



Inver Grove Heights Environmental Commission
Thursday, April 27, 2023 at 7:00 PM
8150 Barbara Avenue, Inver Grove Heights, MN 55077

AGENDA

1. **Call to Order**
2. **Roll Call**
3. **Presentations**
4. **Approval of Minutes**
 - A. Approval of Minutes from the Thursday, January 26, 2023, Environmental Advisory Commission Meeting
5. **Public Comment**

Public comment provides an opportunity for the public to address the Commission on items that are not on the agenda. Comments will be limited to three (3) minutes per person.

 - A. Light Pollution
6. **Regular Agenda**
 - A. Land Alteration Permit for CSAH 26 & CSAH 63 Improvements
 - B. Bituminous Roadways Sand & Gravel Zoning District Five Year Renewal
 - C. Participation in SolSmart and Submittal of Letter of Commitment
7. **Commission and Staff Comments**
8. **Adjourn**

Inver Grove Heights Environmental Advisory Commission
8150 Barbara Avenue
Thursday, January 26, 2023, at 7:00 p.m.

Meeting Minutes

1. Call to Order

The Environmental Advisory Commission of Inver Grove Heights met in City Council Chambers on Thursday, January 26, 2023. Vice Chair Sarah Brass called the meeting to order at 7:00 p.m.

2. Roll Call

Present: Vice Chair Sarah Brass; Commissioners: Nick Ruiz, Ted Trenzeluk, Larry Moehring, Kevin Sethre, Brian Barner

Absent: Nichole Boehmke, Sara Goodman, Todd Kruse (excused)

3. Presentations

A. 2022 Community Development Environmental Initiatives Update

Ally Sutherland, Environmental Specialist, presented an update on 2022 Community Development Department Environmental Initiatives. The PowerPoint presentation reviewed the following topics:

- Programming Guidance
- Dakota County Community Waste Abatement Grant
- Special Collection Events
- Multifamily Recycling Education
- IGH Energy Action Plan, Xcel Energy Partners In Energy
- In-Person Education
- City Environmental E-News
- GreenStep Cities Reporting
- Pine Bend Landfill RNG Project

Commissioner Sethre asked what paper should be shredded. Mrs. Sutherland stated only documents with confidential information should be shredded. All other paper should be recycled in home recycling collections, as paper in its original form is most valuable in the market.

Commissioner Trenzeluk asked what is the most valuable recyclable. Mrs. Sutherland stated she is not aware of the dollar value of each recyclable at this time. However, she noted the County has conducted research with the local material recovery facilities to create a list of what is recyclable locally. This list is referred to as the “designated recyclables list” and is available on the city’s website at www.ighmn.gov/recycle. All items on this list have the highest local recycling value due to having a strong local recycling market.

Commissioner Trenzeluk asked if the energy education events have been well attended. Mrs. Sutherland yes and noted she has learned over the past year that joining existing in-person community events has been more successful in reaching a wider audience than hosting standalone in-person and virtual events.

Commissioner Barner asked if the city has partnered on other items with the Inver Hills Community College (IHCC) outside of the LED light bulb initiatives. Mrs. Sutherland stated she is not aware if other city staff are collaborating with IHCC but knows that the college recently participated in the Dakota County Business Recycling grant.

Commissioner Sethre asked how residents received the free LED bulbs. Mrs. Sutherland noted that the city was eligible to request the LED light bulb kits through Partners In Energy. Residents received these by signing up for the city environmental e-news, or by winning them at community events.

Commissioner Brass asked if the free Home Energy Squad visits are only available to Xcel Energy customers. Mrs. Sutherland noted that any Xcel Energy Gas or Electric customer can sign up for a paid Home Energy Squad visit. The free visit promotion is only available to Xcel Electric customers because Xcel Energy is funding this free opportunity. Dakota Electric customers are not eligible but can still purchase a Home Energy Squad visit to receive energy saving materials. Commissioner Sethre asked how to sign up for the Home Energy Squad visit. Mrs. Sutherland stated residents can sign up on the Xcel Energy website or CEE's website. CEE implements Home Energy Squad visits.

Commissioner Sethre asked what the Grow Solar group-buy opportunity is. Mrs. Sutherland stated Grow Solar's mission is to make solar more affordable. Grow Solar contracts a solar installer then promotes the solar purchasing opportunity to twin cities metro residents. The cost per installation decreases as more residents commit to installing solar through the program.

Commissioner Barner asked if there are any updates on electric vehicle chargers. Mrs. Sutherland stated there are lot of upcoming funding opportunities, and the city is researching all opportunities.

Commissioner Sethre asked about the differences in electric vehicle charging. Mrs. Sutherland stated there are three charging station levels. Level 1 is 120 volts and is a slow charge. On average, it takes 8 hours for a vehicle to fully charge. Level 2 is 240 volts and is a bit faster. On average it takes 4 hours to fully charge. Level 3 is DC fast charging, which provides the fastest charge in about 30 minutes. The equipment costs increase significantly as the charging level increases.

Commissioner Trenzeluk asked when the EAC Work Plan will go to the city council. Mrs. Sutherland noted she will provide a summary of this same presentation to City Council on February 6. She will also review the 2023 EAC Work Plan at that time. If City Council is in favor of the work plan, City Council will review this at a regular meeting for final approval. After that, Mrs. Sutherland will bring the work plan back to the EAC to discuss next steps.

4. Approval of Minutes

A. Minutes of Thursday, November 17, 2022, Environmental Advisory Commission Meeting

Motion by Vice Chair Brass to approve the minutes from Thursday, January 26 as submitted. All responded in favor, none opposed.

Ayes: 6

Nays: 0 Motion carried.

5. Regular Agenda

A. Xcel Energy Partners In Energy MOU Phase 2 - 2023 Implementation Extension

Mrs. Sutherland presented the staff report as included in the meeting packet. Mrs. Sutherland requested the Commission consider recommending City Council approval of the draft Xcel Energy

Partners In Energy MOU extension included in the packet. Extending the MOU would allow the city to continue receiving direct technical assistance from Xcel Energy Partners In Energy facilitators to accomplish the city's Energy Action Plan goals. This would be no cost to the city. The draft 2023 MOU details how Xcel Energy will support the city in achieving the goals of the EAP. The strategies and support are aligned with the energy related goals included in the draft 2023 EAC Work Plan, including supporting SolSmart participation, electric vehicle readiness, and the business and residential sustainable recognition program. Staff recommends the EAC recommend City Council approval of the attached draft Xcel Energy Partners In Energy MOU Phase 2 - 2023 Implementation Extension.

Commissioner Brass noted she is impressed with what the city has accomplished so far with this partnership.

Commissioner Trenzeluk noted there is no financial obligation to participate in this program and this is solely to formalize the no-cost partnership.

Commissioner Moehring noted the program is a win-win opportunity.

Motion by Vice Chair Brass to recommend City Council approval of the attached draft Xcel Energy Partners In Energy MOU Phase 2 - 2023 Implementation Extension. All Commissioners responded in favor, none opposed.

Ayes: 6

Nays: 0 Motion carried.

6. Public Comment

7. Commissioner and Staff Comments

Commissioner Trenzeluk thanked Mrs. Sutherland for her work on environmental initiatives.

Commissioner Brass commended the police officer who was the first responder to the bald eagle incident in Inver Grove Heights and that she would like to know how Pine Bend Landfill will mitigate this situation from happening in the future. Mrs. Sutherland noted that there will be a related IGH Landfill Overview on the February 6 City Council Work Session agenda and encourages the EAC and those interested in learning about landfill matters to listen to that presentation. Mrs. Sutherland also noted the city is following the bald eagle incident closely and is aware the MPCA and U.S. Fish and Wildlife Service have an active and ongoing investigation on the incident. Commissioner Sethre asked for an update on bald eagles' status. Commissioner Brass responded 13 were injured and as of today 3 did not survive, others have been released. The bald eagles allegedly scavenged on a dead carcass that was euthanized and improperly disposed of.

Commissioner Sethre highlighted the latest Insights residential newsletter, which included articles on smart salting and pet waste.

Commissioner Moehring highlighted he has heard of different electric vehicle goals, one being 75% of vehicles will be electric by 2035. He stated in order to meet this goal, higher level charging is needed to quickly charge vehicles. Commissioner Sethre agreed.

8. Adjourn

Motion by Commissioner Barner, seconded by Commissioner Trenzeluk to adjourn at 7:57 p.m.

Ayes: 6

Nays: 0 Motion carried.

DRAFT



Environmental Advisory Commission Staff Report

SUBJECT: **Light Pollution**

MEETING DATE: April 27, 2023
ITEM TYPE: Public Comment
CONTACT:

PURPOSE/ACTION REQUESTED

Resident Cameron Judge will give a short presentation to the Commission on light pollution concerns in Inver Grove Heights.

BACKGROUND

N/A

FISCAL IMPACT

N/A

RECOMMENDATION

N/A

ATTACHMENTS

None



Environmental Advisory Commission Staff Report

**SUBJECT: Land Alteration Permit for CSAH 26 & CSAH 63
Improvements**

MEETING DATE: April 27, 2023
ITEM TYPE: Regular Agenda
CONTACT: Paul Merchlewicz, City Engineer, 651.450.2572

PURPOSE/ACTION REQUESTED

The Environmental Advisory Commission is asked to consider a Land Alteration Permit (LAP) for excavating material in the amount of 81,075 cubic yards to be used on the adjacent Dakota County construction project for CSAH 26 & CSAH 63 Improvements.

BACKGROUND

Dakota County, in cooperation with the cities of Inver Grove Heights and Eagan, will expand County Road 26 (Lone Oak Road/70th Street W.) from a two-lane roadway to a four-lane divided roadway from Highway 55 (Courthouse Boulevard) in Eagan to Highway 3 (South Robert Trail) in Inver Grove Heights.

The project will also reconstruct County Road 63 (Argenta Trail) as a two-lane divided roadway on a new alignment from Amana Trail to the newly constructed 65th Street in Inver Grove Heights. A roundabout will also be built at the intersection of Lone Oak Road/70th Street W. and Argenta Trail as well as additional turn lanes, drainage improvements, curb and gutter, multi-use trails, and an underpass serving the Mendota-Lebanon Greenway system.

In March 2023 S.M. Hentges & Sons Inc. requested council approval per Section 10-13-G(6)(E) to waive certain requirements of Title 10, Chapter 13, Article G and allow the short-term mining of sand and gravel along the North Side of 70th Street, West of Highway 3: 1165 & 1287 70th Street with an excavation permit. The land alteration is to be located on private property directly adjacent to the project location and within the City of Inver Grove Heights. The short-term mining is intended to utilize nearby aggregate sources to provide the county project within the City of Inver Grove Heights and Eagan with enough material to complete its construction.

Per Inver Grove Heights City Code Title 9 Chapter 5, City Council approval is required to issue the Land Alteration Permit for the proposed land alteration volume of 81,075 CY. City Council approval is required for permits with material volumes exceeding 10,000 CY.

Analysis

Generally, this work will be on private property directly adjacent to the project site. The limits of work are contained within an elevated area or hill. The effect of the excavation will lower the hill approximately 10 to 15 feet.

- **Materials:** The County project is still in need of approximately 112,000 cubic yards with between 20,000 and 40,000 cubic yards supplied by on site sources. The remainder, estimated at 81,075 cubic yards will be supplied by this operation.
- **Haul Routes:** As part of the requirements for mining operations, the Contractor will be required to use excavated materials directly on the adjacent County project. Materials used at locations other than the County Project site will not be allowed.
- **Land Disturbance and Tree Preservation:** The total land disturbance will be 6.67 acres impacting established tree growth. Tree removal in the specified area falls within the tree preservation requirements by the City Code allowing for 25 percent removal. The actual anticipated tree removal for this work will be 21.7 percent, falling under thresholds. As a result, no reforestation plans are necessary.
- **Stormwater and Drainage:** The contractor's planned grading closely follows existing drainage break points which maintains existing flow patterns for stormwater run-off to adjacent properties, originally planned project sites, and ponds. Resultant grades from the final completed operation will be flatter than existing ground which will reduce flow velocities and minimize erosion concerns once vegetation is reintroduced and established. There is no expected stormwater impact from grading operations.

FISCAL IMPACT

N/A

RECOMMENDATION

Public Works/Engineering recommends approval of the land alteration permit subject to the standard land alteration permit conditions and in accordance with the following comments and conditions:

1. A surety bond in the amount of \$33,350 shall be provided before excavation can begin. Per IGH Land Alteration Permit: \$5000/acre X 6.67 acres = \$33,350.
2. City Council approval is required to issue the Land Alteration Permit for the proposed land alteration volume of 81,075 CY.
3. All material mined under this LAP is only allowed for use on the adjacent County project.
4. Mining and land alterations allowed under this permit are to be complete no later than six months after permit approval by City Council.
5. The Applicant must comply with conditions of the project SWPPP, dated April 2023.
6. Owner will be responsible for performing weekly NPDES erosion control inspections as required by MPCA Construction Stormwater General Permit.
7. The owner is responsible for supplying the City Engineer with weekly NPDES reports.
8. Applicant must mail written notice to all adjacent property owners. The written notice must include a description of the work being performed, a project schedule, and a contact name and phone number for a project contact authorized to represent the owner.
9. Erosion control shall be installed and inspected by the City Engineer prior to commencing work.
10. Operations shall be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday - Saturday, and shall not interfere with the health and safety of surrounding residents and the premises shall always be maintained so as not to create a nuisance. No Fueling, unloading, or running equipment can occur outside of these hours.

11. Upon completion of land alteration operations, the land must be left according to the plans and contours submitted with this application and planted with vegetation (subject to approval by the City) to prevent erosion.
12. Identify and provide haul roads: Applicant is responsible for maintenance and restoration of haul routes approved by City Engineer.
13. The City Engineer reserves the right to apply additional conditions.

ATTACHMENTS

1. Land Alteration Permit Application
2. Preliminary Sand Borrow Site Development Plans

S.M. Hentges & Sons Inc.

650 Quaker Avenue

Jordan, MN 55352

Office: 952.492.5700 Fax: 952.492.5705

www.smhentges.com



LETTER OF TRANSMITTAL

To: Paul Merchlewicz, Engineering
City of Inver Grove Heights
8150 Barbara Ave
Inver Grove Heights, MN 55077

Date:	3/24/2023	Job No.	21-1171
From:	Mark Sonstegard		
Re:	IGH Land Alteration Permit		

THE FOLLOWING:

	Shop Drawings	X	Plans
	Copy of Letter		Samples
	Prints		Change Order
	Specifications	X	Other

Copies	Date	No.	Description
	3/23/2023	1	Application for Land Alteration Permit Form
	3/21/2023	1	Application Fee, Check Number 1300965
		1	Certificate of Liability Insurance
	3/22/2023	1	Half Size Plan Set - Site Development Plans for Short Term Mining Operations by Sambatek (plans will be submitted electronically)



8150 Barbara Avenue
Inver Grove Heights, MN 55077
(651) 450-2570
Engineering@ighmn.gov

Permit No. _____

APPLICATION FOR LAND ALTERATION PERMIT
(City Code 9-4-1)

Date of Application: 3/23/23

Date of Expiration (2 yrs. from initial application date): _____

Permit must be renewed 30 days or more prior to date of expiration.

Applicant

Applicant Name S.M. Hentges & Sons Inc.
Address 650 Quaker Ave, Jordan, MN 55352
Telephone 952-492-5700 Email joe.miller@smhentges.com

Contractor

☒ Check here if same as applicant.

Company Name S.M. Hentges & Sons Inc.
Contact Person Joe Miller
Address 650 Quaker Ave, Jordan, MN 55352
Telephone 952-492-5700 Email joe.miller@smhentges.com

Land Owner(s)

Land Owner Falcon Partners LP (Jon Riley)
Address 2320 Lexington Ave S, Mendota Heights, MN 55120
Telephone 612-751-2558 Email jonriley@condormgt.com

Site Address 1165 & 1285 70th St W

PID No. 20-28500-01-020 & 20-00600-78-012

Legal Description Lot 2 Block 1 Addition Garvey Addition
& East 660' of South 1353' of W1/2 of SE1/4 of Sec 6 Twn 27 Range 22

Description of Land Being Altered

Purpose of Land Alteration Short-Term Mining, See Plan Set by Sambatek dated March 22, 2023

Cubic Yards of Import 0 c.y Export 80,000 c.y.

Haul routes: Within Work Zone of County Road 26 (70th St W)

Approximate Start Date 5/15/23

Approximate Completion Date 10/20/23

Total Volume of Land Altered (cut & fill) 80,000 c.y.

***This quantity should be used to determine the permit fees.**

Building Permits (continued) Item Description	Code Section	License Period (if applicable)	2023 Fees
Land alteration permit			
Shoreland impact zones: 10 to 499 cubic yards (steep slopes)	10-13B-10		With building permit: no fee If no other permit: \$250
Shoreland impact zones: 50 to 499 cubic yards	10-13B-10		With building permit: no fee If no other permit: \$250
0 to 499 cubic yards	9-4-1-2 9-4-1-7 10-13J-5		No fee, no permit required
500 up to 999 cubic yards	9-4-1-2 9-4-1-7 10-13J-5		\$400
1,000 up to 10,000 cubic yards	9-4-1-2 9-4-1-7 10-13J-5		\$900
10,000 up to 99,999 cubic yards	9-4-1-2 9-4-1-7 10-13J-5		\$5,000
100,000 cubic yards or more	9-4-1-2 9-4-1-7 10-13J-5		\$10,000
All land alteration permits over 500 cubic yards require a cash escrow or letter of credit surety, based on the area disturbed, to guarantee final restoration	9-4-1-6.E		\$5,000 per acre Minimum \$10,000

CITY USE ONLY

Land Alteration Permit Fee \$ _____

(\$5,000 per acre, minimum \$10,000; Must be submitted upon approval of application, if applicable).

Fee Notes:

- >The above fee does not include City expenses for environmental reviews such as: EAWs, AUARs, or EISs. The City reserves the right to collect additional costs if the project requires additional environmental reviews.
- >The surety/bond is to ensure satisfactory performance and compliance with the below stated stipulations. It shall be kept active until the completion of work and/or expiration of permit and can only be released by written notification of the City after a satisfactory final inspection has been performed by the City.
- >All land alteration permits issued to a specific location shall be based on the cumulative quantity of earthwork as the final determination of fees. The City reserves the right to adjust fees based on cumulative quantities.

Required Attachments to Application

- ☐ Certification of Comprehensive General Liability Insurance.
- ☐ Plan sheet or sketch of property showing the below items:
 - ☐ All adjacent property indicating the existing buildings and/or structures.
 - ☐ The correct legal description of the premises.
 - ☐ Existing and proposed finished contours and elevations.
 - ☐ Existing and proposed drainage ways, culverts, storm sewer pipe, drainage structures stabilization walls, retaining walls, cribbing, dams, or other protective items.
 - ☐ Calculations for and approximate quantities of excavation and/or fill required.

- ☐ Storm Water Plan, sediment and erosion control plan meeting the requirements of the City of Inver Grove Heights City Code Title 9, Chapter 5: Stormwater Management.
- ☐ A topographic map or plat of any proposed pit or excavation or excavation to be made showing the confines or limits thereof, together with the existing and proposed finished elevations.
- ☐ Method and schedule for restoration and measures to control erosion during and after work.
- ☐ Method of controlling dust.
- ☐ Upon the City's request, evidence that the material to be excavated or filled does not pose an environmental hazard and does not include any hazardous materials or contaminated soils.

Conditions of Approval (City Code 9-4, 9-5, 10-13, & 10-15)

1. Applicant must pay the fees established by resolution of city council.
2. The resultant grade and slopes at the property line must be in substantial conformity to the surrounding natural topography, to minimize erosion and provide sufficient drainage so that both natural and storm water enter and leave the property at the original natural drainage points.
3. Existing drainage and ponding patterns cannot be significantly altered so as to adversely affect adjoining land.
4. All slopes must be a minimum of four (4) feet horizontal to one (1) foot vertical, unless approved by the Director of Public Works.
5. Do not use concrete, asphalt, tree stumps, branches, or demolition debris (as defined in City Code 9-4-4) as fill material.
6. Fencing must be used around site when open excavation exceeds 20 feet and/or slope of 2:1, or greater.
7. The property must be graded so that no stagnant water collects thereon.
8. All exposed soil must be stabilized no later than 14 days after the construction activity has temporarily or permanently ceased.
9. Limit operations to the hours of 7:00 a.m. to 7:00 p.m., Monday- Saturday. Operations cannot interfere with the health and safety of surrounding residents and the premises must be maintained at all times so as not to create a nuisance.
10. Each day, or when required by the City, material from this operation that is found to exist on City streets needs to be cleaned to the City's satisfaction by the applicants.
11. Upon completion of land alteration operations, the land must be left according to the plans and contours submitted with this application and established with vegetation (subject to approval by the City) to prevent erosion.
12. Total scope of work is to be completed within two (2) years unless a renewal is applied for and approved by the Engineering Department.
13. Upon completion of land alteration operations or expiration of this permit, an inspection

will be made by the City of the premises and adjoining streets. Any damage to have been caused by these operations will be corrected by the applicant upon notification of the City.

**By signing this permit the property owner accepts responsibility for the operation and grants permission for land alteration operation.*

Joe Miller

Digitally signed by Joe Miller
DN: C=US, E=joe.miller@smheritages.com, O=SM Heritages &
Cons, OU=SM Heritages & Cons, CN=Joe Miller
Date: 2023.03.22 09:23:41-05'00'

Applicant's Signature

Date 03/22/2023

Property Owner's Signature

Date 3/24/2023

CITY USE ONLY

Recommended for Approval ☐ Yes ☐ No By _____ Date _____

Recommended for Approval ☐ Yes ☐ No By City Council Date _____

Bond No. _____ Date Bond Expires _____

Insurance Company _____ Date Insurance Expires _____



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

5/19/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must have **ADDITIONAL INSURED** provisions or be endorsed. If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Marsh & McLennan Agency LLC 6160 Golden Hills Drive Minneapolis MN 55416	CONTACT NAME: Casey Olson	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
INSURED S.M. Hentges & Sons, Inc. 650 Quaker Avenue Jordan MN 55352	E-MAIL ADDRESS: Casey.Olson@MarshMMA.com	
	INSURER(S) AFFORDING COVERAGE	
	INSURER A: Western National Mutual Insurance Co	
	INSURER B: Cincinnati Insurance Company	
	INSURER C: Homesite Insurance Company	
	INSURER D:	
INSURER E:		
INSURER F:		

COVERAGES**CERTIFICATE NUMBER:** 1254439450**REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR ☒ 5,000 ☒ XCU GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC OTHER:			CPP1117243	5/23/2022	5/23/2023	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
A	☒ AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ OWNED AUTOS ONLY ☐ SCHEDULED AUTOS ☒ HIRED AUTOS ONLY ☒ NON-OWNED AUTOS ONLY ☒ Hired Car ☒ Physical Dam			CPP1116033	5/23/2022	5/23/2023	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ Hired Car Phys Dam \$ Actual Cash Val.
A	☒ UMBRELLA LIAB ☒ OCCUR ☐ EXCESS LIAB ☐ CLAIMS-MADE ☐ DED ☒ RETENTION \$ 10,000			UMB1019135	5/23/2022	5/23/2023	EACH OCCURRENCE \$ 10,000,000 AGGREGATE \$ 10,000,000 \$
A	☒ WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N ☒ N	N/A	WCV1028665	5/23/2022	5/23/2023	☒ PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT \$ 500,000 E.L. DISEASE - EA EMPLOYEE \$ 500,000 E.L. DISEASE - POLICY LIMIT \$ 500,000
B	Excess Liability x WN			EXS0616515	5/23/2022	5/23/2023	Excess of \$10,000,000 \$5,000,000
C	Excess Liability x CIN			CXP138067374	5/23/2022	5/23/2023	Excess of \$15,000,000 \$5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

This insurance is issued pursuant to the Minnesota surplus lines insurance act. The insurer is an eligible surplus lines insurer but is not otherwise licensed by the State of Minnesota. In case of insolvency, payment of claims is not guaranteed. Company C is subject to statutes and regulations of surplus lines carriers. Evidence of Insurance

CERTIFICATE HOLDER**CANCELLATION**Information
Purposes Only

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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24.15 (LWS TECH) | TRYGVE LODIN | 3/22/2023 9:02:20 AM
L:\PROJECTS\51925\CAD\SHEETS\51925-C1-TITLE.DWG;C1.01 TITLE SHEET

CONSULTANT CONTACT LIST:

DEVELOPER/OWNER
COMPANY
ADDRESS
ADDRESS
TEL
EMAIL
CONTACT:

CIVIL ENGINEER
SAMBATEK
12800 WHITEWATER DRIVE, SUITE 300
MINNETONKA, MN 55343
TEL 763-476-6010
BBUSSELMAN@SAMBATEK.COM
CONTACT: BRADY BUSSELMAN

SURVEYOR
SAMBATEK
12800 WHITEWATER DRIVE, SUITE 300
MINNETONKA, MN 55343
TEL 763-476-6010
EMAIL
CONTACT:

LANDSCAPE ARCHITECT
SAMBATEK
12800 WHITEWATER DRIVE, SUITE 300
MINNETONKA, MN 55343
TEL 763-476-6010
JWORKMAN@SAMBATEK.COM
CONTACT: JOHNNIE WORKMAN

Site Development Plans
for
SHORT TERM MINING
OPERATIONS
CSAH 26 & CSAH 63 IMPROVEMENTS
Inver Grove Heights, Minnesota
Presented by:
S.M. Hentges & Sons

BENCHMARKS

BM NO. 1
1908 E. FROM THE MNDOT GEODETIC DATABASE
ELEV.=897.63

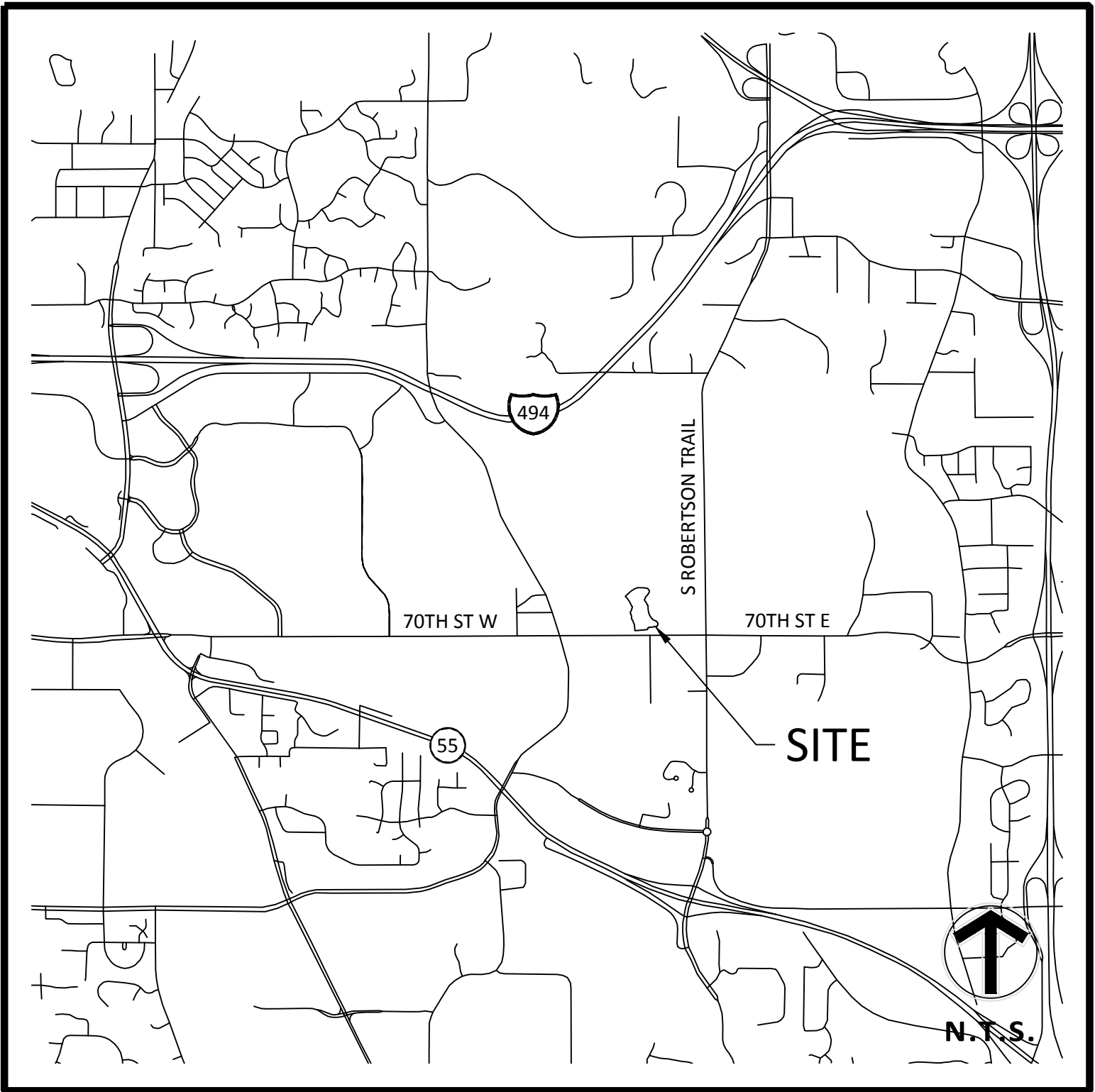
BM NO. 2
1908 F. FROM THE MNDOT GEODETIC DATABASE
ELEV.=902.73

SHEET INDEX

SHEET	DESCRIPTION
C1.01	TITLE SHEET
C5.01	EROSION CONTROL PHASE 1
C5.02	GRADING PLAN AND EROSION CONTROL PHASE 2
C5.03	EROSION CONTROL NOTES AND DETAILS
L1.01	TREE PRESERVATION
L1.02	TREE LIST
L1.03	TREE LIST CONT.

