



VISUAL SITE INSPECTION REPORT - 2015

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

ATC PROJECT NO. 170LF00159

January 14, 2016

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. LISA MESSINGER**

January 14, 2016

Ms. Lisa Messinger
Southern Indiana Gas and Electric Company
8511 Welborn Road
Mount Vernon, IN 47620

Subject: Visual Site Inspection Report - 2015
A. B. Brown Generating Station
Type III Restricted Waste Landfill
West Franklin, Indiana
ATC Project No. 170LF00159

ATC Group Services LLC

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Suite 100
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Dear Ms. Messinger:

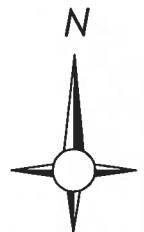
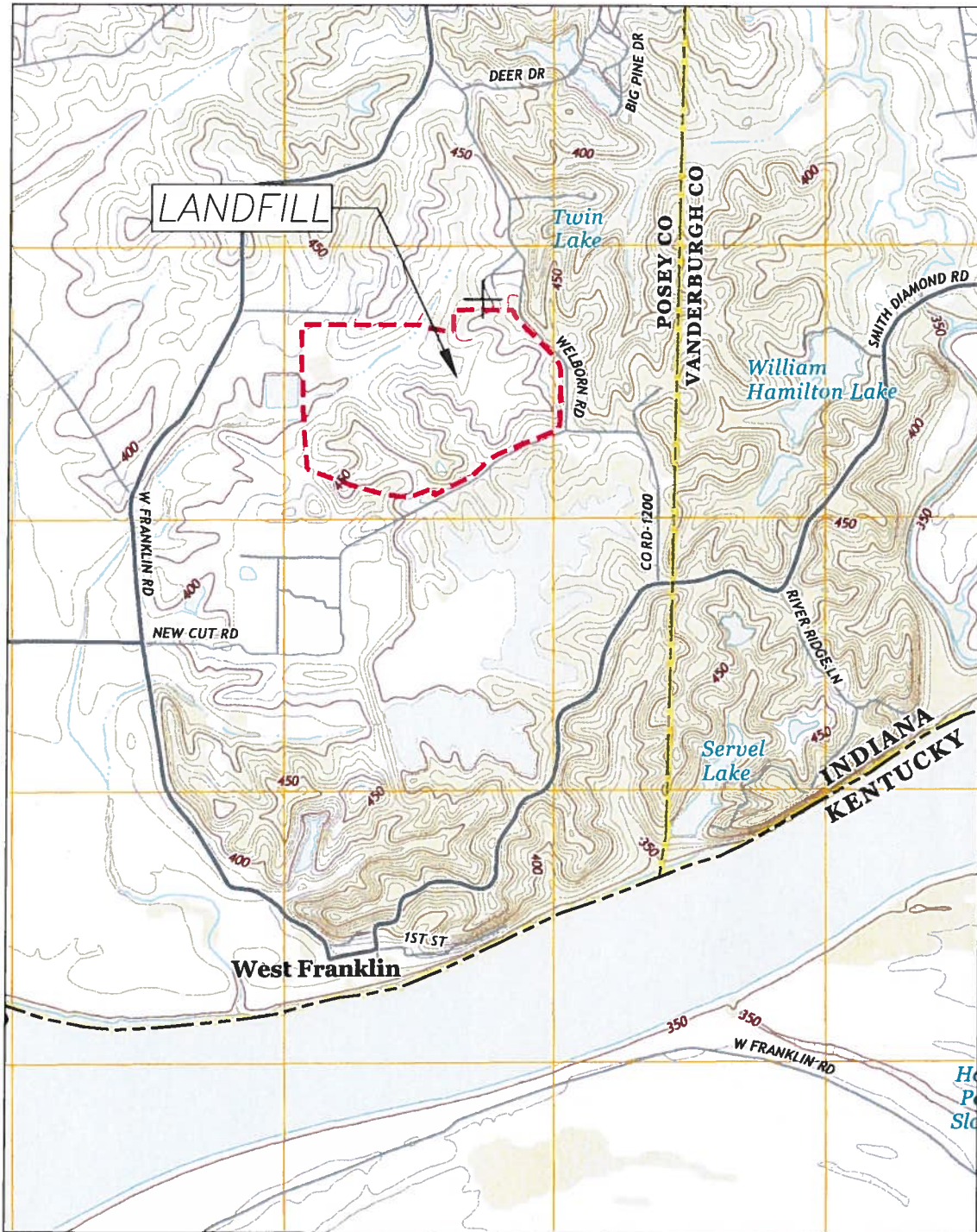
Submitted herewith is the report of our December 3-4, 2015 Visual Site Inspection of the Type III Restricted Waste Landfill at the A.B. Brown Generating Station. This visual inspection and report were done in accordance with guidelines established by the Coal Combustion Residuals (CCR) Rule published by the Environmental Protection Agency on April 17, 2015.

