minnesota power / 30 west superior street / duluth, minnesota 55802-2093 / 800-228-4966 / www.mnpower.com

August 19, 2011

Mr. Stephen Hoffman
U.S. Environmental Protection Agency (5304P)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re. Minnesota Power Laskin Energy Center CCR Site Assessment Follow-Up

Dear Mr. Hoffman,

Minnesota Power (MP) has reviewed your letter of July 26, 2011 regarding findings of the September 23 and 24, 2010 United Stated Environmental Protection Agency (EPA) inspection of our Laskin Energy Center (LEC) coal combustion residual (CCR) management facilities in Aurora, Minnesota. In the following paragraphs the EPA's (and GZA) recommendations are restated in their entirety (in italics), followed by Minnesota Power's response and/or plan and schedule for follow-up on the EPA the recommendations.

3.1 Assessments

*In general, the overall condition of Cell E Impoundment was judged to be **SATISFACTORY**. The Cell E impoundment was found to have the following deficiencies:*

1. Minor erosion along the down slope toe of the east embankment;

2. Minor potholes along the crest gravel access road; and,

3. Presence of trees at the down slope toe of the northwest corner of the embankment.

Minnesota Power (MP), in accordance with permits granted and plans and specifications approved by the Minnesota Pollution Control Agency (MPCA) Division of Water Quality and the Minnesota Department of Natural Resources (MDNR) Division of Dam Safety has recently completed a 4-foot vertical extension of the Cell E perimeter embankments and composite liner system. In conjunction with this embankment and liner extension, the deficiencies noted above were corrected. The minor erosion along the down slope toe of the east embankment was initially corrected on November 4, 2010, and the area was slightly modified and seeded and mulched in conjunction with the recent embankment extension. Minor potholes along the crest of the access road were eliminated in conjunction with the embankment extension, and the trees located down slope of the northeast corner of the embankment were removed. Photos 1 – 4 included with this letter provide photographic documentation of current conditions in the areas where deficiencies were previously noted and which have since been repaired.

*In general, if the Cells A-D Impoundment were rated as an active impoundment, the overall condition would be judged to be **FAIR**. The impoundment was found to have the following deficiencies of an active impoundment:*

1. Presence of trees on the upstream embankment and top of impoundment;

2. Potholes and rutting of the crest access road; and,

3. No maintenance or emergency action plan for the Cells A-D Impoundment.

Trees have been removed from the upstream embankments of Cells A-D and roadways have been regraded and resurfaced to correct potholes and rutting of the crest of the Cell A-D access roads. In addition, Minnesota Power occasionally reviews and updates the Emergency Action Plan (EAP) to account for changes in plant operating personnel and/or procedures and the pre-existing Emergency Action Plan (EAP) for Cell E has been updated to include Cells A-D. A copy of the updated plan is attached for reference.

3.2 Studies and Analyses

GZA recommends that LEC evaluate the structural and seepage stability and flowability of the ash contained within the Cells A-D Impoundment.

As stated in Minnesota Power's comments on the draft GZA Laskin Energy Center CCR Site Assessment inspection report, the objectives of and need for evaluation of "structural and seepage stability and flowability of the ash contained within the Cells A-D Impoundment" continues to be unclear. This is on the basis of the grade of the ash being below embankment elevation and lack of ash above embankment elevation, the accompanying low water elevations, and substantial water surface setback from the embankments. However, it is Minnesota Power's interpretation that a demonstration of the ash containment ability of the Cells A-D perimeter embankments is what is ultimately being requested. To address this item Minnesota Power will retain the services of a geotechnical engineer to perform a slope stability analysis of the critical embankment cross-section for Cells A-D. The critical cross-section for these purposes will be defined as the embankment section appearing to have the greatest elevation differential between the embankment crest and outside toe. This embankment cross-section will be surveyed to document crest and toe elevations and slope angles, and existing ash strength data and geotechnical data will be utilized to facilitate the stability analysis. Given the age of the embankments and relative lack of construction documentation data, it is anticipated that some assumptions will be made regarding material strength in order to facilitate the analysis. This approach is deemed acceptable given the configuration of the embankments as described above and therefore no supplemental site exploration or material testing is proposed. The analysis results will be submitted to the EPA by November 18, 2011.

3.3 Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Increased mowing of the grasses on the embankments to facilitate daily inspections and reduce the risk of burrowing animals;

2. Repair the potholes present in the gravel crest access road. Grade the road to provide better drainage and reduce future potholing;
3. Clear deep rooted vegetation from embankments and top of impoundments;
4. Document impoundment inspections conducted by facility personnel each shift; and,
5. Extend maintenance and emergency action plans to include the Cells A-D Impoundment.

The items noted above have been addressed in an earlier portion of this letter and are documented in brief via the attached photographs. The impoundment inspections conducted by facility personnel each shift consist of inspecting the integrity of impoundment dikes (Cells A-E), inspect discharge piping and record Cell E water levels. The pond level readings are recorded with a hand-held data logger, which records this data into Minnesota Power's IntelaTrac database. Data can then be downloaded into report form for trending and tracking.

3.4 Repair Recommendations
GZA recommends the following minor repairs which may improve the overall condition of the impoundment, but do not alter the current design. The recommendations may require design by a professional engineer and construction contractor experienced in impoundment construction.
1. Repair rutting present on the Cells A-D Impoundment crest access road.

These repairs have been completed as described under Item 3.1 above and as documented in the attached photographs.

As noted previously, MP will provide the slope stability analysis results as described previously on or before November 18, 2011 which, in combination with the contents of this letter, should fulfill the information request. Please contact me in the event that you have any questions or suggested revisions to Minnesota Power's planned follow-up activities described herein.

Best regards,

Allan S. Rudeck, Jr., P.E.
Vice President – MP Generation

Attachments – LEC Cells A-E Photographs

Laskin Energy Center Ash Pond Cell E Emergency Action Plan (EAP)

Owned By:	***Minnesota Power*** ***Laskin Energy Center*** ***Aurora, MN 55705***
Original Version:	***July 1, 2011***
Revision Date:	***August 19, 2011***
Original Plan Prepared By:	***Barr Engineering Company***

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
Phone: (952) 832-2600
Fax: (952) 832-2601

Ash Ponds Emergency Action Plan (EAP)
Minnesota Power
Laskin Energy Center
Aurora, Minnesota

Table of Contents

List of Tables

List of Figures

List of Appendices

Contact List 1 – Laskin Ash Pond Structural Integrity Emergency

Emergency Contact	Name	Extension (Direct Dial within MP Telephone Network)	Telephone Number
Laskin Energy Center	Control Room	4808	218-225-4808
Laskin Supervisor/Production Coordinator (24 hours)	N/A	4808	218-225-4808
Laskin Safety Contact	Greg Rindal	3398	218-393-5455
	Sean Taylor	4416	218-343-9837
Laskin Energy Center and MP Fuels Managers	Lainie Plotnik	4801	218-259-8025
	Amanda Kluge – Fuels Manager	4412	218-256-8883
	Kathy Benham – Fuels General Manager	4624	218-326-3565
Ash Operations Engineer	Mark Scharnott	4639	218-259-7709
Operations Superintendent	Mike Geisdorf	4817	218-229-3856
Maintenance Superintendent	Kris Spenningsby	4805	218-391-2446
Geotechnical Engineer (Dams)	David Aspie	3557	218-340-9660
Civil Engineering Supervisor	Phil Johnson	3156	218-590-3400
Emergency Health and Safety			
Fire/Ambulance/Police – Dependent on Incident Severity	N/A	911	911
Hospital – Dependent on Incident Severity	White Community Hospital	N/A	218-229-2211
	Virginia Regional Medical Center – Emergency Services	N/A	218-749-9412
	St. Luke's Trauma	N/A	218-249-5616
	St. Mary's Trauma	N/A	218-786-4357
Government Agencies			
Minnesota Duty Officer			800-422-0798
National Response Center			800-424-8802
US EPA Region V			312-353-2318
US Coast Guard			218-522-0707
Minnesota Pollution Control Agency (24 hrs)			612-296-8100 or 612-296-6300

Emergency Contact	Name	Extension (Direct Dial within MP Telephone Network)	Telephone Number
Minnesota Emergency Response Commission			612-643-3000
St. Louis County Emergency Management (Sheriff)			218-625-3960

Contact List 2 – Laskin Ash Pond Environmental Incident

Contact	Office Extension	Cell	Home
Minnesota Power Environmental Incident Call Numbers			
Normal Business Hours (8:00 AM – 4:30 PM	3200	n/a	n/a
Outside of Business Hours	2764	n/a	n/a
Additional Contacts for Air Related Incidents at Ash Pond			
Tom Pustovar	3823	218-340-4959	N/A
Tim Hagley	3423	218-390-8387	218-724-6850
Melissa Weglarz	3321	218-343-0927	N/A
Additional Contacts for Water/Chemical Related Incidents and Oil Spills at Ash Pond			
Kurt Anderson	3322	218-343-0178	218-453-1000
Blake Francis	3584	218-391-2487	218-729-5102
Bill Fraundorf	3817	218-343-1317	218-343-4967
Contractors			
Lakehead	Dave Lislegard	218-343-7965	N/A
Moorhead	Cliff Nelson	218-244-3719	N/A

Note: After regular business hours, when Laskin personnel cannot be reached, call the Operation Control Center (OCC) in Duluth by dialing ext. 2764 from an internal telephone. The OCC will then call the appropriate after-hours Minnesota Power environmental personnel. All spills or releases of a chemical, regardless of the amount, and spills of oil greater than 5 gallons (or any amount of oil that reaches surface water) must be reported to the Minnesota Duty Officer by calling 800-422-0798. Refer to the Laskin Environmental Incident Reporting Guide on the Laskin Homepage for procedures on reporting oil and chemical spills and releases. Also see Appendix F for supplemental information.

Contact List 3 – Laskin Ash Pond Emergency Assignments

Role	Contact	Office Extension	Cell
Site Incident Commander (SIC)	Lainie Plotnik	4801	218-259-8025
Alternate 1	Mike Geisdorf	4817	218-290-7923
Alternate 2	Kris Spenningsby	4805	218-391-2446
Public Affairs Officer	Amy Rutledge	7440	218-348-2961
Insurance Claims Leader	Greg Rindal	3398	218-393-5455
Alternate	Roni Salo	3550	218-348-9757
Human Resource and Logistics Leader	Wendy Sersha	4802	218-349-2132
Alternate	Gloria Eckman	4838	218-229-3456
Communications Leader	Mike Geisdorf	4817	218-290-7923
Alternate	Gloria Eckman	4838	218-229-3456
Media Communications	Amy Rutledge	7440	218-348-2961
Resource Leader	Mike Geisdorf	4817	218-290-7923

2.0 Emergency Recognition Subplan

2.1 Emergency Definitions

2.1.1 Imminent/Actual Failure

Description: Impending or actual sudden release of water and/or bottom ash and/or air quality control system (AQCS) scrubber solids caused by an accident to or failure of ash pond structures.

Examples:

- Failure of a segment of the perimeter dam by seepage and/or slope instability, or
- Failure of a segment of the perimeter dam by erosion or overtopping.

2.1.2 Potential Hazard

Description: Potential sudden release of water and/or bottom ash and/or AQCS scrubber solids caused by an accident to or failure of ash pond structures. Actions taken during such potentially hazardous events may prevent or mitigate failure. Even if failure is inevitable, in potential hazard situations more time generally is available than in the imminent/actual failure emergency situation to issue warnings and/or take mitigative actions.

Examples:

- Advance warning or signs of possible dam breech or failure, or
- Erosion or uncontrolled seepage along a segment of a perimeter dam, or
- Extensive movement, cracking or settlement along a segment of the dam.

2.2 Site and Dam Condition Surveillance

The ash pond facilities at LEC are automated and are operated by the Environmental System Operators at LEC. During normal operation periods, on-site inspections are performed on a daily basis.

Three levels of emergency conditions (or warning signs) can be identified with respect to ash pond operations. These are defined as follows:

- Level 1

  Level 1 is defined as unusual conditions that do not warrant an emergency response but require prompt investigation and resolution. Typical situations are outlined in Table D-1.

  The action in the event of a Level 1 condition will typically involve an investigation, intensified monitoring, inspecting and/or testing, and defining and implementing possible corrective measures.

- Level 2

  Level 2 is defined as conditions that represent a potential emergency, if sustained or allowed to progress, but no emergency situation is imminent.

  The first action in the event of a Level 2 emergency condition is to discuss and define an action plan, at the site, under the direction of the Ash Operations Engineer and Site Incident Commander, and then to implement the plan.

- Level 3

  Level 3 is defined as an emergency defined by either imminent failure or actual failure of the ash pond dams or a significant component of the ash ponds.

  The first actions in the event of any Level 3 emergency condition are:

  - Check that all persons who could possibly be affected are safe;
  - Initiate the appropriate chain of communications; and
  - Immediately undertake the appropriate response actions.

Typical situations that would be classified under the Level 2 and Level 3 emergency conditions, their potential or actual consequences, and the actions to be taken are outlined in Tables D-2 and D-3. Site surveillance walkovers carried out by site personnel should focus on observing for the various conditions described in Tables D-2 and D-3.

All those involved in emergency response, after first having communicated with the appropriate parties, should consider two types of actions as first steps in the emergency response, with respect to the protection of human life and health, environment and property:

- What can be done to prevent the situation from worsening?
- What can be done to reduce the consequences of the impending or actual failure?

Any such action must be presented to the Ash Operations Engineer and Site Incident Commander who will decide on its implementation in consultation with the design engineer. Most obvious mobilization requirements associated with Level 2 and Level 3 conditions are detailed in Table D-4.

2.3 Detection and Monitoring Devices

Currently, the pond water elevations are monitored by the Laskin Plant Operators who inspect ash pond water levels 2 times per day on a 24/7 schedule and record ash pond water levels a minimum of once per week. Ash lines are checked 2 times per day. Embankment elevation and alignment at critical locations is monitored semi-annually.

3.0 Emergency Notification Subplan

3.1 Notification Sequence

The Notification Flowchart (Section 1, Figure 3) summarizes the sequence of notification and responsibilities for each participant in the EAP for the LEC ash pond. The chart applies to both emergency conditions, "Imminent Failure" and "Potential Hazard", as previously defined. Parties to be notified include system operators and LEC management, and emergency and safety officials, local, state, and federal government officials, and affected residents and businesses; all as appropriate based on the nature and severity of the incident and as determined by the SIC.

The chart indicates the priority of notification for each participant in the EAP. Since the top priority is the protection of human life, participants are reminded that careful choice of the order of notification or adapting the EAP to unique circumstances may be necessary. If failure is imminent or has occurred, warning and evacuation procedures are top priority. For a potentially hazardous situation, mitigation efforts may be most important to avoid a panic situation. The SIC in conjunction with the Unit Managers are responsible for this judgment.

If the flow of notification is altered, participants are encouraged to regain the order to ensure that every party is notified as needed.

3.2 Modes of Communication with Responsible Persons

The primary modes of communication with responsible persons are land-line telephone and cell phone. If someone cannot be contacted for any reason, first try using an alternate telephone number/cell phone number or contact the alternate person for the position. If telephones or cell phones are out of order, try an alternate mode of communication as listed below:

- Use two-way radio
- E-mail message
- Call dispatcher
- Deliver in person

Minnesota Power uses cell phones for routine communication purposes. If needed, other parties have equipment and personnel available for aid with communication such as the local police/sheriff and county emergency management personnel.

3.3 Notification of Potentially Affected Businesses and Residents

Incidents at the LEC ash pond have limited potential to affect nearby businesses and residents. For incidents at the ash pond that do have the potential to affect nearby businesses and residents, it is likely that the Site Incident Commander's efforts will be supported by establishment of an MP Crisis Management Team (CMT). The Site Incident Commander may or may not lead the CMT. In the event that a CMT is established, the CMT Leader (CMTL) will have the primary responsibility for notifying potentially affected businesses and residents. A CMTL will be named by the SIC on an as-needed, incident by incident basis. A detailed list of the local city contacts for Aurora and Hoyt Lakes, Minnesota is contained in Appendix E.