GOVERNING SPECIFICATIONS

CITY OF INVER GROVE HEIGHTS SPECIFICATIONS (2023)
CITY ENGINEER'S ASSOCIATION OF MINNESOTA STANDARD SPECIFICATIONS (2018)
MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION (2020 EDITION)



VICINITY MAP
NO SCALE

NO	DATE	BY	CKD	APPR	COMMENT
A	4-4-2023	TL	BB	BB	CITY COMMENTS

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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.
Print Name: _____
Date: _____ License # _____

PRELIMINARY
03/22/2023
DESIGN REVIEW
PERMIT SUBMITTAL
CONSTRUCTION DOCUMENTS

DRAWN BY
EAB
DESIGNED BY
TLL
CHECKED BY
BDB
PROJECT NO.
51925



TITLE SHEET
S.M. HENTGES & SONS
HENTGES SAND BORROW
PRELIMINARY
INVER GROVE HEIGHTS, MN

SHEET
C1.01
1 OF 7

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

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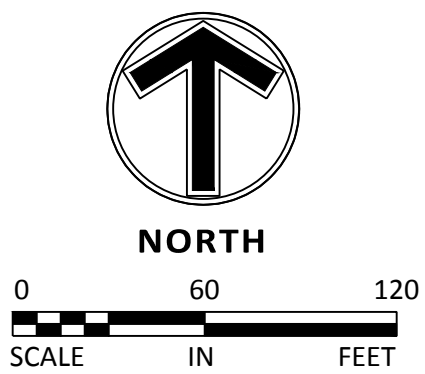


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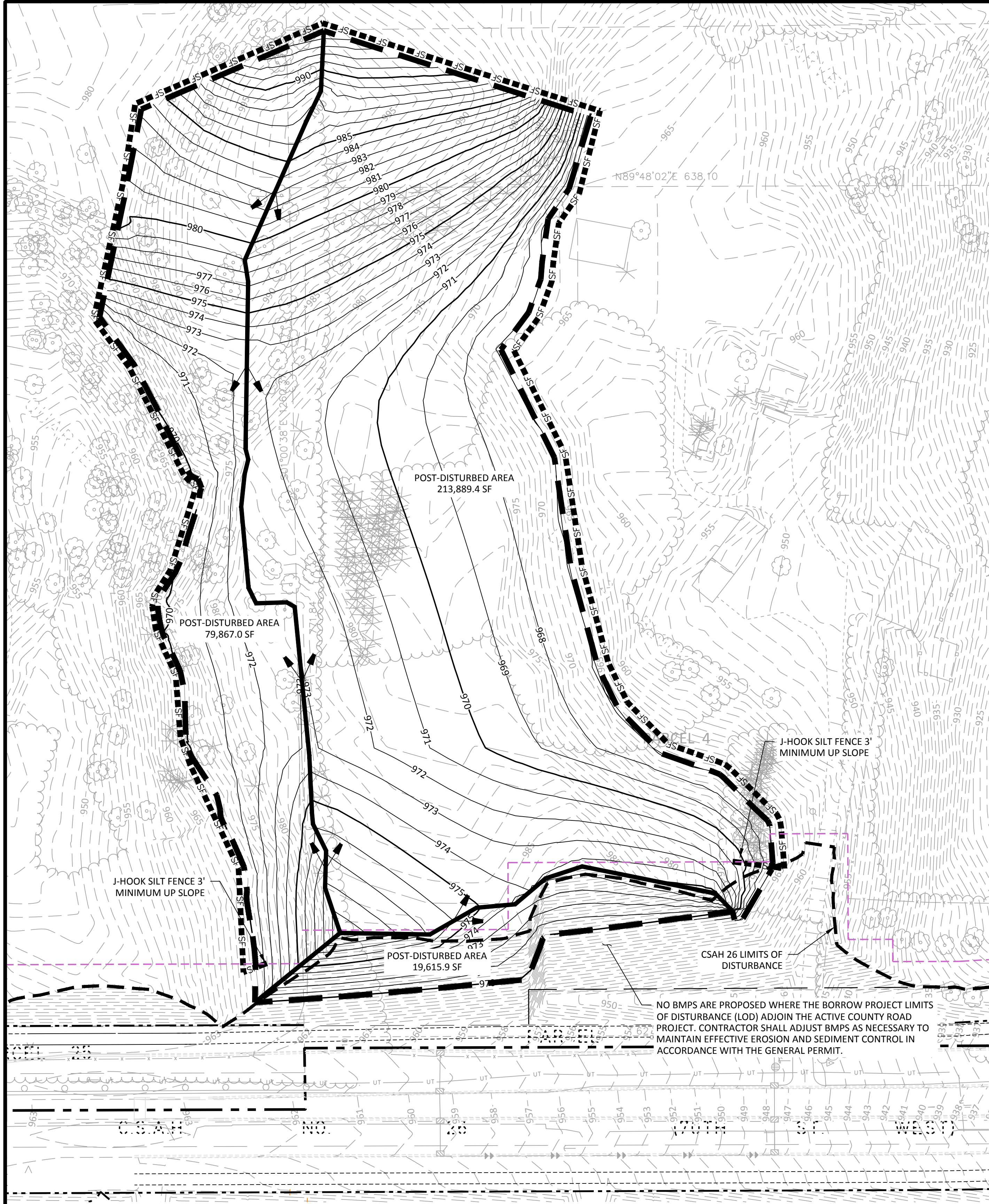
SHEET
C5.01
2 OF 7

- ## NOTE TO CONTRACTOR
- THE EROSION CONTROL PLAN SHEETS ALONG WITH THE REST OF THE SWPPP MUST BE KEPT ONSITE UNTIL THE NOTICE OF TERMINATION IS FILED WITH THE MPCA. THE CONTRACTOR MUST UPDATE THE SWPPP, INCLUDING THE EROSION CONTROL PLAN SHEETS AS NECESSARY TO INCLUDE ADDITIONAL REQUIREMENTS, SUCH AS ADDITIONAL OR MODIFIED BEST MANAGEMENT PRACTICES FOR PROBLEMS IDENTIFIED. AFTER FILING THE NOTICE OF TERMINATION, THE SWPPP, INCLUDING THE EROSION CONTROL PLAN SHEETS, AND ALL REVISIONS TO IT MUST BE SUBMITTED TO THE OWNER, TO BE KEPT ON FILE IN ACCORDANCE WITH THE RECORD RETENTION REQUIREMENTS DESCRIBED IN THE SWPPP NARRATIVE.

* REFER TO SHEET C5.03 FOR GENERAL NOTES, MAINTENANCE NOTES, LOCATION MAPS, AND STANDARD DETAILS



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THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/C1 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NO	DATE	BY	CKD	APPR	COMMENT
A	4-4-2023	TL	BB	BB	CITY COMMENTS

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.

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GRADING NOTES

- PROPOSED CONTOURS ARE TO FINISHED SURFACE ELEVATION. SPOT ELEVATIONS ALONG PROPOSED CURB DENOTE GUTTER GRADE
- CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
- SAFETY NOTICE TO CONTRACTORS: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE DUTY OF THE ENGINEER OR THE DEVELOPER TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE.
- EXISTING TREES AND OTHER NATURAL VEGETATION WITHIN THE PROJECT AND/OR ADJACENT TO THE PROJECT ARE OF PRIME CONCERN TO THE CONTRACTOR'S OPERATIONS AND SHALL BE A RESTRICTED AREA. CONTRACTOR SHALL PROTECT TREES TO REMAIN AT ALL TIMES. EQUIPMENT SHALL NOT NEEDLESSLY BE OPERATED UNDER NEARBY TREES AND EXTREME CAUTION SHALL BE EXERCISED WHEN WORKING ADJACENT TO TREES. SHOULD ANY PORTION OF THE TREE BRANCHES REQUIRE REMOVAL TO PERMIT OPERATION OF THE CONTRACTOR'S EQUIPMENT, CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL TREE TRIMMING SERVICE TO TRIM THE TREES PRIOR TO THE BEGINNING OF OPERATION. SHOULD CONTRACTOR'S OPERATIONS RESULT IN THE BREAKING OF ANY LIMBS, THE BROKEN LIMBS SHOULD BE REMOVED IMMEDIATELY AND CUTS SHALL BE PROPERLY PROTECTED TO MINIMIZE ANY LASTING DAMAGE TO THE TREE. NO TREES SHALL BE REMOVED WITHOUT AUTHORIZATION BY THE ENGINEER. COSTS FOR TRIMMING SERVICES SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONSTRUCTION AND NO SPECIAL PAYMENT WILL BE MADE.
 - RESTRICTED AREAS SHALL INCLUDE ALL DESIGNATED TREED AREAS OUTSIDE OF THE DESIGNATED CONSTRUCTION ZONE. ALL VEGETATION WITHIN THE RESTRICTED AREAS SHALL REMAIN.
 - CONTRACTOR SHALL RESTRICT ALL GRADING AND CONSTRUCTION ACTIVITIES TO AREAS DESIGNATED ON THE PLANS. ACTIVITIES WITHIN THE CONSTRUCTION MAY BE RESTRICTED TO A NARROWER WIDTH IN THE FIELD TO SAVE ADDITIONAL TREES AS DIRECTED BY THE OWNER.
 - ACTIVITIES PROHIBITED OUTSIDE OF THE CONSTRUCTION BOUNDARIES WOULD INCLUDE, BUT NOT BE LIMITED TO: SOIL AND OTHER MATERIAL STOCKPILING, EQUIPMENT OR MACHINERY STORAGE, DRIVING OF ANY VEHICLE, LEAKAGE OR SPILLAGE OF ANY "WASHOUT" OR OTHER TOXIC MATERIAL. THE COLLECTION OF OTHER DEBRIS AND SOIL STOCKPILING WILL BE IN AN AREA DETERMINED ON-SITE BY THE ENGINEER.
 - ALL RESTRICTED AREAS SHALL BE FENCED OFF WITH BRIGHT ORANGE POLYETHYLENE SAFETY NETTING AND STEEL STAKES AS SHOWN ON THE TREE PROTECTION DETAIL. AT NO TIME SHALL THIS FENCING BE REMOVED OR ACTIVITY OF ANY KIND TAKE PLACE WITHIN IT. FINAL PLACEMENT OF ALL PROTECTIVE FENCING SHALL BE COMPLETE BEFORE ANY WORK COMMENCES ON-SITE.
 - BEFORE COMMENCING WITH ANY EXCAVATION CONTRACTOR SHALL COMPLETE ALL PREPARATORY WORK REGARDING TREE REMOVAL, ROOT PRUNING, TREE PRUNING AND STUMP REMOVAL TO THE SATISFACTION OF THE OWNER.
 - PREPARATORY WORK SHALL INCLUDE THE FOLLOWING AND SHALL BE COMPLETED UNDER THE DIRECT SUPERVISION OF THE OWNER'S REPRESENTATIVE:
 - TREE REMOVAL: CONTRACTOR SHALL FELL THE TREES. AT NO TIME SHALL TREES BE BULLDOZED OUT, BUT SHALL BE CUT DOWN AND STUMPS REMOVED SEPARATELY. PRIOR TO THE FELLING OF ALL TREES, PROPER REMOVAL OF A PORTION OR ALL OF THE CANOPY SHALL BE COMPLETED SO THAT TREES IN THE RESTRICTED AREAS SHALL NOT BE INJURED IN THE PROCESS.
 - ROOT PRUNING: BEFORE ANY STUMPS ARE TO BE REMOVED, ALL ROOTS SHALL BE SEVERED FROM ROOTS IN THE RESTRICTED AREAS BY SAW CUTTING WITH A VERMEER DESIGNED FOR ROOT PRUNING, BY HAND, OR WITH A CHAINSAW. TREE ROOTS PROJECTING INTO THE CONSTRUCTION ZONE SHALL BE EXPOSED PRIOR TO ROOT PRUNING WITH SMALL MACHINERY, I.E., BOBCAT.
 - STUMP REMOVAL: AT SUCH TIME THAT ROOTS HAVE BEEN PROPERLY SEVERED, STUMPS MAY BE REMOVED. WHERE REMOVAL OF CERTAIN STUMPS COULD CAUSE DAMAGE TO EXISTING PROTECTED TREES, TREE STUMPS SHALL BE GROUND OUT. ALL STUMP REMOVAL SHALL BE UNDER THE DIRECT SUPERVISION OF THE OWNER'S REPRESENTATIVE.
 - TREE PRUNING: PROPER PRUNING OF TREES IN THE RESTRICTED ZONE SHALL BE DIRECTED BY AND SUPERVISION AT ALL TIMES BY THE OWNER'S REPRESENTATIVE.
 - AN OWNER'S REPRESENTATIVE WILL BE AVAILABLE AT ALL TIMES DURING THE PREPARATORY AND CONSTRUCTION PERIOD.
 - MULCH RATHER THAN SEED OR SOD WILL BE USED AT THE BASE OF QUALITY TREES TO A PERIMETER DETERMINED BY THE OWNER'S REPRESENTATIVE. AREAS TO BE SEEDED FOR EROSION CONTROL PURPOSES WITHIN THE CONSTRUCTION ZONE ARE TO BE DETERMINED BY THE OWNER'S REPRESENTATIVE. NATURAL GROUND COVER WILL BE MAINTAINED WHEREVER POSSIBLE.
 - THE USE OF RETAINING WALLS NEAR TREES, IN ADDITION TO THOSE REQUIRED ON THE PLANS SHALL BE DETERMINED IN THE FIELD, BASED ON TREE LOCATIONS AND TOPOGRAPHY.
- EXCAVATE TOPSOIL FROM AREAS TO BE FURTHER EXCAVATED OR REGRADED AND STOCKPILE IN AREAS DESIGNATED ON THE SITE. CONTRACTOR SHALL SALVAGE ENOUGH TOPSOIL FOR RESPREADING ON THE SITE AS SPECIFIED. EXCESS TOPSOIL SHALL BE PLACED IN EMBANKMENT AREAS, OUTSIDE OF BUILDING PADS, ROADWAYS AND PARKING AREAS. CONTRACTOR SHALL SUBCUT CUT AREAS, WHERE TURF IS TO BE ESTABLISHED, TO A DEPTH OF 6 INCHES. RESPREAD TOPSOIL IN AREAS WHERE TURF IS TO BE ESTABLISHED TO A MINIMUM DEPTH OF 6 INCHES.
- FINISHED GRADING SHALL BE COMPLETED, CONTRACTOR SHALL UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING, INCLUDING ADJACENT TRANSITION AREAS. PROVIDE A SMOOTH FINISHED SURFACE WITHIN SPECIFIED TOLERANCES, WITH UNIFORM LEVELS OR SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE SHOWN, OR BETWEEN SUCH POINTS AND EXISTING GRADES. AREAS THAT HAVE BEEN FINISHED GRADED SHALL BE PROTECTED FROM SUBSEQUENT CONSTRUCTION OPERATIONS, TRAFFIC AND EROSION. REPAIR ALL AREAS THAT HAVE BECOME RUTTED, ERODED OR HAS SETTLED BELOW THE CORRECT GRADE. ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO EQUAL OR BETTER THAN ORIGINAL CONDITION OR TO THE REQUIREMENTS OF THE NEW WORK.
- CONTRACTOR SHALL DETERMINE THE LOCATION OF ANY HAUL ROADS THAT MAY BE REQUIRED TO COMPLETE THE SITE GRADING CONSTRUCTION AND SHALL INDICATE HAUL ROADS ON EROSION AND SEDIMENT CONTROL "SITE MAP". CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE GOVERNING AUTHORITY OF EACH ROADWAY. CONTRACTOR SHALL POST WHATEVER SECURITY AND COMPLY WITH ALL CONDITIONS WHICH ARE REQUIRED BY EACH GOVERNING AUTHORITY OF EACH ROADWAY.

CIVIL 3D MODEL LIMITATIONS

SAMBATEK'S DELIVERABLE AND GOVERNING DOCUMENTS FOR CONSTRUCTION SHALL BE A HARD COPY AND/OR PDF PLAN SHEETS. IF A CIVIL 3D MODEL IS GENERATED IN THE PROCESS OF PREPARING THE PLAN SHEETS, IT IS AS A DESIGN TOOL ONLY AND NOT AS A SEPARATE DELIVERABLE. AT THE OWNER'S REQUEST, WE WILL RELEASE OUR CIVIL 3D MODEL FOR THE CONTRACTOR'S USE. HOWEVER, ITS USE IS AT THE CONTRACTOR'S RISK AND SHALL NOT BE USED FOR STAKING OF CURB, SIDEWALK, OR OTHER HARD SURFACE IMPROVEMENTS. IF A CIVIL 3D MODEL FOR STAKING HARD SURFACE IMPROVEMENTS IS REQUIRED, WE CAN PROVIDE A SUPPLEMENTAL AGREEMENT FOR REFINEMENT AND PREPARATION OF THE CIVIL 3D MODEL.

LEGEND

PROPOSED	EXISTING	
---	---	PROPERTY BOUNDARY
---	---	PERMANENT EASEMENT
---	---	TEMPORARY CONSTRUCTION EASEMENT
---	---	ASPHALT SIDEWALK
---	---	CONCRETE CURB
---	---	STORM SEWER
---	---	DRAINTILE
---	---	CONTOUR
---	---	RIPRAP
---	---	OVERFLOW ELEV.
---	---	BIO-ROLL
---	---	SILT FENCE
---	---	SILT DIKE
---	---	LIMITS OF DISTURBANCE
---	---	CSAH 26 LIMITS OF DISTURBANCE
---	---	DIRECTION OF OVERLAND FLOW
---	---	TEMPORARY DIVERSION DITCH
---	---	CHECK DAM
---	---	LIMITS OF DRAINAGE SUB-BASIN
---	---	TEMPORARY SEDIMENT BASIN
---	---	TEMPORARY STABILIZATION MEASURES (SEED, MULCH, MATS OR BLANKETS AS OUTLINED IN THE SWPPP)
---	---	TEMPORARY STORAGE AND PARKING AREA

NOTE TO CONTRACTOR

THE EROSION CONTROL PLAN SHEETS ALONG WITH THE REST OF THE SWPPP MUST BE KEPT ONSITE UNTIL THE NOTICE OF TERMINATION IS FILED WITH THE MPCA, THE CONTRACTOR MUST UPDATE THE SWPPP, INCLUDING THE EROSION CONTROL PLAN SHEETS AS NECESSARY TO INCLUDE ADDITIONAL REQUIREMENTS, SUCH AS ADDITIONAL OR MODIFIED BMPs DESIGNED TO CORRECT PROBLEMS IDENTIFIED. AFTER FILING THE NOTICE OF TERMINATION, THE SWPPP, INCLUDING THE EROSION CONTROL PLAN SHEETS, AND ALL REVISIONS TO IT MUST BE SUBMITTED TO THE OWNER, TO BE KEPT ON FILE IN ACCORDANCE WITH THE RECORD RETENTION REQUIREMENTS DESCRIBED IN THE SWPPP NARRATIVE.

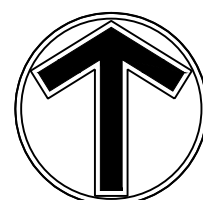
EROSION CONTROL MATERIALS QUANTITIES

ITEM	UNIT	QUANTITY
SILT FENCE	LINEAR FEET	2150
SILT DIKE	LINEAR FEET	0
BIO-ROLL	LINEAR FEET	0
CONSTRUCTION ENTRANCE	UNIT	0
INLET PROTECTION DEVICE (IP-1)	UNIT	0
INLET PROTECTION DEVICE (IP-2)	UNIT	0

* REFER TO SHEET C5.03 FOR GENERAL NOTES, MAINTENANCE NOTES, LOCATION MAPS, AND STANDARD DETAILS

CUT/FILL ANALYSIS

ITEM	UNIT	QUANTITY
CUT	CUBIC YARDS	81,100
FILL	CUBIC YARDS	25
TOTAL	CUBIC YARDS	81,075 CUT



0 60 120
SCALE IN FEET

GRADING PLAN AND EROSION CONTROL PHASE 2

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HENTGES SAND BORROW
PRELIMINARY
INVER GROVE HEIGHTS, MN

SHEET

C5.02
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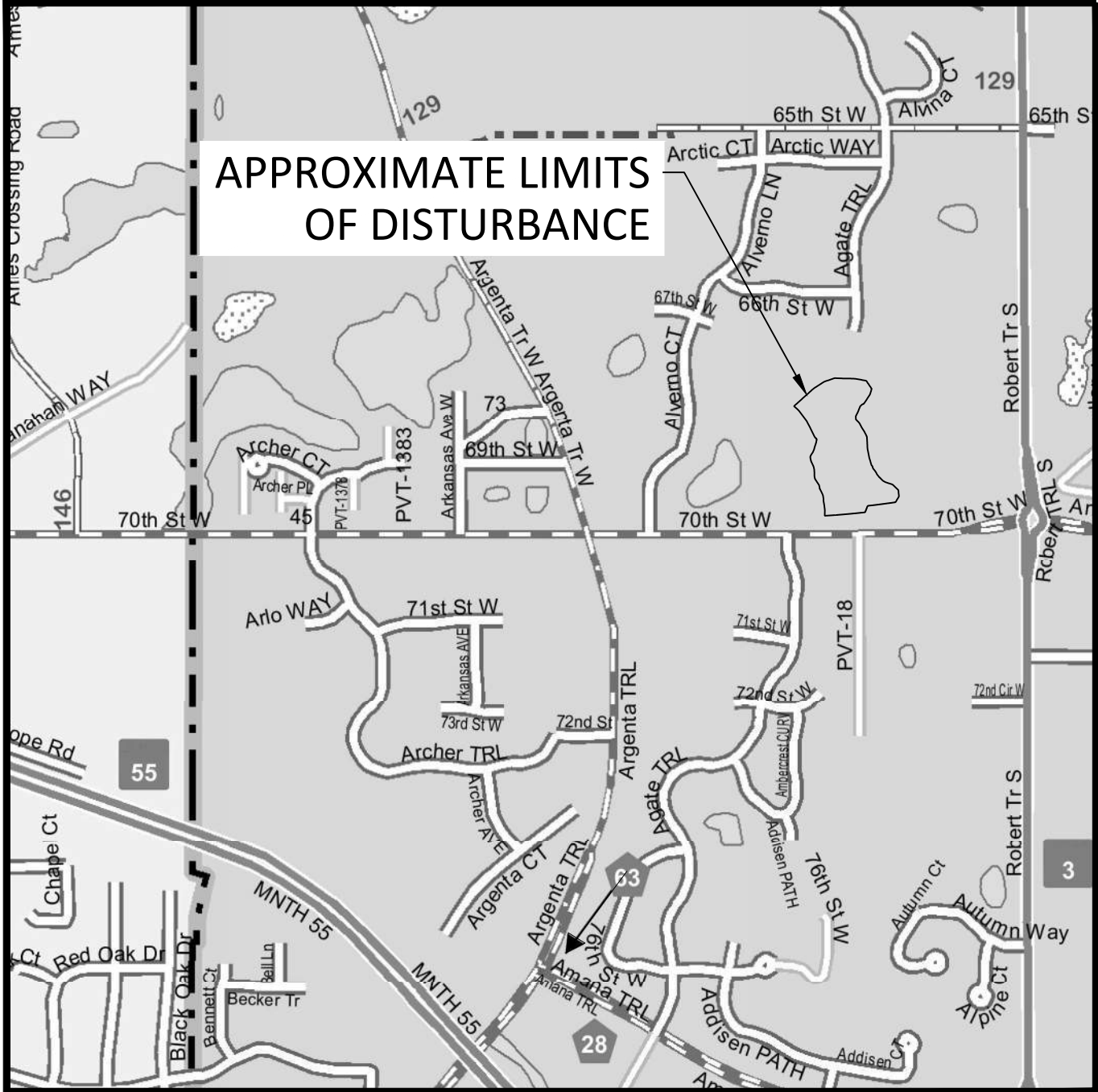
- CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME. WHERE A CONFLICT EXISTS BETWEEN LOCAL JURISDICTIONAL STANDARD SPECIFICATIONS AND SAMBATEK STANDARD SPECIFICATIONS, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
- CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES (BMP'S) AS REQUIRED BY THE PERMITS. CONTRACTOR SHALL OVERSEE THE INSPECTION & MAINTENANCE OF THE BMP'S AND EROSION PREVENTION FROM BEGINNING OF CONSTRUCTION AND UNTIL CONSTRUCTION IS COMPLETED, IS APPROVED BY ALL AUTHORITIES, AND THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA BY EITHER THE OWNER OR OPERATOR AS APPROVED ON PERMIT. ADDITIONAL BMP'S SHALL BE IMPLEMENTED AS DICTATED BY CONDITIONS AT NO ADDITIONAL COST TO OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.
- CONTRACTOR SHALL COMPLY WITH TRAINING REQUIREMENTS IN PART 21.1-21.3 OF THE GENERAL PERMIT.
- BMP'S AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE. CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY PERMITTING AGENCY OR OWNER.
- ESC PLAN MUST CLEARLY DELINEATE ALL STATE WATERS. PERMITS FOR ANY CONSTRUCTION ACTIVITY IMPACTING STATE WATERS OR REGULATED WETLANDS MUST BE MAINTAINED ON SITE AT ALL TIMES.
- CONTRACTOR SHALL MINIMIZE CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THE ESC PLANS SHALL BE CLEARLY DELINEATED (E.G. WITH FLAGS, STAKES, SIGNS, SILT FENCE, ETC.) ON THE DEVELOPMENT SITE BEFORE WORK BEGINS. GROUND DISTURBING ACTIVITIES MUST NOT OCCUR OUTSIDE THE LIMITS OF DISTURBANCE.
- GENERAL CONTRACTOR SHALL DENOTE ON PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
- ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) MUST BE LIMITED TO A DEFINED AREA OF THE SITE AND SHALL BE CONTAINED AND PROPERLY TREATED OR DISPOSED. NO ENGINE DEGREASING IS ALLOWED ON SITE.
- ALL LIQUID AND SOLID WASTES GENERATED BY CONCRETE WASHOUT OPERATIONS MUST BE CONTAINED IN A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER. A COMPACTED CLAY LINER IS NOT ACCEPTABLE. THE LIQUID AND SOLID WASTES MUST NOT CONTACT THE GROUND, AND THERE MUST NOT BE RUNOFF FROM THE CONCRETE WASHOUT OPERATIONS OR AREAS. LIQUID AND SOLID WASTES MUST BE DISPOSED OF PROPERLY AND IN COMPLIANCE WITH MPCA REGULATIONS. A SIGN MUST BE INSTALLED ADJACENT TO EACH WASHOUT FACILITY TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE PROPER FACILITIES. SELF-CONTAINED CONCRETE WASHOUTS ON CONCRETE DELIVERY TRUCKS ARE ALLOWED.
- SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
- DUST ON THE SITE SHALL BE CONTROLLED. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
- SOLID WASTE: COLLECTED SEDIMENT, ASPHALT & CONCRETE MILLINGS, FLOATING DEBRIS, PAPER, PLASTIC, FABRIC, CONSTRUCTION & DEMOLITION DEBRIS & OTHER WASTES MUST BE DISPOSED OF PROPERLY & MUST COMPLY WITH MPCA DISPOSAL REQUIREMENTS.
- HAZARDOUS MATERIALS: OIL, GASOLINE, PAINT & ANY HAZARDOUS SUBSTANCES MUST BE PROPERLY STORED, INCLUDING SECONDARY CONTAINMENT, TO PREVENT SPILLS, LEAKS OR OTHER DISCHARGE. RESTRICTED ACCESS TO STORAGE AREAS MUST BE PROVIDED TO PREVENT VANDALISM. STORAGE & DISPOSAL OF HAZARDOUS WASTE MUST BE IN COMPLIANCE WITH MPCA REGULATIONS.
- ALL STORM WATER POLLUTION PREVENTION MEASURES PRESENTED ON THIS PLAN SHALL BE INITIATED AS SOON AS PRACTICABLE AND PRIOR TO SOIL DISTURBING ACTIVITIES UPSLOPE.
- DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS STOPPED SHALL BE TEMPORARILY SEEDED, WITHIN 14 DAYS OF INACTIVITY. SEEDING SHALL BE IN ACCORDANCE WITH MN/DOT SEED MIXTURE NUMBER 21-111 OR 21-112 DEPENDING ON THE SEASON OF PLANTING (SEE MN/DOT SPECIFICATION SECTION 2575.3) SEEDING METHOD AND APPLICATION RATE SHALL CONFORM TO MN/DOT SPECIFICATION SECTION 2575.3. TEMPORARY MULCH SHALL BE APPLIED IN ACCORDANCE WITH MN/DOT SPECIFICATION SECTION 2575.3F1 AND 2575.3G. ALTERNATIVELY, HYDRAULIC SOIL STABILIZER IN ACCORDANCE WITH MN/DOT SPECIFICATION SECTION 2575.3H MAY BE USED IN PLACE OF TEMPORARY MULCH.
- DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY STOPPED SHALL BE PERMANENTLY STABILIZED. THESE AREAS SHALL BE STABILIZED IN ACCORDANCE WITH THE TIME TABLE DESCRIBED ABOVE. REFER TO THE GRADING PLAN AND/OR LANDSCAPE PLAN FOR VEGETATIVE COVER. (NOTE TO THE PREPARER: WHERE PERMANENT SEEDING IS NOT CALLED OUT IN THE GRADING AND/ OR LANDSCAPE PLAN, REPLACE THE LAST SENTENCE IN THIS ITEM WITH THE FOLLOWING: SEED WITH MNDOT SEED MIX 35-241 5 YEAR STABILIZATION MIX. SEEDING METHOD AND APPLICATION RATE SHALL CONFORM TO MN/DOT SPECIFICATION SECTION 2573.3.)
- CONTRACTORS OR SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING SEDIMENT FROM CONVEYANCES & 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 DRAINAGEWAYS DISCHARGING OFF-SITE OR TO SURFACE WATERS. THE CLEANOUT OF PERMANENT BASINS MUST BE SUFFICIENT TO RETURN THE BASIN TO DESIGN CAPACITY.
- ON-SITE & OFF-SITE SOIL STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION THROUGH IMPLEMENTATION OF BMP'S. STOCKPILE AND BORROW AREA LOCATIONS SHALL BE NOTED ON THE SITE MAP AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS.
- TEMPORARY SOIL STOCKPILES MUST HAVE SILT FENCE OR OTHER EFFECTIVE SEDIMENT CONTROLS & CANNOT BE PLACED IN SURFACE WATERS
- SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION.
- DUE TO THE GRADE CHANGES DURING THE DEVELOPMENT OF THE PROJECT, CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION CONTROL MEASURES (SILT FENCES, CHECK DAMS, INLET PROTECTION DEVICES, ETC.) TO PREVENT EROSION.

