EUREKA TOWNSHIP

LAND USE / ZONING REQUEST APPLICATION

Eureka Township / 25043 Cedar Avenue, Farmington MN 55024
Phone: (952) 469-3736 / Email: deputyclerk@eurekamn.gov

SITE INFORMATION | Eureka Township	PIN#	Permit#
Site Address: 23334 Dodd Blvd, Lakeville, MN 55044	City Lakeville	Zip 55044

PROPERTY OWNER INFORMATION			
Name Dakota Aggregates (Operator), Kelly Aggregate Inc (Permit Holder)	[redacted]		
Address 15950 Station Trail	City Rosemount	State MN	Zip 55044
[redacted]			Fax

PLEASE INDICATE TYPE OF REQUEST

- ☐ Conditional Use Permit (CUP)
- ■ Interim Use Permit (IUP)
- ☐ Variance
- ☐ Non-Conforming Use
  - ☐ Expansion
  - ☐ Alteration

NATURE OF REQUEST

Specific description of request and reason for request (number and attach additional sheets if necessary):

Dakota Aggregates is requesting an IUP Permit Amendment to the Kelly Aggregate Inc. Permit for section 21 "Depth of Excavation". Current IUP "depth of excavation" is limited to 30 feet below the average groundwater elevation. Dakota Aggregates is requesting the "depth of excavation" be changed to the extent of usable material above bedrock. Supporting documentation is attached.

Cite the specific ordinance(s) under which you are making your request:

Dakota Aggregates is requesting an IUP Permit Amendment to the Kelly Aggregate Inc. Permit for section 21 "Depth of Excavation".

Describe the present use(s) of the property:

Level 3 IUP for mining. Mining, processing and sales of aggregate products.

Signature of Applicant:	Matt Mettling	Date: 3/21/2025
Printed name of Applicant:	Matt Mettling	

EUREKA TOWNSHIP

LAND USE / ZONING REQUEST APPLICATION

Eureka Township / 25043 Cedar Avenue, Farmington MN 55024
Phone: (952) 469-3736 / Email: deputyclerk@eurekamn.gov

Township Use Only

The property has an existing: ☐ CUP ☐ IUP ☐ Nonconforming registration

Applicant is requesting a 60 day extension until: _____

Deputy Clerk: _____ Date: _____
☐ Complete Date: ☐ Incomplete Notification sent:

Application Fee $_____ Paid on _____ Receipt #_____ Check #_____

Escrow Fee $_____ Paid on _____ Receipt #_____ Check #_____

Refunded $_____ Paid on _____ Receipt #_____ Check #_____

Notes:

Zoning Administrator: _____ Date: _____

Planning Commission: _____ Date:_____
Recommendation to Town Board: ☐ Approve ☐ Deny
Notes:

Town Board:_____Date:_____
☐ Approved ☐ Denied
Notes:

CONDITIONS OF ISSUANCE

EUREKA TOWNSHIP

Representative Authorization Form

Eureka Township / 25043 Cedar Avenue, Farmington MN 55024
Phone: (952) 469-3736 / email: deputyclerk@eurekatownship-mn.us

SITE INFORMATION | Eureka Township	PIN# 13-00800-25-11		~~Permit#~~ Resolution # 2009-2
Site Address: 23334 Dodd Blvd	City Lakeville		Zip 55044
PROPERTY OWNER INFORMATION			
Name Kelly Aggregate Inc.	[redacted]		
Address 9235 235th St W.	City Lakeville	State MN	Zip 55044
REPRESENTATIVE INFORMATION			
Name Dakota Aggregates - Matt Mettling	[redacted]		
Address 1605 160th St	City Rosemount	State MN	Zip 55068
Cell Pho[redacted]			Fax

By signing this document, I/We the above-named PROPERTY OWNER(S) hereby legally authorize the REPRESENTATIVE named above to act on my/our behalf before Eureka Township Planning Commission, Town Board and/or Board of Adjustments and Appeals in all matters related to my/our APPLICATION for:

IUP Permit Amendment 3/21/2025

(Include Type and date of application for the property involved)

This authorization includes answering questions about the APPLICATION and entering into legally binding agreements with Eureka Township related to the APPLICATION.

Property Owner signature	6/12/25 Date
Property Owner signature	Date

Township Use Only

Received by:

Zoning Administrator: _____ Date: _____

Notes:

Dakota Aggregates

June 2, 2025

Eureka Township Planning Commission
Attn: Eureka Clerk (Liz Atwater)
25043 Cedar Avenue
Farmington, MN 55024

RE: Kelly Aggregate Inc./Dakota Aggregates IUP Permit Amendment – Project Narrative

Eureka Township Planning Commission,

This letter is in response to the request from WSB for a project narrative related to the IUP Permit Amendment. The requested amendment to change the depth of excavation would only modify the depth to which the mine operator can mine too. The existing reclamation plan which slopes underwater would extend to the new depth that are consistent with our approved reclamation plan slopes. This increased excavation would allow the extraction of an approximate additional 1.15 million cubic yards of sand and gravel.

No other operational changes would occur from this amendment. This includes no changes to truck traffic, stockpiling of materials/products, mining techniques, etc.

Please reach out to me with any questions.

Regards,

Matt Mettling

cc: John Rivisto, Pat Mason, Kelly Brosseth, Nate Sparks, Hannah Rybak

Receipt#: 141548

ABSTRACT FEE $46.00

2790655

Recorded on: 3/10/2011 01:54:38PM
By: STG, Deputy

Return to:
EUREKA TOWNSHIP
PO BOX 576
LAKEVILLE, MN 55044

Joel T. Beckman County Recorder
Dakota County, MN

D.4

Eureka Township

Dakota County

State of Minnesota

INTERIM USE PERMIT

1. **Permit.** Subject to the terms and conditions set forth herein, the Township of Eureka grants an Interim Use Permit for an:

   Aggregate extraction and processing (mining) operation.

   For the term of this Permit, and subject to the other terms and conditions described herein, the Property described below may be used for the extraction, crushing, screening, mixing, processing, washing, storage and sale of minerals from the mineral extraction facility.

2. **Property.** The permit is for the following described property in the Township of Eureka, Dakota County, Minnesota and is legally described as follows:

   PARCEL 1
   PROPERTY ID NUMBER: 13-00800-011-25

   LEGAL DESCRIPTION: The Northwest Quarter of Section 8, Township 113, Range 20, Dakota County, Minnesota, Excepting there from the following parcel:

   That part of the Southeast Quarter of the Northwest Quarter of Section 8, Township 113, Range 20, Dakota County, Minnesota described as follows:

   Commencing at the Southeast corner of the Southeast Quarter of the Northwest Quarter; thence westerly along the South line of the Southeast Quarter of the Northwest Quarter, a distance of 858 feet to the point of beginning; thence northerly parallel to the East line of the Southeast Quarter of the Northwest Quarter, a distance of 283 feet; thence westerly parallel to the South line of Southeast Quarter of the Northwest Quarter, a distance of 462 feet, more or less, to the West line of the Southeast Quarter of the Northwest Quarter; thence southerly along said West line of the Southeast Quarter of the Northwest Quarter to the South line of the Southeast Quarter of the Northwest Quarter; thence easterly along said South line of the Southeast Quarter of the Northwest Quarter to the point of beginning.

   PARCEL 2
   PROPERTY ID NUMBER: 13-00700-020-02

   LEGAL DESCRIPTION: That part of the South One Half of the Northeast Quarter of Section 7, Township 113, Range 20, Dakota County, Minnesota, described as follows:

   Beginning at the Northeast corner of the said South One Half of the Northeast Quarter;

thence South 00 degrees 48 minutes 16 seconds West, assumed bearing along the east line of said South One Half of the Northeast Quarter, a distance of 110.00 feet; thence North 89 degrees 36 minutes 38 seconds West, a distance of 650.00 feet; thence South 33 degrees 02 minutes 26 seconds West, a distance of 457.26 feet; thence North 89 degrees 36 minutes 38 seconds 230.00 feet more or less to the easterly right of way line of County-State Aid Highway No. 9; thence northerly along said easterly right of way line to the north line of said South One Half of the Northeast Quarter; thence South 89 degrees 36 minutes 38 seconds East along said North line of the South One Half of the Northeast Quarter to the point of beginning.

Description of the property upon which the extraction permit will apply:

That part of the Northwest Quarter of Section 8, Township 113, Range 20, Dakota County, Minnesota described as follows:

Commencing at the southwest corner of said Northwest Quarter; thence North 00 degrees 48 minutes 16 seconds East, assumed bearing along the west line of said Northwest Quarter, a distance of 876.64 feet to the point of beginning of the land to be described; thence continuing North 00 degrees 48 minutes 16 seconds East, along said west line, a distance of 458.66 feet to the northwest corner of the Southwest Quarter of said Northwest Quarter; thence North 89 degrees 42 seconds 06 seconds East, along the north line of said Southwest Quarter of the Northwest Quarter, a distance of 50.01 feet; thence North 00 degrees 48 minutes 16 seconds East a distance of 523.58 feet; thence North 86 degrees 29 minutes 55 seconds East a distance of 302.92 feet; thence North 74 degrees 41 minutes 32 seconds East a distance of 255.92 feet; thence North 59 degrees 57 minutes 40 seconds East a distance of 254.49 feet; thence North 67 degrees 15 minutes 03 seconds East a distance of 1182.51 feet; thence North 89 degrees 43 minutes 04 seconds East a distance of 628.53 feet; thence South 00 degrees 33 minutes 45 seconds West a distance of 1621.84 feet; thence South 84 degrees 43 minutes 13 seconds West a distance of 1009.03 feet; thence North 88 degrees 17 minutes 02 seconds West a distance of 1147.18 feet; thence North 86 degrees 25 minutes 46 seconds West a distance of 385.76 feet to the point of beginning.

3. **Technical Documents Incorporated by Reference.** The Town of Eureka has received, considered and approved the following plans and specifications as part of its permitting process, and incorporates the same by reference as terms of the Permit:

   Application, dated January 7, 2009;
   Site Plans, dated February 12, 2009;
   Extraction Plan, dated February 12, 2009;
   Groundwater Monitoring Work Plan, approved March 9, 2009;
   Reclamation Plan, dated February 12, 2009;
   Environmental Assessment Worksheet, approved January 12, 2009; and
   Traffic Impact Study, dated November 4, 2008.

The owner, operator, and any successor or assignee shall retain a copy of each of the incorporated documents, in addition to the Town's copy of each document. Compliance with

the incorporated plans is required unless expressly waived, amended, or otherwise approved in advance by resolution of the Town Board.

4. **Conditions.** The permit is issued subject to the following conditions:

1. Term of Permit: The IUP shall expire on December 31, 2030, unless previously terminated by an event described in Paragraph 4 of the Permit.

2. Development Agreement: The Owner and Operator shall execute a Development Agreement with the Town prior to commencing mining operations under this Permit. Owner, Operator, and all successors and assigns shall abide by the terms of the Development Agreement as a condition of the Permit, including terms concerning posting of financial guaranty and maintaining insurance.

3. Compliance with Ordinance. The operation shall at all times comply with the Eureka Township Mining Ordinance and all performance standards stated therein, unless specifically authorized or modified by the express terms of this Permit. The Town has expressly found that the plans and specifications incorporated in Section 3 of this permit comply with all applicable performance standards in place at the time of permit approval.

4. Hours of Operation: Hours of operation shall be Monday through Friday, 7:00 am to 5:30 pm. Loading and hauling of material from the site is permitted on Saturdays from 7:00 am to 12:00 noon; no other activity (e.g. excavation, crushing, screening, grading) is permitted on Saturdays.

5. Storage of Recycled Materials: Stockpiled recycled materials, that have the stockpile base within five feet or less of the highest groundwater elevation as measured from groundwater monitoring, shall be stored to protect against the potential for leachate into the groundwater. The operator shall cover the pile with plastic or line the area planned for RAP storage with a crushed limestone Class 5 material, compacted to 98% Standard proctor.

6. Access, Haul Route, and Roadway Dust Control: Access shall be on CSAH 9 (Dodd Boulevard). Site access is not permitted from 235th Street. The operator shall provide a southbound bypass lane on CSAH 9 at the mining site entrance before the mining operation commences. The operator shall provide advance warning signs on CSAH 9 to notify drivers of the upcoming entrance. The operator shall construct the access road of bituminous millings. The operator shall immediately remove dirt tracked on to CSAH 9. The number of haul trips shall be generally consistent with the Traffic Impact Study dated November 4, 2008.

7. Dust, Noise, and Vibration: The operation shall comply with Minnesota State Noise Standards, shall obtain an MPCA air quality permit, and shall comply with that permit. Water trucks shall be used for dust control. No blasting is permitted. To minimize noise of back-up alarms, haul trucks will use a circular traffic pattern within the extraction site. Operator will take all reasonable measures to assure sound suppression devices are fully operational on equipment within the extraction site. If Mine Safety Health Administration

(MSHA) regulations for backup alarms change to allow use of less intrusive alarms, the operator shall retrofit its equipment with such alarms.

8. Other Regulatory Permits: The operator shall submit to the Town copies of all permits received from other regulatory authorities, such as the MPCA, MnDNR, or Dakota County.

9. Water Use: Dewatering is prohibited. A MnDNR Water Appropriations permit shall be obtained for water use for the purpose of the wash plant and the operator shall provide the Town a copy of the permit.

10. Wastewater: Chemicals will not be used in the aggregate washing process. Wash plant wastewater will be treated prior to discharge or infiltration into a groundwater area. Portable toilets for employees shall be maintained on site.

11. Erosion Control: Best Management Practices (BMP's) shall be installed and maintained to minimize erosion and sedimentation, as shown on the Site Plans dated February 12, 2009. Erosion control measures shall comply with the Vermillion River Watershed Joint Powers Organization (VRWJPO) standards.

12. Hazardous Materials: No painting shall be permitted onsite. Fuel stored onsite shall not exceed 1,200 gallons. Fuel shall be stored in a double-walled tank with secondary containment, and the tank shall not be located on the mine floor. The tank shall be registered with the MPCA. No other hazardous materials are permitted at the site. Employees shall be trained in Spill Prevention and Response, and a Response Kit shall be located on site.

13. Groundwater Monitoring Plan: The Groundwater Monitoring Work Plan shall be implemented by the operator. Implementation shall continue for the duration of the IUP regardless of the level of activity. Any modification of the Groundwater Monitoring Plan must be approved by the Eureka Town Board.

    a. The Town shall approve the location of the sentinel well prior to installation.

    b. Groundwater Monitoring Reporting: The operator shall provide monitoring reports as described in the Groundwater Monitoring Plan to the Township with copies to the Watershed and MnDNR Area Hydrologist. The Town may require revisions to the Groundwater Monitoring Plan to address observed conditions. The Town will confer with the party overseeing the monitoring at least once prior to requiring the revision. Any required revisions will be implemented within forty-five (45) days of being ordered, unless time is specifically extended by the Town Board.

    c. To gather information on background conditions, groundwater monitoring shall be conducted for five consecutive years before mining below the groundwater level.

    d. If monitoring results show an impact, the Operator shall create a mitigation plan prepared by qualified individuals to address the impact. The Town Engineer or

another agency with regulatory authority shall determine whether activity under this Permit is creating an impact. Impacts include: DRO detection above Minnesota Department of Health Health Based Values; significant variations in groundwater level, temperature and pH; and observed negative effects upon the hydrology or vegetation of MnDNR Wetland No. 19-414. Exact threshold standards for all impacts not subject to a statewide standard will be established at the second annual review of mining activity under this Permit. The Town Board, at the recommendation of the Town Engineer or other regulatory agency with jurisdiction, may add or delete categories of "impact" or alter the threshold standards for existing categories at each annual review following the establishment of standards. Any mitigation plan proposed shall be reviewed and approved by the Township and by the Watershed, MnDNR, MPCA, or other regulatory agency that has jurisdiction.

e. When an impact is determined, extraction activity shall cease until a mitigation plan is approved by the Town Board. The Operator may request Town Board approval for extraction during the period that a mitigation plan is being developed. The Board may grant such approval if it is shown that the proposed extraction activity will not contribute to the identified impact

14. Setback Exceptions: Setbacks shall be maintained as required by Ordinance and as shown on the Plans revised February 12, 2009. The Town Board has approved two specific reductions in the setbacks otherwise applicable under Ordinance 6, Chapter 7, Section 1.M:

a. The setback requirements are waived at the common boundary of the Property described in Section 2 above and the existing permitted mining operation located east of CSAH #9 in the South one-half of the Northeast Quarter of Section 7, Township 113 North, Range 20 West (John Storlie), for that area lying outside of the prescribed setback from dwellings. A common reclamation plan and written agreement between the Owners and Operators of both properties must be filed with the Township before commencing mining operations within the waived setback area.

b. Any setback requirement which would otherwise be determined from the personal residence of Kelly Brosseth (located on PID 13-00800-012-25), is reduced to equal the setback required by the presence of existing residential dwellings located along 235th Street West across from the Property.

15. Phasing: Phasing shall conform to the Extraction Plan revised February 12, 2009. All extraction areas that have not yet been mined shall remain in agricultural production. All areas that are not in agricultural production or part of the active mine shall be vegetated with seed and mulch. The Town Board must approve any extraction that deviates from the Extraction Plan prior to the start of any mining activity in the new area.

16. Berms: The operator shall establish berms per the Site Plans dated February 12, 2009. Berms shall be constructed of overburden stripped from the site. Berms shall be vegetated with seed and mulch. Silt fencing shall remain in place until stabilization of the berms is

completed and then shall be removed. The applicant shall be responsible for ongoing maintenance of the plantings for the duration of the permit.

17. Pit Berm: The applicant shall construct a berm at least 10 feet high with 3 to 1 side slopes along the south edge of the pit. The berm shall be constructed adjacent to each of the first six phases from overburden as it is removed from that phase. The berm may be removed as slopes are restored for the completed phase from which it originated. Vegetation shall be established and maintained on the berm until it is removed.

18. Height Outside Setback Areas: Stockpiles shall be placed on the pit floor. Stockpiles and equipment shall not exceed 30 feet in height.

19. Weed Control: The operator shall control noxious weeds and mow or harvest other vegetation as needed, and preserve natural vegetative buffers of native plant species, to maintain reasonable appearance of the site.

20. Reclamation: Reclamation shall conform to the Reclamation Plan revised February 12, 2009, and be completed within nine (9) months from the termination of this Permit unless extended by the Town Board.

21. Depth of Excavation: The elevation of maximum depth of mining shall not exceed 30 feet below the average groundwater elevation.

22. Annual Review: By January 31st of each year, the operator shall provide the Town its annual report as required by Chapter 7, Section 2, of the Mining Ordinance.

4. **Termination of Permit** The mineral extraction permit shall be terminated on the happening of any of the following events:

    1. The date of termination specified herein, December 31, 2030.

    2. The depletion or exhaustion of the aggregate resources proposed to be mined in the Extraction Plan.

    3. The abandonment of the mining operation or any cessation of mineral extraction for a continuous 365-day period. The Owner, Operator, successor or assign may apply to the Town Board for approval of a cessation anticipated to last longer than 365 days, which the Town Board shall approve if good cause exists for the cessation.

    4. Upon a violation of a condition under which the permit was issued, as provided: The Town Board must first provided written notice to the Operator and Owner (if different from the Operator) describing the specific violation and steps necessary to be in compliance with the permit. The Owner and Operator shall have a reasonable opportunity to remedy the violation, but in no case shall the remedy period be longer than five *(5)* working days. The first violation of any condition will result in written notice and appearance before the Town Board. A second violation of any condition will result in

written notice and citation for a misdemeanor. A third violation of any condition will result in written notice and the termination of the permit.

5. Upon violation of hours of operation, dust control, noise, road maintenance, or truck safety issues, the Town Board will notify the Operator and Owner (if different from the Operator) in writing. They will be given twenty-four (24) hours to come into compliance. Enforcement will be as follows: First violation of any condition will result in written notice and appearance before the Town Board. Second violation of any condition will result in written notice and a misdemeanor. Third violation of any condition will result in written notice and termination of permit. To the extent this Paragraph 5 is more demanding than Paragraph 4, then Paragraph 5 shall apply.

5. **Misdemeanor Penalty.** Any person who violates or fails to comply with any provision of this Ordinance shall be guilty of a misdemeanor and upon conviction thereof shall be punished to the maximum extent authorized in Minnesota Statutes, as amended from time to time. Each day the violation continues shall constitute a separate offense. If the violations are not remedied to the satisfaction of the Town Board, the permit will be terminated.

6. **Immediate Cessation of Mining Upon Contamination of Drinking Water:** If at any time it is proven that the mining operation is contaminating drinking water as prescribed by the Minnesota Department of Health Safe Drinking Water Standards or any natural spring, the Town Board will notify the Operator and property owner (if different from the Operator) in writing and mining will cease immediately. If this can not be resolved to the satisfaction of the Town Board, the permit will be terminated.

Date: March 9, 2009

EUREKA TOWNSHIP

BY: _____
Jeff Otto, Chair

Attest: Nanett Sandstrom
Nanett Sandstrom

I hereby certify that the foregoing Interim Use Permit is a true and correct copy of the permit presented to and adopted by the Eureka Town Board at the duly authorized meeting held on the 9th day of March, 2009, as shown by the minutes of the said meeting in my possession.

Nanett Sandstrom
Nanett Sandstrom, Eureka Township Clerk

DRAFTED BY:
Eureka Township
25043 Cedar Ave
Farmington MN 55024

March 12, 2025

Matt Mettling
Dakota Aggregates
1605 160th Street
Rosemount, Minnesota 55068

Re: Comprehensive Groundwater Assessment of Kelly Aggregates, Inc. Brosseth Pit (Site), Eureka Township, MN

Dear Mr. Mettling:

We have been asked to address potential concerns regarding the above-referenced Site (Figure 1) particularly in regard to thermal effects on groundwater, potential contamination, and depth of the operations below the water table.

Executive Summary

We conclude that the Site poses a very low risk to groundwater in general, nor does the Site pose a risk to the Vermillion River trout fishery as has been raised as a concern in the past. On a comparative basis, the Site poses a smaller risk to groundwater than would likely occur as a result of agricultural land use.

This report contains four major findings as described below:

1. Previous studies indicate that the thermal effects of warming the mine pit lake will not reach the Vermillion River or its tributaries. We concur with this conclusion and found that the nearest discharge area to the Vermillion River along groundwater flow path is 3,800 to 4,000 feet away from the mine pit lake. Studies have shown that the summer pulse of warm water will dissipate in about 800 feet or less; winter pulses of cold water dissipate in less than 500 feet. Because the warm water pulse would migrate in groundwater during the winter and the cold water pulse would arrive downgradient in the summer, we conclude that previous concerns expressed about thermal effects may have overstated the potential impact on trout fisheries in the area. In addition, previous estimates that indicated the nearest tributary at 2,600 feet from the Site appear to be incorrect based groundwater flow data from the Site. We propose 4,000 feet as a more accurate distance to the nearest receptor which means there is an even greater protective buffer between the Site and the Vermillion than was previously identified.
2. Like most sand and gravel operations, the Site does not store, manage, or dispose of significant quantities of hazardous materials, does not use chemicals to process the aggregate, and has never detected evidence of fuel or other contaminants in downgradient groundwater during the last 16 years of monitoring. A comprehensive literature search for examples of contamination from a sand and gravel operation did not reveal a single instance of contamination in Minnesota. Moreover, our analysis found that this sand and gravel operation is **less** likely to cause contamination than a similarly situated agricultural land use in the area due to the nature of the operation, secondary containment, and documentation of facility-specific spill response plan.
3. Studies conducted for permitting and over 15 years of groundwater monitoring at a similar mining operation at UMore Park (located 12 miles northeast and possessing similar site

geology/hydrogeology) have shown that there is no logical basis for restrictions on mining aggregates below the water table. Although some sources claim that the saturated sand and gravel is somehow protective of bedrock resources, there is ample evidence to suggest that excavating this material and replacing it with a pit lake would provide as much, if not more, protection of groundwater resources than the equivalent thickness of undisturbed sand and gravel.