The scope of this inspection was limited to an examination of readily observable surficial 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 guaranty of the future performance/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 Kilian Sweet of ATC Group Services LLC (ATC). The weather during the inspection was approximately 40° F and sunny. The landfill system features are highlighted on the attached Site Plan in Appendix A.

H:\2016\VECTREN CORPORATION\AB BROWN 2016 VISUAL INSPECTION 170LF00159\170LF00159-VIC-2016.DWG, HP5500



VICINITY MAP

LANDFILL INSPECTION
 DECEMBER 3rd AND 4th, 2015
 VECTREN A.B. BROWN GENERATING STATION
 WEST FRANKLIN, INDIANA

Project Number:
170LF00159

Drawing File:
SEE LEFT

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12/15

Scale:
1" = 2000'

Drn. By:
PL

Ckd. By:
KS

App'd By:

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

- Top of Landfill Areas with Partial Closure Completed (east end);
- Landfill Side Slopes with Partial Closure Completed;
- Inactive Areas (generally top central portion of landfill);
- Active Areas (generally the west end of the landfill);
- Sedimentation Basin; and
- Capital Pond.

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.

TOP OF LANDFILL PARTIAL CLOSURE AREAS – OBSERVATIONS/RECOMMENDATIONS

The final cover in this approximately 28 acre area consists of a 40 mil LLDPE geomembrane overlain with a 16 oz/sy nonwoven geotextile, 2.5 ft of protective soil and 0.5 ft 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 separate reports in 2012, 2013 and 2014. Items noted during the visual inspection of this area are described in the following list.

- 1) The area is generally well vegetated and well maintained; however, there are some isolated areas with sparse vegetation and areas near drainage structures where the vegetation is overgrown.
Recommendation: Overseed and fertilize the areas of sparse vegetation as part of the ongoing maintenance program. Cut the vegetation around the drainage structure inlets to allow unobstructed flow into the structure.
- 2) There were areas of standing water and poor vegetative cover north and south of the diversion berm.
Recommendation: Adjust the final grades as needed to prevent the ponding of water and revegetate all areas with sparse vegetation and/or disturbed by these modifications.
- 3) At isolated locations along the diversion berms surrounding the partial closure area, some minor erosion gullies were noted on the interior and exterior slopes.
Recommendation: Fill in erosion gullies and reseed the disturbed areas as part of the ongoing maintenance program.
- 4) Animal burrows were noted at isolated locations within the limits of the partial closure area.
Recommendation: Repair animal burrows and implement an animal control program.

LANDFILL SIDESLOPE PARTIAL CLOSURE AREAS – OBSERVATIONS/RECOMMENDATIONS

The final cover on the perimeter slopes noted on Sheet 1 in Appendix A consists of a minimum of 24 inches of cohesive soils, covered with 0.5 ft of topsoil. The approximate limits of the 24.5 acre closed portion of the slopes is noted on Sheet 1 in Appendix A. 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) The sideslopes with final cover are generally well vegetated and well maintained; however, there are some isolated areas with sparse vegetation and erosion.
Recommendation: Overseed and fertilize the areas of sparse vegetation as part of the ongoing maintenance program. Backfill eroded areas and vegetate all areas disturbed by the repairs.
- 2) There are seeps discharging from the south slope. The combined flow rate at the time of this visual inspection was estimated to be approximately 1 gpm. The area in the vicinity of the seep was also covered with phragmites indicating high moisture content in the cover soils in this general area. Flow from the area is currently collected in a piping system and discharged to the Capital Pond. Standing water was noted behind the diversion berm present above the area where the seeps were noted.
Recommendation: Continue to collect water discharging from the seeps until repairs can be made. The diversion berm present above this area should be regraded to drain to remove this possible source of water for the seeps. If the seeps continue to flow following repair of the diversion berm, it will likely be necessary to either add additional cover soils in the vicinity of the seeps, or modify the seepage collection system.
- 3) Some of the diversion berms on the south side of the landfill discharge into downdrain pipes. The entrances to some of the downdrain pipes were overgrown causing obstructed flow into the pipes. Based on the presence of several small depressions both at some of the inlets to the downdrains and along the downdrain alignment, it appears that some water is flowing along the outside of the pipes causing a loss of ground at isolated locations.
Recommendation: Remove vegetation from the entrance of the downdrain pipes. Backfill all depression noted around the pipe entrances and along the pipe alignment. Revegetate all areas disturbed while making these repairs.
- 4) Significant erosion was noted around the outlet end of the downdrain pipes present at the southeast corner of the landfill). At most locations, the perimeter ditch that receives the discharge from the outlet pipes is protected with a riprap plunge pool. However, at this location there is no riprap lined plunge pool. The discharge from the downdrain pipe is eroding the base of the perimeter ditch and undercutting the outlet end of the downdrain pipe.
Recommendation: Riprap should be placed below the outlet pipes to protect the ditch from erosion. Erosion around these pipes should also be repaired.
- 5) The downdrain pipes and the riprap lined downchutes on the north side of the landfill are generally in good condition. A collar connecting two segments of one of the downdrain pipes has separated, causing the pipe ends to also separate. In addition, a portion of a corrugated

