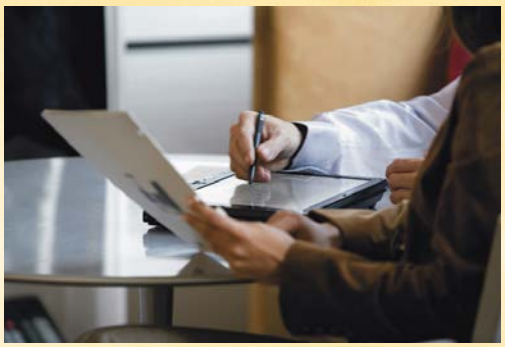
CLOSURE PLAN:
ASH PONDS A, B, C & BOTTOM ASH POND
HUTSONVILLE POWER STATION
Project J04PT



AmerenEnergy Medina Valley Cogen, L.L.C.

Crawford County, Illinois

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Ash Ponds A, B, C and Bottom Ash Pond
Hutsonville Power Station
Project J04PT

REVISION LOG

DATE	SECTION	PAGE	REVISION DETAIL
Revision 1 2/23/15	Revision Log		Added
	Table of Contents	Overall Document Table of Contents	Added Appendix I; Deleted Figures and Tables Dividers
	Closure Plan	8	3.1 Ash Pond A, paragraph 2 edited
	Closure Plan	10	"Critical Embankment Cross Section" page now shows “Cross-Section at B-1”
	Closure Plan	14	Section 4.3 edited
	Closure Plan	16	7.1 Demonstration of Compliance edited
	Closure Plan	17-18	Table 4 edited Table 5 edited 7.2 Compliance Determination and Mitigation Requirements edited
	Figures Tab	divider	Remove insertable divider as it is not needed
	Tables Tab	divider	Remove insertable divider as it is not needed
	Appendix B – GW Monitoring Plan	9	Section 5.2 edited; Table 4 edited; Table 5 edited
	Appendix B – GW Monitoring Plan	11-12	7.2.1 Compliance Determination, paragraph 1 edited; Items 1, 2 & 3 removed
	Appendix B – GW Monitoring Plan	Pages 1 - 25	Groundwater Statistical Calculations (App B) replaced
	Appendix C – GW Model Report	2	Table of Contents edited
	Appendix C – GW Model Report	22	4.5 Calibrations Flow and Transport Model Results, paragraph 3 edited
	Appendix C – GW Model Report	Appendix E Cover-Liner Comparison, Pages 1-93	Added entire Appendix E for inclusion of Cover-Liner Comparison
	Appendix D – GW Management Zone Application	Table of Contents, Page 2	Added reference to Appendix B
	Appendix D – GW Management Zone Application	Figure No. 1, Page 4	Replaced page 4 “Figure No. 3 Extent and Impacts of Limits of GMZ” with page 3 “Figure No. 1 Site Location Map”. Page 8 “Figure No. 3 Extent and Impacts of Limits of GMZ” remains unchanged.
	Appendix D – GW Management Zone Application	Appendix B pages 1 - 5	Added Section 620 including Part 1, Part 2, and Part 3 signed by Owner/Operator of facility
	Appendix I – Hydraulic Calculations	1 - 17	Added

End of Revision Log

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Closure Plan

Appendix A – Hydrogeologic Site Investigation

Appendix B – Groundwater Monitoring Plan

Appendix C – Groundwater Model Report

Appendix D – Groundwater Management Zone Application

Appendix E – Post-Closure Care Plan

Appendix F – Construction Quality Assurance Plan

Appendix G – Construction Specification

Appendix H – Construction Plans

Appendix I – Hydraulic Calculations

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portion of the Trench adjacent to Ash Pond A. Details are provided in the Ash Pond D Closure Plan (Hanson, 2011a) and Project Plans and Specifications (Hanson, 2011c).

Water captured by the Trench will be pumped from the four sumps to a central catch basin located adjacent to the existing Ash Pond D outlet structure along the mid-east side of the pond, from which it will then discharge to the Wabash River in accordance with the Station's NPDES permit.

