



## **Coal Combustion Residuals**

### **Run-on and Run-off Control System Plan**

Prepared for  
Montana-Dakota Utilities Co.  
R.M. Heskett Station

February 2021

# Coal Combustion Residuals Run-on and Run-off Control System Plan

February 2021

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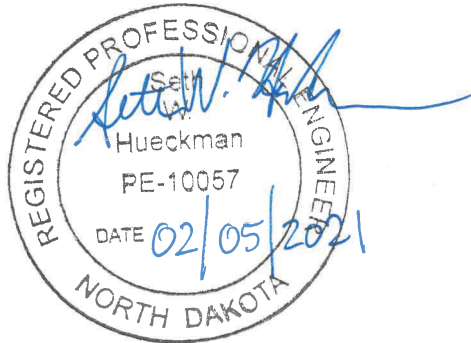
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## Certifications

I hereby certify that I, or my agent, have examined the facility and, being familiar with the provisions of 40 CFR 257 Subpart D, attest that this Coal Combustion Residuals run-on and run-off control system plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 CFR §257.81. I certify that the plan is adequate for this facility and that procedures for recordkeeping and reporting have been established.



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Seth W. Hueckman  
Barr Engineering Co.  
ND Registration Number PE-10057

Dated this 5th day of February, 2021

Revision	Date	Summary of Revisions
0	October 13, 2016	Initial Plan
1	February 5, 2021	2021 Application for Permit Modification

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# 1 Introduction

Montana-Dakota Utilities Co. (MDU) operates the R.M. Heskett Station (Heskett), near Mandan, North Dakota. Operations at Heskett results in the production of coal combustion residuals (CCR). CCR management is subject to Federal Standards for the Disposal of Coal Combustion Residuals in Landfills per 40 CFR 257 Subpart D.

This CCR run-on and run-off control system plan has been developed to satisfy the requirements described in 40 CFR §257.81, run-on and run-off controls for CCR landfills, as they apply to MDU's coal ash landfill.

## 2 Objectives

Run-on and run-off controls for CCR landfills, 40 CFR §257.81, requires the owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill to design, construct, operate, and maintain a run-on and run-off control system. In addition, owner or operator must prepare an initial and periodic run-on and run-off control system plan for the CCR unit.

In order to fulfill these objectives, the run-on and run-off control system plan must:

- provide documentation that the run-on control system adequately manages flow onto the active portion of the CCR unit during and following the peak discharge from a 25-year, 24-hour storm;
- provide documentation that the run-off control system adequately collects and controls at least the water volume from a 25-year, 24-hour storm;
- define recordkeeping requirements;
- define reporting requirements; and
- include a certification from a qualified professional engineer.

## 3 Heskett Station Coal Ash Landfill

MDU's coal ash landfill at Heskett was developed in two phases covering approximately 36 acres. Phase I to the north and Phase II to the south were initially designed to act as two adjacent landfills separated by a haul road. Each phase was further divided into slots; each slot covering an area consisting of a single liner construction event. Phase I (Slots 1-5) is lined with a clay liner while Phase II (Slots 6-10) is composite-lined with a clay liner overlain by a 60-mil high density polyethylene (HDPE) geomembrane liner.

Prior to beginning Phase II construction in 2000, MDU was granted a permit modification to raise the height of the landfill and place ash fill above the haul road, thereby merging Phase I and II into one continuous landfill. Approximately 30 acres of the combined landfill is closed and capped with a cover system consisting of either a clay barrier layer and a cover soil layer, or a geomembrane barrier overlain by a drainage layer overlain by a cover soil layer. The final cover slopes range from 3 percent to nearly 25

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percent, but average roughly 10 percent around the perimeter. Approximately 6 acres of the landfill is currently active, including portions of Slot 8, Slot 9, and Slot 10.

## 4 Run-on Control System

The purpose of a run-on control system is to prevent surface water from offsite areas from flowing onto the active landfill area. Run-on control for the Heskett landfill is accomplished through site grading. Appendix A contains figures of the site. Figure 1 shows the closed and active portions of the landfill. Figure 2 shows contours for the landfill area with flow arrows for surface drainage. The Heskett landfill is elevated above the surrounding topography. Adjacent offsite areas slope away from the landfill, which prevents run-on to the active landfill area. The closed portion of the landfill is graded to drain offsite. These measures prevent clean water from offsite areas from draining to the active landfill area and becoming ash-contact water.

## 5 Run-off Control System

The purpose of a run-off control system is to prevent water that has come into contact with ash from draining offsite. Ash-contact water or leachate generated from the active landfill is controlled within the lined limits of the landfill and ultimately drains to the evaporation pond through two leachate collection pipes located on the northwest corner (Phase I) and southwest corner (Phase II) of the pond.