plastic pipe that conveys water from a diversion berm, under an access road and into a riprap lined downchute, has been damaged and is no longer functioning as intended.

Recommendation: Repair the separated collar and the damaged section of the pipe exposed in the base of the access road.

- 6) 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 decreased following the construction of the composite final cover across the top of the east end of the landfill.
Recommendation: Continue to collect and convey the seep water by discharging to the Capital Pond.
- 7) Animal burrows were noted at isolated locations within the limits of the partial closure area.
Recommendation: Repair animal burrows and implement an animal control program.
- 8) On the western facing slope adjacent to the final cover on the east end there is a washout along a downdrain pipe. The western slope was recently seeded and mulched, but the vegetative cover has not yet been established.
Recommendation: Repair the erosion gully and reseed/mulch the slope. A riprap lined plunge pool should be installed at the outlet of the pipe to minimize the potential for additional erosion. The area should be monitored during weekly inspections until a vegetative cover has been established.
- 9) There is an area of ponded water at the toe of the west end of the north facing slope in a ditch. This standing water appears to be caused by the fill used to make the roads.
Recommendation: The area should be regraded to prevent the ponding of surface water.

INACTIVE LANDFILL OBSERVATIONS/RECOMMENDATIONS

The inactive disposal area noted on Sheet 1 in Appendix B 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, although it has been covered with an intermediate soil cover and vegetated until filtercake placement resumes. Items noted during the visual inspection of this area are described in the following list.

- 1) In general, the vegetation across the majority of the inactive area is in good condition with some isolated areas of sparse vegetation and minor erosion on the interim cover of the inactive landfill.
Recommendation: Overseed and fertilize the areas of sparse vegetation as part of the ongoing maintenance program.
- 2) Some minor erosion was noted at the downdrain pipe inlet on the north side of the inactive area.
Recommendation: Erosion should be repaired and monitored to ensure the water is flowing into the downdrain pipes.

- 3) Ponded surface water was noted on the south side of the inactive area.
Recommendation: Regrade the area to prevent the ponding of surface water over the waste.

ACTIVE LANDFILL OBSERVATIONS/RECOMMENDATIONS

The active disposal area general consists of portions of Cells 16, 17 and the northern portion of Cell 18, which occupy an area of approximately 15 acres. Construction of the southern portion of Cell 18, which was initiated during the summer of 2015, is currently on hold until the spring of 2016 due to winter weather conditions that are not conducive to soil liner construction. Items noted during the visual inspection of this area are described in the following list.

- 1) The edge of the exposed waste in the north end of Cell 17 is at approximately the same elevation as the final cover to the north. Surface water runoff from the waste piled at the north end of Cell 17 enters this area where it is detained. During a significant storm event it appears that water that has been in contact with the waste could be released onto the final cover slope to the north. At the time of this inspection, construction was in progress in this general area to regrade the waste and apply an interim cover.
Recommendation: If the waste is not regraded and covered with soil, a stormwater diversion berm should be installed to prevent the release of contact water.
- 2) At the time of this visual inspection, water was ponded in the base of the unfinished end of Cell 18. The landfill operator indicated that a pump is normally in place to remove surface water from this area.
Recommendation: Reinstall the pump to prevent the ponding of surface water in the vicinity of the active fill area.
- 3) The west slope of the recently constructed haul road on the west side of Cell 18 is steep. Erosion gullies in excess of 4 ft deep and shallow sloughs were noted at multiple locations along this slope.
Recommendation: Although the haul road is located outside of the solid waste boundary of the landfill, its overall stability is an integral part of the performance of the landfill. Therefore, it is recommended that corrective measures be taken to revise the west slope to ensure long term stability and control erosion.

