



Prepared for:

TALLEN MONTANA, LLC

303 N 28th St., Suite 400

Billings, Montana 59101

WRITTEN POST-CLOSURE PLAN

Per Requirements of 40 CFR §257.104

Existing Impoundments

Colstrip Steam Electric Station

Colstrip, Montana

Prepared by:

Geosyntec 
consultants

10211 Wincopin Circle, Fourth Floor
Columbia, Maryland 21044

Project Number ME1272

October 2016

CERTIFICATION STATEMENT

I, Carrie H. Pendleton, a registered Professional Engineer in the State of Montana (License No. 38837PE), certify that the *Written Post-Closure Plan* prepared for the *Colstrip Steam Electric Station's Existing Impoundments* fulfills the minimum requirements of **40 CFR 257.104(d) Written Post-Closure Plan**.

This certification is made in compliance with the specific requirement of §257.104(d)(4) in compliance with the deadline specified in §257.104(d)(2)(i).

This certification is based in part on review of reference documentation and data provided to Geosyntec Consultants (Geosyntec) by Talen Montana, LLC (Talen). These references, which are listed below, contain information regarding existing site infrastructure and past operations, which Geosyntec has relied upon (without independent verification of accuracy) for preparation of this certification.

- Bechtel (1982). "Effluent Holding Pond Design Report." Bechtel Power Corporation. October 1982.
- DOWL (2015). "Stormwater Master Plan Evaluation, Talen Montana, LLC. Facilities Colstrip, Montana," prepared for Geosyntec Consultants and Talen Montana, LLC, August.
- Hydrometrics (2016). "DRAFT Coal Combustion Residual Hydrogeologic Monitoring Plan for the Colstrip Steam Electric Station." Hydrometrics. June 2016.
- United States Environmental Protection Agency (USEPA) (2015). "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule." Title 40 Code of Federal Regulations, Parts 257 and 261.

Geosyntec Consultants



Carrie H. Pendleton, P.E.

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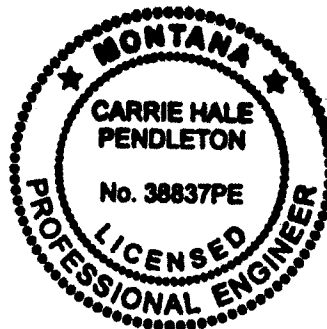


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1. INTRODUCTION

1.1 Organization and Terms of Reference

On 17 April 2015, the United States Environmental Protection Agency (USEPA) published the final rule for disposal of coal combustion residuals (CCR) from electric power utilities under Subtitle D of the Resource Conservation and Recovery Act (RCRA), contained in Part 257 of Title 40 of the Code of Federal Regulations (40 CFR 257 Subpart D), referred to herein as the CCR Rule. Geosyntec Consultants (Geosyntec) has prepared this Written Post-Closure Plan (Plan) for Talen Montana, LLC (Talen) to describe the manner in which post-closure care (PCC) will be provided in compliance with the CCR Rule following closure of existing CCR impoundments at the Colstrip Steam Electric Station (CSES). PCC requirements for CCR units are specified under §257.104.

This Plan was prepared by Ms. Beth Pittaway, and reviewed in accordance with Geosyntec's internal review policy by Mr. David Espinoza, Ph.D., P.E., and Ms. Carrie Pendleton, P.E., all of Geosyntec. Ms. Pendleton is a registered Professional Engineer in the State of Montana.

1.2 Site Location

CSES is a coal-fired steam electric generating facility partially owned and operated by Talen Montana, LLC (Talen). The Site is located in Colstrip, Rosebud County, Montana, approximately 90 miles east of Billings, Montana. CSES is located at 580 Willow Avenue, Colstrip, Montana 59323. An aerial location map for CSES is shown in Figure 1.

1.3 Site Description

CSES has four coal-fired generating units capable of producing up to 2,094 megawatts (MW) of electricity. Units 1 and 2 began commercial operation in 1975 and 1976, and Units 3 and 4 started in 1984 and 1986. Units 1 and 2 have about 307 MW of generating capacity each and Units 3 and 4 have about 740 MW of generating capacity each.

