

# Pleasants Landfill Unstable Areas Demonstration

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A FirstEnergy Company  
Pleasants Power Station  
Pleasants County, West Virginia

October 2018

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## Certification/Statement of Professional Opinion

The Unstable Areas Demonstration (Demonstration) for the Pleasants Power Station Landfill was prepared by GAI Consultants, Inc. (GAI). The Demonstration was based on certain information that, other than for information GAI originally prepared, GAI has relied on but not independently verified. Therefore, this Certification/Statement of Professional Opinion is limited to the information available to GAI at the time the Demonstration was written. On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the State of West Virginia, that the Demonstration has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, and at the time and in the same locale. It is my professional opinion that the Location Restrictions Demonstration was prepared consistent with the requirements of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015.

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not be interpreted or construed as a guarantee, warranty or legal opinion.



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## 1.0 Introduction

The Pleasants Landfill (Landfill) is located approximately one-half mile east-southeast of the Pleasants Power Station (Station); a coal-fired electric generating station located near the community of Willow Island in Pleasants County, West Virginia (WV).

The Landfill is a Class F Solid Waste Disposal Facility according to the WV Department of Environmental Protection (WVDEP). The Landfill receives fly ash, bottom ash, and other miscellaneous wastes from the Pleasants and Willow Island Power Stations for disposal. The Landfill is composed of three stages, referred to as Stages I, II, and III. The Landfill is currently permitted for operations under WVDEP Permit No. 0079171.

This Demonstration was prepared in accordance with the applicable requirements [§ 257.64(a)] of the United States Environmental Protection Agency's 40 Code of Federal Regulations (CFR) Part 257, Criteria for Classification of Solid Waste Disposal Facilities and Practices (CCR Rule).

## 2.0 Unstable Areas Demonstration

Pursuant to 40 CFR § 257.64, an existing CCR unit must not be located in an unstable area unless the owner or operator demonstrates that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted. This Demonstration will be maintained in the facility's operating record in accordance with § 257.64(e).

### 2.1 Demonstration Overview

The Demonstration includes descriptions of the following factors used to determine that the CCR unit is not located in an unstable area:

- on-site or local soil conditions that may result in significant differential settlement;
- on-site or local geologic or geomorphic features; and
- on-site or local human-made features or events (both surface and subsurface).

These factors were evaluated based on the following information:

- United States Geological Survey (USGS) topographic maps (current and historic);
- landslide maps;
- geologic maps;
- mine maps;
- coal resource maps;
- United States Department of Agriculture (USDA) soil reports;
- karst maps;
- aerial photographs (current and historic); and
- as-built construction and permit documents.

The documents were reviewed to determine if the CCR unit is located in an unstable area. The following sections provide evaluation of on-site and local conditions related to the Landfill.

#### 2.1.1 On-Site or Local Soil Conditions

No unanticipated settlement nor significant differential settlement of the Landfill was observed during the annual (2015, 2016, and 2017) and weekly (April 2016 through September 2018)

inspections, both of which are required by the CCR Rule. Historically, no unanticipated settlement nor significant differential settlement has been reported in past documented Landfill inspections. CCR placement techniques typically used reduce the likelihood of differential settlement.

The on-site presence of landslide prone soils was researched by reviewing available USDA Soil Reports. The USDA Soils Report for Pleasants County, WV defines the on-site soils by origin. The majority of the existing site soils are residual in nature. Residual soils are soils that form in-situ by weathering of bedrock. Three on-site soils were classified as alluvial deposits which were formed by stream deposition. Another on-site soil was classified as an eolian deposit which was formed by wind deposition. One on-site soil was classified as colluvium, which was formed by down slope movement of existing soils via landslides, soil creep, etc., and can generally be considered slide-prone. According to the USDA Soils Report, the colluvium accounted for nearly seven percent of the total site soil. However, the colluvium was located higher in elevation and to the north of the landfill, thus should not have an impact on the landfill.

During landfill subsurface investigations, design and construction, apparent landslide prone soils were encountered on-site. Areas where these soils were encountered were investigated and analyses, design, and construction was performed to mitigate the areas of concern using recognized and generally accepted good engineering and construction practices.

The Landfill was designed based on the results of subsurface investigations and stability analyses performed for this site. Calculations are located in the Solid Waste/NPDES Water Pollution Control Permit, Addendum II: Design Calculations (1997), and Stage 1G and 2B minor permit modifications.

### **2.1.2 On-Site or Local Geologic or Geomorphologic Features**

A review of the August 2016 *West Virginia Tax Districts Containing Karst Terrain* map reveals that the Landfill resides in an area with no sinkholes, subsidence, caverns, nor karstic rock formations. Furthermore, the 1969 *Geologic Map of the West Virginia* shows that the rocks below the Landfill are comprised of the Monongahela and Dunkard Groups, both of which do not contain rocks associated with karst terrain formation.

Current and historic topographic maps and aerial photographs were reviewed to determine whether on-site or local geomorphic features exist or existed in the past that could create an unstable area. The documents evaluated did not identify any of these features.

### **2.1.3 On-Site or Local Human-Made Features or Events (both Surface and Subsurface)**

Geologic maps, USGS topographic maps, mine maps, and coal resources maps were reviewed for evidence of surface and deep mining. Mine maps from the WV Geologic and Economic Survey indicate that no mining has occurred below the Landfill.

## **3.0 Conclusion**

Recognized and generally accepted good engineering practices and analyses have been incorporated into the design and construction of the Landfill to reduce the potential for disruption of the structural components of the Landfill. GAI reviewed the available documents to determine if the existing Landfill was constructed in an unstable area. The soil, geologic, geomorphologic, and human-made features evaluated show that the Landfill is not located in an unstable area, or were addressed as part of the engineering design and construction of the landfill.

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