

# 2016 Annual Inspection Report

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

## **Hayden Station**

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

**January 18, 2017**



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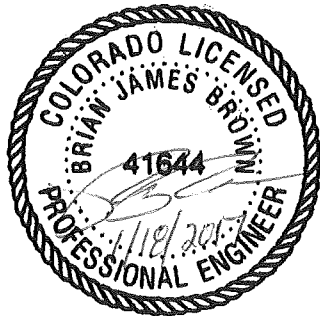
Appendix A: Landfill Site Map

# Certification

## Hayden Station - CCR Unit 2016 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, 2017

# 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 second 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, 2017

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 October 26<sup>th</sup>, 2016. This site inspection was performed well 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 40 to 60 degrees Fahrenheit. The site was free of snow cover.

### 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.
2. Curt Stovall of the Colorado Department of Public Health and Environment (CDPHE) performed an orientation site visit, not a formal inspection, on May 3, 2016. Xcel did receive a follow up email regarding the site visit but no formal report from the site visit was provided by the CDPHE. Xcel Energy reported that there was no discussion of landfill safety or structural concerns.
3. Weekly CCR Landfill Inspection Forms (per Section 257.84(a)) beginning in December 10, 2015 and ending on November 28, 2016.
4. As-Built topographic survey with a field work date of October 5, 2016, performed by Four Points Surveying and Engineering, provided via email by Xcel Energy on December 12, 2016.
5. Records of annual ash tonnage delivered to the CCR landfill from the generation facility from January 2015 through September 2016.

Review of the above documents did not contain any indications of operation, safety, or structural concerns regarding the CCR landfill. The Draft EDOP from 2013 is being updated based upon feedback received from CDPHE . The revised EDOP is expected to be submitted to CDPHE by April 2017.

### 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), nor does this report include an inspection of the off-landfill grading and stormwater management channels located east of the landfill.

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. contact storm water pond;
4. upper storm water pond (northwest pond);
5. stormwater drainage conveyance channel (southern);
6. articulated concrete block lined stormwater conveyance channel (northwestern);
7. lower storm water pond (toe of landfill, northwest);
8. access roads;
9. active CCR fill areas (CCR disposal, spreading, and compaction); and
10. 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. An area of more severe rill erosion, noted in the prior report on the western face on the southern edge of the upper stormwater pond, was filled in and graded over by the landfiling process. The soil surface in this area appears stable with no signs of rill erosion.
- 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 three site stormwater management ponds appear to be functioning as intended with no operational or structural concerns. The contact storm water pond at the current landfill working face had steep side slope banks and showed gully erosion at one of the conveyance channels to the pond. This small, shallow pond is an interior pond and the gully erosion is not anticipated to have an impact on the larger site stability. There are some site safety concerns due to the steep gully side slopes as they relate to worker access and equipment operation. This potential safety concern should be reviewed as

part of site work at or near the contact stormwater pond.. The stormwater other ponds do not pose structural or safety concerns.

- The southern stormwater conveyance channel was repaired and stabilized since the last annual inspection. This area should be closely monitored for erosion until the vegetation is reestablished.
- The western conveyance channel between the upper pond and the lower northwestern storm water pond is protected with articulated concrete block armor. Vegetation is growing between many of the blocks, per design. This channel showed no apparent signs of operational or structural concern and appeared to be functioning as intended.
- There is active moderate rill erosion on the northern internal slope of the landfill, southeast of the Upper Water Quality Pond. This active rill erosion area is roughly thirty (30) feet in width and has a run length of a single landfill lift. This area will eventually be covered by continued CCR placement expected in 2017 or 2018, depending on CCR production and 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 no active CCR disposal during the site inspection. On-site equipment and reported operational procedures have not changes since the prior inspection. Wind blown CCR was not observed during site observation.
- The capped CCR landfill areas, excluding areas immediately adjacent the contact storm water pond, 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 two areas since the initial inspection due to continued CCR disposal and soil cover placement:

The Upper Water Quality Pond was raised by roughly eight (8) feet and the Western Channel was extended upslope accordingly. This fill area is wedge shaped and decreases in width as the fill continues upslope. The western facing wedge face is a stepped slope matching the remainder of the western landfill face.

The top plateau of the main landfill area continued to accept CCR on the northern half of the plateau in a lift of roughly five feet. This lift continues to be constructed with CCR placement , followed by top soil cover to create a stepped slope that matches the remainder of the western face.

No structural or safety concerns were observed due the continued site geometric filling. Fill is expected to continue in a similar manner in both areas for 2017.

## 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. The total combined volume of CCR deposited within the landfill is estimated to be 3,879,644 cubic yards through August of 2015. The addition CCR deposited from September 2015 to September 2016 is estimated to be 203,038 CY, assuming one cubic yard of CCR material equates to one ton. The total CCR volume in the landfill as of September 2016 is estimated to be 4,082,700 CY.

