October 2016

Dynegy Midwest Generation, LLC
13498 E 800th St.
Hennepin, IL 61327

RE: History of Construction
USEPA Final CCR Rule, 40 CFR § 257.73(c)
Hennepin Power Station
Hennepin, Illinois

On behalf of Dynegy Midwest Generation, LLC, AECOM has prepared the following history of construction for the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond at the Hennepin Power Station in accordance with 40 CFR § 257.73(c).

BACKGROUND

40 CFR § 257.73(c)(1) requires the owner or operator of an existing coal combustion residual (CCR) surface impoundment that either (1) has a height of five feet or more and a storage volume of 20 acre-feet or more, or (2) has a height of 20 feet or more to compile a history of construction by October 17, 2016 that contains, to the extent feasible, the information specified in 40 CFR § 257.73(c)(1)(i)–(xii).

The history of construction presented herein was compiled based on existing documentation, to the extent that it is reasonably and readily available (see 80 Fed. Reg. 21302, 21380 [April 17, 2015]), and AECOM’s site experience. AECOM’s document review included construction drawings, geotechnical investigations, operation and maintenance information, etc. for Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond at the Hennepin Power Station.
HISTORY OF CONSTRUCTION

§ 257.73(c)(1)(i): The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

Owner: Dynegy Midwest Generation, LLC
Address: 1500 Eastport Plaza Drive
         Collinsville, IL 62234

CCR Units: Old West Polishing Pond
          Old West Ash Pond (Pond No. 1 and Pond No. 3)
          Ash Pond No. 2
          East Ash Pond, IDNR Dam ID No. IL50363

The Old West Polishing Pond, Old West Ash Pond, and Ash Pond No. 2 do not have a state assigned identification number.

§ 257.73(c)(1)(ii): The location of the CCR unit identified on the most recent USGS 7 1/2 or 15 minute topographic quadrangle map or a topographic map of equivalent scale if a USGS map is not available.

The locations of the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond have been identified on an USGS 7-1/2 minute topographic quadrangle map in Appendix A.

§ 257.73(c)(1)(iii): A statement of the purpose for which the CCR unit is being used.

The following captures the purpose of each CCR unit:
- The Old West Polishing Pond (inactive) was used to store and dispose fly ash and bottom ash and is currently being used to clarify stormwater runoff from the Old West Ash Pond prior to discharge in accordance with the station’s NPDES permit.
- The Old West Ash Pond (inactive) was used to store and dispose fly ash and bottom ash.
- The Ash Pond No. 2 (inactive) was used to store and dispose fly ash, bottom ash, and other non-CCR waste streams including coal pile runoff.
- The East Ash Pond is being used to store and dispose bottom ash, fly ash, and other non-CCR waste and to clarify process water prior to discharge in accordance with the station’s NPDES permit.

Notice of intent to close the Old West Polishing Pond, Old West Ash Pond, and Ash Pond No. 2 was provided in November 2015.¹

¹ This history of construction report was prepared on a facility-wide basis for CCR surface impoundments at the Hennepin Power Station. The inclusion of the Old West Polishing Pond, Old West Ash Pond, and Ash Pond No. 2 in this history of construction report does not concede and should not be construed to concede that the Old
§ 257.73(c)(1)(iv): The name and size in acres of the watershed where the CCR unit is located.

The Hennepin Power Station and the above-referenced CCR units are located at the western edge of the Depue Lake-Illinois River Watershed with a 12-digit Hydrologic Unit Code (HUC) of 071300010804 and a drainage area of 44,525 acres (USGS 2016).

§ 257.73(c)(1)(v): A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.

Physical properties of the foundation materials for the Old West Polishing Pond and Old West Ash Pond are described as cohesive material underlain by granular material. The cohesive material consists of lean clay, gravelly clay, silt, clayey silt, and sandy silt. The consistency of the cohesive material varies from very soft to medium stiff. The granular material consists of silty sand and clayey gravel. The relative density of the granular materials varies from loose to very dense and generally increases with depth. An available summary of the engineering properties of the foundation materials for the Old West Polishing Pond and Old West Ash Pond is presented in Table 1 below. The engineering properties are based on previous geotechnical explorations and laboratory testing.

Table 1. Summary of Material Engineering Properties for the Old West Polishing Pond and Old West Ash Pond

<table>
<thead>
<tr>
<th>Layer</th>
<th>Unit Weight (pcf)</th>
<th>Total (undrained) Shear Strength Parameters</th>
<th>Effective (drained) Shear Strength Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(\phi) (deg)</td>
<td>(c) (psf)</td>
</tr>
<tr>
<td>CL (soft)</td>
<td>120</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>CL (medium stiff gravely clay)</td>
<td>120</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>ML (soft to medium stiff)</td>
<td>125</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>CL-ML (very soft)</td>
<td>120</td>
<td>0</td>
<td>400</td>
</tr>
<tr>
<td>SM (very loose)</td>
<td>125</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>GC (dense)</td>
<td>130</td>
<td>34</td>
<td>0</td>
</tr>
<tr>
<td>GC (very dense)</td>
<td>130</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td>Fill: GC (very dense)</td>
<td>130</td>
<td>34</td>
<td>50</td>
</tr>
</tbody>
</table>

West Polishing Pond, Old West Ash Pond, and Ash Pond No. 2 are subject to the Design Criteria or all Operating Criteria in the CCR Rule.
The Old West Polishing Pond and Old West Ash Pond are enclosed impoundments with dikes and do not have abutments.

Physical properties of the foundation and abutment materials for Ash Pond No. 2 and the East Ash Pond are described as gravel materials with varying amounts of silt and clay. The relative density of the gravel is medium dense to very dense. An available summary of the engineering properties of the foundation materials for Ash Pond No. 2 and the East Ash Pond is presented in Table 2 below. The engineering properties are based on previous geotechnical explorations and laboratory testing.

Table 2. Summary of Foundation and Abutment Material Engineering Properties for the Ash Pond No. 2 and East Ash Pond

<table>
<thead>
<tr>
<th>Material</th>
<th>Unit Weight (pcf)</th>
<th>Effective (drained) Shear Strength Parameters</th>
<th>Total (undrained) Shear Strength Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>c' (psf)</td>
<td>Φ' (°)</td>
</tr>
<tr>
<td>Alluvial Foundation</td>
<td>135</td>
<td>0</td>
<td>38</td>
</tr>
</tbody>
</table>

§ 257.73(c)(1)(vi): A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.

Physical properties of the embankment materials for the Old West Polishing Pond and Old West Ash Pond are described as gravel with occasional zones of clayey sand and lean clay. The gravel has a general relative density of very dense. An available summary of the engineering properties of the embankment materials for the Old West Polishing Pond and Old West Ash Pond is presented in Table 1 above. The engineering properties are based on previous geotechnical explorations and laboratory testing.

The physical properties of Ash Pond No. 2 embankment construction materials are described in this paragraph. The original embankments are constructed of sand with varying amounts of coal pieces and gravel. The initial embankment raise is constructed of silty clay, clayey sand, sand, and gravel and the later embankment raise is constructed with layers of lean clay, silty clay, clayey silt, clayey, and gravel. An available summary of the engineering properties of the embankment materials for Ash Pond No. 2 is presented in Table 3 below. The engineering properties are based on previous geotechnical explorations and laboratory testing.
Table 3. Summary of Construction Material Engineering Properties for Ash Pond No. 2

<table>
<thead>
<tr>
<th>Material</th>
<th>Unit Weight (pcf)</th>
<th>Effective (drained) Shear Strength Parameters</th>
<th>Total (undrained) Shear Strength Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>c' (psf)</td>
<td>c (psf)</td>
</tr>
<tr>
<td>Fill: GP-GM (medium dense)</td>
<td>125</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>Fill: CL (hard)</td>
<td>120</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>Fill: ML (hard)</td>
<td>120</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>Fill: SC (medium dense)</td>
<td>120</td>
<td>0</td>
<td>28</td>
</tr>
</tbody>
</table>

Physical properties of the embankment materials for the East Ash Pond are described as clayey silt and clay. The consistency of both the clayey silt and clay ranges from stiff to hard. The original pond surface is lined with a 4-foot thick compacted clay layer of 1.0 x 10^{-7} cm/s underlain by a 1-foot thick sand layer. The liner system of the embankment raise consists of a (from top to bottom) 45 mil reinforced polyethylene geomembrane, a 1-foot thick clay layer, and an 8 oz/sy polypropylene geotextile. A typical cross section profile of the liner system is shown on drawing C-56 presented in Appendix B. An available summary of the construction material engineering properties for the East Ash Pond is presented in Table 4 below. The engineering properties are based on previous geotechnical explorations and laboratory testing.

Table 4. Summary of Construction Material Engineering Properties for the East Ash Pond

<table>
<thead>
<tr>
<th>Material</th>
<th>Unit Weight (pcf)</th>
<th>Effective (drained) Shear Strength Parameters</th>
<th>Total (undrained) Shear Strength Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>c' (psf)</td>
<td>c (psf)</td>
</tr>
<tr>
<td>Embankment Fill</td>
<td>105</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>Liner System</td>
<td>120</td>
<td>60</td>
<td>30</td>
</tr>
</tbody>
</table>

The method of site preparation and construction of the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and the original East Ash Pond are not reasonably and readily available. Site preparation and construction of the 2003 East Ash Pond liner raise were completed in accordance with the applicable construction specification (see § 257.73(c)(1)(xi) below).

Reasonably and readily available approximate dates of construction of each successive stage of construction of the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond are provided in Table 5 below.
Table 5. Approximate dates of construction of each successive stage of construction.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951 to 1952</td>
<td>Construction of historical Ash Pond No. 1</td>
</tr>
<tr>
<td>1958</td>
<td>Construction of Ash Pond No. 2</td>
</tr>
<tr>
<td>Late 1960’s</td>
<td>Construction of historical Ash Pond No. 3</td>
</tr>
<tr>
<td>1978</td>
<td>Embankment raise of Ash Pond No. 2</td>
</tr>
<tr>
<td>1985</td>
<td>Embankment raise of Ash Pond No. 2 to elevation 484 feet and Ash Pond No. 3 (Old West Ash Pond) to elevation 460 feet</td>
</tr>
<tr>
<td>1988 to 1989</td>
<td>Embankment raise of Old West Ash Pond to elevation 465 feet that merged historical Ash Pond No. 1 and Ash Pond No. 3 into one single pond and created the Old West Polishing Pond</td>
</tr>
<tr>
<td>1989</td>
<td>Embankment raise of Ash Pond No. 2 to elevation 494 feet</td>
</tr>
<tr>
<td>1995 to 1996</td>
<td>Construction of East Ash Pond</td>
</tr>
<tr>
<td>2003</td>
<td>Embankment liner raise of East Ash Pond</td>
</tr>
<tr>
<td>2009 to 2010</td>
<td>Eastern portion of Ash Pond No. 2 was removed to facilitate construction of the Leachate Pond</td>
</tr>
<tr>
<td>2011</td>
<td>Landfill Cell 1 was constructed over placed CCR in Ash Pond No. 2 adjacent to the Leachate Pond</td>
</tr>
<tr>
<td>2014</td>
<td>North Embankment tree removal, grading, and vegetation re-establishment of Ash Pond No. 2</td>
</tr>
</tbody>
</table>

§ 257.73(c)(1)(vii): At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

Drawings that contain items pertaining to the requested information for the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond are listed in Table 6 below. Items marked as “Not Available” are items not found during a review of the reasonably and readily available record documentation.
Table 6. List of drawings containing items pertaining to the information requested in § 257.73(c)(1)(vii).

