2019 Annual Landfill Inspection Report

Little Broad Run Landfill

Mountaineer Plant
New Haven, West Virginia

December 4, 2019

Appalachian Power
Wheeling, WV

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AMERICAN ELECTRIC POWER℠
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2019 Annual Landfill Inspection Report
(CCR Landfill)

Mountaineer Plant

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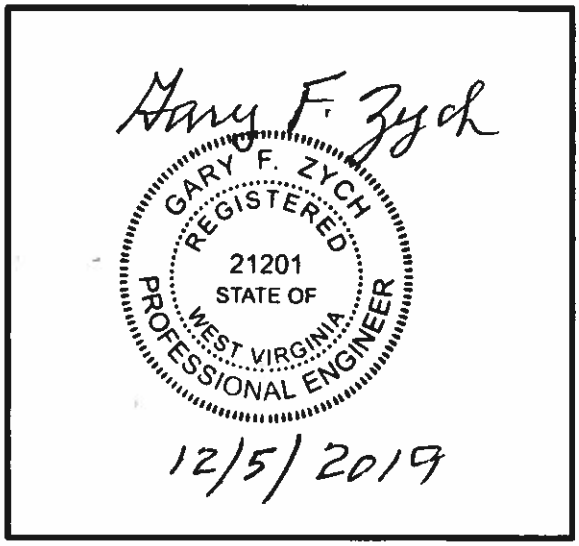


I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.84(b).

Table of Contents

Attachments

1.0 INTRODUCTION

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.84 and to provide the Mountaineer Plant an evaluation of the facility.

Mr. Brett Dreger, P.E. performed the 2019 inspection of the Landfill at the Mountaineer Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Mr. Chris Purdum, P.E. of the plant was the facility contact. The inspection was performed on November 21, 2019. Weather conditions were overcast temperature was in the low 50's (°F). There was 0.0 inches of rainfall recorded by the plant over the seven days prior to the inspection. Portions of the landfill had been recently mowed.

2.0 DESCRIPTION OF LANDFILL

The Landfill is permitted for nine disposal areas (Areas 1 through 9) and a vertical expansion that is designed over the existing landfill area of approximately 209 acre. Areas 1-7 of the landfill are filled to the permitted grades. Areas 8 and 9 are permitted but not constructed. The vertical expansion is currently divided into four development phases (Phase 1-4) and could be adjusted in acreages based on the operational needs. Figure 1 illustrates major components of the landfill facility that includes landfill, leachate collection ponds, ash pond complex, gypsum stacker pad, and sediment ponds. Figure 2 provides general overview of the Landfill and breakdown of areas (1-9) and vertical expansion Phases 1-4. Figures 1 and 2 are included in Attachment A.

The landfill inspection included all the fill areas (1-9) including vertical expansion, storm water management system, leachate collection management system, access roads and ditches, and conveyance channels.

At the time of the landfill inspection, operational activities were performed in the vertical expansion area. The landfill work was performed in accordance with the approved permit. Landfill areas outside of the current active fill area were generally covered with soil cover.

3.0 REVIEW OF AVAILABLE INFORMATION (257.84(b) (1)(i))

A review of available information regarding the status and condition of the Landfill, which include files available in the operating record, such as design, and construction information, previous 7-day inspection reports, and previous annual inspections reports. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions.

4.0 INSPECTION (257.84(b)(1)(ii))

4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.84(b)(2)(i))

No modifications have been made to the geometry of the Landfill since the 2018 annual inspection. The geometry of the landfill has remained essentially unchanged, except for the change in topography of the active disposal area.

4.2 VOLUME (257.84(b)(2)(ii))

The total volume of CCR waste disposed at the landfill as of November 2019 was estimated by Chris Purdum with Mountaineer Plant as 24.01 million cubic yards.

4.3 DEFINITIONS OF VISUAL OBSERVATIONS AND DEFICIENCIES

This summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. The meaning of these terms is as follows:

Good: A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.

Fair/Satisfactory: A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.

Poor: A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.

Minor: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.

Significant: A reference to an observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually conditions that have been identified in the previous inspections, but have not been corrected.

Excessive: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular area being observed or which may be a concern from a structure safety or stability point of view.