CCR generated at CSES are managed in the Site's three primary areas: the Plant area, the Units 1 & 2 Stage-Two Evaporative Pond (STEP) area, and the Units 3 & 4 Effluent Holding Pond (EHP) area. Figures 2, 3, and 4 present the locations of the Plant area, the Units 1 & 2 STEP area, and the Units 3 & 4 EHP area on United States Geologic Survey (USGS) 7 ½ minute topographic quadrangle maps. Individual cells within each of these areas are identified in their respective figure. Cells at CSES covered by the CCR Rule and the PCC requirements of §257.104 are shown below with their primary location area.

Plant Area Units - (Figure 2)
Units 1 & 2 B Flyash Pond
Units 1 & 2 Bottom Ash Pond
Units 3 & 4 Bottom Ash Pond
Units 1 & 2 Stage II Evaporation Ponds (STEP) - (Figure 3)
Old Clearwell
D Cell
E Cell
Units 3 & 4 Effluent Holding Ponds (EHP) – (Figure 4)
A Cell
B Cell (Clearwater Cell)
C Cell
D/E Cell
G Cell
J Cell

Construction of the individual cells is described in the *Colstrip Steam Electric Station History of Construction* (Geosyntec 2016a). A description of the cell closure activities and final cover systems are presented in the *Written Closure Plan Existing Impoundments Colstrip Steam Electric Station* (Geosyntec 2016b). Units 3 & 4 EHP J Cell is not included in this Plan. A separate closure plan and post-closure plan for J Cell have been developed, certified by a professional engineer, and posted to the CSES Facility Operating Record.

2. CCR RULE REQUIREMENTS FOR POST-CLOSURE PLAN

2.1 Written Post-Closure Plan Requirements per §257.104(d)

As described in §257.104(d)(1) of the CCR Rule, a post-closure plan describing the activities to be performed as part of the post-closure care of the CCR unit must be prepared. The post-closure plan must include, at a minimum, the information specified in §257.104 (d)(1)(i) through (iii), including:

- (i) A description of the monitoring and maintenance activities required in §257.104(b) for the CCR unit, and the frequency at which these activities will be performed;
- (ii) The name, address, telephone number, and email address of the person or office to contact about the facility during the post-closure care period; and
- (iii) A description of the planned uses of the property during the post-closure period. Post-closure uses of the property shall not disturb the integrity of the final cover, liner(s), or any other component of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in this subpart. Any other disturbance is allowed if the owner or operator of the CCR unit demonstrates that the disturbance of the final cover, liner, or other component of the containment system, including any removal of CCR, will not increase the potential threat to human health or the environment. The demonstration must be certified by a qualified professional engineer, and notification shall be provided to the State Director that the demonstration has been placed in the operating record and on the owners or operator's publicly accessible Internet site.

The owner or operator of the CCR unit must comply with the additional requirements of §257.104(d)(2) through (4), which pertain to the deadline for Plan preparation/amendment and certification, as well as §257.104(e) and (f), which pertain to notification of the conclusion of the post-closure period and recordkeeping requirements, respectively.

2.2 Compliance with Post-Closure Care Requirements

The table below summarizes where the CCR Rule requirements are addressed in this document.

RULE SECTION	RULE REQUIREMENT	LOCATION WHERE ADDRESSED IN DOCUMENT
§257.104(d)(1)(i)	Description and frequency of monitoring and maintenance activities required by §257.104(b)	Section 3.1
§257.104(d)(1)(ii)	Post-closure period contact information	Section 3.2
§257.104(d)(1)(iii)	Property uses during post-closure period	Section 3.3
§257.104(d)(2)	Deadline to prepare the initial written post-closure plan	CERTIFICATION STATEMENT
§257.104(d)(3)	Amendment of a written post-closure plan	Not Applicable
§257.104(d)(4)	Written certification from a qualified professional engineer that the initial/amended written post-closure plan meets the requirements of §257.104(d)	CERTIFICATION STATEMENT
§257.104(e)	Notification of completion of post-closure care period	Section 3.4
§257.104(f)	Recordkeeping and notification requirements	Section 3.4

3. POST-CLOSURE PLAN DETAILS

3.1 Description and Frequency of Monitoring and Maintenance Activities

Per §257.104(d)(1)(i), this section provides a description of the monitoring and maintenance activities required in §257.104(b) and the frequency at which these activities are performed.

3.1.1 Final Cover System Maintenance

Section 257.104(b)(1) requires the owner or operator to maintain the integrity and effectiveness of the final cover system, including making repairs to the final cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover.

