

---

**HAZARD POTENTIAL CLASSIFICATION ASSESSMENT OF  
COAL COMBUSTION RESIDUAL (CCR) DISPOSAL  
UNITS AT COLSTRIP STEAM ELECTRIC STATION**

Prepared for:

**Talen Montana, LLC**

P.O. Box 38

Colstrip, MT 59323

Prepared by:

**Hydrometrics, Inc.**

3020 Bozeman Avenue

Helena, MT 59601

October 2016

---

**TABLE OF CONTENTS**

LIST OF FIGURES .....ii

1.0 INTRODUCTION .....1-1

    1.1 BACKGROUND .....1-1

    1.2 PURPOSE.....1-2

    1.3 REPORT ORGANIZATION.....1-4

2.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT OF 1&2 STEP  
DAM .....2-1

    2.1 1&2 STEP DAM HAZARD POTENTIAL CLASSIFICATION.....2-1

3.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT OF 1&2 BOTTOM  
ASH POND DIKE.....3-1

    3.1 1&2 BAP DIKE .....3-1

4.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT OF 3&4 EHP  
MAIN AND SADDLE DAM .....4-1

    4.1 3&4 EHP MAIN DAM AND SADDLE DAM .....4-1

5.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT CERTIFICATION.5-1

6.0 REFERENCES .....6-1

**LIST OF FIGURES**

FIGURE 1-1. CCR UNITS OVERALL LOCATION MAP .....1-3

# HAZARD POTENTIAL CLASSIFICATION ASSESSMENT OF COAL COMBUSTION RESIDUAL (CCR) DISPOSAL UNITS AT COLSTRIP STEAM ELECTRIC STATION

## 1.0 INTRODUCTION

### 1.1 BACKGROUND

The United States Environmental Protection Agency (EPA) recently established regulations under Subtitle D of the Resource Conservation and Recovery Act (RCRA) to address the risks associated with disposal of Coal Combustion Residuals (CCRs) generated at electric utilities as well as independent power producers. These regulations became the *Disposal of Coal Combustion Residuals from Electric Utilities* final rule (Coal Ash Rule), which was signed by the EPA Administrator on December 19, 2014 and was published to the Federal Register on April 17, 2015 as Title 40 CFR §257 Subpart D (EPA, 2015). Section 257.73 paragraph (a)(2)(i) requires a hazard potential classification assessment for each surface impoundment.

Talen Montana, LLC is a partial owner and operator of the Colstrip Steam Electric Station (CSES) located near Colstrip, Montana. Other owners include: Puget Sound Energy Inc., Portland General Electric Company, Avista Corporation, PacifiCorp, and NorthWestern Energy. The CSES operates two pairs of coal-fired generating units known as Units 1&2 and Units 3&4. Units 1&2, placed in service in 1975, have a generating capacity of 330-megawatts-gross each. Units 3&4, placed in service in 1983 and 1985 respectively, have a generating capacity of 805-megawatts-gross each (Hydrometrics, 2012).

CCRs produced by the generating units at CSES are handled and disposed of in a closed-loop process aimed at minimizing impacts to water resources in the area. The closed-loop system is comprised of several surface impoundments on and off the plant site that perform various functions to handle and permanently store CCRs generated by Units 1&2 and 3&4. These

surface impoundments and their associated CCR units are now regulated under the new Coal Ash Rule. The CCR units at CSES regulated by the Coal Ash Rule include:

- Units 1&2 Stage II Evaporation Pond (1&2 STEP) D and E/Old Clearwell Cells;
- Units 1&2 Bottom Ash Pond;
- Units 1&2 B Flyash Pond;
- Units 3&4 Effluent Holding Pond (EHP) A, B, C, D/E, G, and J Cells; and
- Units 3&4 Bottom Ash Pond which is incised.

