MINNESOTA DEPARTMENT OF COMMERCE

85 7TH PLACE EAST, SUITE 500
SAINT PAUL, MINNESOTA 55101-2198
MN.GOV/COMMERCE
651.539.1500 FAX: 651.539.1547
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October 30, 2015 **PUBLIC DOCUMENT**

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, Minnesota 55101-2147

RE: **PUBLIC Comments of the Minnesota Department of Commerce, Division of Energy Resources**
Docket No. E015/D-15-711

Dear Mr. Wolf:

Attached are the **PUBLIC** Comments of the Minnesota Department of Commerce, Division of Energy Resources (Department), in the following matter:

Minnesota Power's 2015 Remaining Life Depreciation Petition.

The petition was filed on July 31, 2015 by:

Debbra A. Davey
Supervisor, Accounting
Minnesota Power
30 West Superior Street
Duluth, MN 55802

The Department recommends **approval, with modifications,** and is available to answer any questions the Minnesota Public Utilities Commission may have.

Sincerely,

/s/ CRAIG ADDONIZIO
Financial Analyst

CA/lt
Attachment

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

PUBLIC COMMENTS OF THE MINNESOTA DEPARTMENT OF COMMERCE DIVISION OF ENERGY RESOURCES

DOCKET NO. E015/D-15-711

I. SUMMARY OF THE UTILITY'S PROPOSAL

On July 31, 2015, Minnesota Power (MP or the Company) submitted its 2015 Remaining Life Depreciation Petition (Petition). The Company reviewed its remaining lives for its thermal, hydroelectric and wind production facilities and proposed a six-year life extension for Laskin Energy Center, and one-year passage-of-time adjustments for all other generation facilities. Additionally, the Company proposed new salvage rates for each of its thermal and wind generation facilities based on a new decommissioning study. Finally, for the Company's general plant accounts for which it uses remaining-life depreciation, the Company proposed one-year passage-of-time remaining life adjustments and no changes to salvage rates.

The effect of MP's proposed depreciation rates is a decrease in annual depreciation expense of $0.6 million, or approximately 0.7 percent, relative to what depreciation expense would be if the Company were to retain its current depreciation parameters.

II. DEPARTMENT ANALYSIS

A. DEPRECIATION RULES

Minnesota Statutes Section 216B.11 and Minnesota Rules, parts 7825.0500-7825.0900 require public utilities to seek Commission certification of their depreciation rates and methods. Utilities must use straight-line depreciation unless the utility can justify a different method. Additionally, utilities must review their depreciation parameters and rates annually to determine if they are generally appropriate, and must file depreciation studies at least once every five years. Once certified by order, depreciation parameters remain in effect until the next certification.

As required, MP employs a straight-line depreciation method, and files annual depreciation studies for its generation assets.

B. PRIOR COMMISSION ORDERS AND RELATED PROPOSAL

1. Comparison of Depreciation Remaining Lives and Resource Planning Remaining Lives

The Commission's January 16, 2015 Order in Docket No. E015/D-14-318 (MP's 2014 Depreciation Docket), required MP to include in its Petition "a comparison of the remaining lives used in its depreciation filing and current resource plan and an explanation of any differences." The Company provided this information on pages 8-15 of its Petition.

While the Department concludes that MP has satisfied its requirement to include a comparison of its depreciation petition and its current resource plan, the Department disagrees with the remaining lives MP has proposed for the Sappi/Cloquet Generator No. 5 and Taconite Harbor Energy Center (Taconite Harbor or THEC), as discussed in greater detail below.

The Department recommends that the Commission require MP to continue to provide in future remaining life depreciation studies a comparison of the remaining lives used in its depreciation filing and in the utility's then-current resource plan, and an explanation of any differences.

2. MP's Request to Make Depreciation Petitions Due at the Same Time as IRPs

MP has, for the last several years, made depreciation filings on or around April 15 of each year. In its Petition, MP requested that its depreciation petitions be due on the same date as its Integrated Resource Plans (IRP) in years that the Company files an IRP. MP stated that this request is to ensure that information in its depreciation petitions and IRPs is consistently applied or the reasons for any differences are explained.

While the Department does not strongly oppose MP's proposal, the Department views it as unnecessary. Electric utilities generally file depreciation petitions annually, so if a utility files an IRP a few months after depreciation petition, and the assumptions in the IRP are not consistent with the depreciation petition, the assumptions can be reflected in the next depreciation petition. Additionally, when comparing depreciation filings to IRPs, the Department generally looks for consistency between the current depreciation filing and the Company's most recently *approved* IRP, rather than its most recently *filed* IRP. A recently filed, but as yet unapproved IRP may contain proposed changes that have not been fully reviewed by the Department or other parties and that may ultimately be rejected by the Commission. It could be difficult for the Department and, more importantly the Commission, to reach informed conclusions on any such changes proposed in a depreciation petition.

If a utility has an active IRP while a depreciation petition is being reviewed, it may be appropriate to reflect a proposed change from the IRP in the depreciation parameters if there is broad agreement regarding the change in the IRP. For example, in MP's 2015 IRP, filed September 1, 2015, and as noted in the instant filing, the Company has proposed to idle its units at Taconite Harbor in 2016, and cease coal operations at the plant in 2020.[1] While the Department's analysis of MP's IRP is on-going, it is reasonable to expect the 2020 ceasing of coal operations of Taconite Harbor to be an outcome of MP's IRP proceeding. Thus, as discussed in greater detail below, the Department recommends shortening the remaining life of Taconite Harbor, consistent with MP's IRP.

If the Commission's eventual Order on MP's 2015 IRP results in changes to any of the Company's other depreciation parameters, those changes can be reflected in a future depreciation petition. (This opportunity for annual updates is why electric utilities are generally required by Commission Orders to make annual depreciation filings for their generation facilities.)

3. Depreciation Expense Calculated Without Decommissioning Uncertainties

The Commission's Order in MP's 2014 Depreciation Docket required MP to include in its Petition an estimate of what its depreciation expense would be with 100 percent decommissioning probabilities. Attachment B to the Company's Petition includes a calculation of this estimate. MP's depreciation expense would be approximately $2.7 million higher if did not use decommissioning probabilities. The Department concludes that MP met this requirement.

On October 26, 2015, the Commission issued its Order in Docket No. E,G999/CI-13-626, the Commission's *Inquiry into Decommissioning Policies Related to Depreciation*. In that Order, the Commission required MP to stop using decommissioning probabilities when it files its next rate case, or by January 1, 2020, whichever comes first.

4. Supplemental Depreciation

The Commission's Order in MP's 2014 Depreciation Docket required MP to provide in the 2015 Depreciation Petition a schedule of supplemental depreciation expense recorded during 2014 as well as supplemental depreciation expense to be recorded in the future pursuant to the Commission's Order in Docket No. E015/D-12-378. Attachment C of MP's Petition includes the required information. After review, the Department concludes that MP has reasonably complied with this requirement.

The Department recommends that the Commission require MP to continue to provide in future remaining life depreciation filings a summary of supplemental depreciation expense recorded in the prior year, as well as the supplemental expense to be recorded in the future.

[1] See Docket No. E015/RP-15-690 and page 15 of MP's Petition.

C. REASONABLENESS OF PROPOSED DEPRECIATION PARAMETERS

1. Remaining Lives

a. Laskin Energy Center

The current remaining life for Laskin Energy Center (Laskin) runs through end of 2024. In its Petition, MP proposed a six-year extension, through 2030. In June 2015, the Company completed a refueling project at Laskin that converted the plant from a coal-fired baseload plant to a natural gas peaking plant. MP stated in its Petition that the vast majority of Laskin's existing assets are required to serve the new mission, and believes that the facility has a fifteen year life as of January 1, 2015. The Department notes that in MP's 2013 IRP (Docket No. E015/RP-13-53), MP estimated the capital costs of the refueling project to be approximately $14 million, and in its Petition, MP noted that $7.2 million of existing gross plant was retired pursuant to the project. Laskin's gross plant balance at the end of 2014 was $80.3 million.

The Department concludes that a life extension for Laskin is reasonable based on the new plant investments. However, because the investments were small relative to Laskin's gross plant balance, and the majority of the plant's existing assets, which remain in place, were not directly improved, one would not expect a long life extension. The Department concludes that MP's proposed six-year life extension for Laskin is reasonable.

b. Taconite Harbor Energy Center

MP proposed a one-year passage-of-time adjustment for Taconite Harbor, resulting in a remaining life of 12 years based on the plant's current anticipated retirement date of December 31, 2026. However, as described on pages 14-15 of the Company's Petition, in May 2015, MP ceased coal operation for THEC unit 3; in addition, as indicated in its 2015 IRP, MP proposes to economically idle THEC in the fall of 2016, and cease coal operations in 2020. Between 2016 and 2020, THEC will be available on a seasonal basis for reliability purposes and to generate electricity.[2] In other words, these proposals taken together mean that MP has proposed to continue to depreciate THEC for six years after it plans to cease coal operations at the plant.

In its response to Department IR No. 2, MP explained that because it is exploring future options for the plant, including refueling, repurposing, and retiring the plant, it is possible that some of the infrastructure at the plant will not be retired in 2020, which means that a 2026 retirement date is reasonable for depreciation purposes.[3]

While the Department's analysis of MP's 2015 IRP is on-going, idling THEC units 1 and 2 in 2016 and ceasing coal operations in 2020 seems to be a likely outcome. Based on this information, in order to match the depreciation life with the operational life, and to prevent ratepayers from continuing to pay for a plant well after it has retired, the Department

[2] See MP's 2015 IRP, Section IV, page 54.
[3] See Attachment 2

recommends a six-year remaining life for THEC. The Department notes that any future authorized capital additions would appropriately be depreciated over the useful life as determined at that time.

The Department understands that shortening THEC's remaining life to six years will result in the plant's annual depreciation expense doubling, which will negatively impact MP unless and until the Company files a rate case. However, it is best to match expenses to the periods in which they are incurred based on information known at a given time, which also promotes intergenerational equity among ratepayers. If THEC is refueled or repurposed, some of its assets will be retired in 2020, and some will not, and thus, the average remaining life for the individual assets at the plant will be later than 2020. In recognition of this possibility, the Commission could approve a remaining life between six and twelve years for THEC. However, the Department concludes that a six-year remaining life is conservative and reasonable. As shown in Attachment 1, the Department estimates that this change will result in an increase in annual depreciation expense of $8.8 million relative to MP's proposal.

c. Sappi/Cloquet Generator No. 5

MP's Sappi/Cloquet Generator No. 5 (S/C5) is a generator installed at Sappi's paper mill in Cloquet, MN. Sappi owns the boiler and other infrastructure at the facility, and operates and maintains the generator. MP owns the generator and the energy output, pays for the fuel and operations and maintenance (O&M) costs related to S/C5, and makes monthly payments to Sappi for the use of Sappi's infrastructure.[4]

In its Petition, MP did not request a change to the remaining life of its S/C5, which currently runs through 2024. However, in its Petition, MP noted that as part of the initial agreement reached with Sappi in 2000, Sappi has an option to purchase S/C5 for one dollar on July 1, 2016. MP stated that it believes that it is likely that Sappi will exercise this option. Despite its expectation that Sappi will exercise its option, MP requested to leave S/C5's remaining life, which currently runs through 2024, unchanged. In its response to Department Information Request (IR) No. 1, MP stated that maintaining the current remaining life would allow the Company to recover the undepreciated portion of S/C5 without significant impacts to ratepayers.[5]

Similar to THEC, the Department concludes that a reasonable remaining life for S/C5 for depreciation purposes is one that matches the expected operational life. Thus, based on MP's expectation that Sappi will exercise its option to purchase S/C5 in 2016, the Department recommends a two-year remaining life for S/C5. A two-year remaining life will result in S/C5 being fully depreciated when it is removed from MP's operations, and ratepayers in subsequent years will not have to pay for a generator that is providing no energy or other benefits. As shown in Attachment 1, the Department estimates that this change will increase annual depreciation expense by $1.1 million relative to MP's proposal.

[4] See Docket No. E015/M-00-572 and the Rebuttal Testimony of MP Witness Eric Norberg in Docket No. E015/GR-08-415.
[5] See Attachment 3.

d. All Other Generating Facilities and General Plant Accounts

For all other production plants, as well as general plant accounts 390.0 (Structures and Improvements) and 392.8 (Transportation Equipment, Fixed-Wing Aircraft), MP proposed no changes except for one-year passage-of-time adjustments. The Department concludes that MP's proposal is reasonable.

2. Salvage Rates

On page 3 of its Petition, MP stated that it conducted a decommissioning study in April 2015 (the 2015 Decommissioning Study), and proposed new salvage rates for its production plants based on the results of this study. The Department reviewed the 2015 Decommissioning Study and the resulting salvage rates and concludes that they are reasonable, with two exceptions described below.

a. Taconite Harbor Energy Center

While reviewing THEC's decommissioning cost estimate, the Department compared the 2015 Decommissioning Study to MP's prior decommissioning study from 2013 (the 2013 Decommissioning Study).[6] The Department notes that the estimate of costs associated with landfill and pond closure decreased, from $1.8 million in the 2013 Decommissioning Study, to $1.1 million in the 2015 Decommissioning Study. In its response to Department IR No. 3, MP explained that the decrease was due to the inadvertent omission of coal pile remediation costs in the 2015 Decommissioning Study.[7] MP stated that it has requested that the engineering firm that conducted the 2015 Decommissioning Study provide an update with coal pile remediation costs included.

The Department recommends that the Commission require MP to include an estimate of coal pile remediation costs in the 2015 salvage rate for THEC. MP should use the updated 2015 Decommissioning Study if it receives the information in time for use this year. Otherwise, MP should use the $1.8 million estimate from the 2013 Decommissioning Study as a placeholder, and update THEC's salvage rate again next year. The Department did not estimate the effect of this change in Attachment 1, but expects that it will be small.

b. Laskin Energy Center

In its Petition, MP proposed a salvage rate of negative 15.29 percent for Laskin, based on a decommissioning cost estimate of $15.3 million, which includes estimated landfill and pond closure costs of $8.2 million.

Laskin's salvage rate was a source of controversy in Docket No E015/D-13-275 (MP's 2013 Depreciation Docket), due to the fact that MP proposed salvage rates based on a 2009 Decommissioning Study, rather than a more recent study conducted in 2011. The Department recommended using the results of the 2011 Decommissioning Study. However,

[6] See Appendix D of MP's Petition in the 2014 Depreciation Docket.
[7] See Attachment No. 4.

the Commission ultimately approved a salvage rate for Laskin based on a 2013 Decommissioning Study, which was completed before the 2013 Depreciation Docket was concluded. For Laskin in particular, the differences in cost estimates between the various studies were significant, as summarized in Table 1 below.

Table 1:
Laskin Decommissioning
Cost Estimates

Year of Decommissioning Study	Laskin Decommissioning Cost Estimate
2009	\$8.6 million
2011	\$26.8 million
2013	\$11.7 million

Sources: MP Depreciation Filings and 2013 IRP

The wide variation in Laskin's decommissioning cost estimate over the 2009, 2011, and 2013 Decommissioning Study is largely the result of changing assumptions regarding the treatment of the facility's ash ponds.[8] Laskin's ash ponds consist of five cells (A, B, C, D, and E). Cell E is the only cell currently operating. In 2002, MP submitted a closure plan for Laskin's ash ponds to the Minnesota Pollution Control Agency (MPCA) that assumed all ash from Cells A and B would be relocated to Cell E, which MPCA approved in 2008. Prior to receiving approval from MPCA, MP determined that ash relocation was not required, and therefore developed a decommissioning estimate for Laskin in the 2009 Decommissioning Study based on an assumption that Cells A and B would be capped in place.

As a result of heightened scrutiny of coal ash storage following an ash dike rupture at a coal plant in Tennessee in late 2008, MP decided to use more conservative assumptions in its 2011 Decommissioning Study, and developed a decommissioning estimate based on the assumption that all ash from Cells A and B would be relocated to Cell E. This change in assumption resulted in a significant increase in estimated landfill and pond closure costs from the 2009 Decommissioning Study.