3.4 Responsibilities

The following describes the chain of command and the responsibilities of the primary participants in the EAP.

3.4.1 EAP Implementation

The SIC, or in cases of a significant incident the CMTL, will have the overall responsibility for implementing the EAP. This responsibility includes evaluation of the information provided by the Ash Operations Engineer, Laskin Plant Operator and/or on-site Observer and notification of the following noted in the Notification Flowchart:

- MP's Environmental and Land Management (ELM)
- Fuel Services General Manager and Operations Manager
- City of Hoyt Lakes and Aurora Public Utilities
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency (MPCA) and/or Environmental Protection Agency (EPA)

The CMTL is responsible for these notifications. The MP Vice President of Generation is responsible for these notifications should the CMTL (or alternates) be unavailable.

The SIC is responsible for reviewing, updating, training, testing, and distributing the EAP as set forth in Appendix C.

3.4.2 Surveillance, Monitoring and Initial Notification

The Ash Operations Engineer or Laskin Plant Operator at the ash pond site is responsible for surveillance and notification of the SIC or alternate of any emergency conditions. Once the SIC or alternate is notified, the Ash Operations Engineer and Laskin Plant Operator will concentrate on providing updates of the situation to the SIC (or CMTL if applicable). The SIC or CMTL will maintain communication with local officials.

3.4.3 Warning and Evacuation

The SIC or CMTL (or alternate) will notify the St. Louis County Sheriff of a potential, imminent, or actual failure. The St. Louis County Sheriff will have the responsibility of establishing and implementing the offsite emergency evacuation and warning plan. An example Response Procedure for ash pond dam failure and an example Warning Log are shown in Appendix A. The St. Louis County Sheriff will direct the specific off-site evacuation and warning actions, coordinate with and inform the SIC or CMTL of the action being taken and notify the downstream residents, businesses, and emergency services.

The top priority in an imminent/actual emergency is the warning and evacuation of potentially affected residents and businesses. The St. Louis County Sheriff will contact the following:

- County Public Safety (Sheriff Dispatcher/Local Fire & Rescue) who will contact local government or volunteer personnel assigned to public warning and rescue responsibilities.

- Potentially Affected Residents and Businesses.

3.4.4 Mitigative Actions

The MP Ash Operations Engineer will direct the specific mitigation actions, coordinate with and inform the MP SIC or CMTL of the actions being taken and contact the participants listed in Contact List 1 as required by the specific emergency. The objectives of the mitigative actions are to prevent a failure or reduce the impact of a failure. The Ash Operations Engineer, SIC or CMTL may contact the Engineering Services Manager to coordinate in-house geotechnical or civil engineering support as needed.

3.5 Typical Notification Statements

Preparation of warning messages should begin as soon as their potential need is apparent so that they can be issued promptly upon declaration of an emergency condition. In some cases, an emergency condition may be declared with little or no advance notice. The example messages, included in Appendix A, provide a model for the first announcements in such cases, and may be used by St. Louis County, at its discretion, for the following conditions:

- Potentially Hazardous Condition (Alert Condition)
- Imminent/Actual Failure (Evacuation Condition)

3.6 Updates and End of Emergency Declaration

Updates of the situation are necessary and begin with the Ash Operations Engineer or Laskin Plant Operator at the ash pond site and the MP SIC or CMTL. The same notification flow will be followed as shown in the Notification Flowchart. The SIC or CMTL will determine if changes in the situation are significant enough for notification of every party involved in the EAP. The end of emergency declaration will be made by the SIC or CMTL as stated in Section 5 of this EAP.

4.0 Emergency Operations and Repair Subplan

The objective of the emergency operations and repairs is to prevent or reduce the impact of an impending sudden release of water and/or bottom ash and/or AQCS scrubber solids. It should be anticipated that this work may need to be performed during adverse conditions and will require various supplies and resources. The primary methods of mitigating the potential impact are: coordination and regulation of the flows, the performance of emergency repairs and flood proofing.

4.1 Response During Adverse Conditions

4.1.1 Darkness

Portable lights may be required for poorly lit areas. Portable lights equipped with generators and other equipment is available at the Laskin Fuels area. Filled sandbags are located in a storage container on the Northeast corner of the Cell E .

4.1.2 Electrical Power Outage

Should there be a power outage affecting emergency operations at the pond, mobile generators would be required to operate the lights and any other equipment used in the mitigation efforts. The Laskin cold storage warehouse has a portable welder that is equipped with a generator. The Boswell Energy Center Ash Maintenance Building has additional portable lighting equipped with diesel generators.

4.1.3 Emergency Supplies, Resources and Contractors

MP has equipment necessary to perform on-site mitigative actions. However, stockpiling of additional equipment and materials at the site for emergency repairs and procedures is not considered practical.

An oil boom is available on the west side of the rail car thaw shed and in the storage container on the east side of the locomotive shed. Spill response trailers containing booms and absorbent pads are located at the Little Falls Service Center and the Thomson Hydro facility. Boswell Energy Center also has a spill response trailer in the Unit 4 dry chemical building and oil booms are available at the base of the Boswell Unit 3 Retrofit pipe trestle on the west shoreline.

In the event of a shortage of materials or equipment, requests for assistance can be made to the county and state emergency management offices or environmental response contractors OSI Environmental, Inc. and Bay West, Inc as listed below:,

OSI Environmental, Inc.,	Bay West, Inc.
300 Fayal Road, Eveleth, MN 55734	5 Empire Drive, St. Paul, MN 55103
Phone: 218-744-3064; 800-777-8542	Phone: 612-291-0456; 800-279-0456

4.2 Repairs

The services of a qualified engineer experienced in dam design and construction should be obtained before the performance of any repairs affecting dam safety. The one exception is if the services of an engineering firm cannot be obtained in time to prevent a failure. The MP SIC or CMTL is responsible for determining if repairs are to be performed without the services of an engineer.

Potential emergency repairs that could be performed for some common deficiencies include:

- Erosion

  Erosion protection may be required along the exterior face of earth embankments due to severe rainfall and surface water runoff. Common repairs include the placement of filter gravel, riprap, sand bags, erosion control blankets, and other material.

- Seepage and Leakage

  Repairs at the downstream side of dams should concentrate on allowing the seepage and leakage to be safely passed downstream without transporting materials and without increasing the pressures on the structures. Attempts to "block" seepage or leakage from the downstream side are likely to increase the pressures and often worsen the conditions. Placement of filter gravel, drains, and other material that allow drainage are common types of repairs. Placement of sand bags around and downstream of, but not on top of, the location of seepage to increase the hydraulic head around the seepage location is another potential seepage response. Filled sandbags are located in a storage container on the Northeast corner of the Cell E .

  Repairs at the upstream side should plug or block the seepage or leakage. To effectively "block" the leakage, the material placed should be slightly larger than the anticipated opening (if possible) and then progressively smaller. Common repairs include the placement of clay, plastic membrane, coal ash, sand, gravel, and rock.

5.0 Post-Emergency Action Subplan

5.1 Declaration of End of Emergency

The decision to declare the end of the emergency is left to the MP SIC or CMTL. After the threat of emergency has passed or the immediate consequences of a failure have been realized, it is important that the initiation of recovery or other post-emergency operations are based upon a clearly defined decision. The declaration is to be transmitted through the notification chain as shown in the Notification Flowchart (Section 1, Figure 3).

5.2 Inspection and Repair of Impacted Dams

As soon as practicable following the emergency, irrespective of whether or not a failure actually occurred, the ash pond dams should be inspected by qualified engineers experienced in the design and inspection of dams. The Department of Natural Resources should be notified of the findings. Repairs to the dams should be planned by experienced, technically competent personnel, and appropriate permits required by the regulatory agencies having jurisdiction over the project should be obtained.

However, if emergency conditions affecting the safety of life or property exist, the owner and its agents should, without special instructions, approvals or permits, act at their discretion to prevent such threatened loss or injury.

5.3 Incident Recovery

The objectives of recovery actions are to initiate and carry out post-emergency actions necessary to maintain public health, return community services to normal at the earliest possible time, and to provide assistance in recovery. County and community emergency management will be responsible for directing any necessary actions outside of the plant site. MP will assign personnel to provide ongoing assistance to and information to County and community personnel. Within the plant, recovery will be directed by the Generation Recovery Team. This Section of the EAP summarizes:

- The Generation Process Recovery Team Members
- Generation Process Recovery Procedures
- The Generation Process Recovery Sequence of Events

Reference should be made to the LEC Generation Recovery Plan for more detailed guidance on generation recovery procedures.

5.4 Generation Process Recovery

5.4.1 Generation Process Recovery Team Members

The Generation Process Recovery Team (GRT) is responsible for coordinating the recovery procedures for the LEC generating assets following a business interruption. The GRT will communicate progress to the SIC or CMTL (whichever controls). The CMT member for Generation is:

Al Rudeck

Vice President – MP Generation

Office 1: 218-328-5036 ext 1. 4779

Office 2: 218-722-5642 ext2. 3480

Cell: 218-341-6004

The lead and alternate for the Generation Recovery Team are:

William Boutwell	Dave Leveille
General Manager Thermal Operations	General Manager Production Planning
Office: 218 -313-4740	Office: 218-313-4366
Cell: 218-370-0650	Cell: 218-259-9852

5.4.2 Generation Process Recovery Procedures

In alignment with the objectives of Minnesota Power senior management, processes should be recovered according to the priority listed below:

1. Supporting keeping the lights on.
2. Maintaining cash in and cash out.
3. Communicating with employees, customers, investors, and other external parties.

The overall Generation recovery plan will strive to maintain reliable production throughout a possible business interruption at LEC. To accomplish this, the generation operating units will deploy resources to meet the following operational priorities in descending order of importance:

- Public safety will be protected by maintaining the integrity of the thermal units at LEC to support customer needs.
- Uphold license requirements necessary to protect public health and Minnesota Power regulatory compliance. Document and report any deviations as a result of the emergency to the appropriate agency(s).
- Operate, maintain, and protect all assets.

If staffing is not adequate to support running all units or key supplies (coal, furls, chemicals, etc.) are not available, some units will remain at minimum generation or remain out of service. If this is necessary, decisions will be made on how to maintain the integrity of equipment.

5.4.3 Generation Process Recovery Sequence of Events

During an "event", the Generation Recovery Team's objective is to maintain LEC unit availability for customer and system needs. There may be times when events occur that would not allow for an immediate recovery. During these events, the LEC Emergency Action Plan shall be executed and followed regardless of the complexity of the emergency event.

5.5 Ash Pond EAP Critique

Soon after the emergency, a critique should be prepared describing the events prior to, during, and following the emergency: significant actions taken by each participant; what improvements would be desirable for future emergencies; and all deficiencies found in procedures, materials, equipment, manpower, leadership, and funding. Throughout the process it should be strongly emphasized that the purpose of the critique is not to assign credit or blame, but to determine how future emergencies at the ash pond facilities can be handled with the minimum loss of life and property.

A post emergency report should be prepared and distributed to all organizations that participated in or have a direct interest in the emergency, including the Department of Natural Resources, MPCA, and EPA, under the direction and review of Minnesota Power's Environmental Services Department.

Appendix A

Notification Statement, Operating Procedure, and Warning Log

Example 1

Typical Notification Statement
Potentially Hazardous Condition (Alert Condition)

St Louis County announced at (enter time) today that an ash pond dam at the Laskin Energy Center in Hoyt Lakes is experiencing (enter concise, simple description of the problem) which may lead to failure and an abnormal discharge of water and coal ash. If the problem is not corrected, areas near the ash pond may be flooded. The ash pond is located immediately west of Minnesota Power's Laskin Energy Center, which is located on County Road 633, one mile west of the City of Hoyt Lakes. Residents of low lying areas near the plant site should be on alert for localized flooding and be prepared to evacuate.

If evacuation is necessary, residents and business owners within the following areas should evacuate as follows: (define/list who, what, when, and where)

- _____
- _____
- _____
- _____

If evacuation becomes necessary, the notice to evacuate will be given by (*sirens, loudspeakers, radio, etc.*).

Additional information will be released as promptly as possible.

Example 2

Typical Notification Statement
Imminent/Actual Failure (Excavation Condition)

Urgent: St Louis County has announced that ash pond dams at Minnesota Power's Laskin Energy Center [*are in imminent danger of failure/have failed (give time of failure)*]. The ash pond is located immediately west of the Laskin Energy Center, which is located on County Road 633, one mile west of the City of Hoyt Lakes, MN.

Attempts to save the dams (*have failed/are underway but their success cannot be determined at this time*). Residents and business owners within _________- [*give area/location*] should evacuate to high ground immediately.

(If the ash pond dam fails or since the ash pond dam has started to fail, whichever is the case) the flood surge will take approximately ____ hours to reach __________. Areas closer to the ash ponds will be flooded sooner.

For evacuation by cars, residents and business owners within the following areas should evacuate immediately as follows: (Use mile radius map here for notification).

- _____
- _____
- _____
- _____

The following roads and bridges _______ [*list roads, bridges,* etc.] are closed to all but emergency vehicles and should be avoided. St Louis County is attempting to provide additional notice of the evacuation by *(sirens, loudspeakers, radio, etc.)* but nearby residents and business owners receiving this notification are hereby requested to evacuate immediately.

Additional information will be released as promptly as possible.

Example 3

St Louis County Emergency Management Office Response Procedure: Ash Pond Dam Failure

1. Obtain as much information as possible. If time permits, confirm condition of dam with MP SIC or CMTL or Ash Operations Engineer.

2. Determine appropriate warning declaration and list options or alternatives

3. If Imminent/Actual Failure level, relay warning as per warning log.

4. Contact as many residences as possible using warning log.

5. Evacuate downstream residents and facilities.

6. Maintain telephone communication with MP.

Example 4

St Louis County Public Safety Department Warning Log

Date__________ Time____________________ Party Message Received From____________________

Message____

Confirmation contact with Minnesota Power ____

Determination of Action Level: False Alarm
Potential Hazard (Alert Level)
Imminent/Actual Failure (Evacuation Level)

Warning Relayed to: (List of downstream residences and facilities)

____

____

____

____

____

____

____

____

____

____

Patrol Cars Dispatched:____

Comments:____

____

____

Time "All Clear" declared:____

Appendix B

Purpose of the Emergency Action Plan

Appendix B

Purpose of the Emergency Action Plan

The purpose of the Emergency Action Plan (EAP) is to document a workable plan of action to be followed in the event of failure of the Laskin Energy Center (LEC) ash pond dams. The LEC ash pond dams fall within the requirements of Minnesota Rules 6115.0340 and under these Rules the LEC ash pond dams would be classified as Class II Dams. Class II Dams are characterized as follows:

> Class II – possible health hazard or property loss of high-value property, damage to secondary highways, railroad or other public utilities, or limited direct or indirect economic loss to the public.

These rules further require in part that Class II dam owners prepare a contingency plan for notifying persons whose lives, property or health may be endangered by dam failure – see Minnesota Rules for Emergency Action Plan on following page.

The format of this plan considers "The Guidelines for the Preparation of Emergency Preparedness and Response Plans for Minnesota Dams", a document prepared by the Minnesota Department of Natural Resources. The plan is further modified to meet Minnesota Power's site specific organizational needs and site-specific infrastructure.

A copy of Minnesota Rules Section 6115.0490 Warning Systems and Emergency Procedures is attached.

Minnesota Rules for Emergency Action Plans

6115.0490 WARNING SYSTEMS AND EMERGENCY PROCEDURES.

Class I dam owners shall prepare and file for approval a contingency plan for notifying any persons whose lives, property, or health may be endangered by failure, misoperation, or other circumstances or occurrence affecting the dam, identifying most practical and expeditious means for warning considering the time factor involved based on the proximity of the dam to affected parties. If there is no feasible or practical means to provide for adequate evacuation warning in sufficient time if a catastrophe occurs the owner shall be responsible for notifying affected downstream property owners of that fact.

