

Location Restrictions

Ash Disposal Facility

Otter Tail Power Company – Hoot Lake Plant

Introduction

This report presents documentation and certification for the location standards for the Ash Disposal Facility (landfill) at the Hoot Lake Plant in Fergus Falls, Minnesota. The landfill is an existing coal combustion residual (CCR) landfill. This document addresses the requirements of 40 CFR 257.64, for existing CCR landfills and demonstrates the landfill's compliance with the requirements.

Location Restrictions

The sections below provide substantiation of compliance for the location restrictions.

Compliance with §257.64, Unstable Areas

To comply with §257.64, the owner or operator must demonstrate that:

- (a) *An existing or new CCR landfill, existing or new CCR surface impoundments, and all lateral expansions of CCR units must not be located in an unstable area...*
- (b) *The owner or operator must consider all of the following factors, at minimum, when determining whether an area is unstable:*
 - (1) *On-site or local soil conditions that may result in significant differential settling;*
 - (2) *On-site or local geologic or geomorphologic features;*
 - (3) *On-site or local human-made features or events (both surface and subsurface).*

The *CCR Groundwater Sampling and Analysis Plan (Carlson McCain, 2017)* describes the soils and geology at Hoot Lake Plant. The landfill is located in the Otter Tail County region.

Subsurface material beneath the landfill is comprised of glacial sand, gravel, and till associated with the Wisconsin Glaciation. These unconsolidated deposits consist of discontinuous layers of glacial outwash and till overlaying Precambrian bedrock. Regional hydrogeology indicates that these glacial deposits are several hundred feet thick in the vicinity of the landfill.

A geotechnical investigation was conducted in the late 1980's. The investigation, *Geotechnical Investigation Report & Environmental Work Plan (Phase I) (TKDA, 1988)* and *Phase II Geotechnical Investigation Report and Environmental Monitoring System Plan (TKDA, 1989)*, detail the soil conditions

underlying the landfill. The soils consist of mostly glacial till and alluvium deposits. The alluvium consists of relatively clean sands classified as (SP) and (SP-SM), with some small deposits of silt and gravel. The till soils consist of mostly clayey sand (SC) and sandy lean clays (CL). Standard penetration test (SPT) blow counts (N-values) conducted throughout the landfill range from 11 to 53 in the alluvium and 7 to 26 in the till near the surface. Boring B-3, conducted during the Phase I investigation (*TKDA, 1988*) encountered very loose silty sand, i.e. N-value of 4, four to six feet below the surface elevation of 1262.5 feet above mean sea level (MSL). During construction of the final phase of base liner in August of 2015, pockets of soft soils were encountered during subgrade excavation. These soils were removed and disposed of outside of the landfill embankment footprint.

Following excavation of the subgrade, clay base liner was placed and compacted. The subgrade provided sufficient support during placement and compaction of the clay liner to achieve the specified 97 percent standard proctor density.

The topography surrounding the landfill is relatively flat, sloping north to the Otter Tail River valley, approximately 300 feet from the northern limit of the landfill.

The arrangement of soils and topography provide a stable base not prone to differential settling or mass movements. Additionally, landfill construction practices such as removal of all topsoil and vegetation, soil compaction, and geotechnical testing of the base and embankments ensure the underlying soils are capable of supporting the landfill's structural components (composite liner, leachate collection system, future final cover, run-on/run-off systems).

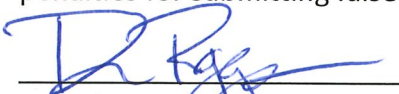
There are no utilities underlying the landfill that would cause unstable conditions.

Conclusion

The hydrogeologic investigations and visual observations of compaction during clay base liner construction verify the Ash Disposal Facility is constructed on stable soils and meets all of the location restrictions listed under 40 CFR §257.64. There are no apparent conditions that would cause underlying soils to move or impact the structure of the unit and cause risk to human health or the environment through structural failures.

Certification

I hereby certify under penalty of law that this report was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



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Date

References

- Carlson McCain, 2017.** CCR Groundwater Sampling and Analysis Plan, Ash Landfill – Hoot Lake Plant. Prepared by Carlson McCain, Inc. October, 2017
- TKDA, 1988.** Geotechnical Investigation Report & Environmental Monitoring System Work Plan, Hoot Lake Ash Landfill, Otter Tail Power Co. Prepared by Toltz, King, Duvall, Anderson and Associates, Inc. April, 1988
- TKDA, 1989.** PHASE II Geotechnical Investigation Report and Environmental Monitoring System Plan, Hoot Lake Ash Landfill, Otter Tail Power Co. Prepared by Toltz, King, Duvall, Anderson and Associates, Inc. June, 1989