4. There is no environmental risk related to increasing the mining depth below the water table. To the contrary, the deeper the pit lake, the greater the attenuation of thermal effects from warming or attenuation of a hypothetical contaminant release. This is because the mixing of deeper cold water (including seasonal turnover seen in natural lakes) provides a greater volume of deep cold water than shallow lakes. Likewise, if a hypothetical spill would occur into the lake, the natural attenuative capacity (due primarily to mixing) of the lake would be greater than that which could otherwise occur within a sand and gravel aquifer. Therefore, increasing the depth of the pit lake is not likely to have a significant effect on groundwater quality or quantity and may instead be protective of groundwater quality relative to a release or spill that were to occur under a different land use scenario.

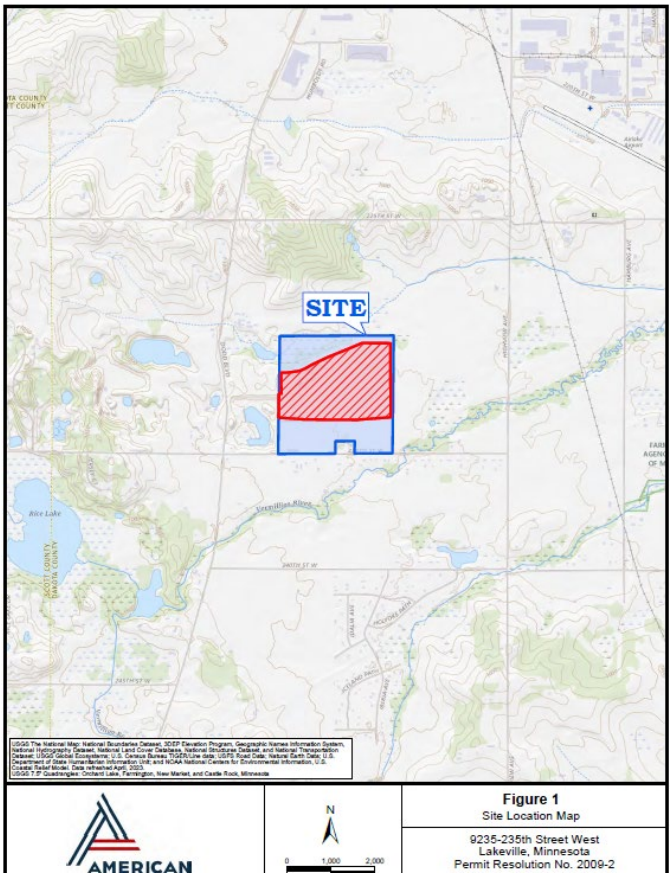


Figure 1 Site Location Map (from AET, 2024)

1 Purpose of Study

The goal of this report is to assemble data to address potential concerns related to aggregate extraction on groundwater generally and specifically with regard to the mine pit lake at the Site.

1.1 Scope of Work and Report Contents

This report includes six sections that follow this introduction that are summarized below in regard to the Site:

Section 2 provides background information regarding the Site setting, an evaluation of the permit record as well as data from recent annual reports including site-specific monitoring data.

Section 3 provides an evaluation of potential thermal effects from the mine pit lake could influence the Vermillion River and includes:

a) Site specific data including recent annual monitoring reports from the Site

b) An updated literature review and evaluation of published information regarding thermal effects on trout streams from pit lakes

Section 4 offers and analysis of the potential for the Site to cause groundwater contamination. This includes:

a) A detailed literature survey of case studies reporting groundwater contamination at gravel pits in Minnesota

b) In consideration of the above information, we performed an assessment to address the sources, pathways, and receptors that would indicate relative risk posed by a release from the Site.

Section 5 describes findings from previous studies and comparable mine operation located at the UMore Park mining area located in Rosemount in order to assess whether the depth of the pit lake and monitoring data has resulted in impacts to groundwater. This included:

a) Assessment of groundwater modeling studies on thermal effects

b) Protectiveness of gravel layers above bedrock

c) Groundwater monitoring data collected to date at the UMore Park mining area

Section 6 provides explores differences between a shallow pit lake compared to a deeper pit lake in terms of ability to attenuate thermal effects as well as the effect of a hypothetical release into the pit lake including:

a) Evaluate the relative attenuative capacity of a sand and gravel aquifer compared to a mine pit lake for a variety of land use including mining operation.

b) Evaluate research that indicates mine pit lakes can attenuate certain contaminants.

c) Discuss potential for the pit lake to attenuate potential thermal effects by mixing either during operations or seasonally.

Section 7 offers a summary and conclusions regarding the Site based on the information evaluated in previous sections.

1.2 Qualifications

This report was prepared by and under the direct supervision of James S. Aiken, P.G. Jim is Vice President and Senior Hydrogeologist at Barr Engineering Co. which was founded in 1961 as a water resources engineering firm and incorporated in 1966 as an employee-owned environmental and engineering firm. Barr's clients include both private industry as well as local, state, and federal government as well as non-governmental entities. Jim is a licensed professional geologist in Minnesota (P.G. #30282) meaning that he has a professional responsibility to protect human health and welfare. He has over 35 years of experience evaluating groundwater issues related to mining as well as investigation of contaminated waste sites. Jim has previously conducted detailed hydrogeologic investigations and has been principal-in-charge for several major groundwater projects in Dakota County including UMore Park which included the evaluation of thermal effects on the Vermillion River. His academic training includes a B.S. in geology as well as a M.S. in glacial geology and hydrogeology from the University of Wisconsin-Madison which included field investigation and groundwater modeling of sand and gravel mining operations in glacial depositional environments. Jim is also a member of the Minnesota Ground Water Association and holds the Registered Member credential with the Society for Mining, Metallurgy and Exploration (SME) as a Qualified Professional for evaluation and development of aggregate mine sites.

2 Background Information

2.1 Mining Status and History

The Site currently operates under a Level 3 mining permit issued by Eureka Township approved in March 2009. A Level 3 permit allows mining of aggregates below the water table where the final end use is an open water lake. The most recent extraction permit envisions mining to a depth of 30' below average groundwater elevation. Dakota Aggregates has indicated that the average depth of the pit lake below the water table is about 30 feet with both higher and lower areas present in various areas of the lake.

2.2 Geologic and Hydrogeologic Setting

The Site is located within a topographically high area that comprises the upper reaches of the Vermillion River watershed. The depth to groundwater is about 15 feet below the ground surface at the Site. This upper most aquifer consists of outwash derived sand and gravel. Groundwater flow direction at the Site is toward the northeast as shown in Figure 3 below. The regional flow directions reflect recharge in the upper portion of the outwash plain near Rice Lake and discharge of groundwater to the Vermillion River east of the Site.

There are two tributaries to the South Branch of the Vermillion River near the Site. One is located approximately 1,000 feet south of the Site; this area is not a designated trout steam by the Minnesota Department of Natural Resources (MDNR) but becomes one further downstream. The nearest tributary likely to receive groundwater from the Site is located about 3,800 feet to the northeast. Both the MDNR map and the Vermillion River Watershed map shown in Figure 2 (Vermillion Watershed, 2025 available at: https://dakotacounty.maps.arcgis.com/apps/webappviewer/index.html?id=304d2225249d4fd3ab3f510e0ff62a7f) indicate that the designated trout stream portion for both the north and south tributaries starts generally east of Highview Avenue.

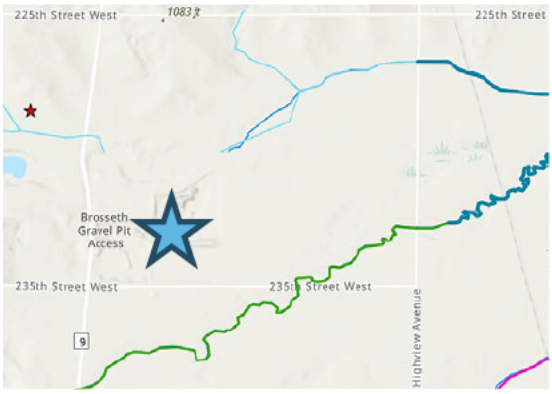


Figure 2 Map from Vermillion River Watershed District. Thick blue lines indicated trout stream reaches. The thick green lines indicate a "Conservation Corridor" and the thin blue lines are a "Water Quality Corridor."

The 1990 Groundwater Atlas flow map (Figure 3) indicates that groundwater from the Site flows northeast and matches the flow direction observed at the Site as shown on Figure 4. The Groundwater Atlas indicates that the both the tributary north of the Site and the one to the south are losing (e.g. supplying or recharging) flow to groundwater near the Site.

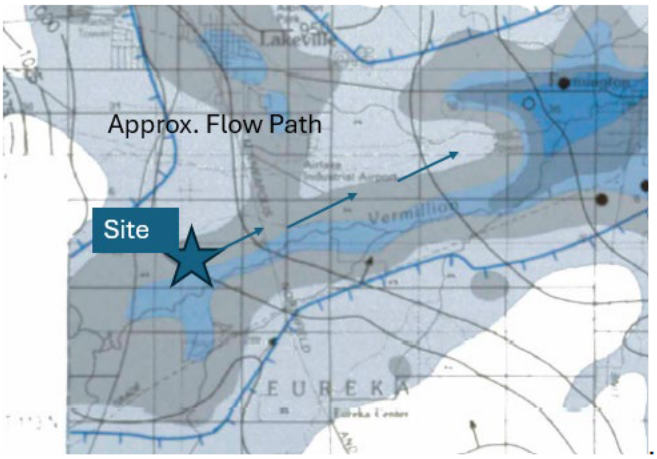


Figure 3 Groundwater flow map from Minnesota Geological Survey (1990) showing groundwater flow toward the northeast. This interpretation of groundwater flow does not indicate groundwater from the Site discharges locally to the Vermillion River.

The northeast flow direction observed at the Site (Section 2.3) is ***away from*** the previously mentioned nearest tributary to the South Branch of the Vermillion River that is located approximately 1,000 feet south of the Site. The nearest tributary to the Vermillion River that is located in the downgradient groundwater flow direction and that may be considered a discharge area for groundwater from the Site is approximately 3,800 to 4,000 feet northeast of the Site as described below.

2.3 Previous Investigation and Studies

During the environmental review and permitting process conducted in 2008 to 2009, the issue of thermal warming or "solar insolation" was addressed primarily in responses to comments from Metropolitan Council, MPCA and LBG Associates (Ames, 2008). Specifically, the MPCA made comment A.3 "Proximity and Impacts to the Vermillion River" citing concerns about solar insolation warming the pit lake and causing an increase in groundwater reaching the Vermillion River. In response, Ames cited the work of Markel and Schincariol (2007) for an analogous site located within the Tricks Creek watershed of Ontario, Canada. This research represents the most well-studied example of thermal effects from mining aggregates from a pit lake. The study, carried out over a series of years found that the thermal effects of the pit lake dissipated to background temperature within about [820 feet] of the pit along the groundwater flow path. Because the distance to the portion of the Vermillion River that is designated as a trout stream has been stated as 2,600 feet from the Site, it was concluded that the thermal effects would not impact

the stream. We reviewed this paper and concur with Ames's conclusions as described in Section 3. However, as described in Section 3, a more accurate estimate of the receptor distance would be 3,800 feet or more.

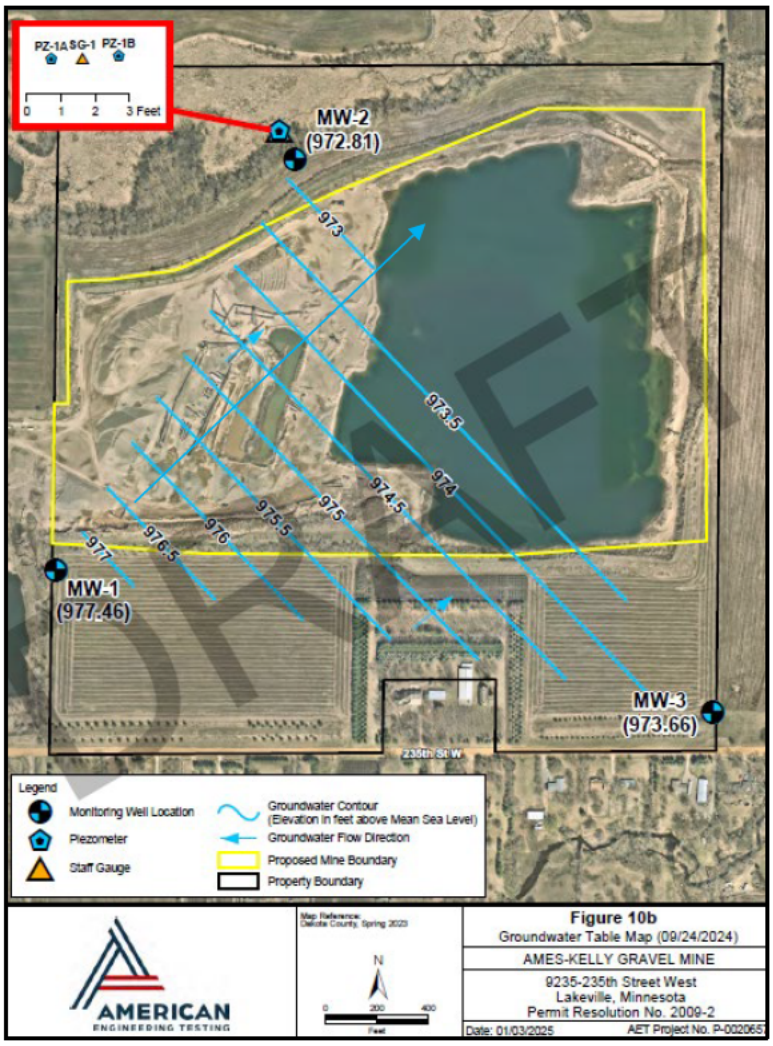


Figure 4 Groundwater flow map from the Draft 2024 Annual Monitoring Report (AMR) showing groundwater flow is toward the northeast and away from the Vermillion River tributary nearest the Site (AET,

In 2011, the Eureka Township Board raised concerns about the thermal effects of aggregate mining on the Vermillion River and its trout fishery. Although we did not have information related to their specific concerns, it was apparently focused on the temperature readings from MW-2 which is a side-gradient well relative to groundwater flow shown in Figure 1 (from Figure 10b of AET, 2025). In response to concerns, Richard Pennings, P.E. a professional engineer from AET described the data and attributed the increase at MW-2 to an adjacent wetland area as the likely cause, unrelated to the mine. Barr generally concurs with this opinion, especially since the available groundwater data clearly shows that flow from the pit lake is generally *away* from MW-2, not toward it. Subsequent flow data included in the annual reports further supports this conclusion. Based on the permit record, thermal changes in downgradient groundwater from mine pit lakes are clearly expected and as noted, are likely to attenuate a relatively short distance from the pit lake. Therefore, the concerns about MW-2 were misleading in the sense that the data did not then and certainly do not now indicate future downgradient thermal effects migrating from the Site that would impact the Vermillion River.

2.4 Annual Groundwater Monitoring Reports

Groundwater flow direction at the Site was established toward the northeast and three monitoring wells were installed (AET, 2008a) to monitor flow directions and water quality from the processing area. American Engineering Testing (AET, 2008b) prepared a groundwater monitoring plan that proposed three monitoring wells (MW-1, MW-2, and MW-3) with MW-3 believed to be a downgradient well. Review of groundwater flow data collected by AET are included in the annual groundwater monitoring reports for the Site (AET 2021-2024) and indicate flow is consistently to the northeast from the Site. In general, flow shifts more eastward during the winter months (approximately December to April) and more northward during the summer months.

Ongoing groundwater monitoring has been conducted since 2009 and later by Dakota Aggregates. Our review of water levels in the 2021 through 2024 Annual Monitoring Reports (AET, 2022-2025) indicates that groundwater flow is predominantly to the northeast relative to the mine pit lake, which is away from the reach of the Vermillion River that is located closest to the Site. Figure 4 above is an excerpt from AET's 2024 report (Figure 10b) showing groundwater flow direction is toward the northeast.

Overall, water quality sampling results indicate that groundwater quality appears to be very good especially in downgradient MW-2. Two near reporting limit detections of 0.2 ug/L and 0.1 ug/L (e.g. in the part per billion or ppb range) readings for Diesel Range Organics (DRO) have been recorded in upgradient MW-1. Because this well is consistently upgradient from the Site is physically not possible for detections to be related to the Site. Regardless, neither detection was verified by subsequent resampling indicating they are potentially false positive results. In addition, DRO measurements of less than 100 ug/L are generally not significant from a health or regulatory standpoint. Other water quality parameters (pH, temperature, and specific conductance) are all typical of background conditions and are similar between wells except for temperature as described below.

Temperature data from the groundwater monitoring wells indicates that upgradient MW-1 has the highest temperature groundwater on average and MW-3 has the lowest average temperature with MW-2 being in the middle of the range between the other two wells. Similar results follow for the standard deviation in temperature for these wells. Data from the 2024 draft report is shown below in Table 1 (Table 4a from AET 2025):

Table 1 Tables from the Draft 2024 AMR including Monitoring Parameters Table 4a and 4b (AET, 2025)

Table 4a
2024 Monitoring Parameter Statistics

Monitoring Location	pH				Temperature				Specific Conductance				Water Elevation			
	Min	Ave	Max	Std. Dev.	Min	Ave	Max	Std. Dev.	Min	Ave	Max	Std. Dev.	Min	Ave	Max	Std. Dev.
MW-1	7.07	7.33	7.71	0.26	11.5	15.2	18.9	3.7	580	619	663	42	975.65	977.55	979.53	1.94
MW-2	6.89	7.26	7.49	0.33	9.9	12.2	13.7	2.1	547	644	772	116	972.57	972.90	973.32	0.38
MW-3	7.19	7.50	7.99	0.43	7.9	9.6	11.1	1.7	587	639	741	88	973.18	974.60	976.97	2.06
PZ-1A	--	--	--	--	--	--	--	--	--	--	--	--	972.10	972.14	972.17	0.04
PZ-1B	--	--	--	--	--	--	--	--	--	--	--	--	972.36	972.40	972.44	0.06
SG-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All MWs	6.89	7.36	7.99	--	7.9	12.3	18.9	--	547	634	772	--	972.10	973.92	979.53	--

Table 4b
2008-2024 Monitoring Parameter Statistics

Monitoring Location	pH				Temperature				Specific Conductance				Water Elevation			
	Min	Ave	Max	Std. Dev.	Min	Ave	Max	Std. Dev.	Min	Ave	Max	Std. Dev.	Min	Ave	Max	Std. Dev.
MW-1	5.49	7.21	10.03	0.63	2.2	12.6	19.9	3.6	8	619	3842	428	970.65	976.13	980.52	2.25
MW-2	5.49	7.20	9.01	0.54	6.3	11.4	18.3	2.6	15	607	5102	589	969.06	972.42	973.65	1.03
MW-3	5.78	7.15	10.86	0.65	6.6	10.6	14.9	2.0	17	714	5613	645	967.81	972.92	977.53	2.33
PZ-1A	--	--	--	--	--	--	--	--	--	--	--	--	968.87	972.18	973.62	0.83
PZ-1B	--	--	--	--	--	--	--	--	--	--	--	--	970.47	972.44	973.83	0.56
SG-1	--	--	--	--	--	--	--	--	--	--	--	--	972.20	972.50	972.91	0.16
All MWs	5.49	7.19	10.86	--	2.2	11.5	19.9	--	8	647	5613	--	967.81	973.10	980.52	--

Notes:
1. pH in standard units, Specific Conductance in microsiemens per centimeter, Temperature in °C
2. Groundwater elevations are in feet referenced to the National Geodetic Vertical Datum

Sampling data under the current monitoring plan appears to be collected quarterly. However, given the consistency in the data year to year, the primary changes in water level and temperature appear to reach their minimums and maximums, respectively, in the spring and fall.

2.5 Mine Pit Lake Conceptual Model

In order to better understand the information provided in this section and as well as the various analyses provided in the remainder of this report, it is helpful to have a visualization of key elements regarding the mine pit lake. Figure 5 shows a conceptual model for the pit lake that illustrates important features relative to the discussion in this section. This figure shows a vertical slice or profile into the ground along a line extending northeast and southwest though the Site. This 2-D representation of the Site illustrates the movement of groundwater into the pit lake from the southwest and out of the pit lake toward the northwest. Groundwater flow is anticipated to be primarily horizontal roughly parallel to the ground surface. Recharge is to the southwest near Rice Lake and the discharge of groundwater is at or beyond the tributary shown to the northeast of the Site. This is the nearest tributary with a trout designation and is located about 4,000 feet downgradient.

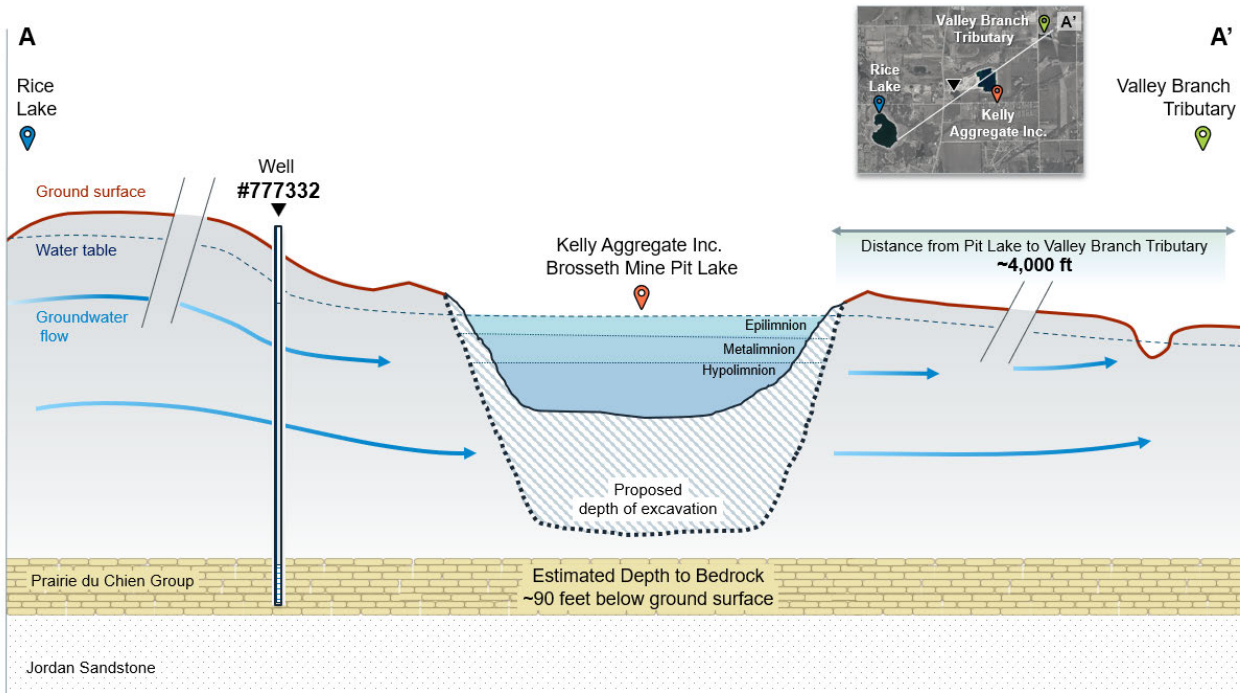


Figure 5 Conceptual Model of Pit Lake and Groundwater Flow

A thermal plume or a hypothetical release into the pit lake would result in mixing within the lake. Deeper lakes tend to stratify into three primary layers shown on the figure as the epilimnion, the metalimnion, and the hypolimnion. Most warming from sunlight occurs in the surficial part of the lake known as the epilimnion. The boundary between the epilimnion and the metalimnion is known as the thermocline. This is the boundary between the warm and cold layers in the lake. The hypolimnion is the deepest part of the lake which is cold throughout the year due to the influx of relatively cold groundwater. As seen from the figure, the deeper the lake the larger the proportion of seasonally cold water that is present.