MAINTENANCE NOTES:

ALL MEASURES STATED ON THIS EROSION AND SEDIMENT CONTROL PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLAN SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK OR FINAL STABILIZATION OF THE SITE. THE DESIGNATED CONTACT PERSON NOTED ON THIS PLAN MUST ROUTINELY INSPECT THE CONSTRUCTION ON SITE ONCE EVERY SEVEN DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CLEANED AND REPAIRED IN ACCORDANCE WITH THE FOLLOWING:

- ALL SILT FENCES MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WHEN THEY BECOME NONFUNCTIONAL OR THE SEDIMENT REACHES 1/2 OF THE HEIGHT OF THE FENCE. THESE REPAIRS MUST BE MADE WITHIN 24 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.
- TEMPORARY AND PERMANENT SEDIMENTATION BASINS MUST BE DRAINED AND THE SEDIMENT REMOVED WHEN THE DEPTH OF SEDIMENT COLLECTED IN THE BASIN REACHES 1/2 THE STORAGE VOLUME. DRAINAGE AND REMOVAL MUST BE COMPLETED WITHIN 72 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS (SEE PART 10.1-10.5 OF THE GENERAL PERMIT).
- SURFACE WATERS, INCLUDING DRAINAGE DITCHES AND CONVEYANCE SYSTEMS, MUST BE INSPECTED FOR EVIDENCE OF SEDIMENT BEING DEPOSITED BY EROSION. CONTRACTOR MUST REMOVE ALL DELTAS AND SEDIMENT DEPOSITED IN SURFACE WATERS, INCLUDING DRAINAGE WAYS, CATCH BASINS, AND OTHER DRAINAGE SYSTEMS, AND RESTABILIZE THE AREAS WHERE SEDIMENT REMOVAL RESULTS IN EXPOSED SOIL. THE REMOVAL AND STABILIZATION MUST TAKE PLACE WITHIN SEVEN (7) DAYS OF DISCOVERY UNLESS PRECLUDED BY LEGAL, REGULATORY, OR PHYSICAL ACCESS CONSTRAINTS. CONTRACTOR SHALL USE ALL REASONABLE EFFORTS TO OBTAIN ACCESS. IF PRECLUDED, REMOVAL AND STABILIZATION MUST TAKE PLACE WITHIN SEVEN (7) CALENDAR DAYS OF OBTAINING ACCESS. CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL LOCAL, REGIONAL, STATE AND FEDERAL AUTHORITIES AND RECEIVING ANY APPLICABLE PERMITS, PRIOR TO CONDUCTING ANY WORK.
- CONSTRUCTION SITE VEHICLE EXIT LOCATIONS MUST BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING ONTO PAVED SURFACES. TRACKED SEDIMENT MUST BE REMOVED FROM ALL OFF-SITE PAVED SURFACES, WITHIN 24 HOURS OF DISCOVERY, OR IF APPLICABLE, WITHIN A SHORTER TIME TO COMPLY WITH PART 9.11-9.12 OF THE GENERAL PERMIT.
- CONTRACTOR IS RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF TEMPORARY AND PERMANENT WATER QUALITY MANAGEMENT BMP'S, AS WELL AS ALL EROSION PREVENTION AND SEDIMENT CONTROL BMP'S, FOR THE DURATION OF THE CONSTRUCTION WORK AT THE SITE. THE PERMITTEE(S) ARE RESPONSIBLE UNTIL ANOTHER PERMITTEE HAS ASSUMED CONTROL (ACCORDING TO PART 3.1 TO 3.8 OF THE MPCA GENERAL PERMIT) OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED OR THE SITE HAS UNDERGONE FINAL STABILIZATION, AND A (N.O.T.) HAS BEEN SUBMITTED TO THE MPCA.
- IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED IN A MANNER AND AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS (E.G., FUGITIVE SEDIMENT IN STREETS COULD BE WASHED INTO STORM SEWERS BY THE NEXT RAIN AND/OR POSE A SAFETY HAZARD TO USERS OF PUBLIC STREETS).
- ALL INFILTRATION AREAS MUST BE INSPECTED TO ENSURE THAT NO SEDIMENT FROM ONGOING CONSTRUCTION ACTIVITIES IS REACHING THE INFILTRATION AREA AND THESE AREAS ARE PROTECTED FROM COMPACTION DUE TO CONSTRUCTION EQUIPMENT DRIVING ACROSS THE INFILTRATION AREA.

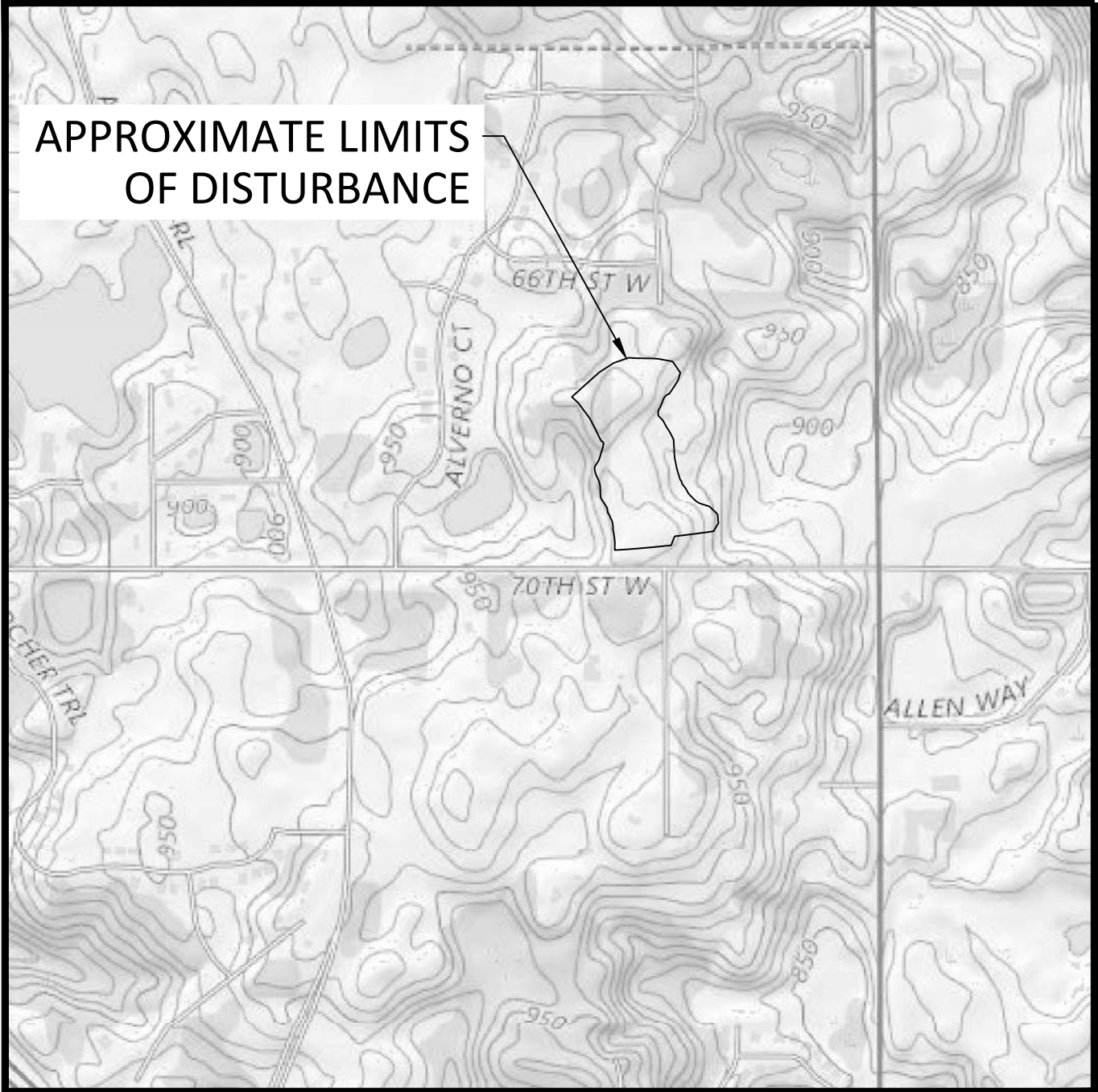
APPROXIMATE LIMITS OF DISTURBANCE



SITE LOCATION MAP

NOT TO SCALE

APPROXIMATE LIMITS OF DISTURBANCE



USGS MAP

NOT TO SCALE

AREA SUMMARY IN ACRES

DEVELOPER/OWNER: S.M. HENTGES & SONS CONTACT: JOE MILLER JOE.MILLER@SMHENTGES.COM 952-492-5700
SITE OPERATOR / GENERAL CONTRACTOR
SUPERINTENDENT:

PAVEMENT AREA	0.00 AC±
BUILDING AREA	0.00 AC±
SEEDED AREA	6.67 AC±
TOTAL DISTURBED	6.67 AC±
PRE - CONSTRUCTION IMPERVIOUS	0.00 AC±
POST - CONSTRUCTION IMPERVIOUS	0.00 AC±

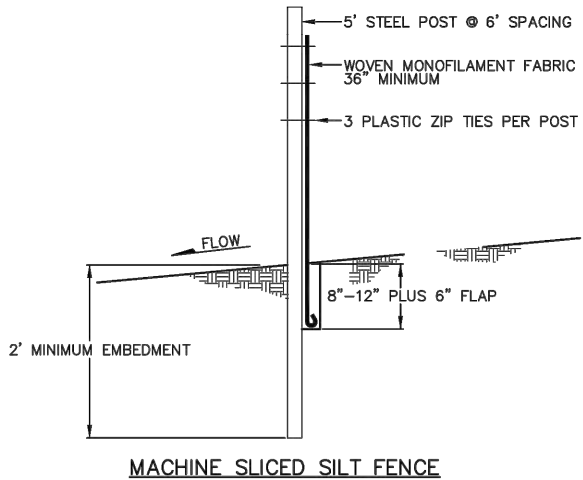
SEQUENCE OF CONSTRUCTION

PHASE I:

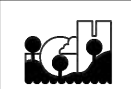
- CONSTRUCT THE SILT FENCES ON THE SITE.
- INSTALL INLET PROTECTION DEVICES ON EXISTING STORM STRUCTURES, AS SHOWN ON THE PLAN.
- CONSTRUCT THE SEDIMENTATION AND SEDIMENT TRAP BASINS, AS REQUIRED.
- CLEAR AND GRUB THE SITE.
- BEGIN GRADING THE SITE.

PHASE II:

- COMPLETE GRADING AND INSTALL PERMANENT SEEDING AND PLANTING.
- REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES (ONLY IF SITE IS STABILIZED), IF REQUIRED BY THE CONTRACT.



- NOTES:
- WOOD POSTS MAY BE USED IN NON-CRITICAL AREAS. WOOD POST SPACING AT 4' MAXIMUM. STEEL POSTS ARE REQUIRED WHEN HEAVY DUTY SILT FENCE IS SPECIFIED.
 - SILT FENCE MUST BE CLEANED OR REPLACED WHEN SILT DEPTH IS 1/3 HEIGHT OF FABRIC.



SILT FENCE

Printed On Dec-21

CITY OF INVER GROVE HEIGHTS
ENGINEERING DEPARTMENT

4/11

PLATE NO.
EC-02

NO	DATE	BY	CKD	APPR	COMMENT
A	4-4-2023	TL	BB	BB	CITY COMMENTS

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.

Print Name: _____

Date: _____ License # _____

PRELIMINARY 03/22/2023 DESIGN REVIEW
PERMIT SUBMITTAL
CONSTRUCTION DOCUMENTS

DRAWN BY EAB
DESIGNED BY TLL
CHECKED BY BDB
PROJECT NO. 51925



EROSION CONTROL NOTES AND DETAILS

S.M. HENTGES & SONS
HENTGES SAND BORROW
PRELIMINARY
INVER GROVE HEIGHTS, MN

SHEET

C5.03
4 OF 7



LEGEND

PROPOSED

EXISTING

PROPERTY LIMIT

CURB & GUTTER

EASEMENT

BUILDING

RETAINING WALL

WETLAND LIMITS

TREELINE

LANDSCAPE EDGING

STORM SEWER

SANITARY SEWER

FORCEMAIN (SAN.)

WATERMAIN

YARDDRRAIN

LIMITS OF DISTURBANCE

TREE PROTECTION FENCE

TREE TO BE REMOVED

SIGN

PIPE BOLLARD

RIPRAP

STANDARD DUTY ASPHALT PAVING

CONCRETE PAVING

CONCRETE SIDEWALK

IGH TREE PRESERVATION CODE

Reforestation:

1. If the land alteration results in woodland removal beyond the woodland removal threshold, the applicant shall be required to submit a reforestation plan. The reforestation plan must be submitted prior to final plat approval. The reforestation plan shall include:

a. Location of proposed reforestation.

b. Species and size of proposed plantings.

c. Quantity of proposed plantings.

2. The reforestation plan shall comply with the following criteria:

a. Tree replacement will be predicated on total number of diameter inches of significant and heritage trees removed beyond the threshold limits outlined in subsection D of this section.

b. Actual replacement quantities shall be adjusted based on the type of woodland removed in accordance with the following guidelines:

(1) Class A, fast growing deciduous species, predominantly aspen, Siberian elm, American elm, silver maple, red maple, willow: fifty percent (50%).

(2) Class B, conifer/mixed hardwoods, predominantly pine, spruce, cedar and mixed hardwoods consisting of the following species: oak, birch, sugar maple, black cherry, basswood, ironwood, walnut, ash, hackberry, locust: one hundred percent (100%).

(3) Class C, heritage tree: one hundred percent (100%). For each heritage tree saved, the developer may receive credit towards the required replacement trees. This credit will be at a rate of two (2) caliper inches for each one dbh inch saved. To receive this credit, the applicant must demonstrate that extraordinary measures h

CALCULATIONS

INCHES REMOVED: 2,684

INCHES PRESERVED: 9,667

TOTAL INCHES ON SITE: 12,351

ALLOWED REMOVAL: 25%

ACTUAL REMOVAL: 21.7%

POSSIBLE EXEMPT COMMERCIAL INCHES:594

24.15 (LWS TECH) | TRYGVE LODIN | 3/31/2023 4:01:15 PM
L:\PROJECTS\51925\CAD SHEETS\51925-10-TREE.DWG:L1.01 TREE PRESERVATION

THE SUBSURFACE UTILITY INFORMATION SHOWN ON THESE PLANS IS A UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/CI 38-02, TITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, BY CONTACTING THE NOTIFICATION CENTER (GOPHER STATE ONE FOR MINNESOTA). THE CONTRACTOR AND/OR SUBCONTRACTOR AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES, WHICH MIGHT BE OCCASIONED BY HIS OR HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES (UNDERGROUND AND OVERHEAD).

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

NO	DATE	BY	CKD	APPR	COMMENT
A	4-4-2023	TL	BB	BB	CITY COMMENTS
© 2021 Sambatek					

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.

Print Name: _____

_____ License # _____

NOT FOR CONSTRUCTION

PRELIMINARY
03/22/2023
DESIGN REVIEW

PERMIT SUBMITTAL

CONSTRUCTION DOCUMENTS

DRAWN BY
EAB

DESIGNED BY
TLL

CHECKED BY
BDB

PROJECT NO.
51925

Sambatek

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Engineering | Surveying | Planning | Environmental

TREE PRESERVATION
S.M. HENTGES & SONS
HENTGES SAND BORROW
PRELIMINARY
INVER GROVE HEIGHTS, MN

SHEET
L1.01
5 OF 7

NORTH

0

60

120

SCALE

IN

FEET

24.15 (LWS TECH) | TRNGVE LODIN | 3/31/2023 4:01:15 PM
LA-PROJECT\51925\CAD\SHEETS\51925-10-TREE.DWG\1.02 TREE LIST

Tree Number	Height ft	DBH	Tree Name	Condition	Status	Class
1	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
2			Oak - Red (Quercus rubra)	G	B	
3		10	Cherry - Black (Prunus serotina)	G	B	
4		14	Elm - American (Ulmus americana)	G	A	
5	23	9.58333333	Cedar - Eastern Red (Juniperus virginiana)	G	B	
6	27	11.25	Cedar - Eastern Red (Juniperus virginiana)	G	B	
7	15	6.25	Cedar - Eastern Red (Juniperus virginiana)	G	B	
8		11	Elm - American (Ulmus americana)	G	A	
9	24	10	Spruce - Colorado (Picea pungens)	G	B	
10		13	Elm - American (Ulmus americana)	G	A	
11		16	Elm - American (Ulmus americana)	G	A	
12	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
13	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
14	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
15		25	Oak - Red (Quercus rubra)	G	B	
16	27	11.25	Cedar - Eastern Red (Juniperus virginiana)	G	B	
17		9	Cherry - Black (Prunus serotina)	G	B	
18		12	Ash - Green (Fraxinus pennsylvanica)	G	B	
19		8	Oak - White (Quercus alba)	G	B	
20	20	8.33333333	Cedar - Eastern Red (Juniperus virginiana)	G	B	
21	12	5	Cedar - Eastern Red (Juniperus virginiana)	G	B	
22	38	15.8333333	Cedar - Eastern Red (Juniperus virginiana)	G	B	
23		21	Oak - White (Quercus alba)	G	B	
24		10	Oak - Bur (Quercus macrocarpa)	G	B	
25		9	Cherry - Black (Prunus serotina)	P	B	
26		10	Aspen - Quaking (Populus tremuloides)	G	A	
27		9	Cherry - Black (Prunus serotina)	G	B	
28	24	10	Cedar - Eastern Red (Juniperus virginiana)	G	B	
29		24	Oak - White (Quercus alba)	P	B	
30		16	Oak - Red (Quercus rubra)	G	B	
31		9	Cherry - Black (Prunus serotina)	P	B	
32		8	Elm - American (Ulmus americana)	G	A	
33	18	7.5	Spruce - Colorado (Picea pungens)	G	B	
34	22	9.16666667	Spruce - Colorado (Picea pungens)	G	B	
35	23	9.58333333	Spruce - Colorado (Picea pungens)	G	B	
36	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
37	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
38	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
39	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
40	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
75		12	Elm - American (Ulmus americana)	G	A	
76		12	Elm - American (Ulmus americana)	G	A	
77		14	Ash - Green (Fraxinus pennsylvanica)	G	B	
78		19	Willow - Black (Salix nigra)	G	A	
79		8	Elm - American (Ulmus americana)	G	A	
80		17	Oak - Red (Quercus rubra)	G	B	
81		20	Oak - Red (Quercus rubra)	G	B	
82		30	Oak - White (Quercus alba)	G	Herit age	
83		12	Oak - Red (Quercus rubra)	G	B	
84		28	Oak - White (Quercus alba)	G	Herit age	
85		16	Oak - Red (Quercus rubra)	G	B	
86		17	Oak - Red (Quercus rubra)	G	B	
87		35	Oak - White (Quercus alba)	G	Herit age	
88	27	11.25	Cedar - Eastern Red (Juniperus virginiana)	G	B	
89	15	6.25	Spruce - Colorado (Picea pungens)	G	B	
90	20	8.33333333	Spruce - Colorado (Picea pungens)	G	B	
91		8	Oak - Red (Quercus rubra)	G	B	
92		19	Oak - Red (Quercus rubra)	G	B	
93		9	Oak - White (Quercus alba)	G	B	
94		10	Cherry - Black (Prunus serotina)	G	B	
95		23	Oak - White (Quercus alba)	G	B	
96		9	Cherry - Black (Prunus serotina)	G	B	
97	12	5	Cedar - Eastern Red (Juniperus virginiana)	G	B	
98	10	4.16666667	Cedar - Eastern Red (Juniperus virginiana)	G	B	
99	18	7.5	Cedar - Eastern Red (Juniperus virginiana)	G	B	
100		10	Oak - White (Quercus alba)	G	B	
101		17	Elm - American (Ulmus americana)	G	A	
102		14	Locust - Honey (Gleditsia triacanthos)	G	B	
103		10	Locust - Honey (Gleditsia triacanthos)	G	B	
104		13	Elm - American (Ulmus americana)	G	A	
105		10	Elm - American (Ulmus americana)	G	A	
106		11	Oak - White (Quercus alba)	G	B	
107		35	Willow - Black (Salix nigra)	G	Herit age	
108		21	Ash - Green (Fraxinus pennsylvanica)	G	B	
109	12	5	Cedar - Eastern Red (Juniperus virginiana)	G	B	
110		19	Elm - Siberian (Ulmus pumilus)	G	A	
111	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
112	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
113	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
114	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
115	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
116	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
117		11	Elm - Siberian (Ulmus pumilus)	G	A	
118	35	14.5833333	Cedar - Eastern Red (Juniperus virginiana)	G	B	
119	35	14.5833333	Cedar - Eastern Red (Juniperus virginiana)	G	B	
120		12	Oak - Red (Quercus rubra)	G	B	
121		30	Oak - White (Quercus alba)	E	Herit age	
122		21	Oak - White (Quercus alba)	P	B	
123		8	Aspen - Quaking (Populus tremuloides)	G	A	
124		13	Aspen - Quaking (Populus tremuloides)	G	A	
125		11	Aspen - Quaking (Populus tremuloides)	G	A	
126	45	18.75	Spruce - Colorado (Picea pungens)	G	B	