## 7 Appearance of Structural Weakness

Based on the site inspection, no apparent or potential structural weaknesses were observed. Continued monitoring and minor repairs 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 one area of severe gully erosion identified in the prior inspection (at the southern stormwater conveyance channel) that had potential to affect long-term stability has been remedied, as have other previously noted areas of rill or gully erosion. There were no new stability concerns observed or reported.



## Appendix A – Landfill Site Map



NOTES:

- 1) THIS EXHIBIT WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE COMMITMENT AND DOES NOT CONSTITUTE A TITLE SEARCH BY FOUR POINTS SURVEYING AND ENGINEERING, LLC. TO DETERMINE TITLE OR EASEMENTS OF RECORD. THIS EXHIBIT DOES NOT PURPORT TO REFLECT ANY OF THE FOLLOWING WHICH MAY BE APPLICABLE TO THE SUBJECT REAL ESTATE: EASEMENTS, OTHER THAN POSSIBLE EASEMENTS THAT WERE VISIBLE AT THE TIME OF MAKING THIS EXHIBIT; BUILDING SETBACK LINES; RESTRICTIVE COVENANTS; SUBDIVISION RESTRICTIONS; ZONING OR OTHER LAND-USE REGULATIONS; AND ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.

2) THIS EXHIBIT WAS PREPARED FOR THE EXCLUSIVE USE OF BASELINE ENGINEERING, INC. AND XCEL ENERGY, INC., NAMED IN THE STATEMENT HEREON. SAID STATEMENT DOES NOT EXTEND TO ANY UNNAMED PERSON WITHOUT AN EXPRESS STATEMENT BY THE SURVEYOR NAMING SAID PERSON.

3) THIS EXHIBIT IS VALID ONLY IF PRINT HAS ORIGINAL SEAL AND SIGNATURE OF SURVEYOR.

4) THE LOCATIONS FOR UNDERGROUND UTILITIES ARE BASED UPON VISIBLE SURFACE EVIDENCE AND MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANIES AND MUNICIPALITIES. LOCATIONS OF UNDERGROUND UTILITIES AND/OR STRUCTURES MAY VARY FROM LOCATIONS SHOWN HEREON. ADDITIONAL BURIED UTILITIES AND/OR STRUCTURES MAY BE ENCOUNTERED. NO EXCAVATIONS WERE MADE DURING THE PROCESS OF THIS EXHIBIT TO LOCATE BURIED UTILITIES AND/OR STRUCTURES. ALL UNDERGROUND UTILITIES SHOULD BE FIELD LOCATED BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION OR EXCAVATION ON OR ADJACENT TO THE SUBJECT PROPERTY. UTILITIES (CULVERTS, MONITORING WELLS, AND OTHER SELECT UTILITIES) WERE LOCATED FROM THE ORIGINAL SURVEY PERFORMED IN MAY 2014 BY FREMONT ENGINEERING AND SURVEYING AND HAVE ONLY BEEN UPDATED IF CHANGED OR IF THE UTILITIES WERE LOCATED DURING THE 2015 AS-BUILT DRAWING.

5) THE DISTANCE MEASUREMENTS SHOWN HEREON ARE U.S. SURVEY FOOT.

6) HORIZONTAL AND VERTICAL CONTROL ARE 1 1/2" ALUMINUM CAPS AS INDICATED HEREON.

7) BASIS OF ELEVATIONS: VERTICAL CONTROL WAS ESTABLISHED BY RTK GPS FROM NGS MONUMENT AP 1973 STA B HON', PID AB8070, A 3 1/4" BRASS SURVEY DISK IN A CONCRETE MONUMENT HAVING A PUBLISHED ELEVATION OF 6598.5' (NAVD 88 USING GEOID 12A).

8) COORDINATE SYSTEM AND DATUM: COORDINATE SYSTEM USED IS A MODIFIED COLORADO STATE PLANE, NORTH ZONE, NAD 83 (2011). CALCULATED COMBINED SCALE FACTOR USED FOR THIS PROJECT IS 0.99965141 AND SCALED FROM THE AFOREMENTIONED NGS MONUMENT USING ITS RECIPROCAL.

9) FLOOD INFORMATION: THE SUBJECT PROPERTY IS LOCATED IN ZONE X. AREAS DETERMINED TO BE LOCATED OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP; COMMUNITY-PANEL NO. 08107C08100, DATED FEBRUARY 4, 2005. FLOOD INFORMATION IS SUBJECT TO CHANGE.