This document also uses the definition of a "deficiency" as referenced in the CCR rule section §257.84(b)(5) Inspection Requirements for CCR Landfills. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, "Qualifications for Impoundment Inspection" CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

A "deficiency" is some evidence that a landfill has developed a problem that could impact the structural integrity of the landfill. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage (Leachate Outbreak)
   Leachate outbreak is the uncontrolled release of leachate from the landfill.
2. Displacement of the Embankment

Displacement of the embankment is large scale movement of part of the landfill. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.

3. Blockage of Control Features

   Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.

4. Erosion

   Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

4.4 VISUAL INSPECTION (257.84(b)(1)(ii))

A visual inspection of the landfill was conducted to identify any signs of distress or malfunction of the landfill and appurtenant structures. Specific items inspected included all structural elements of the landfill perimeter berms, temporary and final covers, drainage features, open cells, and appurtenances such as chimney drains etc.

Overall, the facility is in satisfactory condition. The landfill is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the landfill. Inspection photos are included in Attachment B. Additional pictures taken during the inspection can be made available upon request. A site map presenting locations of the inspection observations is included in Attachment A.

1. Photograph No. 1 illustrates wastewater pond as part of the entire bottom ash complex. The leachate water from the landfill after going through the leachate collection pond system is discharged into the wastewater pond located at the power plant. The two discharge HDPE pipes (8" and 16" in diameter) are located on the west dike of the pond illustrated in the photograph appeared in good functional condition.

2. These two discharge pipes are installed between the leachate collection pond and the wastewater pond. There are numerous cleanouts for the discharge pipes between the wastewater and leachate pond. Typical condition of the cleanout and concrete manhole for protection of the cleanouts are illustrated in Photographs No. 2-4. All the cleanouts were accessible inside the manhole and appeared in good condition. Minor vegetation along the access to the discharge pipes was present that needs some clearing.

3. Typical condition of landfill Areas 6 and 7 is illustrated in Photograph No. 5. Overall landfill Areas 6 and 7 appeared in satisfactory and stable condition with adequate vegetative cover. The perimeter ditches were observed to be in satisfactory and functional condition (Photographs No. 6 and 7). No standing water was observed in the perimeter ditches.

4. Landfill Area 1 appeared in satisfactory and stable condition (illustrated in Photographs No. 8 and 9). A repair to the outside slope berm had just been completed and the slope area has been graded and seeded (Photograph No. 9).

5. Overall Area 2 appeared in satisfactory and stable condition (Photograph No. 10). The soil cover and vegetation appeared to be in satisfactory condition. There is significant scour along the left groin ditch near the toe area that needs to be addressed (Photograph No. 11).

6. The slope remediation work for Area 3 is almost complete (Photograph No. 12). The remediation work consisted of removing unstable fill, placing a layer of geo-grid, place backfill, a drainage layer using geo-composite, and cover soil. The area still needs final grading and top soil cover to provide a base for a good vegetative cover. This area still has minor seepage that will need further monitoring and reporting. Adjacent area to the south also indicates seepage (Photograph No. 13). The toe ditch indicates ongoing iron color seepage from this area. This area needs monitoring and also further investigation.

7. Overall Area 4 appeared in satisfactory and stable condition (Photograph No. 14 and 15). The soil cover, vegetation and rip rap drainage channel appeared to be in satisfactory condition.

8. Landfill Area 5 is illustrated in Photograph No. 16. This area and the perimeter access road was in satisfactory and stable condition with controlled vegetation.

9. Photograph No. 17 illustrates the northwest sediment pond. Overall, the pond appeared in functional and the dikes were in satisfactory and stable condition. Some cattail growth was observed throughout the pond area needs to be cleared.

10. The outside side slope areas of vertical expansion Phase 1A is illustrated in Photograph No. 18. The slope area and perimeter access road were in satisfactory and stable condition with controlled vegetation.

11. The outside side slope areas of vertical expansion Phase 1B is illustrated in Photograph No. 19. The slope area and perimeter access road were in satisfactory and stable condition with controlled vegetation.

12. Photograph No. 20 illustrates gypsum stacker pad. The radial stacker was in operation at the time of inspection. Stacker pad had some water ponding issues and accumulation of gypsum in some areas near the sump structure (Photograph No. 21).

13. Photograph No. 22 and 23 illustrates Phase 1B of the active landfill which is part of the vertical expansion. This area appeared satisfactory and in compliance with the permit requirements.