In 2013, MP launched a closure plan study for Laskin's ash ponds, and discovered that the ash in Cells A and B had not drained as expected, and that ash relocation was not feasible. Based on this discovery, MP assumed in its 2013 Decommissioning Study that Cells A and B

[8] See the Department's August 15, 2014 Comments in the 2014 Depreciation Docket for a more detailed discussion of the changes.

would be capped in place, despite the fact that the current MPCA-approved plan requires ash relocation. The assumption that Cells A and B would be capped in place resulted in a significant decrease in Laskin's estimated decommissioning cost estimate, relative to the 2011 Decommissioning Study's estimate.

The 2015 Decommissioning Study, included with MP's Petition as Attachment D, also assumes that Cells A and B will be capped in place. However, the Environmental Protection Agency (EPA) issued a new Coal Combustion Residual (CCR) rule in December 2014, . Separate from the 2015 Decommissioning Study, MP conducted a Supplemental Cell A, B and E Closure Plan Study for Laskin (Supplemental Laskin Study), which the Company provided in response to Department IR No. 5.[9] Based on this Supplemental Laskin Study, MP created an amended closure plan which it has submitted to the MPCA for approval which complies with the final CCR Rule.[10] MP's amended closure plan involves relocating all ash from Cell B and a portion of the ash from Cell A to Cell E.

In its response to Department IR No. 6, MP provided an updated cost estimate of [TRADE SECRET DATA HAS BEEN EXCISED] for landfill and pond closure for Laskin, based on the Supplemental Laskin Study.[11] The Department considers this cost estimate to represent the best estimate of Laskin's landfill and pond closure costs as it is based on a plan that complies with the new CCR rule, whereas the estimate included in the 2015 Decommissioning Study does not.

The Department substituted the landfill and pond closure estimate from the Supplemental Laskin Study for the same estimate in the 2015 Decommissioning Study and calculated a new salvage rate for Laskin, as shown in Table 2.

[9] See Attachment 5.
[10] See MP's response to DOC IR 4(a), included with these Comments as Attachment 6.
[11] See Attachment 7.

Table 2:
Laskin Salvage Rate Calculation

	Laskin		
	2013	2015	2015 with Updated Landfill and Pond Closure Est.
Mobilization	150	150	150
Demolition & Disposal	2,969	3,203	3,203
Asbestos Abatement Allowance	643	928	928
Galbestos Removal & Disposal	-	-	-
Other Hazardous Material Disposal	211	222	222
Site Grading & Fill	1,012	1,065	1,065
Site Restoration	63	63	63
Landfill and Pond Closure	7,800	8,195	[TRADE SECRET DATA HAS BEEN EXCISED]
Total Project Costs Excl. Contingency	12,848	13,826	
Project Contingency	1,285	1,382	
Total Project Costs	14,133	15,208	
Scrap Value	(2,565)	(2,969)	
Net Project Costs	11,568	12,239	
Laskin Gross Plant Balance 12/31/2014		80,048	
Laskin Salvage Rate		-15.29%	

Sources: 2013 Decommissioning Study, filed in Docket No. E015/D-14-318
2015 Decommissioning Study, Attachment D to Petition
Supplemental Laskin Study

Project Contingency equal to 20% of Total Project Costs in 2011; 10% in 2013

The Department recommends that the Commission approve a salvage rate of **[TRADE SECRET DATA HAS BEEN EXCISED]** for Laskin. The Department estimates that this change will result in an increase in annual depreciation expense of **[TRADE SECRET DATA HAS BEEN EXCISED]** relative to MP's proposal.

III. RECOMMENDATIONS

As described above, the Department recommends that the Commission approve MP's proposed remaining lives, except for the remaining lives of THEC and S/C5, for which the Department recommends shorter lives. Similarly, the Department recommends that the Commission approve MP's proposed salvage rates, except for the salvage rates proposed for Laskin and THEC. The Department recommends that the Commission approve the Department's modified salvage rate for Laskin, and a salvage rate for THEC that includes an estimate of coal pile remediation costs. As shown in Attachment 1, the combined effect of the Department's recommendations is an **[TRADE SECRET DATA HAS BEEN EXCISED]** relative to expense calculated using the current depreciation parameters.

The Department makes no recommendation regarding MP's request to have its depreciation filings be due on the same date as its IRPs in years the Company files an IRP.

1. Approve MP's proposed remaining lives, except for the lives proposed for Taconite Harbor Energy Center and Sappi/Cloquet Generator No. 5;
2. Approve a remaining life of six years for Taconite Harbor Energy Center;
3. Approve a remaining life of two years for Sappi/Cloquet Generator No. 5;
4. Approve MP's proposed salvage rates, except for the salvage rates proposed for Laskin Energy Center and Taconite Harbor Energy Center;
5. Approve a salvage rate of **[TRADE SECRET DATA HAS BEEN EXCISED]** for the Laskin Energy Center;
6. Approve a salvage rate for Taconite Harbor Energy Center based on the 2015 Decommissioning Study that includes either (a) an updated coal pile remediation cost estimate or (b) the coal pile remediation cost estimate from the 2013 Decommissioning Study.
7. Require MP to include in future depreciation filings a comparison of the remaining lives used in its depreciation filing to the Company's most recent integrated resource plan and explain any differences;
8. Require MP to include in its next depreciation filing an analysis comparing its depreciation expense using its current decommissioning probabilities to its depreciation expense using 100 percent decommissioning probabilities;
9. Require MP to include in its next depreciation filing a schedule of its supplemental depreciation expense recorded in the prior year as well as the supplemental depreciation expense to be recorded in the future.
10. Require MP to make its next depreciation filing on or before September 1, 2016 to establish depreciation parameters and rates to be effective January 1, 2016.

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Comparison of Depreciation Expense Estimates
For Minnesota Power's Production Plant
Calculated with Current Parameters, MP's Proposed Parameters and the Department's Proposed Parameters

	Depreciable Plant Balance (12/31/14)	Depreciation Reserve (12/31/14)	Current Parameters/Rates Rem. Life (1/1/15)	Current Parameters/Rates Salvage Value (1/1/15)	Current Parameters/Rates 2015 Annual Accrual	MP's Proposal Rem. Life (1/1/15)	MP's Proposal Salvage Value (1/1/15)	MP's Proposal 2015 Annual Accrual	Difference Between MP's Proposal and Current Rates	Department's Proposal Rem. Life (1/1/15)	Department's Proposal Salvage Value (1/1/15)	Department's Proposal 2015 Annual Accrual	Difference Between Department's Proposal and MP's Proposal	Difference Between Department's Proposal and Current Rates
Steam Generation														
Hibbard SE Station:	91,181,441	50,028,547	10	-2.42%	4,335,948	10	-1.08%	4,213,765	(122,183)	10	-1.08%	4,213,765	-	(122,183)
Laskin Energy Center	80,048,373	57,129,153	10	-14.50%	3,452,623	16	-15.29%	2,197,414	(1,255,209)	16	[TRADE SECRET DATA EXCISED]			
Boswell Energy Center:	1,082,262,136	455,924,021			36,683,428			37,343,131	659,703			37,343,131	-	659,703
Unit No. 1	46,359,481	25,424,653	10	-6.09%	2,375,812	10	-7.67%	2,449,060	73,248	10	-7.67%	2,449,060	-	73,248
Unit No. 2	36,410,959	24,557,632	10	-7.90%	1,472,979	10	-9.88%	1,545,073	72,094	10	-9.88%	1,545,073	-	72,094
Unit No. 3	459,289,395	139,735,182	20	-4.50%	17,011,112	20	-5.68%	17,282,093	270,981	20	-5.68%	17,282,093	-	270,981
Unit No. 4	355,130,026	172,518,768	21	-4.62%	9,477,060	21	-6.03%	9,715,505	238,445	21	-6.03%	9,715,505	-	238,445
Common	185,072,275	93,687,786	15	-2.06%	6,346,465	15	-2.10%	6,351,400	4,935	15	-2.10%	6,351,400	-	4,935
Taconite Harbor Energy Center	155,530,451	57,729,062			8,671,925			8,734,643	62,718			17,469,286	8,734,643	8,797,361
Structure/Unit	150,522,026	52,720,637	12	-4.16%	8,671,925	12	-4.66%	8,734,643	62,718	6	-4.66%	17,469,286	8,734,643	8,797,361
Ash Ponds*	5,008,425	5,008,425	0	-4.16%	-	0	-4.66%	-	-	0	-4.66%	-	-	
Cloquet Energy Center	8,259,986	5,568,756	10	0.00%	269,123	10	0.00%	269,123	-	2	0.00%	1,345,615	1,076,492	1,076,492
Total Steam Generation	1,417,282,387	626,379,539			53,413,047			52,758,076	(654,971)			[TRADE SECRET DATA EXCISED]		
Wind Generation														
Bison 1A	76,427,719	9,898,321	30	0.00%	2,217,647	30	-0.95%	2,241,849	24,202	30	-0.95%	2,241,849	-	24,202
Bison 1B	73,284,514	4,247,500	31	0.00%	2,227,000	31	-0.93%	2,248,986	21,986	31	-0.93%	2,248,986	-	21,986
Bison 2	150,335,809	10,189,365	32	0.00%	4,379,576	32	-0.35%	4,396,019	16,443	32	-0.35%	4,396,019	-	16,443
Bison 3	149,488,322	8,980,978	32	0.00%	4,390,855	32	-0.42%	4,410,475	19,620	32	-0.42%	4,410,475	-	19,620
Bison 4	320,956,002	667,806	34	0.00%	9,420,241	34	0.03%	9,417,409	(2,832)	34	0.03%	9,417,409	-	(2,832)
Subtotal Bison	770,492,366	33,983,970			22,635,319			22,714,738	79,419			22,714,738	-	79,419
Taconite Ridge I Energy Center	45,602,384	4,559,381	28	0.00%	1,465,822	28	-0.33%	1,471,196	5,374	28	-0.33%	1,471,196	-	5,374
Total Wind Generation	816,094,750	38,543,351			24,101,141			24,185,934	84,793			24,185,934	-	84,793
Hydroelectric Production Plants														
Birch Lake Reservoir	3,475,668	215,713	49	0.00%	66,530	49	0.00%	66,530	-	49	0.00%	66,530	-	-
Blanchard HE Station	10,474,221	5,632,427	49	0.00%	98,812	49	0.00%	98,812	-	49	0.00%	98,812	-	-
Boulder Lake Reservoir	483,407	315,850	49	0.00%	3,420	49	0.00%	3,420	-	49	0.00%	3,420	-	-
Fish Lake Reservoir	945,803	215,592	49	0.00%	14,902	49	0.00%	14,902	-	49	0.00%	14,902	-	-
Fond du Lac HE Station	18,148,759	3,211,808	49	0.00%	304,836	49	0.00%	304,836	-	49	0.00%	304,836	-	-
Gauging Stations	125,451	61,044	49	0.00%	1,314	49	0.00%	1,314	-	49	0.00%	1,314	-	-
Island Lake Reservoir	1,459,633	1,033,723	49	0.00%	8,692	49	0.00%	8,692	-	49	0.00%	8,692	-	-
Knife Falls HE Station	3,328,194	1,810,291	49	0.00%	30,978	49	0.00%	30,978	-	49	0.00%	30,978	-	-
Little Falls HE Station	8,010,145	4,091,729	49	0.00%	79,968	49	0.00%	79,968	-	49	0.00%	79,968	-	-
Pillager HE Station	2,089,208	1,299,244	49	0.00%	16,122	49	0.00%	16,122	-	49	0.00%	16,122	-	-
Prairie River HE Station	4,996,088	905,183	49	0.00%	83,488	49	0.00%	83,488	-	49	0.00%	83,488	-	-
Rice Lake Reservoir	73,324	51,114	49	0.00%	453	49	0.00%	453	-	49	0.00%	453	-	-
Scanlon HE Station	2,569,705	1,517,430	49	0.00%	21,475	49	0.00%	21,475	-	49	0.00%	21,475	-	-
Sylvan HE Station	2,252,289	1,495,341	49	0.00%	15,448	49	0.00%	15,448	-	49	0.00%	15,448	-	-
Thomson HE Station	75,892,815	14,116,792	49	0.00%	1,260,735	49	0.00%	1,260,735	-	49	0.00%	1,260,735	-	-
White Iron Lake Reservoir	28,934	13,703	49	0.00%	311	49	0.00%	311	-	49	0.00%	311	-	-
Whiteface Reservoir	1,224,487	581,499	49	0.00%	13,122	49	0.00%	13,122	-	49	0.00%	13,122	-	-
Winton HE Station	4,845,829	2,486,441	49	0.00%	48,151	49	0.00%	48,151	-	49	0.00%	48,151	-	-
Total Hydroelectric Production Plants	140,423,960	39,054,924			2,068,757			2,068,757	-			2,068,757	-	-
Total Generation	2,373,801,097	703,977,814			79,582,945			79,012,767	(570,178)			[TRADE SECRET DATA EXCISED]		

Source: Attachment A1 to MP's Petition

State of Minnesota

DEPARTMENT OF COMMERCE
DIVISION OF ENERGY RESOURCES

Nonpublic [ ]
Public [X]

Utility Information Request

Docket Number: E015/D-15-711 Date of Request: 9/15/2015

Requested From: Debbra A. Davey, Minnesota Power Response Due: 9/25/2015

Analyst Requesting Information: Craig Addonizio

Type of Inquiry:

[X] Financial	[ ] Rate of Return	[ ] Rate Design
[ ] Engineering	[ ] Forecasting	[ ] Conservation
[ ] Cost of Service	[ ] CIP	[ ] Other:

If you feel your responses are trade secret or privileged, please indicate this on your response.

Request No.	
2	Reference: Taconite Harbor Remaining Life

a. If, in MP's current IRP proceeding (Docket No. E015/RP-15-690), the Commission determines that Taconite Harbor Units 1 and 2 should be retired in 2020, please explain why it would be reasonable to continue to record depreciation expense associated with those units through 2026.

b. Please explain why MP's proposed accounting treatment would be more appropriate than adjusting Taconite Harbor's remaining life such that it is fully depreciated by the end of 2020.

RESPONSE:

Minnesota Power recently announced the next steps in its EnergyForward plan, which includes economic idling of the Taconite Harbor Units 1 and 2 in the fall of 2016 and the ceasing of coal-fired operations there in 2020. Because Minnesota Power is exploring future options for the plant that may include refueling, repurposing, or retiring the plant, it is premature to change the useful life of the plant. There are valuable port, rail, and other associated infrastructure at the

Response by: Debbra Davey

Title: Supervisor, Accounting

Department: Accounting – Property & Construction

Telephone: (218) 355-3714

List sources of information:

facility site that may help spur future economic development and business growth opportunities.

Response by:	Debbra Davey	List sources of information:
Title:	Supervisor, Accounting	
Department:	Accounting – Property & Construction	
Telephone:	(218) 355-3714	

State of Minnesota

DEPARTMENT OF COMMERCE
DIVISION OF ENERGY RESOURCES

Nonpublic [ ]
Public [X]

Utility Information Request

Docket Number: E015/D-15-711 Date of Request: 9/15/2015

Requested From: Debbra A. Davey, Minnesota Power Response Due: 9/25/2015

Analyst Requesting Information: Craig Addonizio

Type of Inquiry:			
	[X]....Financial	[ ]....Rate of Return	[ ]....Rate Design
	[ ]....Engineering	[ ]....Forecasting	[ ]....Conservation
	[ ]....Cost of Service	[ ]....CIP	[ ]....Other:

If you feel your responses are trade secret or privileged, please indicate this on your response.

Request No.	
1	Reference: Sappi/Cloquet Generator No. 5 On page 15 of its Petition, MP requests that if Sappi exercises its purchase option, then the assets transferred be treated as normal retirements and the remaining depreciable balance be depreciated over the remaining useful life of 2024. a. Please explain specifically the accounting treatment MP has proposed. More specifically, if part of a plant is retired, thee undepreciated portion of the retired asset is simply absorbed into the depreciable balance of the plant that remains on the books. In this instance, if the S/C5 transfer is treated as a normal retirement, the plant balance will be reduced to zero upon transfer, and therefore there will be no remaining plant to absorb the undepreciated portion of S/C5. b. Please explain why MP believes it is appropriate to continue recording depreciation expense associated with S/C5 for eight years after the generator is sold. c. Please explain whether it would be reasonable to reduce S/C5's remaining life to one year in this Docket, based on MP's expectation that Sappi will exercise its purchase option in 2016.