The depth to bedrock is from a nearby well log and shows that depth to the Prairie du Chein bedrock is about 100 feet below the ground surface near the Site. Because the bedrock is hard and cemented, mining it with dragline methods is not feasible. This means that the deepest limit of mining operations at the Site is about 100 feet. The thickness of the Prairie du Chien above the Jordan Formation is likely about 150 feet.

3 Thermal Effects on Vermillion River

This section provides updated assessment of previous documentation and new analyses to assess whether thermal effects from the Site are likely to affect the Vermillion River.

3.1 Updated Literature Review on Thermal Effects of Mine Pit Lakes

This section describes several research articles and findings regarding thermal effects from mine pit lakes.

3.1.1 Watershed Study – Tricks Creek, Ontario, Canada

The original permit record included reference to a study by Markel and Schincariol (2007). This work was included with and combined with additional work by Markel (2011) that augmented the 2007 work with additional supporting information and groundwater modeling results. This body of work represents one of the most detailed studies of a thermal effects on groundwater related to dredge extraction of aggregates from a mine pit lake. This research is directly applicable to the Site because the mine operation, hydrologic and geological setting are very similar. Important findings from the research include the following information that has not previously been included in the permit record are summarized below:

The site in question is located near Toronto, Canada at about the same latitude as the Site. In general, recharge to groundwater in these areas is stated by author as providing cooling of recharge so that when forested area is cleared for mining (or any development activity), the general affect is to raise groundwater temperatures. By contrast, most areas of Dakota County are not forested but rather are more typically grassland areas, wetlands, or farmland which tends to lead to warmer temperatures of infiltrated water. This means that the warming effects of solar insolation documented in the Tricks Creek watershed are likely more pronounced than expected at the Site.

The pit lake studied was only about 18 feet deep compared to an average depth of 30 feet at the Site. Although the mine pit lake in the study was observed stratify beginning in May, the temperature at the bottom of the lake was reportedly at or near temperature of ambient groundwater or about 4 to 8 degrees Celsius (38 to 46 Fahrenheit).

Markel (2011) reports that plume attenuation occurs no more than about 250 meters or about 820 feet downgradient of the pit lake. However, the author notes that the warming of mine pit lakes is not a continuous source of warm water to the aquifer, but rather a series of seasonal pulses of alternating warm and cold water. That is, the lake warms through the summer reaching a peak in late August and early September. Just as this warm water plume begins moving out into the aquifer, the lake begins to cool into the fall and winter, eventually “turning over” as the cold water in contact with the winter air sinks to the bottom of the lake. As the warm pulse from summer migrates through groundwater during the winter months, it is followed by a cold pulse from the lake that migrates behind the warm pulse arriving at nearby streams in the summer months. This lag effect means that the warmest water is traveling in the aquifer at time when it can do the least harm to the fishery. Conversely the cold winter water from the lake follows the warm pulse but arrives during early to mid-summer just as warm surface water is causing stream temperatures to rise. As dispersion and mixing occur along the groundwater flow path, the blending of the warm and cold plumes would tend to average the thermal effect. Potentially the arrival of the cold water at a stream during the summer months may have a beneficial effect that has not been previously described in the permit record.

3.1.1.1 Estimates of Downgradient Attenuation Distance Applied to the Site

The study showed that the cold-water plume attenuates after about 175 to 200 meters or about several hundred feet shorter than is attributed to the warm water plume. This suggests a portion of the warming attributed to the pit lake may in fact be conflated with the warming coming from other surface sources such as exposed soil or wetlands. According to the author:

> "…identifying the pond signal within the observed temperature signal in the aquifer becomes increasingly difficult as the distance down gradient from the pond increases. As well, any convective heat flow vertically into the aquifer will tend to enhance the plume attenuation."

In summary, the estimate of a maximum distance of 800 feet of downgradient from the pit lake appears to be a conservative estimate given the data presented. The final portion of the research paper is related to groundwater modeling using the field study as the calibration data set. The modeling included sensitivity testing to see if changes in hydraulic conductivity (permeability) values changed the attenuation distance. When hydraulic conductivity was changed by +/- 50%, the author found that the attenuation distance varied from less than 150 meters (492 ft) and over 250 meters (820 feet). Refinement of the estimated distance indicates that attenuation distance may be as low as 330 feet from the mine pit lake but attenuation estimates from the model suggest that attenuation would be achieved between 492 ft and 820 ft. The shorter distance would likely be related to greater mixing and thermal attenuation related to site specific factors such as interaction with lower permeability materials and/or lower average temperature in the mine pit lake. For the purposes of this report we have selected 800 feet as a conservative estimate of the distance required for thermal attenuation from the Site based on the Markel study.

3.2 Analysis of Distance to Nearest Tributary or Receptor

As described in Section 2, groundwater flow at the Site is toward the northeast and away from the nearest reach of the Vermillion River located due south of the Site.

Figure 6 Projected Flow Lines to Downgradient Tributaries of the Vermillion River (from Google Earth, 2025)

Although previous studies have indicated that the distance from the Site to the Vermillion River along the groundwater flow path is 2,600 feet, measurement from the edge of the mine pit lake toward the northeast terminate in farm fields at 2,600 feet well short of the nearest tributary. The 2,600 foot distance is shown on Figure 6 by the short red lines. Therefore, the previous estimate of 2,600 feet appears to be incorrect.

In order to correct the record, we evaluated the distance to the closest Vermillion River tributary based on the distances measured as shown on Figure 6 above. The intermediate length lines on Figure 6 represent 3,800 to 5,000 foot distances to the nearest trout designated tributary. The longest lines present the path based on the groundwater atlas (after Dakota County, 1990) to a trout designated reach about 15,000 feet northeast of the Site assuming continued.

Figure 7 Vermillion River tributary located 3,800 feet northeast of the Site viewed during winter. Note that the creek is frozen with no running water. This suggests that the this tributary is not receiving groundwater from the underlying aquifer during the winter months.

The nearest tributary to the Vermillion River located about 3,800 feet to the northeast of the Site represents the most likely potential discharge area for water leaving the site during the summer months. However as shown in Figure 7, this stream freezes during the winter months, suggesting that it is not a discharge area for groundwater during the winter months. This is because groundwater is generally about 48 degrees Fahrenheit year-round and therefore would keep the stream flowing in winter. Frozen streams also do not support trout or their food sources such as insect larvae that live in the substrate materials of the stream and are sensitive to freezing conditions.

This tributary may be a discharge area for groundwater when the water table is higher in the spring months, but based on the lack of clear connection to groundwater, it appears that the 3,800 foot distance estimate to the nearest trout stream reach is conservative. For this reason, we assume that the distance from the Site to the nearest receptor is likely closer to 4,000 feet.

3.3 Revised Assessment of Potential Impact of Thermal Plume from the Site

The Markel study showed from both field monitoring and groundwater modeling that thermal attenuation of warmed mine pit lake water is achieved within about 800 feet or less from the lake's downgradient edge. Our updated analysis of the distance to the nearest trout designated tributary is approximately 4,000 feet. This distance is five times the distance to the nearest tributary and is more than adequate to attenuate warming effects from the mine pit lake at the Site. Therefore, the Site operation is not likely to have any significant effect on the trout fishery. There is some potential for a beneficial effect if the mine pit lake generates cold water in the wintertime that might serve to lower temperatures reaching the tributary in late spring or early summer.

4 Generalized Potential for Contamination at Sand and Gravel Operations

A commonly stated concern regarding aggregate mining is the potential for groundwater contamination. However, this statement is often puzzling to mining operators and those familiar with the aggregate industry because typical operations do not involve obvious sources of contamination. To test the

hypothesis that sand and gravel operations are a potential source of contamination, we conducted a comprehensive literature search to find examples of groundwater contamination resulting from the operation of an aggregate or sand and gravel mine in Minnesota. The search utilized a manual internet as well as an artificial intelligence (AI) tool to search for published papers, news articles, or other documents that fit one or more of 36 separate query combinations of including the following key words: “Minnesota,” “sand and gravel”, “aggregates,” “non-metallic mining,” linked with one or more of the following “contamination”, “groundwater contamination,” “vulnerability” “pit lakes,” “pollution,” “protection of aquifers,” “diesel fuel,” “nitrates”, and “pesticides.”

4.1 Results of Literature Search for Examples of Contamination

The results of the search and AI queries did not return any research, articles, or studies that cited a single example of groundwater contamination in Minnesota related to sand and gravel operations. To the contrary, the only example of such a contamination problem was from the United States and involved a Superfund site that was used in the 1970s as an illegal disposal facility. Such activities are not directly related to sand and gravel operations and have been illegal in Minnesota for over 60 years. The most commonly returned finding to the query search was regarding the “vulnerability” of sand and gravel sites to contamination or pollution rather than actual examples of contamination.

The observation that sand and gravel sites are vulnerable to contamination is based on the concept that these deposits (and the soils formed over them) have high permeability. Because surface soils are removed prior to mining, the issue is that a release of contamination can rapidly infiltrate to groundwater. The primary example of this position is the MDH (2009) guidance for well head protection areas. Again, for clarity, the guidance document provided no examples of contamination and did not suggest that there is any actual evidence that sand and gravel operations result in more vulnerability to contamination than other, similarly located operations. Numerous searches returned concerns related to the key words rather than actual instances of contamination. The specific concern is that if a release were postulated to occur, it might be expected to move rapidly to a receptor. If the release occurs in a well head protection zone, the water supply could be threatened. The guidance does state that fuel and chemical storage or use be managed consistent with best practices and as required by law.

A possible problem with this guidance document and similar documents, especially in terms of public perception, is that it conflates *vulnerability* of an aquifer to contamination with *actual risk* of contamination. Without a source of contamination, a means for that release to get into the aquifer, and an affected receptor, there is no risk. Although mining is often conducted in close proximity to the water table, there is nothing inherently related to contamination included in these operations. For context, the same vulnerability would exist at any home with a septic tank, warehouse storage of chemicals, an office building with cleaners or solvents, a gas station, a feedlot, or an agricultural farm field that is located on sandy soils. Sandy soils develop in areas with glacial outwash deposits and tend to have low organic matter content that does not significantly attenuate fuel and related types of contamination. Also, many types of contaminants associated with the land uses above do not degrade in soil. An important factor in assessing these land uses is that the greater the volume or concentration of contaminants stored, managed, or released, the greater the risk to potential receptors. In summary, the literature search indicates no evidence that sand and gravel operations actually have resulted in contamination.

However, we did find numerous references to agricultural contamination from fertilizers and pesticides especially in Dakota County (e.g. see ACRE, 2022 at https://www.co.dakota.mn.us/Environment/WaterResources/Agriculture/Documents/ACREPlan.pdf) even though this contamination occurs in areas of the county that are not considered as vulnerable to contamination as sand and gravel mines. The key finding from the literature search is not whether there is

vulnerability but rather whether there is an actual risk and specifically in consideration of the risk from the Site, whether and how substances stored and managed at sand and gravel sites.

4.2 Evaluation of Risk Related to Sand and Gravel Operations

Standard risk assessment methodology (EPA 2025; https://www.epa.gov/risk/conducting-human-health-risk-assessment) requires that three elements must exist in order for there to be a completed risk exposure pathway to the environment and/or human health. The three elements are:

1. A source of contamination that can be released to the environment
2. A migration pathway or means to convey that release to a receptor
3. The actual presence of a receptor that would be affected by the release

If any of the three elements is missing, there pathway in incomplete and no risk is present. Also, any controls that would prevent a release would serve to interrupt the pathway and reduce or eliminate risk of exposure.

4.2.1 Exposure Risk Pathway Evaluation

Each of the three element of the exposure pathway assessment is considered below in regard to the Site on both and absolute and comparative basis. The absolute basis is related to whether or not there is a source, pathway, or receptor present. The comparative basis allows for interpretation of whether the risk is significant relative to the land use that would otherwise be present if the mining operation did not exist. For this comparison, we also evaluated each element used a baseline alternative relative to land use to determine whether the risk from sand and gravel is greater or lesser than the equivalent land use that might otherwise be present at the Site if it were not mined. The baseline land use for each element of the evaluation is a cropped farm field used for agricultural production that would have otherwise existed at the Site if were not used for sand and gravel mining.

4.2.1.1 Contaminant Sources at Site

The first element of exposure risk requires that a source of contamination be present. Several potential sources of contamination are associated with active sand and gravel operations as identified in the MDH (2009) guidance. These include:

- Diesel or fuel storage
- Oils, lubricants
- Recycled bituminous materials
- Septic systems
- Waste material storage or disposal
- Explosives or mine processing chemicals

The guidance also mentions landfills, manure spreading, and illegal disposal but these activities are not relevant to the Site and are generally not applicable to active sand and gravel mine operations.

The Site operation includes mining and washing of sand and gravel to create aggregates of various size classifications. This process does not use or require added chemicals and the site does not have a septic systems. Fueling and lubrication is conducted with mobile maintenance vehicles. There is no on-site repair facility and no chemicals or fuel are stored outdoors at the Site. The dragline operation is fueled with diesel by a fuel truck and the operations area is not located near the mine pit lake. A berm separates the mine from the dragline and the pit lake. No recycled bituminous material is stockpiled at the Site. In

general, the main source of potential contaminants is fuel and lubricants contained within vehicles and other mobile equipment. There are berms around the perimeter of the property and the mine pit lake that minimize the potential for run off during rain events and to prevent migration of contamination on to the Site property. The source assessment therefore indicates that these potential contaminants either do not exist at the Site or in the case of fuel, are fully contained within secondary containment and in accordance with state and federal laws. The Site has a formal written Spill Prevention, Control and Countermeasures (SPCC) plan as well as training for staff on how to report and clean up a release in the unlikely event that one occurs. All of these factors minimize risk and provide additional layers of protection to mitigate the potential effects of a hypothetical release.

As discussed in Section 3, mine pit lakes are subject to both seasonal warming and cooling of groundwater. Where these effects are not offset by mixing in the lake or in the aquifer with cold water at the site, they can be a source of thermal effects on groundwater. This is a different type of effect on the environment but due to the distance from the nearest tributary thermal effects are not significant risk from operations at the Site.

4.2.1.2 Comparative Source Assessment

In contrast to the sand and gravel operation the Site, agricultural land use would likely be otherwise subject to fertilizer and pesticide application as well as operation of diesel or gasoline fueled equipment. No fertilizers or pesticides are used or needed at a sand and gravel operation. Assuming application of these chemicals at typical agronomic rates, the combination of plant uptake and soil attenuation processes can prevent most of these contaminants from reaching the water table and migrating with groundwater. However, the sandy soils present at the Site before mining would have limited attenuation in the surface and potentially allowed for bypass of the soil to groundwater. Agricultural contamination is well documented in Dakota County and poses a significant threat to groundwater, surface water and human health. Although the sources related to fueled equipment are likely similar to the sand and gravel operation, the risks related to pesticide and fertilizer use are far greater than a sand and gravel operation.

Although small amounts of fuel are present at a sand and gravel mine, the risk of contamination from the sand and gravel operation is relatively low. Therefore, we conclude that sand and gravel operations do not pose a significant source of contamination on either an absolute basis as well as being relatively less of a risk to groundwater than comparable agricultural land use.

Thermal pollution is potentially possible from agricultural operations particularly where the sun warms dark soil. Rainfall on this warmed soil migrates to groundwater and causes thermal impacts to the surface water and the trout fishery if the fields are near the Vermillion River. Therefore, on a comparative basis, there is similar likelihood that either land use could be a source of thermal impacts to a nearby trout fishery depending on the distance of migration.

4.2.2 Migration Pathway Assessment

Two primary migration pathways exist at a sand and gravel mine. These are infiltration of a spill into the ground to groundwater or flow into the mine pit lake and then to groundwater. If a contaminant such as diesel fuel were stored within on a concrete or even a soil berm, in a building, in concrete bunker, or in a double walled tank, there would be no migration pathway. If a fuel spill were the released on to bare ground, the release would soak into the ground and reach the water table to migrate with groundwater. If the release were to run overland into the mine pit lake the fuel would be noticeable on the mine pit lake. Unlike a release to soil, a release to surface water would be more likely to be cleaned up quickly due to the obvious sheen that would be visible on the water surface. This means that from a migration standpoint, a mine pit lake water operation is preferable to an operation that leaves soil above the water

table. Based on the forgoing, we conclude that there is a migration pathway possible at the Site if a release were to occur. However, because the Site has a groundwater monitoring network and there are operators present on site to monitor the surface of the lake, it is unlikely that a release would go undiscovered long enough to migrate off of the Site.

Migration of thermal effects are possible from a shallow mine pit lake but as discussed in Section 3, this effect is very limited to the area near the pit lake due to cooling of ambient groundwater and the relatively cold aquifer materials. Furthermore, the warming effects can be offset by seasonal cycles which mean that the warmest water would migrate to a nearby surface water during the winter months when the trout fishery would be least sensitive to the effect. Conversely, the coldest water from the mine pit lake would arrive during the warmer months, which could offer a benefit by offsetting warming from other sources during the summer months. For the Site, the point is moot because thermal effects would be attenuated within 800 feet, leaving a minimum of another 3,000 feet of migration distance as an additional buffer to the trout fishery.

4.2.2.1 Comparative Migration Pathway Assessment

For an agricultural land use, a spill or even typical application of fertilizer or pesticides has the potential to migrate through the soil and travel with groundwater. Unlike sand and gravel mine sites, contaminant migration has and is occurring as a result of agricultural activity in Dakota County.

Thermal effects from agricultural land use would also be attenuated along the pathway as long as the field were greater than 800 feet from the Vermillion River. Unfortunately, there are numerous reaches of the Vermillion River immediately adjacent to the fishery that result in both warm water runoff as well as warmed groundwater directly migrating to the Vermillion River and its tributaries. Therefore, on a comparative basis, agricultural land use would create a greater risk to groundwater than the current Site land use.

4.2.3 Receptor Assessment

Receptor assessment is inherently a site-specific evaluation because it depends on the proximity of that receptor to a site where there is a source and pathway that allows that receptor to be exposed to contamination. For the Site, there is no known potential drinking water receptor within a mile in the downgradient flow direction. While the Vermillion River could be considered a downgradient ecological receptor, the contaminant would need to travel nearly three quarters of a mile downgradient before reaching the river. As described in Section 3 for thermal attenuation, a contaminant released from the Site would likely be dispersed or degraded to the point where it would not be detectable at this distance unless the concentrations were very high. As described above, the operation at the Site does not have concentrated sources or large volumes of contamination that could travel long distances to a potential receptor. If there were a public or private water supply well, this pathway assessment would require additional scrutiny if the mine were located in a wellhead protection area. The nearest wellhead protection area is located 2.7 miles north of the Site near the City of Lakeville (Barr Engineering, 2024). Based on the above information, there is no likely source, a pathway is present but is monitored, and there is no receptor. We conclude that most sand and gravel operations including the Site do not have a completed exposure pathway and there is very little risk of impact to groundwater from the Site.

4.2.3.1 Comparative Receptor Assessment

Similar to the sand and gravel operation it does not appear that there is an obvious receptor from agricultural pollution occurring at or near the Site. However, if future groundwater users were to pound or drill a sand point well, they could be exposed to agricultural chemicals in groundwater from surrounding

agricultural operations. Therefore, there is a greater risk to future human receptors than would be posed by sand and gravel operations.

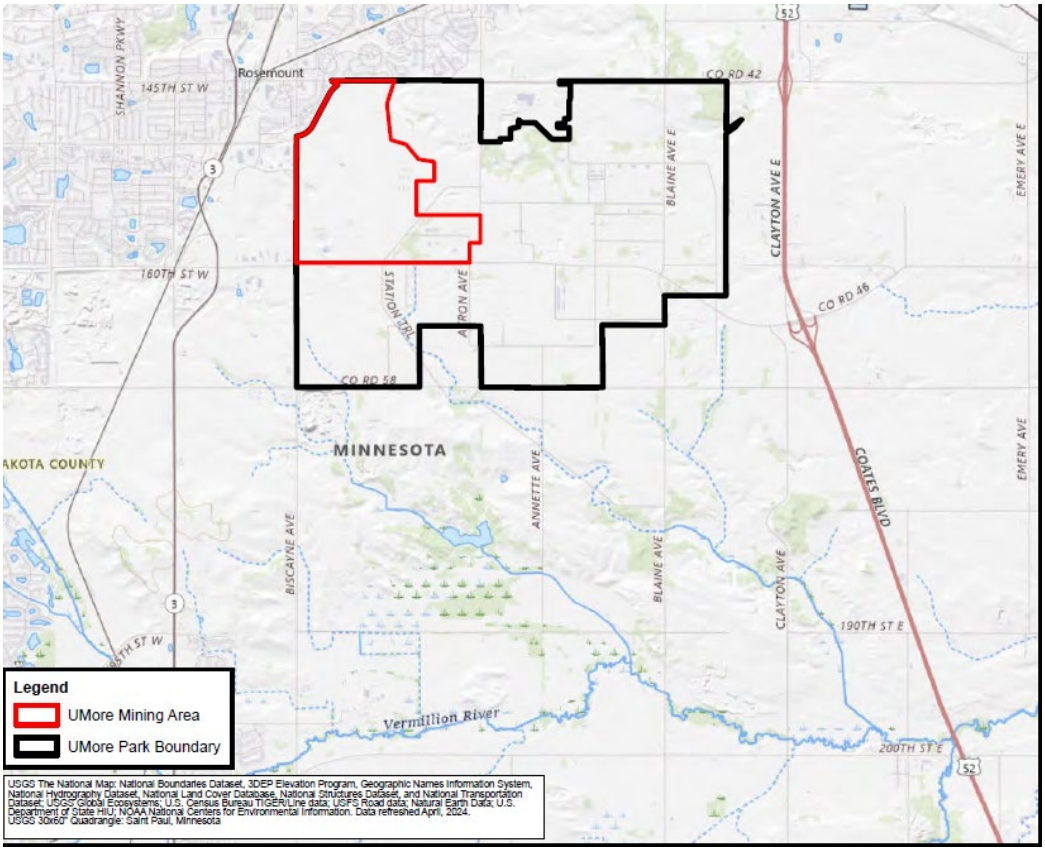
4.3 Risk Evaluation Summary

Based on exposure pathway risk evaluation there is no completed risk pathway for the Site mainly due to a lack of sources of contamination or receptors in the vicinity. This means that this type of operation is well suited for the area and poses minimal risk to the environment. By comparison, an equivalent site operated as an agricultural field would pose greater risks but would similarly not result in a completed exposure pathway due primarily to a lack of a nearby receptor that would be exposed to contamination.