SEDIMENT BASIN OBSERVATIONS/RECOMMENDATIONS

The existing sedimentation basin was constructed in 2015 and the area around the pond had just recently been vegetated. The pond has a composite liner across the base and a riprap protective layer. Items noted during the visual inspection of this area are described in the following list.

- 1) The upstream slopes of the sediment pond were lined with riprap and appeared in satisfactory condition.
Recommendation: None at this time.
- 2) The drop inlet and the primary spillway to the Capital Pond both appeared to be functioning properly and were unobstructed.

Recommendation: None at this time.

- 3) There are small erosion gullies forming along the perimeter ditches of the sediment basin.
Recommendation: Repair and vegetate the erosion features as part of the ongoing maintenance of the landfill area.

- 4) There is a small erosion gulley forming in southeast corner of the berm surrounding the sediment basin.
Recommendation: Repair and vegetate the area of erosion.

CAPITAL POND OBSERVATIONS/RECOMMENDATIONS

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

- 1) The upstream and downstream slopes of the Capital Pond were grass covered and in generally good condition. However, there was evidence of minor erosion in some areas of the slope.
Recommendation: Repair and vegetate the erosion features as part of the ongoing maintenance of the landfill area.
- 2) Standing water and phragmites were noted in the ditch north of the settling pond.
Recommendation: Improve drainage in the area to prevent the ponding of water along the toe of the embankment.

Coal Combustion Residuals Rule Landfill Requirements/Observations

In addition to the general observations and recommendations outlined in the preceding pages, this visual inspection was also performed to address the standards and guidelines required by the CCR Rule instituted by the Environmental Protection Agency on April 17, 2015. As a result, CCR Landfills are now required 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). Listed below are requirements specified within the CCR Rule and the observations made by Don Bryenton and Kilian Sweet during initial annual inspection:

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 initial inspection of the AB Brown Landfill was conducted by the undersigned professional engineer on December 4, 2015. Prior to the inspection, 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 December 4, 2015 did not reveal any immediate signs of failure for the landfill. However, as noted above, there are areas of that require repair and/or modification as part of the ongoing maintenance of the landfill area.

(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;

This is the first annual inspection of the Type III Restricted Waste Landfill at the AB Brown Generating Station. However, in the past year there has been ongoing construction of cells 18 North and 18 South. Cell 18 North is currently in operation, while construction of 18 South has stopped due to winter weather conditions. In addition, AB Brown Generating Station constructed the new sediment basin in the southwest corner of the landfill in 2015.

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

The approximate volume of CCR in the landfill is 6,800,000 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. However, several shallow sloughs and deep erosion gullies were noted on the west slope of the new haul road that is used to access Cell 18. It is recommended that this slope be flattened to reduce the potential for long-term slope instability in this area that is immediately adjacent to the disposal area.

Further, there is exposed CCR near the edge of the north end of Cell 17. It appears that surface water runoff that has been in contact with waste could overtop this area during a significant storm event. The area was being regraded and covered with an intermediate soil layer at the time of this inspection. Once that work has been completed, the area should be re-inspected to confirm that this concern has been resolved. If necessary, a surface water diversion berm should be constructed to ensure that contact water is contained within the limits of Cell 17.

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

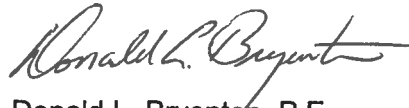
None noted at the time of this inspection.

We appreciate the opportunity to assist you with this project. If you have any questions concerning information contained in the report, or if the condition of the dam should change significantly from that described herein, please do not hesitate to call either of the undersigned at 317.849.4990.