Response by: Debbra Davey

List sources of information:

Title: Supervisor, Accounting

Department: Accounting – Property & Construction

Telephone: (218) 355-3714

RESPONSE:

1a. When the assets are retired the entry will be a credit to plant in-service and a debit to accumulated depreciation for the original installed cost of the asset because Minnesota Power uses group depreciation. The depreciable basis used to calculate depreciation after the retirement will be the undepreciated portion of the retired assets, which will be the debit balance in the accumulated depreciation reserve after the above entry. These are unrecovered costs which Minnesota Power is proposing to depreciate over the original useful life of 2024.

1b. The depreciable life for Cloquet Energy Center is through 2024. Minnesota Power has been attempting to negotiate a contract extension with Sappi Cloquet LLC (Sappi) instead of transferring ownership of the Cloquet Energy Center Generator No. 5 from Minnesota Power to Sappi for a nominal amount on July 1, 2016. However, it is clear that the contract is not going to be extended and that Sappi will exercise the option under the contract to transfer ownership of the Cloquet Energy Center Generator No. 5. As a result, Minnesota Power will be left with unrecovered costs. Minnesota Power proposes that the remaining plant balance continue to be depreciated over the original useful life of 2024 as a way to recover these costs without significant impacts to ratepayers.

1c. Adjusting the remaining life so that the assets are fully depreciated by July 2016 results in higher depreciation expense over a significantly shorter period. Minnesota Power proposes that the remaining plant balance continue to be depreciated over the original useful life of 2024 as a way to recover these costs without significant impacts to ratepayers.

Response by:	Debbra Davey	List sources of information:
Title:	Supervisor, Accounting	
Department:	Accounting – Property & Construction	
Telephone:	(218) 355-3714	

State of Minnesota

Department of Commerce
Division of Energy Resources

Nonpublic [ ]
Public [X]

Utility Information Request

Docket Number: E015/D-15-711 Date of Request: 9/15/2015

Requested From: Debbra A. Davey, Minnesota Power Response Due: 9/25/2015

Analyst Requesting Information: Craig Addonizio

Type of Inquiry:

[X] Financial	[ ] Rate of Return	[ ] Rate Design
[ ] Engineering	[ ] Forecasting	[ ] Conservation
[ ] Cost of Service	[ ] CIP	[ ] Other:

If you feel your responses are trade secret or privileged, please indicate this on your response.

Request No.	
3	Reference: Taconite Harbor Decommissioning Estimates The landfill and pond closure cost estimates for Taconite Harbor in the 2013 and 2015 Decommissioning Studies were, respectively, $1.849 million and $1.070 million. Please explain the reasons for the decrease from the 2013 Study to the 2015 Study.

RESPONSE:

The primary reason for the decrease in landfill and pond closure cost estimates for Taconite Harbor from the 2013 Study to the 2015 Study is that coal pile remediation costs were included in the total landfill and pond closure costs in the 2013 Study, but were inadvertently not included in the 2015 Study.

While one of the 2015 Decommissioning Study assumptions noted that the coal pile will be closed, Minnesota Power understood that the coal pile remediation costs were then included in the 2015 Study.

Response by: Debbra Davey

Title: Supervisor, Accounting

Department: Accounting – Property & Construction

Telephone: (218) 355-3714

List sources of information:

Upon further inquiry, it has been determined that the 2015 Study did not include the costs for coal pile remediation. Minnesota Power has requested that the 2015 Study be updated to include these costs by the engineering firm.

Response by: Debbra Davey

Title: Supervisor, Accounting

Department: Accounting – Property & Construction

Telephone: (218) 355-3714

List sources of information:

State of Minnesota

DEPARTMENT OF COMMERCE
DIVISION OF ENERGY RESOURCES

Nonpublic [ ]
Public [X]

Utility Information Request

Docket Number: E015/D-15-711 Date of Request: 9/29/2015

Requested From: Debbra A. Davey, Minnesota Power Response Due: 10/9/2015

Analyst Requesting Information: Craig Addonizio

Type of Inquiry:

[X]..... Financial	[ ]..... Rate of Return	[ ]..... Rate Design
[ ]..... Engineering	[ ]..... Forecasting	[ ]..... Conservation
[ ]..... Cost of Service	[ ]..... CIP	[ ]..... Other:

If you feel your responses are trade secret or privileged, please indicate this on your response.

Request No.	
5	Reference: MP's Response to DOC IR 4 a. Please provide a copy of any reports prepared for MP by BARR Engineering Company related to the closure of Laskin's ash ponds. b. Please provide a copy of the amended closure plan MP has submitted to the MPCA, referenced in MP's response to DOC IR 4a. c. Please explain why MP did not use the results of BARR Engineering Company's evaluation of Laskin's ash ponds in the decommissioning cost estimates included in its Petition. **d.** As discussed in the Department's August 15, 2014 Comments in Docket No. E015/D-14-318, it is the Department's understanding that the current MPCA-approved closure plan for Laskin's ash ponds involves relocating ash from Cells A and B to Cell E. Thus, the current cost estimate of $8.195 million (in table 5-1 of the 2015 decommission study), which assumes Cells A and B will be capped in place, is inconsistent with the current MPCA-approved plan. Please confirm or correct the Department's understanding.

Response by: Debbra Davey List sources of information:

Title: Supervisor, Accounting

Department: Accounting – Property & Construction

Telephone: (218) 355-3714

RESPONSE:

5a. Please see the attached Supplemental Cell A, B and E Closure Plan ("Closure Plan") prepared by BARR Engineering Company related to the closure of Laskin's ash ponds. This report was submitted to the MPCA.

5b. The Closure Plan referenced in 5a. above is the amended Laskin ash pond closure plan submitted to the MPCA which was referenced in MP's response to IR 4a. and 4c.

5c. MP did not use the results of BARR Engineering Company's evaluation of Laskin's ash ponds in the decommissioning cost estimates included in its 2015 Petition because MP does not know the scope of the plan that will be approved by the MPCA. Once the plan is approved, then MP will know the scope and be able to update cost estimates.

As stated in MP's 2015 Petition, MP anticipates having an MPCA approved plan for decommissioning the Laskin ash ponds in 2016. The updated decommissioning cost estimates related to this approved plan are expected to be reflected in MP's 2016 Petition.

5d. The current MPCA approved closure plan for Laskin's ash ponds involved leaving the ash in cells A and B in place until the closure of cell E. Upon Cell E closure, the ash from cells A and B was to be used to provide required sloping and dry closure materials for cell E. This plan was developed under the assumption that the ash in cells A and B would have suitable material properties and be present in quantities required to perform this function. Currently the ash in cells A and B do not have suitable material properties to be able to perform this function.

The current cost estimate of $8.195 million assumes a full in-place capping of cells A, B, and E, instead of relocating ash from cells A and B to E.

The amended Laskin ash pond closure plan MP submitted to the MPCA is a hybrid of both of the above approaches.

As stated in MP's 2015 Petition, MP anticipates having an MPCA approved plan for decommissioning the Laskin ash ponds in 2016. The updated decommissioning cost estimates related to this approved plan are expected to be reflected in MP's 2016 Petition.

Response by: Debbra Davey

Title: Supervisor, Accounting

Department: Accounting – Property & Construction

Telephone: (218) 355-3714

List sources of information:

Supplemental Cell A, B and E Closure Plan

Laskin Energy Center

Prepared for
Minnesota Power

May 2015

Supplemental Cell A, B and E Closure Plan

May 2015

Contents

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1.0 Introduction/Background

Minnesota Power (MP) is converting the Laskin Energy Center (LEC) fuel source from coal to natural gas. Coal ash will no longer be generated so, consistent with facility NPDES/SDS permit requirements, MP plans to decommission/close (decommissioning and closure are used interchangeably in this report hereafter) the current ash storage area (Cell E) after the conversion, beginning in March 2015. There are three ash storage cells (ponds) at the site; two retired (Cells A and B) and one active (Cell E), all of which are set in a bend of the Partridge River (see Figure 1-1). Unlined legacy Cells A and B were removed from service in the year 2000. Cell E, occupying approximately 25 acres, was built in 2000 with a geomembrane/geosynthetic clay liner system and received coal ash until March of 2015. Two additional Cells (Cells C and D) were also part of previous clarifying operations and have been designated as closed in previous MPCA correspondence[1].

In December 2002, MP submitted a closure plan that envisioned interim storage of ash in Cells A and B until Cell E reached the end of its life at approximately 2017. During closure of Cell E, MP would relocate ash from Cells A and B into open space in Cell E for use in contouring. At the time, this planned ash relocation approach was believed to be possible after the ash was dewatered. MP commissioned test pitting in Cell A and an alternatives evaluation in the spring of 2013 to further evaluate the feasibility of ash relocation to Cell E and to identify and evaluate alternatives to ash relocation should relocation prove impractical. The test pitting was performed as a large scale evaluation of ash characteristics and performance upon excavation, in light of previously performed geotechnical explorations that showed the ash could liquefy if disturbed by construction activity. On the basis of on-site test pitting and performance of an ash relocation pilot test in Cell A, significant portions of the existing ash were found to be thixotropic – having some strength when left in a static condition, but becoming liquid (liquefying) when excavated or otherwise manipulated for relocation. The thixotropic characteristic of the ash imposes significant constraints (constructability, safety and economic) on the number of practical alternatives available for ash cell closure.

Based on these observations, an alternative ash cell closure method was identified for further evaluation by MP in 2014. In order to minimize impact of the thixotropic behavior a pilot test was conducted to determine if mixing Cell A and B ash with admix would allow relocation of the stabilized ash to lined Cell E. Pilot testing of this approach in 2014 is discussed in more detail in Section 3.0. The pilot test provided some valuable information on handling the ash but made it clear that several areas in Cell A would be difficult to remove without significant admixture and time. As the pilot test in 2014 was concluded, the final Coal Combustion Residual Rule (CCR Rule) was released by the EPA that will provide additional regulatory oversight to the cells at LEC. The draft rule scope did not include the legacy impoundments to allow MP time for planning. Given this and other information collected MP is proposing to amend the current closure plan as detailed in Section 2.0.

[1] Letter from Richard Clark - MPCA to Scott Jasperson – MP, December 11, 1998

Figure 1-1 **Laskin Energy Center Ash Disposal and Water Management Facility – Cells A through E**

2.0 Updated Closure Approach Concept

In the 2006 Hydrologic Update Report submitted by MP to MPCA, a detailed leaching study concluded that the impact from ash leaching was insignificant compared to associated parameter concentrations in the process water. Several modeling scenarios in the study concluded that whether ash was removed from the unlined cells or not, that it would take a significant time for groundwater concentrations to return to background concentrations. The conclusions of this study were accepted by the MPCA in a letter dated February 20, 2008 and were the basis for approving the 2002 closure plan that left ash in Cells A and B until use for contouring material in closure of Cell E. At the time of the study the water level in the ponds ranged between 1,443 and 1,445 feet MSL and was expected to take approximately 21 years to return to the preconstruction water level of 1,440 feet MSL. At the time of the approval to leave ash in Cells A and B until 2017, approximately 230,000[2] cubic yards of ash was in contact with groundwater with a goal to remove 100% of the ash from contact with groundwater at final closure.

Based on pilot testing results from 2014 discussed in detail below, MP has determined that it is not feasible to move 100% of the ash from Cell A within an accelerated timeline due to federal regulation because of constructability, safety and cost issues to move the material. However, MP has worked diligently to develop an alternate closure plan that will achieve results nearly equivalent to the previously approved plan. The updated closure plan goals include:

- Reducing potential for ash contact with groundwater to the extent feasible to minimize potential source of leaching,
- Installation of robust final cover to minimize infiltration,
- Restore site groundwater flow conditions to near pre-construction conditions, and
- Conduct post-closure care and monitoring to demonstrate protection of the environment.

MP will reduce the potential for ash contact with groundwater by:

- Eliminating impounded water in Cells B, C and D and restoring flow outlet to previous elevation near 1,440 feet MSL,
- Relocating ash material from Cell B into Cell E,
- Relocating movable material from Cell A into Cell E,
- Consolidating movable material from Cell A onto smaller Cell A footprint to achieve final contours, and
- Covering Cell E ash and ash remaining in Cell A to minimize potential infiltration.

For the purposes of this report, there are three scenarios discussed:

[2] Estimate from perched water elevation in Cell A as shown in Figure 4-3 and ash depth survey. Assumes that all 80,000 cubic yards of ash in Cell B is in the ground water.

- Scenario 1: no action
- Scenario 2: proposed 2015 closure plan; remove ash from Cell B and portion of Cell A into Cell E; cover portion of Cell A in place and cover Cell E
- Scenario 3: 2002 closure plan; remove ash from Cells A and B into Cell E.

The proposed closure concept (Scenario 2) is presented in Figure 2-1. This proposed closure approach will reduce potential ash contact with groundwater for nearly 100% of the ash currently in Cells A and B if groundwater elevation is maintained at approximately 1,440 feet MSL by dewatering Cells B, C and D. This is equivalent to the impact to groundwater that would be achieved under the 2002 closure plan.

Table 2-1 presents the percentage of ash removed from potential groundwater contact with the proposed closure plan (Scenario 2) compared to the 2002 closure plan and conditions in 2014 at a range of water elevations at final closure. Table 2-2 shows the estimated ash in contact with groundwater at each of these conditions. As discussed in more detail below, current water elevations in the ash in Cell A are influenced by the water levels in Cells B, C and D. The water in Cells A, B, C, and D has, over time, created a groundwater mound in this area from residual process water and infiltration. Essentially, the water is higher in this area than the surrounding regional groundwater due to water retained in the ponds. After dewatering and elimination of dikes to prevent impoundment of water, the groundwater elevation will, after time, return to a condition more similar to the surrounding regional groundwater elevations (estimated to be approximately 1440-1441 ft). At that time, water elevations will be influenced primarily by the outlet elevation that would control water levels in Cells B, C and D as well as regional water conditions. While cell dewatering rates can vary with the performance of the treatment system and rain events, impoundment water dewatering activities can be substantially completed in 2015.