5 UMore Park Studies Regarding Groundwater Contamination

A close analog to the Site based on geology, water table conditions, and proximity to the Vermillion River is the UMore Mining area, located within UMore Park about 12 miles northeast of the Site (Figure 8). UMore Park is a 5,000-acre agricultural research facility that is transitioning to a mixed residential and commercial development. The UMore Mining area is bounded to the north by residential development and has maintained a good relationship with adjacent property owners. The northwestern one-third of the property has been operated as a sand and gravel mine since 2010. Within the gravel mining area, an approximately 40-acre open water mine pit has been developed since 2019 using dredge methods to excavate sand and gravel from up to 90 feet below the water table. Upon completion, the mine pit lake is planned to encompass approximately 400 acres.

Figure 8 UMore Mining Area located north of the Vermillion River near Rosemount



5.1 Issues from UMore that are Relevant to the Site

Jennings (2018) provides a thorough description of the geology and hydrogeology of the Vermillion River watershed and the UMore Park operation. The author describes a series of detailed studies of UMore Park by Barr Engineering (2009) that indicated that a large-scale gravel mining operation was not likely to affect the Vermillion River. The UMore site is regulated under the City of Rosemount's Large-Scale Mineral Extraction Permit. During the permitting process, three issues relevant to the Site were addressed by Barr and Dakota Aggregates. Each is described below along with how they were evaluated in the Environmental Impact Statement (EIS) or the permit:

1. **Temperature effects on the trout fishery in the Vermillion River.** Like the Site, the groundwater flow directions at the UMore operation are not toward the designated trout stream and therefore, the mining operation does not affect or interact with the Vermillion River and there are no potential effects on the trout fishery.

2. **Contaminant spills or releases at the site or into the pit lake.** Dakota Aggregates operates mobile fuel trucks that are equipped with spill controls. There is no fuel stored or used on the floating dredge. All fuel and lubricants are stored indoors or within containment that prevents spillage and releases. Barr conducted an analysis and detailed modeling that showed that if an off-site (e.g. from a tanker truck on County Road 42) fuel spill occurred that ran into the pit lake, the concentrations would be easily visible on the lake surface and allow for rapid collection. The portion of the spill dissolved in groundwater would degrade before it was able to migrate off site or to hypothetical future water supply well.

3. **Protective Layer Buffer Concept**. The issue of the saturated sand and gravel providing a protective layer to underlying bedrock units, mainly the Jordan Sandstone, was raised as a concern during permitting the site. The Jordan is the bedrock unit below the Prairie du Chien dolomite that serves as the primary source aquifer for private and public supply wells in the area. Barr's analysis showed that the mining is not capable of disturbing bedrock layers. However, a general belief was expressed during permitting that the that sand and gravel aquifer materials somehow provide protection from contamination to underlying bedrock units. Barr described how a contaminant plume would migrate within sand and gravel and compared it to how a plume would move from the mine pit lake to the sand and gravel. As described above, the sand and gravel itself provide some attenuative capacity largely through a mixing and dilution process known as dispersion. However, in a sand and gravel aquifer this mixing is confined to a relatively thin portion of the sand and gravel located at or near the water table which allows the effects to migrate laterally. In comparison, a contaminant plume mixing within a mine-pit lake due to wave and/or dredge action results in much greater ability to reduce concentrations without leaving the mine pit lake. The mine pit lake also is exposed to sunlight and more oxygen which allows greater degree of natural degradation of certain contaminants (e.g. fuel) than is possible in a sand and gravel aquifer. Over time, the accumulation of organic carbon from phytoplankton in the mine pit lake also provides additional attenuation (Weilhartner, Andreas, et al. 2012).

5.2 UMore Monitoring Data

Annual reports from the mine site are available from the City of Rosemount and indicate that no spills or contamination have resulted from the site operations. The monitoring network (Figure 9) has detected very low concentrations of TPH and volatile organic compounds that appear to be coming from an industrial area upgradient of the property that are not related to the sand and gravel operation. These contaminants are observed in lower concentrations or not detected in the downgradient wells, indicating hat the mine pit lake may be having a beneficial effect in attenuating this contamination.

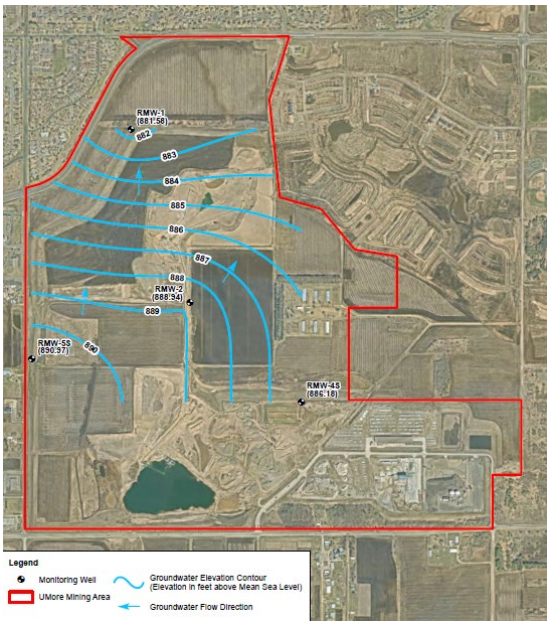


Figure 9 Groundwater Monitoring Network at UMore Mining area. Mine pit lake is in lower left and measures about 1,500 by 1,200 feet or about 40 acres. Groundwater flow is toward the northeast.

Nitrates and total coliform bacteria are present in all wells and appear to be related to agricultural activities. A review of temperature data since 2023 indicates that temperatures in groundwater at a monitoring well approximately 2,000 feet downgradient of the mine pit lake are consistent with background groundwater temperatures throughout the year.

The groundwater monitoring results from UMore gravel mining operation indicate that sand and gravel mining activities are not impacting groundwater quality nor is there evidence of thermal effects downgradient of the operations area. Because of the nearly identical operational and geologic conditions between the two operations, it appears that the Site is unlikely to result in impacts to groundwater. In addition, because the mine pit lake extends to 90 feet below the water table, it is also reasonable to conclude that similar depths can be safely achieved at the Site with risk of impacts to groundwater.

6 Pit Lake Depth

This section is intended to evaluate the potential effects of excavating gravel deeper below the water table than has previously been performed at the Site. One potential issue that may be raised is whether increasing the depth of the pit lake at the Site is likely to cause a potential effect on either groundwater or surface water.

6.1 Effects of Mining Depth in Regard to Groundwater

The pit lake can be viewed conceptually as an aquifer except that the porous sand and gravel aquifer material is removed. Comparing this model with an otherwise unmined saturated aquifer is illustrative because it highlights the actual differences between an underwater aggregate mine operation and other land uses.

6.1.1 Misperception Regarding the Protective Benefits of a Sand and Gravel Aquifer

The protective buffer concept is a commonly expressed belief by the public and others as described in the previous section in regard to UMore Mining area. The idea is derived from the premise that a thick layer of sand and gravel will somehow protect underlying geologic units from contamination. The concern expressed for mining is that removing this layer due to mining will result in greater potential for

contamination of the underlying bedrock used for drinking water supply. While this may sound reasonable, it is not supported by hydrogeologic evidence as described below:

1. The sand and gravel aquifer media has very little ability to neutralize or limit migration of contamination in groundwater. The primary means of attenuation is by mixing due to dispersion which reduces concentrations by dilution.

2. Groundwater flow is primarily horizontal in this geologic setting and vertical mixing is limited. This means that there isn't a downward gradient that would mix a contaminant vertically into the aquifer matrix to reduce concentrations. Most mixing would be limited and occur near the water table within a sand and gravel aquifer.

3. The uppermost bedrock is the Prairie du Chien Group dolostone which is generally not used for water supply in Dakota County due to agricultural contamination. While the Prairie du Chien rock is permeable, modeling studies (Tipping, Runkel et al, 2006) have shown that it is layered and provides a limited barrier to downward vertical migration particularly in the lower portion of the rock known as the Oneota Formation. This means that the bedrock does provide a buffer ability that protects underlying Jodan Sandstone aquifer that the overlying sand and gravel does not.

The main difference between a pit lake compared to a sand and gravel aquifer is the ability of the mine pit lake to mitigate both thermal effects and potential impacts from contamination more effectively than the equivalent thickness of aquifer.

6.2 Potential Beneficial Effects of Mine Pit Lakes

The following section describes the potential of a mine pit lake to mitigate effects of contamination or thermal effects on groundwater. For context, the discussion compares the mixing within the lake to the effects that might be observed if the land use were agricultural without mining.

6.2.1 Mine Pit Lakes and Thermal Mixing with Deeper Water

Deeper mine lakes have a greater proportion of cold water and thoroughly mix annually. This tends to reduce concentrations of contaminants in the lake and also cools the lake so that less warm water is passed through to the aquifer. This hypothesis is supported by research that shows that the layers stratify and mix during the year as described below.

In Minnesota, many deeper mining pit lakes have been developed as a trout fishery supporting populations of rainbow, brook, and lake trout that generally prefer colder temperatures than the brown trout, which is commonly found in the Vermillion River. Tomcko and Pierce (1992) describe a study of 13 mine pit lakes in northern Minnesota and their thermal structure. The uppermost layer is called the epilimnion (see Figure 5 for lake layer descriptions) which includes the water warmed by summer insolation. This layer grades vertically downward into the metalimnion layer marked by the thermocline, a depth where there is a significant transition between the warmer water above and the much colder water in the hypolimnion below. The hypolimnion generally does not warm through the year but may become colder when the lake "turns over" in late fall as air temperatures cool the surface water causing it to become denser and sink into the lake. In general, the thermocline is found between 3 and 7 m (9.8 to 23 ft) below the lake surface in these pit lakes. The location and depth of the thermocline often vary by location on a typical lake and can be influenced by a variety of factors.

Leung (2003) conducted studies on temperature gradients and the uppermost epilimnion layer (see Figure 5 for lake layers) in pit lakes to evaluate their potential as heat sinks for geothermal (renewable)

energy application. The study showed how air temperature and sunlight affect pit lake temperatures. The research describes two pit lakes and found that the top 3 meters (9.8 feet) of water are the most vulnerable to temperature changes. Over a 20-day period in July, air temperatures rose by 15°C, leading to an 8°C increase in the top 3 meters of water. In contrast, water in the metalimnion layer at 6 meters (19.7 feet) showed minimal temperature fluctuations, and water below 10 meters (32.8 feet) in the hypolimnion layer changed by less than 1°C during the 100-day study.

Seasonal turnover or lake mixing occurs as colder air temperatures, evaporation, and heat conduction cool the surface water, increasing its density. This denser water sinks, mixing with deeper layers and equalizing temperatures during late winter. Exposure to below freezing air temps in the winter and ice melts in the spring can drop water temperatures below ambient groundwater temperatures resulting in cold water flux to groundwater. In the early summer as sunlight intensifies, the upper 3 to 15 meters (9.8 – 49 ft) gradually warm, with temperatures peaking in July and September until turnover occurs and the process repeats. This results in alternating seasonal pulses of water that both relatively warmer and colder than ambient groundwater.

These seasonal changes reflect important characteristics of deeper mine pit lakes and suggest that mixing of warmer and cooler waters within the lake can significantly reduce the anticipated thermal effects related to groundwater transport to downgradient streams. The deeper the lake, the greater that proportion of cold water that can dilute thermal effects. In addition, this mixing means that contaminant concentrations from a hypothetical release would also be mitigated before reaching groundwater.

6.2.2 Mixing Related to Dredge Equipment

The dredge equipment used at the Site is a dragline configuration that utilizes overhead cables that are stretched across the lake. The cabling system allows two dragline machines to operate in the pit by ferrying a 6 or 10 cubic yard bucket over the pit lake and releasing it to sink to the bottom of the lake. The bucket is then retracted back to the shoreline where the aggregate is deposited and allowed to drain before being transported to the wash plant for processing. Each dragline cycle takes about 2 minutes for a total of up to 30 passes per hour or about 210 passes per day (not including maintenance or downtime). For a 90-day operating season, this adds up to approximately 19,000 bucket loads. Assuming each bucket is approximate 1600 gallons and is composed of half aggregate and half water, this means that a net amount of 800 gallons per bucket or about 15,000,000 gallons of water is mixed from the bottom to the top of the water column each operating season. Based on the March 2024 aerial photo on Google Earth the pit lake was approximately 1,600,000 sf and on average about 30 feet deep (some areas appear to be significantly deeper and some much shallower) for at total volume of 6.4 million gallons. Based on these measurements, the equivalent of at least two total pit volumes is mixed from the base of the pit lake to the top every operating season. Although most of the mixing would occur as the dredge bucket is extracted, additional mixing can be inferred from the initial placement of the dredge bucket during the dredge pass cycle. Therefore, it appears likely the mixing within the lake by dredge action would minimize potential for potential thermal effects during operations.

6.2.3 Land Use Comparison of Mitigative Effects of Pit Lake

Comparative analysis of different land uses offers insight into the potential beneficial effects of mining compared to other land use such as agriculture. The primary obvious difference between a mine pit lake compared to its use as farmland is that there are no agricultural chemicals needed for a mine operation. The presence of the mine removes contaminants that would otherwise be applied land surface resulting in a lower potential for nitrates or pesticide contamination from mine site compared to agricultural use.

In addition the site is constructed with perimeter berms that prevent agricultural runoff from adjacent areas from flowing onto the property and into the mine pit lake. As discussed in Section 3, fertilizers and nitrate-contaminated runoff from farmland often migrate directly through soil to groundwater and contaminate aquifers and streams in Dakota County (ACRE, 2022).

Finally, the farmland exposed to release would only see attenuation by mixing occurring near the water table within a relatively thin layer of the aquifer. This would spread contamination further from the source of a release than would occur within a mine pit lake. In contrast the mine pit lake would be mixed by wave, dredge, or seasonal turnover and would result in more reduction in concentrations (via dilution) that is not possible in a horizontally stratified aquifer which generally has much more limited ability for mixing and dilution.

7 Summary

Based on the information presented above we find that:

Specifically in regard to thermal effects: Solar insolation from mine pit lakes has been documented at similar sites due to seasonal warming from sunlight known as solar insolation. These effects are presumed to occur at the Site to some degree, but the effects are highly seasonal and are not likely to affect trout streams unless they are very close to the mine site. The effects of solar insolation do not cause a steady source of temperature increase in groundwater temperature. Rather, they occur as a series of alternating seasonal pulses. Research shows these effects are mitigated by winter conditions and mixing in the aquifer. Field studies and groundwater modeling have shown that these thermal effects naturally attenuate within 150 to 250 m (490 to 820 feet) downgradient of the mine pit lake. The closest trout stream tributary that could receive groundwater from the Site is 4,000 feet downgradient.

There are unfortunate misconceptions about sand and gravel mining. However, the operations of a sand and gravel mine like the Site is unlikely to result in environmental contamination because it does not use, store, or dispose of chemicals at the Site. The primary risk is a relatively small amount of fuel used in equipment. A risk evaluation was conducted as part of this report and concludes that the Site poses minimal risk to the environment and on a comparative basis, poses less risk to the environment than if it were an agricultural operation. Groundwater monitoring at the Site does not indicate that there is evidence of contamination to groundwater.

The Site is similar in many respects to the UMore Park mining area which is also a sand and gravel site near the Vermillion River. Numerous investigations and routine monitoring have demonstrated operations at that site are not having a negative affect on groundwater.

Depth of the mine pit lake is not a significant environmental concern. Deeper pit lakes have proportionately less warming potential because the effects of insolation only affect the top 10 to 15 feet of the water column. Mixing of the surface layer with the colder deep water in the mine pit lake is significant during operations and helps minimize potential thermal effects in the pit lake itself before reaching groundwater. Mixing also occurs during the winter months when the surface water cools and sinks into the colder underlying water removing the thermal effects until the following summer. These mixing effects decrease the amount of groundwater that could be affected by the Site.

This latter factor is a critical element in analyzing the interaction of mine pit lakes with respect to thermal effects on groundwater and downgradient streams that receive groundwater because mixing of warm water with deeper cooler water has the potential to mitigate thermal effects before the water ever reaches the aquifer downgradient of the pit lake. For both natural and man-made (e.g. mining) shallow pit lakes, a

greater proportion of the lake volume is exposed to warming from sunlight. Similarly, the mixing is a factor that would serve to attenuate contamination if a hypothetical spill were to be released into the mine pit lake.

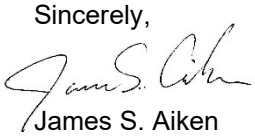
7.1 Conclusions

This analysis confirms the conclusions from earlier studies that the Site is not likely to affect the Vermillion River because the groundwater flow path to the Vermillion River is much greater than the 490 to 820 feet or so needed to attenuate warming from the mine pit lake at the Site. Detailed studies and modeling of thermal effects from mine pit lakes indicate that the timing of the groundwater plume migration suggests that thermal effects on trout streams may be overstated. This is because research shows that even for mine pit lakes in glacial outwash settings located within 820 feet of a trout stream, the warmest groundwater would likely arrive during the winter and early spring months when the ecosystem would be least sensitive to relatively warmer groundwater. Research also shows that thermal effects should dissipate over a shorter distance (e.g. less than 800 feet) for sites with lower hydraulic conductivity and more heterogeneous geology due to greater mixing and contact time with the cooler aquifer matrix.

The depth of the pit lake is not a concern because in general, mixing of warmer surface water with deeper cold water in the lake has a beneficial effect on minimizing thermal effects. Depth of mining below the water table does not increase the potential for groundwater contamination from the Site primarily because there are no significant sources of contamination. However, the deeper the lake the greater the potential for dilution of contaminants that would otherwise not be possible under other land uses that have been shown to cause groundwater contamination in the area (e.g. agriculture).

Please contact me at 952-832-2740 or jaiken@barr.com if you have any questions.

Sincerely,



James S. Aiken
Vice President
P.G. #30282

I certify that this document was prepared by me and/or under my direct supervision and that I am a licensed Professional Geologist in the State of Minnesota.

cc: Pat Ames, Dakota Aggregates
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Wells near Lakeville Kelly Pit

Wells near Lakeville Kelly/Storlie Pits

Well ID	Distance/Direction	Elevation	Total Depth (ft)	Casing Depth (ft)	Open Hole (ft)	Geologic Formation
608254	0.72 miles WSW	1002	180	100	100-180	Prairie Du Chien LS
119626	0.68 miles WSW	994	145	111	111-145	Prairie Du Chien LS
777332	0.61 miles WSW	988	155	110	110-155	Prairie Du Chien LS
755286	0.47 miles SW	1008	180	132	132-180	Prairie Du Chien LS
434059	0.44 miles SW	996	160	132	132-160	Prairie Du Chien LS
428617	0.41 miles SW	994	160	126	126-160	Prairie Du Chien LS
172747	0.38 miles SW	994	145	120	120-145	Prairie Du Chien LS
578262	0.48 miles SSW	990	220	151	151-220	Prairie Du Chien LS
831788	0.36 miles SSW	991	160	109	109-160	Prairie Du Chien LS
597678	0.26 miles SSW	990	180	112	112-180	Prairie Du Chien LS
136483	0.31 miles South	990	140	114	114-140	Prairie Du Chien LS
1000002553	0.45 miles SE	980	160	No Record	No Record	No Record
1000002319	0.47 miles SE	977	25	No Record	No Record	No Record
474673	0.49 miles SE	981	140	111	111-140	Prairie Du Chien LS
747330	0.59 miles NW	989	140	110	110-140	Prairie Du Chien LS

BROSSETH MINING OPERATION

EUREKA TOWNSHIP, MINNESOTA

FINAL MINERAL EXTRACTION & RECLAMATION PLANS–LEVEL THREE PERMIT

FOR

OWNER/APPLICANT – KELLY AGGREGATE, INC.

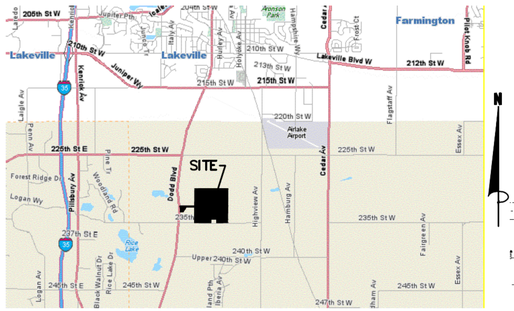
9235 235TH ST. W., LAKEVILLE, MN 55044

PHONE: (612) 685–7967

OPERATOR – AMES CONSTRUCTION, INC.