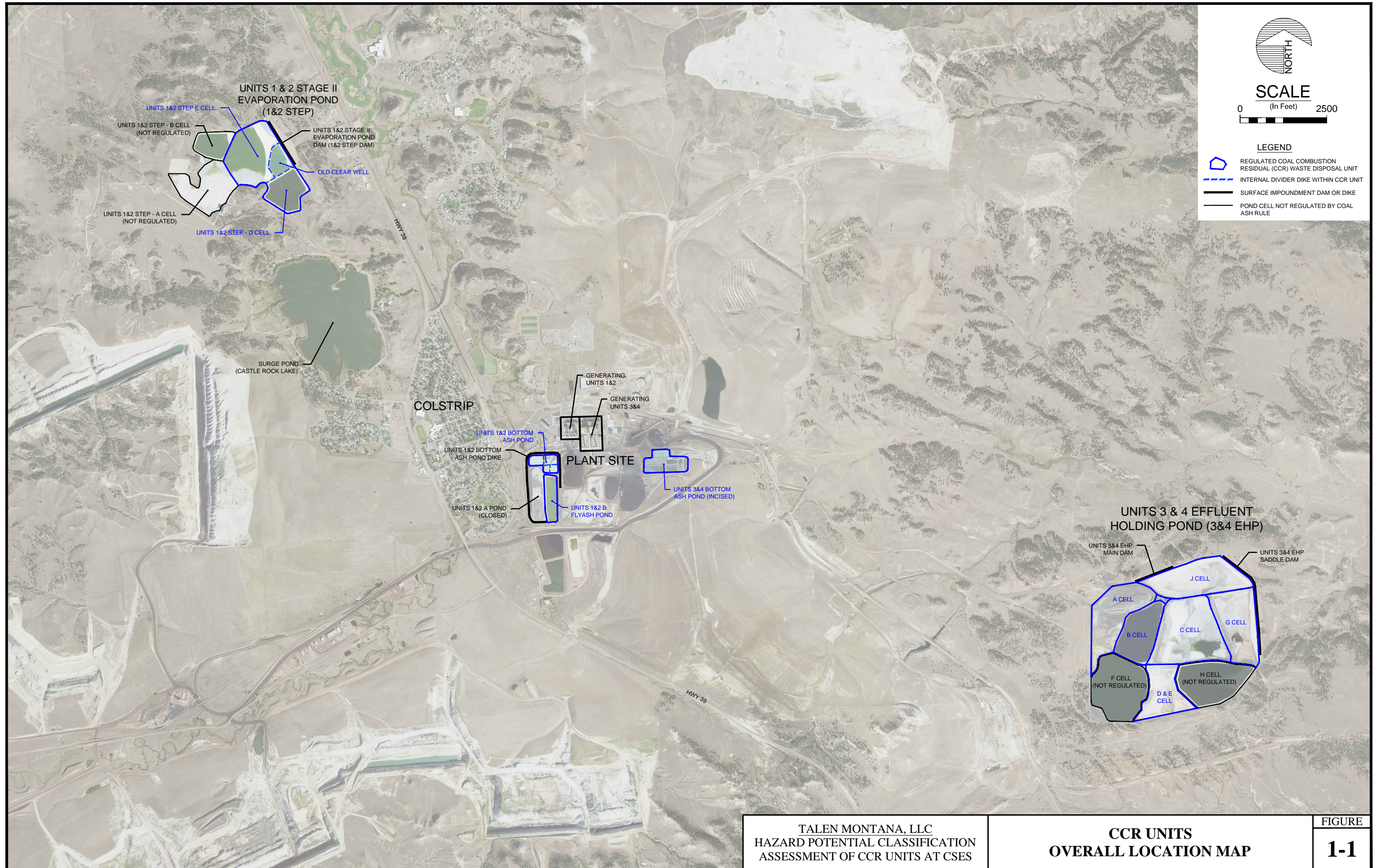
Incised CCR units are exempt from the requirements of §257.73 paragraph (a)(2)(i). Therefore, the 3&4 Bottom Ash Pond will not be assigned a hazard potential classification. The locations of CCR units and their surface impoundments are displayed on Figure 1-1.

## 1.2 PURPOSE

The purpose of this document is to provide an initial hazard potential classification assessment for each Coal Ash Rule regulated surface impoundment at CSES in accordance with the specific requirements of 40 CFR §257.73 paragraph (a)(2)(i). Each CCR unit impoundment will be assigned a hazard classification of low, significant, or high hazard. The basis for each classification will be provided. It is also important to note that the classification is not a statement on the condition of the impoundment but rather on the severity of the potential threat imposed on the downstream area by the impoundment in the event of a failure. Under the Coal Ash Rule each hazard potential classification is described as follows:

- ***Low Hazard Potential*** – Failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner’s property.
- ***Significant Hazard Potential*** – Failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.
- ***High Hazard Potential*** – Failure or mis-operation will probably cause loss of human life.







### **1.3 REPORT ORGANIZATION**

This report is organized as follows:

- Section 2.0 – Hazard Potential Classification Assessment of 1&2 STEP Dam;
- Section 3.0 – Hazard Potential Classification Assessment of 1&2 Bottom Ash Pond Dike;
- Section 4.0 – Hazard Potential Classification Assessment of 3&4 EHP Main and Saddle Dams;
- Section 5.0 – Hazard Potential Classification Assessment Certification; and
- Section 6.0 – References.

## **2.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT OF 1&2 STEP DAM**

The following section provides the initial hazard potential classification assessment for the 1&2 STEP Dam as required by §257.73 paragraph (a)(2)(i).

### **2.1 1&2 STEP DAM HAZARD POTENTIAL CLASSIFICATION**

The 1&2 STEP Dam, which impounds the STEP cells, has been previously classified as high hazard (Maxim, 2006a) and should remain classified as such. An analysis of the downstream inundation area revealed residences, businesses, a primary state highway, and railroad tracks within a short distance from the dam (Hydrometrics, 2016). Sudden failure of this structure is likely to result in extensive property damage and has a high potential for loss of human life.

### **3.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT OF 1&2 BOTTOM ASH POND DIKE**

The following section provides the initial hazard potential classification assessment for 1&2 Bottom Ash Pond (BAP) Dike as required by §257.73 paragraph (a)(2)(i).