<table>
<thead>
<tr>
<th>Dimensional plan view (all zones)</th>
<th>Old West Polishing Pond</th>
<th>Old West Ash Pond</th>
<th>Ash Pond No. 2</th>
<th>East Ash Pond</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEN1-B460-2</td>
<td>HEN1-B460-1 to 2</td>
<td>HEN1-B461, HEN1-C117</td>
<td>HEN1-C55</td>
<td></td>
</tr>
<tr>
<td>Dimensional cross sections</td>
<td>HEN1-B452 to B457</td>
<td>HEN1-B452 to B457</td>
<td>HEN1-B458-1 to 7, Berm Modification Drawings 7 to 9</td>
<td>HEN1-C56 to C59</td>
</tr>
<tr>
<td>Foundation Improvements</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Drainage Provisions</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Spillways and Outlets</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Applicable</td>
<td>HEN1-C8 to C9, HEN1-C109, HEN1-C113</td>
</tr>
<tr>
<td>Diversion Ditches</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Instrument Locations</td>
<td>Figure 2D</td>
<td>Figure 2C</td>
<td>Figure 2A</td>
<td>Figure 2B</td>
</tr>
<tr>
<td>Slope Protection</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Berm Modification Drawings 3 to 9</td>
<td>HEN1-C56 to C59</td>
</tr>
<tr>
<td>Normal Operating Pool Elevation</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Maximum Pool Elevation</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Approximate Maximum Depth of CCR in 2016</td>
<td>11 feet</td>
<td>15 feet</td>
<td>46 feet</td>
<td>35 feet</td>
</tr>
</tbody>
</table>

All drawings referenced in Table 6 above can be found in Appendix B and Appendix C.

Based on the review of the drawings listed above, no natural or manmade features that could adversely affect operation of these CCR units due to malfunction or mis-operation were identified.
§ 257.73(c)(1)(viii): A description of the type, purpose, and location of existing instrumentation.

Existing instrumentation consists of open-standpipe piezometers installed in 2015. The purpose of the piezometers is to measure the pore water pressures within the embankments of the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond. There are seven (7) existing piezometers within the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond. A location map of the existing instrumentation is presented in Appendix C.

§ 257.73(c)(1)(ix): Area-capacity curves for the CCR unit.

Area-capacity curves for the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond are not reasonably and readily available.

§ 257.73(c)(1)(x): A description of each spillway and diversion design features and capacities and calculations used in their determination.

The Old West Polishing Pond contains a 24-inch diameter corrugated metal pipe (CMP) outlet that discharges stormwater to the Illinois River in accordance with the station’s NPDES permit. Current capacity and calculation information for the Old West Polishing Pond’s discharge capability is not reasonably and readily available.

The Old West Ash Pond contains a 24-inch dia. pipe culvert. Stormwater collected within the CCR unit drains via surface flow and through the pipe culvert into the Old West Polishing Pond. Current capacity and calculation information for the Old West Ash Pond’s discharge capability is not reasonably and readily available.

The Ash Pond No. 2 does not contain a spillway or diversion feature. Stormwater collected within the CCR unit drains via surface flow into the East Ash Pond. Current capacity and calculation information for the Ash Pond No. 2’s discharge capability is not reasonably and readily available.

The East Ash Pond contains two outlet structures. The southeast outlet is a 5-foot wide stop-log structure that is connected to a 36-inch diameter reinforced concrete pipe (RCP). The 36-inch diameter RCP discharges into the East Polishing Pond. The northeast outlet, located on the northeast corner of the East Ash Pond, is a headwall structure connected to an 18-inch diameter RCP. The 18-inch diameter RCP discharges into the East Leachate Pond. In 2016, the discharge capacity of the East Ash Pond was evaluated using HydroCAD 10 software modeling a 1,000-year, 24-hour rainfall event. The model results indicate that the East Ash Pond has enough storage capacity and will not overtop the embankment during the 1,000-year, 24-hour storm event. The results of the HydroCAD 10 analysis are presented below in Table 7.
Table 7. Results of HydroCAD 10 analysis

| Approximate Minimum Berm Elevation\(^1\) (ft) | 493.0 |
| Approximate Emergency Spillway Elevation\(^1\) (ft) | Not Applicable |
| Starting Pool Elevation\(^1\) (ft) | 490.4 |
| Peak Elevation\(^1\) (ft) | 492.2 |
| Time to Peak (hr) | 12.5 |
| Surface Area (ac) | 6.5 |
| Storage\(^2\) (ac-ft) | 8.4 |

Note: 1. Elevations are based on NAVD88 datum
2. Storage given is from Starting Pool Elevation to Peak Elevation.

§ 257.73(c)(1)(xi): The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.

The construction specifications for Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and the original East Ash Pond are not reasonably and readily available. The construction specification for the 2003 East Ash Pond liner raise is located in Specification J-2616, Rev. A (presented in Appendix D).

The provisions for surveillance, maintenance, and repair of the Old West Polishing Pond and Old West Ash Pond are located in Hennepin Power Station; West Ash Disposal Pond Maintenance Plan (2013) (presented in Appendix E). The provisions for surveillance, maintenance, and repair of Ash Pond No. 2 are located in Hennepin Power Station; Old East Ash Disposal Pond Maintenance Plan (2013) (presented in Appendix F). The provisions for surveillance, maintenance, and repair of the East Ash Pond are located in Hennepin Power Station; East Ash Disposal Pond Maintenance Plan (2014) (presented in Appendix G).

The operations and maintenance plans for the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond are currently being revised by Dynegy Midwest Generation, LLC.

§ 257.73(c)(1)(xii): Any record or knowledge of structural instability of the CCR unit.

There is no record or knowledge of structural instability of the Old West Polishing Pond, Old West Ash Pond, Ash Pond No. 2, and East Ash Pond at the Hennepin Power Station.
LIMITATIONS

The signature of AECOM's authorized representative on this document represents that to the best of AECOM's knowledge, information and belief in the exercise of its professional judgment, it is AECOM's professional opinion that the aforementioned information is accurate as of the date of such signature. Any recommendation, opinion or decisions by AECOM are made on the basis of AECOM's experience, qualifications and professional judgment and are not to be construed as warranties or guaranties. In addition, opinions relating to environmental, geologic, and geotechnical conditions or other estimates are based on available data and that actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Sincerely,

Claudia Prado Victor Modeer, P.E., D.GE
Project Manager Senior Project Manager

REFERENCES


APPENDICES

Appendix A: History of Construction Vicinity Map
Appendix B: Hennepin Power Station Drawings
Appendix C: Hennepin Power Station Piezometer Locations
Appendix D: Specification J-2616, Rev. A, Primary Ash Pond Modifications
Appendix E: Hennepin Power Station; West Ash Disposal Pond Maintenance Plan (2013)
Appendix F: Hennepin Power Station; Old East Ash Disposal Pond Maintenance Plan (2013)
Appendix G: Hennepin Power Station; East Ash Disposal Pond Maintenance Plan (2014)
Appendix A: History of Construction Vicinity Map
Appendix B: Hennepin Power Station Drawings

1. “Plan of Primary Ash Pond, Modification to Primary Ash Pond”, Drawing No. C-55, Revision 0.1, 14 February, 2003, Sargent & Lundy, LLC.

2. “Sections and Details – Sheet 1, Modification to Primary Ash Pond”, Drawing No. C-56, Revision 0.1, 14 February, 2003, Sargent & Lundy, LLC.

3. “Sections and Details – Sheet 2, Modification to Primary Ash Pond”, Drawing No. C-57, Revision 0.1, 14 February, 2003, Sargent & Lundy, LLC.

4. “Sections and Details – Sheet 3, Modification to Primary Ash Pond”, Drawing No. C-58, Revision 0.1, 14 February, 2003, Sargent & Lundy, LLC.

5. “Sections and Details – Sheet 4, Modification to Primary Ash Pond”, Drawing No. C-59, Revision 0.1, 14 February, 2003, Sargent & Lundy, LLC.


Appendix B: Hennepin Power Station Drawings (continued)


27. “East Berm Modification, Existing Site Conditions”, Drawing No. 3, Revision 3, 4 February, 2015, Civil & Environmental Consultants, Inc.


31. “East Berm Modification, Proposed Sections Sta 1+00 to 15+00”, Drawing No. 7, Revision 3, 4 February, 2015, Civil & Environmental Consultants, Inc.

32. “East Berm Modification, Proposed Sections Sta 16+00 to 23+50”, Drawing No. 8, Revision 3, 4 February, 2015, Civil & Environmental Consultants, Inc.

33. “East Berm Modification, Berm and Erosion Control Details”, Drawing No. 9, Revision 3, 4 February, 2015, Civil & Environmental Consultants, Inc.
CROSS SECTIONS OF
ASH POND BERM EXTENSION
STA 30+00, 35+00 & 39+00
HENNEPIN POWER STATION

FILL TYPE B

NEW BERM
WATER LINE
ESTIMATED ELEVATION

OLD BERM
REFERENCE BASE LINE
SHOWN ON PLAN

15'

3.0

2.5

1.0

460

465

470
CROSS SECTIONS OF ASH POND BERM EXTENSION
STA 61+50
HENNEPIN POWER STATION

SECTION A-A

LEDGEND

15'
465
3
1
2.5
1
2.5

EXISTING ROAD

STATION 61+50

STATION 18+00
1. Data collected from topo on DWG. CE-HEN1-B-450 dated Nov. 4, 1987, Rev. 0
2. Coordinates were supplied by G. Deckard field information tying to J.L. Fisher's panels.
1. DATA COLLECTED FROM TOPO ON DWG. CE-HEN1-B-450 DATED NOV. 4, 1987, REV. 0
2. COORDINATES WERE SUPPLIED BY G. DECKARD FIELD INFORMATION TIEING TO J.L. FISHER'S PANELS.