STAT AUTH: MS s 105.535

Current as of 06/11/08

Appendix C

Emergency Action Plan Review, Updating Training, Testing and Distribution

Appendix C

Emergency Action Plan Review, Updating, Training, Testing and Distribution

C-1 Emergency Action Plan Review and Updating

Review and update of the Emergency Action Plan (EAP) should be accomplished every two years as EAP contents become obsolete and changes occur in ash pond development and defined hazard areas. Review and updating should also include adjustments that are found to be necessary through experience gained as a result of practice sessions or emergencies that occur at other sites. The telephone numbers and persons listed in the Notification Flowchart are of primary importance.

C-2 Training

Anyone assuming significant responsibilities in the EAP and their alternates must periodically review the elements of the EAP and conduct appropriate training.

C-3 Testing

Testing of the EAP may be carried out as a part of the training session. Testing the EAP familiarizes the responsible parties with the EAP, gives the community a good idea of the real time needed for evacuation, and helps make evident any EAP deficiencies. Simulation drills are conducted annually as a means of preparation, training, and testing the EAP and are coordinated with annual Laskin 1st responder training.

C-4 Distribution

The following distribution list is provided to insure that each participant has a copy of the EAP and so updated EAPs can be distributed accordingly.

Minnesota Power Contacts are listed in EAP Section 1.0.

Itasca County Contacts are listed in Appendix E.

MDNR Contact

Jason Boyle
State Dam Safety Engineer
Minnesota Department of Natural Resources
Division of Waters
500 Lafayette Road
St. Paul, Minnesota 55155-4040
Phone: 651-259-5715
jason.boyle@dnr.state.mn.us

Appendix D

Ash Pond Non-Routine Inspection and Emergency Action Guidance

Table D-1 Unusual Occurrences That Warrant a Non-Routine Inspection

Event/Observation	Possible Immediate Action
Concentrated runoff, erosion or slope deterioration.	Inspect the (visible) slopes and the crest of the dams looking for areas of concentrated runoff or erosion. Make a note of saturated ground or soft ground conditions at dam slopes and toes. Examine dam slopes for indications of localized slumping/instability. Inspect ash/reclaim pipeline route.
Rupture of ash/reclaim pipeline at dam structure.	Stop the connected pumps. Check for dam erosion.
Pond level close to or approaching a critical level.	Stop the connected pumps. Reduce the pond level (mobilization of pump and treatment equipment as necessary). Notify the Design Engineer.
Significant, relatively rapid erosion (any cause) of dam slope or sudden seepage break at dam slope or downstream of dam in form of continuous seepage or boils.	Measure size of erosion and/or estimate seepage area and flow rate. Consult with Design Engineer.
Deformation at dam crest, slope or toe area, including development of a continually saturated area at ground surface and/or cracks or scarps on crest or slopes, or sloughing or bulging on slopes.	Consult with Design Engineer.
If piezometers are present – significant change in the piezometer level/levels.	Check piezometer readings again to confirm findings. Initiate findings review by Design Engineer.
Other events/observations.	Consult with Facility or Design Engineer.

Table D-2 Emergency Action Plan for Level 2 Situations

Level	Emergency Condition (Warning Level)	Potential/Actual Consequences	Required Action
2	Signs of slowly forming erosion at downstream slope.	Eventual dam failure.	Discuss findings with the design engineer. Be prepared to carry out corrective actions.
2	Soft toe condition or increased seepage at downstream slope or dam toe.	Internal erosion or slope slumping and eventual dam failure.	Discuss the findings with the design engineer. Commission a field investigation program if so recommended. Be prepared to carry out corrective actions.
2	Cracks developing at dam crest or in slope.	Deformation of dam structure that may lead to eventual dam failure.	Increase frequency of dam walk-overs to daily until the problem is understood and addressed. Seek advice from the design engineer. Monitor crack development for increase in size, spacing, etc. Be prepared to carry out corrective actions.
2	High turbidity in dam seepage flow.	Internal erosion and eventual darn failure.	Increase frequency of dam walk-overs to daily until the problem is understood and addressed. Seek advice from the design engineer. Take water samples for suspended solids determination if recommended by design engineer. Be prepared to carry out corrective actions.
2	Pond level close to or approaching a critical level.	Dam overtopping and eventual dam failure.	Immediately undertake actions to reduce the pond level (mobilization of pump and treatment equipment as necessary). Confirm existence and functionality of emergency bypass. Consult with design engineer as appropriate.
2	Any other change in seepage conditions.	Dam stability safety margin affected.	Seek advice from the design engineer.

Table D-3 Emergency Action Plan for Level 3 Situations

Level	Emergency Condition (Warning Level)	Potential/Actual Consequences	Required Action
3	Unusually high reading in a single piezometer and/or observed high levels of seepage.	Excessive seepage through dam and potential for dam breach.	Check the reading again. Intensify reading frequency to daily. Seek advice from the Design Engineer.
3	Failure or suspected imminent failure of a dam (any reason).	Catastrophic dam breach resulting in release of water or water and liquefied ash and/or AQCS solids.	Initiate chain of communications and ensure safety of people. Mobilize pumping and earthmoving equipment. Stop discharge into the pond. Lower pond by any practical means approved by the design engineer. Construct confinement berms downstream of the dam, where feasible.
3	Slumping, sliding or bulging of a dam slope or adjacent ground.	Catastrophic dam breach resulting in release of water or water and liquefied tailings.	As above (shaded box). Construct stabilizing berm per direction of the design engineer.
3	Boils observed downstream of dam.	An internal erosion failure possible, with potential breach of the dam.	As above (shaded box). Place granular filter buttress over the boils, if approved by the design engineer.
3	Water vortex within the pool.	An internal erosion failure in progress, with potential breach of the dam.	As above (shaded box). Check downstream of the darn area for increased and/or turbid seepage discharge. Place granular filter buttress against any such areas, if approved by the Design Engineer
3	Loss of freeboard.	Dam overtopping and failure under high wave event.	As above (shaded box).
3	Severe flood/intense rainstorm or rapid snowmelt resulting in extreme pond level.	Overtopping of dam and resulting erosion and over-steepening of the downstream slope, leading to dam failure.	As above (shaded box) Carry out detailed inspection of dam.

Table D-4 Mobilization Plan for Level 2 or 3 Situations

Component Failure	Level 2 Condition	Level 3 Condition
Failure of a dam.	Planning for mobilization of earthmoving equipment, pumps and pipelines, as well as lowering of the pond level may be necessary, after all communications are carried out.	Immediate mobilization of earthmoving equipment, pumps, pipelines, power generator(s) available at site locations and lights, will most likely be necessary. Immediate lowering of the pond level will typically be necessary.
Failure of a pump station.	After the repair work is initiated, plan for mobilization of pumping equipment if the timing for repairs would affect the pumping needs.	Immediate mobilization of pumping equipment and, if required, the availability of a power generator may be necessary.
Failure of a pipeline.	Initiate pipe or pipe section replacement.	Initiate chain of communications after initiating pipe or pipe section replacement.
Major power failure.	Evaluate power needs and timing and establish contingent power supply.	Re-check the adequacy and the capacity of the power generators available to the site. Mobilize additional units, including fuel, if necessary.

Appendix E

City of Hoyt Lakes and City of Aurora Contact Information

City of Hoyt Lakes Contact List

Title	Name	Phone
City Office -- Administrator	Michael R. Skrbich	218-225-2344
Public Works Department	Floyd Nelson	218-225-2832
Fire Department	Steven Stoks	218-225-2110
Police Department	Steven Stoks	218-225-2000

City of Aurora Contact List

Title	Name	Phone
City Office -- Mayor	Mary Hess	218-229-2614
Public Works Department	Chris Vreeland	218-229-2231 Cell 218-780-3194
Fire Department	Kent Dickinson	218-229-3131 Cell 218-742-2840
Sheriff's Office	Bill Lesar	218-229-2244 (non-emergency number)

Appendix F

Emergency Incident Checklist and Environmental Spill Report Form

EMERGENCY INCIDENT CHECKLIST

Who Assigned	Phone	Type	Informed	Completed
Wendy Sersha Mike Geisdorf	4802/218-349-2132 4817/218-229-3856	Human Resource Unit Leader	☐	☐
Mike Geisdorf Kris Spenningsby	4817/218-229-3856 4805/218-391-2446	Security Unit Leader	☐	☐
Mike Geisdorf Gloria Eckman	4817/218-229-3856 4838/218-229-3456	Communications Leader, Logistics	☐	☐
Lainie Plotnik Mike Geisdorf Kris Spenningsby	4801/218-666-6065 4817/218-229-3856 4805/218-391-2446	Facility Incident Commander	☐	☐
Larry Popovich Rich Karolczak Joe Dahmen Steve Unruh	4804/218-229-3746 4853/218-229-3172 4872/218-229-2631 4870/218-638-2911	Operations Commander	☐	☐
Sean Taylor Wade Roseth	4416/218-343-9837 3254/218-343-8141	Site Safety Representative	☐	☐
Deborah Amberg Lyssa Supinski	3930/218-428-2410 3982/715-398-7149	Legal Representative	☐	☐
Wendy Sersha Gloria Eckman	4802/218-349-2132 4838/218-229-3456	Finance & Office Management Unit	☐	☐
Greg Rindal Roni Salo	3398/218-393-5455 3550/218-348-9757	Insurance Claims Unit Leader	☐	☐
Amy Rutledge	7440/218-348-2961	Public/Government Affairs Representative	☐	☐
Jason White Air Kurt Anderson Bill Fraundorf-Waste	3132/218-290-3040 3322/218-343-0178 3817/218-343-1317	Environmental Unit Leader	☐	☐
Tom Verbick Jason Norberg Eric Kunnari	4807/218-865-7085 7216/218-229-2040 4803/218-290-5555	Waste Management Specialist	☐	☐

LASKIN ENERGY CENTER

Environmental Spill Report

Date of spill: ____________________ Time of spill: ____ ______________________

Location of spill: ____

Is spill in an aboveground storage tank containment? Yes____No _____

If yes, an assessment and repairs of secondary containment must be performed.

Equipment identification: ____

(tank, drum, ash line, sump, etc.)

Material spilled: ____

Quantity spilled (gallons): ____

Were samples taken? Yes_____ No _____ pH_____ Other_______________

Incident description: ____

____

____

____

____

____

Did any spilled material reach Colby Lake or the Partridge River? Yes _____ No _____

Volume (gallons): _____

Did any spilled material reach the ash pond? Yes_____ No _____ Volume (gallons): _____

What cleanup measures were taken? ______________________________

____

____

____

____

What, if any, preventative measures could be taken to prevent reoccurrence of the incident?

____

____

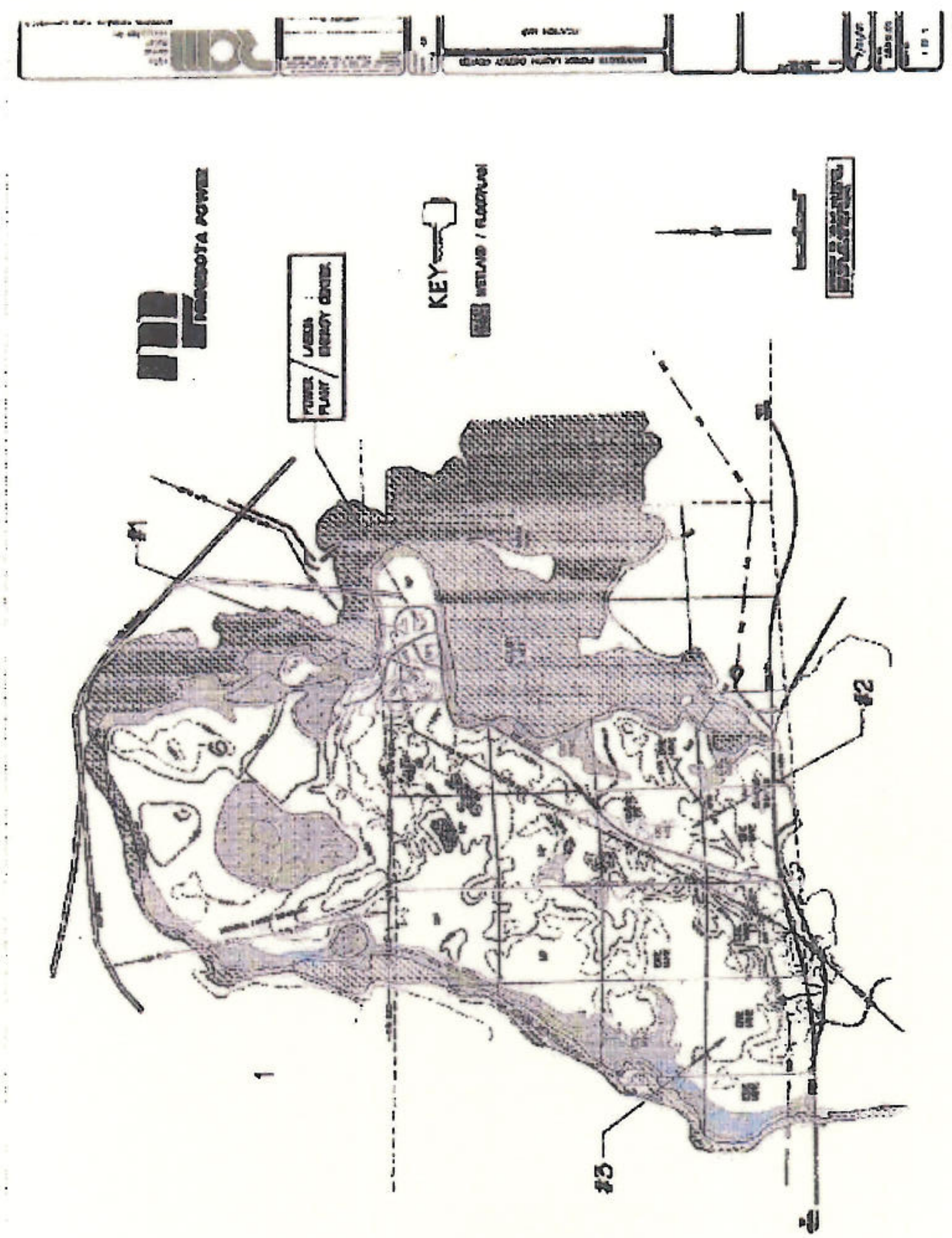
____

____

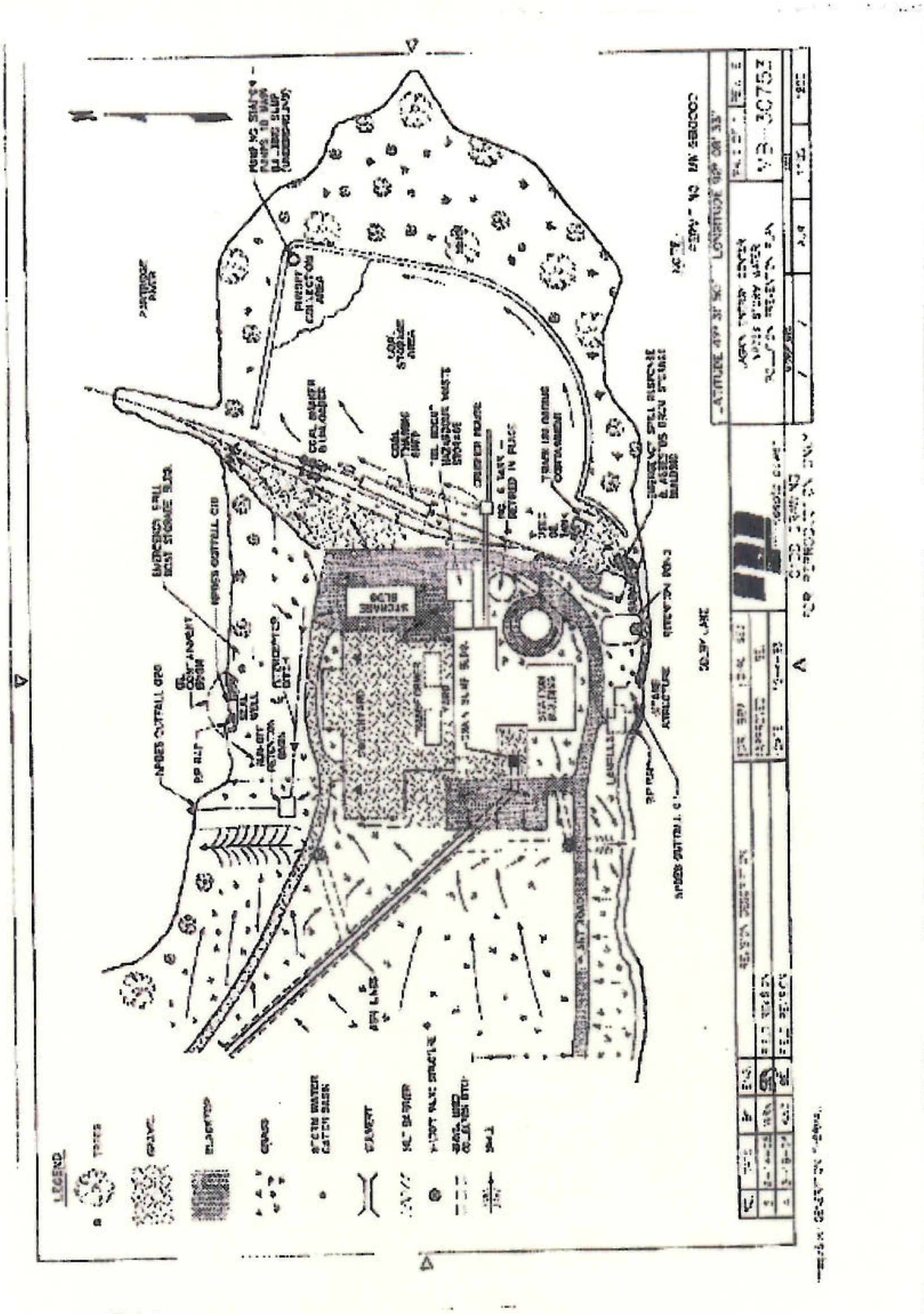
Prepared by: ___________________________ Date: ___________________________

