



**ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING**

VISUAL SITE INSPECTION REPORT – 2019

**SOUTHERN INDIANA GAS AND ELECTRIC
A. B. BROWN GENERATING STATION
TYPE III RESTRICTED WASTE LANDFILL
WEST FRANKLIN, IN**

ATC PROJECT NO. 170LF00789

January 7, 2020

PREPARED FOR:

**SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
dba VECTREN POWER SUPPLY
A.B. BROWN GENERATING STATION
8511 WELBORN ROAD
MOUNT VERNON, IN 47620
ATTENTION: MS. ANGIE SCHELLER**



January 7, 2020

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Re: Visual Site Inspection Report – 2019
A.B. Brown Generating Station
Type III Restricted Waste Landfill
West Franklin, Indiana
ATC Project No. 170LF00789

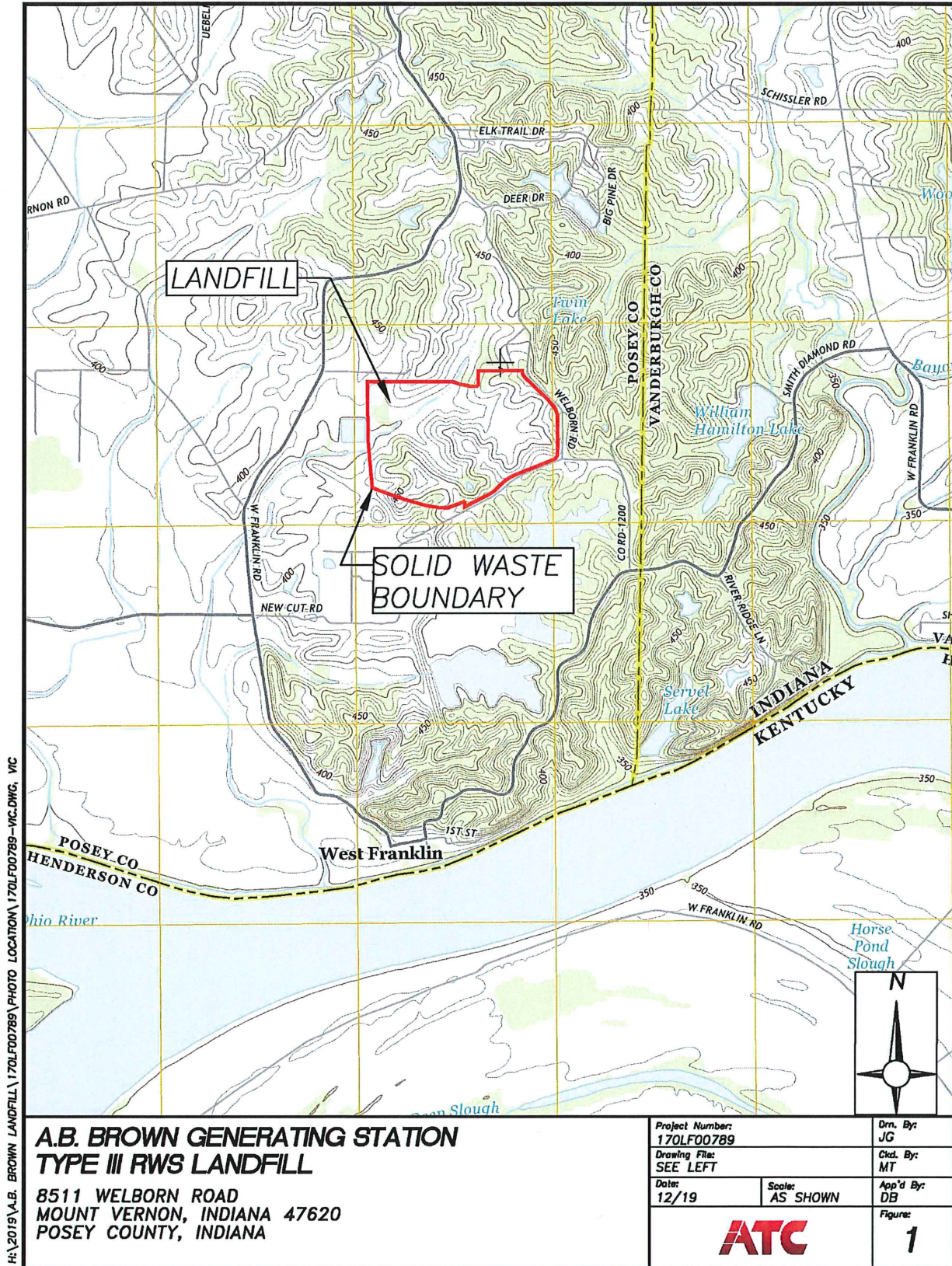
Dear Ms. Scheller:

This report summarizes our November 19, 2019 Visual Site Inspection of the Type III Restricted Waste Landfill at the A.B. Brown Generating Station. The visual inspection and this report were completed in accordance with guidelines established by the Coal Combustion Residuals (CCR) Rule published by the Environmental Protection Agency on April 17, 2015.

The scope of this inspection was limited to a visual examination of readily observable surface features of the landfill and its appurtenant structures, and a review of information that you provided. Please note that the inspection did not include any test drilling, testing of materials, precise physical measurements of landfill features, detailed calculations to verify slope stability, or other engineering analyses. Although the inspection was conducted by competent personnel in accordance with generally accepted methods for inspecting landfills, it should not be considered as a warranty or guarantee of the future performance and/or safety of the landfill.

The landfill is located within the A.B. Brown Station property in Section 24, Township 7 South, and Range 12 West, about a half mile north of the Ohio River in Posey County, Indiana as highlighted on the West Franklin, IN USGS Quadrangle map, Figure 1 on the following page.

The landfill inspection was completed by Don Bryenton and Mike Thornbrue of ATC Group Services LLC (ATC). The weather during the inspection was cloudy with temperatures around 50°F. Ground conditions were relatively moist from recent rains. The landfill system features are highlighted on the attached Site Plan in Appendix A.



The landfill system was divided into the following components to help organize the inspection and the reporting:

- Landfill Partial Closure Areas (Composite Final Cover, and north, east, and south perimeter slopes of the landfill);
- Active Disposal Area (west end of the landfill);
- Vertical Expansion Disposal Area (top central portion of the landfill); and
- Landfill Settling Basin, Capitol Pond, and Detention Basin.

The approximate limits of each of these areas is noted on Sheet 1 in Appendix A. The following paragraphs include a summary of the observations made during the inspection followed by our recommendations in bold print. Approximate locations of some of the observed features are noted on Sheet 1 in Appendix A.

LANDFILL PARTIAL CLOSURE AREAS – OBSERVATIONS / RECOMMENDATIONS

The approximate limits of the Partial Closure Area – Composite Final Cover are shown on Sheet 1 in Appendix A and cover an area of approximately 28 acres. The composite cover consists of a 40-mil LLDPE geomembrane overlain with a 16 oz/yd² nonwoven geotextile, 2.5 feet of protective soil, and 0.5 feet of topsoil. The final cover was constructed in stages from 2012 through 2014. Documentation of the completion of closure activities in this area was submitted to the Indiana Department of Environmental Management (IDEM) in three (3) separate reports in 2012, 2013, and 2014.

The approximate limits of the Partial Closure Area – Soil Final Cover are also shown on Sheet 1 in Appendix A. This section covers an area of approximately 24.5 acres and consists of a minimum of 24 inches of cohesive soils, covered with 0.5 feet of topsoil. Documentation of the completion of the closure activities along these slopes was submitted to IDEM in 2015.

Items noted during the visual inspection of this area are described in the following list.

- 1) In general, this area is well vegetated and well maintained (Locations 1, 4, 5, and 9). No concerns exist at this time.

Recommendation: None at this time.

- 2) The drop inlets and outlet pipes located in the southeast corner of the landfill were generally free of debris at the time of the inspection (Location 2).

Recommendation: None at this time.

- 3) The sinkhole and erosion noted during the 2018 visual inspection in the vicinity of a culvert outlet on the east slope of the Partial Closure Area has been repaired (Location 3).

Recommendation: No further action required at this time.

- 4) On the north side of the Composite Final Cover Area, one of the four drop inlets present has become clogged with vegetation debris (Locations 6 and 7).