3. Description of Ash Ponds

3.1 Ash Pond A

Ash Pond A was operational from 1986 until the plant ceased generation in December 2011 for disposal of CCWs generated at the Site. Fly ash from the operating units was collected by an electrostatic precipitator and sluiced to Ash Pond A. The pond was constructed with an 80 mil HDPE liner. CCWs were sluiced to the pond where solids were permitted to settle out and supernatant liquids were decanted. The pond contains fly ash within an area of approximately 12 acres, with an average ash thickness of 20.4 feet. It is estimated that Ash Pond A currently has 80,667 cubic yards (yd^3) of ash. The ash pond is contained by a 2,400 ft. long perimeter embankment that has an average height variance between 17 ft. on the southwest side, 15 ft. on the east side, and 18 ft. on the north side.

The exterior embankment slopes are approximately 3H:1V along the southwest and east sides and 2H:1V along the north side. Interior embankment slopes are currently 11H:1V, The mean thickness of ash in the pond is approximately 20.4 feet.

The cap will be constructed on a 20H:1V (5%) slope that will intersect the existing exterior embankment slope no higher than the existing ash surface. Soil embankment materials above that point will be removed and utilized for vegetative cover on the final cap.

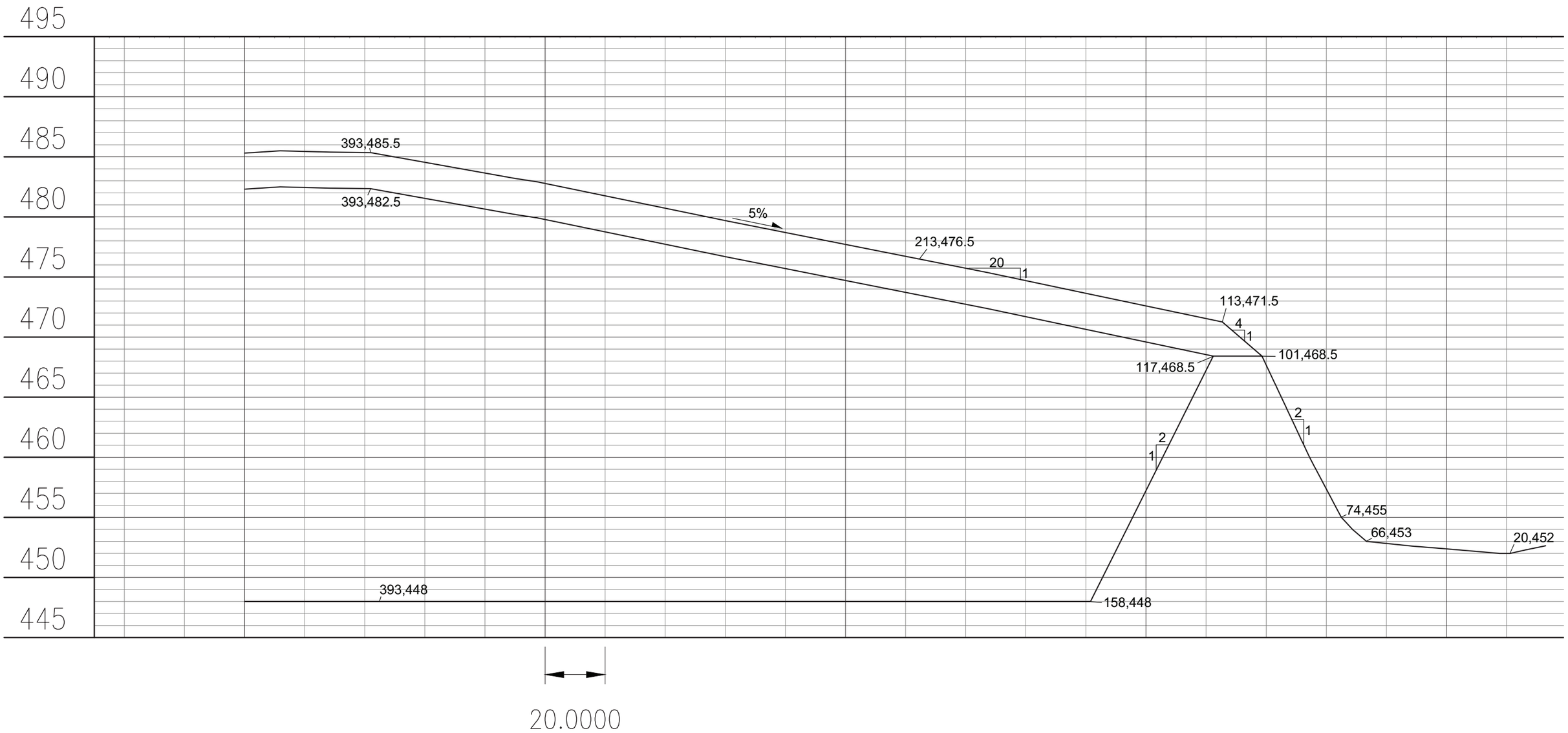
Analyses of the structural integrity of Ash Pond A in the proposed closed condition, including slope stability, bearing capacity and settlement, have been completed. The critical sections, selected for slope stability analysis of the perimeter berm and the final cover, are shown on Figure 3. A cross-section of the fully constructed critical section and the critical analyzed potential failure surface are included on Figure 4. Analyses of the proposed final configuration of the pond resulted in the following factors of safety (FOS) and induced settlement with regard to the structural stability of the pond.