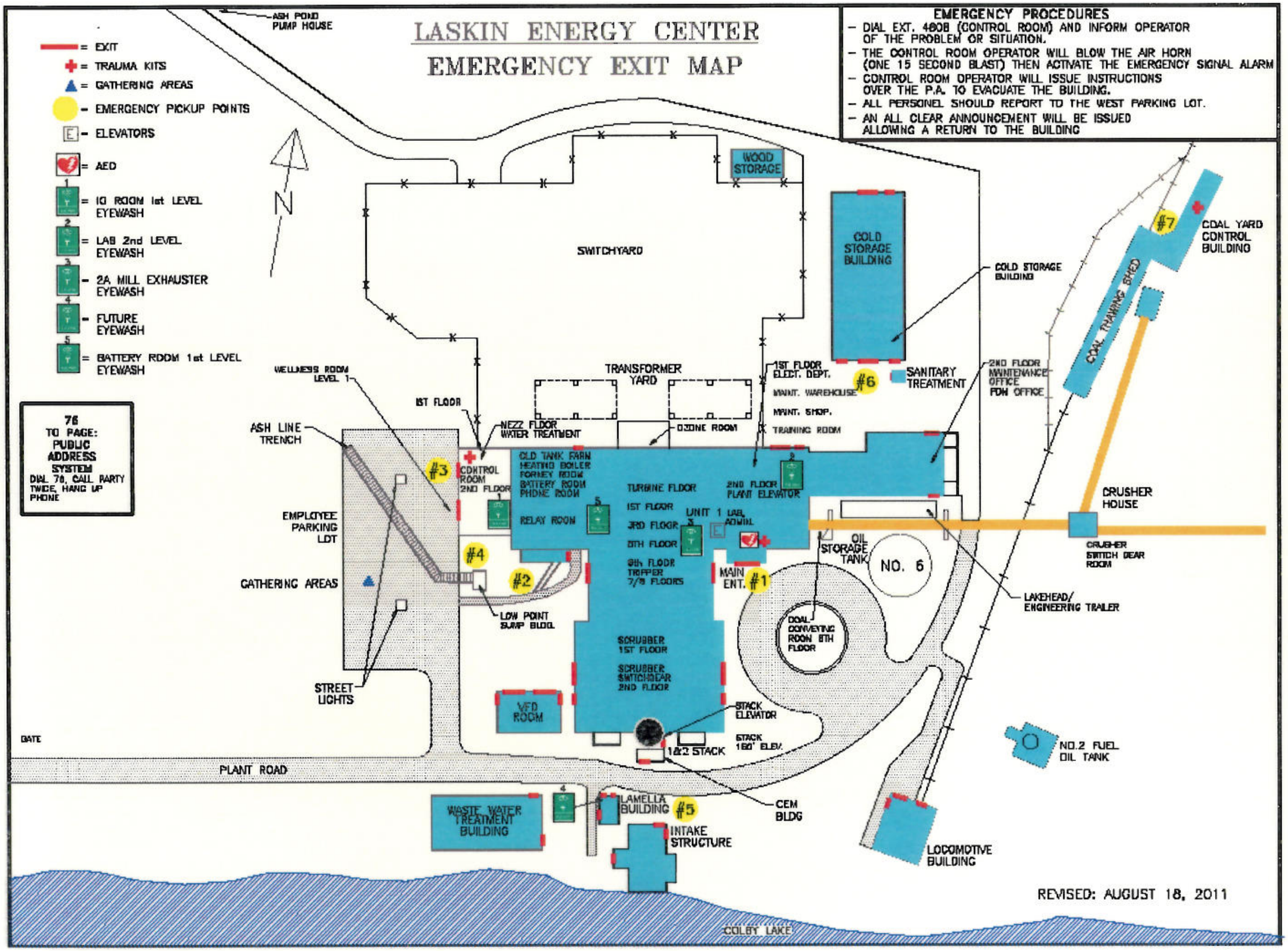
Appendix G

Supplemental Site Location and Layout Diagrams


POWER PLANT / LASKIN ENERGY CENTER
KEY
WETLAND / FLOODPLAIN
#1
#2
#3

1




LASKIN ENERGY CENTER
EMERGENCY EXIT MAP
EMERGENCY PROCEDURES
- DIAL EXT. 4608 (CONTROL ROOM) AND INFORM OPERATOR OF THE PROBLEM OR SITUATION.
- THE CONTROL ROOM OPERATOR WILL BLOW THE AIR HORN (ONE 15 SECOND BLAST) THEN ACTIVATE THE EMERGENCY SIGNAL ALARM
- CONTROL ROOM OPERATOR WILL ISSUE INSTRUCTIONS OVER THE P.A. TO EVACUATE THE BUILDING.
- ALL PERSONEL SHOULD REPORT TO THE WEST PARKING LOT.
- AN ALL CLEAR ANNOUNCEMENT WILL BE ISSUED ALLOWING A RETURN TO THE BUILDING
= EXIT
= TRAUMA KITS
= GATHERING AREAS
- EMERGENCY PICKUP POINTS
- ELEVATORS
= AED
= IO ROOM 1st LEVEL EYEWASH
= LAB 2nd LEVEL EYEWASH
- 2A MILL EXHAUSTER EYEWASH
- FUTURE EYEWASH
= BATTERY ROOM 1st LEVEL EYEWASH
76 TO PAGE: PUBLIC ADDRESS SYSTEM DIAL 76, CALL PARTY TWICE, HANG UP PHONE
ASH POND PUMP HOUSE
N
SWITCHYARD
WOOD STORAGE
COLD STORAGE BUILDING
COLD STORAGE BUILDING
SANITARY TREATMENT
#6
#7
COAL YARD CONTROL BUILDING
COAL THAWING SHED
2ND FLOOR MAINTENANCE OFFICE FOH OFFICE
CRUSHER HOUSE
CRUSHER SWITCH GEAR ROOM
LAKEHEAD/ ENGINEERING TRAILER
TRANSFORMER YARD
OZONE ROOM
1ST FLOOR ELECT. DEPT.
MAINT. WAREHOUSE
MAINT. SHOP.
TRAINING ROOM
WELLNESS ROOM LEVEL 1
1ST FLOOR
NEZZ FLOOR WATER TREATMENT
ASH LINE TRENCH
#3
CONTROL ROOM 2ND FLOOR
OLD TANK FARM HEATING BOILER FORNEY ROOM BATTERY ROOM PHONE ROOM
RELAY ROOM
TURBINE FLOOR
1ST FLOOR
3RD FLOOR
5TH FLOOR
6th FLOOR TRIPPER 7/8 FLOORS
UNIT 1 LAB ADMIN.
2ND FLOOR PLANT ELEVATOR
OIL STORAGE TANK
NO. 6
MAIN ENT. #1
EMPLOYEE PARKING LOT
#4
#2
GATHERING AREAS
LOW POINT SUMP BLDG.
COAL CONVEYING ROOM 8TH FLOOR
SCRUBBER 1ST FLOOR
SCRUBBER SWITCHGEAR 2ND FLOOR
STREET LIGHTS
VFD ROOM
STACK ELEVATOR
STACK 180' ELEV.
1&2 STACK
GATE
PLANT ROAD
CEM BLDG
NO.2 FUEL OIL TANK
WASTE WATER TREATMENT BUILDING
LAMELLA BUILDING #5
INTAKE STRUCTURE
LOCOMOTIVE BUILDING
REVISED: AUGUST 18, 2011
COLBY LAKE

Version History

Version	Notice Date	Author	Change Description	Change Date	Approved By	Approval Date
1.0		Mark Scharnott	Original Document	7/1/11	Lainie Plotnik	7/1/11
2.0		Mark Scharnott	Added sand bags to EAP	8/29/11	Lainie Plotnik	8/23/11

minnesota power
AN ALLETE COMPANY
Allan S. Rudeck, Jr., Vice President – Strategy, Planning & Asset Optimization

30 West Superior Street, Duluth, Minnesota 55802 / 218-355-3480 / fax: 218-723-3983/ arudeck@mnpower.com

November 14, 2011

Mr. Stephen Hoffman
U.S. Environmental Protection Agency (5304P)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re. Minnesota Power Laskin Energy Center CCR Site Assessment Follow-Up

Dear Mr. Hoffman,

On August 19, 2011 Minnesota Power (MP) provided a response to your letter of July 26, 2011 regarding findings of the September 23 and 24, 2010 United Stated Environmental Protection Agency (EPA) inspection of our Laskin Energy Center (LEC) coal combustion residual (CCR) management facilities in Aurora, Minnesota. Item 3.2 of your July 26, 2011 letter and Minnesota Power's August response were as follows:

> ***3.2 Studies and Analyses***
> *GZA recommends that LEC evaluate the structural and seepage stability and flowability of the ash contained within the Cells A-D Impoundment.*
>
> As stated in Minnesota Power's comments on the draft GZA Laskin Energy Center CCR Site Assessment inspection report, the objectives of and need for evaluation of "structural and seepage stability and flowability of the ash contained within the Cells A-D Impoundment" continues to be unclear. This is on the basis of the grade of the ash being below embankment elevation and lack of ash above embankment elevation, the accompanying low water elevations, and substantial water surface setback from the embankments. However, it is Minnesota Power's interpretation that a demonstration of the ash containment ability of the Cells A-D perimeter embankments is what is ultimately being requested. To address this item Minnesota Power will retain the services of a geotechnical engineer to perform a slope stability analysis of the critical embankment cross-section for Cells A-D. The critical cross-section for these purposes will be defined as the embankment section appearing to have the greatest elevation differential between the embankment crest and outside toe. This embankment cross-section will be surveyed

to document crest and toe elevations and slope angles, and existing ash strength data and geotechnical data will be utilized to facilitate the stability analysis. Given the age of the embankments and relative lack of construction documentation data, it is anticipated that some assumptions will be made regarding material strength in order to facilitate the analysis. This approach is deemed acceptable given the configuration of the embankments as described above and therefore no supplemental site exploration or material testing is proposed. The analysis results will be submitted to the EPA by November 18, 2011.

In accordance with Minnesota Power's commitment under Item 3.2 to perform a slope stability analysis of the critical embankment cross-section for Cells A-D, a site survey was performed to identify the critical cross-section, which was defined as that embankment section appearing to have the greatest elevation differential between the embankment crest and outside toe. The attached Drawing G-01 provides the results of cross-section surveys at three perimeter embankment locations identified by visual inspection as having the greatest elevation differential as specified above. Section 1 was selected as the basis of the planned slope stability analysis due to its greatest elevation differential between embankment crest and outside toe, and based on the presence of coal ash on the interior side of the embankment.

As noted in our August 19, 2011 letter outlining our slope stability analysis plan; the analysis was to be based on assumed material strength parameters. For this analysis we utilized an Effective Stress Stability Analysis (ESSA) on the basis of the embankment having been in place for dozens of years, on the basis of the ash cells having been idle for approximately 12 years, and on the basis of the absence of any ponded water on the interior of the ash cell at the location of Section 1. For the embankment construction materials, which are believed to consist primarily of the on-site glacial till (silty sand and gravel with occasional cobbles and boulders), assumed friction angles were utilized and cohesion was taken as zero. Likewise, for the contained ash and again under the assumption effective stress conditions, assumed friction angles were utilized and cohesion was taken as zero. A sensitivity analysis was performed by varying the embankment material effective stress friction angles within a range of 3 degrees and, although no pond exists in Cell A (the location of Section 1), slope stability analyses were also completed for a hypothetical condition of an elevated pond condition.

The table below and the attached slope stability outputs present the results of the stability analysis performed for Minnesota Power by Barr Engineering. On each slope stability output, the input values for soil and ash unit weight, friction angle, and hydraulic conductivity are presented, as is the specified minimum slip surface depth, the specified pond elevation, and the resulting slope stability factor of safety. For this site the specified slip surface depth of 10 feet is intended to be representative of a slip surface that could potentially develop into a breach of the embankment if left unrepaired.

Ash Pond Embankment (Section 1) Slope Stability Factors of Safety Summary [3]

Stability Models Embankment Material Friction Angle (Ø', degrees)	Slope Stability Safety Factors with Water and Ash Surface Elevation Equal at Elev. 1448.5 [1]	Slope Stability Safety Factors with Assumed Pond Bounce to Water Elev. of 1452.0 [2]
28	1.78	1.42
29	1.85	1.48
30	1.93	1.54

Notes:
1) For analysis with ash and water elevations equal each other, it must be assumed that the ash is 100 percent saturated. Actual degree of saturation of the ash is likely to be variable, with some ash at less than 100 percent saturation.
2) A pond elevation of 1452.0 is assumed for purposes of presenting a conservative analysis of slope stability. Cell A does not typically include any pond and water in adjacent Cell B is set well back from and below the crest of the perimeter embankment.
3) Slope stability analysis performed by Barr Engineering Company, Minneapolis, MN.