Precipitation events typically produce minimal observed surface run-off from the approximately 6 acres of active landfill. Instead water quickly infiltrates and is stored in the dry, generally coarse-grained ash. For larger precipitation events, like the design storm, some surface run-off is expected. Water on the surface of the active landfill face would flow to interim, perimeter ditches along the berms on the edge of the active landfill to keep ash-contact water from draining off of the lined limits of the landfill. If necessary, ponded ash-contact water that does not quickly infiltrate will be pumped to the evaporation pond.

Water that infiltrates into the ash percolates down to the base of the landfill and is collected in leachate pipes that drain to the evaporation pond. This process occurs over weeks and months, creating a base flow into the pond that is not large enough for the pond to accumulate water over the long term. The observed discharge from the leachate pipes is insignificant relative to the rate and volume of run-off that would drain to the pond from other areas during the design storm event.

Site hydrology was calculated using the SCS run-off curve number method in HydroCAD version 10.0. The design storm for the run-off control system is the 25-year, 24-hour storm event and has a rainfall depth of 3.87 inches (reference: NOAA Atlas 14). The run-off volume for 6 acres of active landfill area is approximately 1.3 acre-feet. The direct run-off volume draining to the evaporation pond is approximately 0.8 acre-feet. Hydrology calculations are in Appendix B.

The evaporation pond is 5 feet deep and has an approximate storage volume of 5 acre-feet. The evaporation pond does not have a structural outlet. If the water level in the pond exceeds elevation 1680 it will overtop the pond and flow north to Rock Haven Creek. The normal water depth in the pond is

typically around elevation 1676 or less (less than a foot of water) based on MDU site observations. The starting water surface elevation in the pond would need to be roughly elevation 1679 before the 25-year design rainfall event would overtop the pond embankment. If water in the pond is observed near elevation 1678, the plant will need to take measures to draw down the pond water to ensure that there is adequate storage to contain the design rainfall event.

## 6 Recordkeeping

Run-on and run-off controls for CCR landfills, 40 CFR §257.81 (c)(3), states, *"The owner or operator of the CCR unit must prepare the initial run-on and run-off control system plan no later than October 17, 2016."* The plan is considered complete when it is placed in the MDU facility operating record.

After October 17, 2016, MDU will maintain a copy of the most recent version of the run-on and run-off control system plan in the facility's operating record. According to 40 CFR §257.81 (c)(2), MDU *"must amend the written run-on and run-off control system plan whenever there is a change in conditions that would substantially affect the written plan in effect."* In addition, MDU *"may amend the written run-on and run-off control system plan at any time provided the revised plan is placed in the facility's operating record."* If the plan is updated, the new version of the run-on and run-off control system plan will be put in the operating record *"as it becomes available"* in accordance with 40 CFR §257.105 (g). Additionally, MDU will *"prepare periodic run-on and run-off control system plans every five years."* *"The deadline for completing a subsequent plan is based on the date of completing the previous plan."* The plan is considered complete when it *"has been placed in the [MDU] facility operating record."*

MDU will retain a copy of each file *"for at least five years following the date of each occurrence, measurement, maintenance, corrective action, report, record, or study,"* in accordance with 40 CFR §257.105 (b). Figure 3, in Appendix A, is a flow chart describing the process for reviewing or amending run-on and run-off control system plan.