BASE LINE N. 11,000

WATER EDGE OF ILLINOIS RIVER

AREA =5.51058
AREA =43.3203
AREA =7.06549
AREA =41.6442
AREA =3.57402
AREA =6.27182
DATA COLLECTED FROM TOPO ON DWG. CE-HEN1-B-450 DATED NOV. 4, 1987, REV. 0
COORDINATES WERE SUPPLIED BY G. DECKARD FIELD INFORMATION TIEING TO J.L. FISHER'S PANELS.

AREA = 42.1871
AREA = 6.01374
AREA = 40.5428
AREA = 0.018791
AREA = 0.132097
1. Data collected from topo on DWG. CE-HEN1-B450 dated Nov. 4, 1987, Rev. 0
2. Coordinates were supplied by G. Deckard Field Information tying to J.L. Fisher's panels.

Base Line N. 11,000

Water edge of Illinois River
1. DATA COLLECTED FROM TOPO ON DWG. CE-HEN1-B-450 DATED NOV. 4, 1987, REV. 0
2. COORDINATES WERE SUPPLIED BY G. DECKARD FIELD INFORMATION TIEING TO J.L. FISHER'S PANELS.

BASE LINE N. 11,000

WATER EDGE OF ILLINOIS RIVER

SECTION E. 51,920

AREA = 1.27521

AREA = 38.3341

AREA = 6.80794

AREA = 1.37484

AREA = 29.0000
1. DATA COLLECTED FROM TOPO ON DWG. CE-HEN1-B-450 DATED NOV. 4, 1987, REV. 0
2. COORDINATES WERE SUPPLIED BY G. DECKARD FIELD INFORMATION TIEING TO J.L. FISHER'S PANELS.

BASE LINE N. 11,000

WATER EDGE OF ILLINOIS RIVER

AREA = 5.00497
AREA = 5.28837
AREA = 21.4758

2.5

1

AREA = 5.29436
AREA = 10.20844
AREA = 16.7548

2.5

1

2.5
1. Data collected from Topo on DWG. CE-HEN1-B-450 dated Nov. 4, 1987, REV. 0
2. Coordinates were supplied by G. Deckard field information tying to J.L. Fisher's panels.

Section E.

Area = 3.62286

Area = 4.00617
This drawing is the property of DYNEGY MIDWEST GENERATION, INC. 5910 Haper Road, Suite 106  -  Solon, OH  44139.

SURVEY CONDUCTED BY SURDEX CORPORATION.

TOPOGRAPHY MAY VARY.

DUE TO CONSTRUCTION ACTIVITIES, ACTUAL FIELD TOPOGRAPHIC INFORMATION BASED UPON AERIAL.

REVISION - 082-255
11/05/2010

THIS DRAWING IS NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

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It which is, or may be, injurious to a third party orDYNEGY.

LEGEND
EXISTING BENCHMARK
EXISTING FENCE
EXISTING PONDS/STREAMS
EXISTING PIPING
EXISTING STORMWATER DRAINS
EXISTING INDEX CONTOUR
PRIMARY POND
SECONDARY POND
OUTLET STRUCTURE
BRUSH

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
5910 Haper Road, Suite 106  -  Solon, OH  44139

Hennevin Power Station

Location

Discharge
EXISTING SITE CONDITIONS PLAN

AS-BUILT CONSTRUCTION PLANS

BASE GRADE ELEVATION
441.27

EXISTING LOWER ACCESS ROAD

EXISTING LOWER ACCESS ROAD

RETIRED ASH POND NO. 2

LANDFILL PHASE 1

EXISTING BOTTOM ASH ACCUMULATION AREA

RETIRED ASH POND NO. 2

SECONDARY POND

POND 2 EAST

EXHIBIT POND 3 EAST OUTER CONSTRUCTION

LEGEND

1. MEASUREMENT MARKING
   2. REVIEWER MARKING
   3. ELOPE PRIVATE
   4. ACCESS ROAD
   5. PROPERTY PERIMETER
   6. EXISTING EMBANKMENT
   7. EXISTING EMBANKMENT PLANNED
   8. EXISTING ACCESS ROAD
   9. EXISTING ACCESS ROAD
   10. PROPERTY MARKINGS

DESCRIPTION

1. 5/2013 IDNR DAM MODIFICATION PERMIT
2. 6/9/2014 ISSUED FOR CONSTRUCTION
3. AS-BUILT CONSTRUCTION PLANS

SCALE 1:400

DWG: 05-36-00-001

DATE: FEBRUARY 2015

DRAWN BY: DFB MDJ
CHECKED BY: MDJ
APPROVED BY:

PROJECT NO:
SHEET OF:
DRAWING NO.:

DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
EAST BERM MODIFICATION
HENNEPIN, ILLINOIS

555 Butterfield Road, Suite 300 - Lombard, IL 60148
www.cecinc.com
DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
EAST BERM MODIFICATION
HENNEPIN, ILLINOIS

DATE: DWG SCALE:
DRAWN BY: CHECKED BY: APPROVED BY:
PROJECT NO: SHEET OF
DRAWING NO.: PROPOSED GRADING PLAN
132-650AS NOTED FEBRUARY 2015

DESCRIPTION
SUBMITTAL RECORD
3 2/4/2015 AS-BUILT CONSTRUCTION DRAWINGS

REVISION RECORD

DESCRIPTION
REVISION RECORD

NORTH

PROPOSED SECTIONS (THREE)

BASE DECK ELEVATION 441.7

WEST ACCESS RAMPS

LOWER ACCESS ROAD 4' X DEERMAIN

UPPER ACCESS ROAD

-TREE AND ROOT BALL REMOVAL ONLY

-Tree and root ball removal as well as berm reconfiguration

RETIRED ASH POND

LEGEND

AS-BUILT CONSTRUCTION PLANS

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
555 Butterfield Road, Suite 300 - Lombard, IL 60148
www.cecinc.com

DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
EAST BERM MODIFICATION

PROPOSED GRADING PLAN
1 OF 3
Appendix C: Hennepin Power Station Piezometer Locations
HENNEPIN OLD WEST ASH POND (POND NO. 1 AND POND NO. 3)
Appendix D: Specification J-2616, Rev. A, Primary Ash Pond Modifications
DYNEGY MIDWEST GENERATION
HENNEPIN POWER STATION

SPECIFICATION J-2616, REV. A
PERMIT APPLICATION

PRIMARY ASH POND MODIFICATIONS

Prepared By:
Sargent & Lundy, LLC
55 East Monroe Street
Chicago, Illinois 60603
## PRIMARY ASH POND MODIFICATIONS

### ISSUE SUMMARY

<table>
<thead>
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<th>Rev.</th>
<th>Purpose of Issue</th>
<th>Date</th>
<th>Sections Affected</th>
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<td>Spec No. J-2616 Released for Permit Application</td>
<td>02/14/03</td>
<td>All</td>
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CERTIFICATION OF SPECIFICATION
FOR
PRIMARY ASH POND MODIFICATION

I certify that this Specification was prepared by me or under my supervision and that I am a registered professional engineer under the laws of the State of Illinois.

Sargent & Lundy LLC's Illinois Department of Professional Regulation registration number is 184-000106.

Certified By:  
Date: Feb 14, 2003

Seal

Revision:  
Certified By:  
Date:  

EXP. 11-30-03
# PRIMARY ASH POND MODIFICATIONS

## TABLE OF CONTENTS

Notes:

1. Where Division and/or Sections are not included, work under the unlisted headings is not part of the Work.

2. This Table of Contents will indicate the date of issue for the latest complete issue or revision issue of each section and any subsequent revision issue thereto.

3. The numbering and subsequent Revisions to the Specification are in sequence with the previously issued Revision mark number.

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<td>PCTC 54005 Earthwork and Clay Lining for a Clay/Geomembrane Lined Ash Pond</td>
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<td>PCTC 56008 Polypropylene Geomembrane Liner for a Pond</td>
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<td>PCTC 57001 Geotextile for Lined Ponds</td>
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<td>PCTC 60008 Quality Assurance for Installation of Earthwork and Clay Lining for the Ash Pond</td>
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FABRIC FORMED CONCRETE MATS

ISSUE SUMMARY

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<td>Daniel Kline</td>
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**FABRIC FORMED CONCRETE MATS**

**TABLE OF CONTENTS**

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1. This Table of Contents will indicate the date of issue for the latest complete issue or revision issue of each section and any subsequent revision issue thereto.

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<td>5.5 Acceptable Materials</td>
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<td>6.0 Execution</td>
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<tr>
<td>6.1</td>
<td>Acceptance and Storage at the Project Site</td>
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<td>6.1.1</td>
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<td>6.4</td>
<td>Concrete Injection</td>
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1.0 Scope of Work

The intent of this specification is to define the material and installation requirements for fabric formed concrete mats installed in accordance with the Design Drawings, technical data and as specified herein.

1.1 Work Included

The work shall include, but not be limited to, the following items as indicated:

A. Preparation and grading of surfaces to receive fabric mats.
B. Placing fabric mats and filling them with a pumpable sand/cement slurry to form a stable erosion protection system.
C. Offsite disposal of excess or unsuitable materials and debris.

2.0 Codes and Standards

A. Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment and materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state or local codes having jurisdiction.

B. References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of contract for the work.

C. Abbreviations listed indicate the form used to identify the reference documents in the specification text.

2.1 ASTM – American Society for Testing and Materials

A. ASTM C 31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
F. ASTM C 231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.


M. ASTM D3776 – Standard Test Methods for Mass Per Unit Area (Weight) of Fabric.


3.0 Supplier’s Drawings and Data Submittals

A. Supplier shall submit drawings and data as specified. Supplier’s drawings and data shall be submitted via electronic medium in a format compatible for importing into the Buyer’s information systems specified by the Buyer.

3.1 Submittals Prior to Installation

The Supplier shall submit the following items at least 30 days prior to scheduled delivery of materials:

A. Manufacturer’s literature providing specifications on the fabric mats that will be supplied.
B. Manufacturer’s certification that the fabric mats to be supplied comply with the requirements of this Technical Specification.

C. Manufacturer’s Quality Control and Construction Quality Control Plans. The MQC Plan shall state the frequency that index tests are performed on the fabric mat during manufacturing.

D. If requested by the Buyer, four samples of each fabric mat suitable for testing.

E. Required concrete grout slurry mix design, including requirements for compressive strength, slump, air content and maximum temperature.