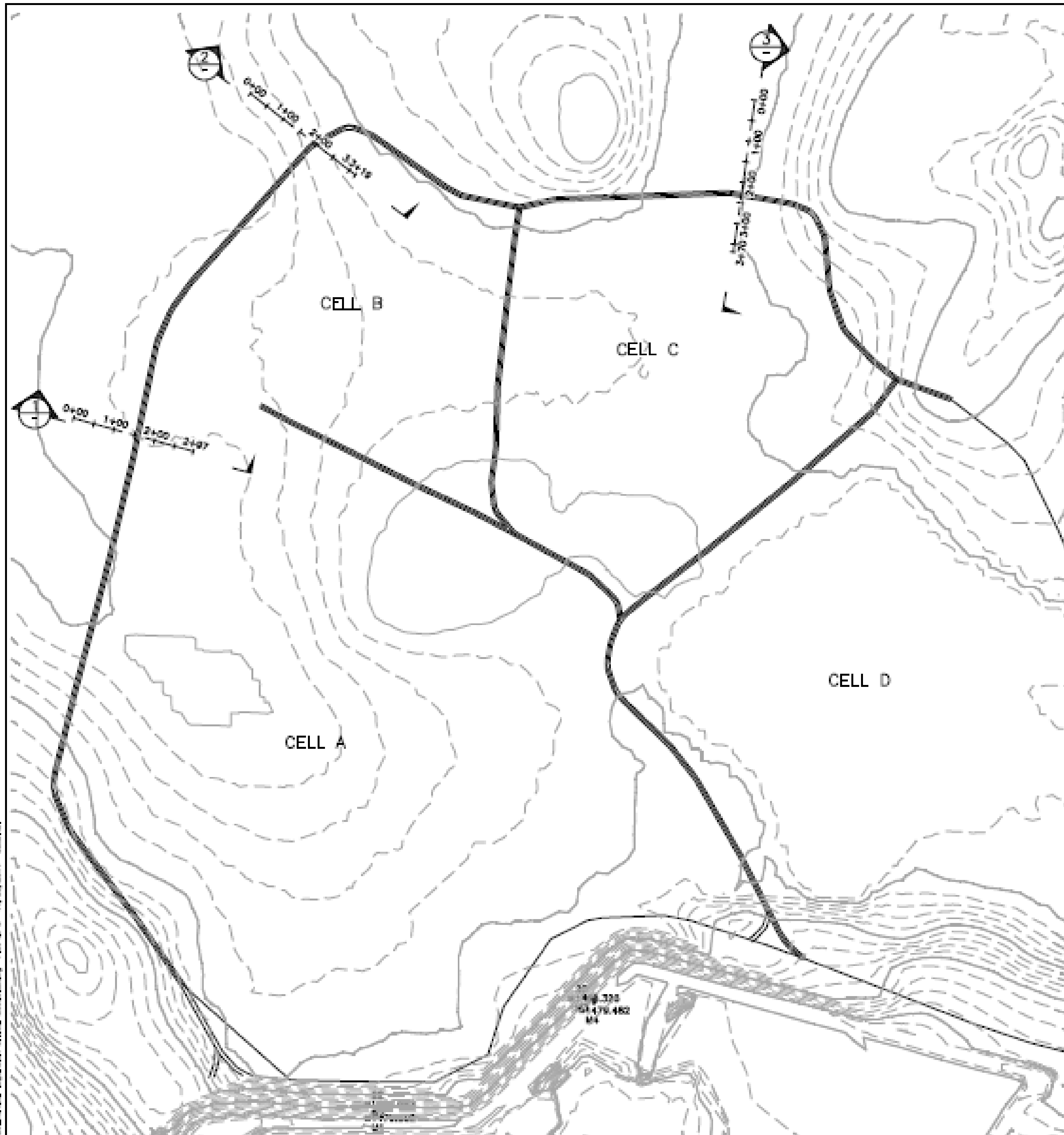
Barr Engineering Company recommends that Minnesota Power achieve a long term slope stability safety factor of equal to or greater than 1.5 for long term effective shear stress conditions. This is achieved per the analysis results summarized above. Barr indicates that safety factors as low as 1.3 or lower are acceptable for the hypothetical pond bounce water elevation condition described herein.. This is due to the limited feasibility of such an occurrence. Pond elevations above 1448.5 may have occurred during operations with continuous discharge of ash sluice water into the ponds. However, lacking this discharge, annual precipitation is insufficient to sustain significant ponding in Cell A and even if such a pond bounce were to occur, it would be expected to be short lived.

With correspondence of August 19, 2011 and this letter and attachments, Minnesota Power has fulfilled the EPA's information request of July 26, 2011 regarding our LEC CCR management facilities and no further analysis is planned. Please contact me in the event that you have any questions.

Best regards,

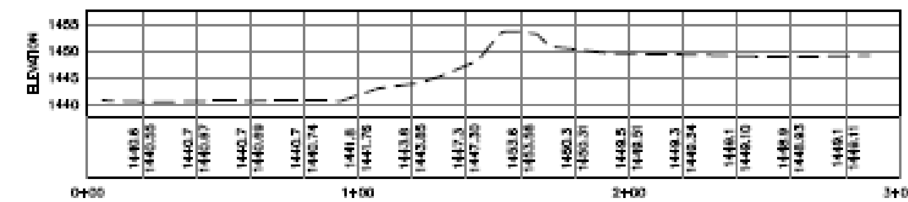
Allan S. Rudeck, Jr., P.E.
Vice President – MP Strategy, Planning & Asset Optimization

Attachments: Old Ash Ponds Cells A – D Cross-Sections 1 through 3
Slope Stability Analysis Outputs (___ Pages)



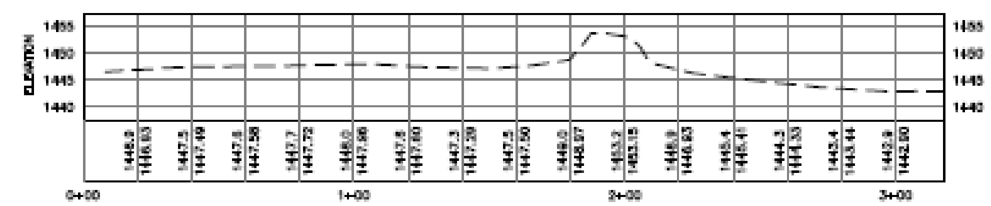
PLAN: OLD ASH PONDS
0 150 300
SCALE IN FEET

SECTION 1



SECTION: OLD ASH PONDS
0 30 60
HORIZONTAL SCALE IN FEET

SECTION 2



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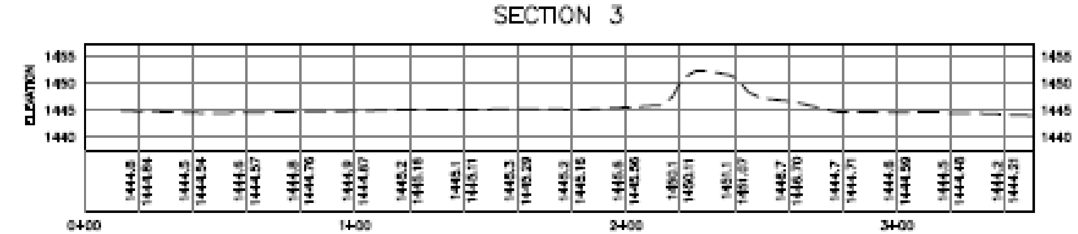
HORIZONTAL SCALE IN FEET

SECTION 3



SECTION: OLD ASH PONDS
0 30 60
HORIZONTAL SCALE IN FEET

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
SIGNATURE
PRINTED NAME THOMAS J. RADUE
DATE NOV. 8, 2011 REG. NO. 20951

CLIENT
BID
CONSTRUCTION
RELEASED TO/FOR
A B C 0 1 2 3
DATE RELEASED

BARR
Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4700 WEST 77TH STREET
MINNEAPOLIS, MN. 55435-4803
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com

Scale	AS SHOWN
Date	8-31-11
Drawn	SWH
Checked	
Designed	
Approved	

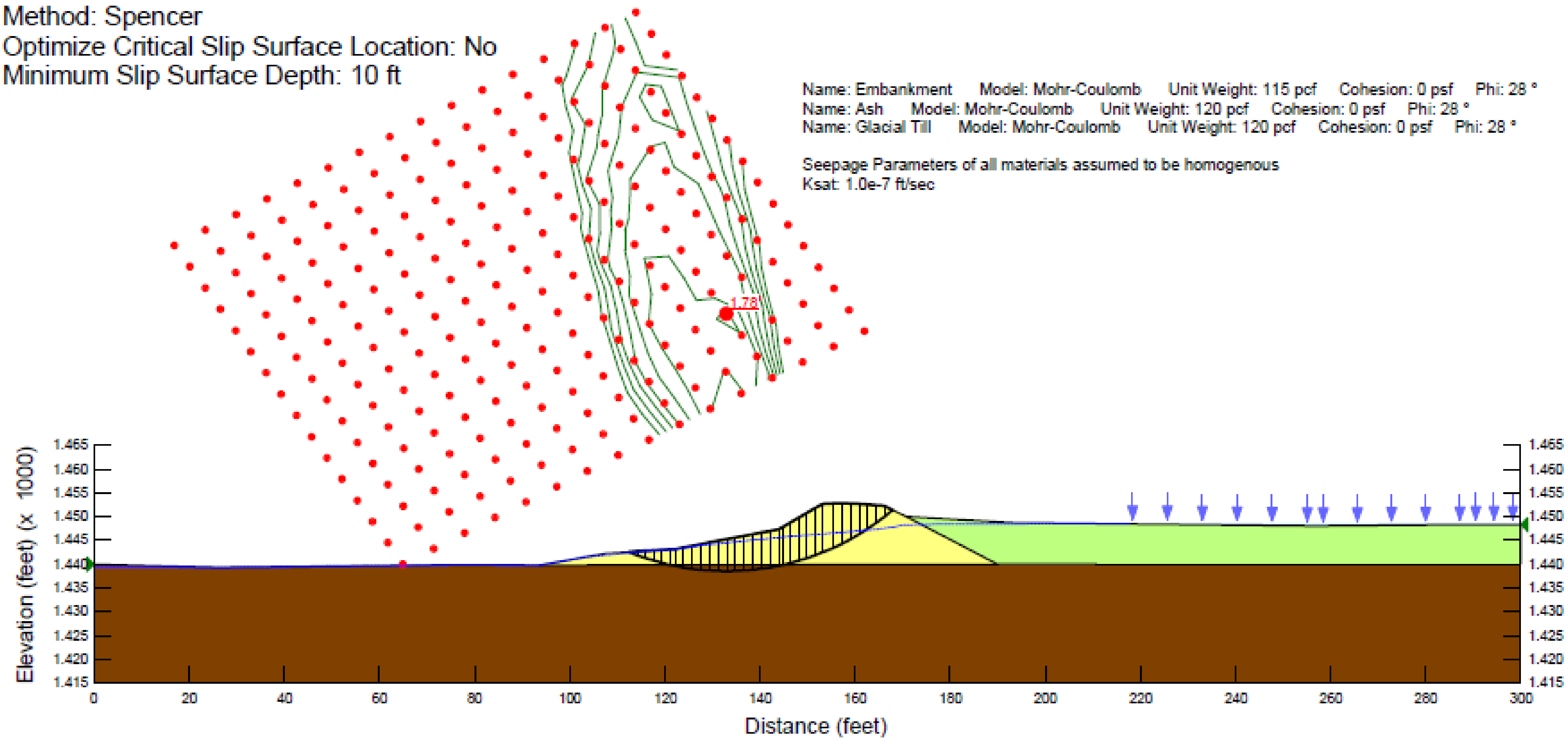
MINNESOTA POWER
LASKIN ENERGY CENTER
HOYT LAKES, MN

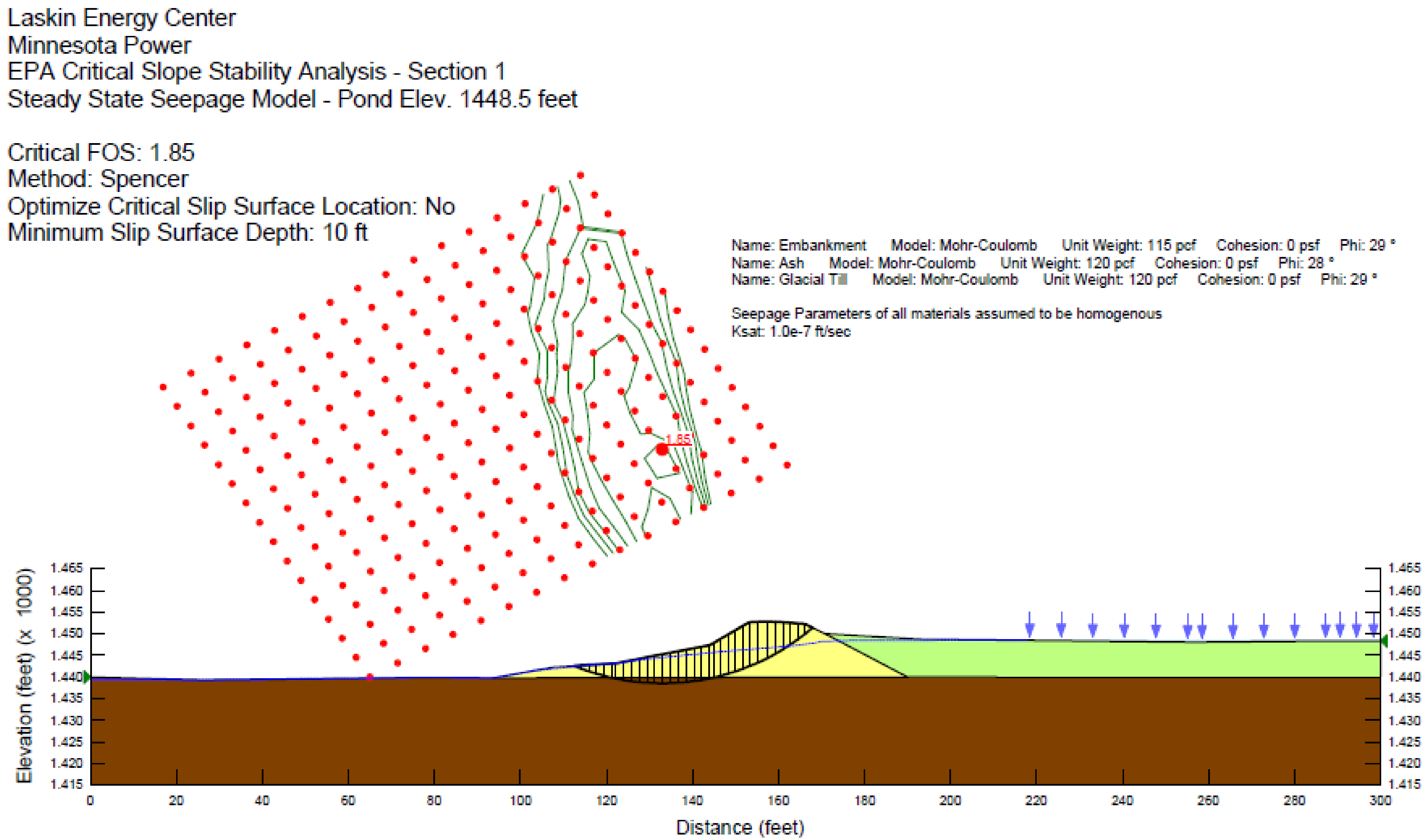
OLD ASH PONDS
CELLS A-D
CROSS SECTIONS 1 THROUGH 3

BARR PROJECT No. 23691109.00
CLIENT PROJECT No.
DWG. No. G-01
REV. No.