127		28	Oak - White (Quercus alba)	G	Herit age	
128		30	Oak - White (Quercus alba)	G	Herit age	
129		27	Oak - White (Quercus alba)	G	Herit age	
130	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
131	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
132	35	14.5833333	Cedar - Eastern Red (Juniperus virginiana)	G	B	
133	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
134	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
135	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
136	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
137	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
138	30	12.5	Spruce - Colorado (Picea pungens)	G	B	
139	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
140	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
141	30	12.5	Spruce - Colorado (Picea pungens)	G	B	
142	30	12.5	Spruce - Colorado (Picea pungens)	G	B	
143	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
144	25	10.4166667	Spruce - Colorado (Picea pungens)	G	B	
145	30	12.5	Spruce - Colorado (Picea pungens)	G	B	
146	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
147	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
148	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
149	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
150	20	8.33333333	Spruce - Colorado (Picea pungens)	G	B	
151	25	10.4166667	Spruce - Colorado (Picea pungens)	G	B	
152	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
153	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
154	35	14.5833333	Spruce - Colorado (Picea pungens)	G	B	
155	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
156	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
157	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
158		20	Oak - White (Quercus alba)	G	B	
159		9	Oak - White (Quercus alba)	G	B	
160	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
161	25	10.4166667	Spruce - Colorado (Picea pungens)	G	B	
162	45	18.75	Spruce - Colorado (Picea pungens)	G	B	
163		28	Oak - White (Quercus alba)	G	Herit age	
164	40	16.6666667	Spruce - Colorado (Picea pungens)	G	B	
165		30	Oak - White (Quercus alba)	G	Herit age	
166		22	Oak - White (Quercus alba)	G	B	
167		27	Oak - White (Quercus alba)	G	Herit age	
168		28	Oak - White (Quercus alba)	G	Herit age	
169		10	Oak - White (Quercus alba)	G	B	
170		30	Oak - White (Quercus alba)	G	Herit age	
171		16	Oak - Red (Quercus rubra)	G	B	
172		17	Oak - Red (Quercus rubra)	G	B	
173		17	Oak - Red (Quercus rubra)	E	B	
174	18	7.5	Cedar - Eastern Red (Juniperus virginiana)	G	B	
175		12	Oak - White (Quercus alba)	G	B	
176		12	Oak - White (Quercus alba)	G	B	
177		10	Oak - White (Quercus alba)	G	B	
178		11	Elm - American (Ulmus americana)	P	A	
179		9	Oak - White (Quercus alba)	G	B	
180		8	Oak - White (Quercus alba)	G	B	
181		10	Oak - White (Quercus alba)	G	B	
182		24	Oak - White (Quercus alba)	G	B	
183		23	Oak - White (Quercus alba)	G	B	
184		10	Oak - White (Quercus alba)	G	B	
185		13	Oak - White (Quercus alba)	G	B	
186		24	Oak - White (Quercus alba)	P	B	
187		23	Oak - White (Quercus alba)	G	B	
188		19	Oak - White (Quercus alba)	G	B	
189		14	Oak - White (Quercus alba)	G	B	
190		9	Aspen - Quaking (Populus tremuloides)	G	A	
191		10	Aspen - Quaking (Populus tremuloides)	G	A	
192		11	Oak - White (Quercus alba)	G	B	
193		13	Aspen - Quaking (Populus tremuloides)	G	A	
194		8	Oak - Red (Quercus rubra)	G	B	
195		25	Oak - White (Quercus alba)	G	B	
196		8	Oak - Red (Quercus rubra)	G	B	
197		8	Cherry - Black (Prunus serotina)	G	B	
198		8	Aspen - Quaking (Populus tremuloides)	G	A	
199		9	Aspen - Quaking (Populus tremuloides)	G	A	
200		10	Aspen - Quaking (Populus tremuloides)	G	A	
201		9	Cherry - Black (Prunus serotina)	G	B	
202		8	Aspen - Quaking (Populus tremuloides)	G	A	
203		8	Aspen - Quaking (Populus tremuloides)	G	A	
204		10	Aspen - Quaking (Populus tremuloides)	G	A	
205		10	Aspen - Quaking (Populus tremuloides)	G	A	
206		8	Aspen - Quaking (Populus tremuloides)	G	A	
207		10	Aspen - Quaking (Populus tremuloides)	G	A	
208		19	Oak - Red (Quercus rubra)	G	B	
209	20	8.33333333	Cedar - Eastern Red (Juniperus virginiana)	G	B	
210		12	Aspen - Quaking (Populus tremuloides)	G	A	
211		9	Aspen - Quaking (Populus tremuloides)	G	A	
212		10	Elm - American (Ulmus americana)	G	A	
213		9	Aspen - Quaking (Populus tremuloides)	P	A	
214		8	Aspen - Quaking (Populus tremuloides)	G	A	
215		10	Aspen - Quaking (Populus tremuloides)	G	A	
216		12	Aspen - Quaking (Populus tremuloides)	G	A	
217		10	Aspen - Quaking (Populus tremuloides)	G	A	
218		23	Oak - White (Quercus alba)	G	B	

219		43	Oak - White (Quercus alba)	G	Herit age	
220		25	Oak - White (Quercus alba)	G	B	
221		26	Oak - White (Quercus alba)	G	B	
222		26	Oak - White (Quercus alba)	G	B	
223		11	Aspen - Quaking (Populus tremuloides)	G	A	
224		15	Oak - Red (Quercus rubra)	G	B	
225		17	Oak - Red (Quercus rubra)	G	B	
226		11	Oak - Red (Quercus rubra)	G	B	
227		9	Aspen - Quaking (Populus tremuloides)	G	A	
228		8	Cedar - Eastern Red (Juniperus virginiana)	G	B	
229		10	Elm - American (Ulmus americana)	G	A	
230		8	Elm - American (Ulmus americana)	G	A	
231		8	Aspen - Quaking (Populus tremuloides)	G	A	
232		8	Aspen - Quaking (Populus tremuloides)	G	A	
233		29	Oak - White (Quercus alba)	G	Herit age	
234		25	Oak - White (Quercus alba)	G	B	
235		11	Cherry - Black (Prunus serotina)	G	B	
236		16	Oak - Red (Quercus rubra)	G	B	
237		9	Oak - Red (Quercus rubra)	G	B	
238		19	Oak - White (Quercus alba)	G	B	
239		21	Oak - White (Quercus alba)	G	B	
240		8	Cherry - Black (Prunus serotina)	G	B	
241		12	Oak - Red (Quercus rubra)	G	B	
242		11	Oak - Red (Quercus rubra)	G	B	
243		12	Cherry - Black (Prunus serotina)	G	B	
244		14	Oak - Red (Quercus rubra)	G	B	
245		8	Aspen - Quaking (Populus tremuloides)	G	A	
246		8	Aspen - Quaking (Populus tremuloides)	G	A	
247		16	Oak - Red (Quercus rubra)	G	B	
248		10	Oak - Red (Quercus rubra)	G	B	
249		9	Oak - Red (Quercus rubra)	G	B	
250		12	Aspen - Quaking (Populus tremuloides)	G	A	
251		12	Oak - Red (Quercus rubra)	G	B	
252		10	Oak - Red (Quercus rubra)	G	B	
253		11	Aspen - Quaking (Populus tremuloides)	G	A	
254		27	Oak - White (Quercus alba)	G	Remov e	Herit age
255		32	Oak - White (Quercus alba)	G	Remov e	Herit age
256		8	Cherry - Black (Prunus serotina)	G	Remov e	B

24.15 (LWS TECH) | TRNGVE LODIN | 3/31/2023 4:01:15 PM
L:\PROJECTS\51925\CAD\SHEETS\51925-LO-TREE.DWG\L1.03 TREE LIST CONT.

584	20	8.333333333	Pine - Red (Pinus resinosa)	E	Remov e	B
585	20	8.333333333	Pine - Red (Pinus resinosa)	E	Remov e	B
586	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
587	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
588	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
589	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
590	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
591	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
592	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
593	22	9.166666667	Pine - Red (Pinus resinosa)	G	Remov e	B
594	10	4.166666667	Pine - Red (Pinus resinosa)	G	Remov e	B
595	10	4.166666667	Pine - Red (Pinus resinosa)	G	Remov e	B
596	12	5	Pine - Red (Pinus resinosa)	G	Remov e	B
597	12	5	Pine - Red (Pinus resinosa)	G	Remov e	B
598	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
599	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
600	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
601	28	11.666666667	Pine - Red (Pinus resinosa)	G	Remov e	B
602	20	8.333333333	Pine - Red (Pinus resinosa)	G	Remov e	B
603	20	8.333333333	Pine - Red (Pinus resinosa)	G	Remov e	B
604	20	8.333333333	Pine - Red (Pinus resinosa)	G	Remov e	B
605		9	Oak - Bur (Quercus macrocarpa)	E	Remov e	B
606		13	Elm - Siberian (Ulmus pumilus)	P	Remov e	A
607	38	15.833333333	Pine - White (Pinus strobus)	G	Remov e	B
608		16	Maple - Silver (acer saccharinum)	G	Remov e	A
609		10	Elm - American (Ulmus americana)	G	Remov e	A
610	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
611	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
612	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
613	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
614	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
615	16	6.666666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
616	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
617	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
618	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
619	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
620	10	4.166666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
621	10	4.166666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
622	10	4.166666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
623	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
624	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
625	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
626	12	5	Pine - Red (Pinus resinosa)	G	Remov e	B*
627	10	4.166666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
628	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
629	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
630	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
631	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
632	10	4.166666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
633	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
634	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
635	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
636	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
637	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
638	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
639	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
640	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
641	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
642	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
643	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
644	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
645	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
646	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
647	12	5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
648	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
649	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
650	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
651	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
652	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*

653	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
654	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
655	16	6.666666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
656	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
657	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
658	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
659	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
660	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
661	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
662	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
663	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
664	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
665	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
666	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
667	18	7.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
668	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
669	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
670	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
671	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
672	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
673	30	12.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
674	35	14.583333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
675	30	12.5	Spruce - Colorado (Picea pungens)	G	Remov e	B*
676	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
677	15	6.25	Oak - Red (Quercus rubra)	G	Remov e	B*
678	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
679	15	6.25	Oak - Red (Quercus rubra)	G	Remov e	B*
680	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
681	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
682	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
683	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
684	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
685	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
686	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B*
687	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
688	25	10.416666667	Spruce - Colorado (Picea pungens)	G	Remov e	B*
689	15	6.25	Spruce - Colorado (Picea pungens)	G	Remov e	B*
690	20	8.333333333	Spruce - Colorado (Picea pungens)	G	Remov e	B
691		8	Birch - Paper (Betula papyrifera)	G	Remov e	B
692	40	16.666666667	Pine - Red (Pinus resinosa)	G	Remov e	B
693	40	16.666666667	Pine - Red (Pinus resinosa)	G	Remov e	B
694	40	16.666666667	Pine - Red (Pinus resinosa)	G	Remov e	B
695	40	16.666666667	Pine - Red (Pinus resinosa)	G	Remov e	B
696	40	16.666666667	Pine - Red (Pinus resinosa)	G	Remov e	B
697	40	16.666666667	Pine - Red (Pinus resinosa)	G	Remov e	B
698	30	12.5	Pine - Red (Pinus resinosa)	G	Remov e	B
699	30	12.5	Cedar - Eastern Red (Juniperus virginiana)	G	Remov e	B
700	33	13.75	Cedar - Eastern Red (Juniperus virginiana)	G	Remov e	B
701		18	Maple - Sugar (Acer saccharum)	G	Remov e	B
702		44	Oak - White (Quercus alba)	E	Heritag e	B
703		15	Elm - American (Ulmus americana)	G	Remov e	A
704		22	Elm - American (Ulmus americana)	G	Remov e	A
705		18	Elm - American (Ulmus americana)	G	Remov e	A
706		19	Elm - American (Ulmus americana)	P	Remov e	A
707	45	16.75	Pine - Red (Pinus resinosa)	G	Remov e	B
708	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
709	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
710	30	12.5	Pine - Red (Pinus resinosa)	G	Remov e	B
711	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
712	12	5	Pine - Red (Pinus resinosa)	G	Remov e	B
713		17	Locust - Honey (Gleditsia triacanthos)	G	Remov e	B
714	12	5	Pine - Red (Pinus resinosa)	G	Remov e	B
715	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
716		9	Locust - Honey (Gleditsia triacanthos)	G	Remov e	B
717		8	Locust - Honey (Gleditsia triacanthos)	G	Remov e	B
718	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
719		8	Locust - Honey (Gleditsia triacanthos)	P	Remov e	B
720	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
721	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
722	45	18.75	Pine - Red (Pinus resinosa)	G	Remov e	B
723	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
724	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
725	35	14.583333333	Pine - Red (Pinus resinosa)	G	Remov e	B
726	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
727	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
728	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
729	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
730	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B

731	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
732	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
733	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
734	45	18.75	Pine - Red (Pinus resinosa)	G	Remov e	B
735	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
736	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
737	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
738	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
740	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
741	20	8.333333333	Pine - Red (Pinus resinosa)	G	Remov e	B
742	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
743	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
744	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
745	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
746	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
747	20	8.333333333	Pine - Red (Pinus resinosa)	G	Remov e	B
748	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
749	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
750	45	16.75	Pine - Red (Pinus resinosa)	G	Remov e	B
751	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
752	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
753	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
754	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
755	20	8.333333333	Pine - Red (Pinus resinosa)	G	Remov e	B
756	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
757	45	18.75	Pine - Red (Pinus resinosa)	G	Remov e	B
758	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
759	50	20.833333333	Pine - Red (Pinus resinosa)	G	Remov e	B
760	25	10.416666667	Pine - Red (Pinus resinosa)	G	Remov e	B
761		9	Oak - Red (Quercus rubra)	G	Remov e	B
762		8	Hackberry (Celtis occidentalis)	G	Remov e	B
763		22	Oak - White (Quercus alba)	P	Remov e	B
764		26	Oak - White (Quercus alba)	G	Remov e	B
765		17	Oak - Red (Quercus rubra)	P	Remov e	B
766		9	Aspen - Quaking (Populus tremuloides)	G	Remov e	A
767		8	Aspen - Big Tooth (Populus grandidentata)	G	Remov e	A
768		14	Cherry - Black (Prunus serotina)	G	Remov e	B
769		34	Oak - White (Quercus alba)	G	Heritag e	B
770		9	Aspen - Quaking (Populus tremuloides)	G	Remov e	A



Environmental Advisory Commission Staff Report

**SUBJECT: Bituminous Roadways Sand & Gravel Zoning District
Five Year Renewal**

MEETING DATE: April 27, 2023
ITEM TYPE: Regular Agenda
CONTACT: Allan Hunting, City Planner, 651.450.2554

PURPOSE/ACTION REQUESTED

The Environmental Advisory Commission is asked to recommend City Council approval of a five-year extension for Bituminous Roadway's Sand & Gravel Overlay District Permit.

BACKGROUND

Bituminous Roadways operates a sand and gravel operation and an asphalt plant on their 200 acres located on the west side of Rich Valley Boulevard, south of Cliff Road. The current and previous approvals require a renewal of the permit every five years. Bituminous Roadways is requesting an amendment to their approval to allow sand excavation to mine to an elevation of 800 feet above sea level and to extend their approvals for another five years. The current permit allows mining down to an 840 foot elevation. The attached planning report provides additional information on the request and history of approvals for the site.

The EAC has reviewed other Bituminous Roadways sand & gravel requests in the past. The EAC reviewed renewals in 2007 and 2012 and an EAW review in 2002 when there was a request to construct a high volume well for washing the sand and gravel aggregate. The Planning Commission always reviews each five year renewal request and city council makes final determination on each request as well.

In November, 2022, the Planning Commission reviewed the request and there was considerable discussion regarding the impact of allowing deeper excavation to the aquifers and if there were any impacts to wells as a result of the operation. Over the course of the last few months, the city retained Barr Engineering to conduct a review of the request and answer the additional questions regarding aquifers and well testing. They have provided a report which is attached to this memo. Bituminous Roadways also conducted further research on these topics and they have provided additional background information.

FISCAL IMPACT

N/A

RECOMMENDATION

Based on the findings from Barr's review and research, staff recommends approval of the five year sand & gravel permit extension.

ATTACHMENTS

1. Staff report to Planning Commission containing Barr's report and supplemental information from Bituminous Roadways
2. Public Comments Received 4-18-2023



PLANNING REPORT

CASE NO: 22-37ZC

APPLICANT: Bituminous Roadways

PROPERTY OWNER: Bituminous Roadways

REQUEST: Sand and Gravel Zoning District designation five (5) year renewal

MEETING DATE: EAC - April 27, 2023 PC - May 2, 2023

LOCATION: 112th Street and Rich Valley Boulevard

COMPREHENSIVE PLAN: RDR, Rural Density Residential

ZONING: A, Agricultural and Sand & Gravel Overlay District

REVIEWING DIVISIONS: Planning
Engineering

PREPARED BY: Allan Hunting
City Planner

BACKGROUND

Bituminous Roadways, Inc. has submitted an application for an extension of their five year Sand and Gravel Overlay Zoning District designation for their approximately 200 acre site. The operations at the existing site include the mining and removal, crushing, screening, washing, and stockpiling of aggregate for the asphalt plant, and the recycling and stockpiling of concrete and rock products. The main processing activities will include, crushing, screening, and washing. Over the life of the facility, mining is proposed to occur on approximately 141 acres of the site and the remaining 60 acres is designated as a buffer area.

Approvals of any Sand and Gravel Overlay Districts require renewal every five years. The current Sand and Gravel approval was granted on October 9, 2017, and expires on October 9, 2022. The site also operates under a Conditional Use Permit to allow for the asphalt plant, processing of sand and gravel and a contractor's yard with open storage. The conditional use permit does not require renewals.

The applicant submitted a request for an extension before the current permit expired. Additional time was needed to review the request before it could be processed.

Request Summary

The applicant has submitted a narrative describing the operation and has provided maps showing existing conditions and a final development plan for the gravel pit. The applicant is proposing one change to the current approvals which is to allow mining below the current lowest elevation. Bituminous Roadways is currently permitted to mine to an elevation of 840 feet above sea level. This is a mining depth of 60-90 feet based on the site based on ground elevation. The applicant is proposing to mine to a depth of 800 feet which would allow Bituminous Roadways to increase the maximum mining depth by 40 feet and extract up to an additional 3.4 million cubic yards of sand and gravel material. The increase in the mining depth is estimated to add approximately 10 years to the life of the mine. The expected duration of mining is 30 years total. Actual life will depend upon market demand.

- The water-table aquifer beneath the site flows generally from west to east at an elevation between 800 to 745-feet
- The same equipment currently in use at the mine will continue to be used for the expansion with no increase in equipment number, size, or type
- The mining rate will remain the same for the expansion, including the frequency of truck trips to and from the operation
- The proposed mine operating aerial footprint will not increase for the proposed expansion
- The location and quantity of fuel, asphalt cement, and other chemical storage will not change from the current operation
- Backfilling of the mine is expected to consist of excess sand from the operation and clean soil from off-site BRI construction projects
- Per Minnesota Rules 4410.4300, subpart 12 the proposed expansion does not trigger a mandatory Environmental Assessment Worksheet

History

The City granted the original Sand and Gravel zoning of the property on May 13, 1974 for a period of 15 years. On December, 26, 1979, the City approved a conditional use permit for the asphalt plant. This permit was initially granted for a period of five years but was extended by the City, at the owners request in 1984. On April 24, 1989, the City approved the next five year extension and a CUP for the asphalt plant and for a contractors yard for the painting contractor that also operates out of the site. The City Council again approved an extension on March 28, 1994 for both the Sand and Gravel Overlay and for the CUP extension.

The City Council approved a five year extension for the Sand and Gravel Overlay and CUP for sand and gravel processing, asphalt plant and contractor's yard in April 2001 at the existing 70 acre site.

In 2002, the City Council approved a 130 acre expansion of the sand and gravel operation. That expansion required that an EAW be prepared for the site. This was done and was reviewed by the Environmental Commission and was approved by the City Council with a negative declaration that an environmental impact statement was not needed.

In 2012, the City Council approved a modification to the approval to allow a well to be drilled to use for wash water. The DNR approved a water appropriation permit and the site has been using the well for wash water at times during the summer.

In 2017, the City approved a five year extension along with a modification allowing larger capacity bulk storage tanks. This request runs through October, 2022.

The Planning Commission reviewed the initial request in November, 2022 and through discussion, there were a number of issues raised by some of the Planning Commission members. Further information was needed to address the questions raised. Staff had Barr Engineer conduct a review of questions raised which focused on; results of well testing, impacts to aquifers relating to the request to excavate deeper, and groundwater quality. Bituminous Roadways also conducted further research regarding the raised concerns. The reports generated by Bituminous and Barr are attached to this report.

EVALUATION OF THE REQUEST

The site is surrounded by the following uses:

North - Vacant land; zoned A; guided IOS

East - Open space, west 100 acres/agricultural; zoned A and I-1; guided Limited Industrial

West - Open space/agricultural; zoned A; guided RDR

South - Residential, Open space/agricultural; zoned A; guided IOS

ANALYSIS

The analysis of this report consists of a review of each condition of the existing Sand and Gravel Temporary Zoning District approval as well as addressing the three proposed changes. The existing condition will be listed followed by a response on the status of that condition and/or modification.

A. Sand and Gravel Temporary Zoning District

1. The Temporary Sand and Gravel (S&G) Zoning shall remain in place on the property for a period of five (5) years to expire on October 9, 2017.

The original schedule for approval would have occurred before October 9 but additional review time was needed as the city had its environmental consultant, Barr Engineering review the request to determine if there were any negative effects of allowing additional mining depth.

The application will be reviewed by the Environmental Commission on November 17 and City Council on November 28.

2. The operation of the sand and gravel operation approved herein shall comply with all provisions of Inver Grove Heights City Code, Title 10-13G, Sand and Gravel Zoning District, except as specifically modified herein.

No issues found with this condition. Staff is not aware of any non-compliance with this condition.

3. The following plans, on file with the Planning Division, shall constitute the "approved plans" referenced therein:

Existing conditions dated 8/5/22
Phasing Plan dated 8/5/22
Cross Sections of Mining Area dated 8/5/22
Final Land Use Plan dated 4/25/02
Reclamation Plan dated 8/5/22
Landscaping Plan - east property line dated 2012
Landscape Plan - south property line dated 2012

All aspects of the operation of the site shall comply with the approved plans.

The site has been operating in accordance with the approved plans since the expansion was approved in 2002. The current Comp Plan guides the area as IOP, Industrial Open Space. This category was created to serve as a buffer between heavier industrial uses (land fill, gravel pit and refinery) and residential uses. Industrial uses that are currently operating within this area would be allowed to continue operating under existing permits without further restrictions. The final land use plan shows large lot residential with a public street extending from Rich Valley Boulevard. No sewer is expected on the west side of Rich Valley and therefore the lots would be served by their own well and septic system. No other issues existing with this condition.

4. The location of the asphalt plant shall remain in its existing position and shall not be relocated unless this sand and gravel ordinance is amended.

No changes proposed. No issues with this condition.

5. "Operation" as it relates to hours of operation, shall include, but is not limited to, all mining and grading operations, washing, the operation of the asphalt plant on the site, and movement of vehicles and equipment in and out of the site. Hours of operation on the site shall be limited to 7:00 a.m. to 7:00 p.m., Monday - Saturday, except hours of operation may begin at 6:00 a.m. Monday - Saturday for internal operations only, including start up of the asphalt plant and allowing BRI owned vehicles that were parked overnight to exit the site. The crushing of concrete and asphalt shall be regulated by condition #6.

No changes proposed.

6. Crushing of concrete on site shall be permitted provided the following conditions are met:
 - a) All crushing operations shall be conducted in the current location in the existing site.
 - b) The stockpile of concrete to be crushed and the stockpile of already crushed concrete shall not in the aggregate exceed a total of 50,000 cubic yards.
 - c) The height of the stockpiles shall not exceed 25 feet.
 - d) Crushing shall occur on not more than 12 weeks during the calendar year. No crushing shall occur on Sunday; crushing shall only occur between the hours of 7:00 a.m. and 7:00 p.m. Monday - Friday and 9:00 a.m. to 6:00 p.m., Saturday.

No issues with this condition. To our knowledge, the site operates under these conditions. Staff has not received any complaints that the operator is working outside of the approved hours.

7. Bituminous Roadways may temporarily store Manufactured Organic Shingle Scrap (MOSS) in open storage areas provided the areas in the aggregate do not exceed one (1) acre in size and provided the location and storage configuration is approved by the Fire Marshal and Director of Community Development. MOSS storage areas may be relocated as operations on the site change subject to the approval of the Fire Marshal and the Director of Community Development. The City may impose reasonable conditions relating to dust control, fire prevention and size, height and configuration of the storage piles.

Bituminous Roadways does temporarily store MOSS on site in the area identified as shingle storage on the site plan. The stock pile is located in the same area as the previous approval (typically in the northern portion of the site). No issues with this condition.

8. The final disposal of MOSS on the site shall be prohibited.

Operational condition.

9. As part of the approval granted herein, the applicant may use used concrete and asphalt products as a part of the operation. Stockpiling area for these materials shall be as noted on the approved plans.

The proposed plans show the location of the product stockpiles. The stockpiles are generally located in the same location as previous approvals. No issues with this condition.

10. Bituminous Roadways shall prohibit all drivers of trucks from using Rich Valley Boulevard north of Cliff Road except in those instances where materials are being taken to a project located within the City's regulatory authority. Bituminous Roadways shall post an advisory to all drivers to the same effect at exits from the site.

No issues with this condition. To our Knowledge, the site operates under these conditions.

11. The site shall be kept clear, at all times, of windblown debris.

No issues with this condition. To our Knowledge, the site operates under these conditions.

12. The foundry sand in the southeast berm shall be left undisturbed.

The southeast foundry sand berm had been undisturbed and contained a vegetative cover. This condition has been satisfied.

13. Bituminous Roadways shall bring no additional foundry sand onto the site.

Operational condition. No additional foundry sand has been found on the site.

14. The berms which cover the foundry sand shall be maintained in vegetative cover to control erosion of the foundry sand.

This condition has been satisfied.

15. The stockpiled MOSS, shingle scrap, recycled asphalt, and concrete pavement will not be disposed at the site.

No issues with this condition. To our knowledge, the site operates under these conditions.

16. Stockpiles of recycled asphalt, MOSS, shingles, and concrete shall be limited in size to amount that will be used that year.

No issues with this condition. To our knowledge, the site operates under these conditions.

17. Backfill material shall be either clean fill material that was stripped off the site or other clean fill material which is brought in from offsite.

Operational condition.

18. Spent bag house bags will be disposed of in a lined landfill permitted or approved to accept such materials.

Bituminous Roadways indicates the spent bags are disposed of at a landfill.

19. A restoration bond shall be in an amount to cover the costs of restoration of the site, as determined by the City Engineer, prior to City Council approval.

The City does have a restoration bond from Bituminous Roadways to cover the costs of restoration. The City Engineer indicates no changes are needed.

20. Bituminous Roadways shall obtain and maintain the necessary licenses and approvals from Dakota County and Minnesota Department of Natural Resources. Terms and conditions of the license and approval shall be hereby incorporated into this City approval.

Bituminous Roadways has provided the city with copies of all necessary permits from other agencies. The site is in compliance with this condition.

21. Bituminous Roadways shall obtain and maintain the necessary Minnesota Pollution Control Agency permits including two air quality permits and one industrial storm water permit. The terms and conditions of those permits shall be hereby incorporated into this City approval.

Bituminous Roadways has provided the city with copies of all of the required permits. No notices of violation have ever been issued by the MPCA. The site is in compliance with this condition.

22. All reports which are required to be submitted to Dakota County under the single Hazardous Waste Generators License and the one Processing License shall also be submitted to the City, including the required annual and quarterly reports.

During the 2012 renewal, it was discovered from Dakota County that as of 2003, the facility was no longer a hazardous waste generator and no reports were required. Condition should be eliminated with this renewal.

23. All reports which are required to be submitted to the Minnesota Pollution Control Agency shall also be submitted to the City, including annual emissions inventory report, semi-annual deviations report, annual compliance certification report, and annual report.

Bituminous Roadways has provided to the city copies of their reports submitted to the MPCA. The site is in compliance with this condition.

24. Monitoring shall be conducted at the single ground water well that consists of arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, DRO, GRO, phenol, pH, electric conductivity and alkalinity. The monitoring should occur with half the wells every other year. Parameters and protocols shall be as agreed to by Dakota County, the City and Bituminous Roadways.

Staff has received copies of the well tests. According to the project narrative, the sample concentrations show the levels below limits.

25. Monitoring of the east and west storm water ponds both wash water ponds and three wells shall be conducted every other year and shall be tested for the same elements as listed in condition #24 per the proposed testing schedule identified on the Water Testing Map.

No changes.

26. All buildings shall be removed from the site within three (3) months of the closure of the facility.

Operational Condition.

27. Bituminous Roadways shall enter into a Host Community Agreement with the City of Inver Grove Heights including the payment of host community fees, within three (3) months of the State Legislature providing the City with the Authority to enter into such an agreement.

The Legislature has not approved any regulations providing cities the authority to collect host community fees for sand and gravel extraction. This condition should remain for future action.