3.2 Submittals During and After Installation

The Supplier shall submit the following items on a daily basis during installation and a complete set of data within 30 days of the completion of the work:

A. Results of tests performed on the concrete grout fill.

4.0 Construction Quality Assurance

A. The Supplier shall examine the areas and conditions under which the work is to be installed and notify Buyer in writing of conditions detrimental to the proper and timely completion of the work that have changed from the time of the bidder’s walkdown.

B. Material and installation procedures are subject to inspection and tests conducted by an Independent Testing Service employed by the Buyer. Such inspections and tests will not relieve the Supplier of responsibility for providing material and installation procedures in compliance with specified requirements. The Buyer reserves the right, at any time before final acceptance, to reject material not complying with the specified requirements.

C. The Supplier shall correct deficiencies in the work which inspections and laboratory test reports have indicated to be not in compliance with requirements. The Supplier shall perform additional tests, at his expense, as may be necessary to reconfirm any noncompliance of the original work, and as may be necessary to show compliance of corrected work.

D. The Supplier shall promptly correct errors or flaws in material or placement of the protection mats identified during construction. The Supplier shall make immediate substitution of non-complying component or make field changes to make the non-complying component acceptable. Whether the correction is made by substitution or field correction, it shall be performed without cost to the Buyer.
4.1 Testing

4.1.1 Independent Testing Service

An Independent Testing Service shall perform the following:

A. Test material for the concrete slurry fill and prepare initial test cylinders in accordance with the requirements specified herein.

B. Prepare test cylinders and determine the compressive strength of job concrete fill test cylinders.

4.1.2 Concrete Grout Testing

A. Obtaining and testing concrete grout shall be by the Independent Testing Service in accordance with the following specifications:

- Sampling freshly mixed grout shall be done in accordance with ASTM C172.
- Making and curing concrete test specimens shall be in accordance with ASTM C31.
- Slump test shall be in accordance with ASTM C143.
- Air Content tests shall be in accordance with ASTM C173 or ASTM C231.
- Tests for the temperature of the freshly mixed grout shall be in accordance with ASTM C1064.
- Compressive strength test shall be in accordance with ASTM C39.

B. The frequency of testing shall be as directed by Buyer as follows:

- At least one test shall be made for each day's placement of grout, but not less than once for each 100 cubic yards or part thereof placed.
- A test shall consist of a minimum of four cylinders taken from the same truck. One 7-day and two 28-day tests shall be performed by the laboratory with results submitted to the Buyer as soon as possible. One spare cylinder shall be made and used as directed by the Buyer.
- A slump test and air content test shall be performed on every 100 cubic yards of concrete grout.
- The temperature of each 100 cubic yards shall be recorded in the field prior to placement. If the concrete grout temperature is in excess of 100°F, the concrete shall be rejected.
5.0
Materials

5.1
Fabric Design

A. Fabric-forming material shall consist of double-layer, open selvage fabric joined in a mat configuration. The fabric shall be woven of 100% continuous multi-filament nylon fiber of which 50% by weight shall be bulk textured fiber. The use of staple yarns will not be permitted.

B. The fabric shall be woven in such a manner as to provide interwoven points of attachment on spaced centers. These points of attachment shall serve to control the thickness of the finished product and to also act as a filter point to provide relief of hydrostatic uplift pressure beneath the completed revetment. The fabric shall be woven in a basket or other open pattern to provide permeability at the filter points and the main fabric field.

C. The spacing of the filter points is indicated on the Design Drawings. This spacing will result in an average revetment thickness that is consistent with the average thickness published by the manufacturer for the designated style specified.

5.2
Fiber and Fabric Material

A. The warp fiber shall be 1260 Denier Nylon, 18.5 ends/inch per single layer and the fill fiber shall be 1900 Denier Nylon, 14 picks/inch per single layer. The fiber and fabric material shall meet the minimum requirements listed in Table 1.


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<tr>
<th>PROPERTY</th>
<th>ASTM TEST METHOD</th>
<th>MINIMUM TEST VALUE</th>
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<td>Fiber count</td>
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<tr>
<td>Trapezoidal tear breaking force on the warp fiber at 70%</td>
<td>D 4533</td>
<td>80 lbs/in</td>
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<td>elongation</td>
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<tr>
<td>Trapezoidal tear breaking force on the fill fiber at 70%</td>
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<td>40 lbs/in</td>
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<td>elongation</td>
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<td></td>
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<tr>
<td>Density</td>
<td>D 792</td>
<td>1.00 g/cm³</td>
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<tr>
<td>Fiber dry breaking strength at 48% elongation</td>
<td>D 2101</td>
<td>20 lbs</td>
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<td>Fiber wet breaking strength at 53% elongation (soaked in</td>
<td>D 2101</td>
<td>19 lbs</td>
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<td>water for 2 hours)</td>
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<td>Tensile strength in the warp direction after exposure to</td>
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<td>300 hours of Ca (OH) at a pH of 10</td>
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<td>300 hours of H₂SO₄</td>
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<td>Tensile breaking strength in the warp direction on a strip</td>
<td>D 5034, D 5035</td>
<td>160 lbs/in</td>
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<td>of the fabric at 39% elongation (1)</td>
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<td>Tensile breaking strength in the fill direction on a strip</td>
<td>D 5034, D 5035</td>
<td>190 lbs/in</td>
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<td>of the fabric at 34% elongation (1)</td>
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<tr>
<td>Mass/unit area for a single layer of fabric</td>
<td>D 3776</td>
<td>7.8 oz/sq yd</td>
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<td>Thickness of a single layer of fabric</td>
<td>D 1777</td>
<td>31 mils</td>
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<td>Falling head permittivity of two layers of fabric woven</td>
<td>D 4491</td>
<td>0.28 s⁻¹</td>
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<td>together</td>
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<td>0.04 cm/s (3)</td>
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<td>Falling head permittivity of a single layer of fabric</td>
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<td>1.3 s⁻¹</td>
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<td>Seam strength (2)</td>
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<td>Abrasion resistance in the warp direction</td>
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<td>Grab strength in the warp direction at 31% elongation</td>
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<td>350 lbs</td>
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<td>Grab strength in the fill direction at 41% elongation</td>
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<td>Breaking strength in the warp direction after exposure to</td>
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<td>Mullen burst test</td>
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<td>Puncture test</td>
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Notes for Table 1:
(1) 3" x 8" sample gripped along full width of the specimen with 3" of separation between grips. Strip test to be performed on single layer of fabric at cross-head speed of 5 inches per minute.
(2) Seam centered between grips 3" apart and gripped the full width of the specimen.
5.3 Fabric Assembly
A. Adjacent fabric panels shall be connected by sewing or by means of zipper.
B. The two top layers of fabric and the two bottom layers of fabric shall be joined separately permitting full mat thickness between the two parallel seams. A single seam in which all four layers of the fabric are joined at one point will not be permitted.
C. If required, grout stops may be installed parallel to and in between individual mill widths at predetermined intervals to regulate the flow of the concrete fill. Grout stops shall be so designed as to produce full mat thickness along the full length of the grout stop.

5.4 Concrete Grout
A. The concrete grout shall consist of a mixture of Portland cement, fine aggregate and water so proportioned and mixed as to provide a readily pumpable slurry.
B. Admixtures and/or a pozzolan may be used with the approval of the Buyer. The use of superplasticizers and/or silica fume require special precautions and the approval of the Buyer.
C. The hardened concrete shall exhibit a minimum compressive strength of 2,500 psi at 28 days when specimens are made and tested in accordance with the provisions of ASTM C 31 and ASTM C 39.

5.5 Acceptable Materials
The following companies manufacture products that meet the requirements of the specification:
A. Fabrifilm Filter Point Fabric as manufactured by Construction Techniques, Inc., Cleveland, Ohio, 440-572-8300.
B. Other approved by Buyer.

6.0 Execution

6.1 Acceptance and Storage at the Project Site

6.1.1 Handling of Rolls
A. The method of off-loading the fabric at the project site shall not cause any damage to the fabric, its core, nor its protective covering.
B. Any protective covering that is accidentally damaged or stripped off of a pallet or roll shall be immediately repaired or the pallet or roll shall be moved to an enclosed facility until the repair can be made.
6.1.2
Storage at the Field Site
A. The Buyer shall provide on-site storage space in a location near where the fabric will be placed such that on-site transportation and handling are minimized. The Supplier shall be responsible for protecting the stored material from theft and vandalism.
B. Rolls or pallets of fabric shall be stored in such a manner that cores are not crushed, the fabric damaged, and as required to provide protection from exposure to ultraviolet light, inundation, mud, dirt, dust, puncture, cutting or any other damaging or deleterious condition.
C. Outdoor storage of rolls or pallets shall not exceed the manufacturer’s recommendations or longer than six months, whichever is less.

6.2 Inspection upon Delivery
A. Upon delivery of the materials to the site, the Supplier shall conduct a visual inspection of all rolls of fabric for damage or defects. This inspection shall be done without unrolling any rolls unless damage to the inside of a roll is found or suspected.
B. Any damage or defects shall be noted and immediately reported to the Buyer, the manufacturer and the carrier that transported the material. Any roll, or portion thereof, which, in the judgement of the Buyer, is seriously damaged, shall be removed from the project site and replaced with complying material at no additional cost to the Buyer.

6.3 Fabric Placement
A. Prior to concrete injection, the fabric shall be positioned over a geotextile on the grade as indicated on the Design Drawings making appropriate allowances for contraction of the fabric mats as a result of injecting the concrete grout.
B. Anchoring of fabric shall be as shown on the Design Drawings.
C. Fabric panels may be factory assembled in predetermined sizes and joined together side-by-side at the project site by field sewing or by means of zipper closures attached to the upper and lower layers of the fabric. In no case will simple unattached butt joints between panels be allowed. Overlapping shall be allowed only if approved by the Buyer.

6.4 Concrete Injection
A. Following placement of the fabric mats the specified concrete grout shall be injected between the top and bottom layers of the fabric through small slits cut in the upper layer of the fabric. The injection pipe shall be wrapped tightly at the point of injection with a strip of burlap, or similar material, during pumping to seal the joint between the injection pipe and the slit. After pumping, the burlap shall be pushed into the slit as the injection pipe is withdrawn in order to minimize spillage of the concrete slurry onto the surface of the revetment.
B. The sequence of concrete slurry injection shall be such as to insure complete filling of the revetment-forming fabric to average thickness indicated by the manufacturer for the designated style specified on the Design Drawings.

C. Foot traffic will not be permitted on the freshly pumped mat since such traffic will cause permanent indentations in the mat surface. Walk boards shall be used where necessary.

D. Excess concrete slurry which has been inadvertently spilled on the mat surface shall be cleaned up with a broom and shovel. The use of a water hose to remove spillage from the surface of a freshly pumped mat will not be permitted.