Laskin Energy Center
Minnesota Power
EPA Critical Slope Stability Analysis - Section 1
Steady State Seepage Model - Pond Elev. 1448.5 feet

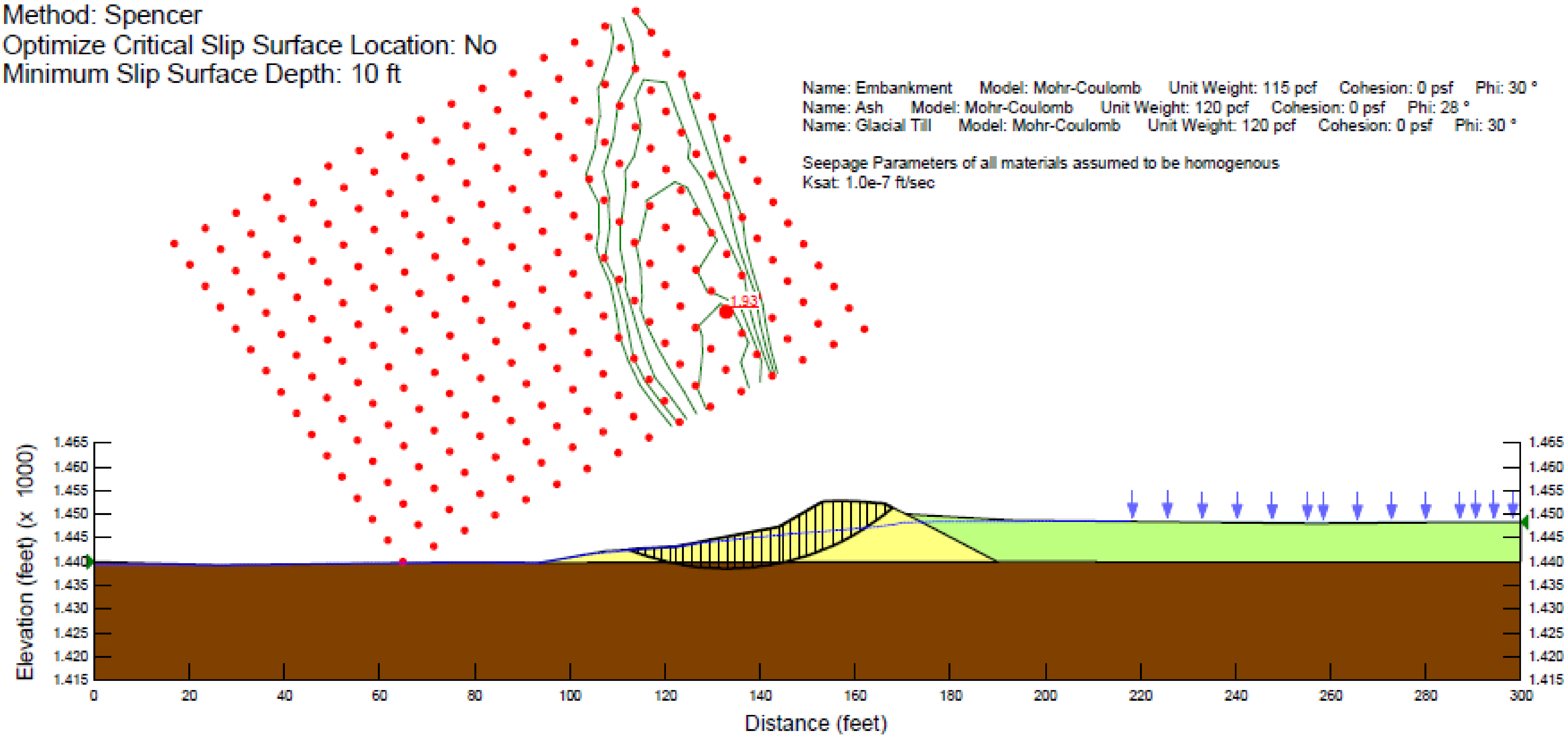
Critical FOS: 1.78
Method: Spencer
Optimize Critical Slip Surface Location: No
Minimum Slip Surface Depth: 10 ft




Laskin Energy Center
Minnesota Power
EPA Critical Slope Stability Analysis - Section 1
Steady State Seepage Model - Pond Elev. 1448.5 feet
Critical FOS: 1.85
Method: Spencer
Optimize Critical Slip Surface Location: No
Minimum Slip Surface Depth: 10 ft
Name: Embankment Model: Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 0 psf Phi: 29 °
Name: Ash Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion: 0 psf Phi: 28 °
Name: Glacial Till Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion: 0 psf Phi: 29 °
Seepage Parameters of all materials assumed to be homogenous
Ksat: 1.0e-7 ft/sec
1.85
Elevation (feet) (x 1000)
1.465
1.460
1.455
1.450
1.445
1.440
1.435
1.430
1.425
1.420
1.415
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
Distance (feet)

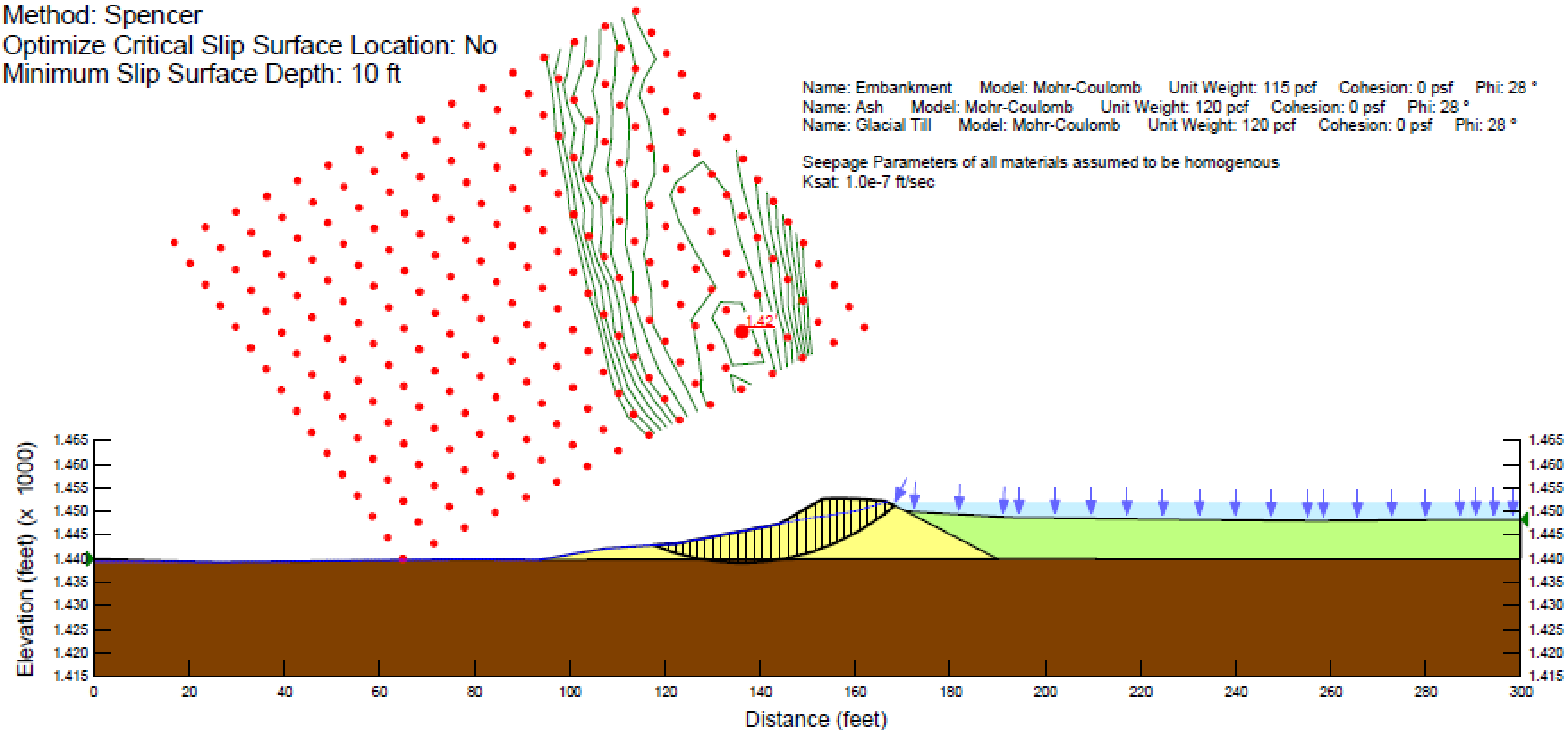
Laskin Energy Center
Minnesota Power
EPA Critical Slope Stability Analysis - Section 1
Steady State Seepage Model - Pond Elev. 1448.5 feet

Critical FOS: 1.93
Method: Spencer
Optimize Critical Slip Surface Location: No
Minimum Slip Surface Depth: 10 ft



Laskin Energy Center
Minnesota Power
EPA Critical Slope Stability Analysis - Section 1
Steady State Seepage Model - Pond Elev. 1452.0 feet

Critical FOS: 1.42
Method: Spencer
Optimize Critical Slip Surface Location: No
Minimum Slip Surface Depth: 10 ft



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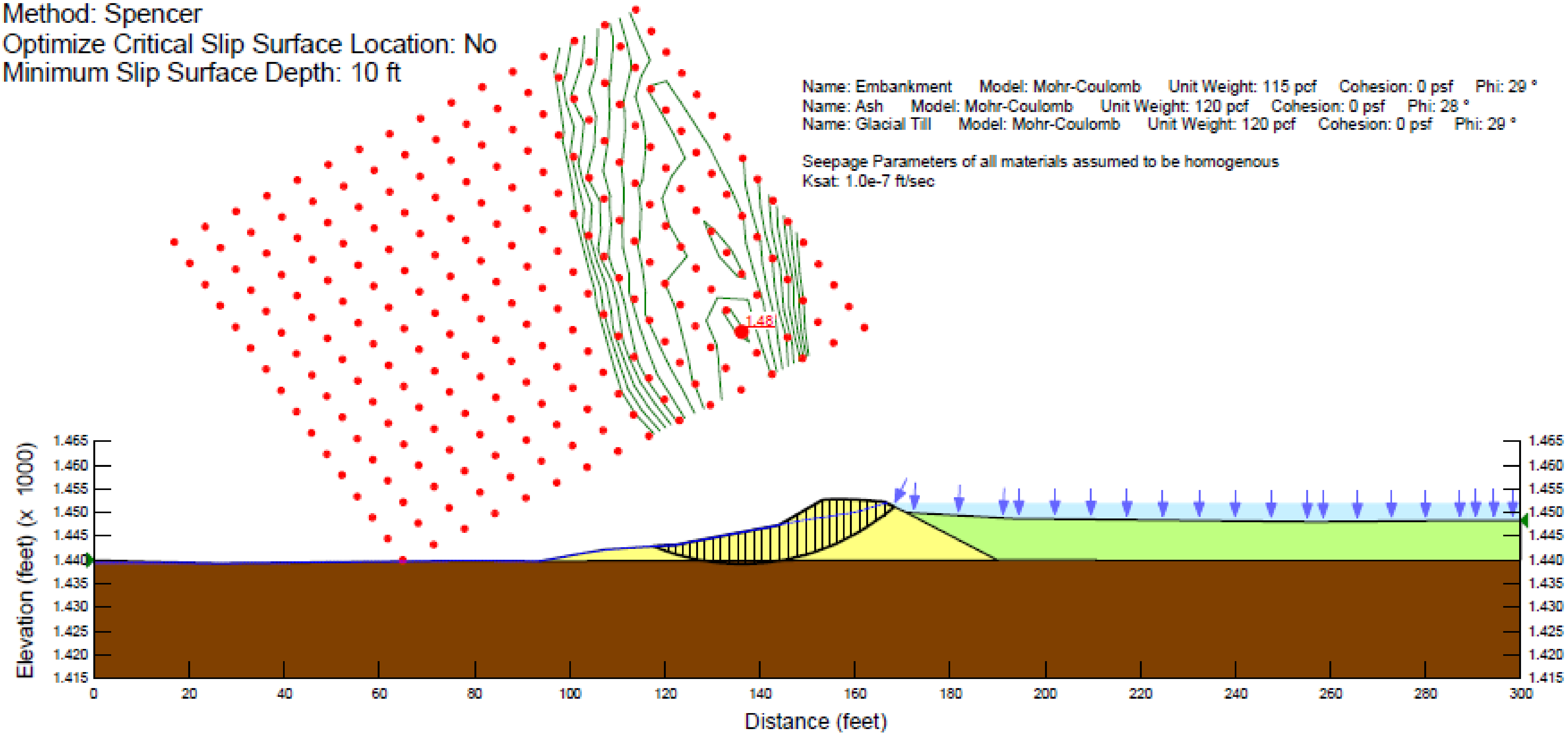
Minnesota Power
EPA Critical Slope Stability Analysis - Section 1
Steady State Seepage Model - Pond Elev. 1452.0 feet

Critical FOS: 1.48
Method: Spencer
Optimize Critical Slip Surface Location: No
Minimum Slip Surface Depth: 10 ft



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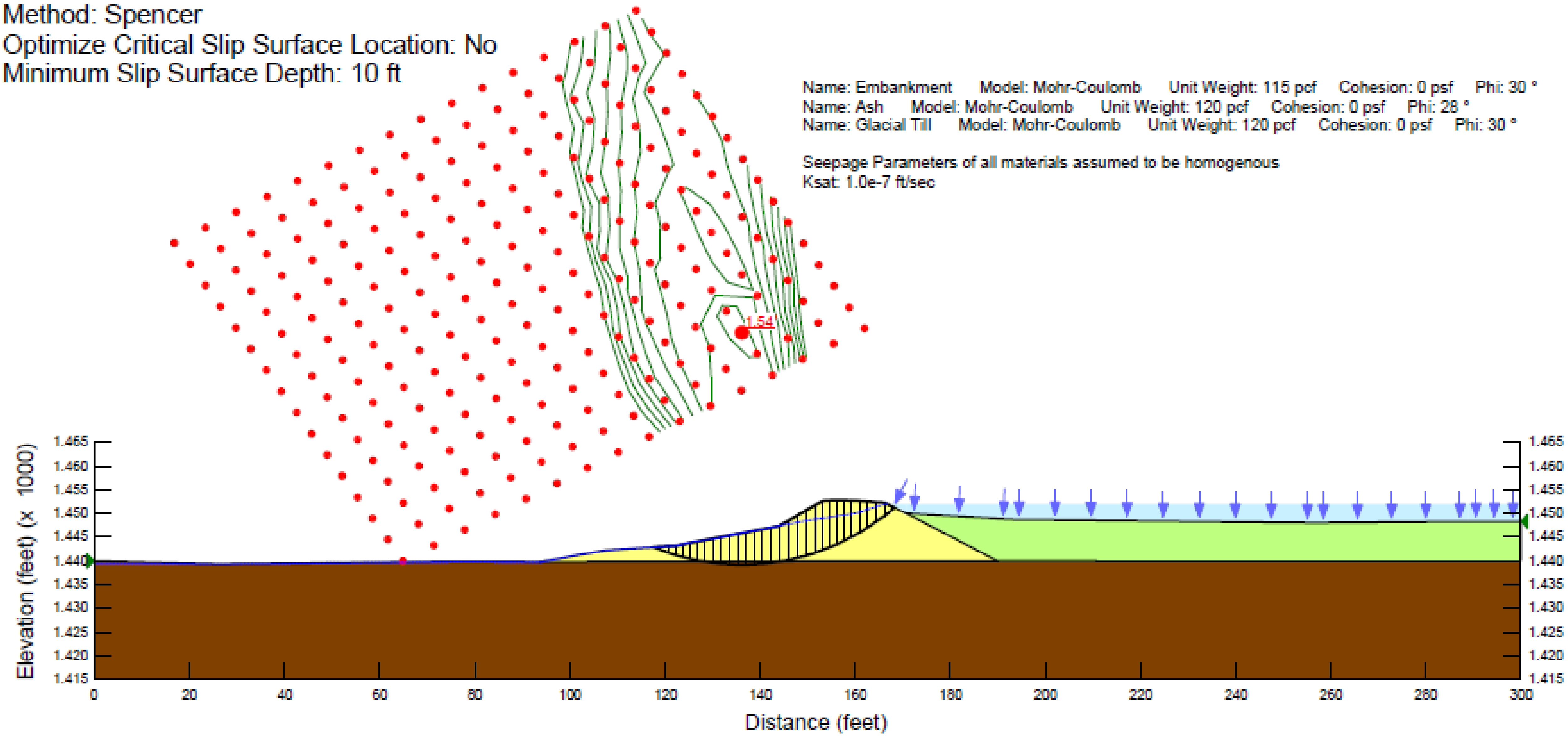


minnesota power
AN ALLETE COMPANY
Allan S. Rudeck, Jr., Vice President – Strategy, Planning & Asset Optimization

30 West Superior Street, Duluth, Minnesota 55802 / 218-355-3480 / fax: 218-723-3983/ arudeck@mnpower.com

November 14, 2011

Mr. Stephen Hoffman
U.S. Environmental Protection Agency (5304P)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re. Minnesota Power Laskin Energy Center CCR Site Assessment Follow-Up

Dear Mr. Hoffman,

On August 19, 2011 Minnesota Power (MP) provided a response to your letter of July 26, 2011 regarding findings of the September 23 and 24, 2010 United Stated Environmental Protection Agency (EPA) inspection of our Laskin Energy Center (LEC) coal combustion residual (CCR) management facilities in Aurora, Minnesota. Item 3.2 of your July 26, 2011 letter and Minnesota Power's August response were as follows:

> ***3.2 Studies and Analyses***
> *GZA recommends that LEC evaluate the structural and seepage stability and flowability of the ash contained within the Cells A-D Impoundment.*
>
> As stated in Minnesota Power's comments on the draft GZA Laskin Energy Center CCR Site Assessment inspection report, the objectives of and need for evaluation of "structural and seepage stability and flowability of the ash contained within the Cells A-D Impoundment" continues to be unclear. This is on the basis of the grade of the ash being below embankment elevation and lack of ash above embankment elevation, the accompanying low water elevations, and substantial water surface setback from the embankments. However, it is Minnesota Power's interpretation that a demonstration of the ash containment ability of the Cells A-D perimeter embankments is what is ultimately being requested. To address this item Minnesota Power will retain the services of a geotechnical engineer to perform a slope stability analysis of the critical embankment cross-section for Cells A-D. The critical cross-section for these purposes will be defined as the embankment section appearing to have the greatest elevation differential between the embankment crest and outside toe. This embankment cross-section will be surveyed

to document crest and toe elevations and slope angles, and existing ash strength data and geotechnical data will be utilized to facilitate the stability analysis. Given the age of the embankments and relative lack of construction documentation data, it is anticipated that some assumptions will be made regarding material strength in order to facilitate the analysis. This approach is deemed acceptable given the configuration of the embankments as described above and therefore no supplemental site exploration or material testing is proposed. The analysis results will be submitted to the EPA by November 18, 2011.