28. Restoration shall be conducted in phases at the site. As portions of the mining area are completed, the areas will be backfilled, graded, topsoil applied and vegetation established.

Operational condition. Engineering would review the backfilling operation to make sure the work is in compliance with the approved plans.

29. The operator is responsible for obtaining all required permits for the wash water well from the appropriate state and or county agencies and must meet all DNR requirements, obligations and protocols for a well appropriations permit, including responsibilities and protocols for any remedial actions and those responsibilities and protocols for any compensation or damages from the loss of well use affected neighboring properties. Any change or any application for an appropriation permit for an aquifer different than the one that has been identified would require an amendment to the conditional use permit.

The City approved the use of a new well to be utilized for washing the aggregate as part of the 2012 approval. The DNR approved a water appropriation permit for the site. The applicant has provided information from the DNR indicating the amount of water used each year.

30. Bituminous Roadways shall provide a voluntary well interference protocol agreement for neighboring properties within ½ mile of the well requesting to be a

party thereto. The agreement shall be prepared by Bituminous Roadways and shall stipulate procedures to follow should well problems occur. The agreement between the parties is strictly voluntary and not required for the well to be operational.

Bituminous Roadways prepared an agreement that was part of the package approved by City Council in 2012. BRI has an agreement with 18 neighbors.

31. The southern access to the site shall be allowed as a secondary driveway for the operation provided it is used by no more than 10% of the truck traffic for the site.

Expansion of mining depth. Barr Engineering was retained to conduct an environmental review of the project to determine if there would be any negative effects of allowing deeper excavation. Barr reviewed the request against the following environmental impacts; air quality, groundwater quality, groundwater quantity, surface water quality, and noise. Barr's memo dated 9/29/2022 is attached to this memo. In conclusion, Barr does not see any negative impacts with the request, but does recommend some additional conditions related to back filling soil material since the material would be close to the water table. Essentially, non-contaminated and clean soils should only be used as back fill material. There are two new conditions (31 and 32) added to the ordinance that address Barr's recommendation.

Conditional Use Permit. The site operates under a conditional use permit for the asphalt plat and contractor's yard. No changes to the CUP are proposed. The majority of the conditions are part of the Sand and Gravel Overlay Ordinance and have been covered above.

ALTERNATIVES

The Planning Commission has the following actions available on the proposed project:

A. Approval: If the proposed request is found to be acceptable, approval of the applicable following actions should be taken:

o Approval of the **Temporary Sand and Gravel Zoning** Renewal for a period of five (5) years subject to the following conditions:

1. The Temporary Sand and Gravel (S&G) Zoning shall remain in place on the property for a period of five (5) years to expire on (council approval date), 2022.
2. The operation of the sand and gravel operation approved herein shall comply with all provisions of Inver Grove Heights City Code, Title 10-13G, Sand and Gravel Overlay District, except as specifically modified herein.
3. The following plans, on file with the Planning Division, shall constitute the "approved plans" referenced therein:

Existing conditions dated 8/5/22
Phasing Plan dated 8/5/22
Cross Sections of Mining Area dated 8/5/22
Final Land Use Plan dated 4/25/02
Reclamation Plan dated 8/5/22
Landscaping Plan - east property line dated 2012
Landscape Plan - south property line dated 2012

All aspects of the operation of the site shall comply with the approved plans.

4. The location of the asphalt plant shall remain in its existing position and shall not be relocated unless this sand and gravel ordinance is amended.
5. "Operation" as it relates to hours of operation, shall include, but is not limited to, all mining and grading operations, washing, the operation of the asphalt plant on the site, and movement of vehicles and equipment in and out of the site. Hours of operation on the site shall be limited to 7:00 a.m. to 7:00 p.m., Monday through Saturday, except hours of operation may begin at 6:00 a.m. Monday - Saturday for internal operations only, including start up of the asphalt plant and allowing BRI owned vehicles that were parked overnight to exit the site. The crushing of concrete which shall be regulated by Condition #6. The asphalt plant shall be allowed to operate a maximum of 30 night shifts (7:00 p.m. to 7:00 a.m.) during the construction season each year. Bituminous Roadways shall provide the city with written notice prior to each event, including confirmation of contact with the nearest neighbor so a record can be kept to monitor total hours used each season.
6. Crushing of concrete on site shall be permitted provided the following conditions are met:
 - a) All crushing operations shall be conducted in the current location in the existing site.
 - b) The stockpile of concrete to be crushed and the stockpile of already crushed concrete shall not in the aggregate exceed a total of 50,000 cubic yards.
 - c) The height of the stockpiles shall not exceed 25 feet.
 - d) Crushing shall occur on not more than 12 weeks during the calendar year. No crushing shall occur on Sunday; crushing shall only occur between the hours of 7:00 a.m. and 7:00 p.m. Monday - Friday and 9:00 a.m. to 6:00 p.m., Saturday.
7. Bituminous Roadways may temporarily store Manufactured Organic Shingle Scrap (MOSS) in open storage areas provided the areas in the aggregate do not exceed one (1) acre in size and provided the location and storage configuration is approved by the Fire Marshal and Director of Community Development. MOSS storage areas may be relocated as operations on the site change subject to the approval of the Fire Marshal and the Director of Community Development. The City may impose reasonable conditions relating to dust control, fire prevention and size, height and configuration of the storage piles.
8. The final disposal of MOSS on the site shall be prohibited.

9. As part of the approval granted herein, the applicant may use used concrete and asphalt products as a part of the operation. Stockpiling area for these materials shall be as noted on the approved plans.
10. Bituminous Roadways shall prohibit all drivers of trucks from using Rich Valley Boulevard north of Cliff Road except in those instances where materials are being taken to a project located within the City's regulatory authority. Bituminous Roadways shall post an advisory to all drivers to the same effect at exits from the site.
11. The site shall be kept clear, at all times, of windblown debris.
12. The foundry sand in the southeast berm shall be left undisturbed.
13. Bituminous Roadways shall bring no additional foundry sand onto the site.
14. The berms which cover the foundry sand shall be maintained in vegetative cover to control erosion of the foundry sand.
15. The stockpiled MOSS, shingle scrap, recycled asphalt, and concrete pavement will not be disposed at the site.
16. Stock piles of recycled asphalt, MOSS, shingles, and concrete shall be limited in size to amount that will be used that year.
17. Backfill material shall be either clean fill material that was stripped off the site or other clean fill material which is brought in from offsite.
18. Spent bag house bags will be disposed of in a lined landfill permitted or approved to accept such materials.
19. A restoration bond shall be in an amount to cover the costs of restoration of the site, as determined by the City Engineer, prior to City Council approval.
20. Bituminous Roadways shall obtain and maintain the necessary licenses and approvals from Dakota County and Minnesota Department of Natural Resources. Terms and conditions of the license and approval shall be hereby incorporated into this City approval.
21. Bituminous Roadways shall obtain and maintain the necessary Minnesota Pollution Control Agency permits including two air quality permits and one industrial storm water permit. The terms and conditions of those permits shall be hereby incorporated into this City approval.
22. All reports which are required to be submitted to the Minnesota Pollution Control Agency shall also be submitted to the City, including annual emissions inventory report, semi-annual deviations report, annual compliance certification report, and annual report.

23. Monitoring shall be conducted at the single water well that consists of arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, DRO, GRO, phenol, pH, electric conductivity, and alkalinity. The monitoring shall occur with half the wells every other year. Parameters and protocols shall be as agreed to by Dakota County, the City and Bituminous Roadways.
24. Monitoring of the storm water ponds and wells shall be conducted every other year and shall be tested for the same elements as listed in condition #24 per the proposed testing schedule identified on the Water Testing Map.
25. All buildings shall be removed from the site within three (3) months of the closure of the facility.
26. Bituminous Roadways shall enter into a Host Community Agreement with the City of Inver Grove Heights including the payment of host community fees, within three (3) months of the State Legislature providing the City with the Authority to enter into such an agreement.
27. Restoration shall be conducted in phases at the site. As portions of the mining area are completed, the areas will be backfilled, graded, topsoil applied and vegetation established.
28. The operator is responsible for obtaining all required permits for the wash water well from the appropriate state and or county agencies and must meet all DNR requirements, obligations and protocols for a well appropriations permit, including responsibilities and protocols for any remedial actions and those responsibilities and protocols for any compensation or damages from the loss of well use affected neighboring properties. Any change or any application for an appropriation permit for an aquifer different than the one that has been identified would require an amendment to the conditional use permit.
29. Bituminous Roadways shall provide a voluntary well interference protocol agreement for neighboring properties within ½ mile of the well requesting to be a party thereto. The agreement shall be prepared by Bituminous Roadways and shall stipulate procedures to follow should well problems occur. The agreement between the parties is strictly voluntary and not required for the well to be operational.
30. The southern access to the site shall be allowed as a secondary driveway for the operation provided it is used by no more than 10% of the truck traffic for the site.
31. For soil backfill material, only non-organic compactable soil material be used that is free of contamination, recycled or salvaged aggregate, asphaltic pavement, crushed concrete, scraps of shingles, debris, rubbish, frozen soil, boulders over 1-inch in diameter, logs, wood chips or other objectionable material. Backfill soil should be free of stumps, roots, and branches over 1.5-inches in diameter. Backfill soils should not be placed over frozen subgrade.
32. Contaminated soil shall not be used as fill or brought to the site. If the source of imported fill will be from a location where soil contamination is known, suspected, or can be expected

(e.g., soils from gas stations, certain industrial sites, etc.), that soil should not be used for backfilling. Any offsite backfill soil used must come from only BRI projects and include a manifest from each site indicating that no contaminants are suspected to be in the soil material. A copy of the manifest should be submitted to the City.

33. Bituminous Roadways shall review and amend the SPCC Plan as appropriate and submit a copy to the City. The SPCC Plan shall document practices, personnel, equipment, and resources available to prevent a spill and what actions to take if a spill were to occur.

34. A well on the Wicker property has been part of the monitoring process. A new deeper well was constructed on the Wicker property in 2020 and should no longer be used as an indicator of downgradient water quality from the BRI facility because the new well is too deep to intersect groundwater flow paths from BRI. To provide property well monitoring, BRI shall be required to install a monitoring well with a well screen intersecting the water table on the Wicker property to provide early detection of groundwater impacts from the operation at this location.

35. All the BRI wells should be periodically sampled for metals commonly associated with foundry sand including arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, copper, nickel and zinc.

36. BRI shall prepare a Sampling and Analysis Plan using Minnesota Pollution Control Agency guidance that would include sample parameters, sample schedule and requirements for purging wells to stabilize prior to sampling, and field filtering of samples if appropriate.

B. Denial: Should the proposed request, or portions thereof, not be found to be acceptable, the appropriate requests described above should be denied. The basis for denial must be stated in any such motion.

RECOMMENDATION

Bituminous Roadways has provided additional information to address the questions and concerns raised by the Planning Commission. Barr Engineering has also responded to the questions in the attached report. Based on the report, Barr did not find any issues that would lead to a non-support of the additional mining depth and did not find any concerns regarding the well tests as they relate to chemicals found.

Based on this information, Staff recommends **Alternative A**, approval of the request with the conditions listed.

Attachments: Site Location

Barr Technical Memorandum dated 2/28/23

Sunde Engineering Memorandums dated 11/18/22, 12/21/22 and 3/27/23

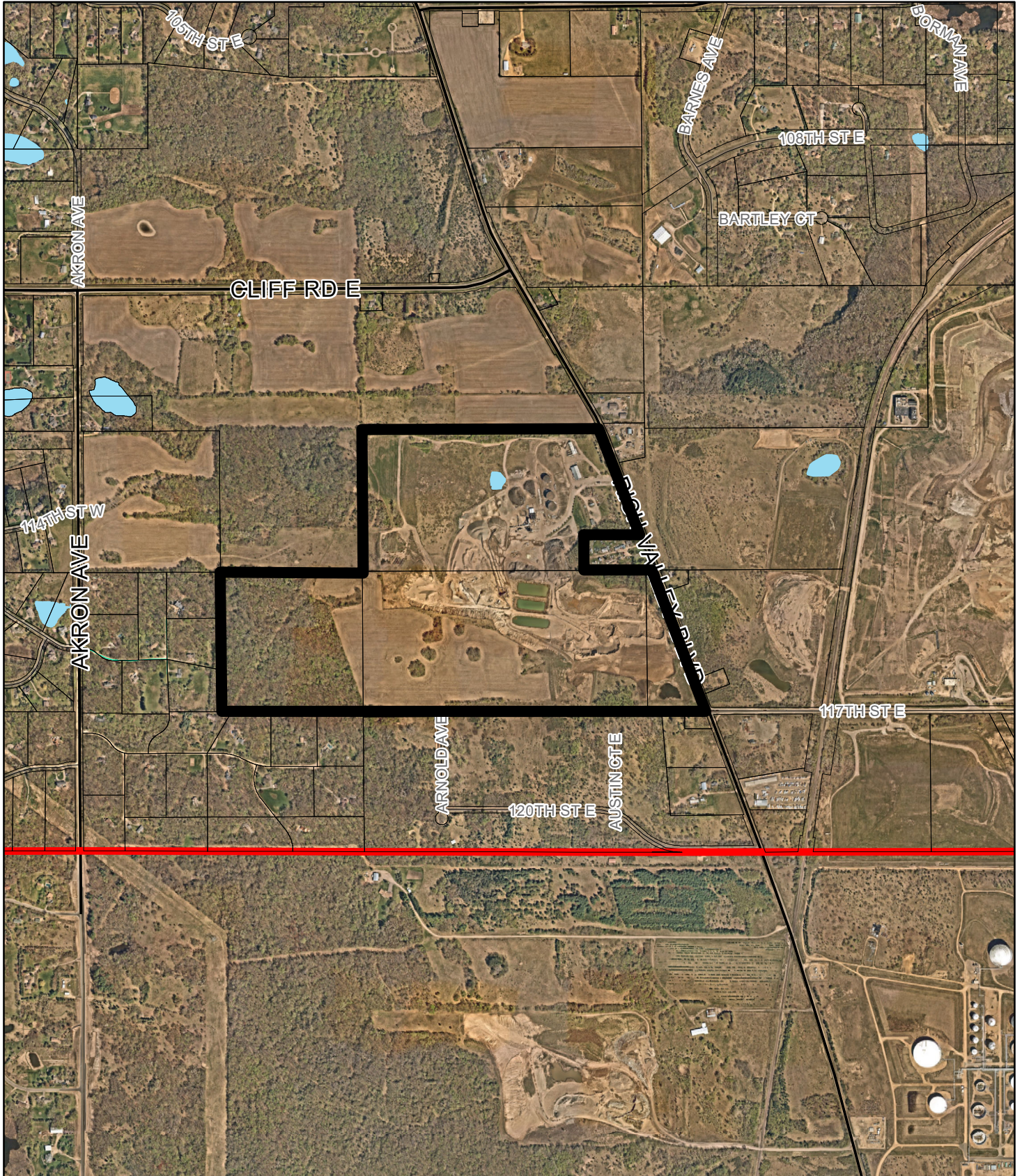
Application Packet including Plans

Barr Engineering Review Memo
Current Sand and Gravel Ordinance



Location Map

Case No. 22-37SC



August 5, 2022
Revised: October 12, 2022

REPORT TO:

BITUMINOUS ROADWAYS, INC.

**APPLICATION FOR
REISSUANCE OF CONDITIONAL USE PERMIT FOR THE
MINING AND PROCESSING OF SAND AND GRAVEL, AN
ASPHALT PLANT AND CONTRACTOR'S YARD WITH
OPEN STORAGE AND FIVE YEAR SAND AND GRAVEL
OVERLAY DISTRICT**

INVER GROVE HEIGHTS, MINNESOTA



Consulting Civil Engineers

Sunde Engineering, PLLC.

10830 Nesbitt Avenue South • Bloomington, Minnesota 55437-3100
Phone: (952) 881-3344 • Fax: (952) 881-1913 • E-Mail: info@sundecivil.com

REPORT TO:
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**APPLICATION FOR
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OVERLAY DISTRICT**

INVER GROVE HEIGHTS, MINNESOTA

I HEREBY CERTIFY THAT THIS REPORT
WAS PREPARED BY ME OR UNDER MY
DIRECT SUPERVISION AND THAT I AM
A DULY LICENSED PROFESSIONAL
ENGINEER AND A DULY LICENSED
PROFESSIONAL GEOLOGIST UNDER
THE LAWS OF THE STATE OF MINNESOTA.



Kirsten Pauly, P.E. P.G.

DATE 10/12/22 REG. NO. 21842

SUBMITTED BY:

SUNDE ENGINEERING, PLLC
10830 Nesbitt Avenue South
Bloomington, MN 55437

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- Figure 3: Landscaping – East Property Line
- Figure 3A: Landscaping – South Property Line
- Figure 3B: Screening Berm Detail
- Figure 4: Water Testing Map 2022-2026

- Attachment 1: Property Owners Within 1000 Feet
- Attachment 2: The Technical Memorandum for the Bituminous Roadways, Inc. - Environmental Review of Proposed Expansion, by Barr Engineering Co. dated September 29, 2022
- Attachment 3: Report of Frequently Asked Questions for Bituminous Roadways, Inc. Proposed Wash Water Well by Barr Engineering Company, dated October 2012
- Attachment 4: The Technical Memorandum for the Bituminous Roadways Noise Assessment, by Barr Engineering Co. dated November 29, 2018
- Attachment 5: Wetland Delineation Report
- Attachment 6: Storm Water Management Calculations

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- A-1 2021 Aerial
- C-1 Existing Conditions
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- C-6 Reclamation Plan

I. INTRODUCTION

Bituminous Roadways, Inc. (BRI) operates a sand and gravel mining and processing facility located in the southern portion of Inver Grove Heights (Site). The Site operates in accordance with City of Inver Grove Heights Ordinance 1343 which establishes operating conditions and a five year Sand and Gravel Zoning over the property. The Site also operates under a five year Conditional Use Permit (CUP) that allows for operation of the asphalt plant, mining and processing of sand and gravel, and a contractor's yard. The current CUP and Ordinance 1343 were issued in October of 2017. The CUP was amended in 2020 to allow the storage of 5.3 million gallons of asphalt cement in three above ground tanks. This application pertains to a five year renewal of the operating conditions and Temporary Sand and Gravel Zoning of the Site. This application provides updated information on Site operations.

Activities allowed include mining and processing (crushing, screening, and washing), stockpiling, loading and hauling, reclamation, bulk asphalt cement storage, and operation of an asphalt plant and a contractor's yard. In addition, the Site operates under a General Non-Metallic Mineral Mining and Associated Activities National Pollutant Discharge Elimination System (NPDES) Permit and an Air Emissions Permit issued by the Minnesota Pollution Control Agency (MPCA), a Minnesota Department of Natural Resources (DNR) Water Appropriations Permit, a Dakota County Hazardous Waste Generators License and Processing License, and a MPCA Permit for Storage of Liquid Substances at a Major Aboveground Storage Tank Facility. Environmental Review was completed for the mining operation with the City of Inver Grove Heights as the Responsible Government Unit (RGU). The City Council issued a negative declaration on the need for an Environmental Impact Statement (EIS) on April 8, 2002 in accordance with the Minnesota Environmental Quality Board (EQB) Rules. In 2020 a mandatory Environmental Assessment Worksheet (EAW) was completed for the construction of the 5.3 million gallon bulk asphalt cement storage facility on the Site with the MPCA as the RGU. The MPCA issued a negative declaration on the need for an EIS on September 14, 2020.

This application proposes to continue operations as currently approved, with the exception of one request to amend the current mining depth as follows:

Amend Mining Depth Limits:

BRI is currently permitted to mine to an elevation of 840 feet above mean sea level (msl) at the Site. This equates to a mining depth of approximately 60-90 feet. BRI is requesting to amend the mining depth to an elevation of 800 feet above msl in the remaining Phases of the Site. This will provide a more efficient use of this resource which is vital to meet the ongoing demand for construction aggregate in the

surrounding area. The material will be available for use in important public infrastructure projects, road improvement projects, schools, housing and other building construction needs.

The proposed mining depth would lower the maximum mining depth to the elevation of the groundwater table, but not into or below the groundwater table. The mined area will be backfilled in accordance with the approved reclamation plan allowing for future development of the Site. Backfill material will consist of only non-organic compactable soil material that is free of contamination, recycled or salvaged aggregate, asphaltic pavement, crushed concrete, scraps of shingles, debris, rubbish, frozen soil, boulders over 1-inch in diameter, logs, wood chips or other objectionable material. This amendment will allow BRI to increase the maximum mining depth by 40 feet and extract up to an additional 3.4 million cubic yards of sand and gravel material over the remaining life of the mine.

The City of Inver Grove Heights retained Barr Engineering Company (Barr) to review the potential environmental-related impacts of the proposed increased mining depth at the Site. The Technical Memorandum for the Bituminous Roadways, Inc. - Environmental Review of Proposed Expansion, by Barr Engineering Co. dated September 29, 2022 (Barr Technical Review) is provided as Attachment 2 in this report. Barr's review states that the proposed increase in mining depth will not change the air quality from the current operation. The report also states that the groundwater quality and quantity and surface water quality will not be negatively impacted by the change, but recommends that only non-organic fill free of contamination be used for backfill material. Barr's report also states that there will not be any negative noise impact from the proposed change. Barr's recommendations include that the CUP contain requirements for soil backfill material and that BRI review and amend the Spill Prevention, Control, and Countermeasure (SPCC) Plan as appropriate. BRI's current SPCC Plan includes the practices, personnel, equipment, and resources available to prevent a spill and what actions to take if a spill were to occur. The SPCC Plan will be reviewed and amended prior to initiating any mining activity below elevation 840 feet above msl at the Site.

As part of the 2012 permit renewal BRI requested to install a wash water well for the sand and gravel washing operation conducted at the Site. At that time Barr was retained to study the effects the new well would have on groundwater and the neighboring wells. Barr prepared a report to answer frequently asked questions neighbors may have had regarding the study and the installation of the wash water well. Based on the report and Barr's findings the groundwater elevation at the Site at that time was approximately 800 feet above msl. The Report of Frequently Asked

Questions for Bituminous Roadways, Inc. Proposed Wash Water Well by Barr Engineering Company, dated October 2012 (2012 FAQ Wash Water Well) is provided as Attachment 3 in this report. BRI's request to mine to the elevation of 800 feet above msl is based on the groundwater elevation information provided in this report. Since groundwater elevations fluctuate annually and seasonally, BRI will monitor the groundwater elevation at the Site and will not mine below the groundwater. BRI will update their Spill Prevention Control and Countermeasures (SPCC) Plan accordingly and implement best management practices to protect groundwater quality. BRI will also conduct groundwater monitoring in accordance with the current groundwater monitoring plan included in Section III.15.

This report and accompanying plan set provides information regarding the mining operation.

II. SITE INFORMATION

1. General Site Information

The Site is located in Section 32, Township 27 North, Range 22 W, in the City of Inver Grove Heights in Dakota County, just west of County Road 71 (Rich Valley Boulevard). The general location of the Site is illustrated on Figure 1.

The Site includes the original north mine which has been actively mined since 1963, the asphalt production plant that has been permitted since 1980, and the southerly expansion area which was originally permitted in 2002 after completion of an Environmental Assessment Worksheet (EAW). During the 2002 permitting process, the areas were combined into one permit to facilitate the five-year permit review and renewal process.

The Site encompasses a total of approximately 201 acres. Over the life of the facility, mining is proposed to occur on approximately 141 acres and the remaining 60 acres is setback and buffer area. Mining has been completed over the majority of the northern portion of the Site and has progressed to the south. Reclamation activity is substantially complete on the northern portion of the Site and will continue throughout the next five-year permit term in areas where mining has been completed.

Mining activity currently takes place in the southern portion of the Site. Portions of this area have been stripped in preparation for the progression of mining. Screening from Rich Valley Boulevard and from the Wicker property (an adjacent residential property) is provided with screening berms and tree/brush cover. Figure 3, Landscaping – East Property Line shows the approximate location of screening berms and tree/brush

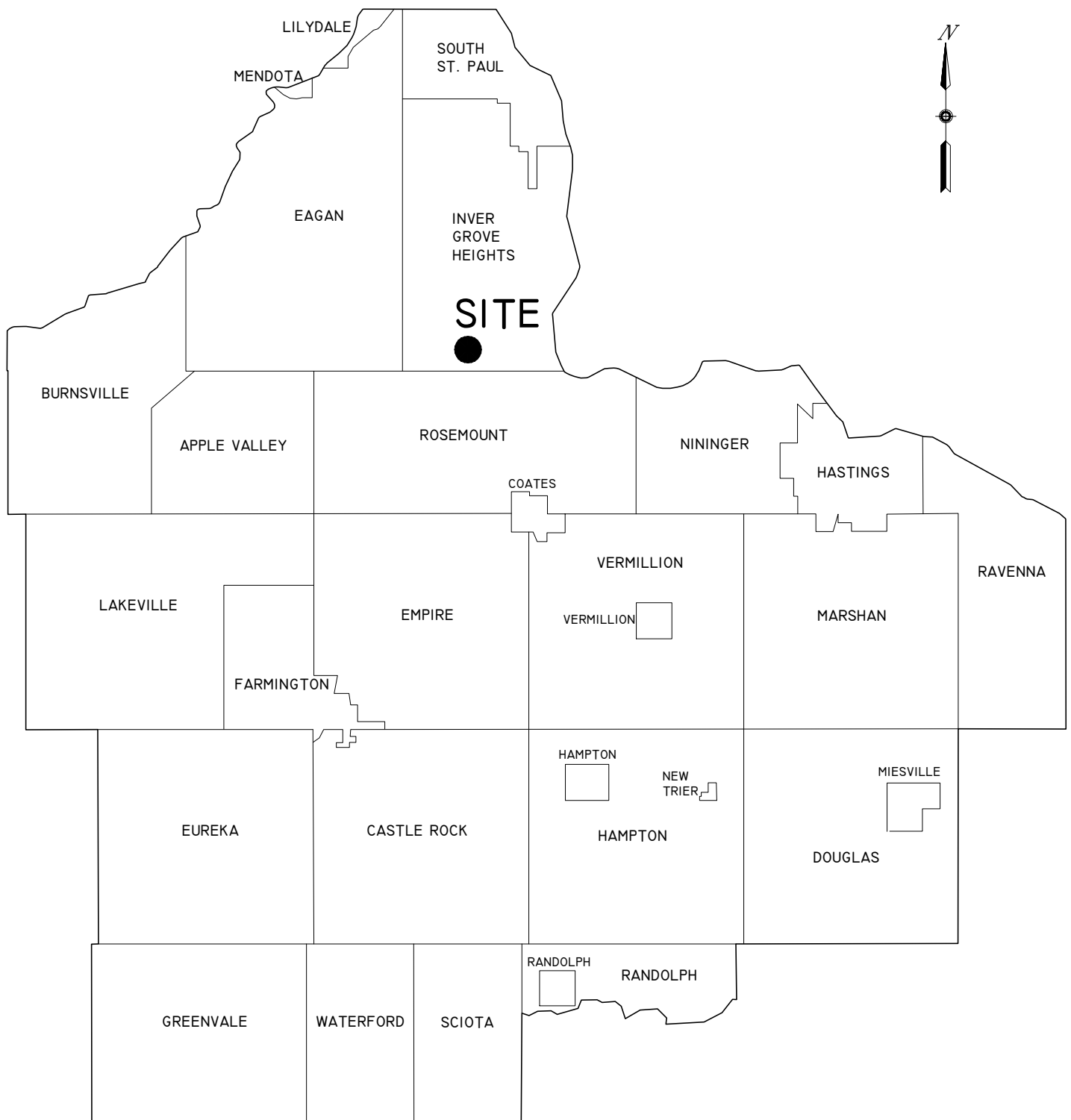


FIGURE 1

GENERAL LOCATION MAP

BITUMINOUS ROADWAYS INC.
INVER GROVE HEIGHTS GRAVEL PIT

2022 PERMIT REISSUANCE

cover. A washplant and sedimentation ponds were constructed during the 2012 permit term in accordance with the approved plans. Inactive phases of the Site continue to be used for agricultural production and open space/wooded areas. A gas pipeline runs along a portion of the southern boundary of the Site and transects the western portion of the Site. The pipeline will not be disturbed as part of the mining operations.

