. stormwater drainage conveyance channels (southern, western, northwestern, and eastern);
6. lower storm water ponds (toe of landfill – northwest and southwest);
7. access roads;
8. active CCR fill areas (CCR disposal, spreading, and compaction); and
9. temporarily soil covered CCR landfilled areas.

The following are the findings of the site inspection:

- The landfill side slopes have grades of approximately 4 horizontal to 1 vertical (4H:1V); well established vegetation; and show little to no signs of erosion and no signs of operational or functional concerns.
- The side slopes are constructed with erosion control benches at regular intervals. Benches are approximately 10 feet in width. In areas of more recent filling, benches were developed with a back slope to create a swale that directs stormwater runoff to a downchute channel. In older portions of the landfill, benches simply create a flat area to slow stormwater flow. The older portions of the benches have substantial vegetation cover and limited areas of minor rill erosion. The benches showed no signs of operational or functional concern.
- In general, areas that had a topsoil layer were stabilized with a dense stand of vegetation and were functioning as intended. Small and localized areas of minor rill erosion were observed in isolated areas around the vegetated areas. These should continue to be monitored.
- In general, areas more recently constructed where a topsoil layer has not yet been installed and vegetation not yet established were showing signs of rill erosion. This is expected due to the slope grades and lack of vegetation. Rill erosion in these areas posed no apparent operational or structural concerns. Once the topsoil layer is placed, seeded, and a dense stand of vegetation established, the bank faces are anticipated to be stabilized.
- All four site stormwater management ponds (three non-contact ponds and one contact pond) appear to be functioning as intended with no operational or structural concerns. The conveyance channels into the three perimeter non-contact stormwater ponds appear adequately armored with articulated concrete block or erosion control blankets to minimize concentrated conveyance erosion in the conveyance channels. The conveyance routes to these three perimeter stormwater ponds and the ponds

themselves were not observed to have functional or operational concerns. The Contact Stormwater Pond is a new pond with a perimeter fence and was anticipated in the prior Annual Report. This pond is lined to minimize stormwater infiltration into the CCR landfill. The prior contact water pond has been abandoned as a contact water pond.

- The active moderate rill erosion on the northern internal slope of the landfill, southeast of the Upper Water Quality Pond has not been covered by CCR placement as discussed in the prior report. This active rill erosion area is roughly thirty (30) feet in width and has a run length of a single landfill lift, which is the same condition as the previous year, and does not present operational or structural concerns. This area will be covered by continued CCR placement.
- The access roads to the top of the landfill showed no signs of operational or structural concern. The road side slopes were vegetated and had minimal rill erosion. The plateau road showed no signs of operational or structural concern. The east end of the most eastern access road was experiencing rill and minor gulley erosion. This erosion was contained within the active landfill area and had no larger operational or structural concerns for the landfill.
- There was active CCR disposal during the site inspection with placement of CCR material. The material was observed during unloading into piles but spreading and compaction was not observed during the inspection. On-site equipment and reported operational procedures have not changed since the prior inspection. Wind blown CCR was not observed during site observation.
- The capped CCR landfill areas, excluding the final berm fill around the northern and western sides of the active landfill cell, appeared to have adequate soil cover, had established vegetation, and showed no signs of operational or structural concern.

5 Changes in Geometry

The Federal CCR Rules require that site geometry changes be identified since the last inspection. The site geometry changed in multiple areas since the initial inspection due to continued CCR disposal, abandonment and construction of a new contact water pond, top landfill grading modifications, and construction of additional perimeter soil embankment. Specific changes are listed below:

1. Construction of the southern stormwater conveyance channel was completed with surface stabilization immediately north of the channel.
2. The prior contact water pond was abandoned and a new, lined, and larger contact water pond on the east side of the active fill area on the top of the landfill area was constructed with a perimeter fence.
3. A perimeter soil embankment was constructed on the west and north sides of the CCR disposal area to a height of roughly ten feet.
4. The top plateau of the main landfill area continued to accept CCR on the northern half of the plateau in a lift of roughly ten to twelve feet thick. This lift continues to be constructed with CCR placement, followed by an intermediate soil cover to create a stepped slope that matches the remainder of the western face.

5. Surface grading around the new contact water pond to direct drainage to the pond. This grading included up to roughly three feet deep fill in the southeast area of the landfill top plateau.

No structural or safety concerns were observed due the site geometric changes. Fill placement is expected to continue in a similar manner in the main landfill plateau top in 2019.

6 Approximate CCR Volume

The reported estimated CCR volume is based on the tonnage of CCR delivered to the landfill from the power plant. The CCR volume was estimated based on the power plant operation and electric load type from 1984 to December 1999. From January 2000 up to the present, Xcel Energy has recorded monthly CCR volumes. In reviewing landfill CCR volumes, it was determined that prior annual inspection reports did not include CCR landfill volume estimates for the period from 1984 to December 1999. The totals in this report add the estimated volumes during that time period and the volumes previously reported. The total combined volume of CCR deposited within the landfill through October 2017 is estimated to be 8,307,400 cubic yards. The additional CCR deposited from November 2017 through October 2018 is estimated to be 186,600, assuming one cubic yard of CCR material equates to one ton. The total CCR volume in the landfill as of the end of October 2018 is estimated to be 8,494,000 CY.

7 Appearance of Structural Weakness

Based on the site inspection, no apparent or potential structural weaknesses were observed. Continued monitoring and minor repairs or surface vegetation should be completed to address rill and gully erosion before it becomes a potential structural landfill weakness.

8 Changes Affecting Stability or Operation

There were no observed or reported operation changes that are anticipated to impact the site's near-term or long-term stability. The southern perimeter stormwater conveyance channel that was previously noted to have gully erosion has been regraded and is now armored.

Appendix A – Landfill Site Map