In accordance with Minnesota Power's commitment under Item 3.2 to perform a slope stability analysis of the critical embankment cross-section for Cells A-D, a site survey was performed to identify the critical cross-section, which was defined as that embankment section appearing to have the greatest elevation differential between the embankment crest and outside toe. The attached Drawing G-01 provides the results of cross-section surveys at three perimeter embankment locations identified by visual inspection as having the greatest elevation differential as specified above. Section 1 was selected as the basis of the planned slope stability analysis due to its greatest elevation differential between embankment crest and outside toe, and based on the presence of coal ash on the interior side of the embankment.

As noted in our August 19, 2011 letter outlining our slope stability analysis plan; the analysis was to be based on assumed material strength parameters. For this analysis we utilized an Effective Stress Stability Analysis (ESSA) on the basis of the embankment having been in place for dozens of years, on the basis of the ash cells having been idle for approximately 12 years, and on the basis of the absence of any ponded water on the interior of the ash cell at the location of Section 1. For the embankment construction materials, which are believed to consist primarily of the on-site glacial till (silty sand and gravel with occasional cobbles and boulders), assumed friction angles were utilized and cohesion was taken as zero. Likewise, for the contained ash and again under the assumption effective stress conditions, assumed friction angles were utilized and cohesion was taken as zero. A sensitivity analysis was performed by varying the embankment material effective stress friction angles within a range of 3 degrees and, although no pond exists in Cell A (the location of Section 1), slope stability analyses were also completed for a hypothetical condition of an elevated pond condition.

The table below and the attached slope stability outputs present the results of the stability analysis performed for Minnesota Power by Barr Engineering. On each slope stability output, the input values for soil and ash unit weight, friction angle, and hydraulic conductivity are presented, as is the specified minimum slip surface depth, the specified pond elevation, and the resulting slope stability factor of safety. For this site the specified slip surface depth of 10 feet is intended to be representative of a slip surface that could potentially develop into a breach of the embankment if left unrepaired.

Ash Pond Embankment (Section 1) Slope Stability Factors of Safety Summary [3]

Stability Models Embankment Material Friction Angle (Ø', degrees)	Slope Stability Safety Factors with Water and Ash Surface Elevation Equal at Elev. 1448.5 [1]	Slope Stability Safety Factors with Assumed Pond Bounce to Water Elev. of 1452.0 [2]
28	1.78	1.42
29	1.85	1.48
30	1.93	1.54

Notes:
1) For analysis with ash and water elevations equal each other, it must be assumed that the ash is 100 percent saturated. Actual degree of saturation of the ash is likely to be variable, with some ash at less than 100 percent saturation.
2) A pond elevation of 1452.0 is assumed for purposes of presenting a conservative analysis of slope stability. Cell A does not typically include any pond and water in adjacent Cell B is set well back from and below the crest of the perimeter embankment.
3) Slope stability analysis performed by Barr Engineering Company, Minneapolis, MN.

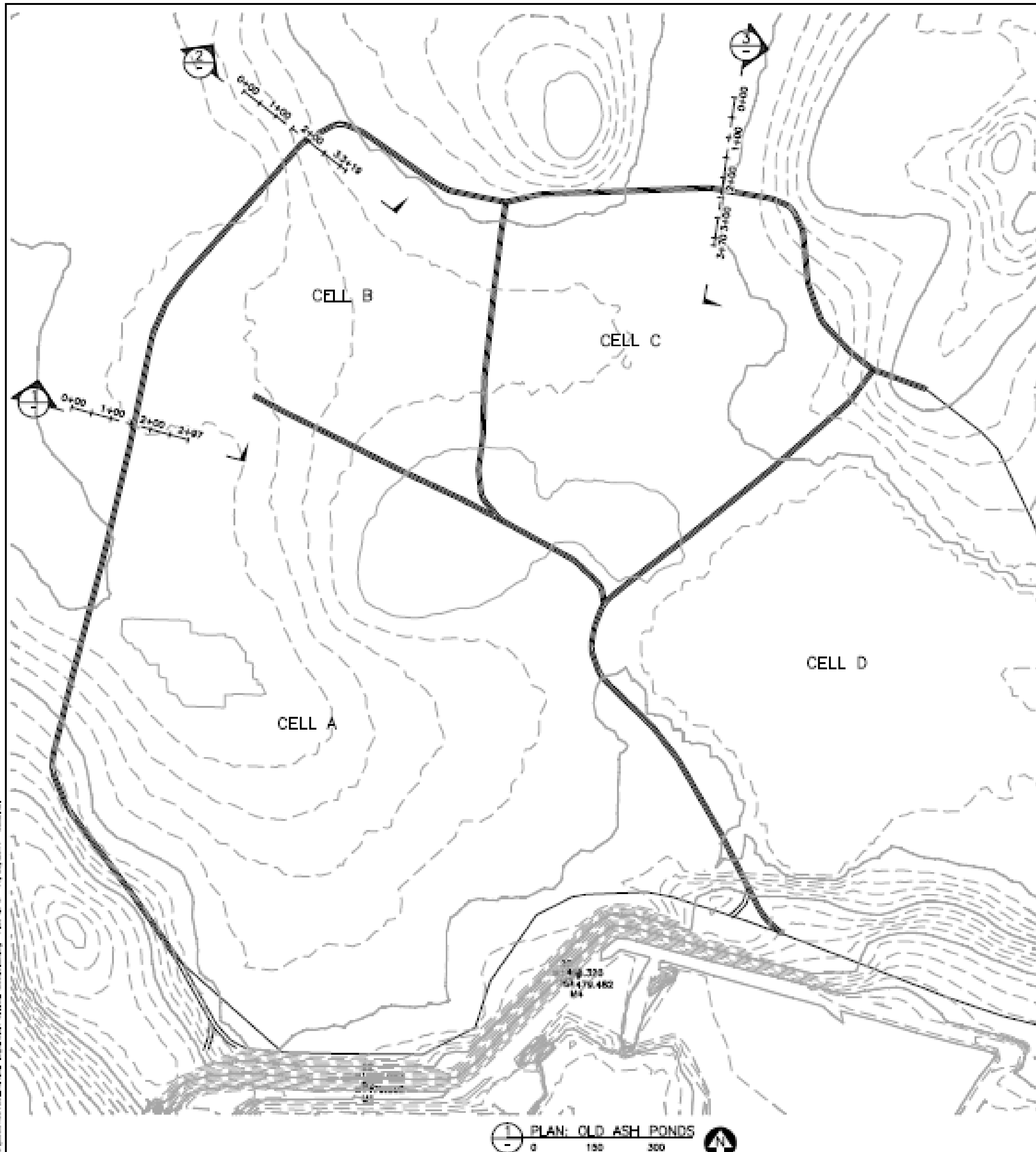
Barr Engineering Company recommends that Minnesota Power achieve a long term slope stability safety factor of equal to or greater than 1.5 for long term effective shear stress conditions. This is achieved per the analysis results summarized above. Barr indicates that safety factors as low as 1.3 or lower are acceptable for the hypothetical pond bounce water elevation condition described herein.. This is due to the limited feasibility of such an occurrence. Pond elevations above 1448.5 may have occurred during operations with continuous discharge of ash sluice water into the ponds. However, lacking this discharge, annual precipitation is insufficient to sustain significant ponding in Cell A and even if such a pond bounce were to occur, it would be expected to be short lived.

With correspondence of August 19, 2011 and this letter and attachments, Minnesota Power has fulfilled the EPA's information request of July 26, 2011 regarding our LEC CCR management facilities and no further analysis is planned. Please contact me in the event that you have any questions.

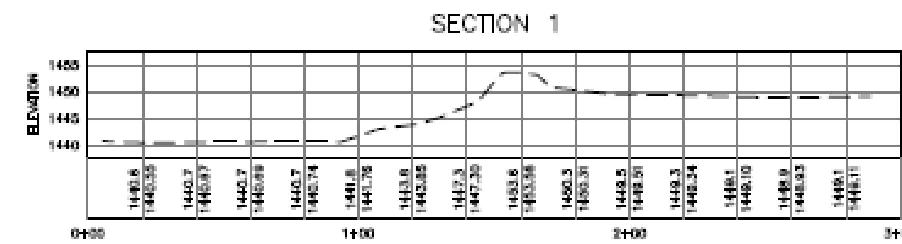
Best regards,

Allan S. Rudeck, Jr., P.E.
Vice President – MP Strategy, Planning & Asset Optimization

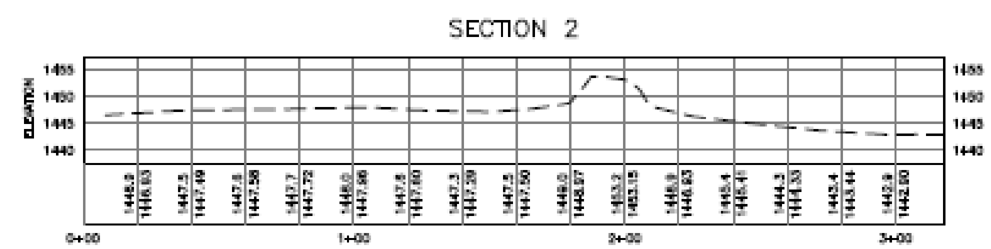
Attachments: Old Ash Ponds Cells A – D Cross-Sections 1 through 3
Slope Stability Analysis Outputs (___ Pages)



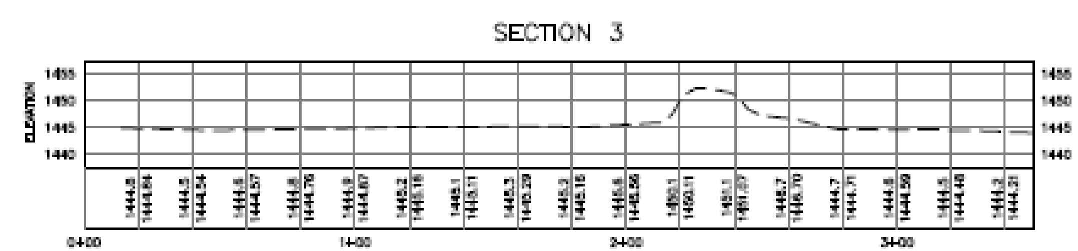
PLAN: OLD ASH PONDS
SCALE IN FEET



SECTION: OLD ASH PONDS
HORIZONTAL SCALE IN FEET



SECTION: OLD ASH PONDS
HORIZONTAL SCALE IN FEET



SECTION: OLD ASH PONDS
HORIZONTAL SCALE IN FEET

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

RELEASED TO/FOR: A B C 0 1 2 3 — DATE RELEASED

BARR
BARR ENGINEERING CO.
4700 WEST 77TH STREET
MINNEAPOLIS, MN. 55435-4803

Scale	AS SHOWN
Date	8-31-11
Drawn	SWH
Checked	
Designed	
Approved	

MINNESOTA POWER
LASKIN ENERGY CENTER
HOYT LAKES, MN

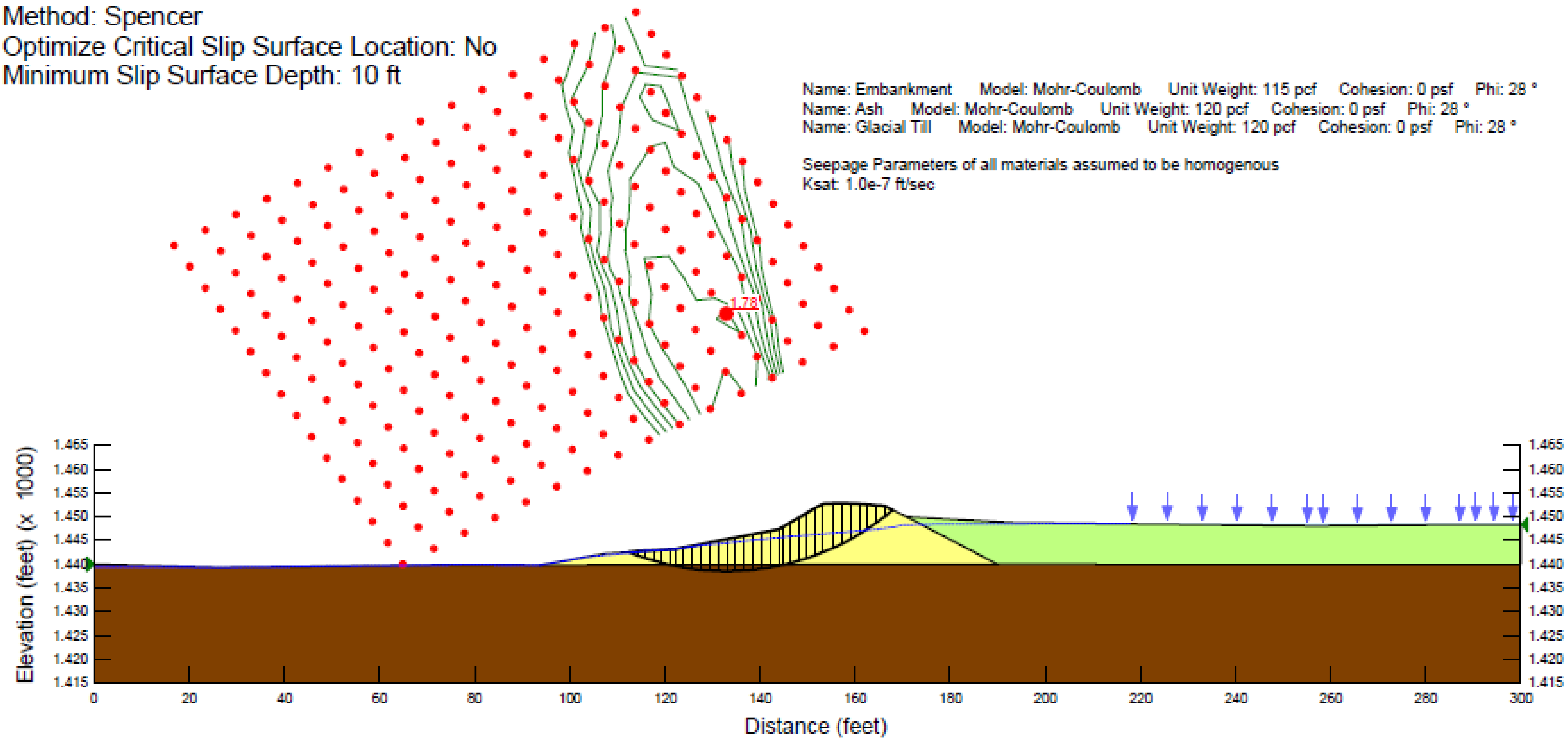
OLD ASH PONDS
CELLS A-D

CROSS SECTIONS 1 THROUGH 3

BARR PROJECT No. 23691109.00
CLIENT PROJECT No.
DWG. No. G-01
REV. No.