Recommendation: Remove debris to restore the original condition. This drop inlet was also noted to be clogged during the 2018 inspection. It is recommended that the drop inlet be inspected at least quarterly to remove accumulated debris.

- 5) A seep is present on the north slope near the east end of the landfill. A trench has been excavated in the area to collect the seep water and convey it in pipes to the Capital Pond. It is our understanding that the flow rate varies seasonally and that the peak rate continues to decrease following the construction of the composite final cover across the top of the east end of the landfill (Location 8).

Recommendation: Continue to collect and convey the seep water to the Capital Pond.

- 6) Observations made during the site visit indicate that Manholes 1 through 6, 8, 9, 10.5, 11, 11.5, 12, 20 and 21 are flowing without significant obstruction. Based on water levels noted in Manholes 7 and 10, some blockage appeared to be present at those locations at the time of the inspection. Maintenance was being performed to remove the blockage from Manhole 10 at the time of the inspection (Location 9).

Recommendation: Continue maintenance of the subsurface drainage system on an as needed basis to ensure the line drains freely.

- 7) During the 2018 inspection of the Partial Closure Area, an HDPE pipe was draining the active 2018 fill operations in the Vertical Expansion Area to Manhole 11.5. At the time of that inspection, there were no erosion or sediment controls installed upstream of the pipe inlet which allowed filter cake sediment to flow directly into the pipe and into the stormwater management system outside of the Solid Waste Boundary. That pipe has been removed and Manhole 11.5 was flowing freely at the time of this inspection.

Recommendation: No further action required at this time.

- 8) The inspection noted filter cake in the drainage ditch north of the north slope of the landfill outside of the Solid Waste Boundary (Location 10). At the time of this inspection, there was no evidence to indicate migration of waste beyond the property boundary.

Recommendation: Remove filter cake from the drainage ditch to help control the migration of filter cake outside of the Solid Waste Boundary and continue proactive maintenance of stormwater controls.

- 9) The riprap in a downchute near the west end of the north slope has been displaced at several locations, including one area where the geotextile underlying the riprap is now exposed (Location 11). A significant amount of soil sediment was also noted in the riprap (Location 12) and in the drainage ditch that receives discharge from that downchute. Site personnel indicated that the displacement of the riprap and deposition of the soil sediment occurred as the result of a recent significant rain event. Based on field observations, it appears that the drainage area that is now discharging to this downchute increased significantly as a result of the 2019 filling operations in the vertical expansion area. It appears that this downchute was not designed to accommodate this additional discharge.

Recommendation: Re-establish the riprap protective layer in the downchute as soon as practical to try to avoid further damage to the downchute. An analysis should be performed to modify the temporary stormwater controls to either divert a portion of the

drainage area to a different outlet pipe or channel, or provide some detention to reduce the peak flow to the downchute.

- 10) The inspection noted seeps at the toe of the south slope. The water gravity flows through subsurface drain to the Landfill Settling Basin (Location 14)

Recommendation: Continue to monitor the area for the presence of salt deposits, filter cake, erosion, or subsidence.

- 11) The inlet of one of the downdrain pipes, which conveys water from one of the drainage terraces on the south slope is partially clogged (Location 15). Further, a subsidence feature was noted along the pipe alignment (Location 16) and the pipe has been damaged near its outlet (Location 17).

Recommendation: The debris should be removed from the pipe inlet and the eroded area near the outlet should be revegetated. Further, the downdrain pipe should be repaired and the subsidence area backfilled.

ACTIVE DISPOSAL AREA OBSERVATIONS / RECOMMENDATIONS

The active disposal area generally consists of portions of Cells 16, 17 and 18, which occupy an area of approximately 21 acres. Items noted during the visual inspection of this area are described in the following list.

- 1) Active filling is ongoing at the west end of the landfill (Locations 18 and 19).

Recommendation: None at this time.

- 2) There is a limited amount of freeboard between the surface of the waste and the adjoining access road at the south end of the Active Landfill Area (Location 20). In addition, surface water runoff from the northern portion of the Active Landfill Area is routed to a depression with limited freeboard at the far north end (Locations 21 and 22).