E. During concrete slurry injection, the mat thickness shall be measured by inserting a short piece of stiff wire through the crowns of the mats midway between the filter points at several locations from the crest to the toe of the slope. Any mat measurements less than 90% of the average of all thickness measurements shall be re-injected until the average thickness indicated for the style specified has been attained.
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<td>Donald Cook</td>
<td>Daniel (Mark)</td>
<td>Donald Cook</td>
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IS-1
## TEMPORARY AND PERMANENT SEEDING (ILLINOIS)

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Notes:

1. This Table of Contents will indicate the date of issue for the latest complete issue or revision issue of each section and any subsequent revision issue thereto.

2. The numbering and subsequent Revisions to the Specification are in sequence with the previously issued Revision mark number.

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Temporary and Permanent Seeding (Illinois) – Technical Specification and Optional Features/Accessories

1.0 Scope of Work

The intent of this specification is to define the minimum requirements for material and work for establishing a vegetative cover by planting grass seed.

1.1 Purpose and Use

A. All graded areas, slopes, and ditches which will not be paved or otherwise surfaced shall be provided with permanent seeding.

B. Graded areas subject to erosion shall not remain unprotected for longer than 30 days. Temporary seeding shall be provided by the Supplier to protect graded areas from erosion where permanent protection is not scheduled to be installed for 2 to 12 months after grading is completed.

1.2 Method of Seed and Mulch Application

Seed may be spread by a conventional method of application such as broadcasting, grass drill, or cultipacker followed by an application of mulch or by a hydro seeding procedure consisting of spraying a slurry mixture of water, seed, mulch, fertilizer, and tackifier onto the prepared seedbed.

1.3 Work Included

A. Furnish all materials.

B. Subgrade preparation.

C. Seedbed preparation, including placing topsoil and the addition of lime and fertilizer.

D. Seeding using broadcast, grass drill, or the cultipacker method and mulching, or hydro seeding with a mixture that contains seed, mulch and a tackifier.

E. Installation of matting where specified for erosion control.

F. Protection.

G. Maintenance.

H. Repairing and reseeding.

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2.0 Codes and Standards

A. Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment and materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state or local codes having jurisdiction.

B. References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

C. Abbreviations listed indicate the form used to identify the reference documents in the Specification text.

2.1 USDA - United States Department of Agriculture, Soil Conservation Service

A. USDA-SCS Soil Classification Supplement to Soil Classification System (7th Approximation), SCS, USDA, Second Printing, March 1967.

2.2 ASTM - American Society for Testing and Materials

C. D2026 - Specification for Cutback Asphalt (Slow-Curing Type).
D. D2027 - Specification for Cutback Asphalt (Medium-Curing Type).
E. D2028 - Specification for Cutback Asphalt (Rapid-Curing Type).
F. D2397 - Specification for Cationic Emulsified Asphalt.
G. D5268 - Specification for Topsoil Used for Landscaping Purposes.

3.0 Supplier’s Drawings and Data Submittals

Supplier shall submit drawings and data not less than 30 days before material is to be delivered. Supplier’s drawings and data shall be submitted via electronic medium in a format compatible for importing into the Buyer’s information systems specified by the Buyer.

3.1 Topsoil

A. Topsoil Material:
   • A copy of laboratory reports on two representative samples of topsoil. Laboratory tests shall be performed for:
   • Percent deleterious material.
   • Total organic content.
3.2 Seed

A. A certified copy of a statement signed by the seed supplier that each lot of seed has been tested by a recognized seed-testing laboratory within six months before the date of delivery to the plant site.

B. A certified statement signed by the seed supplier that the maximum percentage of noxious weeds in the seed mixture complies with state law.

3.3 Data on Materials as Applied

As applied data on the following items:

A. Seed mixture and seed application rate.
B. Limestone application rate.
C. Fertilizer type, trademark name (if any), chemical composition, and application rate.
D. Mulch.
E. Tackifier.

3.4 Binder Spray

Data on the binder spray (tackifier) to be used on straw mulch or with hydro seeding. If a synthetic binder (tackifier) will be used, the Supplier shall provide a complete set of Manufacturer’s specifications at least 30 days prior to anticipated use. Manufacturer’s specifications shall contain a description of the binder material, the recommended method of application, and the recommended application rate.

3.5 Matting

Catalog data on the proposed erosion control matting and Manufacturer’s literature on the recommended method of installation.

3.6 Samples

If requested by the Buyer, submit a sample of each material designated by the Buyer for laboratory testing.
4.0 Products

4.1 Topsoil
A. Topsoil shall consist of sandy clay loam, sandy loam, loam, clay loam, silty clay loam or silt loam as defined by the SCS Soil Classification System.
B. Topsoil shall be relatively free from large roots, sticks, weeds, brush or stones larger than 1 inch in diameter or other litter and waste products. It shall have at least 90 percent passing the No. 10 sieve.
C. The topsoil shall meet requirements of ASTM D5268 as follows:
   - It shall contain not less than 2 percent nor more than 20 percent total organic matter.
   - It shall contain not less than 35 percent nor more than 70 percent silt and clay.
   - It shall contain not less than 20 percent nor more than 60 percent sand.
   - The pH of the sample shall not be lower than 5.0 nor higher than 7.5.
   - The percent deleterious material (rock, gravel, slag, cinder, roots, sod) shall not exceed 5 percent.

4.2 Seed
4.2.1 General Requirements
A. Grasses, legumes, or cover crop seed of the type specified herein shall conform to the standards of the United States Department of Agriculture for seed certification.
B. Seed or seeding mixtures shall be furnished in sealed bags or containers in accordance with standard commercial practice.
C. Each bag or container shall be tagged or labeled in accordance with state law. As a minimum, the tag or label shall provide the following information:
   - Name and address of the supplier.
   - Common name of seed.
   - Lot number.
   - Net weight.
   - Guaranteed percentage of germination.
   - Percentage of weed seed and inert material content.
D. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.
E. All seed furnished shall be free of primary noxious weed seed such as Russian or Canadian Thistle, European Birdweed, Johnson Grass and Leafy Spurge. The maximum allowable percentage of noxious weed seed in the seed mixture shall comply with state law.
4.2.2  
Seed Storage  
If it is necessary to store seeds after their arrival on the site, they shall be stored in an approved  
weatherproof building in such a manner as to protect the seeds from deterioration and to permit easy  
access for inspection. The Buyer’s approval for the storage building and the method of storage shall not  
relieve the Supplier of responsibility for the quality and fitness of the seeds at the time of their use.

4.2.3  
Seed Mixture  
A. Seed species, rate per acre, and other data relevant to permanent seeding are given in Table 1.  
B. Seed species, rate per acre, and other data relevant to temporary seeding are given in Table 2.
### TABLE 1

**ACCEPTABLE MIXTURES FOR PERMANENT SEEDING**

<table>
<thead>
<tr>
<th>Mixture</th>
<th>Seed Species (1)</th>
<th>Seeding Rate, Pure Live Seed for Conventional Seed Application (2)</th>
<th>Suitable pH</th>
<th>Site Suitability</th>
<th>Acceptable Dates for Seeding</th>
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<tr>
<td></td>
<td></td>
<td>Lbs. per acre</td>
<td>Lbs. per 1,000 sq. ft.</td>
<td></td>
<td>Sunny, Dry</td>
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<tr>
<td>1</td>
<td>Smooth Bromegrass or Tall Fescue</td>
<td>30</td>
<td>0.75</td>
<td>6.0-7.5</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Alfalfa or Birdsfoot Trefoil</td>
<td>10</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Smooth Bromegrass or Tall Fescue</td>
<td>30</td>
<td>0.75</td>
<td>6.0-8.0</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Crown Vetch</td>
<td>20</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Tall Fescue</td>
<td>15</td>
<td>0.35</td>
<td>5.5-7.5</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Timothy or Redtop</td>
<td>3</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Birdsfoot Trefoil</td>
<td>15</td>
<td>0.35</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>Reed Canary Grass</td>
<td>15</td>
<td>0.35</td>
<td>5.5-7.5</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Smooth Bromegrass or Tall Fescue</td>
<td>15</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ladino (optional)</td>
<td>3</td>
<td>0.07</td>
<td></td>
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</table>

Notes:  
(1) Mixtures as defined by SCS for Illinois.  
(2) Triple the seeding rate shown in the table when hydro seeding.
<table>
<thead>
<tr>
<th>MIXTURE</th>
<th>SEED SPECIES</th>
<th>MAXIMUM WEED SEED (percentage)</th>
<th>SEEDING RATE PER ACRE</th>
<th>SUITABLE pH</th>
<th>PLANTING DEPTH</th>
<th>ACCEPTABLE DATES FOR SEEDING</th>
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<tr>
<td>1</td>
<td>Wheat</td>
<td>0.50</td>
<td>150 lbs</td>
<td>5.5 to 7.0</td>
<td>1&quot; to 1 ½&quot;</td>
<td>3-1 to 5-15 7-1 to 10-15</td>
</tr>
<tr>
<td>2</td>
<td>Cereal Rye</td>
<td>0.50</td>
<td>150 lbs</td>
<td>5.5 to 7.0</td>
<td>1&quot; to 1 ½&quot;</td>
<td>3-1 to 5-15 7-1 to 10-15</td>
</tr>
<tr>
<td>3</td>
<td>Spring Oats</td>
<td>0.50</td>
<td>100 lbs</td>
<td>5.5 to 7.0</td>
<td>1&quot;</td>
<td>3-1 to 7-1</td>
</tr>
<tr>
<td>4</td>
<td>Perennial Ryegrass</td>
<td>0.50</td>
<td>40 lbs</td>
<td>5.0 to 7.5</td>
<td>1/4&quot;</td>
<td>4-1 to 6-1 8-1 to 9-15</td>
</tr>
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</table>
4.3
Lime (Agricultural Ground Limestone)
Agricultural lime shall be flour grade meeting the requirements of ASTM C602.

4.4
Fertilizer
A. Fertilizer shall be a standard brand commercial grade of inorganic fertilizer furnished in unopened containers. The material may be separate or in a mixture containing the percentage of total nitrogen, available phosphoric acid and water-soluble potash in the amounts specified. If materials are separate, the Buyer shall be present when the separate fertilizers are mixed in the field. The fertilizer shall be odor free.

B. Fertilizer shall be supplied in one of the following forms:
   • A dry free-flowing granular fertilizer suitable for application by an agricultural fertilizer spreader.
   • A soluble form that will permit complete suspension of insoluble particles in water, suitable for application by power sprayer.