14. Landfill Area 7 sediment pond is illustrated in Photograph No. 24 appeared to be functioning as designed and in satisfactory condition.

15. The leachate collection system of the landfill is collected in a manhole at the east side of the landfill. Photograph No. 25 illustrates interior of the manhole as a collection point for all the leachate pipes. Based on observations, the leachate pipes indicated accumulation and buildup of precipitates inside the pipes. Photographs No. 26 and 27 illustrates the two leachate ponds. The ponds appeared in satisfactory and functional condition.

4.5 CHANGES THAT EFFECT STABILITY OR OPERATION (257.84(b)(2)(iv))

Based on interviews with plant personnel and field observations there were no changes to the landfill since the last annual inspection that would affect the stability of the landfill.

5.0 SUMMARY OF FINDINGS

5.1 GENERAL OBSERVATIONS

The following general observations were identified during the visual inspection:

1) In general, the landfill is functioning as intended and the active cell, inactive cells, closed areas, and storm water ditches are in satisfactory condition. The Plant is performing regular maintenance and inspections as required. Several maintenance items have been noted and are described in Section 5.2.

5.2 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection, see site map for locations. Contact GES for specific recommendations regarding repairs:

1. Clear excessive vegetation from the landfill area and along the leachate discharge pipes and cleanouts as noted.

2. Perform repair of erosion cut in Landfill Area 2 along the downstream groin area near the toe.

3. Complete the final grading and top soil cover work in Area 3. Establish a good vegetative layer over the area to prevent erosion.

4. Backfill, regrade, and compact low areas of the stacker pad and remove any excessive gypsum for positive drainage.

5. Clean out precipitate accumulation in the leachate pipes. Perform inspection of the leachate pipe using confined space camera.

6. Engineering should evaluate the precipitates chemistry to determine the process/cause.

5.3 ITEMS TO MONITOR

The following items were identified during the visual inspection as items to be monitored:

1. After completing remediation at Area 3 of the landfill, continue monitoring and inspecting the performance of remedial work and seepage management. Investigate to determine the root cause of the existing seepage in an area adjacent to the area been remediated.

2. Monitor poor drainage issues at the gypsum stackout pad to reduce the amount of sediment build up in the sump structure.

5.4 DEFICIENCIES (257.84(b)(2)(iii))

There were no signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action.

There was, however, a noted deficiency pertaining to the lower leachate underdrain discharge at MH-1. The deficiency related to high TSS numbers identified as part of regular monitoring and inspections in March of 2019. Several video inspections and high pressure jetting activities were performed in the spring and summer of 2019. There was no video evidence of broken lines and the jetting activities removed a lot of solids build up in the pipe. Eventually the lines cleared up and the TSS numbers came down to normal levels.

A deficiency is defined as either:

1) Uncontrolled seepage (leachate outbreak),
2) Displacement of the embankment,
3) Blockage of control features, or
4) Erosion, more than minor maintenance.