As described in Geosyntec (2016b), the existing impoundments will be closed by leaving CCR in place. Following closure, EHP B Cell will be used for stormwater storage. Closure of EHP G Cell, a portion of EHP C Cell, and a portion of EHP A Cell will be followed by the construction of a new CCR Rule-compliant impoundment directly above the closed unit. Closure methods are in accordance with §257.102(d).

Following the closure of a CCR surface impoundment where no overfill construction or stormwater storage is planned, erosion and sedimentation control measures will be maintained in accordance with the approved erosion and sedimentation control plan until vegetated surfaces of the final cover system are fully stabilized. After vegetation is fully established, routine site inspections will be performed to monitor the condition of the access roads, stormwater channels, and final cover. Routine inspections will be performed monthly for the first year following closure and quarterly thereafter. Routine inspections will also be performed following major storm events.

When identified during routine site inspections, eroded, non-vegetated, or otherwise damaged areas of the final cover will be repaired by the addition of soil, regrading, and revegetation, as necessary. Plans and a schedule for repair will be prepared for necessary corrective action.

During detailed design of impoundment closure, a run-on and run-off control and stormwater management system will be developed. The run-on and run-off control system will be designed and constructed to minimize erosion and other damage to the final cover. The run-on and run-off control system will also be designed and constructed to maintain its effectiveness following closure and settlement of the surface impoundment.

For existing impoundments where a new CCR Rule-compliant surface impoundment overfill or a stormwater pond will be constructed directly above the closed CCR surface impoundment (i.e., a portion of EHP A Cell, all of EHP B Cell a portion of EHP C Cell, and all of EHP G Cell), the cover system for the underlying impoundment will be protected from erosion damage by the placement of CCR and/or water in the overfill impoundment, thus negating the need for installation of an erosion layer as part of the cover system and eliminating the need for future maintenance and

repair of erosion layer soils and vegetation. Each of the overfill impoundments will be constructed with a drainage system consisting of one or more components that may include a geocomposite, bottom ash or soil protective drainage layer, piping, and/or gravel. Liquids collected in the drainage system will be conveyed to a sump fitted with riser pipes in which a pump will be operated to remove liquids.

The drainage systems will be operated and monitored as needed to remove liquids from above the underlying impoundments' cover system, including by managing leachate produced by the waste placed in the overfill impoundment and/or by managing water that drains from the overlying impoundment into the drainage system. The operability of the drainage system will also be inspected as part of the weekly inspections performed in accordance with the requirements of §257.83. If routine inspections and/or monitoring or performance of the drainage system indicate that the drainage system is not operating as designed, maintenance will be performed to correct the deficiency.

3.1.2 Leachate Collection and Removal System Maintenance

Section 257.104(b)(2) requires the owner or operator to maintain the integrity and effectiveness of the leachate collection and removal system (LCRS) and operate the LCRS in accordance with the requirements of §257.70.

None of the cells detailed in Section 1.3 were constructed with a LCRS. As such, the requirements of §257.104(b)(2) are not applicable.

3.1.3 Groundwater Monitoring System Maintenance and Groundwater Monitoring

Section 257.104(b)(3) requires the owner or operator to maintain the groundwater monitoring system and monitor the groundwater in accordance with the requirements of §§257.90 through 257.98.

Following closure of each of the impoundments listed in Section 1.3, the groundwater will be monitored by a monitoring well network that was designed to meet the requirements of §§257.90 through 257.98. The groundwater monitoring system will be maintained as part of the continued operation of the active impoundments in the Plant area, Unit 1 & 2 STEP and Unit 3 & 4 EHP areas, as appropriate. Each of these areas is monitored via a multi-unit groundwater monitoring system as described in §257.91(d). The locations, procedures, and frequency of groundwater monitoring for each of the multi-unit groundwater monitoring systems are described separately from this document in the DRAFT Coal Combustion Residual Hydrogeologic Monitoring Plan for the Colstrip Steam Electric Station (Hydrometrics 2016).

The groundwater monitoring system will be operated and maintained so that it performs to the design specifications throughout the life of the monitoring program. Routine inspections will be performed at least once per year to evaluate the integrity of each monitoring point such that it provides representative samples of groundwater from the upper aquifer. Inspection items include an overall visual examination of surface components to evaluating the integrity of the locking

protective surface casing and surface seal for potential damage, periodically painting the surface casing and any associated traffic bollards with high-visibility paint, checking that grading promotes storm water runoff away from the surface seal, removal of vegetation and insect nests (if any), and checking the total depth to evaluate whether redevelopment to remove accumulated sediment is necessary. Periodic repair maintenance items are anticipated to include repainting of the surface casing and traffic bollards, redevelopment, and potentially replacement of sampling pump components and repairs to cracks in the surface seal.