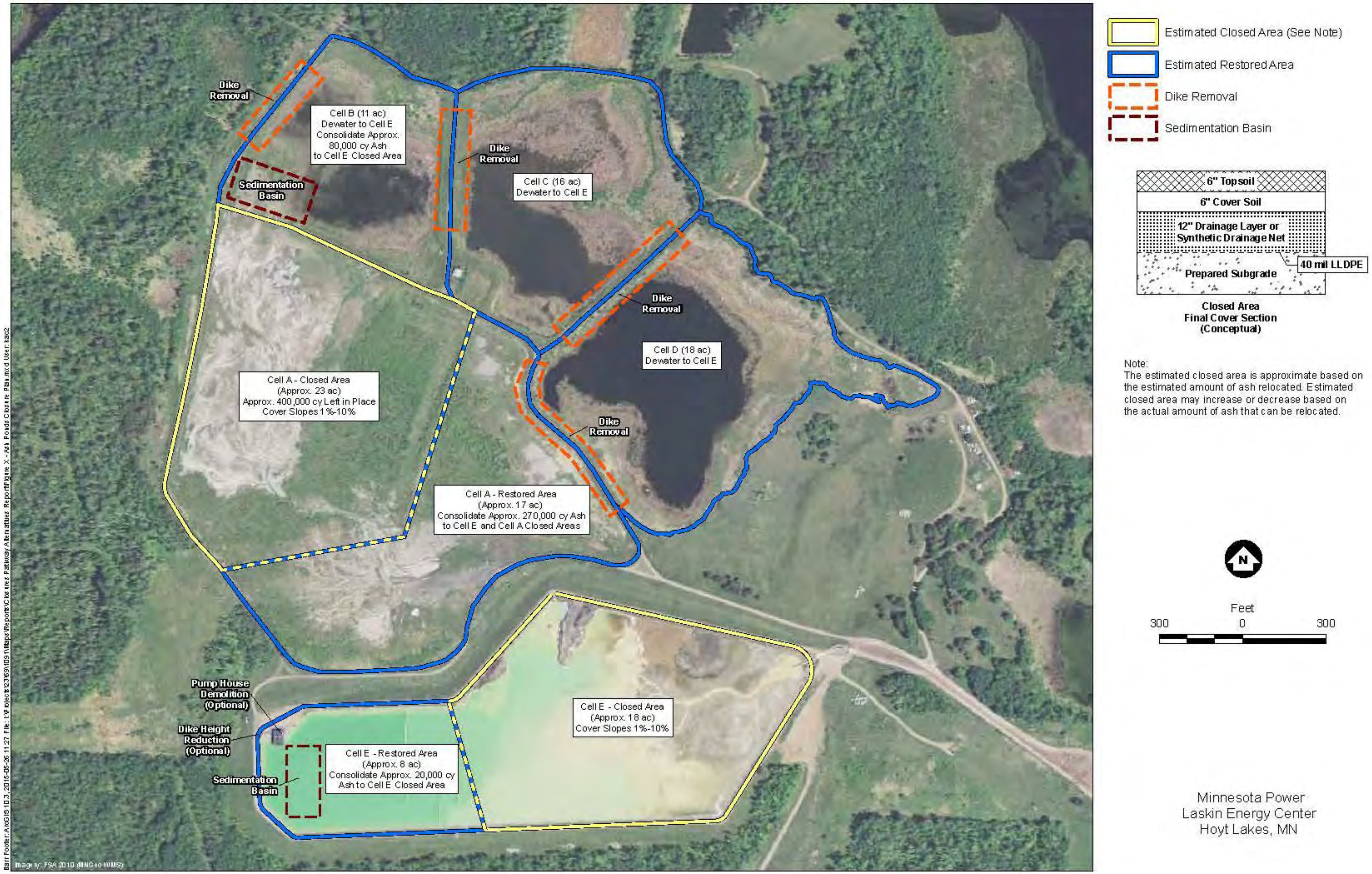

Figure 2-1 Closure Concept Overview

Table 2-1 Reduction in Cell A and B Ash Contact with Groundwater at Proposed Closure Conditions

Groundwater Elevation	Reduction in Volume of Ash in Groundwater (%)
Scenario 1: No Action	0%
Scenario 2: Estimated Water Table Contour (el. 1440 to 1441)	~98 to 100%
Scenario 3: 2002 Closure Plan 1 – Consolidated Cell A and B Ash into Cell E	~100%

Table 2-2 Estimated Ash in Contact With Groundwater at Current and Proposed Conditions

Cell A and B Groundwater Scenario	2014 Cell A and B Boundary		
	Volume of Ash in Groundwater (CY) Low End (Neatline – 15%)	Volume of Ash in Groundwater (CY) Neatline	Volume of Ash in Groundwater (CY) High End (Neatline + 15%)
Scenario 1: No Action: Estimated Perched Water Table Contour (Figure 4-3)	200,000	230,000	260,000
	Cell A Consolidated Boundary		
Scenario 2: Estimated Water Table Contour (el. 1440 to 1441)	<2,600	<3,000	<3,500
Scenario 3: 2002 Closure Plan (assumes complete removal of ash from Cells A and B)	0	0	0

Notes:
1) Neatline quantities calculated in Civil3D.
2) See Figure 4-3 for assumed Cell A and B boundary and Figure 2-1 for Cell A consolidated boundary.

In addition to achieving all or most of the goals originally set in the 2002 closure plan, the proposed closure plan also accomplishes several additional benefits.

Wetland Areas: Lowering the water in cells B, C and D and providing a connection to the west will create wetland areas similar to those that were originally found in the area.

Accelerated Closure: The proposed closure plan is anticipated to be completed within 3 to 4 years. This would complete closure by the end of 2017 or early to mid-2018 which is the time originally anticipated to begin closure of the entire site.

Consistent with EPA CCR Rule: The proposed closure approach is consistent with the EPA CCR rule published on April 17, 2015. The rule allows closure of inactive surface impoundments through in-place closure with a cover or removal to a lined facility. The proposed approach at LEC would include a combination of the two approved closure approaches detailed in the CCR rule.

MPCA will Retain Primary Oversight of Closure Monitoring: Closure within three years from the date of CCR rule publication will prevent interference of dual water monitoring and evaluation under both the State and Federal programs that may not be consistent. Completing timely closure will continue to ensure that MPCA has sole oversight of the LEC facility to best protect Minnesota surface and groundwater resources.

3.0 Ash Relocation Pilot Test

The quantity of ash potentially requiring relocation from Cells A and B to Cell E is on the order of 800,000 cubic yards. The thixotropic nature of significant portions of this ash adds significant uncertainty to the technical feasibility and economics of relocating portions of the ash to Cell E. To reduce this uncertainty an Ash Relocation Test Plan was prepared by Barr in 2014, with plan implementation competitively bid. Four contractors were invited to bid:

- Hoover Construction – Virginia, Minnesota
- Veit Construction – Duluth, Minnesota
- Charah – Louisville, Kentucky
- TransAsh – Cincinnati, Ohio

Contractors were identified for bidding with the objective of receiving bids from local general earthwork contractors having local resources but somewhat limited ash pond closure experience (Hoover and Viet), and of receiving bids from contractors specializing in ash pond management and having significant ash relocation experience (Charah and TransAsh). TransAsh was awarded the work and performed the ash relocation pilot study during the period of September 15, 2014 through October 2, 2014.

3.1 Pilot Test Objectives

Primary objectives of the ash relocation test plan are provided in Table 3-1 and Figure 3-1, and are more broadly summarized as an effort to learn the following:

- Relative stability of excavations performed in existing ash deposits,
- Relative stability and bearing capacity of existing ash deposits,
- Water drainage conditions from excavated ash and within ash excavations,
- Liquefaction potential in existing and excavated ash,
- Transportability of excavated ash,
- Benefits of and methods for admixture addition to existing ash,
- Stackability of relocated ash; with and without admixture addition,
- Particulate generation resulting from ash relocation activities,
- Identification of potential alternate ash relocation or stabilization methods, and
- Improved estimates of cost for ash relocation from Cells A and B to Cell E.

Another important test plan objective was confirmation of the ability of existing in-place ash and of relocated ash to support construction vehicle traffic, to facilitate excavation and relocation, and to support cover construction activities for ash relocated to Cell E.

Table 3-1 Ash Relocation Test Plan Objectives Summary

Activity No.	Activity Name	Objectives Summary
1	Cell A Ash Relocation without Amendment (Excavation Area 2 and Fill Placement Area 2)	• Observe Cell A Excavation Stability and Dewatering Requirements • Observe Stability and Slope Angles of Relocated Ash • Confirm whether Cell A Ash Relocation without Admixture is Feasible • Confirm Timing and Process for Dewatering Cell A Ash • Estimate Unit Cost to Relocate and Grade Cell A Ash
2	Cell A Ash Relocation with Calciment Amendment (Excavation Area 1 and Fill Placement Area 1)	• Confirm Timing, Process and Quantity of Admixture Incorporation Into Ash • Observe Cell A Excavation Stability and Dewatering Requirements • Observe Stability and Slope Angles of Relocated Ash • Estimate Unit Cost to Amend, Relocate and Grade Cell A Ash using Calciment
3	Excavation Stability	• Observe Excavation Side Slope Stability and Water Inflow • Track Time Until Excavation Sloughing, If Sloughing Occurs • Observe Excavation Dewatering Requirements
4	In-Place Ash Cell Closure without Geogrid Reinforcement	• Observe Ash Surface Accessibility • Observe Ash Deposit Bearing Capacity and Settlement • Estimate Unit Cost to Close In-Place without Geogrid Reinforcement
5	In-Place Ash Cell Closure with Geogrid Reinforcement	• Observe Ash Surface Accessibility • Observe Ash Deposit Bearing Capacity and Settlement • Estimate Unit Cost to Close In-Place with Geogrid Reinforcement

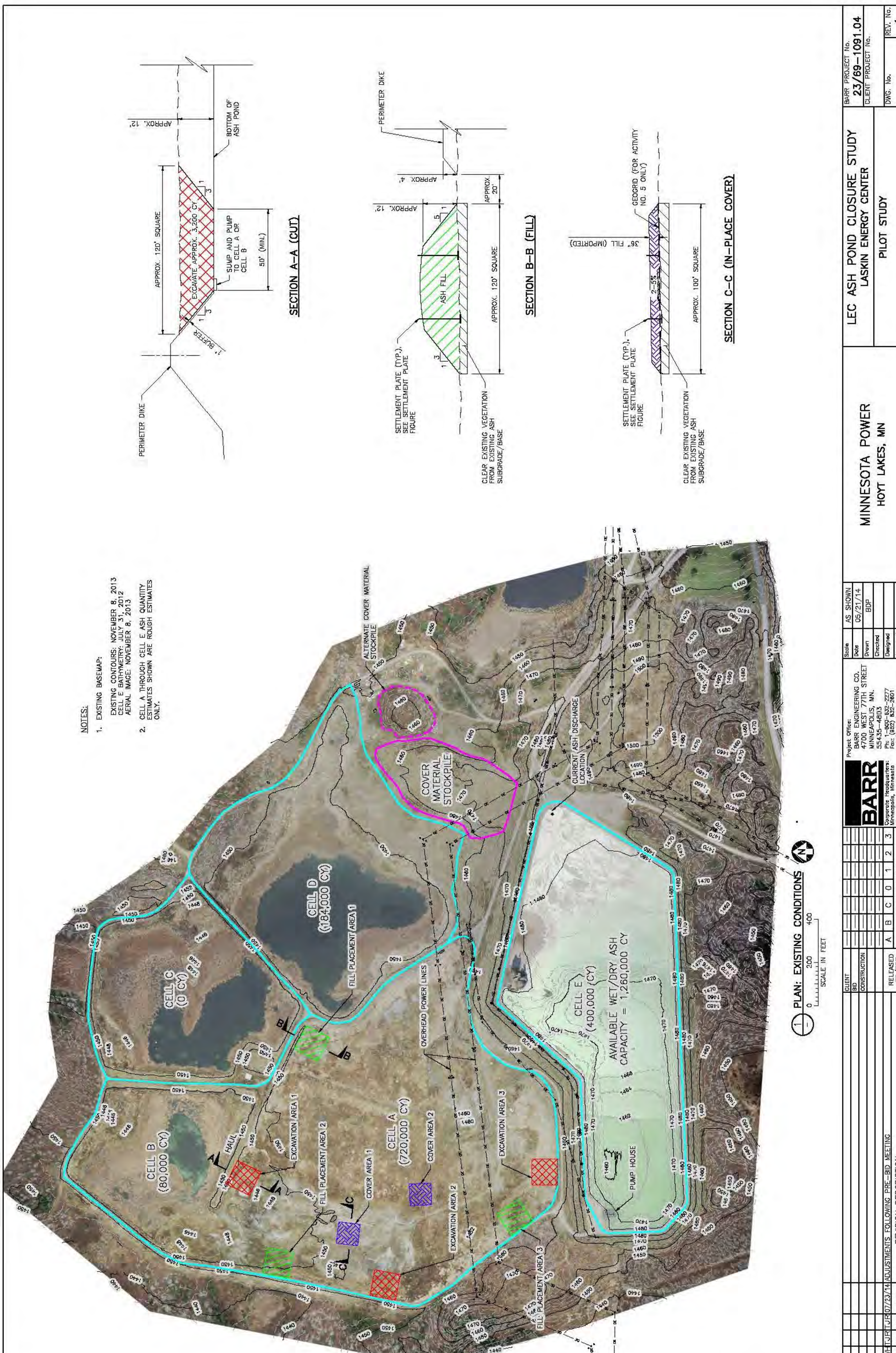

Figure 3-1 Pilot Ash Relocation Test Plan

3.2 Pilot Test Approach

The Test Plan established baseline activities for the implementation contractor as listed in Table 3-1. In addition, the contractor was given latitude to carry out additional explorations and construction activities to aid their understanding of site-specific ash pond characteristics and to subsequently aid in their cost estimating assistance to MP. TransAsh carried out the requirements of the Test Plan and the following additional activities, a number of which were requested by Minnesota Power and Barr:

- Performed numerous test pits on perimeter of Cell A, from ash surface to underlying glacial till,
- Constructed an in-cell ash haul road,
- Performed pilot-scale ash mixing trials (lower moisture content ash and/or bottom ash with higher moisture content ash), and
- Completed excavation/test pit dewatering trials.

These activities were to aid Minnesota Power, Barr and the contractor in understanding the overall conditions of the ash deposit in Cell A, to understand the variation in ash type and moisture condition throughout the Cell, and to understand the local groundwater conditions and the degree to which groundwater would affect ash excavation and relocation. Figure 3-2 provides a summary of the 41 test pit locations from the pilot work. These test pits provide detailed information on the depth of ash, stability and characteristics of the ash, and additional groundwater observations.

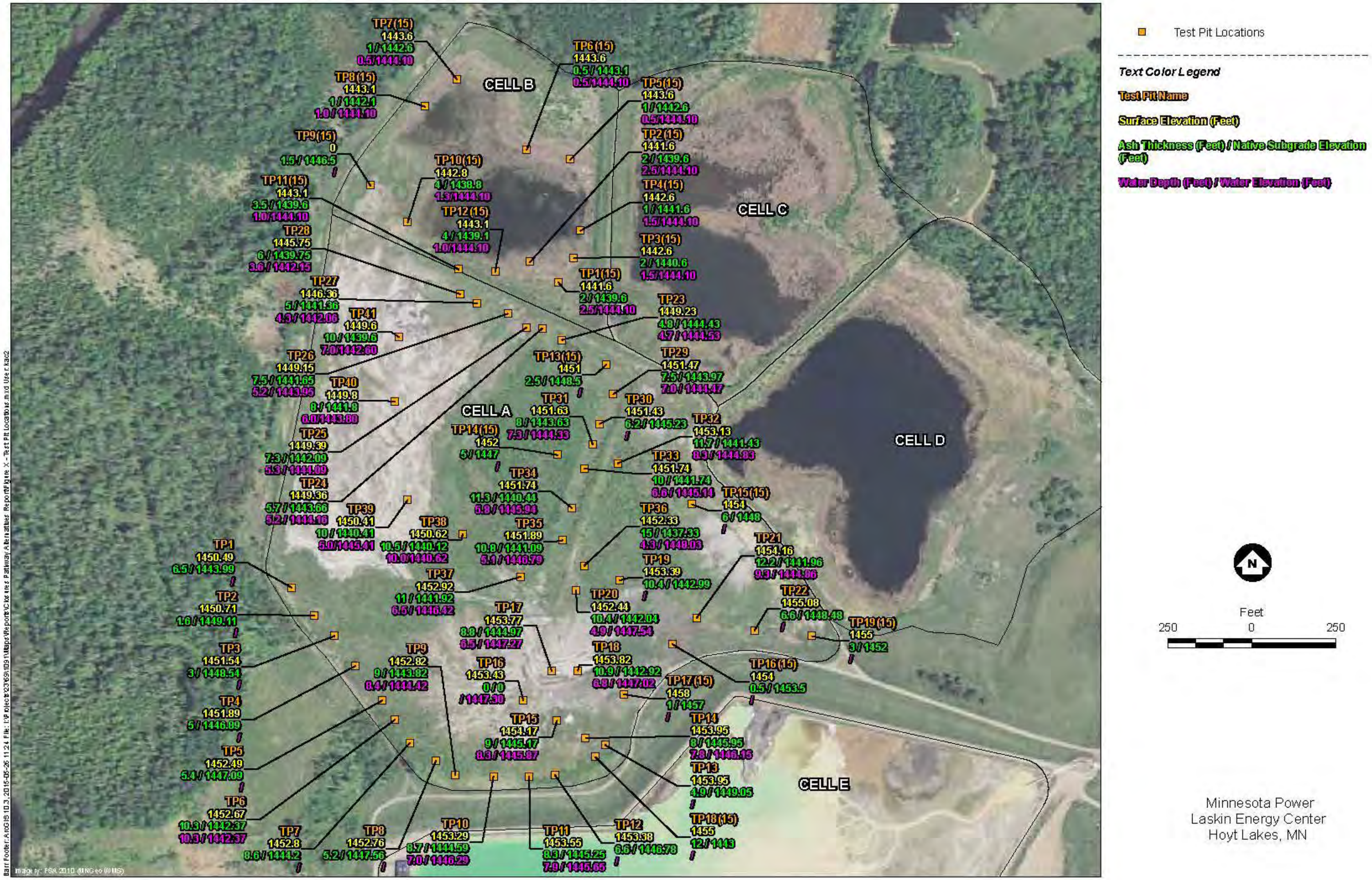

Figure 3-2 **Test Pit Locations Summary**

3.3 Pilot Test Findings

Pilot test findings are summarized in Table 3-2. An important finding from the Pilot Test were the ash moisture condition and groundwater conditions in Cell A. Ash moisture content was highly variable, with some zones of ash (mostly bottom ash) being reasonably dry and workable, and other zones of ash appearing reasonably dry but clearly containing large quantities of water as evidenced by liquefaction during excavation, relocation, transport and deposition. Yet other zones of ash, primarily those below the apparent groundwater elevation, were clearly saturated and also subject to liquefaction during excavation and transport.