If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

ATTACHMENT A

Figure 1 – Sit Location Map
Figure 2 – Landfill Map

Figure 1 – Site Location Map
Little Broad Run Landfill-Mountaineer Plant

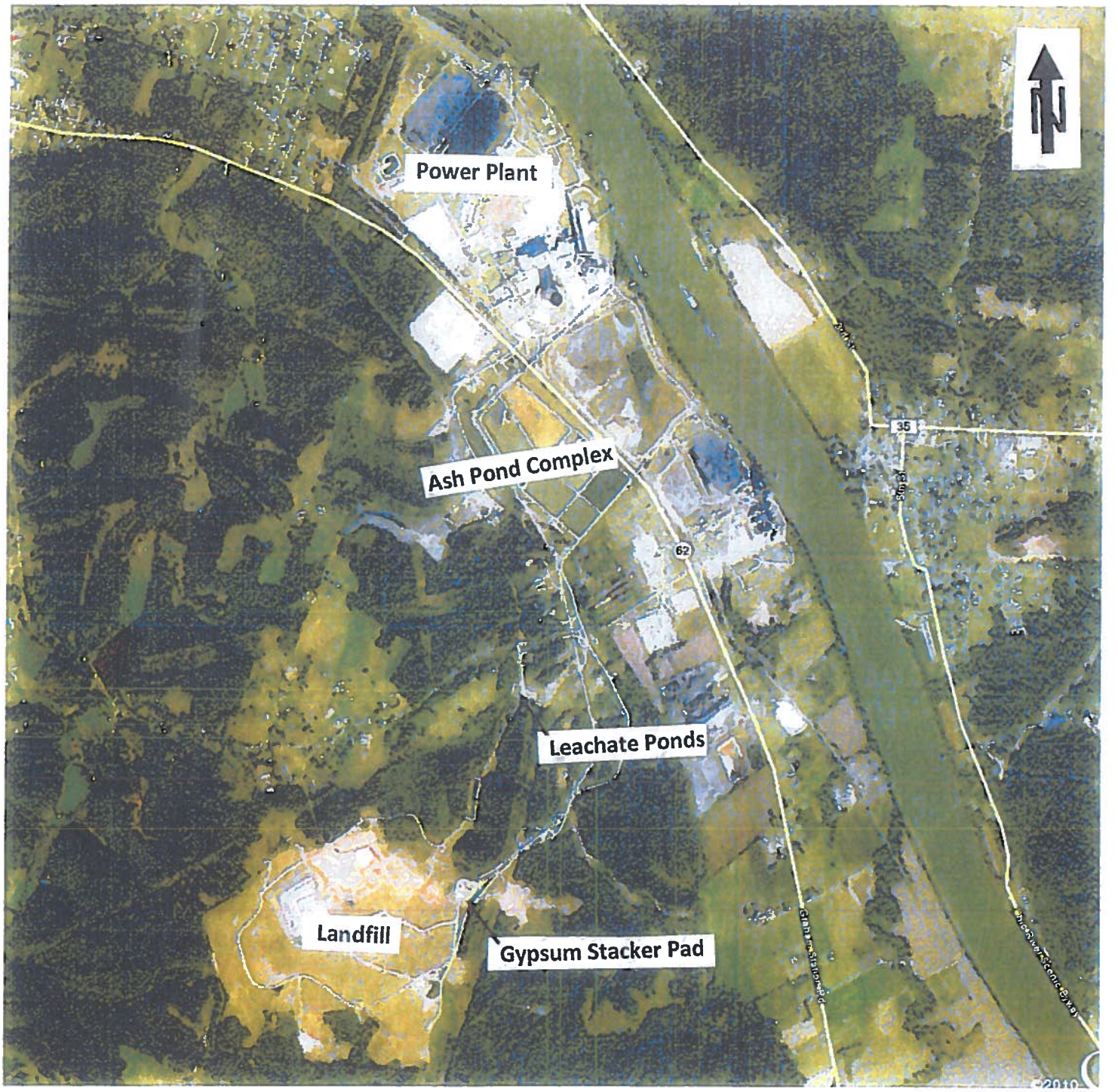
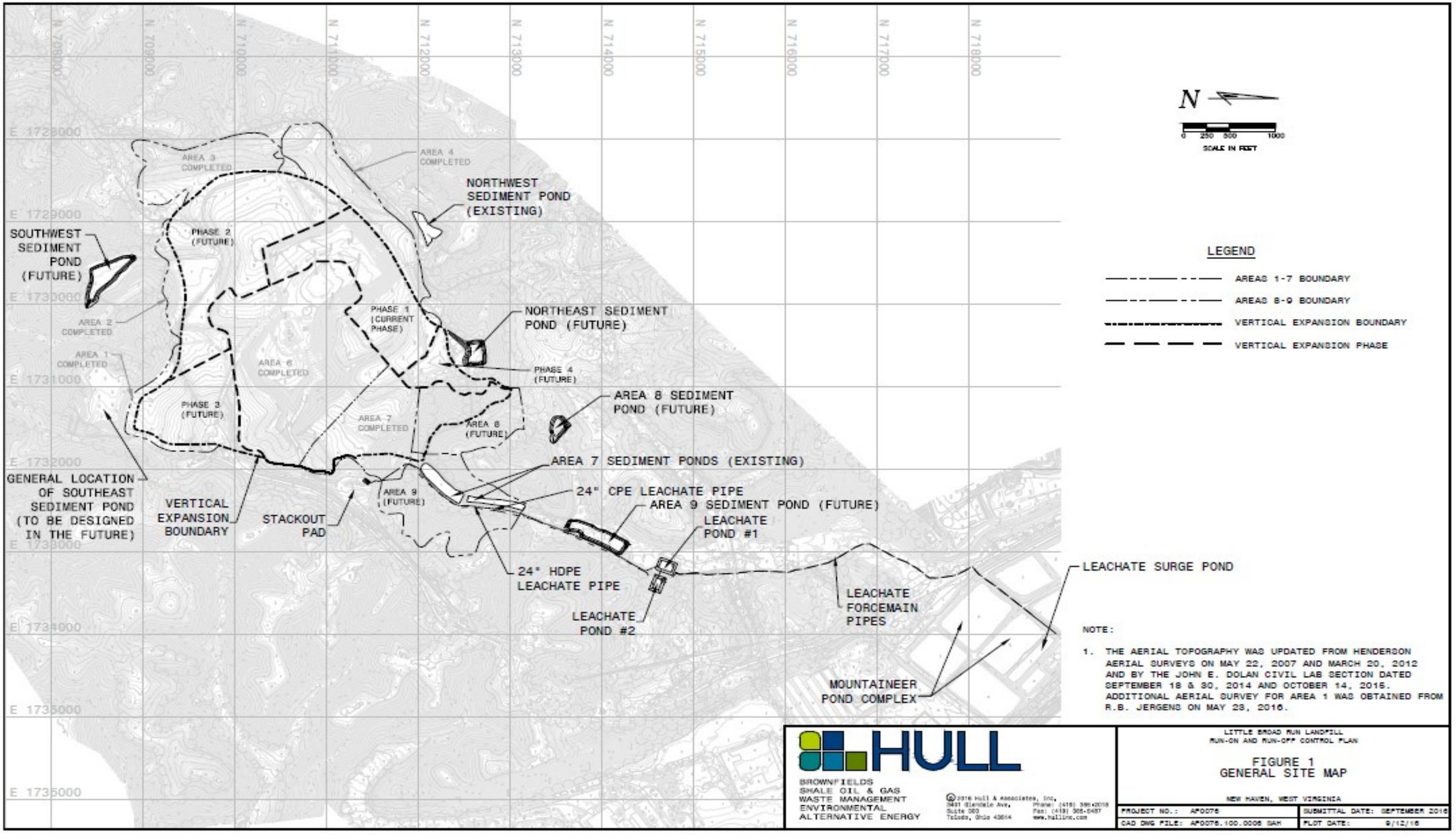