Surrounding land uses include agricultural production to the north (under the control of Flint Hills Resources), rural residential to the south and west, and agricultural and industrial to the east and southeast. The Site with respect to adjacent features is indicated on Figure 2, USGS Quadrangle Map Excerpt.

Specific Site features are indicated on the Existing Conditions Plan, Sheet C-1.

2. Site Ownership

The northern parcel is owned by:
Kent Peterson, LLC
1520 Commerce Drive
Mendota Heights, MN 55120
(651) 686-7001

The southern parcels are owned by:
Bituminous Roadways, Inc.
1520 Commerce Drive
Mendota Heights, MN 55120
(651) 686-7001

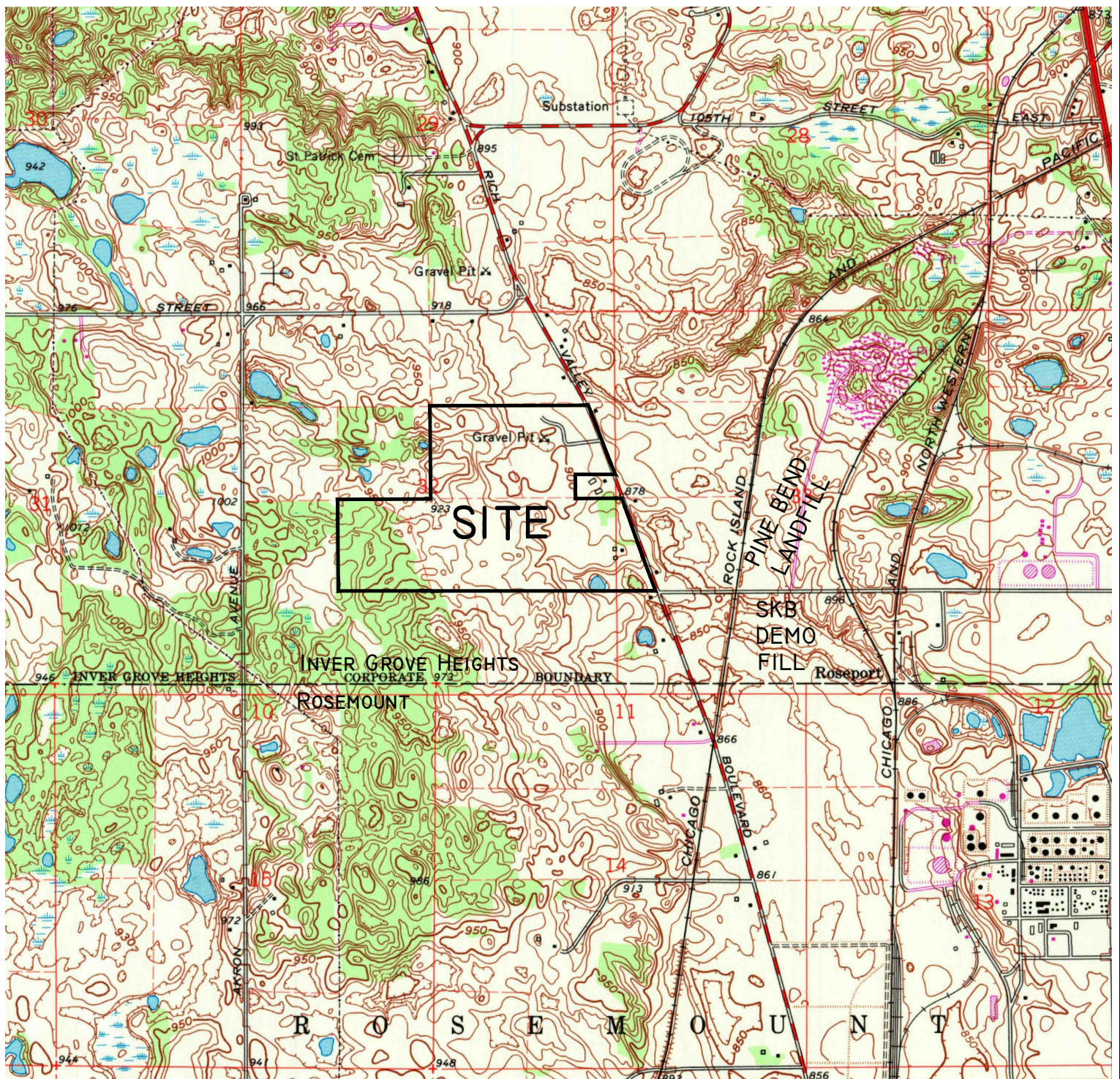
3. Site Operator

The Site is operated by:
Bituminous Roadways, Inc.
1520 Commerce Drive
Mendota Heights, MN 55120
(651) 686-7001

4. Legal Description

The legal description of the Site is as follows:

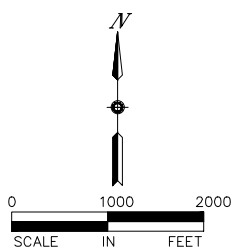
That part of the S $\frac{1}{2}$ of the NE $\frac{1}{4}$ of Section 32, Township 27, Range 22, W, lying Westerly of Rich Valley Boulevard; except that part described as follows: Commencing at the SE corner of said S $\frac{1}{2}$ of the NE $\frac{1}{4}$; thence West along the South line thereof, a distance of 592.43 feet; thence North 344.9 feet; thence East 570 feet to the centerline



Source: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1967
INVER GROVE HEIGHTS, MINNESOTA

FIGURE 2
USGS QUADRANGLE MAP EXCERPT

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INVER GROVE HEIGHTS GRAVEL PIT



2022 PERMIT REISSUANCE

of Rich Valley Boulevard; thence Southeasterly along said centerline, a distance of 67 feet to the East line of said S $\frac{1}{2}$ of the NE $\frac{1}{4}$; thence South 281.85 feet to the point of beginning.

And

The Northeast Quarter (NE $\frac{1}{4}$) of the Southwest Quarter (SW $\frac{1}{4}$) and the North One-Half (N $\frac{1}{2}$) of the Southeast Quarter (SE $\frac{1}{4}$), Section thirty-two (32), Township twenty-seven (27), Range twenty-two (22) AND All of that tract of land lying West of Highway Number Five (5) in the Northwest Quarter (NW $\frac{1}{4}$) of the Southwest Quarter (SW $\frac{1}{4}$), Section thirty-three (33), Township twenty-seven (27), Range twenty-two (22); subject to an easement to Minnesota Northern Natural Gas Company, as described in Deed recorded in Book 193 of Deeds, page 374.

5. Neighboring Properties

A property owner's list within 1000 feet of the Site is included in Attachment 1.

III. OPERATIONS

1. Mineral Extraction

Site operations include stripping overburden from areas to be mined. Overburden is used to create screening berms along the perimeter of the property. The depth of overburden varies across the Site from one to seven feet in thickness based on soil borings drilled over the project area. Overburden remains on-site and is later used during the reclamation process.

Aggregate is removed from the bank using a front end loader. Currently excavation is permitted to a maximum elevation of 840 feet above msl. Areas are subsequently backfilled with on-site material or imported clean soil fill to achieve the proposed reclamation grades.

BRI is requesting to mine to a maximum elevation of 800 feet above msl, the approximate groundwater elevation as determined by Barr in the 2012 Wash Water Well FAQ Report, provided in this report in Attachment 3. This will increase the depth of the mining excavation to the elevation of the groundwater (an increase of about 40 feet) to better utilize the existing resource and continue to meet current market demand. This would allow to BRI to extract up to an additional 3.4 million cubic yards of sand and gravel material over the remaining life of the mine. The additional mining depth will provide a more efficient use of this resource which is vital to meet the ongoing demand for construction aggregate in the surrounding area. The material will be available for

use in important public infrastructure projects, road improvement projects (State, County, City and local), schools, housing and other building construction needs. Mining operations at the Site will not change as part of the proposed increase in mining depth. No additional equipment will be used, no additional storage of fuel or other chemicals is proposed, and the frequency of truck trips will remain the same as current operations. The increase in mining depth is estimated to add approximately 10 years to the life of the mine.

The City of Inver Grove Heights retained Barr to review the potential environmental-related impacts of the proposed increased mining depth at the Site. The Barr Technical Review states that the proposed increase in mining depth will not change the air quality from the current operation. The report also states that the groundwater quality and quantity and surface water quality will not be negatively impacted by the change, but recommends that only non-organic fill free of contamination be used for backfill material (see Section IV. RECLAMATION for additional backfill information). Barr's Technical Review also states that there will not be any negative noise impact from the proposed change.

Many mining operations in Minnesota and Wisconsin mine to and into the groundwater. BRI is proposing to mine just to the groundwater and is not proposing dredging or dewatering operations. BRI will monitor the groundwater level to maintain excavation activity at or above the groundwater level. During reclamation activities BRI will backfill with only non-organic material that is free of contamination.

Excavation will proceed in phases as illustrated on the Phasing Plan, Sheet C-2. Each phase is estimated to represent approximately eight years' worth of mining activity. The expected duration of mining is approximately an additional thirty years, although the actual life of the Site will depend upon market demand. Cross Sections A-A', B-B' and C-C' Sheets C-3 through C-5 illustrate the sand and gravel deposit, maximum mining depth, reclamation grades, and existing grades.

2. Processing

Excavated material is loaded into a feed bin and conveyed to the screening area and wash plant. Material is screened and washed and conveyed into product stockpiles. Oversized rock is screened and conveyed to a stockpile in the processing area to be crushed at a later date. Material is then transported to the northern portion of the Site for additional processing. Material is transported from the active face to the processing area using conveyors and/or off road haul trucks. Crushing operations occur at the Site approximately once per year for a duration of about 3-4 weeks and is performed by an

outside contractor. Processing includes crushing, washing, screening, sorting and blending into a variety of aggregate products. The majority of the material produced is used in the production of asphalt mix at the on-site asphalt plant.

Recycling of concrete and asphalt occurs in the northern portion of the Site. The material is hauled to the Site and stockpiled. These materials are crushed periodically and blended into specific aggregate products. Crushing occurs on the Site as described above. The combined volume of concrete material to be crushed and the crushed concrete stockpile is not allowed to exceed 50,000 cubic yards. Asphalt is crushed and used on-site in various asphalt mixes. Crushing associated with the recycling operation is restricted to no more than 12 weeks of operation during the calendar year and is subject to limited hours of operation as described in item 4 below.

Manufactured organic shingle scrap (MOSS) recycling is no longer processed at the Site.

A washplant is operated full time on the Site. A washplant is a structure that is composed of a series of screens and spray bars. As aggregate is passed through the plant it is sprayed with water to remove fine sand and silt from the aggregate. The washwater contains no chemicals or additives. After the washwater passes through the plant, it is discharged into a series of sedimentation ponds. The sedimentation ponds allow for the fine sediment to settle out of the washwater. Treated washwater is recycled back to the wash plant from the final sedimentation pond for reuse.

The washplant and sedimentation pond area was updated in 2013. A Water Appropriations Permit was obtained from the DNR and a new production well was drilled as part of the washplant updates. A series of sedimentation ponds treat the washplant discharge removing suspended fine sediment and then the treated washwater is recycled back to the plant. The production well supplies make up water to the clean water intake pond and operates for a maximum of 12 hours per day on a seasonal basis.

BRI has provided a voluntary well interference protocol agreement with neighboring properties within ½ mile of the well requesting to be a party thereto. The agreement stipulates procedures to follow if a well interference issue should occur.

Above Ground Asphalt Cement Storage

In 2020 BRI obtained all applicable permits for and constructed an above ground asphalt cement tank storage system. The system includes three 48 feet high 65-80 foot diameter carbon steel above ground tanks and associated piping to store a total of 5.3 million gallons of asphalt cement. The system also includes a secondary containment

system along with a fire protection system. BRI operates the asphalt cement tank system in accordance with all required permits and State and Federal laws.

Typically, the storage tanks will be filled with asphalt cement during the winter months, when market conditions are favorable. Asphalt cement will be transported to the Site in tanker trucks and pumped from the tanker trucks into the storage tanks. During the construction season, asphalt cement will either be pumped from the storage tanks and transferred directly to the adjacent asphalt plant or pumped into tanker trucks for distribution to BRI's other asphalt production facilities.

3. Fencing

Portions of the Site adjacent to steep slopes are fenced with six-foot high chain link fencing. Fencing is illustrated on the Existing Conditions Plan C-1.

4. Hours of Operation

The Site is currently permitted to operate all activities, except crushing concrete and asphalt recycle material, including mining, grading, crushing and screening of aggregate, washing, movement of vehicles into and out of the Site, and operation of the asphalt plant between the hours of 7 a.m. and 7 p.m. Monday through Saturday. An additional hour from 6 a.m. to 7a.m. Monday through Saturday is permitted for internal operations only, including start-up of the asphalt plant and allowing BRI owned vehicles that were parked overnight to exit the Site. Concrete and asphalt recycle crushing activity only occurs between the hours of 7 a.m. – 7 p.m., Monday – Friday, and 9 a.m. – 6 p.m., Saturday. Concrete and asphalt recycle crushing will be limited to no more than 12 weeks during the calendar year and there will be no crushing on Sunday.

The asphalt plant is permitted to operate a maximum of 30 night shifts from the hours of 7 p.m. – 7 a.m., during the construction season each year. Night shifts are required with certain jobs, especially State Highway work. BRI provides the City with written notice prior to each event so a record can be kept to monitor the total number of nights work.

BRI also notifies their closest neighbor, Todd Wicker, prior to night shift work. Mr. Wicker's house is approximately 600 feet from the plant's driveway and approximately 800 feet from the asphalt plant itself. The next nearest occupied residence is approximately 2,000 feet from the plant. BRI has never received any noise or disruption complaints from neighbors regarding night shift operations.

In late 2018 the City of Inver Grove Heights retained Barr Engineering Company (Barr) to perform a noise assessment of the BRI Site to evaluate noise levels from BRI's operations reaching nearby residences. Monitoring for the study was performed in August of 2018. The noise assessment included noise monitoring at the western edge of the Site and an assessment of the data. The report stated that there were no hours where noise levels were above the state residential daytime or nighttime thresholds. Barr concluded in the November 29, 2018 Technical Memorandum that "Monitoring of noise at the western edge of the Bituminous Roadways property indicates that conditions at nearby residences are likely in full compliance with state noise standards. Levels were below the state nighttime noise standards for all hours monitored. Bituminous Roadways' operation on Rich Valley Boulevard does not appear to significantly affect overall noise levels at the residences to the west as the observed cyclical daily noise pattern occurred on days both with and without Bituminous Roadways in operation." The Technical Memorandum for the Bituminous Roadways Noise Assessment, by Barr Engineering Co. dated November 29, 2018 is provided as Attachment 4 in this report. The noise emissions from the Site meet or are below the state nighttime noise standards.

5. Setbacks

Stripping, excavation, processing, stockpiling and sedimentation ponds are setback a minimum of 50 feet from all property lines and gas pipelines, a minimum of 75 feet from the right-of-way line of County Road 71 (Rich Valley Boulevard) and a minimum of 300 feet from adjacent residential structures. Setbacks are indicated on the Phasing Plan, Sheet C-2.

6. Site Access

The main Site is accessed at the north-east corner of the Site off of County Road 71 (Rich Valley Boulevard). The entrance to the Site is paved for at least 75 feet. The haul routes are currently Rich Valley Boulevard north to Cliff Road and Rich Valley Boulevard south to 117th Street. Average daily traffic generated from the Site is approximately 150 truck trips per day. Levels of production are expected to remain fairly consistent over the course of the next permitting period.

The majority of the truck traffic for the asphalt cement tank operation will be generated during the construction off-season during the winter months when the storage tanks are filled. Estimated average daily traffic will be 40 loads (80 trips) per day and 4 loads (8 trips) per hour for up to 25 days during the winter months. Peak hourly traffic generated during the winter months is 8 trips per hour as the filling process can't occur at a faster rate to accommodate more loads. Filling all three tanks will require

approximately 25 ten-hour days of hauling. Traffic generation is based on the capacity of the pump used to unload the trucks which results in about 15 minutes needed to unload each truck. Typically, the tanks will be filled one time per year.

BRI utilizes the north access as the primary access, but keeps the south-east access off of Rich Valley Boulevard as a secondary access to be used intermittently. During the 2012 year renewal period the old farmhouse that was located in the south-east corner of the Site was removed. The driveway associated with this farmhouse remains. The secondary access was previously the driveway for the farmhouse on the Site. The south access has been widened and resurfaced with crushed concrete approximately 200 feet into the Site. The north access is the primary Site access and the southern access is used for up to 10 percent of the Site truck traffic. Haul routes will remain the same as previously permitted and as described above.

7. Landscaping

The setback areas on the Site will be landscaped in accordance with the approved landscape plans (see Figures 3, 3A and 3B). Landscaping includes the establishment of berms along Rich Valley Boulevard and along portions of the southern setback area of the Site. A portion of the berms along the southern setback area and along Rich Valley Boulevard have been constructed and vegetation established.

8. Weed Control

Weeds or other unsightly or noxious vegetation shall be controlled as necessary to maintain a neat appearance of the Site.

9. Wetlands

There are no wetlands located on the Site. There are two low areas on the southern portion of the Site that were indicated as wetland basins in the National Wetland Inventory. A field delineation of the wetland basins was performed by SEH and it was determined that neither area meets the criteria for a jurisdictional wetland determination. A copy of the SEH report is included as Attachment 5.

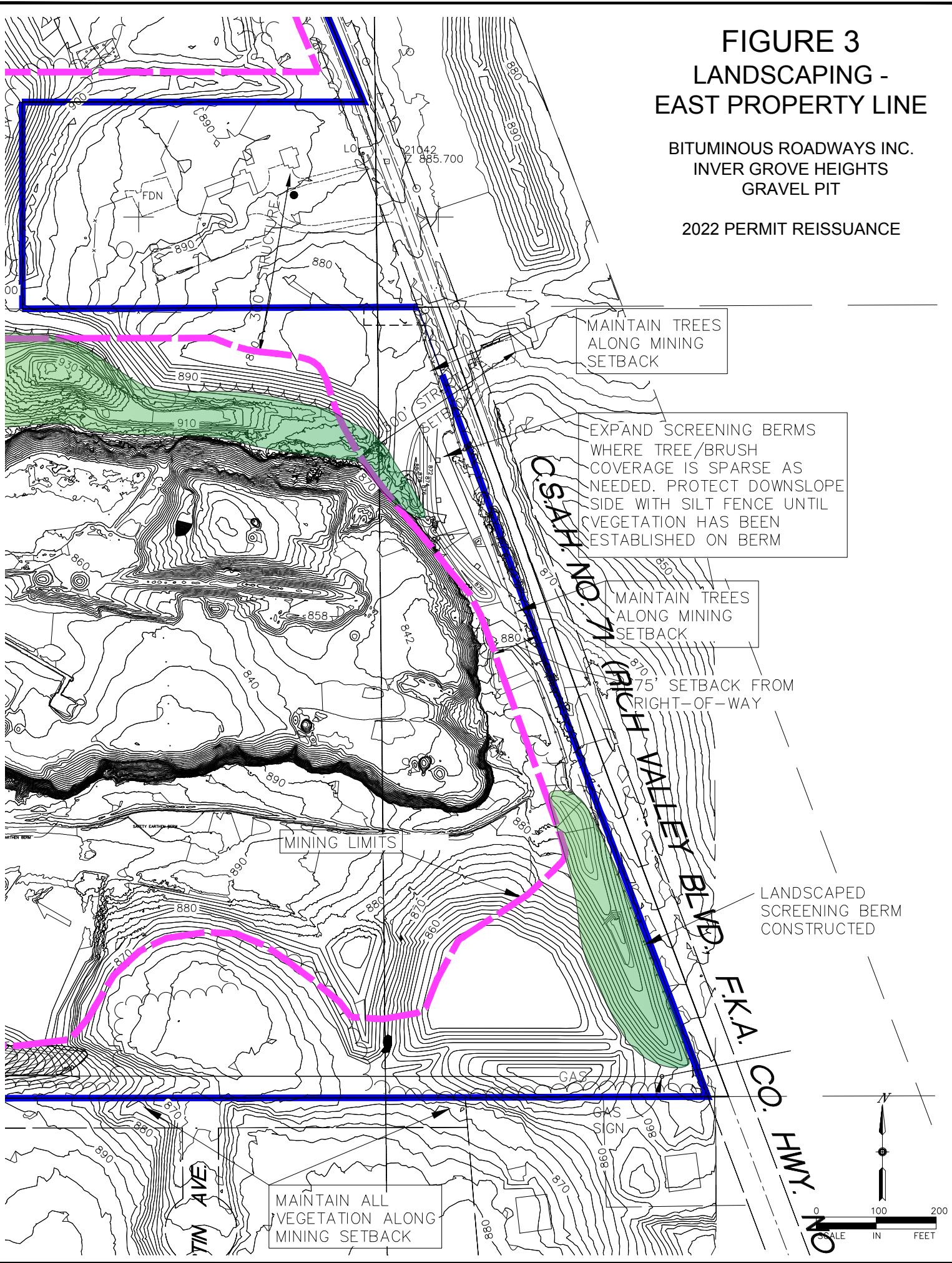
10. Stormwater Management

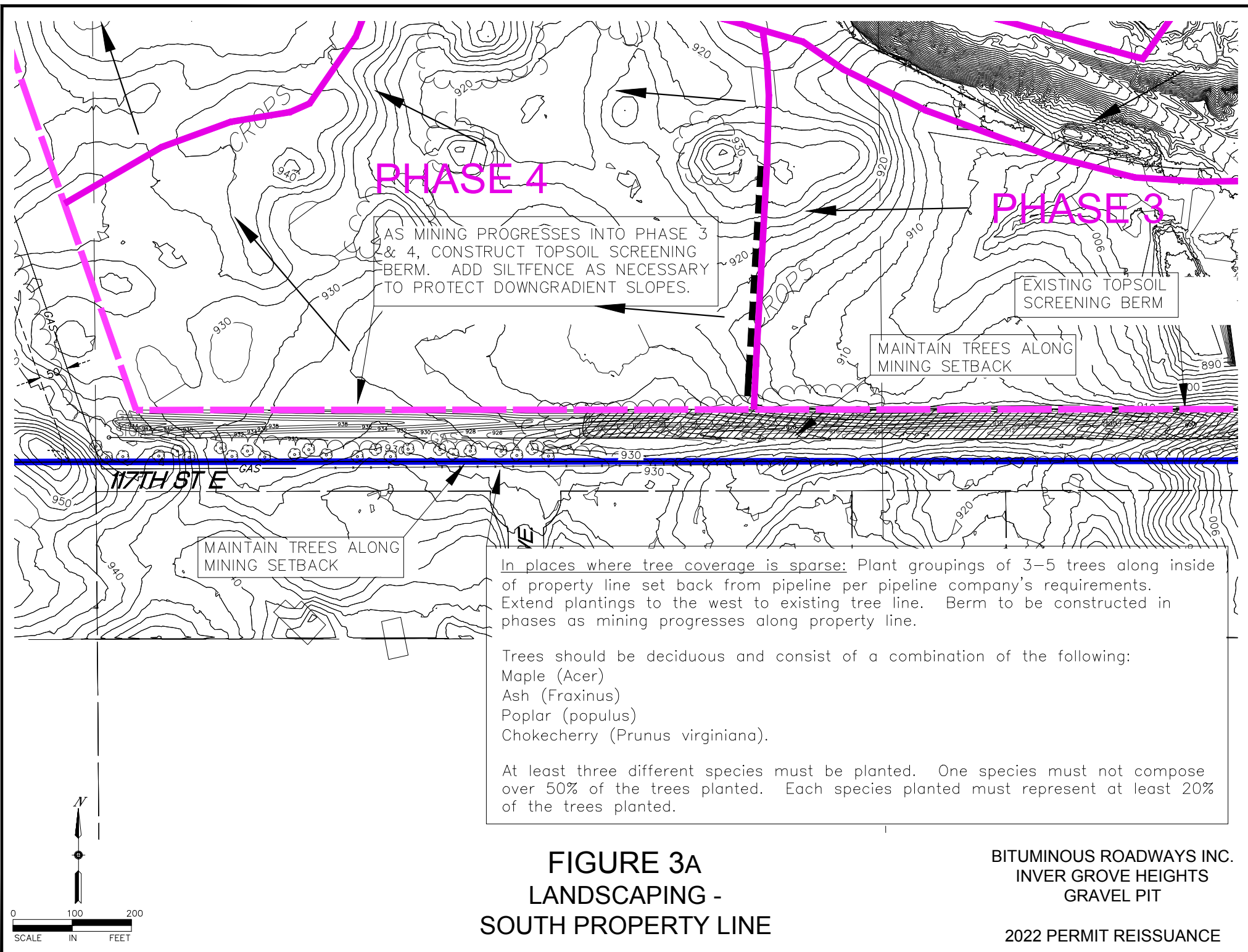
Stormwater calculations for the 2, 10, and 100 year events from pre and post mining conditions, as well as a long term yield model for the Site using precipitation data from the last thirty years to establish high water levels for the proposed future ponding areas were submitted as part of the past permitting applications. These studies are still applicable and are provided in Attachment 6.

FIGURE 3
LANDSCAPING -
EAST PROPERTY LINE

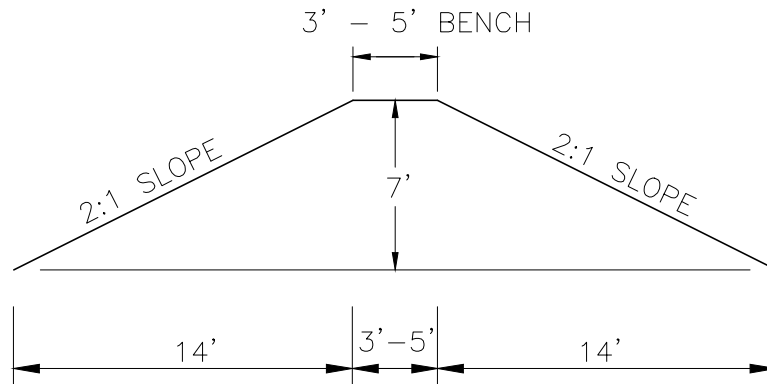
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INVER GROVE HEIGHTS
GRAVEL PIT

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NO SCALE



SEED BERM ACCORDING TO SPECIFICATIONS:

In areas to be permanently seeded, use native seed mixture equivalent to MNDOT No. 350. Apply seed mixture at a rate of 94.7 kg per hectare (84.5 lbs per acre) in accordance with MNDOT Standard Spec. 2575. Incorporate a Type 3 fertilizer (slow release type with 10 week residual) consisting of 22-5-10 (%N-P-K) into the soil at an application rate of 392 kg per hectare (350 lbs per acre) by disking prior to seeding.

Establish native seed mix in accordance with MNDOT Standard Spec. 2575.3. Use a Truax type, or equal interseeder drill with at least two seed boxes: a small/fine seed box and a large/fluffy seed box. Drill large/fluffy seeds to a final planting depth of 10 mm (1/2 inch) to 25 mm (1 inch) deep from the large/fluffy seed box. Split the drill rates in half and make two passes over the site in order to decrease competition in drill rows. Scatter small/fine seeds over the soil surface by drop-seeding from the small/fine seed box, or broadcast. Coordinate with the seed vendor to keep the large/fluffy seeds separate from the small/fine seeds so that they may be installed from separate seed boxes. Lightly harrow or rake the site following the seeding operation. Pack the site following harrowing in order to ensure a firm seed-bed.