Another very important and potentially overriding finding from the Pilot Test is the importance of water management and sequencing. From this perspective ash relocation from Cell B may be particularly challenging. The presence of the pond within Cell B makes vehicle access difficult and the presence of thick vegetation over portions of Cell B limit the potential for hydraulic dredging for ash relocation. Further, it is believed that water in Cells C and D may recharge portions of ash in Cell A.

Table 3-2 Ash Relocation Pilot Test Observations Summary

Activity No.	Activity Name	Objectives Summary	Observations Summary
1	Cell A Ash Relocation without Amendment (Excavation Area 2 and Fill Placement Area 2)	Observe Cell A Excavation Stability and Dewatering Requirements Observe Stability and Slope Angles of Relocated Ash Confirm whether Cell A Ash Relocation without Admixture is Feasible Confirm Timing and Process for Dewatering Cell A Ash Estimate Unit Cost to Relocate and Grade Cell A Ash	Test pit and larger excavation side slopes are typically stable; some caving occurs in pits that fill with water either from groundwater inflow or from water drainage from side of excavation. Ash is thixotropic – appears to be stable and is generally stackable when disturbance of ash is minimized; liquefies and is not capable of supporting construction traffic nor is it stackable after transportation via truck, dumping from truck, and attempting to traffic on top via dozer. Ash performance is highly dependent on moisture content and bottom ash content; a mix of roughly 50% bottom ash with 50% flyash of varying moisture content yields a workable ash mix – ash that can be stacked and traveled on by dozer. Construction Roads are Required to Support Vehicle Traffic Generally Stable Test Pit Excavations Throughout; Some Sidewall Caving at Locations of High Ground Water Elevation Near Vertical Excavation Sidewalls Ash Can Be Excavated and Loaded Without Admixture Use Ash Can Be Relocated – Some Relocated Ash Liquefies on Transport and Deposition and Cannot Support Construction Equipment Some Locations of Dry or Coarse Ash More Amenable To Stacking and Vehicle Support Some Excavations Dry; Other Excavations With Water Inflow From Base and Sidewalls
2	Cell A Ash Relocation with Calciment Amendment (Excavation Area 1 and Fill Placement Area 1)	Confirm Timing, Process and Quantity of Admixture Incorporation Into Ash Observe Cell A Excavation Stability and Dewatering Requirements Observe Stability and Slope Angles of Relocated Ash Estimate Unit Cost to Amend, Relocate and Grade Cell A Ash using Calciment	Ash with Calciment admixture can be stacked and can support construction vehicle traffic. Performance of ash/Calciment mix is dependent on at least: • Moisture content of ash • Percent Calciment addition • Curing time after admix addition • Quality of Calciment Ash with 10% Calciment addition requires curing time (24 hours +) prior placement of subsequent lifts of ash. Ash with 20% Calciment addition requires minimal curing time (hours) prior placement of subsequent lifts of ash. See Findings for Activity 1 Calciment Effective in Strengthening Ash Pre-Mix Moisture Content of Ash Affects Calciment Reaction Time • High Moisture – Slow Reaction • Low Moisture – Rapid Reaction Admix Addition and Mixing Via Dozer Yields Variable Mix Consistency and Quality
3	Excavation Stability	Observe Excavation Side Slope Stability and Water Inflow Track Time Until Excavation Sloughing, If Sloughing Occurs Observe Excavation Dewatering Requirements	See Findings for Activity 1 Concerns for Relatively Rapid Water Inflow to Test Pits on North Side of Cell A, Near Cell B Concerns for Water Management in Cell B and Access to Ash
4	In-Place Ash Cell Closure without Geogrid Reinforcement	Observe Ash Surface Accessibility Observe Ash Deposit Bearing Capacity and Settlement Estimate Unit Cost to Close In-Place without Geogrid Reinforcement	Ash surface strength is variable and unpredictable. Low strength ash areas require placement of an overlying foundation layer (i.e., 2 to 3 feet of bottom ash) in order to support construction traffic. Higher strength ash areas require placement of a minimal to no foundation layer in order to support construction traffic. Construction Roads Required to Support Vehicle Traffic Final Cover Constructible on Un-amended Ash Surface is Feasible
5	In-Place Ash Cell Closure with Geogrid Reinforcement	Observe Ash Surface Accessibility Observe Ash Deposit Bearing Capacity and Settlement Estimate Unit Cost to Close In-Place with Geogrid Reinforcement	See Findings for Activity 4 Geogrid Reinforcement Likely Not Required for Majority of Cell A; may be Required for Portions of Cell E and Other Saturated Ash Surface Areas Requiring Closure

3.4 Contractor Experience and Input

TransAsh provided with their Bid a summary of company qualifications and experience, which is summarized as follows:

- 54 years of Coal Combustion Residuals (CCR) Management Experience (ash pond construction, management and closure; ash landfill construction, management and closure; hydraulic dredging)
- Over 250 employees and $45,000,000 in revenue
- Power company clients including TVA, Hoosier Energy, Duke Energy, AES, Alabama Power

From discussions with TransAsh personnel and from Barr's observations of TransAsh's Pilot Test implementation approach we offer the following additional observations:

- TransAsh prefers to operate at a slow pace to minimize the effects of liquefaction on overall ash relocation operations to allow time for excavated ash to dry and to provide time for mixing of wet ash with drier ash.
- TransAsh is most used to having warm dry weather available as an aid to ash drying. Ash relocation during wet and/or cold weather conditions is relatively less successful than ash relocation during dry and warm weather conditions.
- Excavated ash can be placed in temporary piles that are turned one or more times to expose additional ash surface area to drying conditions, provided that extended periods of warm dry weather are routinely available for the duration of ash excavation activities.
- TransAsh has a preference for use of rim-ditch excavation sequencing; an approach whereby ash excavation proceeds in small increments along the face of an extended ditch length, rather than from a more limited length of open ditch. The rim-ditch approach is believed by TransAsh to accommodate drainage of water from the open face of the ash excavation.
- TransAsh has significant experience with ash relocation; their experience with ash pond and/or ash landfill final cover construction appears to be somewhat limited.

3.5 Ash Admixture Testing

Prior initiation of the Ash Relocation Pilot Study, Barr conducted test work to evaluate a number of potential materials that could be used as admixtures to improve the strength of any relocated ash. Admixtures included Taconite Harbor Energy Center (THEC) fly ash, Boswell Energy Center (BEC) Unit 3 fly ash, Lime, and an off-spec cement material called Calciment. Various ratios of Cell E ash from LEC were mixed with the identified admixtures and subsequently tested for shear strength. It was preliminarily determined that in order to achieve stability of a closure system for ash relocated to Cell E, a mix would be required to achieve an unconfined compressive strength of 0.5 tons per square foot (tsf). Table 3-3 provides a summary of findings from the in-laboratory testing of the admixtures at various ratios with LEC Cell A ash.

Table 3-3 Unconfined Compressive Strengths (UCS) in Tons per Square Foot of Treated Ash with Varying Stabilizing Agents and Additive Contents

Admixtures	UCS (tsf) with Stabilizing Agents															
	Lime (AgLime)				Boswell Fly Ash				Taconite Harbor Energy Center Fly Ash				Calciment			
Additive Content	Test Pit 2A		Test Pit 5A		Test Pit 2A		Test Pit 5A		Test Pit 2A		Test Pit 5A		Test Pit 2A		Test Pit 5A	
(% of wet weight)	Shallow	Deep	Shallow	Deep	Shallow	Deep	Shallow	Deep	Shallow	Deep	Shallow	Deep	Shallow	Deep	Shallow	Deep
In situ	--	No Samp(1)	0.08(UU)	--	--	No Samp(1)	0.08(UU)	--	--	No Samp(1)	0.08(UU)	--	--	No Samp(1)	0.08(UU)	--
0 percent	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	No Form(2)
5 percent (4 with Calciment)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	0.21	Too Soft(3)	Too Soft(3)	Too Soft(3)	Too Soft(3)	Too Soft(3)	Too Soft(3)	Too Soft(3)	0.57	0.31	0.16	0.66
10 percent (9 with Calciment)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	0.27	0.17	Too Soft(3)	0.21	0.64	0.58	0.19	0.61	5.04	1.02	0.97	1.61
15 percent (14 with Calciment)	No Form(2)	No Form(2)	No Form(2)	No Form(2)	0.31	0.35	Too Soft(3)	0.49	2.75	3.00	0.75	4.46	8.22	4.95	1.89	3.97
20 percent	--	--	--	--	0.69	0.93	0.31	1.06	9.19	8.61	4.59	8.48	--	--	--	--

(1) "No Samp" indicates that ash was not retained in a thin-wall tube pushed in the test pit excavation.
(2) "No Form" indicates the sample did not hold shape after removal from the compaction mold.
(3) "Too Soft" indicates the sample did not resist initial seating load during testing.

As noted by the unconfined compressive strength test results, only Taconite Harbor Fly Ash admixtures at 10 percent and above and the Calciment at 4 percent and above, routinely yielded the necessary unconfined compressive strength. On the basis of the pre-pilot study test work the Calciment was determined to be potentially the most reliable admix material for use in stabilizing Cell A ash for relocation and cover contouring in Cell E.

As part of the Pilot Study, TransAsh was tasked with procuring Calciment and conducting in-field admixing with Cell A ash to expand on knowledge gained from the in-laboratory testing of this admix material. Calciment was delivered in bulk solids tanker trucks and discharged on-site, then mixed by dozer with ash in Cell E. The dozer operator bladed and mixed the material until, on a visual basis, a uniform mix was achieved. Portions of the ash-Calciment mix were then stacked and left to cure to evaluate the relative strength gain achieved in the ash by admixing with Calciment. Several important conclusions from the in-laboratory and in-field admix testing include:

- Readily available fly ash materials and lime are relatively ineffective admix materials; even at large mix ratios, shear strength gain is below levels desired to achieve Cell E closure contours and to support cover construction vehicle traffic.
- Even though relatively small quantities were delivered (2 truckloads), delivery delays occurred with the Calciment (nearest source appears to be Chicago), causing delay in the in-field pilot admix program.
- Some portions of the Calciment seemed ineffective at improving ash strength, while other portions were reasonably effective; the quality of Calciment appears to be quite variable.
- Mixing Calciment with Cell A ash via dozer is partially successful; a more robust mechanized approach to mixing, such as use of a pug mill, would likely be required. However, this would significantly limit the rate of production and may not be feasible given the quantity of ash potentially requiring relocation from Cell A.

Overall the findings from the pilot testing of admixture addition to Cell A ash to aid in relocating the ash to Cell E and to produce sufficient strength were less than ideal. The consistency of delivered Calciment is likely to be an unknown and therefore the amount of Calciment required is likely to remain unknown. Further, the duration required for construction and the overall feasibility of admixing large quantities of Cell A ash with Calciment are uncertain. It is Barr's opinion that use of an admixture like Calciment should be limited to the extent possible; limited to where it's use is critical to achieving final cell closure objectives.

3.6 Additional Pilot Study Observations

As noted in a previous section of this report, portions of the Cell A ash excavated and transported during the Test is thixotropic; it appears to have significant strength when in a static, at rest condition. However, once the ash is excavated and handled further, the ash loses all strength – it liquefies. This characteristic of portions of the ash has significant implications for the final selection of an ash pond closure approach:

- Only portions of the ash can readily be excavated, loaded into trucks for transport, and deposited at a new location without losing all strength.
- Portions of the ash, upon excavation, transport and subsequent deposition, has insufficient strength to allow stacking and insufficient strength to support subsequent construction vehicle traffic during closure.
- Weather conditions have the potential to place significant constraints on ash excavation and relocation. More specifically, erosion control and particulate transport will require special attention during ash relocation and closure.
- Portions of the ash will more successfully be closed in place in order to avoid initiating liquefaction of the ash through attempts at excavation and relocation.

Barr also concurs with TransAsh that a slow pace of operations is preferred. Provided good weather conditions for ash relocation (warm and dry), a slow pace of operations facilitates drying of the ash. However, the number of warm dry construction days available in a single construction season at Laskin Energy Center is somewhat limited. Therefore, a multi-year approach to ash relocation would be required if significant benefit is to be derived from warm dry weather conditions. A potential conflict with this is the degree to which a single rain event can potentially “undo” what was accomplished during dry weather conditions. That is; to what extent does excavated and dried ash readily reabsorb moisture during even short wet weather conditions? And, for any stacked ash, how much erosion of an unprotected ash surface occurs in even short duration low intensity rainfall. Although rain was hoped for during the Pilot Study to observe its effects on ash handling and placement, conditions were generally dry but cool. Even in the relatively dry conditions experienced during the Pilot Test, the cool overcast conditions limited the amount of drying that occurred in excavated ash.

4.0 Hydrogeologic Conditions Review

Hydrogeologic investigations were conducted at the site in 2014 to evaluate the hydraulic connection and groundwater flow between the ash and underlying native soil at Cell A, and to evaluate water quantity and potential contact of groundwater in Cell A with the ash. Investigation work consisted of the following activities:

- Installed monitoring wells in Cell A,
- Periodically measuring water levels in monitoring wells,
- Operation of data loggers in select monitoring wells in September and October 2014,
- Performance of dewatering tests in test pits to evaluate recharge and evaluate radius of influence of dewatering, and
- Calculating approximate volumes of water that may be generated to dewater Cells A and B.

4.1 Summary of Recent Work

Two monitoring well nests were installed within Cell A in May 2014. The nests were placed in areas that were topographically low wetland areas prior to construction of Cell A to evaluate the connection between the ash and the water table in this area. Well nest MW-5AS/MW-5AD was located in the southwestern portion of the central area of Cell A, and well nest MW-6AS/MW-6AD was located along the western edge of Cell A where a topographically low area is present outside of Cell A (Figure 4-1). Boring and well construction logs are presented in Appendix A.

The thickness of the ash at the two well locations was 12.5 to 14 feet. A peat layer approximately 1 to 1.5 feet thick was present below the ash at each of the well nest locations. Native glacial till soil was encountered below the peat. The till consisted of sandy silt and/or silty sand with varying amounts of gravel depending on location.

Well construction in each nest was similar. Shallow wells (MW-5AS, MW-6AS) were constructed entirely within the ash. Deep wells (MW-5AD, MW-6AD) were constructed with the well screens only in the underlying glacial till, and boreholes were sealed through the ash and underlying peat layers.

Water levels have been periodically measured in the wells (Table 4-1). Significant differences in water levels were measured between the shallow and deep wells at each nest. The water elevations in the shallow wells have generally been 2 to 3 feet higher than water elevations in the deep wells, indicating that there is a downward vertical gradient from the ash to the till soil. This downward gradient could indicate either that the groundwater is perched within the ash in Cell A, that the ash is slow to release entrained water, or a combination of the two.