Table 2. Structural Stability Analysis Results for Ash Pond A

Structural Stability Criteria	Calculated FOS	Required FOS*
Short Term Slope Stability – Exterior Embankment	2.02	1.5
Long Term Slope Stability – Exterior Embankment	2.18	1.5
Seismic Event Slope Stability – Exterior Embankment	1.96	1.3
Short Term Slope Stability – Cover Materials	12.45	1.5
Long Term Slope Stability – Cover Materials	11.70	1.5
Seismic Event Slope Stability – Cover Materials	6.79	1.3
Bearing Capacity	36.9	2.0
Seismic Event Bearing Capacity	36.2	1.5
Maximum Induced Settlement	2.25	N.A.

*The Required FOS is based on Illinois EPA Landfill Requirements, for comparison purposes.

Cross Section at B-1



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CRITICAL EMBANKMENT CROSS SECTION

ASH PONDS CLOSURE
HUTSONVILLE POWER STATION
HUTSONVILLE, CRAWFORD CO., ILLINOIS

HANSON NO. 14E0016 FIGURE 4

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4.14 Surface Water Management

Surface water management features have been incorporated into the final cover design, which will be graded to drain surface water at a uniform 5% slope toward the outside berm. The cover drainage is split into three collection areas. Drainage off the western-most third of the cover will collect in a rock chute at the northwest corner, where it is free to discharge toward the northeast using the existing roadside ditch and then out through an existing culvert beneath the north Site access road. Drainage from the eastern-most third of the cover will collect in a similar rock chute at the northeast corner, where it also discharges to the north through the same culvert beneath the Site access road. Drainage from the southern-most third of the cover will collect in a rock chute at the southeast corner, where it will discharge into a storm water retention pond in the area where Ash Pond B is currently located.

4.2 Clean Closure of Ash Pond B

Ash Pond B will be clean-closed and the berms removed to be re-used as cover material for Ash Pond A. Ash removal from Ash Pond B and relocation to Ash Pond A is estimated at approximately 12,500 yd^3. The geomembrane liner at Ash Pond B will be removed and the pond bottom graded to 4-ft. below the pond perimeter. The pond bottom will then be graded to drain to the southeast through a culvert and into the existing paved ditch along the south side of Ash Pond D. Storm water tributary to this pond will be detained for intermediate to large rain events to elevation 446.00 by under sizing the outlet culvert.