## 7 Reporting

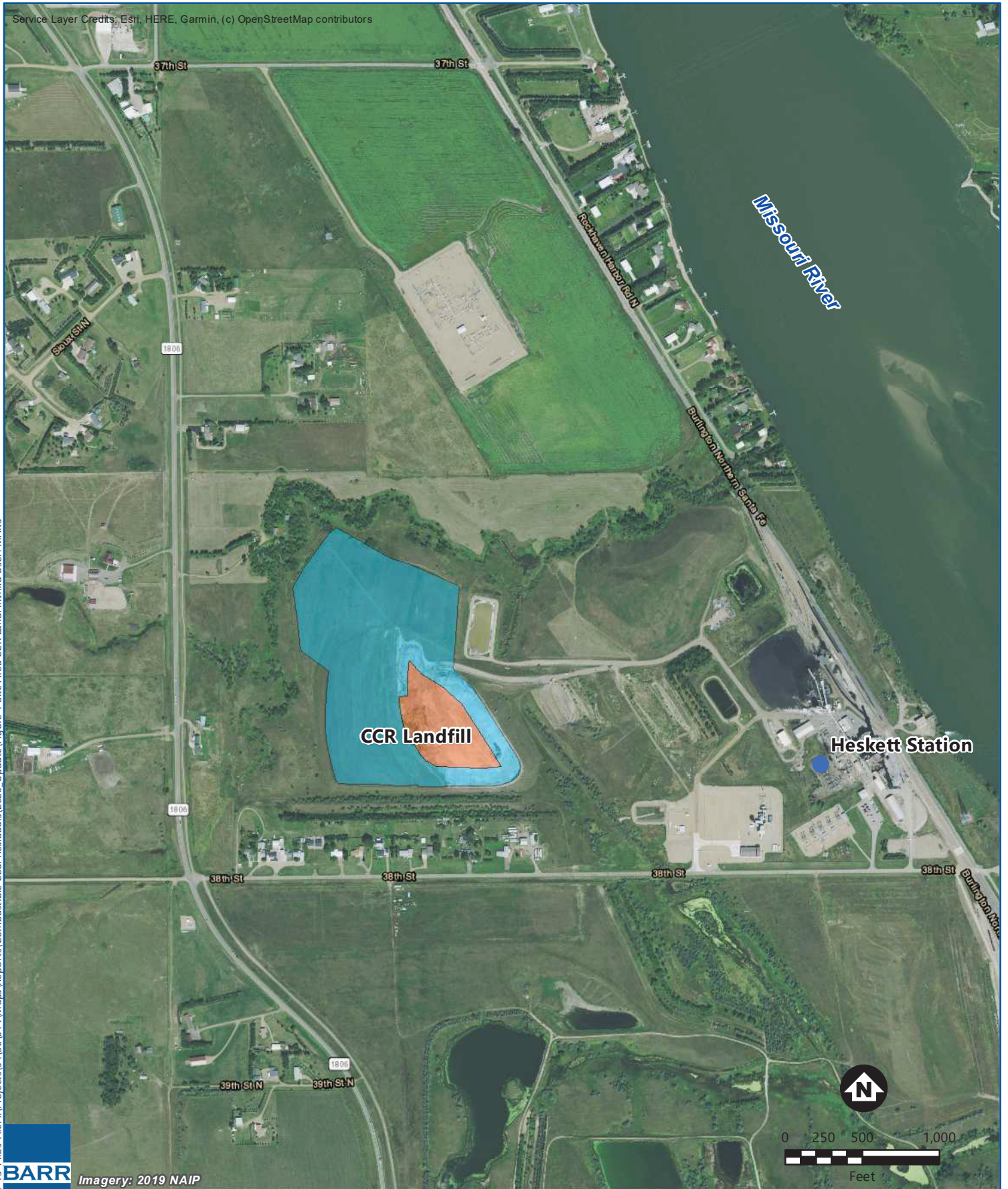
When the initial plan, and successive amendments to the plan, are placed in the operating record they will be made publicly available on the MDU CCR web site in compliance with 40 CFR §257.107 (g)(3), Publicly Accessible Internet Site Requirements. Additionally, to comply with 40 CFR §257.106 (g)(3), Notification Requirements, MDU will *"notify the State Director... when [the Run-on and Run-off Control System Plan] has been placed in the operating record and on the owner or operator's publicly accessible internet site."* Notification to the State Director will be made to [solidwaste@nd.gov](mailto:solidwaste@nd.gov) as requested by the North Dakota Department of Health.

## 8 References

NOAA Atlas 14 Point Precipitation Frequency Estimates: North Dakota. National Weather Service.  
[http://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html). Accessed July 26, 2016

## Appendix A

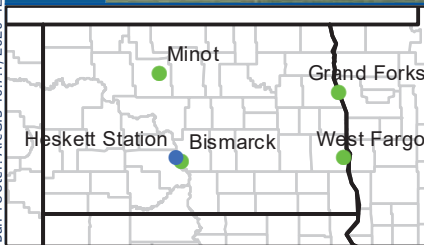
### Figures



Barr Footer: ArcGIS 10.7.1, 2020-12-15 11:29 File: I:\Projects\34\30\014\Maps\Reports\Combustible Coal Residuals\2020 Update\Figure 1 Site Area CCR Landfill.mxd User: MAK3