Table 4-1 Groundwater Elevation Data

	MN Unique Well No. 804293		MN Unique Well No. 804294		MN Unique Well No. 804295		MN Unique Well No. 804296	
	MP Well ID: MW-6AS		MP Well ID: MW-6AD		MP Well ID: MW-5AS		MP Well ID: MW-5AD	
Date	Measured depth to water, ft	Water level, elev.	Measured depth to water, ft	Water level, elev.	Measured depth to water, ft	Water level, elev.	Measured depth to water, ft	Water level, elev.
7/2/2014	5.84	1446.89	9.84	1442.74	6.75	1448.54	9.52	1445.86
8/13/2014	7.83	1444.9	10.95	1441.63	7.68	1447.61	10.65	1444.73
9/3/2014	7.91	1444.82	11.28	1441.3	7.75	1447.54	10.89	1444.49
10/22/2014	8.9	1443.83	11.57	1441.01	8.3	1446.99	11.6	1443.78
2/16/2015	10.77	1441.96	12.8	1439.78	9.66	1445.63	13.04	1442.34

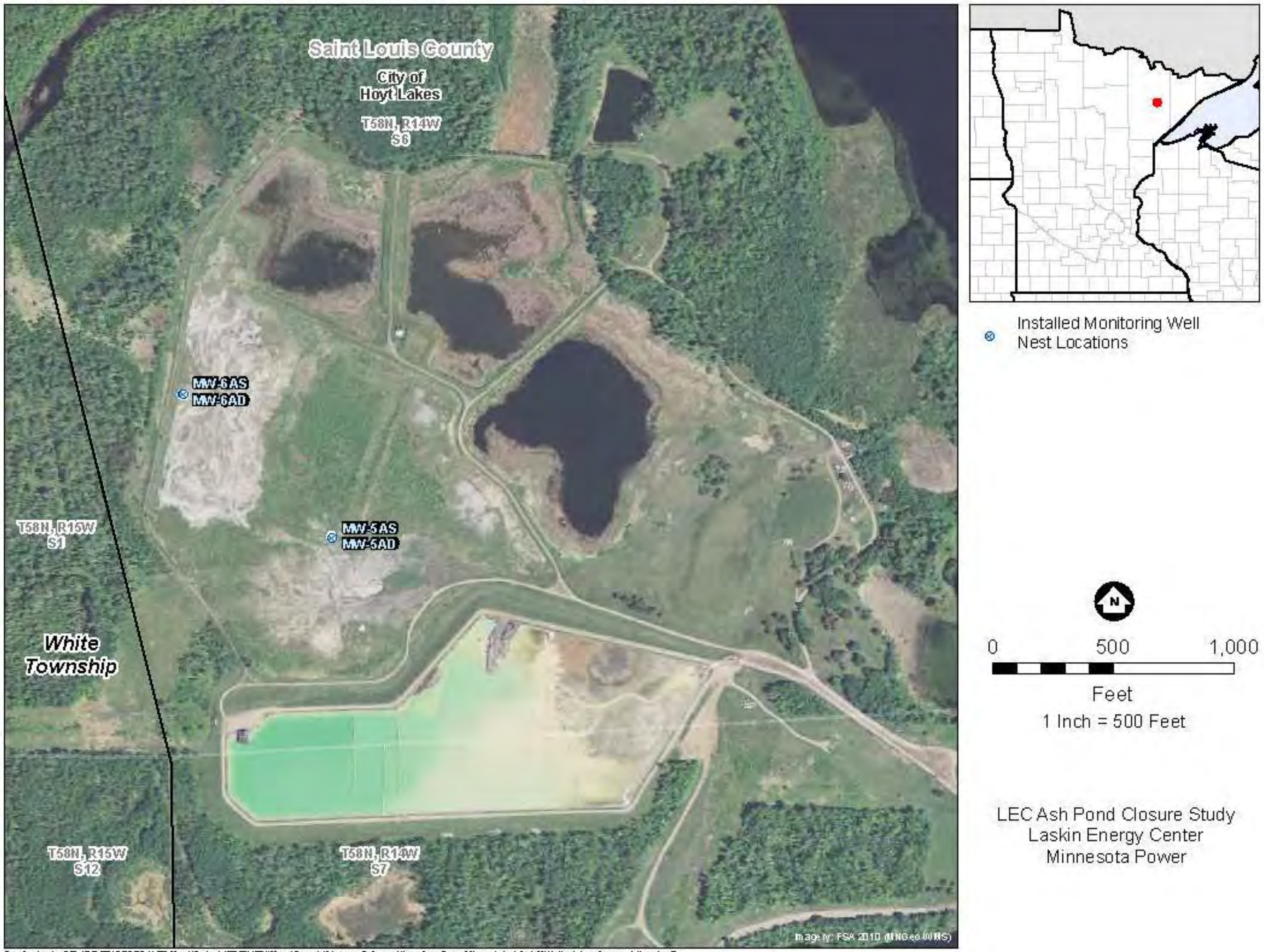

Figure 4-1 Monitoring Well Nest Locations

Data loggers were installed in the monitoring wells in September 2014 to help evaluate the hydraulic connection between groundwater in the ash and in the underlying glacial till. The data loggers were also operated during a dewatering test conducted in October 2014 from a test pit (test pit TP37) dug in the ash in Cell A. A plot of water levels is shown on Figure 4-2. The plots indicate that water levels in all wells followed the same general trends, except during pumping, indicating there is a hydraulic connection between the ash and underlying glacial till. Discussion of the differential response to pumping is presented in Section 4.2.2.

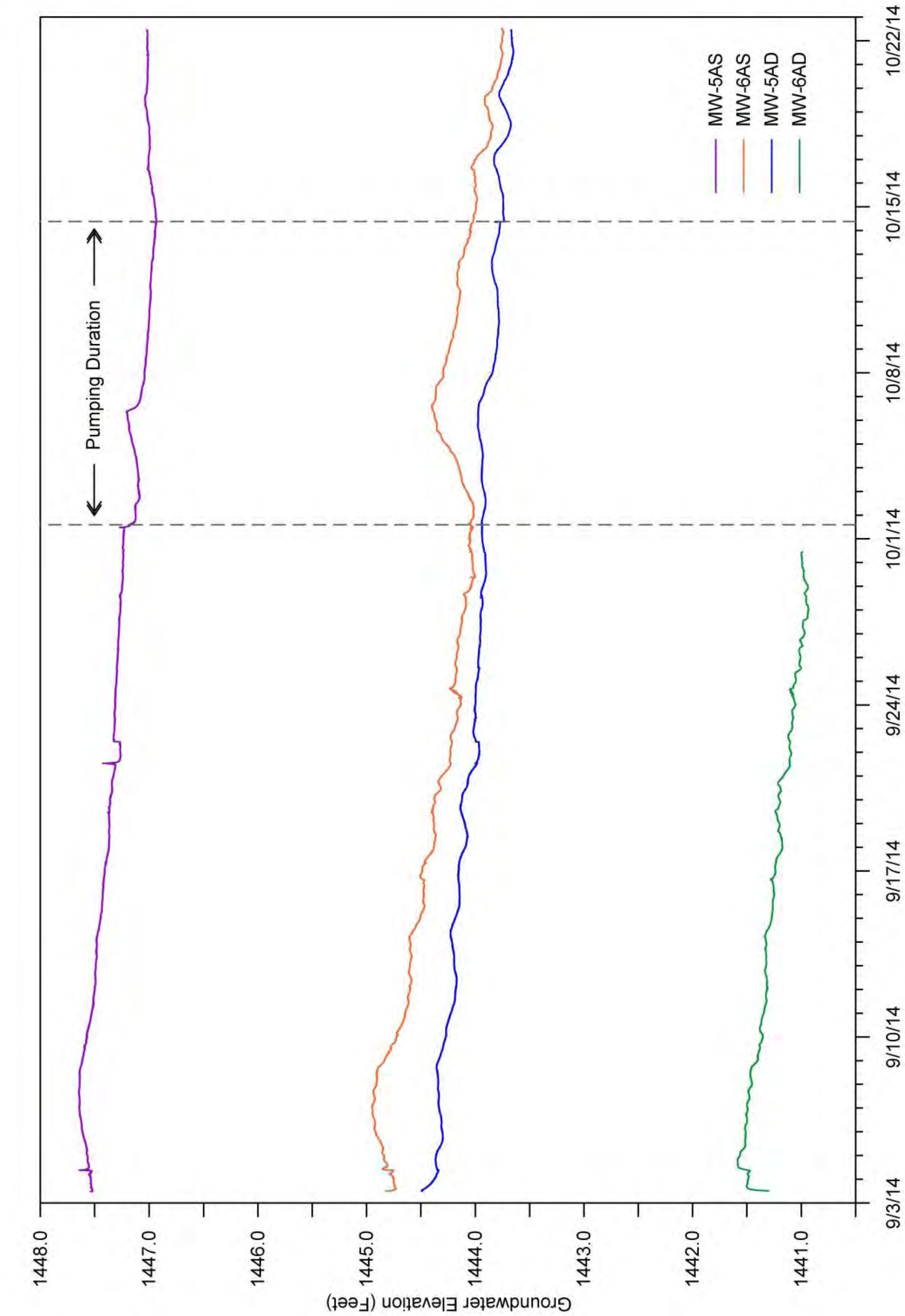

Figure 4-2 Groundwater Elevation Data at Cell A Monitoring Wells

4.2 Groundwater Management

4.2.1 Water Table Elevation with Respect to Ash

Current water elevations in the ash in Cell A are influenced by the surrounding water levels in Cells B, C and D. The water stored in cells A, B, C, and D has, over time, created a groundwater mound across this area. Essentially, the water is higher in this area than the surrounding regional groundwater due to water retained in the ponds. After dewatering and elimination of dikes to prevent impoundment of water, the groundwater elevation will, after time, return to a condition more similar to the surrounding regional groundwater with a significant reduction in the volume of ash in contact with the water table.

Water elevation data from the nested wells in Cell A indicate that groundwater is perched or mounded within the ash at an elevation higher than the groundwater in the underlying native soil (Section 4.1; Figure 4-3). The elevation of the bottom of the ash (the elevation of the underlying ground surface) at test pit locations is also shown on Figure 4-3. The data on the figure indicate that the lowest portion of the ash in the northwest part of Cell A would remain saturated from below in the event that water in the ash could be drained and no additional water was input into Cell A from precipitation or other sources. Scenario 2 presents the estimated ash in contact with groundwater under the proposed closure plan. The water table elevation at 1440' under Scenario 2 is shown on Figure 4-4.

4.2.2 Evaluation of Dewatering Rates and Areas of Influence

A pumping test was conducted at test pit TP37, which was located approximately 50 feet from monitoring well MW-5AS. A pump was used to maintain the water level at the bottom of the ash for a period of approximately 2 weeks. The pumping rate required to keep the water level at the bottom of the ash ranged from less than 5 gallons per minute to 6.4 gallons per minute. This included periods during rain events. The water level drawdown in the pit was approximately 5 feet. The water level in the test pit only increased approximately 1 foot within one day after pumping was stopped.

During the pumping period, the drawdown at monitoring well MW-5AS was less than 0.3 feet. Water levels at MW-5AS took approximately 2 days to regain the 0.3 feet head loss after pumping was stopped, indicating the low permeability of the ash.

Observations made during the test trenching indicated that water did not readily flow into some test pits, while other test pits did fill with water. This indicates there will be variable volumes of water produced from different areas within Cell A during excavation and test-pit pumping activities. Based on the test pit pumping test results and on the post-pumping test observations, if dewatering is accomplished by pumping of a single location, water removed from storage within the ash will likely be localized, and water flowing to any dewatering location may only be from areas within 50 feet of pits, sumps, or trenches. Due to the fine-grained nature of the ash, it is important to note that, even if excess water is removed from the ash, it will likely retain some water within the pore spaces of the ash due to surface tension between the ash and water.