Recommendation: Monitor these areas during significant storm events to avoid the release of filter cake. Consider regrading the areas to provide additional storage capacity for stormwater runoff and/or add a soil berm to increase freeboard in these areas.

- 3) Filter cake has recently been stockpiled at the north end of the active fill area (Location 23). A portion of this stockpile extends onto the cover soils at the west end of the north side of the Landfill Partial Closure Area (Location 24) creating a potential path for filter cake to migrate on to the north slope of the partial closure area (Location 25).

Recommendation: Regrade the filter cake stockpile to ensure that all runoff from the pile is contained within the active fill area to prevent filter cake from migrating outside the Solid Waste Boundary.

VERTICAL EXPANSION DISPOSAL AREA OBSERVATIONS / RECOMMENDATIONS

The vertical expansion disposal area noted on Sheet 1 in Appendix A generally consists of approximately 18 acres across the top of the central portion of the landfill. This area has not yet been filled to the approved final grades. Additional waste was placed in the area during 2019. Items noted during the visual inspection of this area are described in the following list.

- 1) Filter cake was placed along the western side of the Vertical Expansion Area in late summer/fall of 2019. The newly placed material was covered with soil and vegetated. However, due to an extended dry period that occurred following the seeding the vegetative cover is not well established and therefore significant erosion was noted in multiple areas (Locations 26 thru 31). Repairs were underway at the time of this inspection to fill and reseed the eroded areas and to install some temporary drainage controls, included a diversion berm (Location 32) and a downdrain pipe.

Recommendation: Complete the repairs that are currently underway. A drainage analysis should be performed to determine the need for additional temporary drainage controls to include the diversion or detention of a portion of the drainage that currently discharges to the riprap lined downchute on the north slope of the partial closure area (discussed above).

- 2) The 2019 placement of fill in the active fill area created portions of two drainage terraces at the northwest corner of the new fill placement. Both of these terraces are sloped to drain to the west but the recent filling did not extend far enough to install the permanent downchute. As a result, surface water runoff currently flows down either the west or north slopes causing erosion of the recently seeded cover soils (Location 29).

Recommendation: Temporary stormwater controls should be designed and installed to control discharge from the partially completed drainage terraces.

LANDFILL SETTLING BASIN OBSERVATIONS / RECOMMENDATIONS

The existing Landfill Settling Basin was constructed in 2015 to receive water that has been in contact with waste in the landfill. The pond has a composite liner across the base and a riprap protective layer. The inlet pipe is located in the southeast corner of the pond while the drop inlet for the outlet to the Capitol Pond is located in the northwest corner of the pond. A stormwater detention basin is located immediately north of the Capitol Pond. Items noted during the visual inspection of this area are described in the following list.

- 1) The slopes of the Settling Basin are lined with riprap and appeared in satisfactory condition. Also, the pond is maintaining adequate freeboard (Location 33).

Recommendation: Continue to monitor the condition of the pond and perform maintenance as necessary.

- 2) The southeast portion of the pond has accumulated sediment that may impair the discharge into the pond (Location 34).

Recommendation: Remove accumulated sediments as needed to maintain the pond capacity.

- 3) The drop inlet which conveys water from the Settling Basin to the Capitol Pond was free of debris at the time of this inspection (Location 35).

Recommendation: None at this time.

- 4) The exterior perimeter slopes of the Capitol Pond are well vegetated and generally in good condition at the time of this inspection (Locations 36 thru 39).

Recommendation: None at this time.

- 5) The inspection noted an accumulation of sediment in the northeast corner of the Capitol Pond (Location 40).

Recommendation: Remove the sediment from the basin and place it in the landfill.

- 6) The concrete lined sediment basin located within the detention basin was nearly full of sediment at the time of this inspection (Location 41).

Recommendation: Remove the sediment from the basin and place it in the landfill. Monitor the basin and remove sediment once the basin is approximately half full to help minimize the potential migration of filter cake into the detention basin.