Comply with the requirements of MNDOT Standard Spec. Table 2575-1 for season of planting native seed mixtures. The appropriate dates for spring seeding are from April 15 through July 20. Fall seeding dates are from September 20 to October 20. Dormant seeding dates are from October 20 to November 15. Dormant seeding will only be allowed if the maximum soil temperature at a depth of 25 mm (1 inch) does not exceed 10 degrees C (50 degrees F) in order to prevent germination.

In seeded areas with slopes equal to or flatter than 3:1, apply MNDOT Standard Spec. 3882 Type 1 mulch uniformly over the soil surface by hand or machine within 24 hours after seeding in accordance with MNDOT Standard Spec. 2575.3. Apply mulch at a rate of 4.5 metric tons per hectare (2 tons per acre). Immediately after placement, anchor all mulch material into the soil by crimping (straight disking) in a direction perpendicular to that of the overland storm water flow. Punch the mulch into the soil to a depth of 2 to 3 inches with a disk spacing of 8" or less.

FIGURE 3B SCREENING BERMS

11. Tree Preservation

The existing woods located west of the gas pipeline will not be impacted by mining or reclamation grading. Trees and vegetation within the 300 foot setback from existing structures will also remain undisturbed. Existing trees in the setback area along the southern portion of the Site have been undisturbed and provide screening of Site operations. Additional trees may be planted as the proposed topsoil screening berm along the south property line is expanded to the west in accordance with the previously approved landscaping plans (see Figures 3, 3A and 3B, Landscaping).

12. Dust Control

Dust is controlled at the Site by utilizing the existing paved Site entrance. Interior haul roads are watered as needed in order to minimize dust from vehicular travel within the Site. Screening berms are vegetated.

13. Noise Control

The Site must operate in compliance with State noise standards. Vehicles and equipment are operated with standard noise reduction features such as mufflers. Perimeter berms and operation of equipment in the recessed portion of the Site also help to reduce noise emissions from the Site.

During the original permitting phase of the southern portion of the Site, Barr Engineering modeled anticipated noise generation from the Site based on topography, equipment to be operated and location of adjacent residences or receptors. The modeling results and applicable noise standards were discussed in detail in the EAW. The noise analysis predicted that the Site will operate below noise standards established by the Minnesota Pollution Control Agency for residential areas both during stripping operations which occur at grade and during mining operations when equipment is recessed on the floor of the mining operation and the active bank provides noise mitigation.

Barr's analysis also noted that back up alarms will likely be audible at the nearest residences particularly when there is a light northern wind and little other background noise. Although the noise may be audible, it does not represent a predicted exceedance of state standards. Back up alarms are a requirement of Mining Safety and Health Administration (MSHA). Back up alarms are intentionally loud and audible and are required in order to ensure the protection of on-site workers.

In late 2018 the City of Inver Grove Heights retained Barr Engineering Company (Barr) to perform a noise assessment of the BRI Site to evaluate noise levels from BRI's

operations reaching nearby residences. Monitoring for the study was performed in August of 2018. The noise assessment included noise monitoring at the western edge of the Site and an assessment of the data. The report stated that there were no hours where noise levels were above the state residential daytime or nighttime thresholds. Barr concluded in the November 29, 2018 Technical Memorandum that "Monitoring of noise at the western edge of the Bituminous Roadways property indicates that conditions at nearby residences are likely in full compliance with state noise standards. Levels were below the state nighttime noise standards for all hours monitored. Bituminous Roadways' operation on Rich Valley Boulevard does not appear to significantly affect overall noise levels at the residences to the west as the observed cyclical daily noise pattern occurred on days both with and without Bituminous Roadways in operation." The Technical Memorandum for the Bituminous Roadways Noise Assessment, by Barr Engineering Co. dated November 29, 2018 is provided as Attachment 4 in this report.

14. Lighting

There is no lighting within the active mining area. There are a total of 12 exterior lights associated with security for the asphalt plant and contractors yard. Exterior lights are located as follows:

- 2 - Rainbow shop
- 1 - East scale house
- 3- Top of small asphalt cement tanks at plant
- 2- Top of silos at plant
- 2- Top of large asphalt cement storage tanks
- 2- Top of truck loadout scale

15. Groundwater Monitoring

In accordance with the permit, groundwater monitoring is conducted every other year at the on-Site well (known as the "Rainbow well") and at the Todd Wicker and Robert Plan properties. Monitoring of the on-site surface water ponds is also conducted every other year. The groundwater testing map is provided in Figure 4 of this report. Ground water (well) and surface water pond samples are analyzed for both diesel range organics (DRO) and gasoline range organics (GRO) and for arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, phenol, pH, electric conductivity and alkalinity. Results are submitted to the City.

The results from the last five years show that sample concentrations for both GRO and DRO in the on-site and neighboring groundwater wells are below the detection limit and reporting limit. Results from the sample concentrations of the on-site stormwater ponds

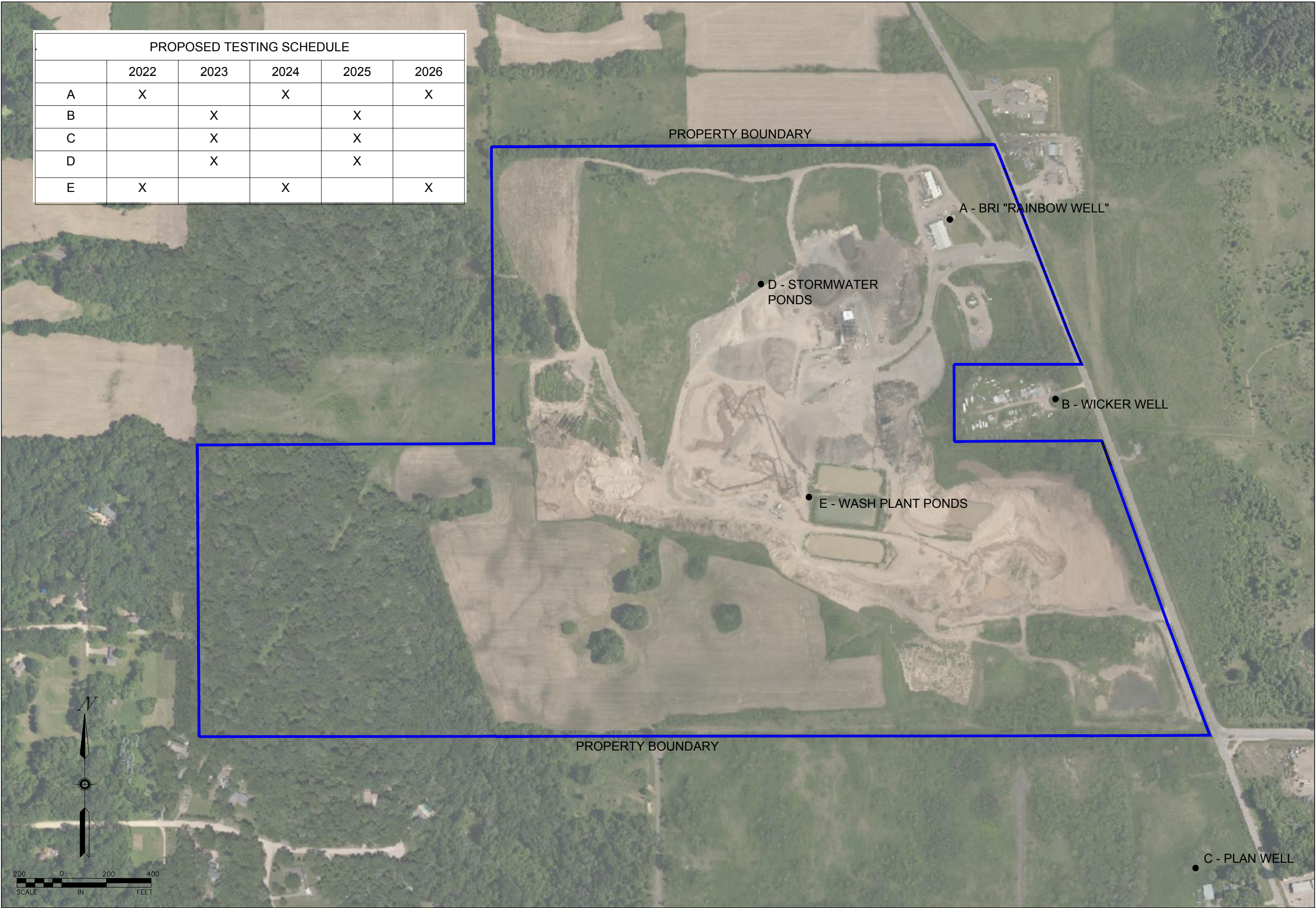
and wash plant ponds for GRO are below the detection limit and reporting limit. Results from the sample concentrations of the on-site stormwater ponds and wash plant ponds for DRO are above the reporting limit, but below the “action level”, for surface water and drinking water standards, of 1 mg/L at which point a Remedial Investigation (RI) per MPCA Guidance Document 4-01 (Petroleum Remediation Program) would be warranted. The results from all the wells and surface waters show that the concentrations of barium, cadmium, chromium, nickel, selenium, silver, zinc, and phenol were all below the Health Risk Limit (HRL) established by the Minnesota Department of Health. The sample concentrations of arsenic and mercury were below the Maximum Contaminate Level (MCL) (HRLs have not been established for arsenic or mercury), which is a federal standard for the lowest concentration at which a particular contaminant is believed to be a potential health concern. The sample concentrations for lead and copper were both below the “action level” (HRLs or MCLs have not been established for lead or copper).

An existing well associated with the farmstead on the Site has been sealed in accordance with Dakota County Ordinance No. 114 and the Minnesota Department of Health.

16. Volumes

The volume of in-place material to be removed from the Site within all of Phases 1-5 is approximately 8 million cubic yards to the current maximum excavation elevation of 840 feet above msl. Approximately 1.5 million cubic yards have been removed from the Site as part of Phase 1 mining and approximately 1.5 million cubic yards have been removed from the Site as part of Phase 2 to date. BRL is requesting to increase the mining depth by about 40 feet to elevation 800 feet above msl for the remaining mining phases. The volume of additional in-place material is approximately 3.4 million cubic yards from elevations 840-800 feet above msl. The total lifetime volume of in-place material would increase to about 11.4 million cubic yards. The life expectancy of the Site will depend upon the future economy and aggregate demand in the metropolitan area. Reports by the Metropolitan Council, Minnesota Geologic Survey and Minnesota Department of Natural Resources indicate that the supply of aggregate materials in the metropolitan area is rapidly being depleted. However, the vitality of the economy and the construction industry impact market demand which varies from year to year. With the additional 40 feet of mining depth, the remaining mining life of this Site is estimated to be approximately 30 years.

PROPOSED TESTING SCHEDULE					
	2022	2023	2024	2025	2026
A	X		X		X
B		X		X	
C		X		X	
D		X		X	
E	X		X		X



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BITUMINOUS
ROADWAYS INC.
INVER GROVE HEIGHTS
GRAVEL PIT

2017 PERMIT
REISSUANCE

DATE	REVISION
10/16/17	Add Wash Plant Pond to Testing Schedule
08/05/22	2022-2026 SCHEDULE

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.

Kirsten Pauly
Kirsten Pauly
DATE: 08/05/22 REG. NO.: 21842

INFORMATION:	
PROJECT NO.:	87-185
DRAWN BY:	mw
CHECKED BY:	kp
APPROVED BY:	kp
SCALE:	graphic
DATE:	09/05/17

DESCRIPTION:

WATER TESTING
MAP

SHEET NO.

FIGURE 4

17. Permits

In addition to the local permits required by the City of Inver Grove Heights, which include the Conditional Use Permit and Land Alteration Permit, the Site must operate in compliance with other state and federal regulations. The Site operates under a NPDES Stormwater Permit and Air Emissions Permit issued by the MPCA, a Minnesota DNR Water Appropriations Permit, a Dakota County Hazardous Waste Generators License and Processing License, and a MPCA Permit for Storage of Liquid Substances at a Major Aboveground Storage Tank Facility

All reports which are required to be submitted to the MN DNR for the Water Appropriations Permit including annual water usage report, Dakota County for the Hazardous Waste Generators License and the Processing License, and the MPCA, including annual emissions inventory report, semi-annual deviations report, annual compliance certification report, and annual report will also be submitted to the City. The Site also operates under a Spill Prevention Control and Countermeasures (SPCC) Plan. The SPCC Plan documents practices, personnel, equipment, and resources available to prevent a spill and what actions to take if a spill were to occur.

IV. RECLAMATION

1. Phasing

Reclamation is conducted in phases at the Site. As portions of the mining area are completed, the areas are backfilled, graded, topsoil applied and vegetation established. During the past five year permit period, substantial reclamation activity has been completed in the northern portion of the Site. The Reclamation Plan, Sheet C-6 illustrates the reclamation grades that will be established at the Site upon conclusion of mining. The Phasing Plan, Sheet C-2 illustrates areas where reclamation has been completed. Reclamation activities will leave the Site in a state that will prepare it for final development.

2. Grades and Backfill Material

Areas within the northern portion of the Site have been backfilled, sloped and vegetated. Reclamation activities will continue in areas where mining has been completed. Reclamation activities in these areas will include continued backfilling and sloping.

Along the perimeter of the excavation limits, backfilling will be required to achieve a maximum 4:1 final slope previously approved by the City of Inver Grove Heights. The processing and stockpile area will remain open and active. Reclamation grades for the southern portion of the Site will be graded to a maximum slope of 10:1 as indicated on the Reclamation Plan, Sheet C-6.

Backfill Material:

Clean backfill material will be brought to the Site from local construction projects to be used for establishment of reclamation grades. The majority of materials will be from BRI construction projects. Backfill material may also include on-site excess mining materials unsuitable for sale or use in asphalt mix. All backfill material used in reclamation activities will be clean, compactable, natural earthen material free of debris or contamination.

As recommended in the Barr Technical Review, backfill material will consist of only non-organic compactable soil material that is free of contamination, recycled or salvaged aggregate, asphaltic pavement, crushed concrete, scraps of shingles, debris, rubbish, frozen soil, boulders over 1-inch in diameter, logs, wood chips or other objectionable material. Contaminated soil will not be used as fill or brought to the site. Soils will not be allowed to be imported for reclamation backfilling if the source of imported fill is from a location where soil contamination is known, suspected, or can be expected (e.g., soils from gas stations, certain industrial sites, etc.).

BRI will maintain a manifest from each off-site soil source indicating where soils are imported from. The manifest will include a statement that no contaminants are suspected to be in the soil material, information regarding location of where the soils are placed on Site, and an approximate volume of material imported. Records will be maintained by BRI and made available to the City upon request.

If site grading is performed during cold weather, all snow and ice will be removed from cut and fill areas prior to additional grading. No fill will be placed on frozen subgrades. No frozen soils will be used as fill.

3. Topsoil

Topsoil capable of establishing and supporting vegetation, will be placed as areas are reclaimed. Topsoil will be replaced to a minimum depth of six inches. Backfilled and graded areas will be seeded and mulched to establish vegetation, stabilize slopes and minimize erosion.

4. Removal of buildings

Within three months after completion of the sand and gravel mining operation any buildings or structures which have been established on the Site as an accessory to the mining operation will be removed. Permanent structures which conform to the permanent zoning district requirements in which they are located, may remain on-site.

5. Bond

A reclamation bond has been posted with the City of Inver Grove Heights to ensure that the Site is properly reclaimed upon completion of mining activity. Final use of the property will be consistent with the zoning and subdivision ordinances in effect at the time of final development. According to the City of Inver Grove Heights 2040 Comprehensive Plan dated October 2019 the current land uses are Industrial and Vacant/Agricultural with a sand and gravel overlay and the future land use is designated Rural Density Residential. It is possible that this area will be serviced by sanitary sewer at the time of final development. Even if this area is not within the Metropolitan Urban Service Area (MUSA) at the time of final development, previous drain field design and percolation testing within Inver Grove Heights have shown that septic systems and drain fields can be properly designed in areas previously disturbed by grading and earth moving activities in areas with permeable sand and gravel soils. Another option would be to provide a community drain field design in an undisturbed portion of the Site. In this situation, individual septic tanks could be pumped up to a larger drain field serving all of the residential uses on the Site.

V. PLAN SET

Operations are described in detail within this report. The following plans have been prepared which help to illustrate the Site operations.

1. 2021 Aerial: A-1

2. Existing Conditions: C-1

This plan illustrates pertinent Site features including the Site boundary, existing topography, utilities, easements, wooded areas, and existing on-Site and adjacent buildings.

3. Phasing Plan: C-2

The Phasing Plan illustrates the sequence of mining and reclamation activities which are proposed to occur on the Site.

4. Cross-Sections: C-3, C-4, C-5

Cross Sections have been prepared for the Site and are included as Figures C-3, C-4 and C-5. These cross sections illustrate the existing elevation, proposed reclamation grades, depth of topsoil, maximum mining elevation and extent of sand and gravel deposit on Site.

5. Reclamation Plan: C-6

This plan illustrates the end use grades for the Site, limits of mining, and setbacks. Final grades have been designed at a maximum 10:1 slope for the southern portion of the Site and a maximum 4:1 slope as previously approved for the northern portion of the Site.



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BITUMINOUS
ROADWAYS INC.
NVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE[illegible]

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.

Kirsten Pauly
Kirsten Pauly

INFORMATION:

PROJECT NO.: 87-185

DRAWN BY: mw

CHECKED BY: kp

APPROVED BY: kp

SCALE: graphic

DATE: 08/05/2022

DESCRIPTION:

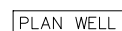
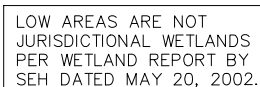
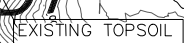
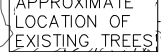
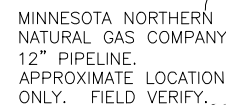
2021 AERIAL

SHEET NO:

A-1



BOUNDARY INFORMATION FROM SUNDE
LAND SURVEYING, LLC.



BITUMINOUS
ROADWAYS INC.
INVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE[illegible]

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.

DATE: 8/5/2022 REG NO: 2184

INFORMATION:

PROJECT NO.: 87-185

DRAWN BY: mw

CHECKED BY: kp

APPROVED BY: kp

SCALE: graphic

DATE: 08/05/2

DESCRIPTION:

EXISTING CONDITIONS

SHEET NO:

C-1

TOPOGRAPHY IN THE CENTRAL PORTION OF SITE FROM DRONE SURVEY BY USA DRONE, DATED 12/20/22.

TOPOGRAPHY OF THE NORTHERN AND SOUTHERN PORTION OF SITE FROM 2016 LIDAR DATA.

BOUNDARY INFORMATION FROM SUNDE LAND SURVEYING, LLC.

MINNESOTA NORTHERN NATURAL GAS COMPANY 12" PIPELINE. APPROXIMATE LOCATION ONLY. FIELD VERIFY.

WOODED AREA. NO AGRICULTURAL RUNOFF. NO DIVERSION BERM NEEDED.

DIVERSION BERM

SLOPED AND VEGETATED

STORMWATER PONDING AREA

SLOPED AND VEGETATED

METAL BUILDING SALT STORAGE

"RAINBOW WELL" ACTIVE

PRIMARY ACCESS

SLOPED AND VEGETATED

BRI WELL ACTIVE

ASPHALT PLANT OPERATIONS AREA

SWICKER WELL

N LINE OF NW 1/4 OF SW 1/4 OF SEC. 33, T. 27, R. 22

ROAD LOCATION TAKEN FROM 80018028.DWG BASED ON OLD SECTION BREAKDOWN. ROAD LOCATION NEEDS TO BE VERIFIED.

SECONDARY ACCESS

33

S LINE OF NW 1/4 OF SW 1/4 OF SEC. 33

LOW AREAS ARE NOT JURISDICTIONAL WETLANDS PER WETLAND REPORT BY SEH DATED MAY 20, 2002.

PLAN WELL ACTIVE

PHASE 5

IN-PLACE MATERIAL VOLUME = ±2,133,000 CY*

PHASE 1

PHASE 4

IN-PLACE MATERIAL VOLUME = ±3,181,000 CY*

PHASE 3

IN-PLACE MATERIAL VOLUME = ±1,833,000 CY*

PHASE 2

IN-PLACE MATERIAL VOLUME = ±2,964,000 CY*

RECLAIMED AREA

RECLAIMED AREA

RECLAIMED AREA

RECLAIMED AREA

MINING LIMITS

DIVERSION BERM

DIVERSION SWALE

WASHPLANT LOCATION

HIGH CAPACITY WELL

PLAN WELL ACTIVE



CONSULTING CIVIL ENGINEERS
10830 NESSBITT AVENUE SOUTH
BLOOMINGTON, MINNESOTA 55437
(952) 881-3344 TELEPHONE
(952) 881-1913 FAX
www.sundecivil.com

BITUMINOUS
ROADWAYS INC.
INVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE

DATE REVISION

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.

Kirsten Pauly
Kirsten Pauly
DATE: 8/5/2022 REG. NO.: 21842

INFORMATION:

PROJECT NO.: 87-185

DRAWN BY: mw

CHECKED BY: kp

APPROVED BY: kp

SCALE: graphic

DATE: 08/05/2022

DESCRIPTION:

PHASING PLAN

SHEET NO.

C-2



BITUMINOUS
ROADWAYS INC.
INVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE[illegible]

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Kirsten Pauly
DATE: 8/5/2022 REG. NO.: 2184

INFORMATION:

PROJECT NO.: 87-185

DRAWN BY: mw

CHECKED BY: kp

APPROVED BY: kp

SCALE: graphic

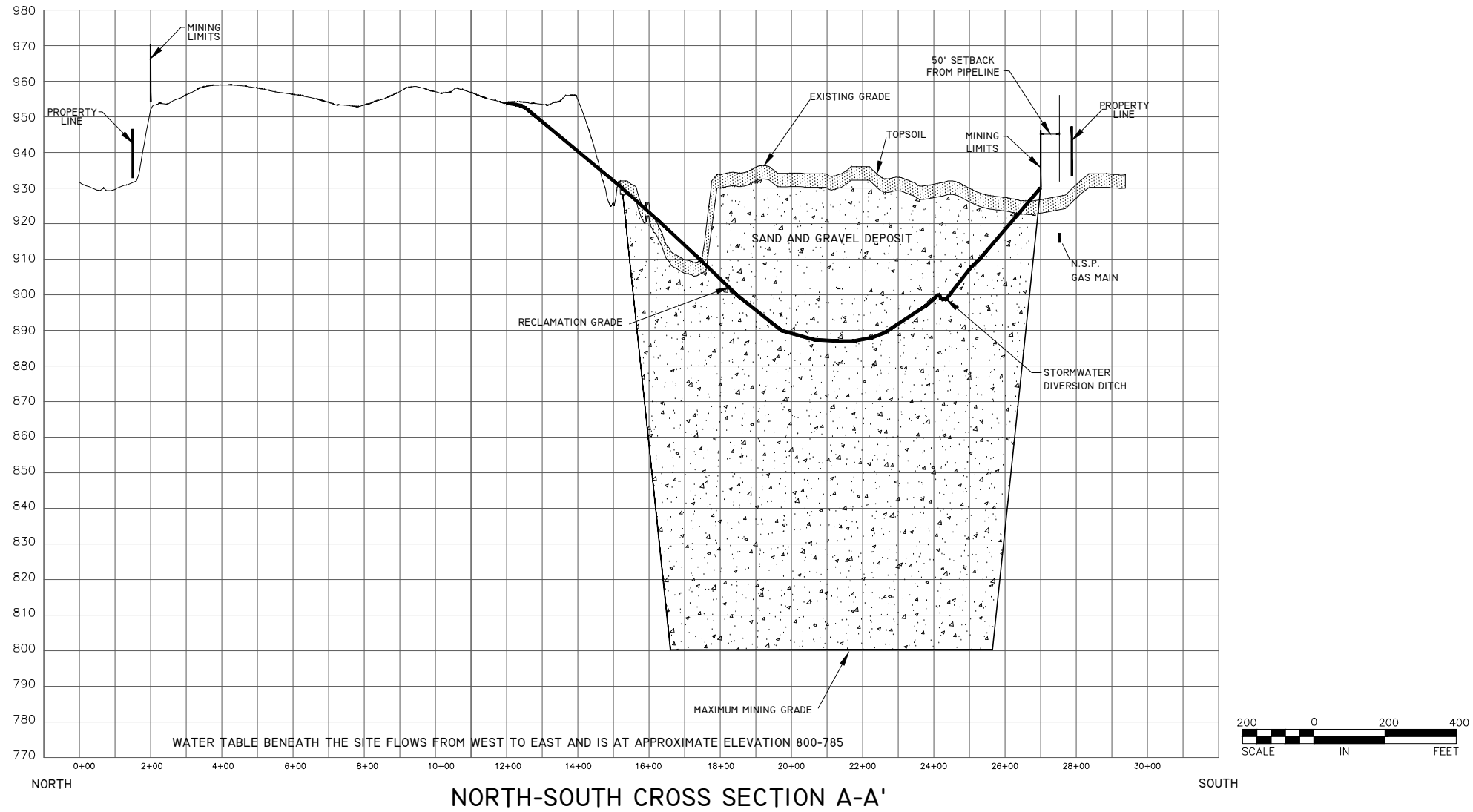
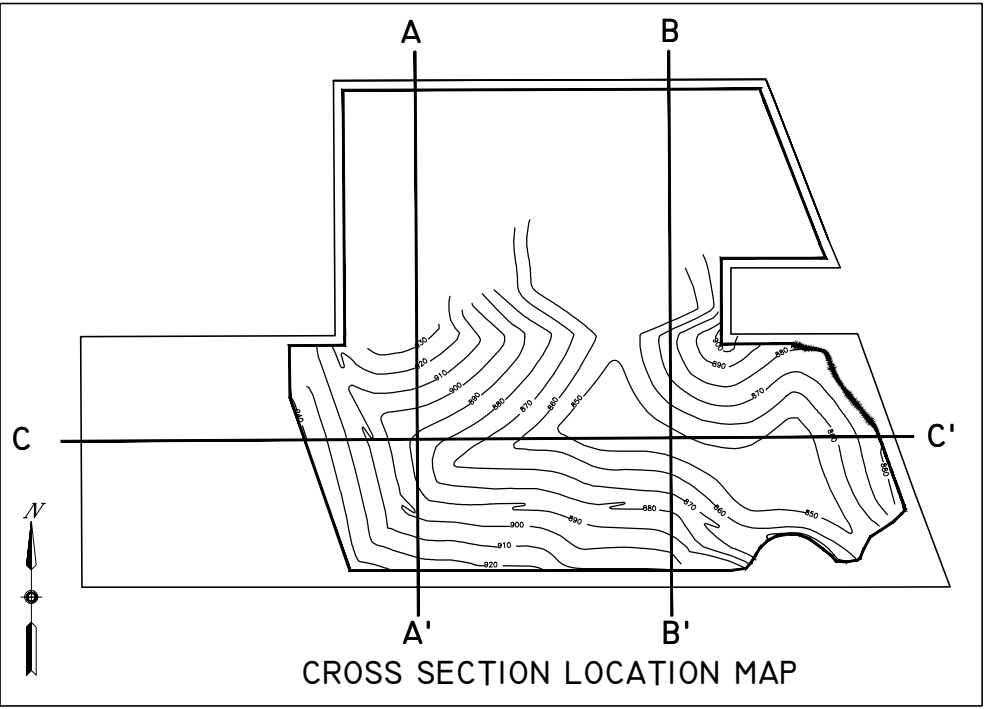
DATE: 08/05/2022

DESCRIPTION:

CROSS SECTION
A-A'

SHEET NO: _____

C-3





BITUMINOUS
ROADWAYS INC.
NVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE[illegible]

I HEREBY CERTIFY THAT THIS PLAN,
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PROFESSIONAL ENGINEER UNDER THE LAWS
OF THE STATE OF MINNESOTA.