Figure 2 – Landfill Map

Little Broad Run Landfill, Mountaineer Plant



ATTACHMENT B

Figure 3 – Photo Location Map
Inspection Photos

Figure 3A – Inspection Photographs Location Map
Little Broad Run Landfill, Mountaineer Plant

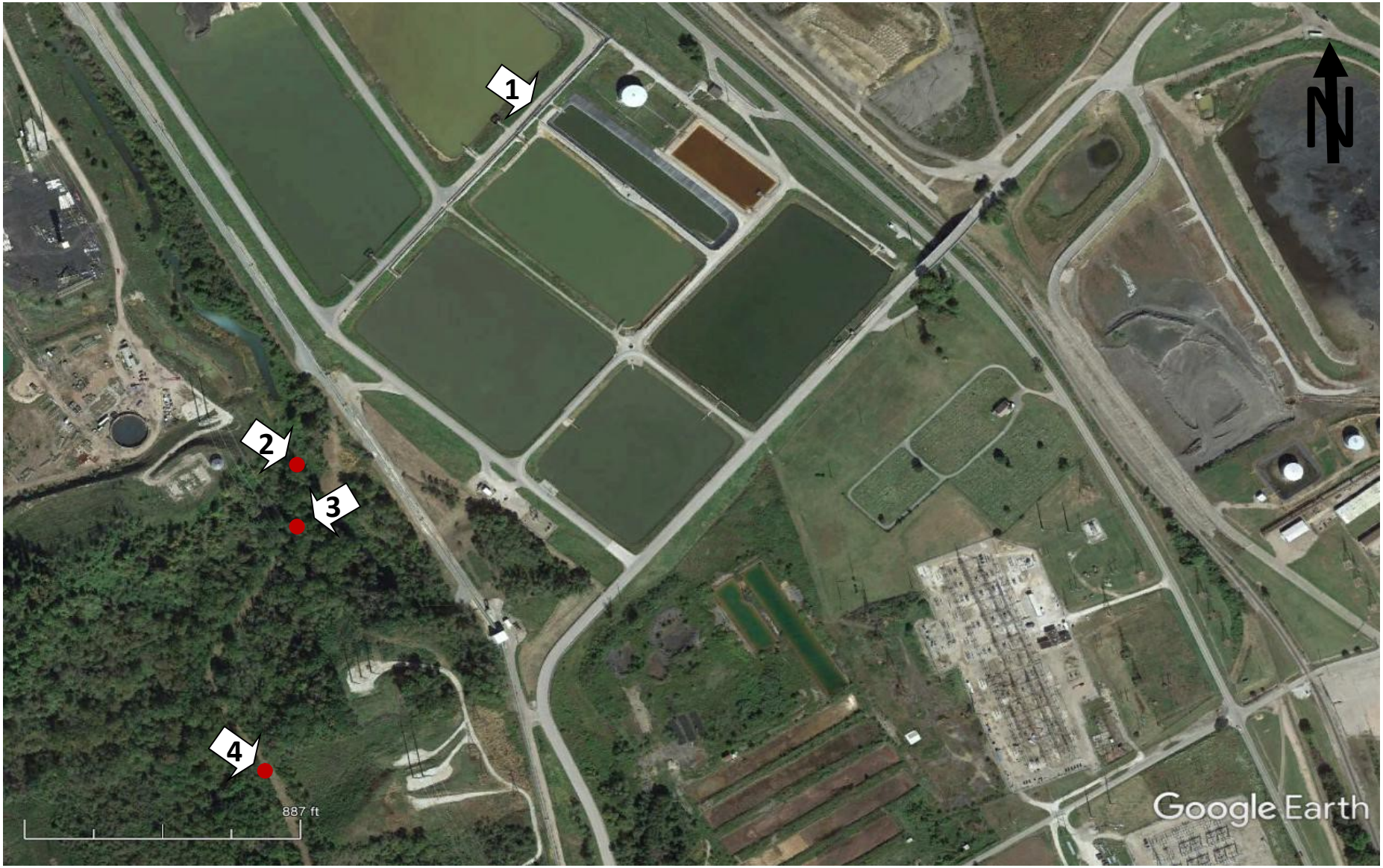


Figure 3C – Inspection Photographs Location Map
Little Broad Run Landfill, Mountaineer Plant

Figure 3B – Inspection Photographs Location Map
Little Broad Run Landfill, Mountaineer Plant