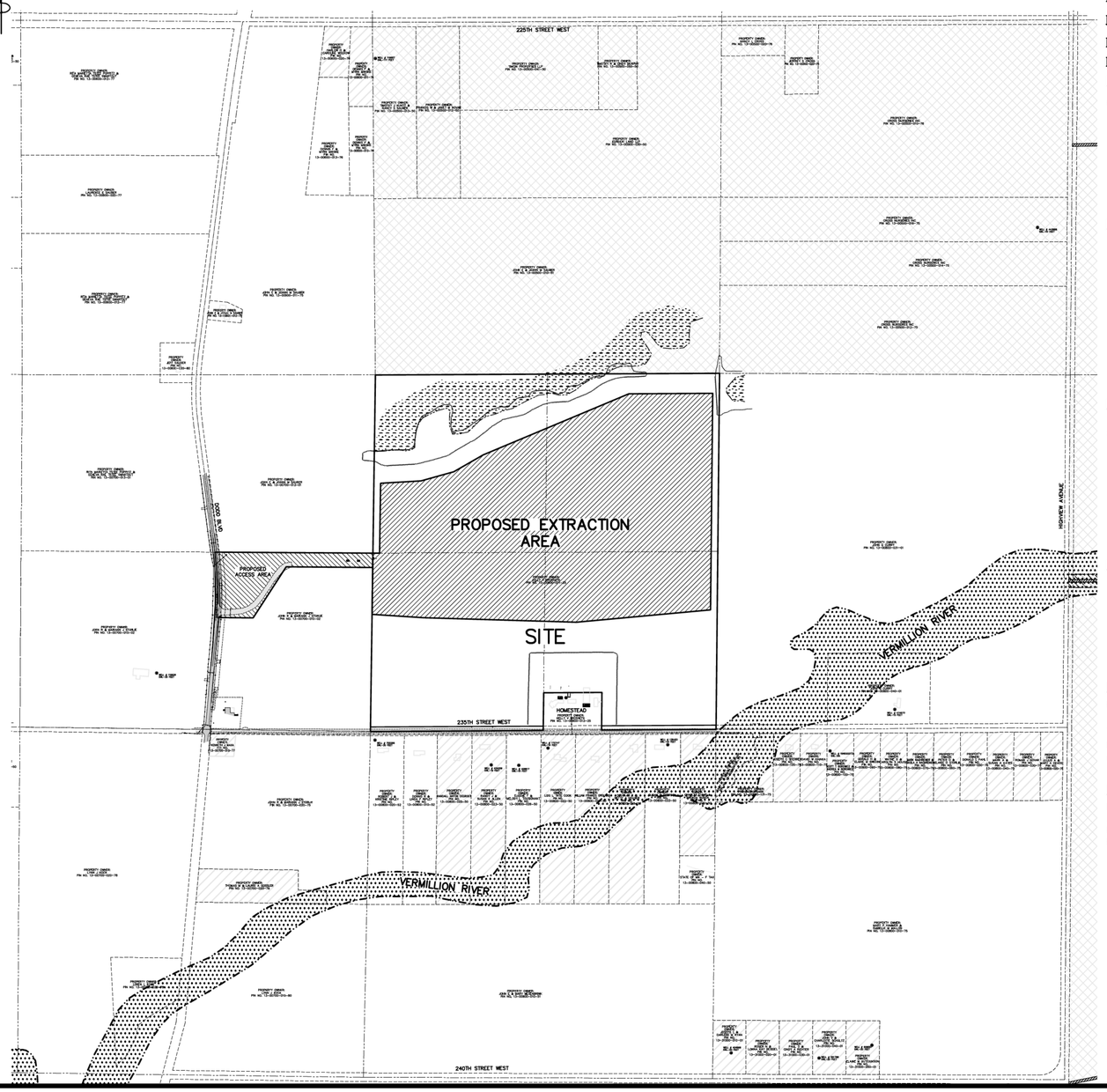
2000 AMES DRIVE, BURNSVILLE, MINNESOTA 55306

PHONE: (952) 435–7106 FAX: (952) 435–7142



LOCATION MAP

NOT TO SCALE



LEGEND

- EXISTING BITUMINOUS SURFACE
- EXISTING CONCRETE SURFACE
- EXISTING GRAVEL SURFACE
- EXISTING BUILDINGS
- EXISTING CONTOUR
- EXISTING TELEPHONE PEDESTAL
- EXISTING DRAIN FIELD CLEAN OUT
- EXISTING CULVERT
- EXISTING GUARDRAIL
- EXISTING TREE LINE
- OHP — OHP — EXISTING OVERHEAD POWER LINE/POWER POLES
- EXISTING BORING LOCATION
- EXISTING WELL LOCATION
- SWL — STATIC WATER LEVEL
- 1000 — PROPOSED CONTOUR
- UNDISTURBED AREA
- PROPOSED SILT FENCE
- PROPOSED HEAVY–DUTY SILT FENCE
- PROPOSED CONSTRUCTION FENCE
- PROPOSED MnDOT NATIVE SEED MIX #340–3" MIN. TOPSOIL–PERMANENT
- MnDOT CATEGORY 3 EROSION CONTROL BLANKET
- SINGLE–FAMILY RESIDENTIAL LAND USE (ALL OTHER PROPERTIES AGRICULTURAL/VACANT) LAND USE DESIGNATION INFORMATION PER EUREKA TOWNSHIP COMPREHENSIVE PLAN (CURRENT WEBSITE DOWNLOAD)
- FEMA LINE
- 100 YEAR FLOOD PLAIN
- 1000' RESIDENTIAL SETBACK LINE
- SECTION CONTAINING TROUT STREAM (PER MPCA SPECIAL AND IMPAIRED WATERS SEARCH)
- TROUT STREAM DESIGNATION(PER MPCA SPECIAL AND IMPAIRED WATERS SEARCH)
- IMPAIRED WATER(PER MPCA SPECIAL AND IMPAIRED WATERS SEARCH)
- 10' SAFETY BENCH (10:1 MAX.)
- RECLAMATION CONTOUR

INDEX

LEGAL DESCRIPTION–SITE–155.53 ACRES

The Northwest Quarter of Section 8, Township 113, Range 20, Dakota County, Minnesota, Excepting therefrom the following parcel:

That part of the Southeast Quarter of the Northwest Quarter of Section 8, Township 113, Range 20, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of the Southeast Quarter of the Northwest Quarter; thence westerly along the South line of the Southeast Quarter of the Northwest Quarter, a distance of 858 feet to the point of beginning; thence northerly parallel to the East line of the Southeast Quarter of the Northwest Quarter, a distance of 283 feet; thence westerly parallel to the South line of the Southeast Quarter of the Northwest Quarter, a distance of 462 feet, more or less, to the West line of the Southeast Quarter of the Northwest Quarter; thence southerly along the West line of the Southeast Quarter of the Northwest Quarter to the South line of the Southeast Quarter of the Northwest Quarter; thence easterly along the South line of the Southeast Quarter of the Northwest Quarter to the point of beginning.

LEGAL DESCRIPTION–PROPOSED EXTRACTION AREA–79.85 ACRES

That part of the Northwest Quarter of Section 8, Township 113, Range 20, Dakota County, Minnesota, described as follows:

Commencing at the southwest corner of said Northwest Quarter; thence North 00 degrees 48 minutes 16 seconds East, assumed bearing along the west line of said Northwest Quarter, a distance of 876.64 feet to the point of beginning of the land to be described; thence continuing North 00 degrees 48 minutes 16 seconds East, along said west line, a distance of 459.66 feet to the northwest corner of the Southwest Quarter of said Northwest Quarter; thence North 89 degrees 42 minutes 06 seconds East, along the north line of said Southwest Quarter of the Northwest Quarter, a distance of 50.01 feet; thence North 00 degrees 48 minutes 16 seconds East a distance of 523.58 feet; thence North 86 degrees 29 minutes 55 seconds East a distance of 302.92 feet; thence North 74 degrees 41 minutes 32 seconds East a distance of 255.92 feet; thence North 59 degrees 57 minutes 40 seconds East a distance of 254.49 feet; thence North 67 degrees 15 minutes 03 seconds East a distance of 1182.51 feet; thence North 89 degrees 43 minutes 04 seconds East a distance of 626.53 feet; thence South 00 degrees 33 minutes 45 seconds West a distance of 1621.84 feet; thence South 84 degrees 43 minutes 13 seconds West a distance of 1009.03 feet; thence North 88 degrees 17 minutes 02 seconds West a distance of 1147.19 feet; thence North 86 degrees 25 minutes 46 seconds West a distance of 365.76 feet to the point of beginning.

LEGAL DESCRIPTION–PROPOSED ACCESS AREA–5.95 ACRES

That part of the South One Half of the Northeast Quarter of Section 7, Township 113, Range 20, Dakota County, Minnesota, described as follows:

Beginning at the northeast corner of the said South One Half of the Northeast Quarter; thence South 00 degrees 48 minutes 16 seconds West, assumed bearing along the east line of said South One Half of the Northeast Quarter, a distance of 106.67 feet; thence North 89 degrees 36 minutes 38 seconds West, a distance of 647.97 feet; thence South 33 degrees 02 minutes 26 seconds West, a distance of 455.28 feet; thence North 89 degrees 36 minutes 38 seconds West a distance of 270.50 feet to the centerline of C.S.A.H. No. 9 as traveled; thence northerly 479.11 feet, along said centerline, being a non-tangential curve, concave to the west, having a central angel of 11 degrees 49 minutes 57 seconds, a radius of 2320.00 feet and a chord bearing of North 01 degree 35 minutes 53 seconds West; thence North 07 degrees 30 minutes 51 seconds West, along said centerline, being tangent to last described curve, a distance 12.14 to the north line of said South One Half of the Northeast Quarter; thence South 89 degrees 36 minutes 38 seconds East along said north line, a distance of 1183.52 feet to the point of beginning.

LEGAL DESCRIPTION–HOMESTEAD–2.84 ACRES

That part of the Southeast Quarter of the Northwest Quarter of Section 8, Township 113, Range 20, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of the Southeast Quarter of the Northwest Quarter; thence westerly along the South line of the Southeast Quarter of the Northwest Quarter, a distance of 858 feet to the point of beginning; thence northerly parallel to the East line of the Southeast Quarter of the Northwest Quarter, a distance of 283 feet; thence westerly parallel to the South line of the Southeast Quarter of the Northwest Quarter, a distance of 462 feet, more or less, to the West line of the Southeast Quarter of the Northwest Quarter; thence southerly along said West line of the Southeast Quarter of the Northwest Quarter to the South line of the Southeast Quarter of the Northwest Quarter; thence easterly along said South line of the Southeast Quarter of the Northwest Quarter to the point of beginning.

PROJECT CONTACTS

PROJECT ENGINEER	KURT QUAINTANCE, P.E.–JAMES R. HILL, INC.	(952)–890–6044 (O) (612)–508–8890 (M)
TOWNSHIP CONSULTING ENGINEER	RON QUANBECK, P.E.–TKDA	(651)–221–4674 (O)
NPDES OFFICER:	BRANDON FINKE–MPCA	(651)–215–0267 (O)
OPERATOR REPRESENTATIVE:	SHAWN DAHL–AMES CONSTRUCTION, INC.	(952)–435–7106 (O)
	PAT MASON–AMES CONSTRUCTION, INC.	(952)–435–7106 (O)

MINERAL EXTRACTION AREA SETBACKS

DWELLING	1000 FEET
ADJACENT PROPERTY LINE	50 FEET
ROAD RIGHT OF WAY	50 FEET
PUBLIC UTILITY	50 FEET

✳ PROPERTY PIN NUMBERS AND PROPERTY OWNER NAMES FROM DAKOTA COUNTY REAL ESTATE INQUIRY WEB SITE

SITE LOCATION

LATITUDE N 44°36'45"
LONGITUDE W 93°15'12"

N

SCALE IN FEET
0 500 1000 1500
1 inch = 500 feet

GOPHER STATE ONE CALL

CALL 48 HOURS BEFORE YOU DIG!
TWIN CITY AREA 651–454–0022
MN. TOLL FREE 1–800–252–1166

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2500 W. Cty. Rd. 42, Suite 120, Burnsville, MN 55337
PHONE: (952)890–6044 FAX: (952)890–6244

I hereby certify that this plan, report or specification was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

KURT QUAINTANCE
Reg.No. 24676
Date: 7/31/08

BROSSETH MINING OPERATION
EUREKA TOWNSHIP, MINNESOTA
TITLE SHEET
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY	CJK
DATE	7/31/08
REVISIONS	
8/21/08 ADDED END USE CROSS SECTION SHEET	
8/26/08 REV. ACCESS/HAUL ROAD	
9/03/08 ADDED CONSTRUCTION FENCING	
10/21/08 REVISED EXTRACTION PLAN	
1/08/09 REVISED PER EAW	
2/12/09 REV PER MPCA REQUIREMENTS	
5/20/25 REV BOTTOM ELEV	
CAD FILE	22507–10TS
PROJECT NO.	22507–10
	1.1

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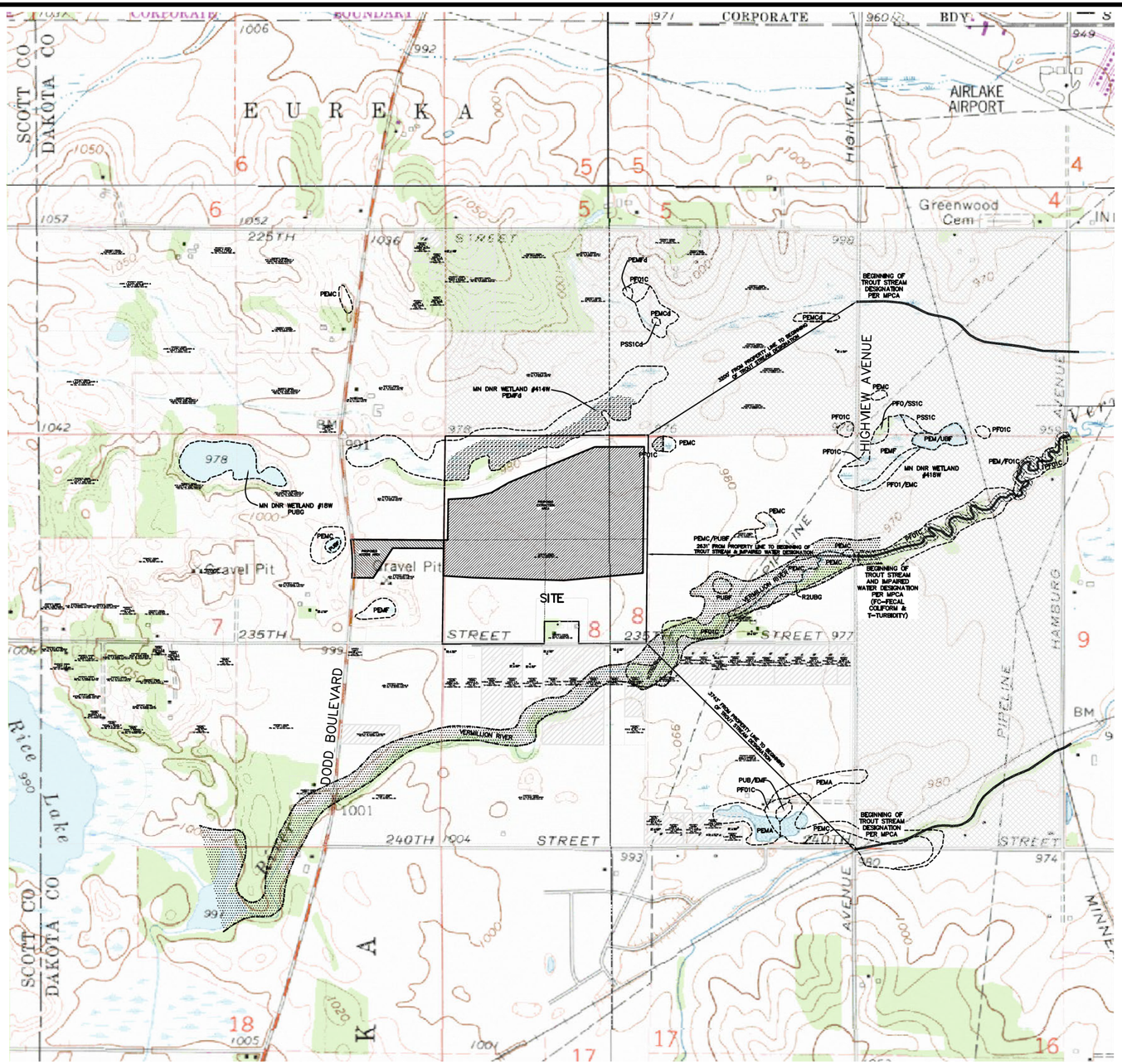


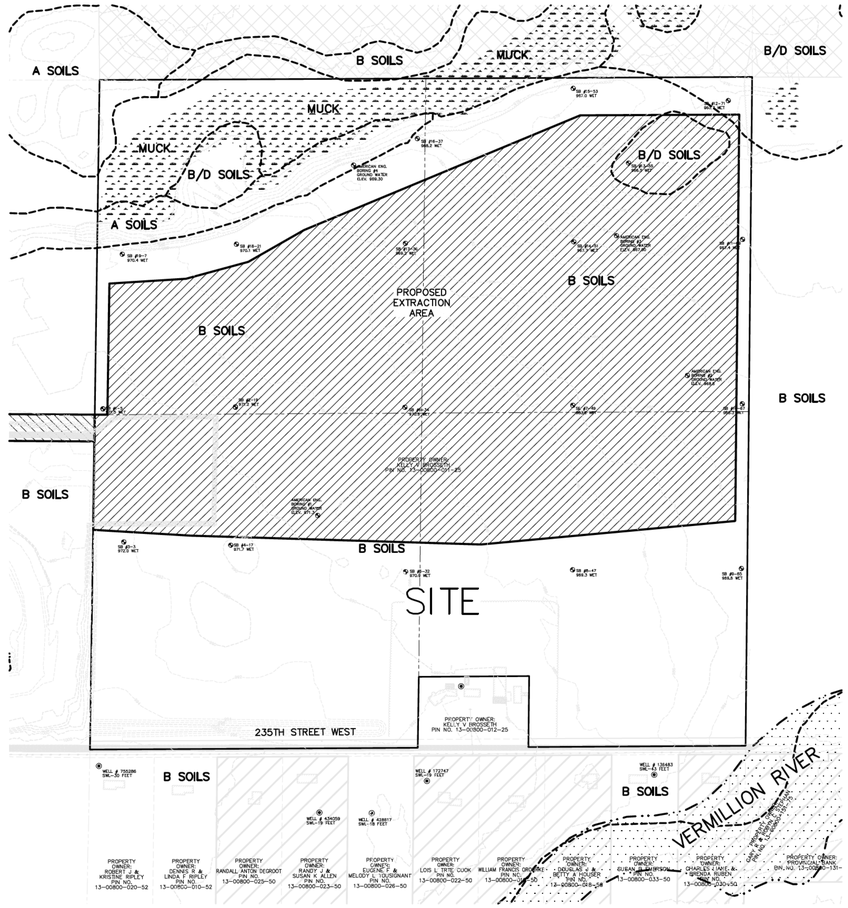
USGS MAP

SCALE IN FEET
0 800 1600 2400
1 inch = 800 feet

WETLAND CLASSES AND SUB-CLASSES

PALUSTRINE (P)	EMERGENT (EM)	PERSISTENT (1)
	FORESTED (FO)	SEASONALLY FLOODED (C)
	UNCONSOLIDATED BOTTOM (UB)	SEMIPERMANENTLY FLOODED (F)
	SCRUB - SHRUB (SS)	INTERMITTENTLY EXPOSED (G)
		TEMPORARILY FLOODED (A)

Hydrologic Soil Group	Soil Textures
A	Sand, loamy sand, or sandy loam
B	Silt loam or loam
C	Sandy clay loam
D	Clay loam, silty clay loam, sandy clay, silty clay, or clay



SOIL GROUP MAP

SCALE IN FEET
0 300 600 900
1 inch = 300 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2500 W. Cty. Rd. 42, Suite 120, Burnsville, MN 55337
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Kurt Quantance
Date: 7/31/08 Reg.No. 24676

BROSSETH MINING OPERATION
EUREKA TOWNSHIP, MINNESOTA
FOR
SITE INFORMATION
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY	CJK
DATE	7/31/08
REVISIONS	
8/26/08 REV. ACCESS/HAUL ROAD	
2/12/09 REV PER MPCA REQUIREMENTS	
CAD FILE	22507-10SI
PROJECT NO.	22507-10
	1.2

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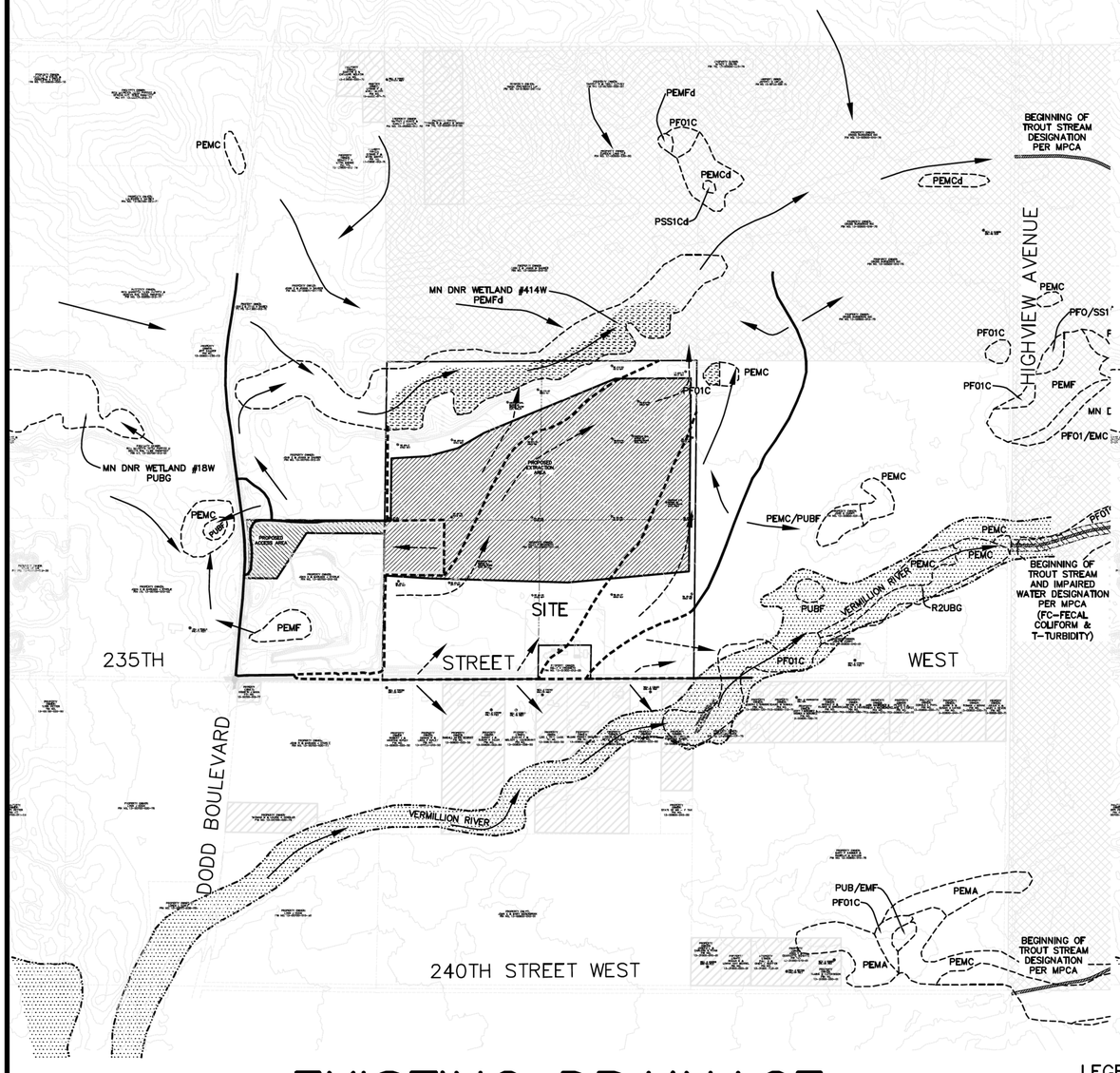
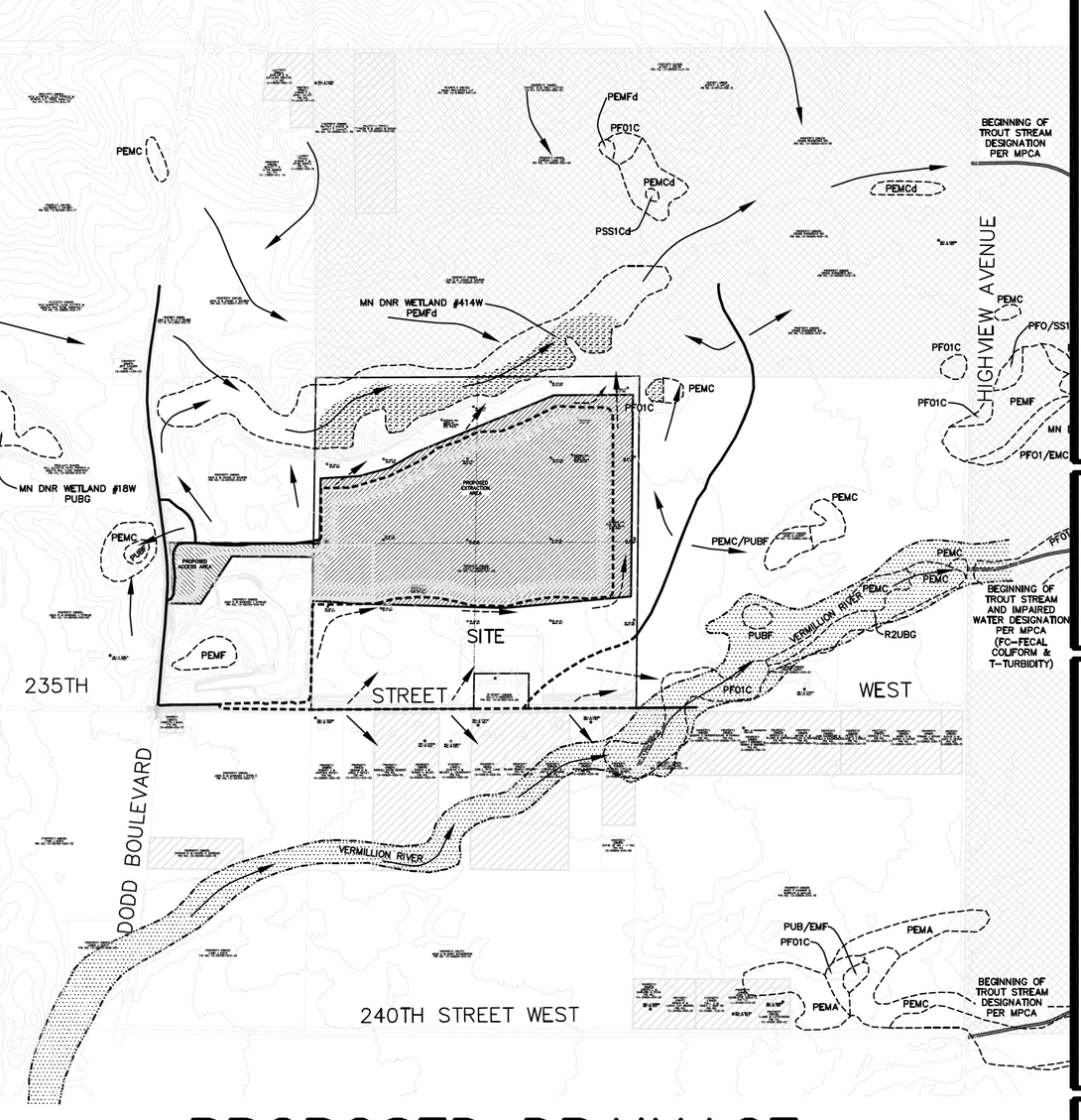


EXISTING DRAINAGE



PROPOSED DRAINAGE

LEGEND

- REGIONAL DRAINAGE BOUNDARY
- SITE DRAINAGE BOUNDARY
- FLOW DIRECTION

N

SCALE IN FEET
0 600 1200 1800
1 inch = 600 feet

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Kurt Quantance
Date: 7/31/08 Reg.No. 24676

BROSSETH MINING OPERATION
EUREKA TOWNSHIP, MINNESOTA
SITE INFORMATION
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY	CJK
DATE	7/31/08
REVISIONS	
8/26/08 REV. ACCESS/HAUL ROAD	
10/21/08 REVISED EXTRACTION PLAN	
2/12/09 REV PER MPCA REQUIREMENTS	
CAD FILE	22507-10SI
PROJECT NO.	22507-10
	1.3

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CONSTRUCTION SAND & GRAVEL, ROCK QUARRYING AND HOT MIX ASPHALT PRODUCTION FACILITIES - NPDES REQUIREMENTS

* THE BROSSETH MINING OPERATION-LEVEL THREE PLAN CONTAINS ALL NECESSARY REQUIRED ITEMS OF THE POLLUTION PREVENTION PLAN *

TEMPORARY EROSION & SEDIMENTATION CONTROL METHODS

1. TEMPORARY MULCH MnDOT TYPE 1 AT A RATE OF 2 TONS/ACRE AND DISC ANCHORED.

2. HYDROSPREAD MnDOT TYPE 6 HYDRAULIC SOIL STABILIZER.
   a. HYDRAULIC SOIL STABILIZER : MnDOT TYPE 6 AT A RATE OF 350 LBS/1000 GALLONS OF SLURRY.
   b. WATER : 875 GALLONS/1000 GALLONS OF SLURRY.