C. The following information shall be shown on the fertilizer container or on a tag attached thereto:
   • Name and address of manufacturer.
   • Name, brand or trademark.
   • Number of net pounds of ready-mixed material in the package.
   • Chemical composition or analysis.
   • Guarantee of analysis.

4.5
Mulch
4.5.1
Straw Mulch
A. Straw shall be stalks of small grain straw of wheat, rye, oats, barley or other approved grain. Straw shall be air dried and free of grain and noxious weed seed, other materials detrimental to plant life, and mold.

B. Straw shall be seasoned before bailing or loading. Straw mulch shall be suitable for spreading with mulch blower equipment.

C. Old dry straw which breaks up in the crimping process instead of bending, or straw in such advanced stages of decomposition that it will smoother or retard the normal growth of grass, is not acceptable.

4.5.2
Wood Cellulose Fiber Mulch
A. Wood cellulose fiber shall be partly digested wood fibers.

B. The material shall be dyed green.
C. The material shall not contain growth or organism inhibiting agents.

D. The material shall be air-dried with a minimum of 30 percent of the fibers 3.7 mm (0.145 inch) or longer.

4.5.3
Binder Sprays

A. Cutback Asphalt shall be in accordance with ASTM D2026 (Slow-Curing Type), ASTM D2027 (Medium-Curing Type) or ASTM D2028 (Rapid-Curing Type).

B. Emulsified Asphalt shall be in accordance with D977 (Emulsified Asphalt) or D2397 (Cationic Emulsified Asphalt).

4.6
Tackifier (Synthetic Binder)

A. Tackifier material shall be an acrylic copolymer or a polyvinyl acetate emulsion in a liquid form. The material may contain additives to enhance its ability to penetrate the soil.

B. The material shall be non-toxic, non-flammable, and biodegradable.

C. Approved Materials:
   • Soil Seal Concentrate manufactured by Soil Seal Corp., 1111 W. Sixth St., Los Angeles, California 90017, telephone number 213-481-7185.
   • Reinco Mulch Binder and Terra Tec manufactured by Reinco Mulch Binder Corp., 520 North Avenue, Plainfield, New Jersey 07060, telephone number 1-800-526-7687.
   • Aerospray 70 Binder manufactured by American Cyanamid Company, Mobile, Alabama 36601, telephone number 205-476-5800.

4.7
Inoculant

A. The inoculant for treating legume seeds shall be a pure culture of nitrogen fixing bacteria prepared specifically for the species and shall not be used later than the date indicated on the container. A mixing medium, as recommended by the manufacturer, shall be used to bond the inoculant to the seed.

B. All legumes not pre-inoculated shall be inoculated within 12 hours of seeding. If the seed was pre-inoculated more than 60 days prior to seeding then it must be reinoculated.

4.8
Matting for Erosion Control

A. Matting for erosion control may be one of the following unless a specific matting is specified on the Design Drawings.
   • Jute mat shall be cloth of a uniform plain weave of undyed and unbleached single jute yarn, 48 inches in width, plus or minus 1 inch and weighing an average of 1.2 pounds per linear yard of cloth with a tolerance of plus or minus 5 percent, with approximately 78 warp ends per width of cloth and 41 weft ends per linear yard of cloth. The yarn shall be...
of a loosely twisted construction having an average twist of not less than 1.6 turns per inch and shall not vary in thickness by more than one-half its nominal diameter.

- Excelsior mat shall be wood excelsior, 48 inches in width plus or minus 1 inch and weighing 0.8 pounds per square yard plus or minus 10 percent. The excelsior material shall be covered with a netting to facilitate handling and to increase strength.
- Glass fiber matting of bonded textile glass fibers with an average fiber diameter of 8 to 12 microns, 2 to 4 inch strands of fiber bonded with phenol formaldehyde resin. Mat shall be roll type, water permeable, minimum thickness 1/4 inch, maximum thickness 1/2 inch, density not less than 3 pounds per cubic foot.

B. Staples for anchoring soil stabilizing materials shall be No. 11 gauge wire or heavier. Their length shall be 6 to 10 inches. Ten inch long staples shall be used on loose, unstable soils.

5.0 Execution

5.1 Site Preparation

A. Prior to seeding, install all erosion control facilities specified on the Design Drawings. These include: diversions, berms, sediment control traps, silt fences and straw bale dikes.
B. Grade areas as specified on the Design Drawings. Gullied and uneven areas shall be smoothed before starting seedbed preparation.

5.2 Limestone for pH Adjustment

A. The Supplier shall apply limestone as required to raise the pH of the subsoil. Apply a minimum of 4 tons of limestone per acre for clayey soils, 3 tons of limestone per acre for sandy loam, and 2 tons of limestone per acre for loamy sand or silty soils.
B. Thoroughly work the limestone into the subsoil to a depth of 2 to 3 inches with a harrow or disk. The limestone may be applied prior to or concurrently with the fertilizer described.

5.3 Fertilizer

A. The Supplier shall apply a 12-12-12 fertilizer to the subsoil at a rate of 300 pounds per acre.
B. Work the fertilizer into the soil to a depth of 2 to 3 inches with a harrow, disk, or rake. On slopes, operate the disk or rake across the slope.
C. If hydro seeding is used, the fertilizer may be added to the hydroseed mixture.

5.4 Tilling of Subsoil

Prior to placing the topsoil, scarify the subsoil to a depth of 3 inches immediately prior to spreading topsoil to ensure bonding of the topsoil and the subsoil. Repeat scarification in areas where equipment used for hauling and spreading topsoil has compacted the subsoil.
5.5

Placing Topsoil

Note: topsoil does not have to be placed for temporary seeding. Topsoil must be placed prior to permanent seeding.

A. Place topsoil during dry weather on a dry, unfrozen subgrade. Topsoil shall not be spread if it is frozen or muddy.

B. Remove large pieces of organic matter and foreign non-organic material from topsoil while spreading. There shall be no large roots, branches or trash of any kind in the topsoil.

C. Spread the topsoil to provide a compacted thickness of not less than 4 inches.

D. Compact the topsoil with a roller not exerting more than 100 pounds per square inch. The topsoil must be loose enough for water infiltration and root penetration. The soil surface on slopes shall be roughened to catch seeds if they are to be broadcast.

5.6

Seeding (Conventional Method)

A. Tables 1 and 2 list acceptable seed mixtures that may be used for seeding. The Supplier shall select a mixture from the appropriate table and plant within the dates shown in that table for that mixture.

B. Apply seed uniformly at the rate shown in the appropriate table with a rangeland grass drill or cultipacker type seeder, or broadcast seed uniformly. The seeding methods and equipment shall be submitted to the Buyer for approval prior to beginning work.

C. All seeders shall be calibrated and adjusted to sow seeds at the proper rate. Equipment shall be operated to ensure a complete and even coverage. Do not seed areas greater than that which can be mulched on the same day.

D. Do not sow immediately following a rain, where the ground is too dry, during windy periods, or otherwise when conditions are not proper for seeding.

E. No seeds shall be sown until the purity test has been completed for the seeds to be used and the tests show that the seed meets the noxious weed seed requirements.

F. Within 12 hours, all seeded areas shall be rolled at right angles to the runoff with a cultipacker or approved roller to compact the seedbed and place the seed in contact with the soil. The optimum depth for planting shall be 1/4 inch. Rolling is not required if the seeding equipment is equipped with a roller that achieves the desired compaction or a grass drill has been used. Note: For temporary seeding planted without topsoil, the optimum planting depth is shown in Table 2.

5.7

Mulching (Conventional Method)

5.7.1

Straw Mulching

A. All seeded areas shall be mulched with straw mulch within 24 hours after seeding. The mulch may be hand or machine applied. The mulch shall be uniformly applied in a loose enough condition to permit air to circulate, but compact enough to reduce erosion. About 25 percent of
the solid surface should show through the mulch. If baled mulch material is used, care shall be taken that the material is in a loosened condition and contains no lumps or knots of compacted material.

B. Straw mulch shall be applied at the rate of 2 tons per acre, or 75 to 100 (two bales) pounds per 1,000 square feet.

C. Straw mulch shall be anchored immediately after placement to minimize loss by wind or water. Straw mulch shall be anchored using a mulch anchoring tool or by spraying with a liquid binder.

5.7.2 Anchoring Mulch Using a Mulch Anchoring Tool

A. The mulch anchoring tool shall be designed to punch and anchor the mulch into the top 2 to 3 inches of soil at 6 inch intervals. As an alternative, a smooth disk set in a straight position may be used.

B. On slopes flatter than 3 horizontal to 1 vertical, mulch anchoring shall cross the contour of the land (across slopes). On slopes steeper than 3 horizontal to 1 vertical, the mulch shall be anchored by tracking a bulldozer with 1-1/2 inch track cleats up and down slope making grooves running across the slope.

5.7.3 Anchoring Using a Sprayed Liquid Binder

A. A sprayed liquid binder may be used in lieu of crimping to anchor the mulch. The binder may be sprayed into the mulch as it leaves the blower pipe or it may be applied as an over spray. If over sprayed, the binder spray should be heavier at the edges where wind catches the mulch, in valleys and at crests of banks. Binder shall be applied uniformly over the remainder of the area. Caution shall be used when spraying binder near areas occupied by construction personnel.

B. Binder Spray shall be applied at the following rates:
   - Cutback asphalt - Rapid curing (RC-70, RC-250, and RC-800) or medium curing (MC-250 or MC-800). Apply 5 gallons per 1,000 square feet or 218 gallons per acre.
   - Emulsified asphalt - (SS-1, CSS-1, CMS-2, MS, RS-1, RS-2, CRS-1, and CRS-2). Apply 5 gallons per 1,000 square feet or 218 gallons per acre.
   - Synthetic binders - Synthetic binders such as Acrylic Dir (Agri-Tac), DCA-70, Petrosset or Terra Tack may be used at rates recommended by the manufacturer to anchor mulch material.

5.7.4 Repairing and Reseeding

A. Areas not mulched and anchored within 24 hours after seeding shall be reseeded and mulched.

B. Areas not properly mulched, or damaged due to construction activities, shall be repaired, reseeded, and remulched.
5.8 Hydro Seeding

A. Hydro seeding consists of spraying a slurry mixture of water, seed, fertilizer, mulch, and a tackifier on a prepared seed bed.

B. The slurry mixture shall be mixed and applied using a hydraulic seeder. Hydraulic seeding equipment shall include a pump rated and operated at not less than 100 gallons per minute and 100 psi pressure. The tank shall have a mechanical agitator powerful enough to keep the slurry mixture in a uniform suspension in water.