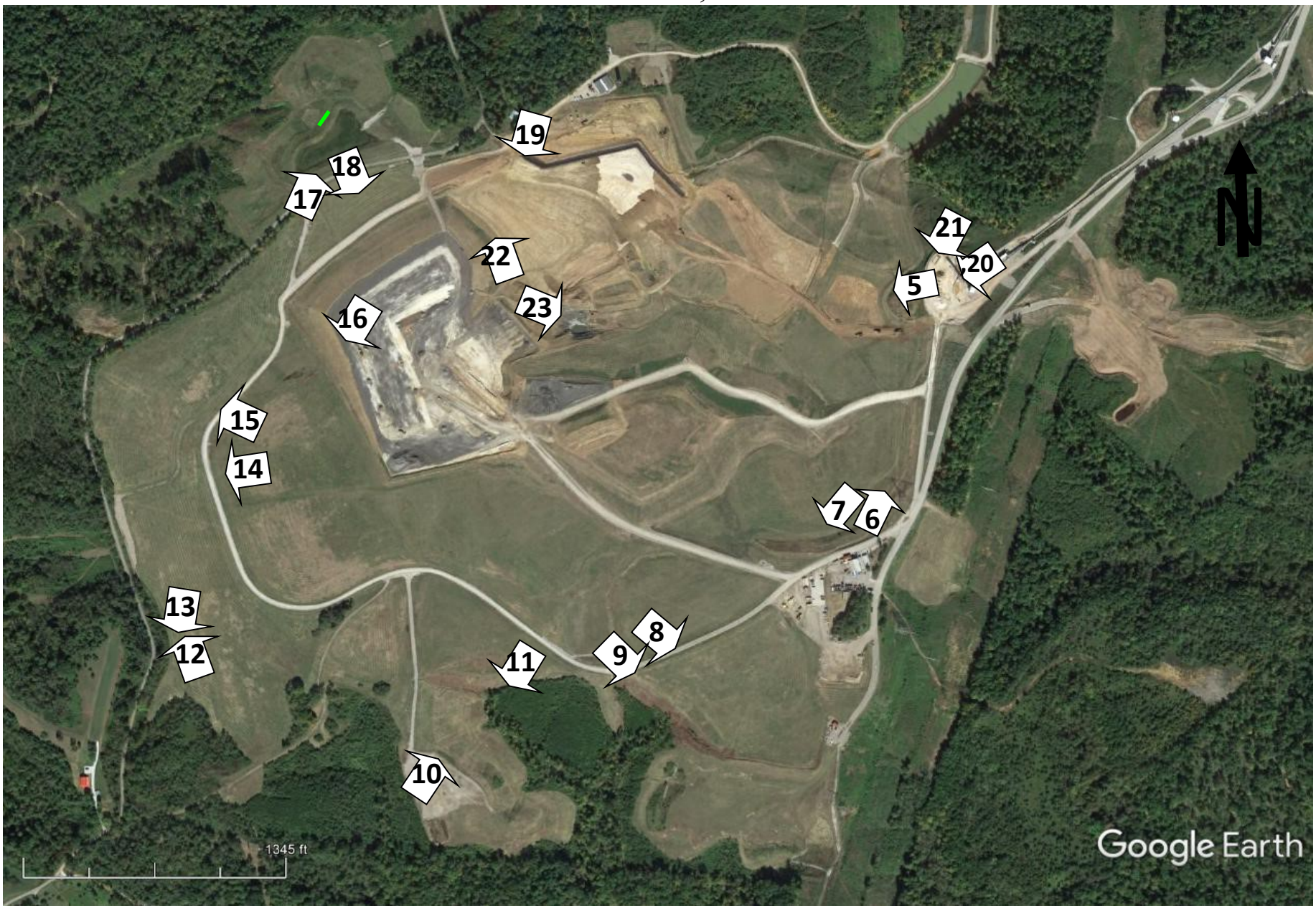


Photo # 1	
This photograph illustrates landfill leachate surge pond and discharge pipes.	

Photo # 2	
Typical condition of the cleanout #2 and protective concrete collar.	

Photo # 3	
Typical condition of the cleanout #3 and protective concrete collar.	

Photo # 4	
Typical condition of the cleanout #5 and protective concrete collar.	
Photo # 5	
Typical condition of landfill Areas 6 and 7 vegetative cover.	
Photo # 6	
View along the perimeter ditch of Areas 6 and 7 (looking northeast).	

Photo # 7	
View along the perimeter ditch of Areas 6 and 7 (looking west).	
Photo # 8	
Overall view of Area 1, top of the landfill.	
Photo # 9	
Overview of Area 1 side slope cover.	

Photo # 10	
Overall view of Area 2 side slope vegetative cover.	
Photo # 11	
Overview of Area 2 groin ditch near the toe. There is significant scour along the groin ditch.	
Photo # 12	
Overview of Area 3 side slope vegetative cover.	

Photo # 13	
Overview of Area 3 perimeter ditch looking south.	

Photo # 14	
Overview of Area 4 drainage channel.	

Photo # 15	
Overview of Area 4 vegetative cover, top of landfill.	

Photo # 16	
Overview of Area 5 vegetative cover, top of landfill.	
Photo # 17	
Overview of Northwest sediment pond.	
Photo # 18	
Overview of Area 4 and side slope area of vertical expansion Phase 1A.	

Photo # 19	
Overview of side slop area of vertical expansion Phase 1B.	

Photo # 20	
Gypsum Stackout Pad. View of Ponding Water and Gypsum Accumulation near the Sump Structure.	

Photo # 21	
Gypsum Stackout Pad. View of Ponding Water and Gypsum Accumulation near the Sump Structure.	

Photo # 22	
Active landfill - Vertical Expansion Phase 1B. Looking Northwest.	
Photo # 23	
Active landfill – Vertical Expansion Phase 1B. Looking East.	
Photo # 24	
Overview of Area 7 Sediment Pond.	

Photo # 25	
Landfill Leachate Pipe Collection Manhole MH-1.	
Photo # 26	
Leachate Pond 1.	
Photo # 27	
Leachate Pond 2.	