3. TEMPORARY SEED & MULCH (SEASONAL)
   a. SEED : MnDOT SEED MIX #150 AT A RATE OF 40 LBS/ACRE.
   b. MULCH : MnDOT TYPE 1 AT A RATE OF 2 TONS/ACRE AND DISC ANCHORED.
   c. FERTILIZER : 10-10-20 AT A RATE OF 200 LBS/ACRE.

4. TEMPORARY SEED & MULCH (SPRING)
   a. SEED : MnDOT SEED MIX #110 AT A RATE OF 100 LBS/ACRE.
   b. MULCH : MnDOT TYPE 1 AT A RATE OF 2 TONS/ACRE AND DISC ANCHORED.
   c. FERTILIZER : 10-10-20 AT A RATE OF 200 LBS/ACRE.

5. TEMPORARY SEED & MULCH (WINTER)
   a. SEED : MnDOT SEED MIX #100 AT A RATE OF 100 LBS/ACRE.
   b. MULCH : MnDOT TYPE 1 AT A RATE OF 2 TONS/ACRE AND DISC ANCHORED.
   c. FERTILIZER : 10-10-20 AT A RATE OF 200 LBS/ACRE.

6. HYDROSPREAD SEED, FERTILIZER, & MnDOT TYPE 6 HYDRAULIC SOIL STABILIZER.
   a. SEED : MnDOT SEED MIX #190 AT A RATE OF 10 LBS/1000 GALLONS OF SLURRY.
   b. FERTILIZER : 10-10-20 AT A RATE OF 50 LBS/1000 GALLONS OF SLURRY.
   c. HYDRAULIC SOIL STABILIZER : MnDOT TYPE 6 AT A RATE OF 350 LBS/1000 GALLONS OF SLURRY.
   d. WATER : 875 GALLONS/1000 GALLONS OF SLURRY.

7. TEMPORARY SEDIMENTATION BASINS WITH STANDPIPE OUTLET & EMERGENCY SPILLWAY (SEE DETAIL).

8. TEMPORARY SEDIMENTATION TRAP WITH SPILLWAY (SEE DETAIL).

9. ROCK CONSTRUCTION ENTRANCE (SEE DETAIL).

10. HORIZONTAL SLOPE GRADING (SEE DETAIL).

11. DITCH CHECKS MnDOT TYPE 3-12" BIOROLL WITH MnDOT CATEGORY 3 EROSION CONTROL BLANKET (SEE DETAIL).

12. EROSION CONTROL BLANKET MnDOT CATEGORY 3 (SEE DETAIL).

13. PERIMETER SILT FENCE (SEE DETAILS).

14. INLET PROTECTION (SEE DETAILS).

PERMANENT EROSION & SEDIMENTATION CONTROL METHODS

1. GENERAL NATIVE SEED & MULCH - PERMANENT SCREENING BERMS (MIN. 3" TOPSOIL)
   a. SEED : MnDOT SEED MIX #340 AT A RATE OF 84.5 LBS/ACRE.
   b. FERTILIZER : 17-10-7 NATURAL BASE AT A RATE OF 150 LBS.ACRE.
   c. MULCH : MnDOT TYPE 3 AT A RATE OF 2 TONS/ACRE AND DISC ANCHORED.

2. GENERAL SEED & MULCH-DODD BLVD SLOPES (MIN. 3" TOPSOIL)
   a. SEED : MnDOT SEED MIX #250 AT A RATE OF 70 LBS/ACRE.
   b. FERTILIZER : 23-0-30 NPK AT A RATE OF 200 LBS.ACRE.
   c. MULCH : MnDOT TYPE 1 AT A RATE OF 2 TONS/ACRE AND DISC ANCHORED.

NARRATIVE & NOTES

1. THE BROSSETH MINING OPERATION, APPROXIMATELY 155.53 ACRES, IS TO BE EXCAVATED THEN RECLAIMED AND RESPREAD WITH TOPSOIL TO THE PROPOSED ELEVATIONS, AND STABILIZED.

2. PHASE CONSTRUCTION TO MINIMIZE SOIL LOSS.

3. ALL EROSION & SEDIMENT CONTROL MEASURES CALLED FOR ON THESE PLANS AND SPECIFICATIONS, WHICH MAY INCLUDE SILT FENCE, TEMPORARY SEDIMENTATION BASINS OR TEMPORARY SEDIMENT TRAPS, SHALL BE CONSTRUCTED AND SERVICEABLE IN THE FOLLOWING ORDER, AS REQUIRED.
   a. ROCK CONSTRUCTION ENTRANCES.
   b. SILT FENCE & TREE PROTECTION FENCE.
   c. EXISTING INLET PROTECTION.
   d. TEMPORARY CULVERTS.
   e. TEMPORARY SEDIMENTATION BASINS, TRAPS, AND OUTFALL FACILITIES.
   f. STORM WATER POND CONSTRUCTION.
   g. COMMON EXCAVATION AND EMBANKMENT, UTILITY INSTALLATION AND STREET CONSTRUCTION.
   h. TEMPORARY SEED AND/OR MULCH.
   i. HORIZONTAL SLOPE GRADING.
   j. DITCH CHECK, SILT FENCE, & EROSION CONTROL BLANKET.
   k. PERMANENT SEED AND MULCH OR CROP.

4. THE OPERATOR SHALL PROVIDE AND MAINTAIN ALL EROSION & SEDIMENT CONTROL MEASURES AS SHOWN ON THESE PLANS AND SPECIFICATIONS AND IMPLEMENT ANY ADDITIONAL EROSION & SEDIMENT CONTROL MEASURES NECESSARY IN ORDER TO PROTECT ADJACENT PROPERTY.

5. ALL EROSION & SEDIMENT CONTROL FACILITIES SHALL BE MAINTAINED BY THE OPERATOR DURING CONSTRUCTION OPERATIONS. ANY TEMPORARY FACILITIES WHICH ARE TO BE REMOVED AS CALLED FOR ON THESE PLANS AND SPECIFICATIONS SHALL BE REMOVED BY THE OPERATOR WHEN DIRECTED BY THE ENGINEER. THE OPERATOR SHALL THEN RESTORE THE SUBSEQUENTLY DISTURBED AREA IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS.

6. THE OPERATOR SHALL PROVIDE OR CONSTRUCT TEMPORARY STORM WATER DRAINAGE FACILITIES AS MAY BE REQUIRED TO ALLOW THE OPERATOR TO CONDUCT CONSTRUCTION OPERATIONS WITHIN THE AREAS AS SHOWN ON THE PLAN AND AT THE SAME TIME MAINTAIN STORM WATER DRAINAGE THROUGH THE SERIES OF AFFECTED STORM WATER PONDING AREAS.

7. DO NOT DISTURB ANY AREA UNTIL IT IS NECESSARY FOR CONSTRUCTION TO PROCEED.

8. WHEREVER POSSIBLE, PRESERVE THE EXISTING TREES, GRASS, AND OTHER VEGETATIVE COVER TO HELP FILTER RUNOFF.

9. COVER OR STABILIZE ALL DISTURBED AREAS AS SOON AS POSSIBLE (SEE NPDES PERMIT TIMELINE REQUIREMENTS ABOVE).

10. TIME CONSTRUCTION ACTIVITIES TO LIMIT IMPACT FROM SEASONAL CLIMATE CHANGES OR WEATHER EVENTS.

11. DO NOT REMOVE TEMPORARY PERIMETER CONTROLS UNTIL AFTER ALL UPSTREAM AREAS ARE FINALLY STABILIZED.

12. IT IS THE RESPONSIBILITY OF THE OPERATOR TO KEEP PUBLIC STREETS, TRAVEL WAYS, PARKING LOTS AND TRAILS UTILIZED FOR INGRESS TO AND EGRESS FROM THE CONSTRUCTION SITE FREE OF DIRT AND OTHER DEBRIS WHICH RESULTS FROM SAID CONSTRUCTION. A SWEEPER WILL BE AVAILABLE AS NEEDED TO REMOVE DIRT TRACTED ONTO DODD BLVD BY THE MINING OPERATION.

13. ADEQUATE CONTROL OF DUST SHALL BE MAINTAINED BY THE OPERATOR; WATER TRUCKS AVAILABLE AS NEEDED.

Chapter 1. General Aggregate/Asphalt

4. General Permit Requirements

Water Quality Impaired Waters

4.1 If a site discharges to a water of the state that appears on the current U.S. Environmental Protection Agency (USEPA) approved list of impaired waters under Section 303 (d) of the Clean Water Act (33 U.S.C. Sec 303 (d)), the Permittee must review whether changes may be warranted in the site's Pollution Prevention Plan (Plan) to reduce the impact of the discharge. If an USEPA approved Total Maximum Daily Load (TMDL) has been developed, the Permittee must review the adequacy of the Plan to meet the TMDLs Waste Load Allocation. If the Plan is not meeting the applicable requirements, schedules and objectives of the TMDL, the Permittee must modify the site's Plan as appropriate, within 18 months after the TMDL Waste Load Allocation is approved.

5. Surface Discharges

General

5.1 Except for stormwater and sand and gravel mine pit dewatering flows meeting the terms of this permit, discharges of wastewater to waters of the state are not authorized by this permit.

5.2 A wastewater discharge shall not cause or contribute to a violation of water quality standards unless the discharge meets all requirements of 40 CFR 122.44.

5.3 The MPCA may modify this permit, require corrective actions or take other actions if it determines that a discharge authorized by this permit is causing or contributing to a violation of water quality standards.

5.4 Floating solids or visible foam shall not be discharged in other than trace amounts.

5.5 Oil or other substances shall not be discharged in amounts that create a visible color film.

5.6 Any outlet pipe, culvert or hose outlets for the discharge shall be located on the ground. The Permittee shall install and maintain outlet protection measures, such as properly sized riprap, splash pads or gabions at the discharge stations (outlets) to prevent erosion.

5.7 All water from dewatering or basin draining activities must be discharged in a manner that does not cause nuisance conditions, erosion in receiving channels or on downslope properties, or inundation in wetland causing significant adverse impact to the wetland.

5.8 Requirements for Discharging to Wetlands:

If the site has any discharges with the potential for significant adverse impacts to a wetland (e.g., conversion of a natural wetland to a stormwater pond), the Permittee must demonstrate that the wetland mitigative sequence has been followed.

If the potential adverse impacts to a wetland on a specific site have been addressed by permits or other approvals from an official statewide program (U.S. Army Corps of Engineers 404 program, Minnesota Department of Natural Resources, or the State of Minnesota Wetland Conservation Act) that are issued specifically for the site, the Permittee may use the permit or other determination issued by these agencies to show that the potential adverse impacts have been addressed. For the purposes of this permit, dminimus actions are determinations by the permitting agency that address the site impacts, whereas a non-jurisdictional determination does not address site impacts.

5.9 If there are impacts from the site that are not addressed in one of the permits or other determinations (e.g., permanent inundation or flooding of the wetland, significant degradation of water quality, excavation, filling, draining), the Permittee must minimize all adverse impacts to wetlands by utilizing appropriate measures. Measures used must be based on the nature of the wetland, its vegetative community types and the established hydrology. These measures include in order of preference:

a. Avoid all significant adverse impacts to wetlands from site discharges.

b. Minimize any unavoidable impacts to wetlands from site discharges.

c. Provide compensatory mitigation when the Permittee determines that there is no reasonable and practicable alternative to having a significant adverse impact on a wetland. For compensatory mitigation, wetland restoration or creation shall be of the same type, size and wherever reasonable and practicable in the same watershed as the impacted wetland.

Stormwater

5. Surface Discharges

5.10 For stormwater discharges within 2000 feet of Outstanding Resource Value Waters (ORVWs) as defined in Minn. R. 7050.0180, subp.3, 4, 5, 6 and 6a, except calcareous fens listed in Minn. R. 7050.0180, Minn. R. 7050.0470, and/or to trout waters as listed in Minn. R. 6264.0050, subp. 2 and 4, the following additional Best Management Practices (BMPs) apply:

a. All exposed soil areas with a slope of 3:1 or steeper, that have a continuous positive slope to a ORVW or trout waters must have temporary erosion protection or permanent cover within 3 days after the area is no longer actively being worked. All other slopes that have a continuous positive slope to a ORVW or trout waters must have temporary erosion protection or permanent cover within seven (7) days after the area is no longer actively being worked.

b. Temporary sediment basin requirements must be used for common drainage locations that serve an area with five (5) or more acres disturbed at one time.

c. The water quality volume that must be treated by the site's stormwater management system shall be one (1) inch of runoff from the new impervious surfaces created at the site.

d. An undisturbed buffer zone of not less than 100 linear feet from the receiving water (not including tributaries) shall be maintained at all times. Exceptions from this requirement for areas, such as water crossings or limited water access, are allowed if the Permittee fully documents in the Plan the circumstances and reasons that the buffer encroachment is necessary. All potential water quality, scenic and other environmental impacts of these exceptions must be minimized and documented in the Plan for the site.

5.11 For stormwater discharges within 2000 feet of those ORVWs identified in Minn. R. 7050.0180 subp. 3, 4, and 5, Minn. R. 7050.0470, and trout lakes identified in Minn. R. 6264.0050 subp.2 the stormwater management system must be designed such that the pre and post project runoff rate and volume from the 1 and 2-year 24-hour precipitation events remains the same.

5.12 For stormwater discharges within 2000 feet of trout streams as listed in 6264.0050 subp. 4, the following additional BMPs for temperature controls apply:

The stormwater management system must be designed such that the discharge from the site will minimize any increase in the temperature of trout stream receiving waters resulting from the 1 and 2-year 24-hour precipitation events. This includes all tributaries of designated trout streams within the section that the trout stream is located. Sites that discharge to trout streams must minimize the impact using one or more of the following measures, in order of preference:

a. Minimize new impervious surfaces.

b. Minimize the discharge from connected impervious surfaces by discharging to vegetated areas, or grass swales, and through the use of other non-structural controls.

c. Infiltration or evapotranspiration of runoff in excess of pre-project conditions (up to the 2-year 24-hour precipitation event).

d. If ponding is used, the design must include an appropriate combination of measures such as shading, filtered bottom withdrawal, vegetated swale discharges or constructed wetland treatment cells that will limit temperature increases. The pond should be designed to draw down in 24 hours or less.

e. Other methods that will minimize any increase in the temperature of the trout stream.

Erosion Prevention Practices

5. Surface Discharges

5.13 The Permittee must plan for and implement appropriate phasing, vegetative buffer strips, horizontal slope grading, and other practices that minimize erosion. The location of areas not to be disturbed must be delineated (e.g. with flags, stakes, signs, silt fence etc.) on the site before work begins.

5.14 All exposed soil areas with a continuous positive slope that pose a risk of sediment discharge to waters (not including water inside the pit), must have temporary erosion protection or permanent cover for the exposed soil areas year round, according to the following slopes and time frames:

Type of Slope	Time (Maximum time an area can remain open when the area is not actively being worked.)
Steeper than 3:1	7 days
10:1 to 3:1	14 days
Flatter than 10:1	21 days

These areas include constructed stormwater management pond side slopes, and any exposed soil areas with a positive slope to a stormwater conveyance system, such as a curb and gutter system, storm sewer inlet, temporary or permanent drainage ditch or other natural or man-made systems that discharge to a surface water.

5.15 The normal wetted perimeter of any temporary or permanent drainage ditch that drains water from a site, or diverts water around a site, must be stabilized within 200 lineal feet from the property edge, or from the point of discharge to any surface water. Stabilization must be completed within 24 hours of connecting to a surface water.

5.16 Pipe outlets must be provided with temporary or permanent energy dissipation within 24 hours of connection to a surface water.

Sediment Control Practices

5.17 Sediment control practices must minimize sediment from entering surface waters, including curb and gutter systems and storm sewer inlets.

a. Sediment control practices must be established on all down gradient perimeters before any upgradient land disturbing activities begin. These practices shall remain in place until final stabilization has been established.

b. If the down gradient treatment system is overloaded, additional upgradient sediment control practices must be installed to eliminate the overloading, and the Pollution Prevention Plan must be amended to identify these additional practices.

5.18 The timing of the installation of sediment control practices may be adjusted to accommodate short-term activities such as clearing or grubbing, or passage of vehicles. Any short-term activity must be completed as quickly as possible and the sediment control practices must be installed immediately after the activity is completed. However, sediment control practices must be installed before the next precipitation event even if the activity is not complete.

5.19 All storm drain inlets must be protected by appropriate Best Management Practices (BMPs) until all sources with potential for discharging to the inlet have been stabilized.

5.20 Temporary erodable stockpiles or strippings/overburden stored outside the pit must have silt fence or other effective sediment controls, and cannot be placed in surface waters, including stormwater conveyances such as curb and gutter systems, or conduits and ditches.

5.21 Vehicle tracking of sediment onto paved surfaces from the site or operation must be minimized by BMPs such as stone pads, concrete or steel wash racks, or equivalent systems. Street sweeping must be used if such BMPs are not adequate to prevent sediment from being tracked onto the street.

5. Surface Discharges

5.22 Where ten (10) or more acres of disturbed soil drain to a common location, a sediment basin must be provided prior to the runoff leaving the site or entering surface waters. The Permittee is encouraged, but not required, to install temporary sediment basins where appropriate in areas with steep slopes or highly erodible soils even if less than ten (10) acres drains to one area. The basins must be designed and constructed according to the following requirements:

a. The basins must provide storage below the outlet pipe for a calculated volume of runoff from a 2 year, 24 hour storm from each acre drained to the basin, except that in no case shall the basin provide less than 1800 cubic feet of storage below the outlet pipe from each acre drained to the basin.

b. Where no such calculation has been performed, a sediment basin providing 3,600 cubic feet of storage below the outlet pipe per acre drained to the basin, shall be provided where attainable until final stabilization of the site.

c. Temporary basin outlets must be designed to prevent short-circuiting and the discharge of floating debris. The basin must be designed with the ability to allow complete basin drawdown (e.g., perforated riser pipe wrapped with filter fabric and covered with crushed gravel, pumps or other means) for maintenance activities, and provide a stabilized emergency overflow to prevent failure of pond integrity. Energy dissipation must be provided for the basin outlet.

d. Where the sediment basin is not attainable due to site limitations, equivalent sediment controls such as smaller basins, and/or sediment traps, silt fences, vegetative buffer strips, or any appropriate measures are required for all down slope boundaries of the area and for those side slope boundaries deemed appropriate by individual site conditions.

5.23 In determining whether installing a sediment basin is attainable, the Permittee must consider public safety and may consider factors such as site soils, slope, and available area on site. This determination must be documented in the Pollution Prevention Plan.

5.24 All nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs. The Permittee must investigate and comply with the following requirements:

a. All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/3 of the height of the fence.

b. If utilizing sedimentation basins, the basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches 1/2 the storage volume.

c. Surface waters, including drainage ditches and conveyance systems, must be inspected for evidence of sediment being deposited by erosion. The Permittee must remove all deltas and sediment deposited in surface waters, including drainage ways, catch basins, and other drainage systems, and re-stabilize the areas where sediment removal results in exposed soil. This removal and stabilization must take place unless precluded by legal, regulatory, or physical access constraints. The Permittee shall use all reasonable efforts to obtain access. If precluded, removal and stabilization must take place within seven calendar days of obtaining access. The Permittee is responsible for contacting all local, regional, state and federal authorities and receiving any applicable permits prior to conducting any work.

d. Tracked sediment onto offsite paved surfaces must be removed.

e. All infiltration areas must be inspected to ensure that no sediment from ongoing activities is reaching the infiltration area and these areas are protected from compaction due to equipment driving across the infiltration area.

6. Pollution Prevention Plan

Inspection and Maintenance

6.11 At least one of the designated employees shall inspect the site at least monthly during active operations to ensure that the Plan is followed, and that the Permittee is in compliance with the requirements of this permit.

6.12 The Permittee shall keep a written record of the inspections, and shall update the information required for the Annual Report/Site Inventory Form, as needed.