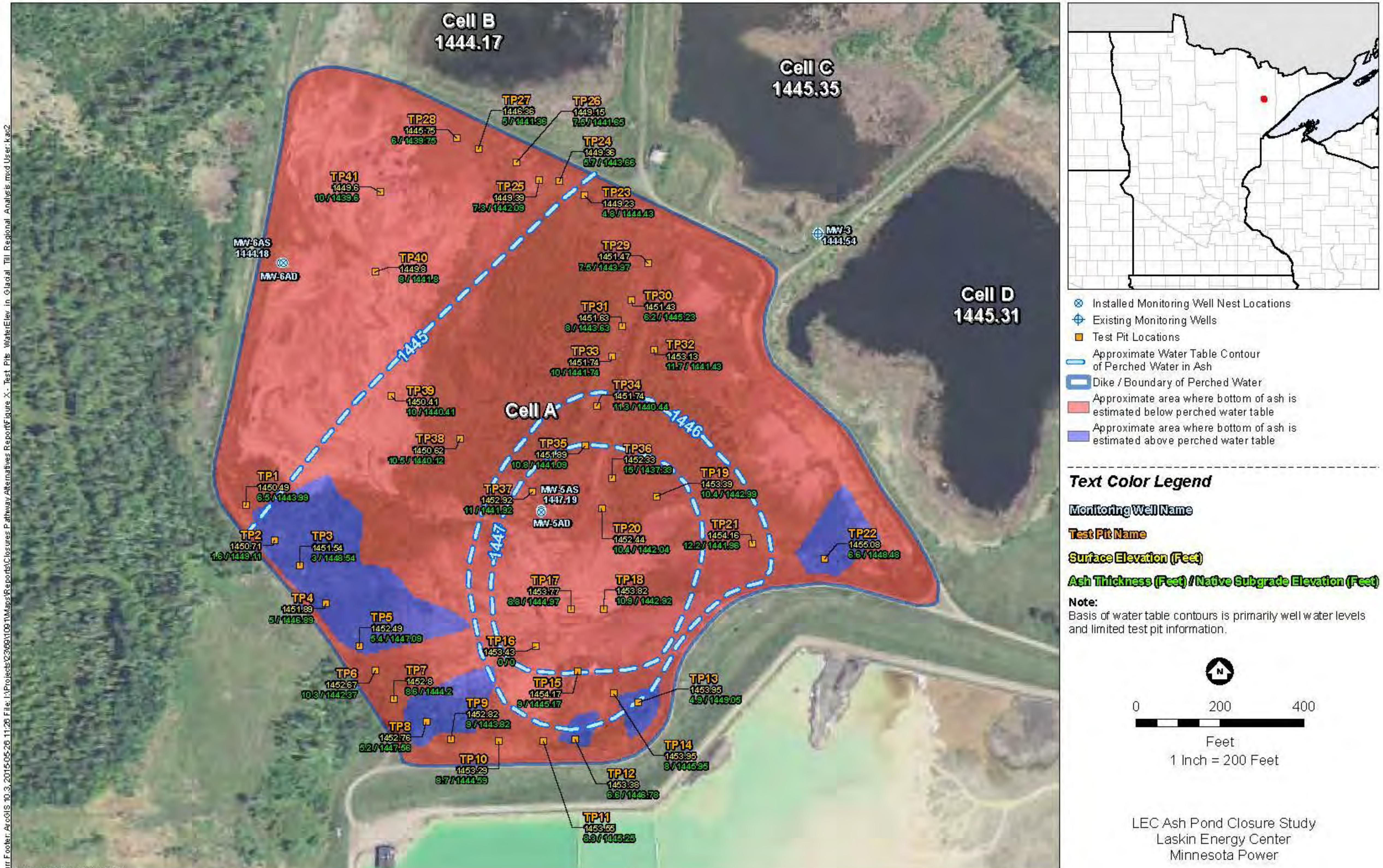

Figure 4-3 Scenario 1: No Action

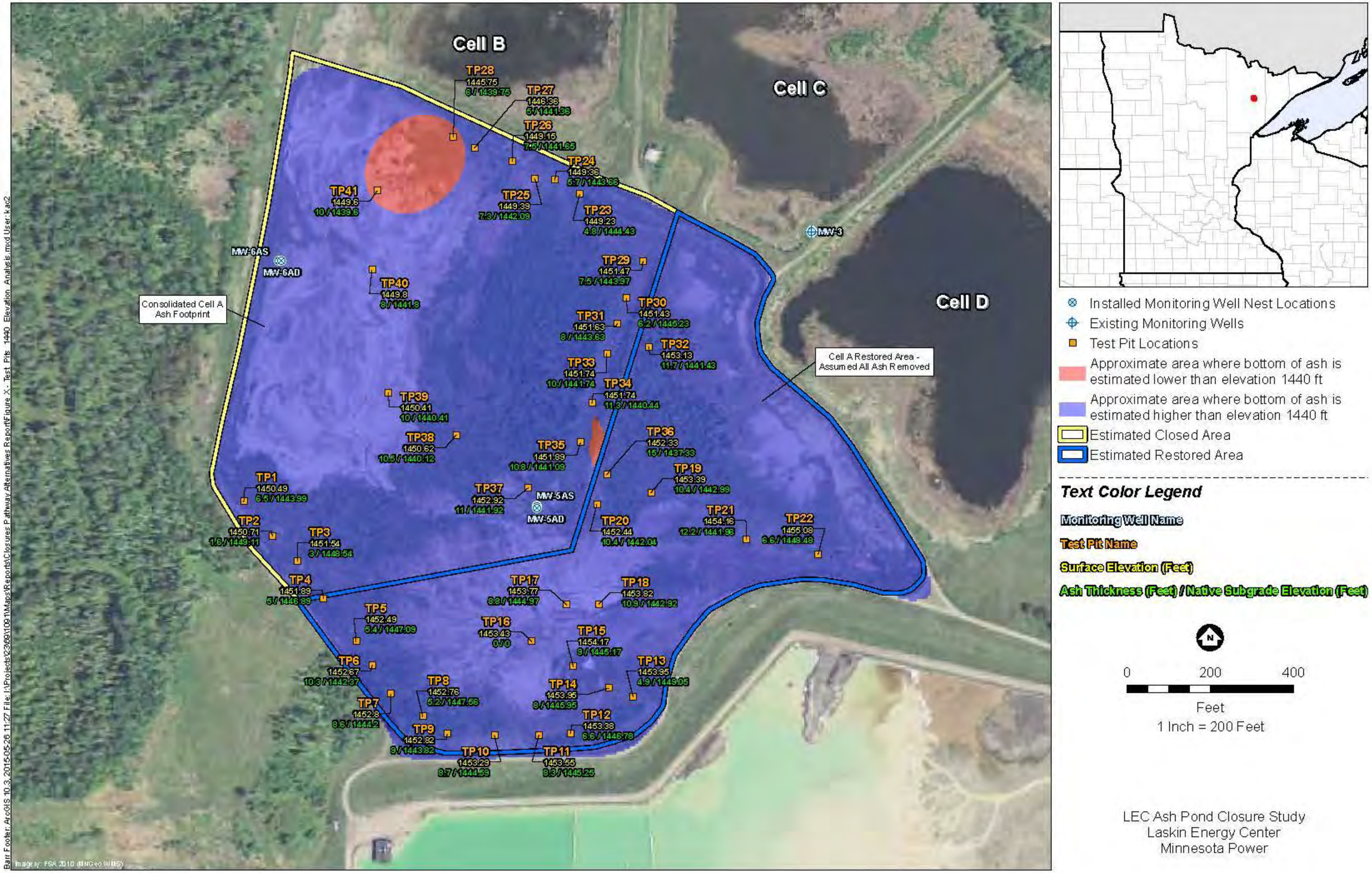

Figure 4-4 Scenario 2: Proposed 2015 Closure Plan; Remove Ash from Cell B and Portion of Cell A into Cell E; Cap Portion of Cell A in Place

4.2.3 Estimated Quantity of Groundwater

4.2.3.1 Water Volume Calculation Assumptions

The purpose of these calculations is to estimate a potential maximum volume of water that may need to be removed, treated, and discharged during removal of ash from Cells A and B at Laskin Energy Center. These calculations estimate the volume of water in ponds or in ash/soil pore space (groundwater) above an elevation of 1,440 feet (MSL) within Cells A, B, C, and D. Based on test trenching results, drilling results, and on available information regarding pre-pond topography, the bottom of the ash in Cell A is generally present at or above an elevation of 1,440 feet in all areas except for a small area in the vicinity of Test Pit TP36 and an area in the northwestern portion of Cell A in the vicinity of wells MW-6AD and MW-6AS. At these locations ash is 1440 feet.

Based on water elevations measured in monitoring wells at the property, the four cells are centered in an area of mounded groundwater. Therefore, groundwater flow is generally from the mound radially outward (away from the ash). Due to the mounded groundwater condition, groundwater is not expected to flow into the area of these cells from the surrounding area, even during dewatering operations. The current source of recharge water to the cells is from precipitation.

4.2.3.2 Water Elevation in Cells

Water in Cell A is present as groundwater and no surface ponding of water was observed in 2014. Two monitoring well nests were installed in Cell A in May 2014 as described in Section 4.1. Test pits were dug in the ash in Cell A in September 2014. Water levels were measured in the test pits, however, water levels were highly variable across the cell. Some pits were relatively dry, while other pits nearby may have had water. Also, some pits had very little water but field notes indicated that water was seeping into the pits at a higher elevation. The groundwater elevation in the ash for Cell A was contoured (Figure 4-3) mainly using water elevations from the monitoring wells, and sparingly using anecdotal data from the test pits. The pits were likely not open long enough to get stable water levels at all locations. These data indicate that the permeability of the ash is low across much of the cell.

Ponded surface water is present in Cells B, C, and D. The water surface elevation in each of the cells was surveyed in September 2014. For the purpose of this exercise, it is assumed that the water elevation of the pond represents the water elevation across the entire cell (including areas of groundwater) enclosed within the dikes.

4.2.3.3 Preliminary Volume Estimates

Cell A

In order to estimate the volume of water within Cell A, two surfaces were created that represent the top surface of saturated ash and the bottom of the saturated ash. First, the generalized water table surface was created by hand generating a water table contour map using water level data from monitoring wells and test pit data collected in September 2014. The water table contours were entered into GIS to generate a surface image (Figure 4-3). Another surface was also created for the bottom of ash (top of native soil surface), based on data collected during test trenching. The volume of ash between the water surface and bottom of ash represents the volume of saturated ash in Cell A. The volume of saturated ash calculated using the GIS program ArcGIS 10.3 and the 3D analyst extension, is 170,000 cubic yards. Assuming that the ash has a porosity of 30 percent (0.3), which is the general approximation for soil, the volume of groundwater in the ash is nearly 10 million gallons. It should be noted that this volume (along with similar volume estimates for the other cells discussed below) is a preliminary approximation, based on some very conceptual contoured surfaces. The intent of these approximations is for use as order-of-magnitude estimates to help guide discussions of potential dewatering.

Cells B, C, and D

Both ponded water and groundwater are present in Cells B, C, and D. The area of ponded water is assumed to be the entire area of the open pond and areas of cattails around the perimeter of the pond. For simplicity, the bottom of the ponded water is assumed to be at an elevation of 1440 feet for the purpose of these calculations (believed to be a conservative assumption). The area of groundwater is the remaining area outside the ponded water to the edge of the dikes between the surface elevation of the pond and an elevation of 1440 feet. The porosity of the soil is assumed to be 30 percent (0.3).

Total Volume of Water – Conservative Estimate

The total volume of water (surface water and groundwater) within the boundaries of Cells A, B, C, and D, above an elevation of 1440 feet is approximated to be:

Cell	A	10,000,000	gallons
Cell	B	10,000,000	gallons
Cell	C	18,000,000	gallons
Cell	D	24,000,000	gallons
Total		62,000,000	gallons

Recharge Rates

Annual precipitation in the area is approximately 28 inches per year (USGS, 1979). The annual volume of rainfall on the areas of Cells A, B, C, and D totals approximately 70 million gallons (see attached spreadsheet). However, evaporation rates from surface water and transpiration in the Hoyt Lakes area are approximately 21 inches per year (NOAA, 1982). This results in a net recharge volume of approximately 7 inches of precipitation totaling approximately 17.5 million gallons per year of recharge over all four cells (note - the proportional recharge for Cells A and B only is on the order of 10 million gallons per year).

4.2.3.4 Water Volume Estimates and Time of Removal

The calculated water volumes presented above likely represent the maximum volumes of water that may need to be managed during dewatering and removal of ash. These estimates assume complete drainage of all water from saturated ash that is removed (complete drying and no retention of soil moisture) and a perfect hydraulic connection (i.e., soil with infinite permeability) between the areas of excavation in Cells A and B and the areas with higher hydraulic head to the east (primarily the ponded areas in Cells C and D).

Additionally, a 10 percent change in porosity estimates (0.1) changes the estimated volume of groundwater by approximately 33 percent.

Based on a "worst-case" scenario that all of the existing water in Cells A, B, C, and D will need to be removed (~ 62 million gallons) and an assumed pumping rate of 250 gallons per minute (gpm), it would take approximately 172 days of round-the-clock pumping for removal of this quantity of water. If only the water contained in Cells A and B needs to be removed (~ 20 million gallons), it would require approximately 56 days of pumping at 250 gpm. Similarly, the estimated 10 million gallons per year of proportional precipitation recharge for Cells A and B would require approximately 28 days of additional pumping per year (at 250 gpm).

5.0 Ash Cell Closure Design

This section presents the updated ash cell closure design details as described above. This closure design will amend the currently approved closure plan for the following items:

- A portion of Cell A ash will not be moved into Cell E.
- The portion of Cell A ash not moved into Cell E will be covered with the cover system described below.

The following actions will be completed for closure of the remaining Laskin ash cells:

- Eliminating impounded water in Cells B, C and D and restoring flow outlet to previous elevation near 1,440 feet MSL,
- Relocating ash material from Cell B into Cell E,
- Relocating movable material from Cell A into Cell E,
- Consolidating movable material from Cell A onto smaller Cell A footprint to achieve final contours, and
- Covering Cell E and a portion of Cell A containing ash to minimize potential infiltration.

Further details are described in the sections below.

5.1 Design Approach

The goals/objectives of the closure design are as follows:

- Achieve cell dewatering and lower the impounded water head to near background levels,
- Minimize the volume of ash in contact or potential contact with groundwater,
- Minimize erosion from the cover,
- Provide sedimentation for surface water runoff,
- Provide for surface discharge of non-contact storm water, and
- Provide for sediment control and erosion control BMP's for the closed areas.

Sedimentation is provided by the sedimentation basin adjacent to the west corner of Cell E and the perimeter ditch which conveys runoff from the entire closed area perimeter to the sedimentation basin. Long term erosion control is provided by vegetative cover. Best Management Practices (BMPs) to be in place during closure construction will be detailed in the construction Stormwater Pollution Prevention

Plan (SWPPP). Figure 2-1 presented earlier provides an overview of the closure plan concept described above.

5.2 Cover Design

The closure system will generally consist of a geomembrane barrier layer overlain by a granular drainage layer or geonet drainage layer, followed by rooting soil and topsoil. This is illustrated in Figure 2-1. For the granular drainage layer method of cover the profile would likely be:

- Geomembrane Foundation Layer/Interim Cover (flyash, bottom ash, or sand)
- 40 mil Low Density Polyethylene Geomembrane (or 24 inch clay as alternative)
- 12 inch Granular Drainage Layer
- 12 inch Rooting Soil Layer
- 6 inch Vegetated Topsoil Layer

If a geonet drainage layer is utilized, it would replace the 12 inch granular drainage layer and be supplemented with an additional 6 inches of rooting soil.

5.3 End Use

Currently LEC's planned end use of the closed area is open space. The proposed closure design provides for low maintenance long term control of sediment transport and soil erosion. LEC will seek agency approval for alternate end uses, should alternate uses be contemplated.

5.4 Maintenance

Routine maintenance, such as mowing vegetation to prevent tree growth and to maintain drainageway flow capacity, will be performed as needed. All features including, but not limited to, site security, monitoring wells, and surface water runoff control structures will be properly maintained.

The surface cover will require periodic maintenance. Supplemental cover soil will be placed to repair the effects of severe erosion or settlement. Seeding, fertilizing, and mulching of bare soil will be performed as required to restore the area and establish a stable vegetative cover. These areas will be inspected periodically to ensure that vegetative growth has been re-established.

Surface water runoff control systems will be maintained on a routine basis. Drainage ditches, terraces, and spillways will be inspected for condition and proper function. For systems that are found to be in poor condition and/or non-functioning, routine maintenance will be performed.

6.0 Closure Schedule

MP has outlined the proposed closure schedule above but this section summarizes the major construction tasks and timeline. Table 6-1 provides the closure plan schedule details.

Table 6-1 Laskin Cell A, B, and E Proposed Closure Schedule

Sequence	Description	Estimated Duration (months)	Start Date	End Date
2015				
1	CCR Rule Published	N/A	May-15	N/A
2	Dewater Cells B, C and D	2	May-15	Oct-15
3	Consolidate Cell B Ash into Cell E	4	Jun-15	Oct-15
4	Cell B Reclamation	2	Oct-15	Dec-15
5	Cell B/C Berm Removal	1	2015	2016
6	Cell C/D Berm Removal	1	2015	2016
7	Consolidate Cell A Ash into Cell E and Cell A Cover Area	7	Jun-15	Dec-15
8	Dewater Cell E	9	Mar-15	Dec-15
2016				
9	Consolidate Cell A Ash into Cell E and Cell A Cover Area (continue)	11	Jan-16	Nov-16
10	Cell A/D Berm Removal	1	Nov-16	Dec-16
11	Cell B Berm Removal	1	2016	2016
12	Cell A Closure	4	Aug-16	Nov-16
13	Consolidate Cell E Ash in Cell E Cover Area	2	May-16	Jul-16
2017				
14	Cell A Closure (continue)	2	May-17	Jun-17
15	Cell E Closure	6	May-17	Nov-17
16	Cell A Reclamation	2	Jul-17	Sep-17
17	Cell E Reclamation	2	Jul-17	Sep-17
18	CCR Rule Closure	36	Apr-15	Apr-18

7.0 Progress Reporting

7.1 Closure Design Submittal

Final design plans and specifications for the cover areas will be submitted to the MPCA 30 days prior to construction of each closure area in Cell A and Cell E. Designs will incorporate provisions for long term sediment and erosion control BMPs. Construction sediment and erosion control BMPs will be presented in each Construction SWPPP.

7.2 Progress Report

Minnesota Power proposes to provide annual progress reports on the closure plan progress from the previous year. The annual reports would be submitted to the MPCA with the facility Annual Groundwater Report currently submitted each year by July 1.

Appendix A

Boring Logs for MW-5AS/MW-5AD and MW-6AS/MW-6AD Well Nests

Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING MW-5AD

SHEET 1 OF 1

Project:Laskin Ash Pond Closure Study
Project No.:23691091
Location:Laskin Station
Coordinates:N 3,615,521.3 ft E 4,825,312.6 ft
Datum:St. Louis County Transverse Mercator Projection

Surface Elevation:1452.9 ft
Drilling Method:Sonic
Sampling Method:Corebarrel
Completion Depth:30.0 ft

Depth, feet	Sample No.	USCS	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL
0	1		ASH with the consistantcy of Silt with Sand (SP-SM), trace organics 0'-0.5' bgs; grey; moist; 0% gravel, 90% sand, 10% fines.	Neat cement 0.0'-20.5' bgs
5	2		Wet at 5' bgs.	
10	3			
12.5		PT	PEAT (PT): fiberous woody material; dark brown; moist.	
15.5	4	ML	SILT WITH SAND (ML): trace gravel; light brown; moist; 5% gravel, 45% sand, 50% fines.	
20	5			Bentonite chips 20.5'-23.0' bgs
23			Boulder at 23' bgs. Increased gravel content present 23-25 feet bgs; 15% gravel, 35% sand, 50% fines.	FIlter pack 23.0'-30.0' bgs
25		SM	SILTY SAND (SM): medium to coarse sand; light brown; moist to wet; 0% gravel, 75% sand, 25% fines.	Screen, Johnson 10 slot stainless, 25.0'-30.0' bgs
26	6	SM	SILTY SAND WITH GRAVEL (SM): light brown; moist to wet; 20% gravel, 60% sand, 20% fines.	
30			End of boring at 30 feet bgs.	

Elevation, feet: 1450, 1445, 1440, 1435, 1430, 1425

Date Boring Started: 5/12/14 4:05 pm
Date Boring Completed: 5/12/14 5:35 pm
Logged By: CJG2
Drilling Contractor: Cascade
Drill Rig: Sonic

Remarks: MDH Unique Well ID# 804296
Approx. 50 gal. of water was used in drilling 20-30 feet bgs.