10) DATES OF FIELDWORK:
  - ORIGINAL FIELD WORK WAS PERFORMED BY WALSH ENVIRONMENTAL SCIENTISTS AND ENGINEERS, LLC ON MAY 15-21, 2013. THIS SURVEY Laid Ground Control FOR THE AERIAL SURVEY THAT WAS COLLECTED AUGUST 28, 2013. AERIAL SURVEY WAS PERFORMED BY ROCKY MOUNTAIN AERIAL SURVEYS, INC. USING LIDAR.
  - OCTOBER 2014 SURVEY WAS PERFORMED TO CONVEY THE WORK PERFORMED FOR THE 2014 CONSTRUCTION SEASON. DATES FOR THESE SELECT AREAS WAS PERFORMED ON OCTOBER 22-23, 2014.
  - OCTOBER 2015 SURVEY WAS PERFORMED BY FOUR POINTS SURVEYING AND ENGINEERING TO CONVEY THE WORK PERFORMED FOR THE 2015 CONSTRUCTION SEASON. DATES FOR THESE SELECT AREAS WAS PERFORMED ON OCTOBER 14-15, 2015.
  - OCTOBER 2016 SURVEY WAS PERFORMED BY FOUR POINTS SURVEYING AND ENGINEERING TO CONVEY THE WORK PERFORMED FOR THE 2016 CONSTRUCTION SEASON. DATES FOR THESE SELECT AREAS WAS PERFORMED ON OCTOBER 5, 2016.

11) BOUNDARY DETERMINATION IS NOT A PART OF THIS EXHIBIT. THIS IS NOT A "LAND SURVEY PLAT" OR "IMPROVEMENT SURVEY PLAT" AND THIS EXHIBIT IS NOT INTENDED FOR PURPOSES OF TRANSFER OF TITLE OR SUBDIVISIONS OF LAND. PROPERTY LINES AND SECTION LINES ARE APPROXIMATED FOR INFORMATIONAL PURPOSES ONLY. THIS EXHIBIT IS NOT A LAND SURVEY.

12) STOCK PILE AREAS HIGHLIGHTED HEREON DO NOT REFLECT ACCURATE TOPOGRAPHY DO TO THE INHERENT IRREGULARITIES THAT EXIST.

13) PROPERTY OWNERSHIP INFORMATION SHOWN HERE ON WAS RESEARCHED ON ROUTT COUNTY'S ONLINE MAPPING INFORMATION AS RESEARCHED ON NOVEMBER 3, 2016.

14) BOTTOM OF POND WAS NOT SURVEYED AND THEREFORE ELEVATIONS SHOWN ARE NOT REPRESENTATIVE FOR THE BOTTOM OF POND.
- LEGEND
- ESTIMATED PROPERTY LINE

ESTIMATED SECTION LINE

EXISTING CONTOUR MINOR

EXISTING CONTOUR MAJOR

MINOR CONTOUR 2016

MAJOR CONTOUR 2016

FENCE

PAVED ROAD

UNPAVED ROAD 2014

OVERHEAD UTILITY LINE

FIBER OPTIC LINE

GAS LINE

CREEK

UTILITY POLE

CULVERT

MONITORING WELL

OVERHEAD UTILITY LINE EASEMENT

BLACK MAT - TEMPORARY

EROSION MAT

ESTIMATED 2016 CONSTRUCTION LIMITS

ESTIMATED ACTIVE ASH LIMITS

AT TIME OF 2016 SURVEY
- SURVEYOR'S CERTIFICATE
- I, WALTER N. MAGILL, BEING A DULY REGISTERED LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THE SURVEY (I) WAS PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION, (II) HAS BEEN PREPARED IN COMPLIANCE WITH ALL APPLICABLE LAWS OF THE STATE OF COLORADO AT THE TIME OF THIS SURVEY (III) IS ACCURATE TO THE BEST OF MY KNOWLEDGE AND (IV) CONTAINS ALL OF THE INFORMATION REQUIRED BY C.R.S. 38-51-102 (9) AND C.R.S. 38-51-103, 38-51-104 38-51-105 AND 38-51-106.
- WALTER N. MAGILL, REGISTERED LAND SURVEYOR, PLS 38024  
STATE OF COLORADO
- # TOPOGRAPHIC EXHIBIT
- LOCATED IN THE SOUTHEAST QUARTER OF SECTION 17 AND THE SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 6 NORTH , RANGE 87 WEST OF THE 6TH P.M.,  
COUNTY OF ROUTT , STATE OF COLORADO  
SHEET 1 OF 1
- 
- Notes in red text boxes added by  
HDR Engineering for CCR Annual  
Inspection Report, January 2017
- Hayden Power Plant  
Hayden, CO 80487
- October 2016  
As-Built Survey
- 
- | NO. | DATE | REVISIONS | INT |
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| DATE:      | 11-17-2016 | DESIGNER: | WNM |
| JOB NO.:   | 1453-001   | DRAFTER:  | WNM |
| DWG. NAME: | 12-2015 EX | REVIEW:   | WNM |
- Four Points  
Surveying and Engineering
- 440 S. Lincoln Ave. Suite 4B  
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OF 1