6.13 All inspections and maintenance conducted must be recorded in writing and these records must be retained with the Pollution Prevention Plan. Records of each inspection and maintenance activity shall include:

a. Date and time of inspections;

b. Name of person(s) conducting inspections;

c. Findings of inspections, including recommendations for corrective actions;

d. Corrective actions taken (including dates, times, and party completing maintenance activities);

e. Date and amount of all rainfall events greater than 1/2 inch (0.5 inches) in 24 hours, obtained by actual measurement at the site, data from the nearest National Weather Station or local precipitation data found at http://www.crh.noaa.gov/mpx/ and

f. Documentation of changes made to the Plan.

7. Facility Operation

Final Stabilization and Closure

7.1 In order to be released from the inspection, recording and reporting requirements of this permit for a site where the Permittee no longer conducts the activities authorized by this permit, the Permittee shall ensure and certify on the Annual Report/Site Inventory Form that:

a. There is no stormwater runoff and/or pit dewatering from the site; or

b. The Permittee certifies that a new owner or operator has assumed responsibility for the site; or

c. The site closure achieves final stabilization.

7. Facility Operation

7.2 Site closure must achieve final stabilization as follows:

a. The drainageways that leave the site are stabilized to prevent erosion with riprap or other protective material.

b. The soil disturbing activities at the site are completed and all soils are stabilized by a uniform perennial vegetative cover with a density of 70 percent over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions.

c. The drainage ditches constructed to drain water from the site are stabilized to preclude erosion.

d. The temporary synthetic, and structural erosion prevention and sediment control BMPs (such as silt fence) are removed.

e. The Permittee cleans out all sediment from conveyances and from temporary sedimentation basins that are to be used as permanent water quality management basins; sediment must be stabilized to prevent it from being washed back into the basin, conveyances or drainage-ways discharging off-site or to surface waters. The cleanout of permanent basins must be sufficient to return the basin to design capacity.

f. The Permittee installs permanent stormwater treatment for new impervious surfaces created as a result of the activities covered by this permit. The permanent stormwater treatment must be designed for 0.5 inches of runoff from all created impervious surfaces.

g. Other BMPs as necessary are implemented so as to prevent erosion from the site excavation areas and stockpiles that have been used by the Permittee.

7.3 A Permittee seeking to certify that a site complies with this part shall inspect the site to verify compliance before providing certification to the MPCA.

7.4 After the Permittee has certified on the Annual Report/Site Inventory Form that a site complies with this part, the site can be released and the Permittee is no longer required to inspect, record and report on that site.

RESPONSIBILITY REQUIREMENTS

AMES CONSTRUCTION, INC. WILL HAVE RESPONSIBILITY FOR IMPLEMENTATION OF THE SWPPP BEFORE AND DURING CONSTRUCTION.

THE OPERATOR SHALL PROVIDE THE OWNER WITH A CHAIN OF RESPONSIBILITY WITH ALL OPERATORS ON SITE TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AS FOLLOWS:

OPERATOR : AMES CONSTRUCTION, INC. (BUSINESS NAME)

SHAWN DAHL (952)-435-7106 (O) (CONTACT PERSON / TELEPHONE (INCLUDE AREA CODE))

PAT MASON (952)-435-7106 (O) (CONTACT PERSON / TELEPHONE (INCLUDE AREA CODE))

(CONTACT PERSON / TELEPHONE (INCLUDE AREA CODE))

THE OPERATOR SHALL FOLLOW THE IMPLEMENTATION SEQUENCE AS SHOWN ON THIS SHEET.

OPERATOR SHALL ADHERE TO ALL THE REQUIREMENTS OF THE MINNESOTA POLLUTION CONTROL- **CONSTRUCTION SAND & GRAVEL, ROCK QUARRYING AND HOT MIX ASPHALT PRODUCTION FACILITIES PERMIT.**

ALL BEST MANAGEMENT PRACTICES (BMP'S) SELECTED SHALL BE APPROPRIATE FOR THE TIME OF YEAR, SITE CONDITIONS AND ESTIMATED DURATION OF USE.

A COPY OF THESE PLANS & RECORDS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.

POTENTIAL ON-SITE POLLUTION SOURCES

EXCAVATION, CRUSHERS & SCREENERS, OVERBURDEN STOCKPILES, MATERIAL LOADING, HAUL ROAD, VEHICLE PARKING, & FUEL STORAGE TANK.

TRAINING REQUIREMENTS

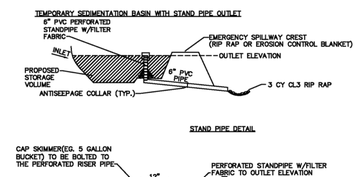
KURT D. QUAINTANCE, P.E.
DESIGN OF SWPPP CERTIFICATION (2007)
UNIVERSITY OF MINNESOTA
INSTRUCTORS : LEO HOLM & DEWAYNE STENLUND

DEVELOPMENT SUMMARY

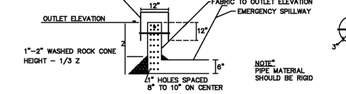
TOTAL SITE AREA	161.48 AC.
TOTAL DISTURBED AREA	75.71 AC.
EXISTING IMPERVIOUS AREA	0.83 AC.
PROPOSED IMPERVIOUS AREA	1.75 AC.

PROPOSED EROSION/SEDIMENT CONTROL QUANTITIES

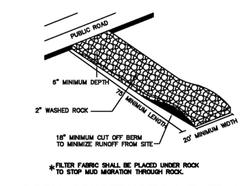
SILT FENCE	885 LF
HEAVY-DUTY SILT FENCE	1367 LF
CONSTRUCTION FENCE	7820 LF
DITCH CHECK DAMS	8 EA
CATEGORY 3 EROSION CONTROL BLANKET	2178 SY
TEMPORARY SEED & MULCH	1.7 AC
MnDOT #250 SEED & MULCH	0.5 AC
MnDOT #340 SEED & MULCH	18.4 AC



STAND PIPE DETAIL

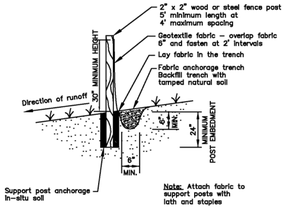


TEMPORARY SEDIMENTATION BASIN

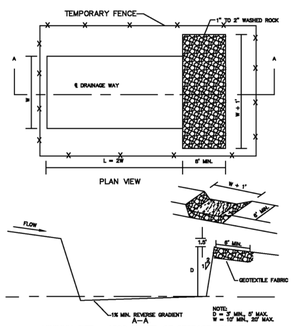


*FILTER FABRIC SHALL BE PLACED UNDER ROCK TO STOP MUD MIGRATION THROUGH ROCK.

ROCK CONSTRUCTION ENTRANCE

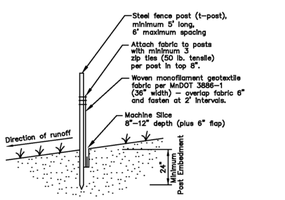


SILT FENCE

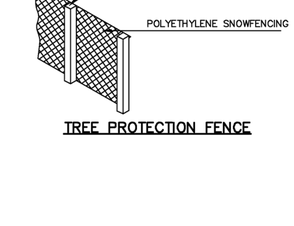


MINIMUM SIZE – 1800 CU. FT. OF STORAGE VOLUME FOR EACH ACRE DRAINING TO THE TRAP

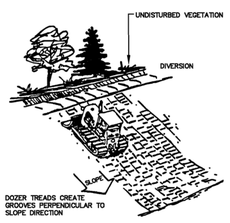
TEMPORARY SEDIMENT TRAP



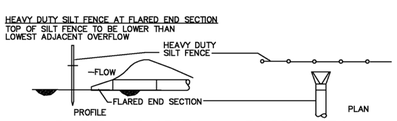
SILT FENCE HEAVY DUTY



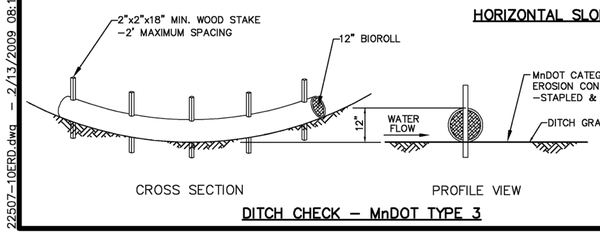
TREE PROTECTION FENCE



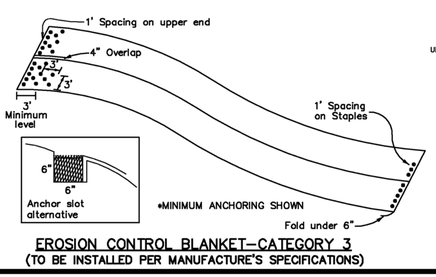
HORIZONTAL SLOPE GRADING



FLARED END SECTION INLET PROTECTION



DITCH CHECK – MnDOT TYPE 3

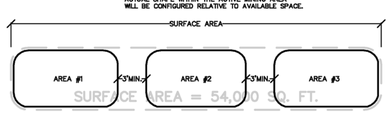


EROSION CONTROL BLANKET–CATEGORY 3
(TO BE INSTALLED PER MANUFACTURE'S SPECIFICATIONS)

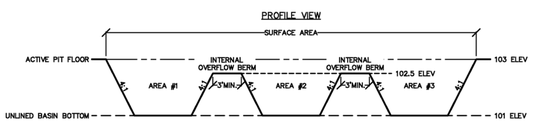
WASH WATER SEDIMENTATION/INFILTRATION BASIN–TYPICAL

PLAN VIEW

SHAPE OF BASIN SHOWN IS ILLUSTRATIVE ONLY. ACTUAL SHAPE WITHIN THE ACTIVE MINING AREA WILL BE CONFIGURED RELATIVE TO AVAILABLE SPACE.



PROFILE VIEW



NOTES:

1. THE WASH WATER SEDIMENTATION/INFILTRATION BASIN WILL BE CONSTRUCTED AS SHOWN ABOVE WITH AN APPROXIMATE SURFACE AREA OF 54,000 SQ. FT. AND A 2' DEPTH TO THE UNLINED BASIN BOTTOM, APPROXIMATELY 1' ABOVE THE GROUNDWATER ELEVATION. THE BASIN WILL BE DIVIDED INTO ROUGHLY 3 EQUAL AREAS BY INTERNAL OVERFLOW BERMS. WASH WATER WILL BE DISCHARGED INTO AREA #1 FOR INITAL SEDIMENT REMOVAL AND INFILTRATION. WASH WATER IS THEN EXPECTED TO FLOW OVER THE INTERNAL OVERFLOW BERMS AND INTO AREA #2 AND THEN INTO AREA #3 IF NEEDED FOR FURTHER SEDIMENT REMOVAL AND SUBSEQUENT INFILTRATION.

2. THE WASH WATER SEDIMENTATION/INFILTRATION BASIN WILL BE LOCATED ADJACENT TO THE WASH PLANT WITHIN THE ACTIVE MINING AREA AND WILL CONTINUALLY MOVE THROUGHOUT THE ENTIRE PIT WITH THE PROGRESSION OF FUTURE MINING ACTIVITIES. ONCE THE WASH PLANT IS RELOCATED TO ANOTHER PHASE OF THE ACTIVE MINING AREA AND A NEW WASH WATER SEDIMENTATION/INFILTRATION BASIN IS CONSTRUCTED, THE SEDIMENT IN THE OLD BASIN WILL BE REMOVED AND THE BASIN WILL BE FILLED IN WITH ON–SITE GRANULAR MATERIAL AND FINISH GRADED TO CURRENT FLOOR ELEVATIONS.

3. THE WASH WATER SEDIMENTATION/INFILTRATION BASIN SHALL BE INSPECTED AT LEAST MONTHLY DURING ACTIVE MINING OPERATIONS AS REQUIRED BY THE MPCA.

4. THE WASH WATER SEDIMENTATION/INFILTRATION BASIN WILL BE MAINTAINED AND SEDIMENT WILL BE REMOVED WHEN THE DEPTH OF THE SEDIMENT REACHES 1/2 THE STORAGE VOLUME IN ANY OF THE BASIN AREAS.

5. BASED ON THE MOST CURRENT MONITORING WELL DATA (12/18/2008), THE GROUND WATER ELEVATIONS RANGE FROM ROUGHLY 969.0 TO 972.5 ACROSS THE SITE.

PROJECT CONTACTS

PROJECT ENGINEER	KURT QUAINTANCE, P.E.-JAMES R. HILL, INC.	(952)-890-6044 (O) (612)-508-8890 (M)
TOWNSHIP CONSULTING ENGINEER	RON QUANBECK, P.E.-TKDA	(651)-221-4674 (O)
NPDES OFFICER:	BRANDON FINKE-MPCA	(651)-215-0267 (O)
OPERATOR REPRESENTATIVE:	SHAWN DAHL-AMES CONSTRUCTION, INC.	(952)-435-7106 (O)
	PAT MASON-AMES CONSTRUCTION, INC.	(952)-435-7106 (O)

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2500 W. Cty. Rd. 42, Suite 120, Burnsville, MN 55337
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
KURT QUAINTANCE
Date: 7/31/08 Reg.No. 24676

BROSSETH MINING OPERATION
EUREKA TOWNSHIP, MINNESOTA
EROSION & SEDIMENT CONTROL DETAILS
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY: CJK
DATE: 7/31/08
REVISIONS:
1/08/09 REVISED PER EAW
2/12/09 REV PER MPCA REQUIREMENTS
CAD FILE: 22507–10ERD
PROJECT NO.: 22507–10
2.1

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225TH STREET WEST

PEMC

PEMFd

PF01C

PEMCd

PSS1Cd

BEGINNING OF TROUT STREAM DESIGNATION PER MPCA

PEMCd

HIGHVIEW AVENUE

MN DNR WETLAND #414W
PEMFd

PEMC

PFO/SS1

PF01C

PEMC

PF01C

PEMF

MN DNR WETLAND #18W
PUBG

PF01/EMC

PROPOSED EXTRACTION AREA

50' SETBACK

50' SETBACK

PEMC

PEMC

PUBF

PROPOSED ACCESS AREA

BY-PASS/TURN LANE

EXISTING GRAVEL MINING OPERATION

SITE

PEMC/PUBF

PEMC

PEMC

PEMC

VERMILLION RIVER

R2UBG

BEGINNING OF TROUT STREAM AND IMPAIRED WATER DESIGNATION PER MPCA (FC-FECAL COLIFORM & T-TURBIDITY)

PEMF

WEST BERM

EAST BERM

PF01C

235TH STREET WEST

DODD BOULEVARD

VERMILLION RIVER

PUB/EMF

PF01C

PEMA

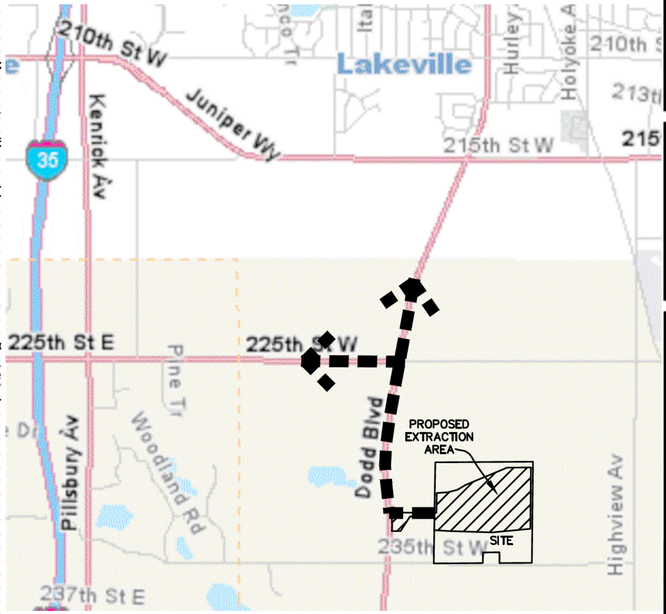
PEMA

PEMC

BEGINNING OF TROUT STREAM DESIGNATION PER MPCA

240TH STREET WEST

SCALE IN FEET
0 400 800 1200
1 inch = 400 feet



SCALE IN FEET
0 2000 4000 6000
1 inch = 2000 feet

N

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2500 W. Cty. Rd. 42, Suite 120, Burnsville, MN 55337
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
KURT J. KRAINTANCE
Date: 7/31/08 Reg.No. 24678

BROSSETH MINING OPERATION

EUREKA TOWNSHIP, MINNESOTA

OVERALL SITE PLAN & HAUL ROUTE

FOR

KELLY AGGREGATE, INC.

9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY	CJK
DATE	7/31/08
REVISIONS	
8/26/08 REV. ACCESS/HAUL ROAD	
10/21/08 REVISED EXTRACTION PLAN	
2/12/09 REV PER MPCA REQUIREMENTS	
5/20/25 REV BOTTOM ELEV	
CAD FILE	22507-100HR
PROJECT NO.	22507-10
	3.1

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DODD BLVD

PROPERTY OWNER:
JOHN R & MARIANN J STORLIE
PIN NO. 13-00700-010-02

840 LF 4" SOLID WHITE EPOXY STRIPE

381 LF 4" SOLID WHITE EPOXY STRIPE

500 LF 4" BROKEN & SOLID YELLOW EPOXY STRIPE

200 LF 4" BROKEN WHITE EPOXY STRIPE

392 LF 4" BROKEN YELLOW EPOXY STRIPE

302 LF 4" SOLID WHITE EPOXY STRIPE

REMOVE 965 LF EX. PAINT STRIPING

EXISTING CENTERLINE

PROPOSED CENTERLINE

CURVE DATA
R=2138.60
L=505.80
T=254.09
Δ=13°33'04"

15:1 STRIPING TAPER

61:1 CENTERLINE TAPER

INV 15" RCP 995.95

INV 15" RCP 994.61

INV 15" RCP 992.53

INV 15" RCP 992.84

INV 6' BOX CULVERT 984.29

INV BOX CULVERT 981.83

INV BOX CULVERT 981.86

EX. SSMH
RE 998.68
INV 973.40

40' ACCESS/HAUL ROAD

±247

PROPOSED ACCESS AREA

SCALE HOUSE/OFFICE

PORT-A-POTTY

SCALE

NOTE: ACCESS/HAUL ROAD & SCALE HOUSE AREA TO BE CONSTRUCTED OF BITUMINOUS MILLINGS

±94'

PROPERTY OWNER:
JOHN E & JOANN M SAUBER
PIN NO. 13-00700-012-01

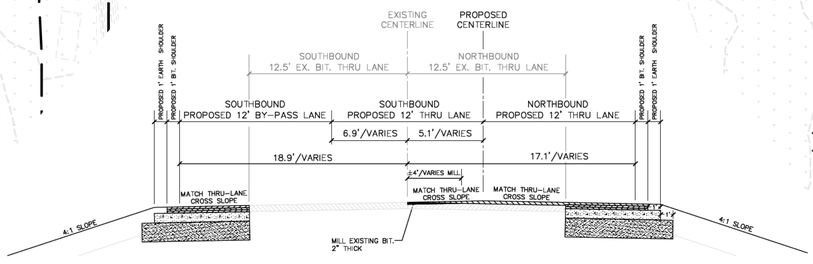
PROPERTY OWNER:
JOHN R & MARIANN J STORLIE
PIN NO. 13-00700-010-02

✳EXISTING GRAVEL MINING OPERATION✳

24' ACCESS/HAUL ROAD

±94'

235TH STREET WEST



PROPOSED BY-PASS/TURN LANE CONSTRUCTION
(DODD BOULEVARD)

ROADWAY HORIZONTAL CENTERLINE SHIFT VARIES THROUGHOUT THE LENGTH OF THE CONSTRUCTION.

PAVEMENT SECTION – MATCH EXISTING IN-PLACE THICKNESS.

DESIGN : 2" TYPE MV 3 WEARING COURSE MIXTURE (MVWE35035C)
TACK COAT (2357)
2" TYPE MV 3 NON WEARING COURSE MIXTURE (MVNW35035C)
TACK COAT (2357)
2" TYPE MV 3 NON WEARING COURSE MIXTURE (MVNW35035B)
9" MnDOT CLASS 5 AGGREGATE, SPEC. 2211
18" MnDOT SELECT GRANULAR

NOTE : 1. CONTRACTOR SHALL CONTACT BUTCH McCONNELL FROM DAKOTA COUNTY (952-891-7115) REGARDING PROCESS FOR REMOVING EXISTING STRIPING AND APPLYING NEW STRIPING.

2. CONTRACTOR SHALL SUBMIT ALL NECESSARY TRAFFIC CONTROL PLANS TO DAKOTA COUNTY FOR THEIR APPROVAL PRIOR TO THE START OF CONSTRUCTION.

NOTE:
✳ RECLAMATION GRADES SHOWN FOR THE ADJACENT PROPERTY-STORLIE PROPERTY DEMONSTRATE COORDINATION OF RECLAMATION PLANS BETWEEN THE BROSSETH SITE AND THE STORLIE PROPERTY. STORLIE PROPERTY RECLAMATION GRADES AS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY AND WILL NOT BE CONSTRUCTED AS PART OF THIS PROPOSED MINING OPERATION.

N

SCALE IN FEET
0 60 120 180
1 inch = 60 feet

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2500 W. Cty. Rd. 42, Suite 120, Burnsville, MN 55337
PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

KURT J. QUANTANCE
Date: 7/31/08 Reg.No. 24676

BROSSETH MINING OPERATION
EUREKA TOWNSHIP, MINNESOTA
BY-PASS/TURN LANE, ACCESS AREA, AND EROSION & SEDIMENT CONTROL PLAN
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY	CJK
DATE	7/31/08
REVISIONS	
8/26/08 REV. ACCESS/HAUL ROAD	
1/26/09 REV PER COUNTY COMMENTS	
2/12/09 REV PER MPCA REQUIREMENTS	
CAD FILE	22507-10G-BP
PROJECT NO.	22507-10
	3.2

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NOTES:

1. EXISTING TOPOGRAPHY FROM JAMES R. HILL, INC. (JULY 21, 2008).

2. MINING ACTIVITY TO BE SETBACK A MINIMUM OF 50' FROM PROPERTY LINES AS NOTED ON PLAN.

3. EXCAVATION BELOW WATER TABLE WILL BE ACCOMPLISHED WITH THE USE OF A BACKHOE AND/OR AN ELECTRIC DREDGE. THERE WILL BE NO DEWATERING AT THE SITE.

4. A SERIES OF THREE UNLINED SEDIMENTATION/INFILTRATION BASINS WILL BE CONSTRUCTED AND USED TO TREAT/INFILTRATE AND RECYCLE WASH WATER FROM THE WASHPLANT OPERATION. SEE PAGE 2.1 FOR TYPICAL DETAIL.

5. PHASES DEPICT THE GENERAL PROGRESSION OF MINING. PHASE 1 WILL INCLUDE THE ESTABLISHMENT OF SITE OPERATIONS, STOCKPILING & PROCESSING AREA, AND MINERAL EXTRACTION WHICH WILL EMCOMPASS 15 ACRES. THE PROCESSING EQUIPMENT, STOCKPILES, AND SEDIMENTATION/INFILTRATION BASINS WILL CONTINUALLY MOVE THROUGHOUT THE INTERIOR OF THE PIT WITH PROGRESSION OF MINING INTO FUTURE PHASES.

6. PHASES 1-6 WILL INCLUDE THE EXTRACTION OF ONLY THE MATERIAL FROM EXISTING ELEVATIONS TO ELEVATIONS 2'-3' ABOVE THE GROUNDWATER. PHASES 7-12 WILL EXTRACT THE AGGREGATE FROM ELEVATION 2'-3' ABOVE THE GROUNDWATER TO THE ±90' DEPTH (ESTIMATED BEDROCK DEPTH) BELOW THE GROUNDWATER AS PROPOSED.