Additional data may have been collected in the field which is not included on this log.
Weather:

BARR
Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING MW-5AS

SHEET 1 OF 1

Project:Laskin Ash Pond Closure Study
Project No.:23691091
Location:Laskin Station
Coordinates:N 3,615,526.7 ft E 4,825,313.4 ft
Datum:St. Louis County Transverse Mercator Projection

Surface Elevation:1453.0 ft
Drilling Method:Sonic
Sampling Method:Corebarrel
Completion Depth:13.5 ft

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0					ASH with the consistency of Silty Sand (SM) with silt lenses throughout section; light grey; moist; 0% gravel, 60% sand, 40% fines.		1452.5
						Neat cement 0.0'-3.0' bgs	
2.5		1					
							1450.0
						Bentonite chips 3.0'-5.0' bgs	
5.0					Wet at 5.0' bgs.		1447.5
7.5		2					
							1445.0
						Filter pack 5.0'-12.0' bgs	
						Screen, Johnson 10 slot stainless, 7.0'-12.0' bgs	
10.0							1442.5
		3					
12.5			PT		PEAT (PT): dark brown; moist to wet.	Bentonite chips 12'-13.5' bgs	1440.0
					End of boring at 13.5 feet bgs.		
15.0							

Date Boring Started:	5/13/14 9:35 am
Date Boring Completed:	5/13/14 9:55 am
Logged By:	CJG2
Drilling Contractor:	Cascade
Drill Rig:	Sonic

Remarks: MDH Unique Well ID# 804295

Additional data may have been collected in the field which is not included on this log.
Weather:

Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
BARR Telephone: 952-832-2600

LOG OF BORING MW-6AD

SHEET 1 OF 1

Project: Laskin Ash Pond Closure Study
Project No.: 23691091
Location: Laskin Station
Coordinates: N 3,616,120.0 ft E 4,824,696.1 ft
Datum: St. Louis County Transverse Mercator Projection

Surface Elevation: 1450.0 ft
Drilling Method: Sonic
Sampling Method: Corebarrel
Completion Depth: 31.0 ft

Depth, feet	Sample No.	USCS	Lithologic Description	Well or Piezometer Construction Detail	Elevation, feet
0	1		ASH with the consistency of Silty Sand; light grey to brown; moist; 0% gravel, 60% sand, 40% fines. Light grey to black; moist; 0% gravel, 70% sand, 50% fines.		1450
5	2		Wet at 5 feet bgs. Very soft, trace fine sand; light grey; wet; 0% gravel, 10% sand, 90% fines.		1445
10	3			Neat cement 0.0'-22.0' bgs	1440
15		PT	PEAT (PT): small fibers present; brown; moist.		1435
	4	SM	SILTY SAND (SM): trace gravel; grey; moist; 5% gravel, 80% sand, 15% fines.		
20	5	SP-SM	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM): grey; moist; 25% gravel, 65% sand, 10% fines.	Bentonite chips 22.0-24.0' bgs	1430
25	6		Wet at 25 feet bgs.	Filter pack 24.0-31.0' bgs; Screen, Johnson 10 slot stainless, 26.0'-31.0' bgs	1425
30					1420
			End of boring at 31.0 feet bgs.		

Date Boring Started:	5/13/14 12:50 pm
Date Boring Completed:	5/13/14 2:05 pm
Logged By:	CJG2
Drilling Contractor:	Cascade
Drill Rig:	Sonic

Remarks: MDH Unique Well ID# 804294

Additional data may have been collected in the field which is not included on this log.
Weather:

BARR
Barr Engineering Company
4700 West 77th St. Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING MW-6AS

SHEET 1 OF 1

Project:Laskin Ash Pond Closure Study
Project No.:23691091
Location:Laskin Station
Coordinates:N 3,616,120.1 ft E 4,824,702.3 ft
Datum:St. Louis County Transverse Mercator Projection

Surface Elevation:1450.2 ft
Drilling Method:Sonic
Sampling Method:Corebarrel
Completion Depth:13.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0.0					ASH with the consistency of Silty Sand (SM), trace organics 0.0'-0.5' bgs; light grey to black; moist; 0% gravel, 80% sand, 20% fines.		1450.0
						Neat cement 0.0'-4.0' bgs	
2.5		1					1447.5
5.0					Consistency of Sandy Silt (ML) from 5.0-13.0' bgs., wet at 5' bgs; 0% gravel, 30% sand, 70% fines.	Bentonite chips 4.0'-6.0' bgs	1445.0
7.5		2					1442.5
						FIlter pack 6.0'-13.0' bgs	
10.0						Screen, Johnson 10 slot stainless, 7.0'-13.0' bgs	1440.0
12.5							1437.5
					End of boring at 13.0 feet bgs.		
15.0							

Date Boring Started:	5/13/14 3:30 pm
Date Boring Completed:	5/13/14 4:05 pm
Logged By:	CJG2
Drilling Contractor:	Cascade
Drill Rig:	Sonic

Remarks: MDH Unique Well ID# 804293

Additional data may have been collected in the field which is not included on this log.
Weather:

State of Minnesota

Department of Commerce
Division of Energy Resources

Nonpublic [ ]
Public [X]

Utility Information Request

Docket Number: E015/D-15-711 — Date of Request: 9/15/2015

Requested From: Debbra A. Davey, Minnesota Power — Response Due: 9/25/2015

Analyst Requesting Information: Craig Addonizio

Type of Inquiry:

[X] Financial	[ ] Rate of Return	[ ] Rate Design
[ ] Engineering	[ ] Forecasting	[ ] Conservation
[ ] Cost of Service	[ ] CIP	[ ] Other:

If you feel your responses are trade secret or privileged, please indicate this on your response.

Request No.	
4	Reference: Laskin Salvage Rate On page 12 of its Petition, MP states that the impact of the final CCR rule on the decommissioning cost estimates for Laskin ash ponds is still being evaluated. a. Please provide a detailed description of the difficulty MP is experiencing in evaluating the impact of the final CCR rule on Laskin's ash ponds. b. Please explain how the estimate of $8.195 million in table 5-1 of the 2015 decommission study was derived, and also explain how the underlying assumptions might be inconsistent with the final CCR rule. c. Is MP evaluating the impacts of the final CCR rule on its own, or has it retained outside consultants? d. Will MP's evaluation of the final CCR rule's impact on Laskin be complete in time to be reflected in the Company's 2016 depreciation filing?

Response by:	Debbra Davey	List sources of information:
Title:	Supervisor, Accounting	Kristopher Spenningsby, Supervisor Project Development
Department:	Accounting – Property & Construction	Strategy and Planning
Telephone:	(218) 355-3714	(218) 355-3382

RESPONSE:

4a. Minnesota Power is not experiencing any difficulty in evaluating the impact of the final CCR rule on Laskin ash ponds. Minnesota Power has provided an amended closure plan to the Minnesota Pollution Control Agency (MPCA) for approval which complies with the final CCR rule. The MPCA is currently evaluating our proposed plan. Ultimately the MPCA will determine the scope of the Ash Pond Decommissioning through its approval authority.

4b. The estimate of $8.195 million in table 5-1 of the 2015 decommissioning study remained consistent with costs in the 2013 decommissioning study that assumed a 40 mil low-density Polyethylene (LDPE) cover, a 12 inch drainage layer, a 12 inch rooting layer, and 6 inches of topsoil over cells A, B and E. A potential outcome of the CCR rule may be additional consolidation of closure footprint, although the cover assumptions are maintained. Ultimately the MPCA will determine the scope of the Ash Pond Decommissioning through its approval authority.

4c. Minnesota Power retained BARR Engineering Company to prepare the Ash Pond Closure Plan that was submitted to the MPCA.

4d. Minnesota Power expects a decision from the MPCA on the closure plan this winter, which will be prior to the Company's 2016 depreciation filing.

Response by:	Debbra Davey	List sources of information:
Title:	Supervisor, Accounting	Kristopher Spenningsby, Supervisor Project Development
Department:	Accounting – Property & Construction	Strategy and Planning
Telephone:	(218) 355-3714	(218) 355-3382

State of Minnesota

DEPARTMENT OF COMMERCE
DIVISION OF ENERGY RESOURCES

Nonpublic	[ ]
Public	[x]

Utility Information Request

Docket Number: E015/D-15-711 Date of Request: 10/8/2015

Requested From: Debbra A. Davey, Minnesota Power Response Due: 10/19/2015

Analyst Requesting Information: Craig Addonizio

Type of Inquiry:			
	[X]....Financial	[ ]....Rate of Return	[ ]....Rate Design
	[ ]....Engineering	[ ]....Forecasting	[ ]....Conservation
	[ ]....Cost of Service	[ ]....CIP	[ ]....Other:

If you feel your responses are trade secret or privileged, please indicate this on your response.

Request No.	
6	Reference: Supplemental Cell A, B, and E Closure Plan prepared by BARR Engineering Company Please provide any cost estimates MP has prepared, or has had prepared on its behalf, for implementing each of the three closure scenarios referenced on page 4 of the Supplemental Cell A, B, and E Closure Plan report prepared by BARR Engineering.

RESPONSE:

Please see the attached Consolidate and Close-In-Place Concept Design - Cost Estimate prepared by BARR Engineering Company (BARR) which is considered trade secret. These are the only cost estimates MP has related to the Supplemental Cell A, B, and E Closure Plan prepared by BARR.

Response by: Debbra Davey

Title: Supervisor, Accounting

Department: Accounting – Property & Construction

Telephone: (218) 355-3714

List sources of information:

PUBLIC DOCUMENT
TRADE SECRET DATA EXCISED

PREPARED BY: BARR ENGINEERING COMPANY

Ash Relocation Alternatives Study
PROJECT: Laskin Energy Center
LOCATION: Hoyt Lakes, MN
PROJECT #: 23/69-1091.05

BY:	SWH	DATE:	3/18/2015
CHECKED BY:	TJR	DATE:	3/18/2015
APPROVED BY:		DATE:	
ISSUED:	DRAFT	DATE:	3/18/2015
ISSUED:		DATE:	

Consolidate and Close-In-Place Concept Design - Cost Estimate

TRADE SECRET DATA EXCISED

Task	Description	Unit	Unit Cost	Quantity	Estimated Cost
1	**Consolidate Cell B Ash into Cell E**	CY	[redacted]		
2	**Consolidate Cell A Ash into Cell E and Cell A Cover Area**	CY			
3	**Consolidate Cell E Ash in Cell E Cover Area**	CY			
4	**Cell B Berm Removal (#1)**	EA			
5	**Cell B/C Berm Removal (#2)**	EA			
6	**Cell C/D Berm Removal (#3)**	EA			
7	**Cell A/D Berm Removal (#4)**	EA			
8	**Cell E Berm (#1)**	EA			
9	**Cell A Berm North (#2)**	EA			
10	**Cell A Berm South (#3)**	EA			
11	**Cell A Closure**	AC			
	Liner Subgrade Fill	CY			
	40mil LLDPE	SF			
	12" Drainage Layer	CY			
	12" Cover Soil Layer	CY			
	6" Topsoil Layer	SF			
	Turf Establishment	AC			
12	**Cell E Closure**	AC			
	Liner Subgrade Fill	CY			
	40mil LLDPE	SF			
	12" Drainage Layer	CY			
	12" Cover Soil Layer	CY			
	6" Topsoil Layer	SF			
	Turf Establishment	AC			
13	**Cell A Reclamation**	AC			
	12" Cover Soil Layer	CY			
	6" Topsoil Layer	SF			
	Turf Establishment	AC			
14	**Cell B Reclamation**	AC			
	12" Cover Soil Layer	CY			
	6" Topsoil Layer	SF			
	Turf Establishment	AC			
15	**Cell E Reclamation**	AC			
	12" Cover Soil Layer	CY			
	6" Topsoil Layer	SF			
	Turf Establishment	AC			
16	**Mobilization, Overhead & Profit**	%			
17	**Permitting, Engineering, and Construction CQA**	%			
18			**Low Range Cost Estimate (-25%)**		
19			**Mid Range Cost Estimate (0%)**		
20			**High Range Cost Estimate (+50%)**		

TRADE SECRET DATA EXCISED

CERTIFICATE OF SERVICE

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

Minnesota Department of Commerce
Public Comments

Docket No. E015/D-15-711

Dated this 30th day of October 2015

/s/Sharon Ferguson

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Christopher	Anderson	canderson@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022191	Electronic Service	No	OFF_SL_15-711_D-15-711
Julia	Anderson	Julia.Anderson@ag.state.mn.us	Office of the Attorney General-DOC	1800 BRM Tower 445 Minnesota St St. Paul, MN 551012134	Electronic Service	Yes	OFF_SL_15-711_D-15-711
Debbra A	Davey	ddavey@allete.com	Minnesota Power	30 W Superior St Duluth, MN 55802	Electronic Service	No	OFF_SL_15-711_D-15-711
Emma	Fazio	emma.fazio@stoel.com	Stoel Rives LLP	33 South Sixth Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-711_D-15-711
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 500 Saint Paul, MN 551012198	Electronic Service	No	OFF_SL_15-711_D-15-711
Margaret	Hodnik	mhodnik@mnpower.com	Minnesota Power	30 West Superior Street Duluth, MN 55802	Electronic Service	No	OFF_SL_15-711_D-15-711
Lori	Hoyum	lhoyum@mnpower.com	Minnesota Power	30 West Superior Street Duluth, MN 55802	Electronic Service	No	OFF_SL_15-711_D-15-711
Michael	Krikava	mkrikava@briggs.com	Briggs And Morgan, P.A.	2200 IDS Center 80 S 8th St Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-711_D-15-711
James D.	Larson	james.larson@avantenergy.com	Avant Energy Services	220 S 6th St Ste 1300 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-711_D-15-711
Douglas	Larson	dlarson@dakotaelectric.com	Dakota Electric Association	4300 220th St W Farmington, MN 55024	Electronic Service	No	OFF_SL_15-711_D-15-711
John	Lindell	agorud.ecf@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012130	Electronic Service	Yes	OFF_SL_15-711_D-15-711

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Susan	Ludwig	sludwig@mnpower.com	Minnesota Power	30 West Superior Street Duluth, MN 55802	Electronic Service	No	OFF_SL_15-711_D-15-711
Pam	Marshall	pam@energycents.org	Energy CENTS Coalition	823 7th St E St. Paul, MN 55106	Electronic Service	No	OFF_SL_15-711_D-15-711
Herbert	Minke	hminke@allete.com	Minnesota Power	30 W Superior St Duluth, MN 55802	Electronic Service	No	OFF_SL_15-711_D-15-711
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	Yes	OFF_SL_15-711_D-15-711
Andrew	Moratzka	apmoratzka@stoel.com	Stoel Rives LLP	33 South Sixth Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_15-711_D-15-711
Jennifer	Peterson	jjpeterson@mnpower.com	Minnesota Power	30 West Superior Street Duluth, MN 55802	Electronic Service	No	OFF_SL_15-711_D-15-711
Susan	Romans	sromans@allete.com	Minnesota Power	30 West Superior Street Legal Dept Duulth, MN 55802	Electronic Service	No	OFF_SL_15-711_D-15-711
Thomas	Scharff	thomas.scharff@newpagecorp.com	New Page Corporation	P.O. Box 8050 610 High Street Wisconsin Rapids, WI 544958050	Electronic Service	No	OFF_SL_15-711_D-15-711
Ron	Spangler, Jr.	rlspangler@otpco.com	Otter Tail Power Company	215 So. Cascade St. PO Box 496 Fergus Falls, MN 565380496	Electronic Service	No	OFF_SL_15-711_D-15-711
Eric	Swanson	eswanson@winthrop.com	Winthrop Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	OFF_SL_15-711_D-15-711

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Karen	Turnboom	karen.turnboom@newpagecorp.com	NewPage Corporation	100 Central Avenue Duluth, MN 55807	Electronic Service	No	OFF_SL_15-711_D-15-711
Daniel P	Wolf	dan.wolf@state.mn.us	Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 551012147	Electronic Service	Yes	OFF_SL_15-711_D-15-711