#### **3.1 1&2 BAP DIKE**

No previous hazard potential classification exists for the 1&2 BAP Dike (Hydrometrics, 2014), which impounds Units 1&2 Bottom Ash Pond and B Flyash Pond. A review of the existing breach model and resulting downstream inundation area shows that breach flow from the dike could potentially flood the CSES plant area, residences to the west within the City of Colstrip, as well as Willow Avenue and structures to the northwest along East Fork Armells Creek (Hydrometrics, 2016). This data indicates that failure of 1&2 BAP Dike has the potential to cause loss of life as well as significant economic and environmental damage. 1&2 BAP Dike is therefore assigned a hazard potential classification of high.



## **4.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT OF 3&4 EHP MAIN AND SADDLE DAM**

The following section provides the initial hazard potential classification assessment for the Units 3&4 EHP Main and Saddle Dams as required by §257.73 paragraph (a)(2)(i).

### **4.1 3&4 EHP MAIN DAM AND SADDLE DAM**

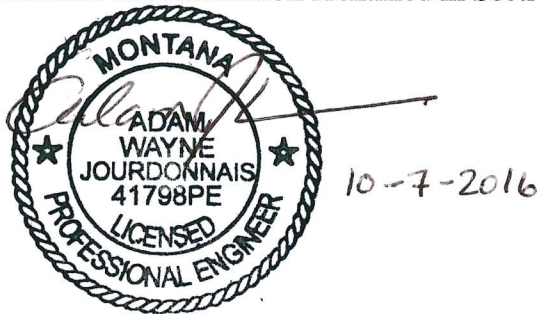
The Main and Saddle Dams were originally classified as low hazard under U.S. Army Corps of Engineers' guidelines (Maxim, 2006b). However, a 2009 EPA-mandated site-specific assessment of the surface impoundments at CSES recommended a hazard classification of "significant" based on the potential for economic and environmental damage in the event of a breach (GEI, 2009).

The area downstream from the Main and Saddle Dams is a combination of rural, rangeland, and agricultural land. Sudden failure of the 3&4 EHP dams is expected to result in a breach flow, which would dissipate in the relatively broad, flat drainage valleys of Cow Creek and later Rosebud Creek. The nearest group of structures is located about eight miles from the EHP area along Rosebud Creek. Closer analysis of the existing dam breach model and resulting inundation map for the Main and Saddle Dams determined that breach flows would reach this group of structures more than two hours after a sudden breach at an approximate maximum height of 13 feet (Hydrometrics, 2016). These structures are located on a small bluff approximately 12 to 15 vertical feet above Rosebud Creek. While shallow flooding of these structures is possible, it is highly unlikely given the conservative assumptions made in the breach model. Furthermore, the large amount of time between dam failure and the resulting breach flow reaching these structures, as well as other structures further downstream, provides sufficient time for advance warning and evacuation of potential occupants. For these reasons we have determined that loss of life from failure of the Main or Saddle Dam is not probable. Therefore, Main and Saddle Dam are assigned a hazard potential classification of significant.

## 5.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT CERTIFICATION

### CERTIFICATION

I, Adam Jourdonnais, a registered Professional Engineer in the State of Montana, certify that this *Hazard Potential Classification Assessment Report* for the Colstrip Steam Electric Station was conducted in accordance with the requirements of **40 CFR 257.73(a)(2)(i) Hazard Potential Classification Assessment**. This certification is made in compliance with the specific requirements of §257.73(a)(2)(ii). This certification is based in part on review of reference documentation identified in Section 6 of this report.



Adam W. Jourdonnais, P.E.

## 6.0 REFERENCES

- EPA, 2015. “Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities.” <https://www.epa.gov/coalash/coal-ash-rule>.
- GEI, 2009. “Coal Ash Impoundment – Specific Site Assessment Report, PPL Montana, Colstrip Power Plant,” Prepared by GEI Consultants. Draft-Final version August 2009.
- Hydrometrics, Inc., 2012. “Colstrip Steam Electric Station Administrative Order on Consent: Plant Site Report.” Prepared by Hydrometrics, Inc. December 2012. Revised July 2015.
- Hydrometrics, Inc., 2014. “2014 Engineer’s Inspection: A/B Pond Complex Dike, Colstrip, Montana.” Prepared by Hydrometrics, Inc. September 2014.
- Hydrometrics, Inc., 2016. “Emergency Action Plan: Units 1&2 Stage II Evaporation Pond Dam, Castle Rock Lake Main Dam, Castle Rock Lake Saddle Dam, Units 3&4 Effluent Holding Pond Main Dam, Units 3&4 Saddle Dam and B Pond Complex Dike.” Prepared by Hydrometrics, Inc. February 2016.
- Maxim, 2006a. “2005 Phase I Inspection, Units 1&2 Stage II Evaporation Pond Main Dam, Colstrip, Montana.” Prepared by Tetra Tech, Inc. dba Maxim Technologies. January 2006.
- Maxim, 2006b. “2005 Phase I Inspection, Units 3&4 Effluent Pond Main and Saddle Dams, Colstrip, Montana.” Prepared by Tetra Tech, Inc. dba Maxim Technologies. January 2006.