**BARR**

Imagery: 2019 NAIP

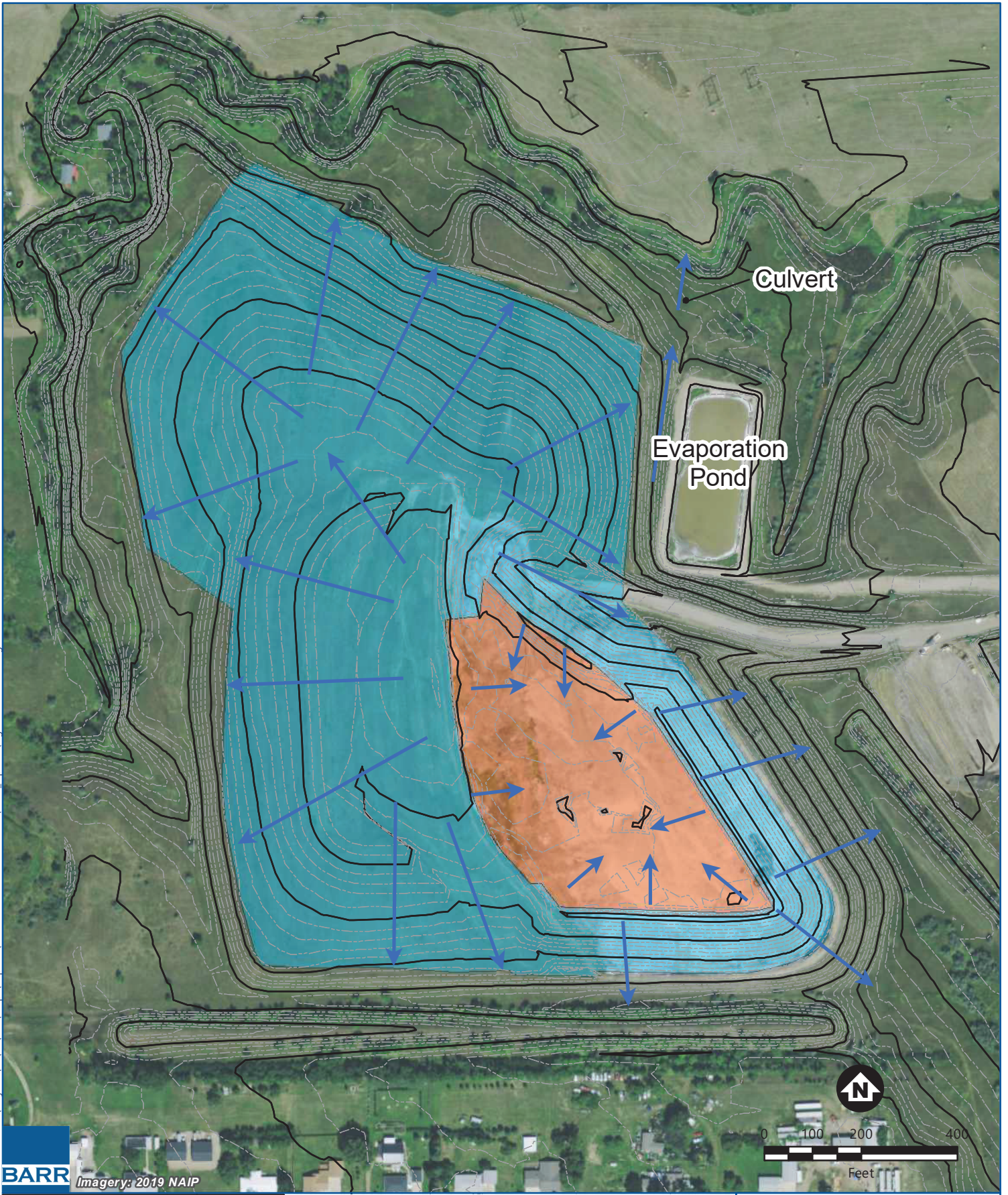


- Heskett Station
- Active CCR Landfill Limits
- Closed CCR Landfill Limits

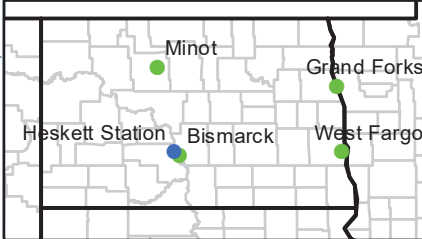
**Heskett Station**  
**CCR Landfill**  
 Montana-Dakota Utilities Co.  
 Mandan, North Dakota

**FIGURE 1 - SITE AREA**





**BARR** Imagery: 2019 NAIP



- Heskett Station
- Flow Arrows
- Active CCR Landfill Limits
- Closed CCR Landfill Limits
- 10' Contour
- - - 2' Contour

Heskett Station  
CCR Landfill  
Montana-Dakota Utilities Co.  
Mandan, North Dakota

**FIGURE 2 - SITE DRAINAGE**