3.2 Post-Closure Period Contact Information

Per §257.104(d)(1)(ii), this section provides the name, address, telephone number, and email address of the person or office to contact about the facility during the post-closure care period.

Day-to-day access to each of the impoundment areas is controlled by CSES facility personnel. Facility personnel can be reached using the contact information below.

Gordon Criswell
Director, Environmental & Compliance
580 Willow Avenue
Colstrip, Montana 59323-0038
(406) 748-5002
Gordon.Criswell@TalenEnergy.com

3.3 Property Uses during Post-Closure Period

Per §257.104(d)(1)(iii), this section describes the planned uses of the property during the post-closure period.

Following completion of EHP B Cell closure, Talen proposes to construct a stormwater pond as an overflow directly above EHP B Cell.

Following completion of EHP A Cell, EHP C Cell, and EHP G Cell closure, Talen proposes to construct a new CCR Rule-compliant surface impoundment, designated as EHP New Clearwell, EHP C-1 Cell, and EHP G-1 Cell, respectively, as surface impoundments overfills directly above the existing surface impoundments or a portion of the existing surface impoundments. The new CCR surface impoundments and the other CCR units within the EHP area will continue to be operated for the dewatering and storage of CCR. EHP New Clearwell, EHP C-1 Cell, and EHP G-1 Cell will be designed, constructed, operated, and maintained in accordance with the requirements of the CCR Rule. Operation of these three overflow impoundments will include placement of additional CCR above the final cover system for the underlying impoundments. CCR placement will be performed so as to not disturb the integrity of the final cover or other portions of the containment system for the underlying impoundments, or the functionality of the monitoring system for the EHP.

No planned use is scheduled for the remaining CCR impoundments or portions of CCR impoundments detailed in Section 1.3 and, therefore, no disturbance to the integrity of any portion of the containment system is anticipated.

3.4 Notifications and Recordkeeping

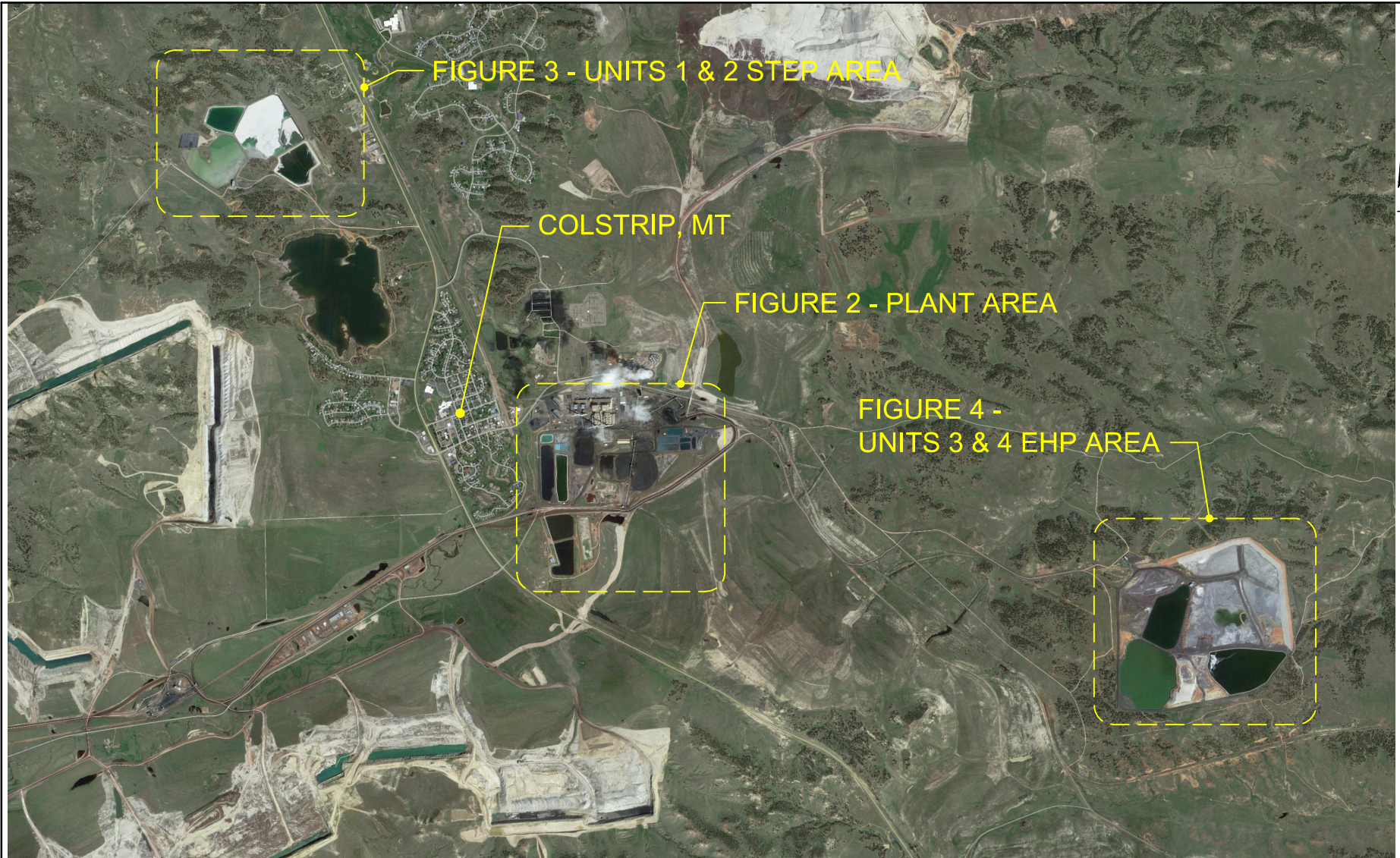
The owner or operator of a closed CCR surface impoundment must comply with the requirements of §257.104(e) and (f), which pertain to notification of completion of post-closure care period and recordkeeping requirements, respectively. Key dates and milestones that will be observed in order to comply with these requirements include:

1. Notification of Completion of Post-Closure Care Period: This notification is required no later than 60 days following completion of the PCC period. The notification must include a certification by a qualified professional engineer verifying that PCC has been completed in accordance with the Written Closure Plan and Written Post-Closure Plan.
2. Recordkeeping Requirements: The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in §257.105(i), the notification requirements specified in §257.106(i), and the Internet requirements specified in §257.107(i). The timing for compliance with §257.105(i) is specified only in terms of placing required information in the facility's operating record as it becomes available. The timing for compliance with §257.106(i) and §257.107(i) is triggered by fulfillment of §257.105(i).

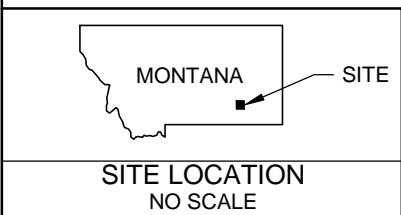
4. REFERENCES

- Geosyntec (2016a). “History of Construction Per Requirements of 40 CFR §257.73 Colstrip Steam Electric Station Colstrip, Montana” Geosyntec Consultants. September 2016.
- Geosyntec (2016b). “Closure Plan Per Requirements of 40 CFR §257.102 Colstrip Steam Electric Station Colstrip, Montana” Geosyntec Consultants. September 2016.
- Hydrometrics (2016). “DRAFT Coal Combustion Residual Hydrogeologic Monitoring Plan for the Colstrip Steam Electric Station.” Hydrometrics. June 2016.
- United States Environmental Protection Agency (USEPA) (2015). “Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule.” Title 40 Code of Federal Regulations, Parts 257 and 261.
- United States Geological Survey (USGS) (2014). “Colstrip SE Quadrangle Montana-Rosebud Co. 7.5-Minute Series.” Accessed 17 March 2016.
[http://store.usgs.gov/b2c_usgs/usgs/maplocator/\(ctype=areadetails&xcm=r3standardpitrex_prd&carearea=%24root&layout=6_1_61_48&uiarea=2\)/.do](http://store.usgs.gov/b2c_usgs/usgs/maplocator/(ctype=areadetails&xcm=r3standardpitrex_prd&carearea=%24root&layout=6_1_61_48&uiarea=2)/.do)

FIGURES



BACKGROUND © GOOGLMAPS (2015)