C. Hydrated lime shall not be added to the slurry mixture.

D. The slurry mixture shall contain a maximum of 55 percent solids (125 pounds of solids per 100 gallons of water).

E. The seed mixture shall be as specified in Table 1 or Table 2 except that the weight of seed in the slurry mixture shall be a minimum of three times the weight of pure live seed per acre specified in the appropriate table for conventional seed application.

F. The slurry mixture shall contain a minimum of 1500 pounds of wood cellulose fiber mulch per acre or 2000 pounds of straw mulch per acre.

G. The amount of tackifier provided per acre shall be in accordance with Manufacturer's recommendations.

H. The slurry-mixture shall contain a minimum of 1000 pounds of grade 12-12-12 fertilizer per acre or the equivalent weight of chemicals if another grade is used.

I. The soil surface shall be moist when the slurry mixture is applied.

5.9 Laying and Securing Matting

5.9.1 Laying and Securing Jute Matting

A. Prepare the seed bed as specified and lime, fertilize, and seed, except that when using jute matting, apply approximately one-half of the seed after laying the mat.

B. Most drainage channels will require multiple widths of jute matting. The total width shall be as specified on the Design Drawings. Unroll matting starting at the upper end of the channel allowing a 4 inch overlap of mattings along center of channel.

C. Bury the top ends of jute matting in a narrow trench. Backfill the trench and tamp firmly to conform to channel cross-section. Secure the matting with a row of staples about 4 inches down slope from the trench. Spacing between staples shall be a maximum of 6 inches.

D. Staple the 4 inch overlap in the center of the channel using an 18 inch spacing between staples. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil. Staples shall be placed 2 feet apart along the outer edge of matting.

E. Where one roll of jute matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4 inches, shiplap fashion.
F. Where matting crosses erosion stops, reinforce with a double row of staples placed six (6) inches apart in a staggered pattern on either side of erosion stop. Likewise, overlaps joining the length of matting together and the discharge end of the matting liner should be similarly secured with 2 double rows of staples.

5.9.2 Laying and Securing Excelsior Matting

A. Provide the same seedbed preparation as specified for jute matting with the exception that all seeding must be completed before laying excelsior matting.

B. Bury the top ends of excelsior matting in a trench as described for jute matting. As the blankets are unrolled down slope, the matting must be on top with the wood fibers in contact with the soils. Butt snugly at the ends and sides before stapling.

C. Using two (2) foot spacing between staples, excelsior matting shall be secured with four rows for each strip, with one row along each edge and alternating parallel rows down the center. The stapling over erosion stops, entrance and discharge ends of matting and butted end joints shall be the same as described for jute matting.

5.10 Construction Completed after Acceptable Seeding Dates

When construction is completed between October 15 and March 1 prepare the seedbed, fertilize and mulch as specified. Apply seed for permanent seed sometime between December 1 and March 1 increasing the seeding rates shown in Table 1 by 50 percent.

6.0 Protection

Planted areas shall be protected from damage and erosion. The Supplier shall provide and erect temporary barriers and signs as necessary to prevent vehicles, equipment and foot traffic from damaging seeded areas.

7.0 Maintenance

The Supplier shall perform the following maintenance tasks:

A. Keep seedbed continually moist with light, frequent sprinklings several times a day to prevent seedlings from drying out.

B. Inspect periodically after planting to see that vegetative stands are adequately established. Immediately reseed areas which show bare spots larger than 2 feet by 2 feet after germination.

C. Check for erosion damage after storm events and repair damage. Reseed and mulch, if necessary.

D. Fertilize newly permanent seeded areas one year after seeding with 300 pounds per acre of a complete (N-P-K) 10-10-10 or equivalent turf type slow release fertilizer.

- Application rate per acre shall be:
  
  Nitrogen (N) - 120 pounds of actual nitrogen.
Phosphorus (P) - 120 pounds of $P_2O_5$.
Potassium (K) - 120 pounds of $K_2O$. 
Appendix E: Hennepin Power Station; West Ash Disposal Pond Maintenance Plan (2013)
DYNEGY MIDWEST GENERATION, LLC

Hennepin Power Station
Hennepin, Illinois

Putnam County

West Ash Disposal Pond

IDNR Permit No. (not permitted)

Dam ID No. (not permitted)

Maintenance Plan

September 2013
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1.0 GENERAL

The following operations and maintenance procedures are provided to maintain the structural integrity of the west ash storage surface impoundment at the Hennepin Power Station, which is unclassified and unpermitted, by the Illinois Department of Natural Resources, Office of Water Resources.

2.0 EMERGENCY OPERATIONS

2.1 Unusual Conditions

Any unusual condition discovered during major storm events or routine inspection, which may constitute an emergency, shall be handled as follows. Notice of any type of emergency involving the dikes or outfall shall be made to the Shift Leader on duty [(815) 339-9211]. The Shift Leader on duty shall notify the Station Manager, Ted Lindenbusch [home: (815) 875-2381], or, in his absence, the Environmental Coordinator, John P. Augspols [home: (815) 925-7488]. One of the above designated personnel shall notify the following city, county, state and federal regulatory authorities of the emergency condition.

- Division of Water Resources, Dam Safety Section, Dam Safety Engineers (217) 782-3862
- Illinois Emergency Management Agency, 24-hour service 1-(800) 782-7860
- Putnam County Sheriff/Hennepin Police Department (815) 925-7015
- Senior Director – Environmental Compliance, Dynegy Operating Company (618) 206-5912

2.2 Dewatering

The Station Manager or the Environmental Coordinator shall have the responsibility of determining how repairs shall be accomplished and whether dewatering of the disposal facility is necessary. Emergency dewatering shall be accomplished by portable pumps.
3.0 MAINTENANCE

3.1 Vegetation

Dikes shall be maintained to protect the structural integrity of the disposal facility. Damaged and barren areas shall be repaired as soon as appropriate after being discovered. Damaged areas shall be filled with topsoil. Limed, fertilized, and seeded with appropriate vegetation. Trees and shrubs observed during semiannual inspections shall be cut and removed from the dikes and discharge channel. This shall be done as frequently as is necessary to insure that no tree reaches a size where the root structure would require removal and filling. Woody vegetation, shrubs, and trees shall be removed during the early stages of growth before reaching a three-inch diameter.

Low growing vegetation, a prairie grass mixture that grows to a height of no more than six inches, shall be planted and maintained to facilitate inspections.

3.2 Discharge Structure

The discharge structure shall be inspected periodically for significant corrosion and deterioration. Any defects discovered shall be promptly repaired.

3.3 Animal Damage and Repairs

Animal burrows discovered during inspections shall be promptly repaired by filling with grout.

3.4 Restriction of Unauthorized Vehicles

Facility approaches shall be posted with signs restricting unauthorized travel on the roadways and slopes.

3.5 Inspections/Remedial Measures

3.5.1 Weekly Inspections

Weekly inspections of the perimeter berms shall be conducted, looking for seepage and slumping, and unusual seepage at and/or blockage of the outfall structures in each cell. All findings shall be entered into the weekly inspection checklist, discussed in Section 4.0. Maintenance activities shall be initiated, if required. Refer to Section 4.0 for the recommended inspection checklist to be used for the weekly inspections.
3.5.2 Quarterly Inspections

Inspections shall be made quarterly by Station personnel to determine the general condition of the dam and embankments. During these inspections, embankment erosion, tree growth, and embankment seepage shall be monitored. Seepage shall be observed for change in quantity and coloration. Refer to Section 4.0, for the recommended inspection checklist to be used for documenting the quarterly inspections.

3.5.3 Annual Inspections

An annual inspection shall be made by a licensed professional engineer. This inspection shall follow the Illinois Department of Natural Resources (IDNR) Guidelines and Forms for Inspection of Illinois Dams, and shall be followed by verbal and written reports by the consulting engineer. Based on the findings of the inspection, the Station Manager shall implement corrective action as required to promote dam safety. Procedures and methods for corrective action shall be performed in accordance with recommendations of the consulting engineer and as outlined above. Because the dam is not permitted by the IDNR, copies of the engineer’s report, along with corrective action taken, will not be reported to the IDNR.

4.0 INSPECTION CHECKLISTS

The following Inspection checklists should be used during the weekly and quarterly inspections.
WEEKLY DAM INSPECTION FORM

Dam Location: Hennepin Power Station – West Ash Pond
Owner: Dynegy Midwest Generation, LLC, Havana Power Station
Permit No.: Not permitted          Class of Dam: Not classified
Type of Dam: Homogeneous earth dam
Type of Spillway: Drop structure

Date Inspected: ____________________
Weather Conditions: ____________________
Pool Elevation: ____________________

Inspection Personnel:

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## QUARTERLY DAM INSPECTION FORM

**Dam Location:** Hennepin Power Station – West Ash Pond  
**Owner:** Dynegy Midwest Generation, LLC, Hennepin Power Station  
**Permit No.: Not permitted**  
**Class of Dam:** Not classified  
**Type of Dam:** Homogeneous earth dam  
**Type of Spillway:** Drop structure

**Date Inspected:**  
**Weather Conditions:**  
**Pool Elevation:**

**Inspection Personnel:**

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10/13/16
Appendix F: Hennepin Power Station; Old East Ash Disposal Pond Maintenance Plan (2013)
DYNEGY MIDWEST GENERATION, LLC

Hennepin Power Station
Hennepin, Illinois

Putnam County

Old East Ash Disposal Pond

IDNR Permit No. (not permitted)

Dam ID No. (not permitted)

Maintenance Plan

September 2013
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1.0 GENERAL

The following operations and maintenance procedures are provided to maintain the structural integrity of the old east ash storage surface impoundment at the Hennepin Power Station, which is unclassified and unpermitted, by the Illinois Department of Natural Resources, Office of Water Resources.

This is primarily the @ 0.5 mile significant berm system that extends along the Illinois River. The old east ash pond system consists of the inactive cells # 2 and # 4. As a result of the May 2011 USEPA dam assessment, a dam safety permit was submitted to IDNR in May 2013, to address major modifications to this significant berm. These major modifications include extensive tree removal and resloping. Resloping is required to improve slope stability and allow safe access to slope, for long-term mowing and maintenance.

2.0 EMERGENCY OPERATIONS

2.1 Unusual Conditions

Any unusual condition discovered during major storm events or routine inspection, which may constitute an emergency, shall be handled as follows. Notice of any type of emergency involving the dikes or outfall shall be made to the Shift Leader on duty [(815) 339-9211]. The Shift Leader on duty shall notify the Station Manager, Ted Lindenbusch [home: (815) 875-2381], or, in his absence, the Environmental Coordinator, John P. Augspols [home: (815) 925-7488]. One of the above designated personnel shall notify the following city, county, state and federal regulatory authorities of the emergency condition.