Coal Combustion Residuals Rule Landfill Requirements/Observations

In addition to the general observations and recommendations outlined above, this visual inspection was also performed to address the standards and guidelines required by the CCR Rule established by the Environmental Protection Agency on April 17, 2015. As a result, CCR Landfills are now required to meet the requirements of 40 C.F.R. §257 to conduct annual inspections of the landfill in accordance with 40 C.F.R. §257.84(b). The requirements specified within the CCR Rule and the observations made by Don Bryenton and Mike Thornbrue during the 2019 annual inspection are listed below:

40 C.F.R. §257.84

(b) Annual inspections by a qualified professional engineer.

(1) Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:

(i) A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspections by a qualified person, and results of previous annual inspections); and

The annual inspection of the AB Brown Landfill was conducted by the undersigned professional engineers on November 19, 2019. Operating records along with design plans were reviewed by the undersigned.

(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

The inspection conducted on November 19, 2019 did not reveal any signs of immanent failure for the landfill. However, there are isolated areas of erosion, and seepage that require repair and/or modification as part of the ongoing maintenance of the landfill area. Further, filter cake sediment was noted in a ditch located beyond the solid waste boundary on the north side of the landfill. However, there was no evidence of the migration of waste beyond the property boundary.

(2) *Inspection report. The qualified professional engineer must prepare a report following each inspection that addresses the following:*

(i) *Any changes in geometry of the structure since the previous annual inspection;*

In general, the following changes in the geometry of the structure were noted during the 2019 visual inspection:

- **In the past year the site continued filling operations in Cells 16, 17 and 18.**
- **New waste was also placed on the center, western and southern portions of the Vertical Expansion Landfill Area.**
- **Maintenance issues noted during the 2018 visual inspection had been addressed.**
- **At the time of the 2019 inspection, maintenance work was being performed to address blockage in the manholes which are part of the subsurface drainage system on the east and north sides of the landfill. Work was also being performed to repair erosion in the vicinity of the recent filling operation in the Vertical Expansion Area which occurred as the result of a significant rainfall event. Erosion features were being repaired with the placement of additional soil cover, the addition of diversion berms and an additional downdrain pipe.**

The measures taken as outlined above have improved the overall condition of this facility.

(ii) *The approximate volume of CCR at the time of the inspection;*

The approximate volume of CCR within the limits of the 1988 landfill expansion is 4,920,000 cubic yards.

(iii) *Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and*

There were no signs of structural weakness noted within the permitted solid waste boundary at the time of this visual inspection. Additional temporary erosion and sediment controls should be deployed in the vicinity of recently place fill in the Vertical Expansion area to minimize the potential for migration of filter cake outside of the active fill areas.

(iv) *Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.*

None noted at the time of this inspection.

We appreciate the opportunity to assist you with this project. If you have any questions concerning information contained in this report, please do not hesitate to call either of the undersigned at 317.849.4990.