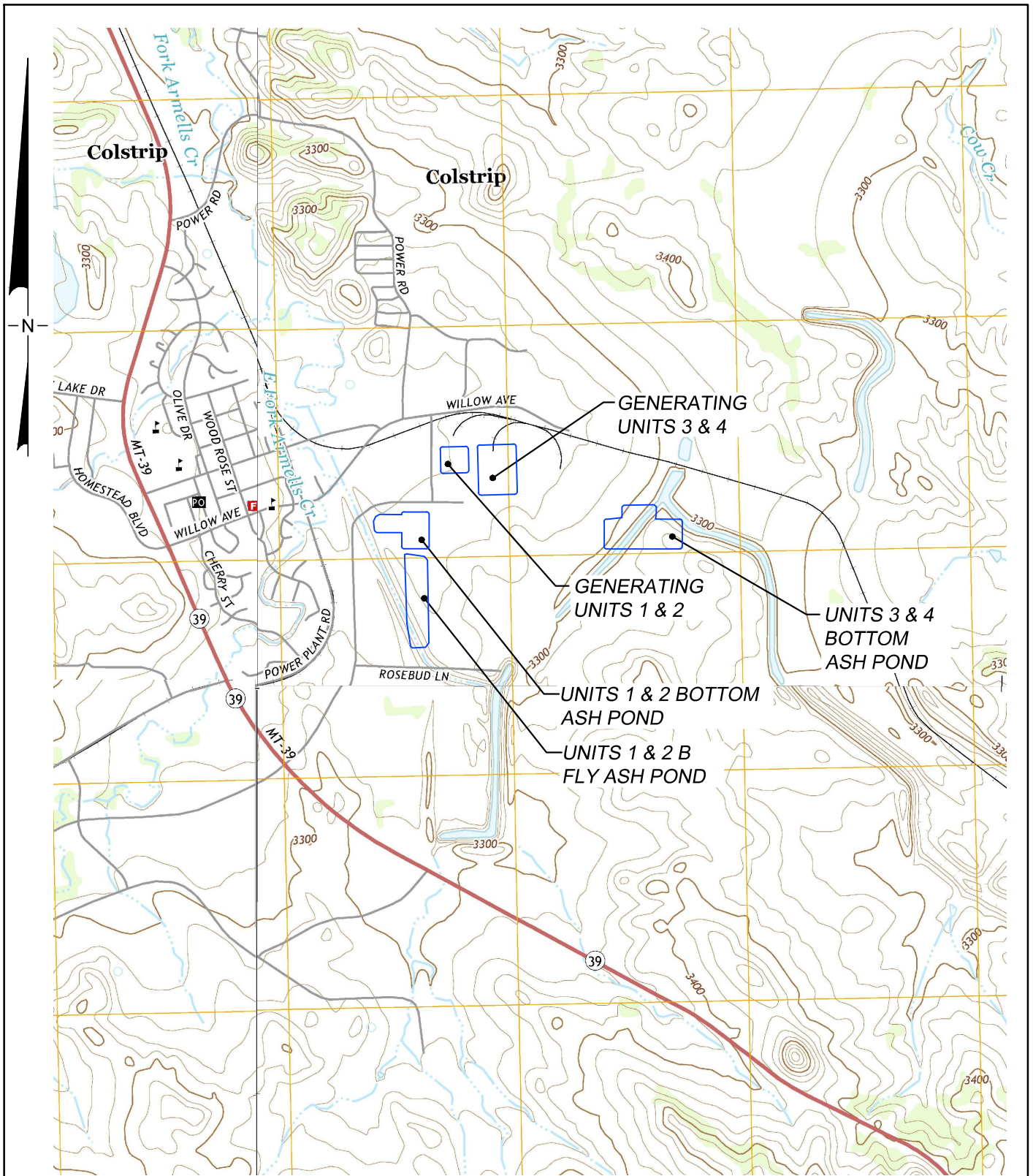


PROJECT LOCATION MAP
COLSTRIP STEAM ELECTRIC STATION
COLSTRIP, MONTANA

Geosyntec
consultants

COLUMBIA, MARYLAND

DATE:	OCTOBER 2016
PROJECT NO.	ME1272
DOCUMENT NO.	MD16193
FILE NO.	1199f154
FIGURE NO.	1



SOURCE: USGS MAP (7.5, MINUTE SERIES, ROSEBUD COUNTY, 2014)