4.3 Clean Closure of Ash Pond C and Bottom Ash Sluice Pond

Ash Pond C and the Bottom Ash Sluice Pond will be clean-closed and graded to drain to the northeast through an open cut channel through the original east perimeter berm of Ash Pond D and discharged towards the Wabash River. Ash removal from Ash Pond C and relocation to Ash Pond A is estimated at 10,000 yd^3. The geomembrane liner at Ash Pond C will be removed. An estimated depth of 12 feet of bottom ash over the 1.2 acre area of the Bottom Ash Sluice Pond contains approximately 23,000 yd^3, which will be removed and relocated to Ash Pond A. All ash in these areas will be removed to ensure clean closure of these ponds. Any modifications required at the interface between previously closed Ash Pond D and the Bottom Ash Sluice Pond will be constructed in full compliance with the site-specific (Ash Pond D) closure requirements at 35 IAC 840.126. The required documentation will be submitted to the Illinois EPA upon completion of construction.

4.4 Groundwater Model Simulation of Closure

The groundwater model predicts that groundwater quality after Site closure as the following:

- The proposed closure activities, consisting of excavation, capping, and operation of the completed groundwater trench system, will facilitate compliance of the surrounding groundwater to the Class I groundwater standard.
- Monitoring wells for Ash Ponds A, B, and C are predicted to reach the Class I groundwater standard within 10 years.

4.5 Schedule

Completion of the closure activities is dependent on final approval of this Plan by the Illinois EPA. Assuming approval by December 31, 2014, and dependent on weather, the closure will be completed during the 2015 construction season.

7. Groundwater Monitoring Program

Upon approval of the Groundwater Management Zone Application (Hanson and NRT, 2014a), the groundwater monitoring program will be instituted. The requirements of the Groundwater Monitoring Program are found in the accompanying Groundwater Monitoring Plan (Hanson, 2014c).

The elements of the groundwater monitoring plan include:

1. Groundwater monitoring system with background (upgradient) and compliance (downgradient) monitoring wells identified including construction details/depths.
2. Groundwater monitoring for 7 field and 24 inorganic parameters (Table 4 and Table 5).
3. Quarterly groundwater monitoring frequency.
4. Groundwater sample collection protocol with standard operating procedures.
5. Laboratory analysis by a state-certified laboratory and listing of methods and reporting limits.
6. Quality Assurance Program for field collection of samples and laboratory analysis of samples.
7. Groundwater monitoring system maintenance, including schedule of inspections and methods for inspection of monitoring wells.
8. Data reporting schedule and content of reports.
9. Demonstration of compliance (Section 7.1 below). Statistical methods for evaluating groundwater quality data (Section 7.2 below). Included is a notification schedule with actions to be taken in cases of non-compliance.

Groundwater monitoring can be concluded upon successful completion of post-closure activities and approval of the Illinois EPA. All monitoring data and trend analysis data will be maintained at the offices of Ameren Environmental Services in St. Louis, Missouri, for a minimum of ten years following generation of the data.

7.1 Demonstration of Compliance

Compliance will be based on attainment of groundwater quality that meets the numeric standards for Class I potable resource groundwater as set forth in 35 IAC 620.410. Groundwater quality that does not meet the Class I standard will be considered in compliance when no statistically significant increasing trend can be attributed to the ash ponds at the compliance (GMZ) boundary for four (4) consecutive years, which must be approved by the Illinois EPA. Post-closure groundwater compliance monitoring will continue for a minimum of ten years from the Illinois EPA's approval of this Closure Plan.