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- Illinois Emergency Management Agency, 24-hour service 1-(800) 782-7860
- Putnam County Sheriff/Hennepin Police Department (815) 925-7015
- Senior Director – Environmental Compliance, Dynegy Operating Company (618) 206-5912

2.2 Dewatering

Not applicable.
3.0 MAINTENANCE

3.1 Vegetation

Dikes shall be maintained to protect the structural integrity of the disposal facility. Damaged and barren areas shall be repaired as soon as appropriate after being discovered. Damaged areas shall be filled with topsoil. Limed, fertilized, and seeded with appropriate vegetation. Trees and shrubs observed during semiannual inspections shall be cut and removed from the dikes and discharge channel. This shall be done as frequently as is necessary to insure that no tree reaches a size where the root structure would require removal and filling. Woody vegetation, shrubs, and trees shall be removed during the early stages of growth before reaching a three-inch diameter.

Low growing vegetation, a prairie grass mixture that grows to a height of no more than six inches, shall be planted and maintained to facilitate inspections.

3.2 Discharge Structure

Not applicable.

3.3 Animal Damage and Repairs

Animal burrows discovered during inspections shall be promptly repaired by filling with grout.

3.4 Restriction of Unauthorized Vehicles

Facility approaches shall be posted with signs restricting unauthorized travel on the roadways and slopes.

3.5 Inspections/Remedial Measures

3.5.1 Weekly Inspections

Weekly inspections of the perimeter berms shall be conducted, looking for seepage and slumping. All findings shall be entered into the weekly inspection checklist, discussed in Section 4.0. Maintenance activities shall be initiated, if required. Refer to Section 4.0 for the recommended inspection checklist to be used for the weekly inspections.
3.5.2 Quarterly Inspections

Inspections shall be made quarterly by Station personnel to determine the general condition of the dam and embankments. During these inspections, embankment erosion, tree growth, and embankment seepage shall be monitored. Seepage shall be observed for change in quantity and coloration. Refer to Section 4.0, for the recommended inspection checklist to be used for documenting the quarterly inspections.

3.5.3 Annual Inspections

An annual inspection shall be made by a licensed professional engineer. This inspection shall follow the Illinois Department of Natural Resources (IDNR) Guidelines and Forms for Inspection of Illinois Dams, and shall be followed by verbal and written reports by the consulting engineer. Based on the findings of the inspection, the Station Manager shall implement corrective action as required to promote dam safety. Procedures and methods for corrective action shall be performed in accordance with recommendations of the consulting engineer and as outlined above. Because the dam is not permitted by the IDNR, copies of the engineer’s report, along with corrective action taken, will not be reported to the IDNR.

4.0 INSPECTION CHECKLISTS

The following Inspection checklists should be used during the weekly and quarterly inspections.
WEEKLY DAM INSPECTION FORM

Dam Location: Hennepin Power Station – Old East Ash Pond
Owner: Dynegy Midwest Generation, LLC, Havana Power Station
Permit No.: Not permitted                    Class of Dam: Not classified
Type of Dam: Homogeneous earth dam
Type of Spillway: N/A

Date Inspected: _______________________
Weather Conditions: ____________________________________________
Pool Elevation: ________________________________________

Inspection Personnel:

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QUARTERLY DAM INSPECTION FORM

Dam Location: Hennepin Power Station – Old East Ash Pond
Owner: Dynegy Midwest Generation, LLC, Hennepin Power Station
Permit No.: Not permitted Class of Dam: Not classified
Type of Dam: Homogeneous earth dam
Type of Spillway: Not applicable

Date Inspected: ________________
Weather Conditions: ____________________________________________
Pool Elevation: ________________

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10/13/16
Appendix G: Hennepin Power Station; East Ash Disposal Pond Maintenance Plan (2014)
DYNEGY MIDWEST GENERATION, LLC

Hennepin Power Station
Hennepin, Illinois

Putnam County

East Ash Disposal Pond

Small Class III Dam

IDNR Permit No. DS2011079

Dam ID No. IL50363

Maintenance Plan

Revised – August 2014
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1.0 GENERAL

The following operations and maintenance procedures are provided to maintain the structural integrity of the east ash storage surface impoundment at the Hennepin Power Station, which is classified as a small Class III dam by the Illinois Department of Natural Resources, Office of Water Resources. The primary pond’s maximum normal pool elevation will be 489.5 msl with a dam crest at elevation 494.0 msl. The secondary pond’s maximum normal pool elevation will be 480.5 with a dam crest at 494.0 msl.

2.0 EMERGENCY OPERATIONS

2.1 Unusual Conditions

Any unusual condition discovered during major storm events or routine inspection, which may constitute an emergency, shall be handled as follows. Notice of any type of emergency involving the dikes or outfall shall be made to the Shift Leader on duty [(815) 339-9211]. The Shift Leader on duty shall notify the Managing Director, Byron Veech [cell: (309) 543-8714], or, in his absence, the Environmental Coordinator, John P. Augspols [home: (815) 925-7488]. One of the above designated personnel shall notify the following city, county, state and federal regulatory authorities of the emergency condition.

- Division of Water Resources, Dam Safety Section, Dam Safety Engineers (217) 782-3862
- Illinois Emergency Management Agency, 24-hour service 1-(800) 782-7860
- Putnam County Sheriff/Hennepin Police Department (815) 925-7015
- Senior Director – Environmental Compliance, Dynegy Operating Company (618) 343-7761

2.2 Dewatering

The Station Manager or the Environmental Coordinator shall have the responsibility of determining how repairs shall be accomplished and whether dewatering of the disposal facility is necessary. Dewatering shall be accomplished by manually removing the concrete beams from the primary and/or secondary pond structures until the desired water level is reached.
3.0 MAINTENANCE

3.1 Vegetation

Dikes shall be maintained to protect the structural integrity of the disposal facility. Damaged and barren areas shall be repaired as soon as appropriate after being discovered. Damaged areas shall be filled with topsoil. Limed, fertilized, and seeded with appropriate vegetation. Trees and shrubs observed during periodic inspections shall be cut and removed from the dikes and discharge channel. This shall be done as frequently as is necessary to insure that no tree reaches a size where the root structure would require removal and filling. Woody vegetation, shrubs, and trees shall be removed during the early stages of growth before reaching a three-inch diameter.

Low growing vegetation shall be planted and maintained to facilitate inspections.

3.2 Discharge Structure

The discharge structure shall be inspected periodically for significant corrosion, spalling, and cracking. Any defects discovered shall be promptly repaired.

3.3 Animal Damage and Repairs

Animal burrows discovered during inspections shall be promptly repaired by filling with grout.

3.4 Restriction of Unauthorized Vehicles

Facility approaches shall be posted with signs restricting unauthorized travel on the roadways and slopes.

3.5 Inspections/Remedial Measures

3.5.1 Weekly Inspections

Weekly inspections of the perimeter berms shall be conducted, looking for seepage and slumping, and unusual seepage at and/or blockage of the outfall structures in each cell. All findings shall be entered into the weekly inspection checklist, discussed in Section 4.0. Maintenance activities shall be initiated, if required. Refer to Section 4.0 for the recommended inspection checklist to be used for the weekly inspections.
3.5.2 Quarterly Inspections

Inspections shall be made quarterly by Station personnel to determine the general condition of the dam and embankments. During these inspections, embankment erosion, tree growth, and embankment seepage shall be monitored. Seepage shall be observed for change in quantity and coloration. Refer to Section 4.0, for the recommended inspection checklist to be used for documenting the quarterly inspections.

3.5.3 Five-Year Inspections

Every five years, an inspection shall be made by a licensed professional engineer. This inspection shall follow the Illinois Department of Natural Resources (IDNR) Guidelines and Forms for Inspection of Illinois Dams, and shall be followed by verbal and written reports by the consulting engineer. Based on the findings of the inspection, the Station Manager shall implement corrective action as required to promote dam safety. Procedures and methods for corrective action shall be performed in accordance with recommendations of the consulting engineer and as outlined above. Copies of the engineer’s report, along with corrective action taken, shall be reported to the IDNR.

3.6 Annual Statement

An annual statement on forms furnished by IDNR, certifying compliance with this maintenance plan, shall be submitted to IDNR.

4.0 INSPECTION CHECKLISTS

The following Inspection checklists should be used during the weekly and quarterly inspections.
WEEKLY DAM INSPECTION FORM

Dam Location: Hennepin Power Station – East Ash Pond
Owner: Dynegy Midwest Generation, LLC, Havana Power Station
Permit No.: DS2011079  Class of Dam: III
Type of Dam: Homogeneous earth dam, with clay and geosynthetic / clay liner
Type of Spillway: Drop structure and stop logs

Date Inspected:
Weather Conditions:
Pool Elevation:

Inspection Personnel:

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<tr>
<th>Name / Title</th>
<th>Signature</th>
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<table>
<thead>
<tr>
<th>Inspection Item</th>
<th>Conditions</th>
<th>Location of Problem and Recommended Remedial Measures and Implementation Schedule</th>
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<tbody>
<tr>
<td>Vertical and Horizontal Alignment of Crest</td>
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<tr>
<td>Unusual Movement or Cracking at or Beyond Toe</td>
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<td>Seepage</td>
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<td>Vegetative Cover</td>
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<tr>
<td>Embankment Erosion</td>
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<td>Structural Cracking</td>
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<tr>
<td>Outfall Structures</td>
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<tr>
<td>Other</td>
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</tbody>
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QUARTERLY DAM INSPECTION FORM

Dam Location: Hennepin Power Station – East Ash Pond  
Owner: Dynegy Midwest Generation, LLC, Hennepin Power Station  
Permit No.: DS2011079  
Class of Dam: III  
Type of Dam: Homogeneous earth dam, with clay and geosynthetic / clay liner  
Type of Spillway: Drop structure and stop logs  
Date Inspected:  
Weather Conditions:  
Pool Elevation:  

inspection Personnel:

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<thead>
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<td>Inspection Item</td>
<td>Conditions</td>
<td>Location of Problem and Recommended Remedial Measures and Implementation Schedule</td>
</tr>
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<td>Downstream Fill Slopes</td>
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<tr>
<td>Upstream Fill Slopes</td>
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<tr>
<td>Unusual Movement or Cracking at or Beyond Toe</td>
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<tr>
<td>Seepage (Condition/Color)</td>
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<tr>
<td>Vegetative Cover (Tree growth)</td>
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<tr>
<td>Animal Damage</td>
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<tr>
<td>Embankment Erosion</td>
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<td>Water Passages</td>
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<td>Structural Cracking</td>
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<tr>
<td>Outfall Structures</td>
<td>Good condition</td>
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<tr>
<td>Other</td>
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