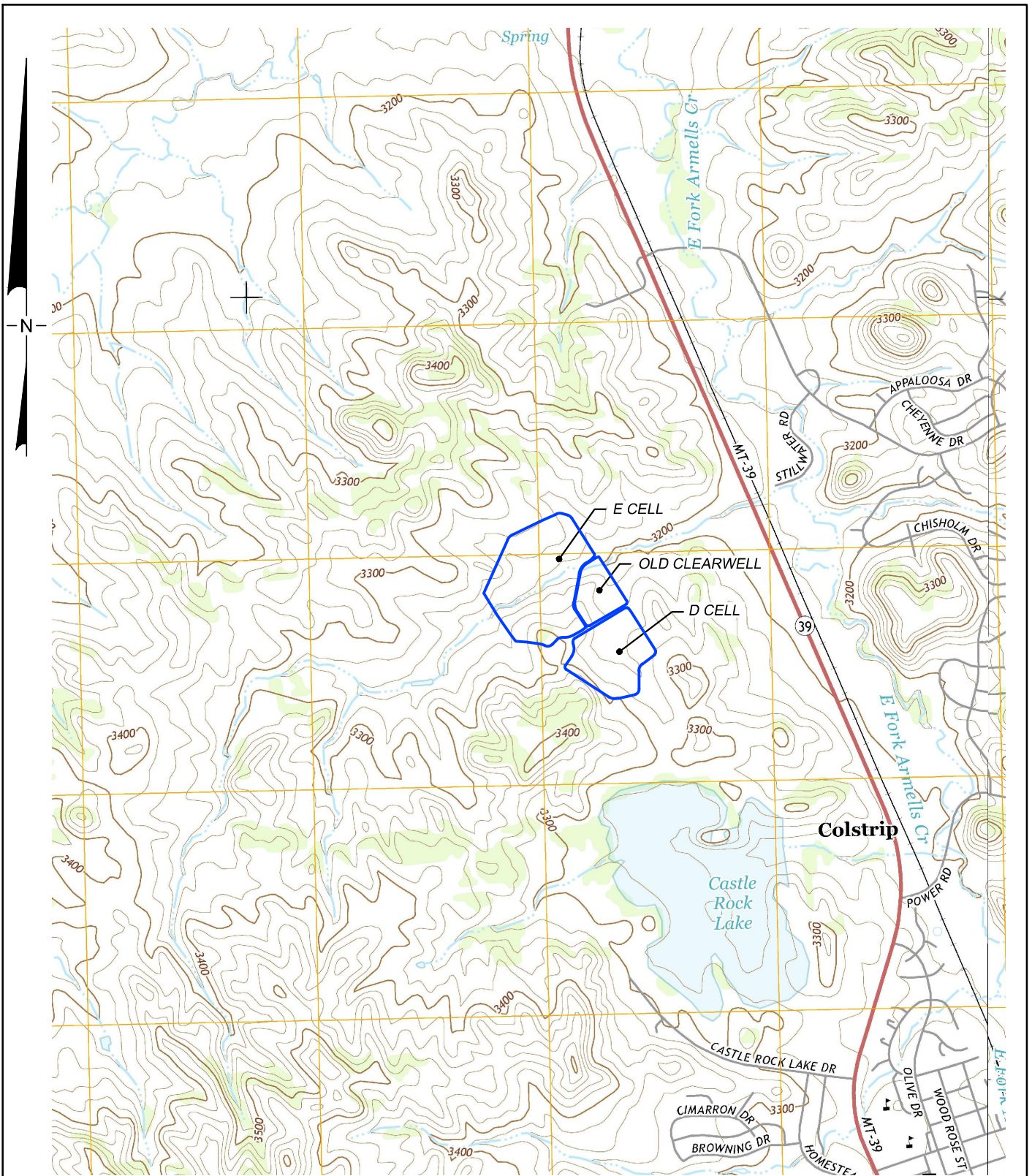


UNIT LOCATIONS PLANT AREA

Geosyntec
consultants

COLUMBIA, MARYLAND

DATE:	OCTOBER 2016
PROJECT NO.	ME1272
DOCUMENT NO.	MD16193
FILE NO.	F001-003
FIGURE NO.	2



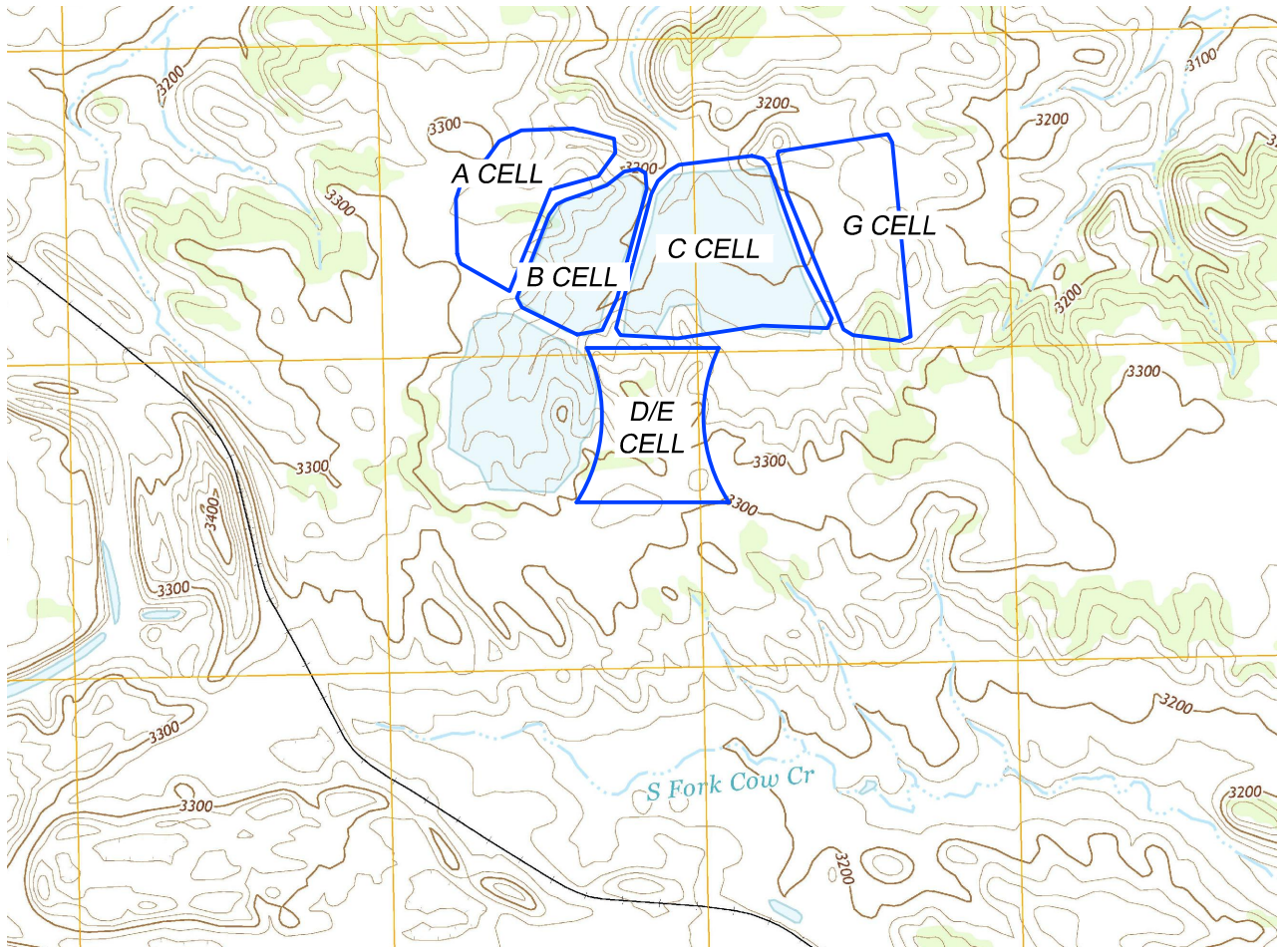
SOURCE: USGS MAP (7.5, MINUTE SERIES, ROSEBUD COUNTY, 2014)



UNIT LOCATIONS UNITS 1 & 2 STEP AREA

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COLUMBIA, MARYLAND

DATE:	OCTOBER 2016
PROJECT NO.	ME1272
DOCUMENT NO.	MD16193
FILE NO.	F001-003
FIGURE NO.	3



SOURCE: USGS MAP (7.5, MINUTE SERIES,
ROSEBUD COUNTY, 2014)



UNIT LOCATIONS UNITS 3 & 4 EHP AREA

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COLUMBIA, MARYLAND

DATE:	OCTOBER 2016
PROJECT NO.	ME1272
DOCUMENT NO.	MD16193
FILE NO.	F001-003
FIGURE NO.	4