Sincerely,
ATC Group Services, LLC



Kilian S. Sweet, E.I.T.
Staff Engineer



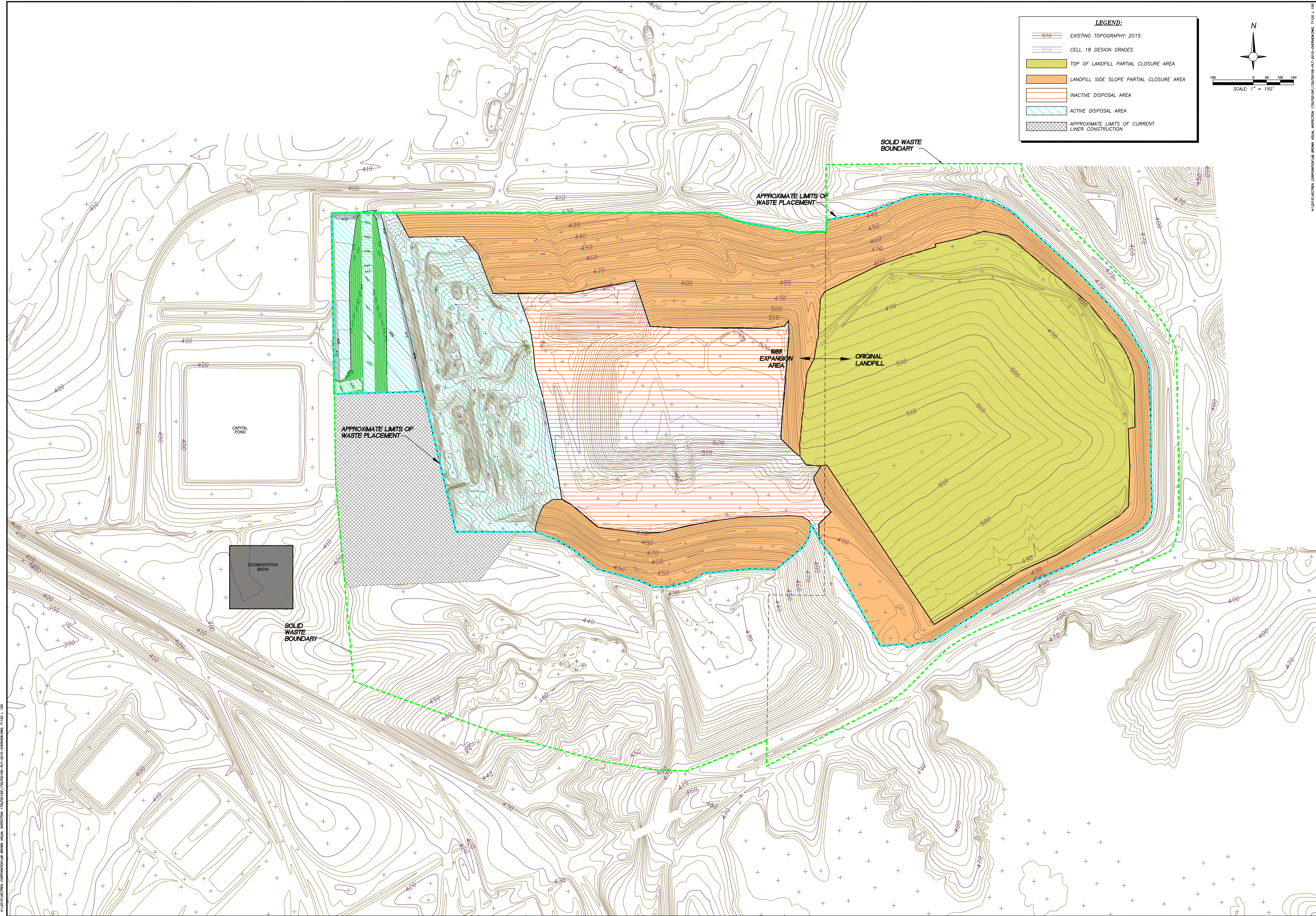
Donald L. Bryenton, P.E.
Principal Engineer

Copies: (3) Lisa Messinger – SIGECO



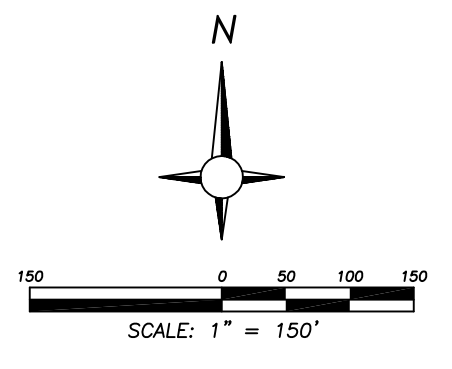
APPENDIX

APPENDIX A: SITE PLAN



LEGEND:

	EXISTING TOPOGRAPHY 2015
	CELL 18 DESIGN GRADES
	TOP OF LANDFILL PARTIAL CLOSURE AREA
	LANDFILL SIDE SLOPE PARTIAL CLOSURE AREA
	INACTIVE DISPOSAL AREA
	ACTIVE DISPOSAL AREA
	APPROXIMATE LIMITS OF CURRENT LINER CONSTRUCTION



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Company Name: SOUTHERN INDIANA GAS AND ELECTRIC COMPANY A.B. BROWN GENERATING STATION WEST FRANKLIN, INDIANA	
ATC GROUP SERVICES LLC 7988 Centertown Drive, Suite 100, Indianapolis, Indiana 46226-3345 Phone: (317) 254-8848, Fax: (317) 254-8849 www.atcgroupservices.com	
Drawing Title: SITE PLAN - 2015 LANDFILL VISUAL INSPECTION A.B. BROWN GENERATING STATION	
Sheet: 1	