N

SCALE IN FEET
0 100 200 300
1 inch = 100 feet

PROPERTY OWNER:
JOHN E & JOANN M SAUBER
PIN NO. 13-00500-010-51

MN DNR WETLAND #414W

SOUTHERLY EDGE OF WETLAND DELINEATED BY GRAHAM ENVIROMENTAL SERVICES, INC. (JULY 21, 2008)

WETLAND DELINEATED BY GRAHAM ENVIROMENTAL SERVICES, INC. (JULY 21, 2008)

CONSTRUCTION FENCING TO BE INSTALLED/ADJUSTED PER MINING PHASE TO ALLOW FOR CURRENT AGRICULTURAL USE OF LAND.

WATER ELEVATION X
972.59

AMERICAN ENG. BORING #4 GROUND WATER ELEV. 969.30

AMERICAN ENG. BORING #3 GROUND WATER ELEV. 967.00

AMERICAN ENG. BORING #2 GROUND WATER ELEV. 968.6

AMERICAN ENG. BORING #1 GROUND WATER ELEV. 971.3

SB #15-53 967.0 WET
SB #12-71 966.7 WET
SB #16-37 968.2 WET
SB #13-55 966.5 WET
SB #18-21 970.1 WET
SB #19-7 970.4 WET
SB #17-36 969.7 WET
SB #14-51 967.7 WET
SB #11-69 967.4 WET
SB #2-19 971.2 WET
SB #6-34 970.6 WET
SB #7-49 968.6 WET
SB #10-67 968.3 WET
SB #5-5 WET
SB #3-3 972.0 WET
SB #4-17 971.7 WET
SB #5-32 970.9 WET
SB #8-47 969.3 WET
SB #9-65 969.6 WET

(ESTIMATED BEDROCK DEPTH)
883 890 900 910 920 930 940 950 960 965 970 972 973 974 976 980 990

PROPOSED EXTRACTION AREA

PHASE 1 (15 ACRES)
PHASE 2 (10 ACRES)
PHASE 3 (10 ACRES)
PHASE 4 (10 ACRES)
PHASE 5 (10 ACRES)
PHASE 6 (10 ACRES)
PHASE 7 (10 ACRES)
PHASE 8 (10 ACRES)
PHASE 9 (10 ACRES)
PHASE 10 (10 ACRES)
PHASE 11 (10 ACRES)
PHASE 12 (15 ACRES)

GROUND WATER AREA

PROPOSED ACCESS AREA

STOCKPILE & PROCESSING AREA

WASH WATER SEDIMENTATION/INFILTRATION BASINS

PLANT SITE

50' SETBACK

1000' SETBACK

PROPERTY OWNER:
KELLY V BROSSETH
PIN NO. 13-00800-011-25

PROPERTY OWNER:
JOHN E & JOANN M SAUBER
PIN NO. 13-00700-012-01

PROPERTY OWNER:
JOHN R & MARIANN J STORLIE
PIN NO. 13-00700-010-02

PROPERTY OWNER:
JOHN G CURRY
PIN NO. 13-00800-031-01

EXISTING GRAVEL MINING OPERATION

SITE

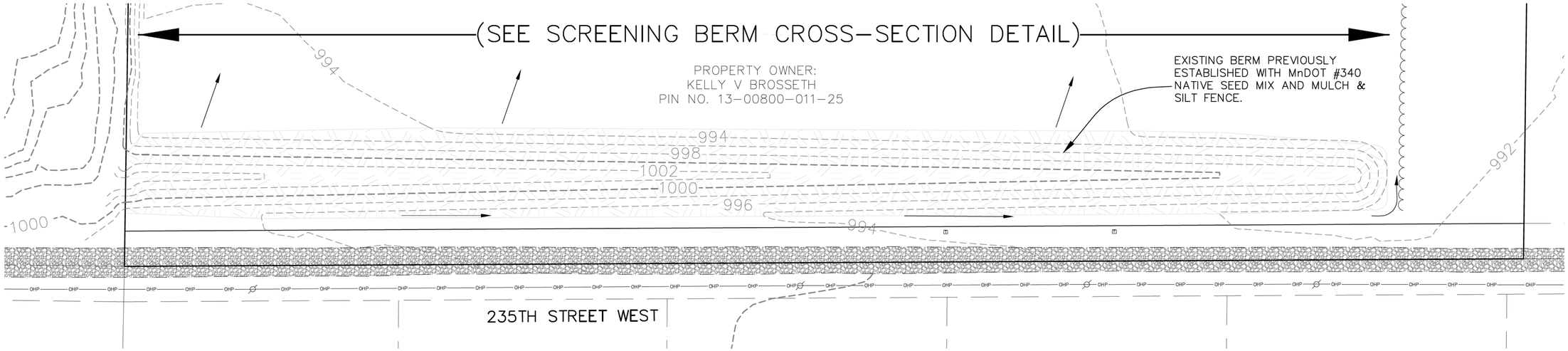
22507-10G-EXT.dwg - 5/22/2025, 08:23AM

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2500 W. Cty. Rd. 42, Suite 120, Burnsville, MN 55337
PHONE: (952)890-6044 FAX: (952)890-6244

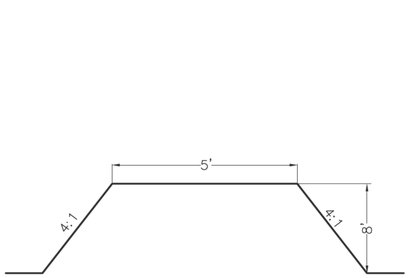
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
KURT J. KRAINTANCE
Date: 7/31/08 Reg.No. 24676

BROSSETH MINING OPERATION
EUREKA TOWNSHIP, MINNESOTA
FOR
EXTRACTION PLAN
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

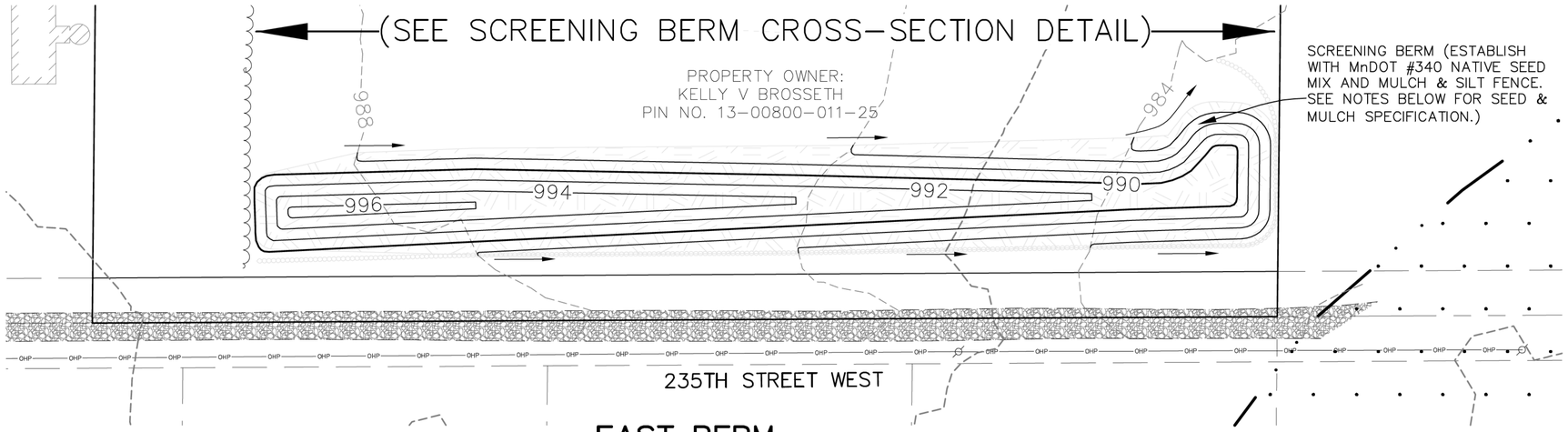
DRAWN BY	CJK
DATE	7/31/08
REVISIONS	
9/03/08 ADDED CONSTRUCTION FENCING	
10/21/08 REVISED EXTRACTION PLAN	
1/08/09 REVISED PER EAW	
2/12/09 REV PER MPCA REQUIREMENTS	
5/20/25 REV BOTTOM ELEV	
CAD FILE	22507-10G-EXT
PROJECT NO.	22507-10
	3.3



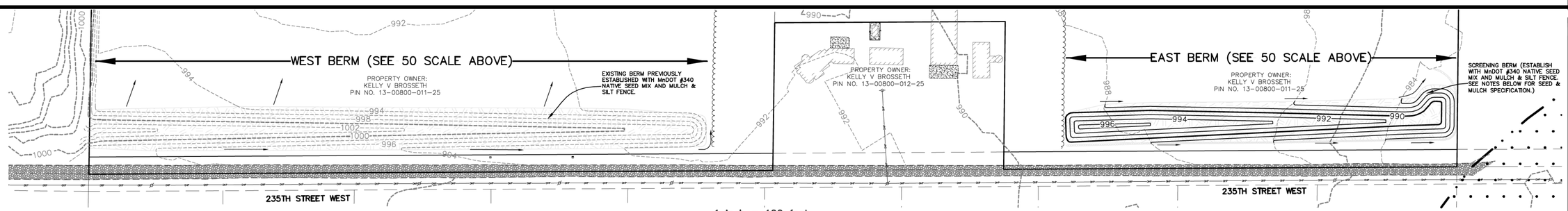
WEST BERM
1 inch = 50 feet



SCREENING BERM CROSS-SECTION



EAST BERM
1 inch = 50 feet



1 inch = 100 feet

NOTES:
1. VEGETATED SCREENING BERMS (EAST & WEST BERMS) WILL BE LEFT IN PLACE AS A PERMANENT FEATURE.
2. A MINIMUM OF 3" TOPSOIL WILL BE PLACED ON THE SURFACE OF THE BERM.
3. PERMANENT SCREENING BERMS TO BE CONSTRUCTED AS INDICATED ON THE PLAN. BERMS TO BE VEGETATED USING NATIVE SEED MIXTURE EQUIVALENT TO MnDOT #340 APPLIED AT THE FOLLOWING RATES:
   a. SEED : MnDOT SEED MIX #340 AT A RATE OF 84.5 LBS/ACRE.
   b. FERTILIZER : 17-10-7 NATURAL BASE AT A RATE OF 150 LBS/ACRE.
   c. MULCH : MnDOT TYPE 3 AT A RATE OF 2 TONS/ACRE AND DISC ANCHORED.
4. SILT FENCE SHALL REMAIN IN PLACE UNTIL STABILIZATION OF THE BERMS IS COMPLETED AND THEN SHALL BE REMOVED.

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Name: KURT CHANCE
Date: 7/31/08 Reg.No. 24676

BROSSETH MINING OPERATION
EUREKA TOWNSHIP, MINNESOTA
BERMING AND EROSION & SEDIMENT CONTROL PLAN
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY	CJK
DATE	7/31/08
REVISIONS	
8/19/08 ADDED LANSCAPING	
1/08/09 REVISED PER EAW	
2/12/09 REV PER MPCA	
REQUIREMENTS	
CAD FILE	22507-10G-BL
PROJECT NO.	22507-10
	3.4

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NOTES:
1. EXISTING TOPOGRAPHY FROM JAMES R. HILL, INC. (JULY 21, 2008).

2. RECLAMATION ACTIVITY
RECLAMATION WILL CONSIST OF GRADING AND BACK-FILLING THE SITE RESULTING IN TOPOGRAPHY THAT IS IN SUBSTANTIAL CONFORMITY TO THE LAND AREA IMMEDIATELY SURROUNDING, WHICH WILL HELP MINIMIZE EROSION DUE TO RAINFALL. SLOPES WILL BE GRADED TO A MAXIMUM 10:1 RATIO ON SLOPES IMMEDIATELY ADJACENT (15') AND DRAINING TO THE LAKE, A MAXIMUM 10:1 RATIO FOR 10' HORIZONTALLY ON SLOPES IMMEDIATELY BELOW THE WATER LINE PROVIDING A BELOW WATER SAFETY BENCH, A MAXIMUM 4:1 RATIO FOR 28' HORIZONTALLY BELOW THE SAFETY BENCH, AND A MAXIMUM 1½:1 RATIO FOR REMAINING SLOPES TO THE BOTTOM OF THE LAKE. A MAXIMUM 4:1 RATIO ON ALL OTHER ABOVE WATER SLOPES IS PROPOSED AS WELL. ALL MATERIALS USED FOR BACK-FILLING IN ANY AREA OF THE RECLAMATION WILL BE CLEAN SOIL FILL, FREE OF CONTAMINANTS, NON-NOXIOUS, NON-FLAMMABLE AND NON-COMBUSTIBLE.

A MINIMUM OF 3" OF TOPSOIL WILL BE PLACED OVER ALL DISTURBED AREAS. AREAS WITH SURFACE DRAINAGE TO THE LAKE (PIT AREA) WILL BE SEEDED WITH MnDOT #340 NATIVE SEED MIX & MULCH (SEE PAGE 2.1 FOR SEED & MULCH SPECIFICATIONS). ALL OTHER DISTURBED AREAS TO BE SEEDED WITH AN AGRICULTURAL CROP OR TEMPORARY SEED (IF NEEDED). PORTIONS OF A GIVEN PHASE, FOR EXAMPLE, ALONG BORDERS OF SUBSEQUENT PHASES, OR TO ALLOW MATERIAL TRANSFER FROM ONE PHASE TO THE OPERATIONAL AREA, MAY BE LEFT AT AN INTERMEDIATE STAGE OF RECLAMATION UNTIL COMPLETION IS PRACTICAL.

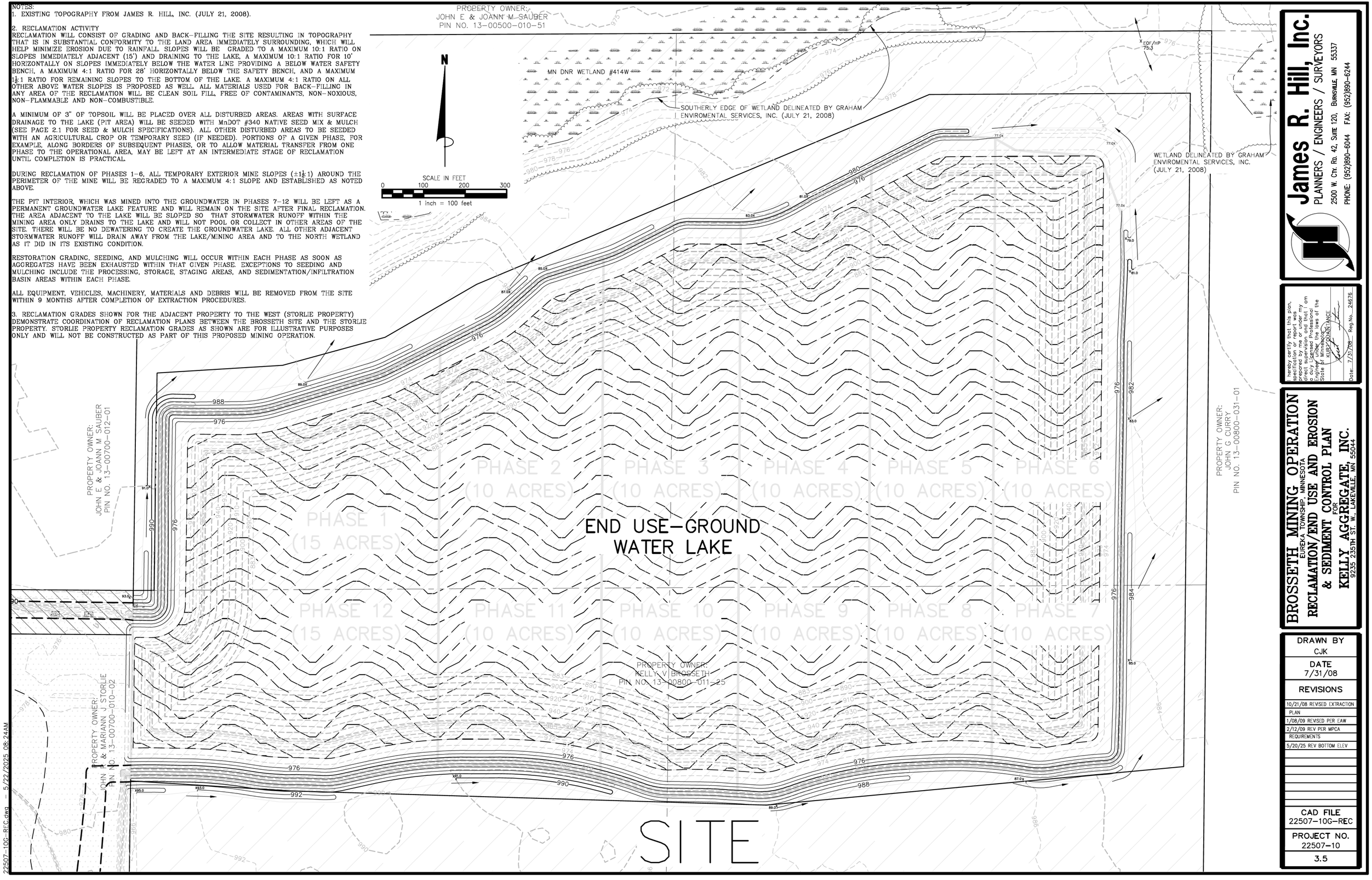
DURING RECLAMATION OF PHASES 1-6, ALL TEMPORARY EXTERIOR MINE SLOPES (±1½:1) AROUND THE PERIMETER OF THE MINE WILL BE REGRADED TO A MAXIMUM 4:1 SLOPE AND ESTABLISHED AS NOTED ABOVE.

THE PIT INTERIOR, WHICH WAS MINED INTO THE GROUNDWATER IN PHASES 7-12 WILL BE LEFT AS A PERMANENT GROUNDWATER LAKE FEATURE AND WILL REMAIN ON THE SITE AFTER FINAL RECLAMATION. THE AREA ADJACENT TO THE LAKE WILL BE SLOPED SO THAT STORMWATER RUNOFF WITHIN THE MINING AREA ONLY DRAINS TO THE LAKE AND WILL NOT POOL OR COLLECT IN OTHER AREAS OF THE SITE. THERE WILL BE NO DEWATERING TO CREATE THE GROUNDWATER LAKE. ALL OTHER ADJACENT STORMWATER RUNOFF WILL DRAIN AWAY FROM THE LAKE/MINING AREA AND TO THE NORTH WETLAND AS IT DID IN ITS EXISTING CONDITION.

RESTORATION GRADING, SEEDING, AND MULCHING WILL OCCUR WITHIN EACH PHASE AS SOON AS AGGREGATES HAVE BEEN EXHAUSTED WITHIN THAT GIVEN PHASE. EXCEPTIONS TO SEEDING AND MULCHING INCLUDE THE PROCESSING, STORAGE, STAGING AREAS, AND SEDIMENTATION/INFILTRATION BASIN AREAS WITHIN EACH PHASE.

ALL EQUIPMENT, VEHICLES, MACHINERY, MATERIALS AND DEBRIS WILL BE REMOVED FROM THE SITE WITHIN 9 MONTHS AFTER COMPLETION OF EXTRACTION PROCEDURES.

3. RECLAMATION GRADES SHOWN FOR THE ADJACENT PROPERTY TO THE WEST (STORLIE PROPERTY) DEMONSTRATE COORDINATION OF RECLAMATION PLANS BETWEEN THE BROSSETH SITE AND THE STORLIE PROPERTY. STORLIE PROPERTY RECLAMATION GRADES AS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY AND WILL NOT BE CONSTRUCTED AS PART OF THIS PROPOSED MINING OPERATION.



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KURT J. KONTANCE
Date: 7/31/08 Reg.No. 24676

BROSSETH MINING OPERATION
RECLAMATION/END USE AND EROSION & SEDIMENT CONTROL PLAN
EUREKA TOWNSHIP, MINNESOTA
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY	CJK
DATE	7/31/08
REVISIONS	
10/21/08 REVISED EXTRACTION PLAN	
1/08/09 REVISED PER EAW	
2/12/09 REV PER MPCA REQUIREMENTS	
5/20/25 REV BOTTOM ELEV	
CAD FILE	22507-10G-REC
PROJECT NO.	22507-10
	3.5

22507-10G-REC.dwg - 5/22/2025 08:24AM

N

SCALE IN FEET
0 120 240 360
1 inch = 120 feet

PROPERTY OWNER:
JOHN E & JOANN M SAUBER
PIN NO. 13-00500-010-51

MN DNR WETLAND #414W

SOUTHERLY EDGE OF WETLAND DELINEATED BY GRAHAM ENVIROMENTAL SERVICES, INC. (JULY 21, 2008)

WETLAND DELINEATED BY GRAHAM ENVIROMENTAL SERVICES, INC. (JULY 21, 2008)

PROPERTY OWNER:
JOHN E & JOANN M SAUBER
PIN NO. 13-00700-012-01

PROPERTY OWNER:
JOHN G CURRY
PIN NO. 13-00800-031-01

PROPERTY OWNER:
KELLY V BROSSETH
PIN NO. 13-00800-011-25

PROPERTY OWNER:
JOHN E & MARIANN J STORLIE
PIN NO. 13-00700-010-02

PHASE 1 (15 ACRES) PHASE 2 (10 ACRES) PHASE 3 (10 ACRES) PHASE 4 (10 ACRES) PHASE 5 (10 ACRES) PHASE 6 (10 ACRES)

PHASE 12 (15 ACRES) PHASE 11 (10 ACRES) PHASE 10 (10 ACRES) PHASE 9 (10 ACRES) PHASE 8 (10 ACRES) PHASE 7 (10 ACRES)

END USE-GROUND WATER LAKE

SITE

A1 A2 B1 B2

A-A SECTION

B-B SECTION

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KURT JOHNTANCE
Date: 7/31/08 Reg.No. 24676

BROSSETH MINING OPERATION

EUREKA TOWNSHIP, MINNESOTA

END USE CROSS-SECTION

FOR

KELLY AGGREGATE, INC.

9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY CJK
DATE 8/21/08
REVISIONS
10/21/08 REVISED EXTRACTION PLAN
1/08/09 REVISED PER EAW
2/12/09 REV PER MPCA REQUIREMENTS
5/20/25 REV BOTTOM ELEV
CAD FILE 22507-10EUXSEC
PROJECT NO. 22507-10
3.6

22507-10EUXSEC.dwg — 5/22/2025 08:47AM

This is an artistic concept only. It is deemed reliable but not guaranteed. Kelly Aggregate, Inc. 2008

James R. Hill, Inc.
PLANNERS / ENGINEERS / SURVEYORS
2500 W. CTY. RD. 42, SUITE 120, BURNSVILLE, MN 55337
PHONE: (952)890-6044 FAX: (952)890-6244

BROSSETH MINING OPERATION
EUREKA TOWNSHIP, MINNESOTA
END USE RENDERING
FOR
KELLY AGGREGATE, INC.
9235 235TH ST. W., LAKEVILLE, MN 55044

DRAWN BY
CJK
DATE
8/19/08
REVISIONS

CAD FILE
22507–10EUR
PROJECT NO.
22507–10

3.7

22507–10EUR.dwg – 1/07/2009 03:34PM