Table 4. Field Monitoring Parameters

Parameters[2]
pH[3]
Specific Conductance[3]
Elevation of GW Surface[3]
Depth of Well (bls)[3]
Temperature
Depth to Water (bmp)
Elevation of measuring point

Table 5. Routine Monitoring Parameters

Parameters[2]	Parameters[2]
Antimony, dissolved	Iron[3], dissolved
Arsenic, dissolved	Lead, dissolved
Barium, dissolved	Manganese[3], dissolved
Beryllium, dissolved	Mercury, dissolved
Boron[3], dissolved	Nickel, dissolved
Cadmium, dissolved	Nitrate (as N), dissolved
Chloride, dissolved	Selenium, dissolved
Chromium, dissolved	Silver, dissolved
Cobalt, dissolved	Sulfate[3], dissolved
Copper, dissolved	Total Dissolved Solids (TDS) [3]
Cyanide, total	Thallium, dissolved
Fluoride, dissolved	Vanadium, dissolved
	Zinc, dissolved

7.2 Compliance Determination and Mitigation Requirements

Groundwater Management Zone (GMZ) compliance will be demonstrated by performing an annual trend analysis for each downgradient monitoring well for all of the monitored constituents listed in Table 4 and Table 5. The analysis shall be performed on a minimum of four (4) consecutive samples and use Sen's Estimate of Slope for compliance determination. Generally, if analyses for a parameter show an increasing trend at a down-gradient well, a Mann-Kendall analysis must be performed at a 95% confidence limit to determine whether the increasing trend is statistically significant. If there is a statistically significant increase, then an investigation determining that the statistically significant increasing trend is due to a superseding cause will be performed, and the Illinois EPA will be notified in writing, stating the cause of the increasing trend and the rationale used in its determination.

[2] Routine parameters are reported as dissolved (filtered) concentrations with the exception of the Field Monitoring Parameters and Cyanide, which are taken from total (unfiltered) samples.
[3] Mandatory monitoring parameter under 35 IAC 840.114(a).

If a statistically significant increasing trend continues to be observed over two or more consecutive monitoring periods and there is no superseding cause, a hydrogeologic investigation (and additional site investigation(s), if necessary) must be performed.

Based on the outcome of the additional activities, action must be taken to mitigate the statistically significant increasing trends that are causing, threatening or allowing exceedances of the GMZ groundwater quality standards. Any actions must be proposed as a modification to the post-closure care plan within 180 days after completion of the additional hydrogeologic and/or additional site investigations.

8. Time and Cost Estimates

8.1 Time to Complete Closure

Completion of the closure activities is dependent on weather and final approval of the closure plan and accompanying submittals by the Illinois EPA. However, they are expected to be completed during the 2015 construction season.

8.2 Time to Reach Hydrostatic Equilibrium of Groundwater

The Hydrogeologic Evaluation of Landfill Performance model (HELP Version 3.07) was used to estimate the time for groundwater levels within Ash Pond A to reach hydrostatic equilibrium following completion of the cap. Based on model results for four scenarios with initial moisture contents ranging from zero to 180 inches, the minimum and maximum times for hydraulic head to reach equilibrium ranged from 6 to 8 years. Three of the four scenarios resulted in modeled equilibriums ranging from 61 to 69 inches of head occurring in Year 6 following cap completion.

8.3 Model Predicted Time to Attain Groundwater Quality Standards

The number of years following closure for model predicted boron concentrations (NRT, 2014) in Ash Pond A, B, and C monitoring wells to attain the Class I groundwater standard is approximately 10 years (2025). Predicted boron concentrations will stabilize shortly after the closure plan is implemented in monitoring wells with low concentrations (wells MW5 and MW9), while other wells are predicted to take as long as 40 years to stabilize. Stabilization time is greater than time to comply with Class I groundwater standards at some wells because concentrations continue to decline for a period after the standard is attained.

8.4 Cost of Closure and Post-Closure Care (or Cost of Closure Alternative)

The cost for closure activities related to the closure of Ash Pond A, Ash Pond B, Ash Pond C, and the Bottom Ash Sluice Pond, as described in Section 4 of this Closure Plan and as detailed in the Plans and Specifications (Hanson, 2014d), is estimated to be $2,600,000. The cost for post-closure care activities related to the closure of Ash Pond A, Ash Pond B, Ash Pond C, and the Bottom Ash Sluice