Sincerely,

ATC Group Services LLC

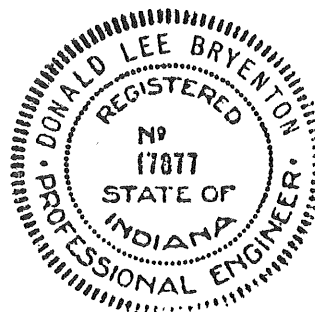


Donald L. Bryenton, P.E.
Principal Engineer



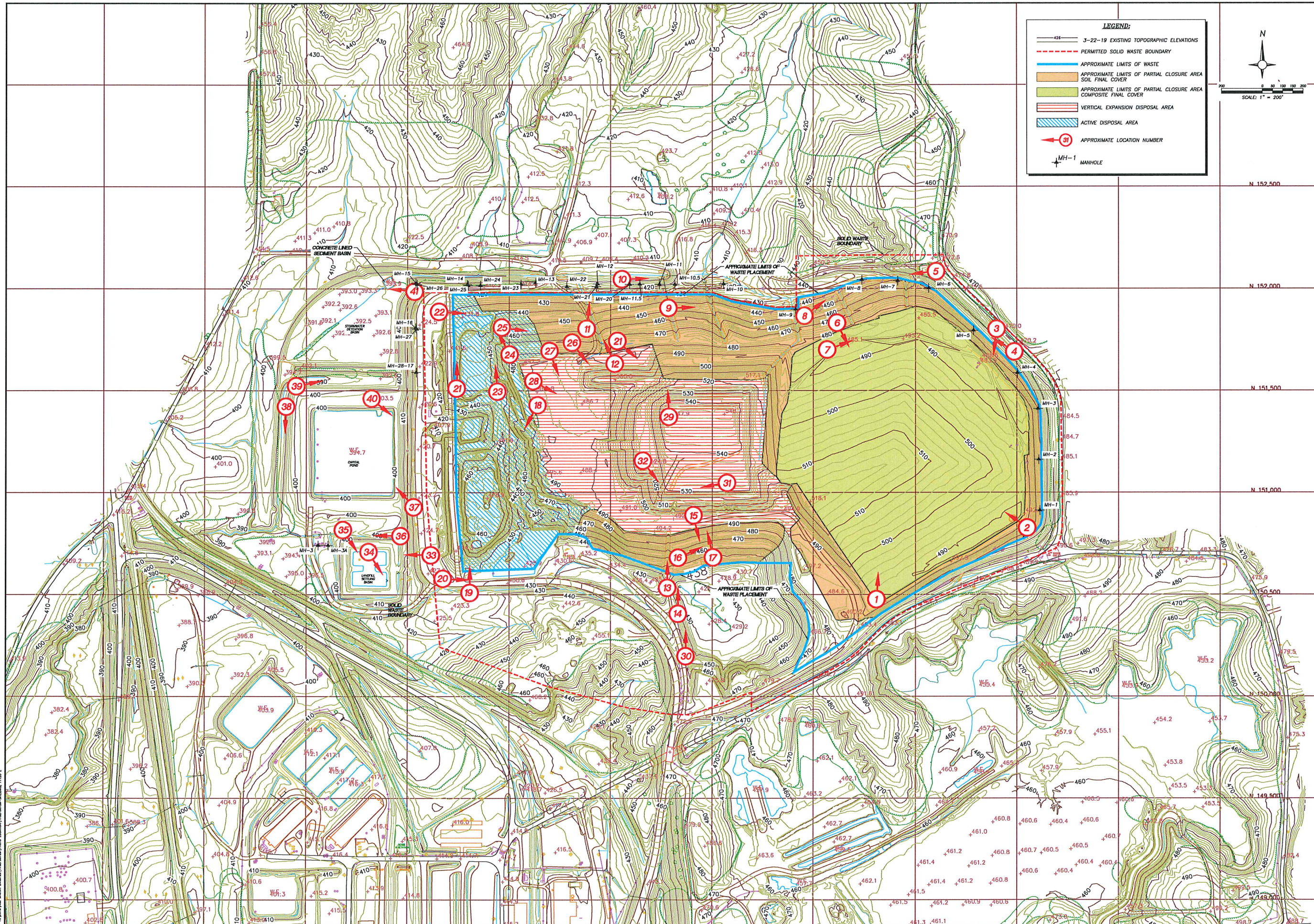
Michael D. Thornbrue, P.E.
Senior Project Engineer

- Copies:
- (3) Angie Scheller – SIGECO
 - (1) Brandie Rucker – SIGECO
 - (1) Jason Copeland – SIGECO



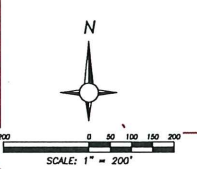
Appendices

Appendix A: Site Plan



LEGEND:

- 3-22-19 EXISTING TOPOGRAPHIC ELEVATIONS
- - - PERMITTED SOLID WASTE BOUNDARY
- APPROXIMATE LIMITS OF WASTE
- APPROXIMATE LIMITS OF PARTIAL CLOSURE AREA SOIL FINAL COVER
- APPROXIMATE LIMITS OF PARTIAL CLOSURE AREA COMPOSITE FINAL COVER
- VERTICAL EXPANSION DISPOSAL AREA
- ACTIVE DISPOSAL AREA
- ① APPROXIMATE LOCATION NUMBER
- MH-1 MANHOLE



Revision:	
Project Number:	173000789
Drawing File:	See File Location
Date:	12/19
Scale:	AS SHOWN
App'd By:	DR
Check By:	JC
Drawn By:	JC

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Drawing Title:
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