Laskin Energy Center
Minnesota Power
EPA Critical Slope Stability Analysis - Section 1
Steady State Seepage Model - Pond Elev. 1448.5 feet

Critical FOS: 1.78
Method: Spencer
Optimize Critical Slip Surface Location: No
Minimum Slip Surface Depth: 10 ft



Laskin Energy Center
Minnesota Power
EPA Critical Slope Stability Analysis - Section 1
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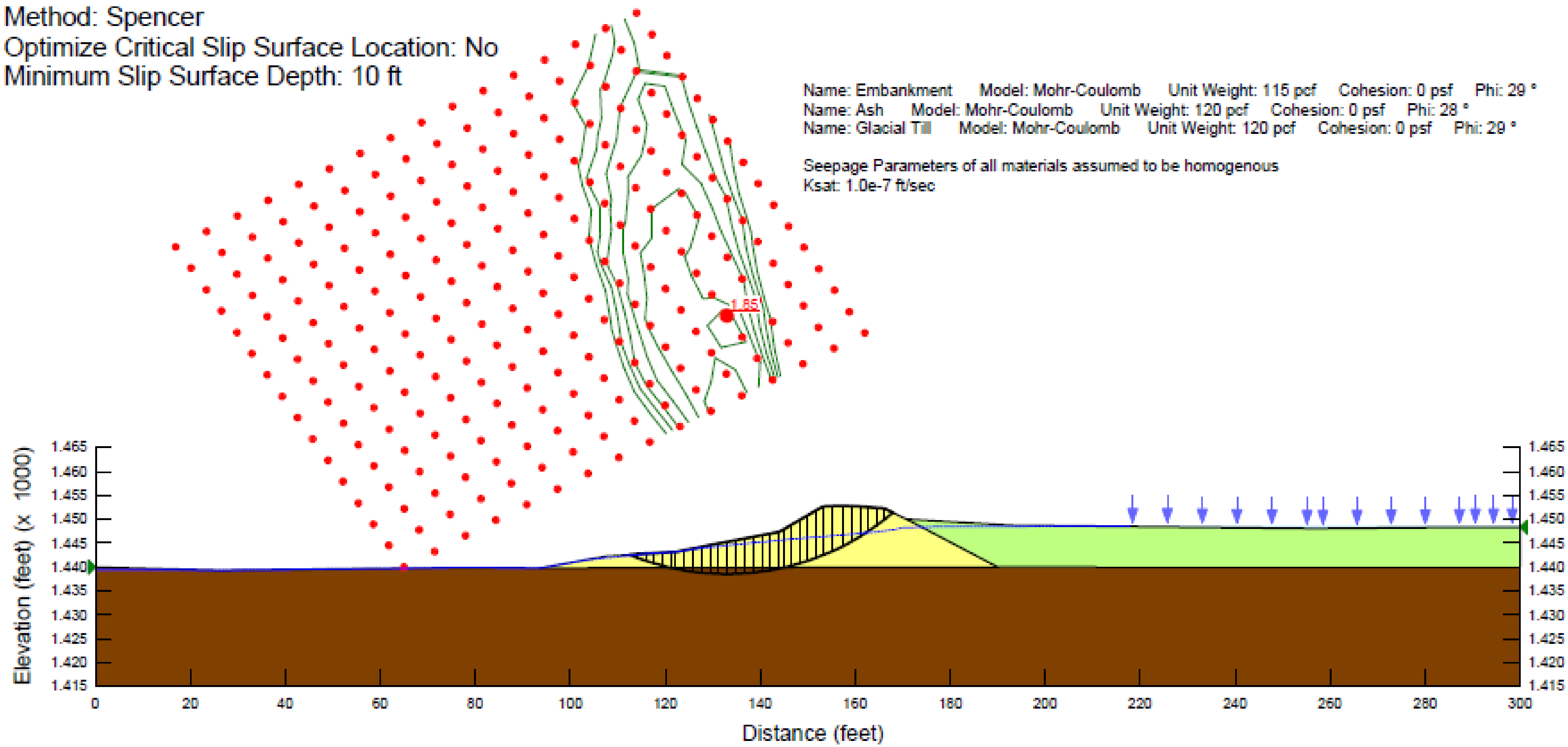
Critical FOS: 1.85
Method: Spencer
Optimize Critical Slip Surface Location: No
Minimum Slip Surface Depth: 10 ft



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Minnesota Power
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Critical FOS: 1.93
Method: Spencer
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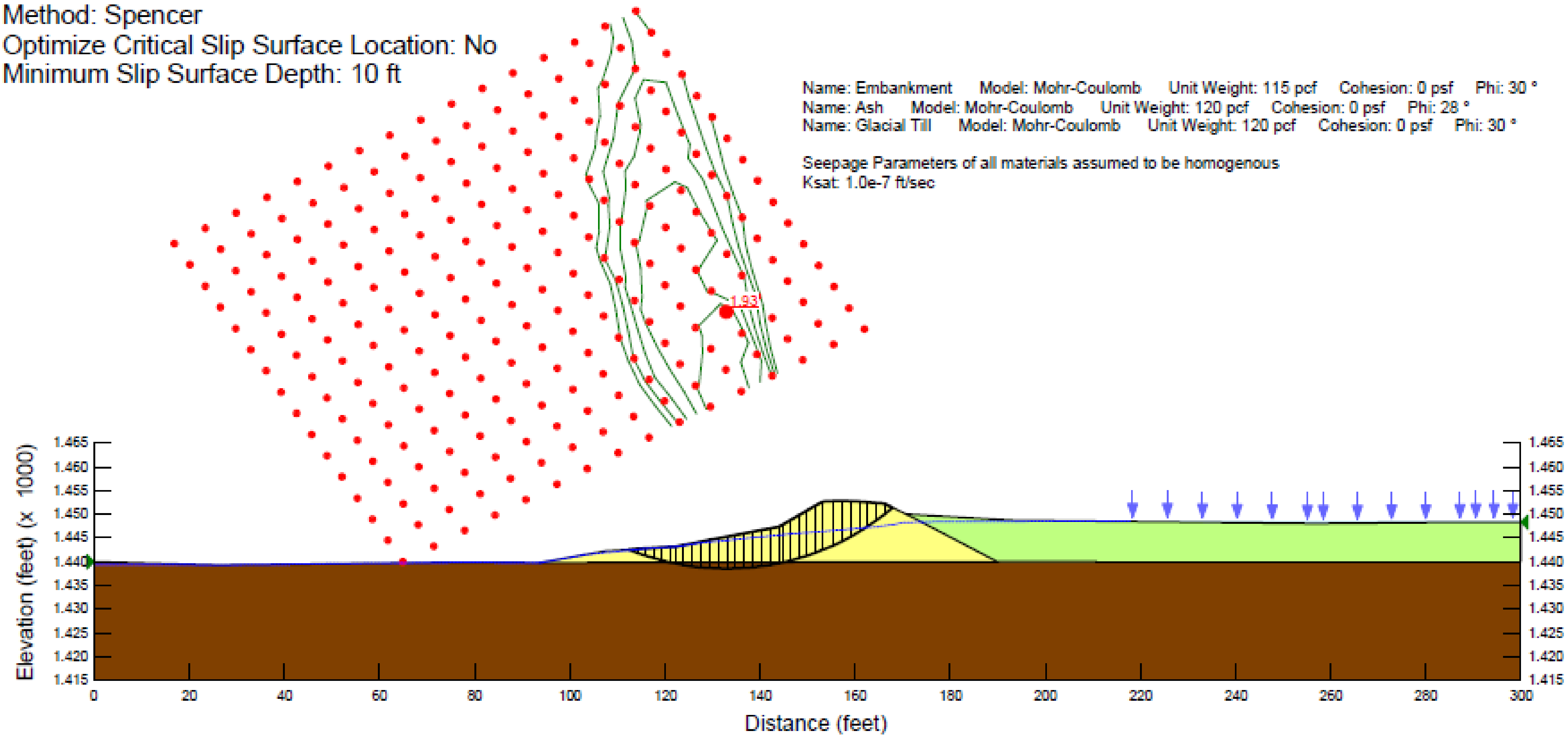

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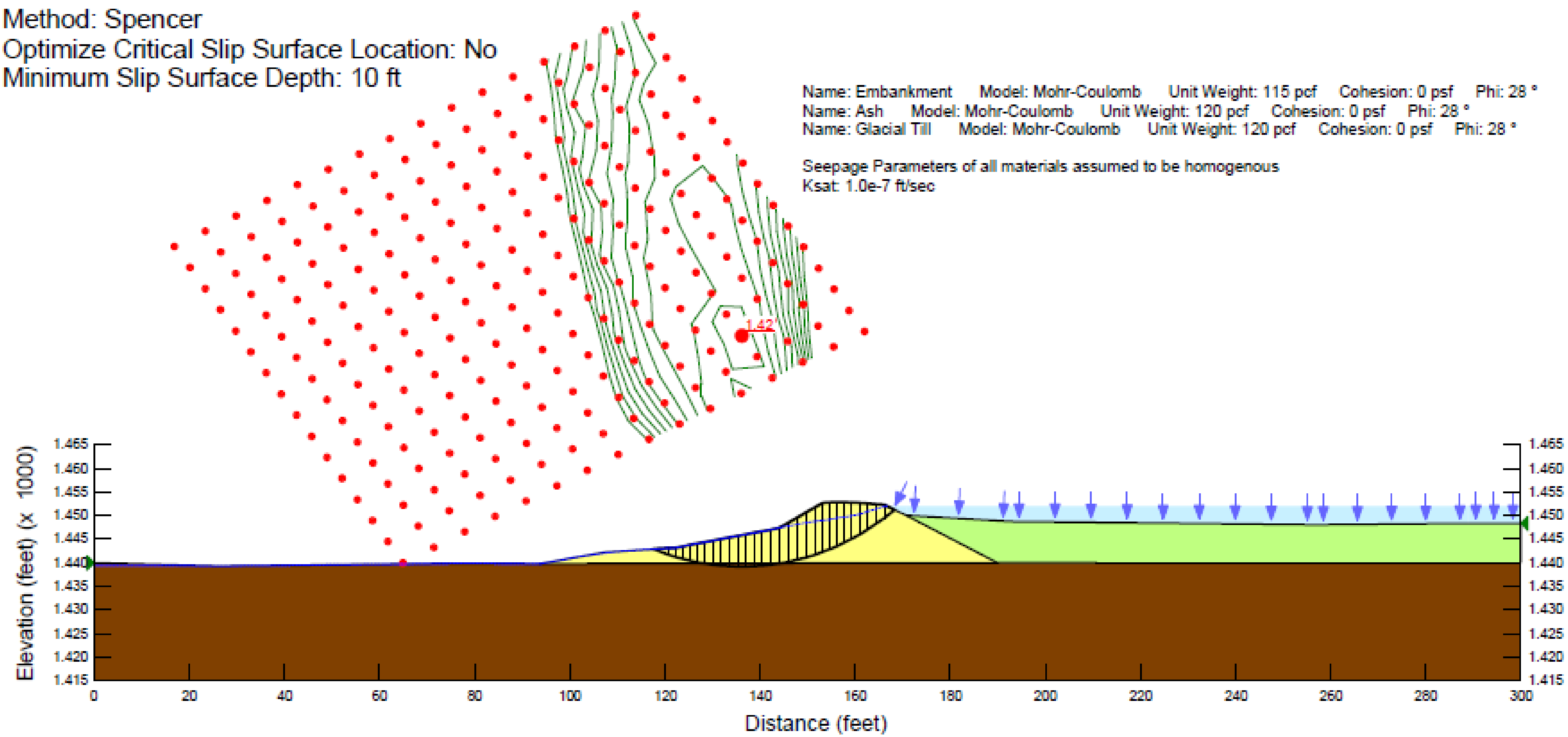

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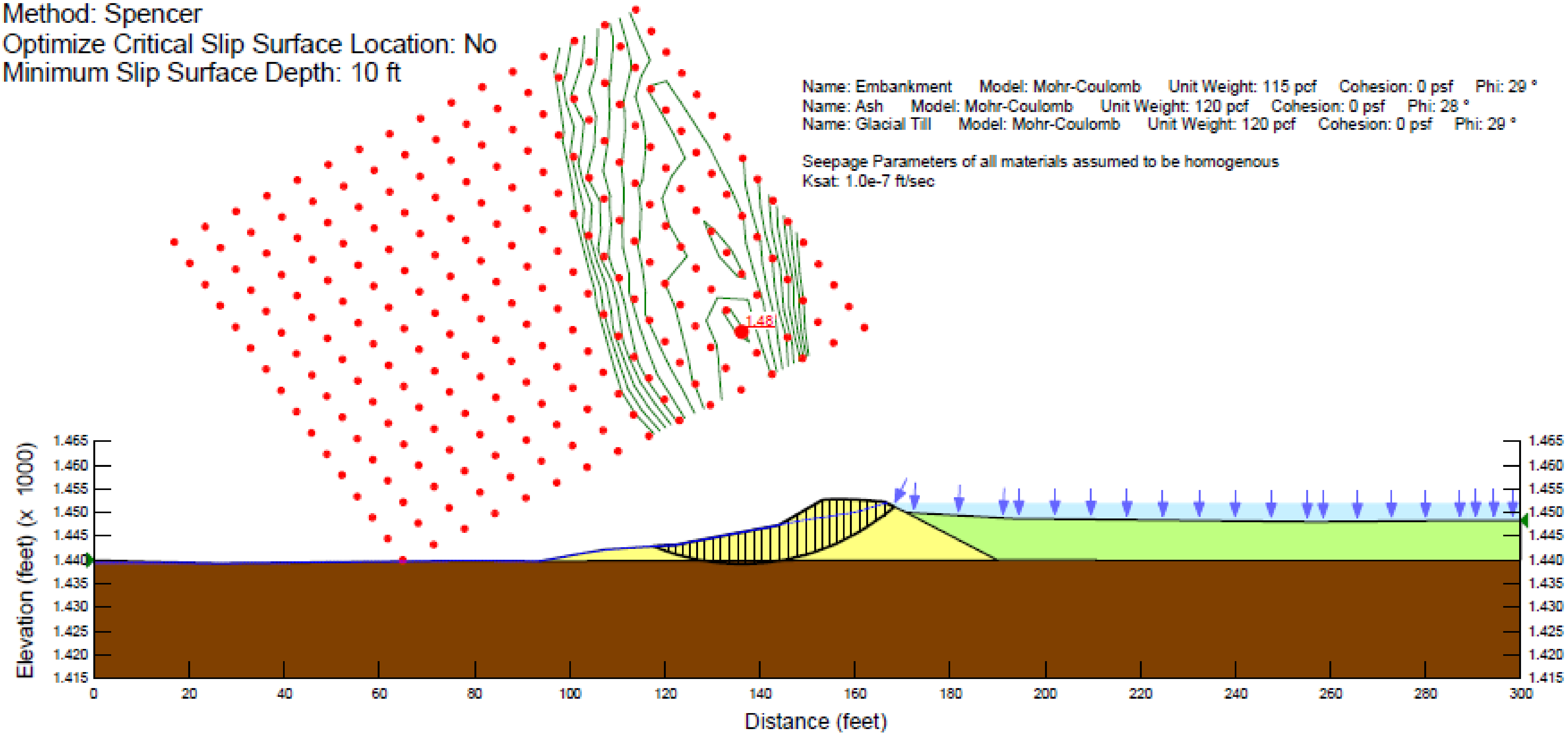

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