Kirsten Pauly
DATE: 8/5/2022 REG. NO.: 21842

INFORMATION:

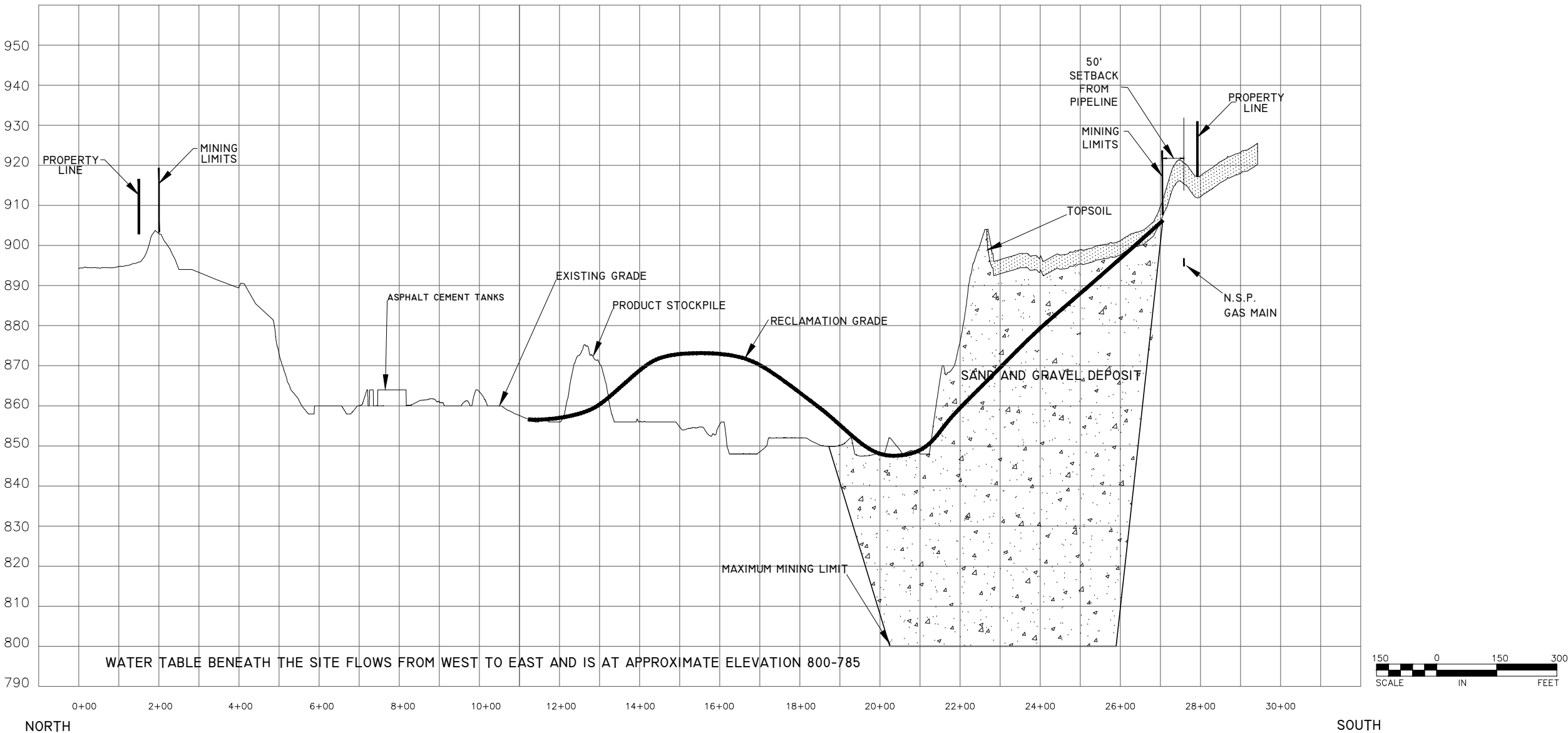
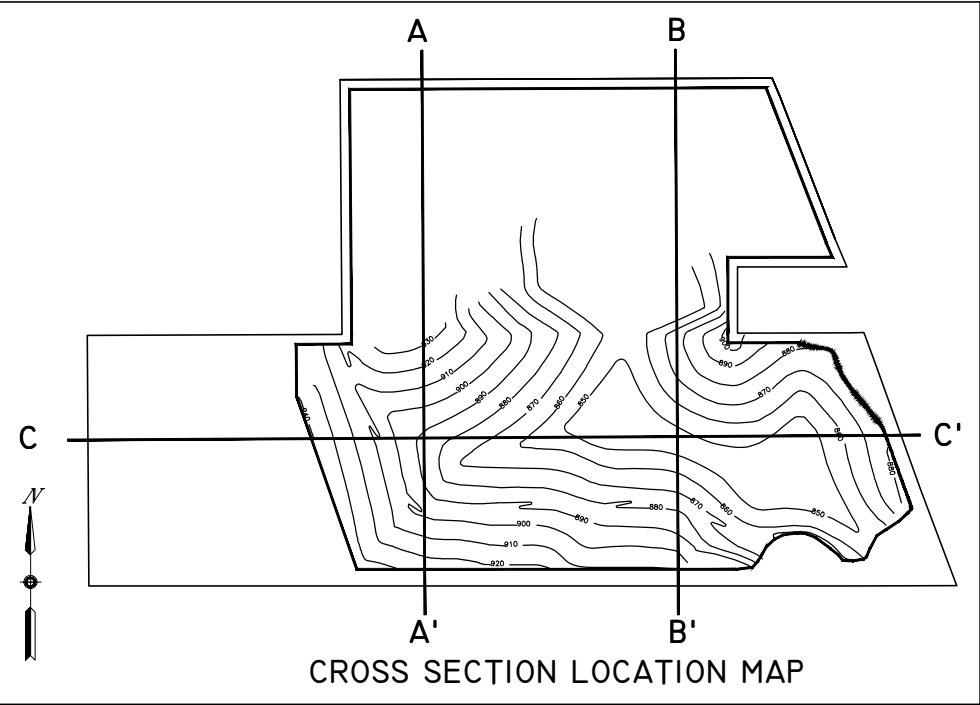
PROJECT NO.:	87-185
DRAWN BY:	mw
CHECKED BY:	kp
APPROVED BY:	kp
SCALE:	graphic
DATE:	08/05/2022

DESCRIPTION:

CROSS SECTION
B-B'

SHEET NO:

C-4





BITUMINOUS
ROADWAYS INC.
NVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE[illegible]

I HEREBY CERTIFY THAT THIS PLAN,
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AND THAT I AM A DULY LICENSED
PROFESSIONAL ENGINEER UNDER THE LAWS
OF THE STATE OF MINNESOTA.

Kirsten Pauly
Kirsten Pauly
DATE: 8/5/2022 REG. NO.: 2184

INFORMATION:

PROJECT NO.: 87-185

DRAWN BY: mw

CHECKED BY: kp

APPROVED BY: kp

SCALE: graphic

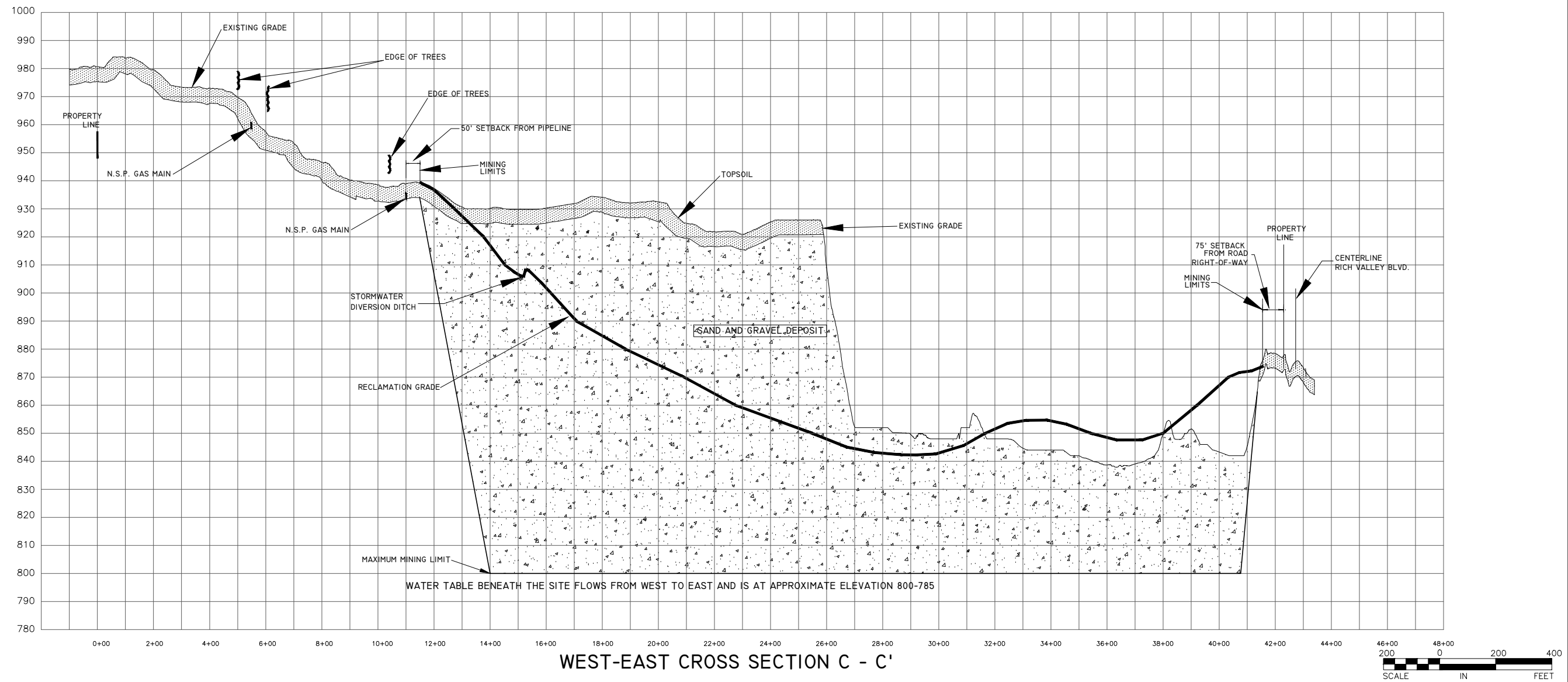
DATE: 08/05/2022

DESCRIPTION:

CROSS SECTION
C-C'

SHEET NO:

C-5





BITUMINOUS
ROADWAYS INC.
NVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE

DATE	REVISION
------	----------

NOTES:

1. Topography in the central portion of site from drone survey by USA Drone, dated 12/20/22.
2. Topography of the northern and southern portion of site from 2016 LIDAR data.
3. Boundary information from Sunde Land Surveying, LLC.
4. Reclamation
Grades: Reclamation grading will consist of backfilling and grading excavated areas with spoil materials unsuitable for sale or use in asphalt mix. Clean soil fill may also be brought to the site to be used for establishment of reclamation grades. All backfill used in reclamation activities is clean fill and natural earthen material free of debris or contamination.

Along the perimeter areas, backfilling will be required to achieve the final slopes that were previously approved by the City of Inver Grove Heights. The processing and stockpile area will remain open and active. Reclamation grades for the southern portion will be graded to a maximum slope of 10:1 as indicated on the Reclamation Plan.

Topsoil and Seeding: Topsoil capable of establishing and supporting vegetation, will be placed as areas are reclaimed. Topsoils will be replaced to a minimum depth of 6 inches. Reclaimed areas will be seeded and mulched to establish vegetation, stabilize slopes and minimize erosion.

Removal of Buildings: Within three months after completion of the sand and gravel mining operation any buildings or structures which have been established on the site as an accessory to the mining operation will be removed. Permanent structures which conform to the permanent zoning district requirements in which they are located, may remain on site.

Bond: A reclamation bond has been posted with the City of Inver Grove Heights to insure that the site is properly reclaimed upon completion of mining activity.

Final Use: Final use of the property upon reclamation will be consistent with the zoning and subdivision ordinances in effect at the time of final development. Community septic systems may be constructed in the future site development.

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PROFESSIONAL ENGINEER UNDER THE LAWS
OF THE STATE OF MINNESOTA.

Kirsten Pauly
DATE: 8/5/2022 REG NO: 208

INFORMATION:

PROJECT NO.: 87-185

DRAWN BY: mw

CHECKED BY: kp

APPROVED BY: kp

SCALE: graphic

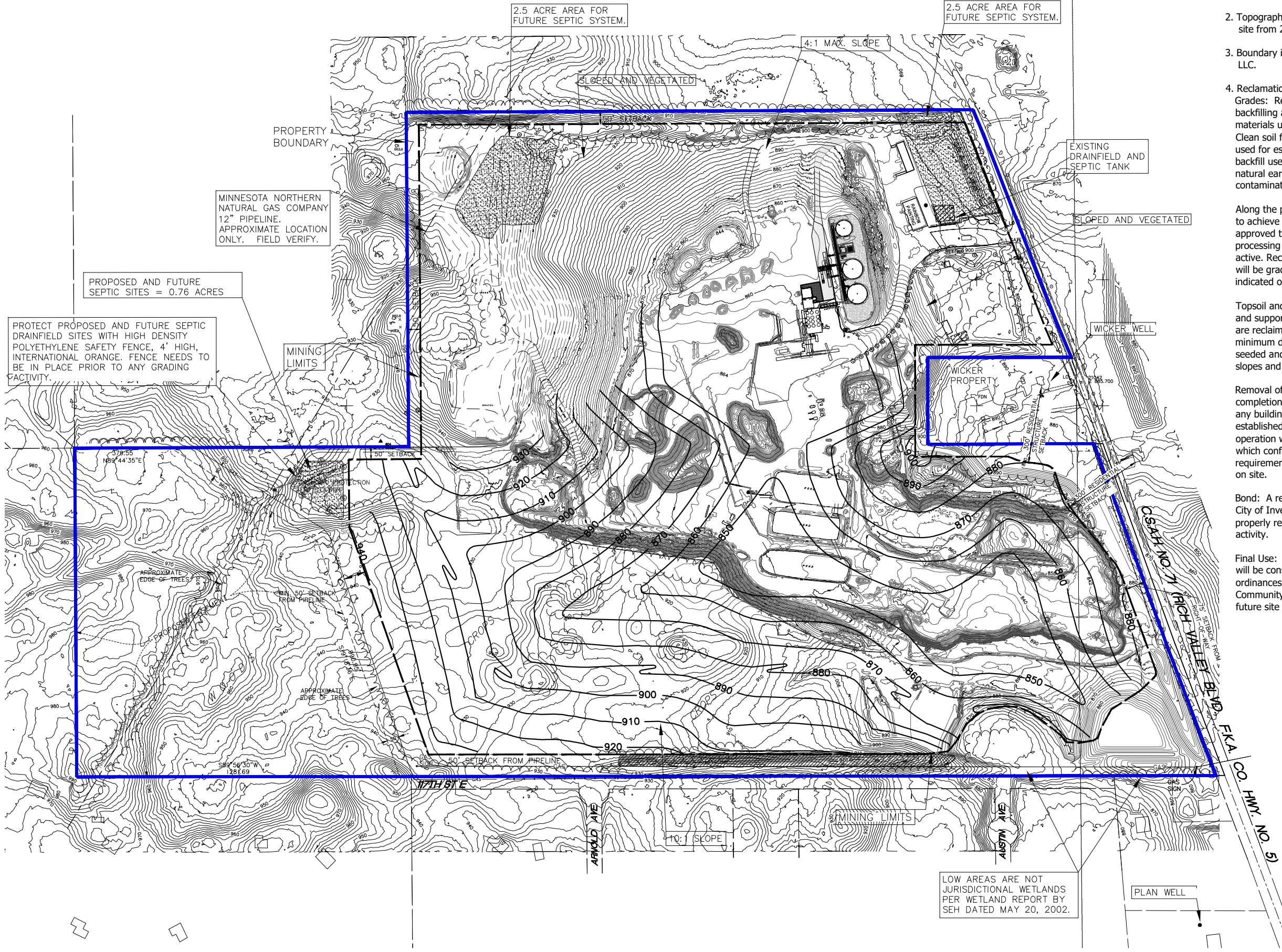
DATE: 08/05/2022

DESCRIPTION:

RECLAMATION PLAN

SHEET NO: _____

C-6



Technical Memorandum

To: Ally Sutherland and Allan Hunting
From: Ray Wuolo, Senior Hydrogeologist and Jeff Ubl, P.E.
Subject: Bituminous Roadways, Inc. (BRI) – Environmental Review of Proposed Expansion
Date: September 29, 2022
Project: 2319-0218

This memorandum provides Barr Engineering Co.'s (Barr's) review of potential environmental-related impacts from BRI's proposed expansion of their sand and gravel mining operation located on Rich Valley Boulevard.

Proposed Expansion

Barr's understanding of the proposed BRI sand and gravel expansion is based on:

- The Conditional Use Permit (CUP) application and seven-sheet plan set both dated August 5, 2022, and prepared by Sunde Engineering, PLLC (Sunde) and,
- The September 22, 2022, virtual meeting with BRI, Sunde, City staff

From this information we understand:

- The proposed mining depth will increase by 40 feet from elevation 840-feet to elevation 800-feet
- The water-table aquifer beneath the site flows generally from west to east at an elevation between 800 to 745-feet
- The proposed expansion will increase the life of the mine by approximately 10 years
- The same equipment currently in use at the mine will continue to be used for the expansion with no increase in equipment number, size, or type
- The mining rate will remain the same for the expansion, including the frequency of truck trips to and from the operation
- The proposed mine operating aerial footprint will not increase for the proposed expansion
- The location and quantity of fuel, asphalt cement, and other chemical storage will not change from the current operation
- Backfilling of the mine is expected to consist of excess sand from the operation and clean soil from off-site BRI construction projects
- Per Minnesota Rules 4410.4300, subpart 12 the proposed expansion does not trigger a mandatory Environmental Assessment Worksheet
- After mining operations are complete, topsoil will be placed over the site and the area vegetated; end use will include agriculture and potentially residential lots

To: Ally Sutherland and Allan Hunting
From: Ray Wuolo, Senior Hydrogeologist and Jeff Ubl, P.E.

Subject: Bituminous Roadways, Inc. (BRI) – Environmental Review of Proposed Expansion
Date: September 29, 2022
Page: 2

Review of Potential Environmental Impacts

Barr reviewed the proposed expansion for potential negative impacts relating to air quality, groundwater quality and quantity, surface water quality, and noise. A discussion on each of these topics is provided below.

Air Quality

Because the proposed expansion will not increase the rate of mining, the type or quantity of equipment used, or the number of truck trips to and from the site, we believe that air quality impacts will not change from the current operation.

Groundwater Quality

Groundwater quality monitoring is conducted every-other-year at the onsite well (Rainbow well) and at the Todd Wicker and Robert Plan property wells for diesel and organics (DRO) and gasoline range organics (GRO) and for arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, phenol, pH, conductivity, and alkalinity. Results are submitted to the City and City staff indicate they have no concerns with the reported results.

It is not expected that groundwater quality would be negatively impacted by the expanded sand and gravel extraction operation. However, the subsequent soil backfilling should use only clean soil. The soil backfill material will be in very close proximity to groundwater and the 40 feet of unsaturated sand and gravel that currently is present above the water table will be removed. While this decreased thickness in the unsaturated zone should not change groundwater flow directions or rates, it will result in the water-table aquifer to be slightly more vulnerable to leaks, spills, or potential contamination in the backfill soil, compared to current conditions, because there will be less time between the discovery of a leak or spill and the ability to respond to it before the leak or spill reaches the water table and less unsaturated sand and gravel to naturally attenuate or adsorb potential contamination.

Groundwater Quantity

Because dewatering will not be needed to extract the sand and gravel for the proposed expansion, it is not expected that groundwater quantity of nearby wells will be negatively impacted.

Surface Water Quality

Surface water quality monitoring is conducted every-other-year at the site ponds for diesel and organics (DRO) and gasoline range organics (GRO) and for arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, phenol, pH, conductivity, and alkalinity. Results are submitted to the City and City staff indicate they have no concerns with the reported results.

Because the proposed expansion would increase the depth of mining it is understood that surface water runoff would continue to be contained at the site during the life of the mine. It is also understood that

To: Ally Sutherland and Allan Hunting
From: Ray Wuolo, Senior Hydrogeologist and Jeff Ubl, P.E.

Subject: Bituminous Roadways, Inc. (BRI) – Environmental Review of Proposed Expansion

Date: September 29, 2022

Page: 3

storage of fuel, asphalt cement, and other chemicals would continue at the same location and at the same quantities as the current operation.

After mining is complete and the mine backfilled, surface water is proposed to be contained on site in the same manner as the plan for the current operation. Therefore, we do not foresee any negative impacts to surface water quality from the proposed expansion but recommend that BRI review and update its Spill Prevention, Control, and Countermeasure (SPCC) Plan as appropriate.

Noise

Barr was retained by the City to perform a noise assessment on the western edge of BRI's operation in 2018. Barr's assessment concluded that conditions at nearby residences was likely in full compliance with state noise standards.

Because the proposed expansion will not increase the rate of mining, the type or number of equipment used, or the number of truck trips to and from the site, we do not believe there will be any negative noise impacts from the proposed expansion.

Conclusions and Recommendations

Barr recommends that the City's CUP contain requirements for soil backfilling and the SPCC plan as described below.

For soil backfill material, Barr recommends only non-organic compactable soil material be used that is free of contamination, recycled or salvaged aggregate, asphaltic pavement, crushed concrete, scraps of shingles, debris, rubbish, frozen soil, boulders over 1-inch in diameter, logs, wood chips or other objectionable material. Backfill soil should be free of stumps, roots, and branches over 1.5- inches in diameter .

Backfill soils should not be placed over frozen subgrade.

Contaminated soil should not be used as fill or brought to the site. If the source of imported fill will be from a location where soil contamination is known, suspected, or can be expected (e.g., soils from gas stations, certain industrial sites, etc.), that soil should not be used for backfilling. Therefore, it is further recommended that offsite backfill soil come from only BRI projects and include a manifest from each site indicating that no contaminants are suspected to be in the soil material. A copy of the manifest could be submitted to the City.

Barr recommends that BRI review and amend the SPCC Plan as appropriate and submit a copy to the City. The SPCC Plan should document practices, personnel, equipment, and resources available to prevent a spill and what actions to take if a spill were to occur.

CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA

ORDINANCE NO. 1343

AN ORDINANCE AMENDING TITLE 10, CHAPTER 4 OF THE INVER GROVE
HEIGHTS CITY CODE

CASE NO. 12-17CZA

The City Council of Inver Grove Heights ordains as follows:

SECTION I. Ordinance No. 1037 adopted July 8, 2002, entitled, "AN ORDINANCE AMENDING, RESTATING, AND RECODIFYING SECTIONS 405, 425, 515, 505, 516, 517, 518, 519, 520, 525, 535, 540, 545, 546, AND 550 OF THE INVER GROVE HEIGHTS CITY CODE" being also known as the City Zoning Ordinance is hereby amended to rezone to Temporary Sand and Gravel (S & G) for a period of five (5) years to following described property located within the City of Inver Grove Heights, Minnesota, to wit:

That part of the S $\frac{1}{2}$ of the NE $\frac{1}{4}$ of Section 32, Township 27, Range 22, lying westerly of Rich Valley Boulevard; except that part described as follows: Commencing at the SE corner of said S $\frac{1}{2}$ NE $\frac{1}{4}$; thence west along the south line thereof, a distance of 592.43 feet; thence north 344.9 feet; thence east 570 feet to the centerline of Rich Valley Boulevard; thence southeasterly along said centerline, a distance of 67 feet to the east line of said S $\frac{1}{2}$ NE $\frac{1}{4}$; thence south 281.85 feet to the point of beginning. Part of PID # 20-03200-011-05, and

The Northeast Quarter of the Southwest Quarter and the North One-Half of the Southeast Quarter, Section 32, Township 27, Range 22, and all of that tract of land lying West of Highway 5 in the Northwest Quarter of

the Southwest Quarter , Section 33, Township 27, Range 22; subject to an easement to Minnesota Northern Natural Gas Company, as described in Deed recorded in Book 193 of Deeds, page 374. PID No. 20-03200-010-75, 20-03200-020-50.

SECTION II. The Zoning Map of the City of Inver Grove Heights referred to and described in said Ordinance No. 1037 as that certain map entitled "Inver Grove Heights Zoning Map, June 24, 2002," shall not be republished to show the aforesaid rezoning, but the Clerk shall appropriately mark the said zoning map on file in the Clerk's Office for the purpose of indicating the rezoning hereinabove provided for in this ordinance and all of the notations, references and other information shown thereon are hereby incorporated by reference and made a part of this ordinance.

SECTION III. This Ordinance shall be in full force and effect from and after its publication according to law, and shall be subject to the following conditions:

1. The Temporary Sand and Gravel (S&G) Zoning shall remain in place on the property for a period of five (5) years to expire on (council approval date), 2022.
2. The operation of the sand and gravel operation approved herein shall comply with all provisions of Inver Grove Heights City Code, Title 10-13G, Sand and Gravel Overlay District, except as specifically modified herein.
3. The following plans, on file with the Planning Division, shall constitute the "approved plans" referenced therein:
 - Existing conditions dated 8/18/17
 - Phasing Plan dated 8/18/17
 - Final Land Use Plan dated 4/25/02
 - Cross Section Plans (3 sheets) dated 8/18/17
 - Reclamation Plan dated 8/18/17
 - Landscaping Plan - east property line dated 2017
 - Landscape Plan - south property line dated 2017
 - Water Testing Map - dated 9/5/17

All aspects of the operation of the site shall comply with the approved plans.

4. The location of the asphalt plant shall remain in its existing position and shall not be relocated unless this sand and gravel ordinance is amended.
5. "Operation" as it relates to hours of operation, shall include, but is not limited to, all mining and grading operations, washing, the operation of

the asphalt plant on the site, and movement of vehicles and equipment in and out of the site. Hours of operation on the site shall be limited to 7:00 a.m. to 7:00 p.m., Monday through Saturday, except hours of operation may begin at 6:00 a.m. Monday - Saturday for internal operations only, including start up of the asphalt plant and allowing BRI owned vehicles that were parked overnight to exit the site. The crushing of concrete which shall be regulated by Condition #7. The asphalt plant shall be allowed to operate a maximum of 30 night shifts (7:00 p.m. to 7:00 a.m.) during the construction season each year. Bituminous Roadways shall provide the city with written notice prior to each event, including confirmation of contact with the nearest neighbor so a record can be kept to monitor total hours used each season.

6. Crushing of concrete on site shall be permitted provided the following conditions are met:
 1. All crushing operations shall be conducted in the current location in the existing site.
 2. The stockpile of concrete to be crushed and the stockpile of already crushed concrete shall not in the aggregate exceed a total of 50,000 cubic yards.
 3. The height of the stockpiles shall not exceed 25 feet.
4. Crushing shall occur on not more than 12 weeks during the calendar year. No crushing shall occur on Sunday; crushing shall only occur between the hours of 7:00 a.m. and 7:00 p.m. Monday - Friday and 9:00 a.m. to 6:00 p.m., Saturday.
7. Bituminous Roadways may temporarily store Manufactured Organic Shingle Scrap (MOSS) in open storage areas provided the areas in the aggregate do not exceed one (1) acre in size and provided the location and storage configuration is approved by the Fire Marshal and Director of Community Development. MOSS storage areas may be relocated as operations on the site change subject to the approval of the Fire Marshal and the Director of Community Development. The City may impose reasonable conditions relating to dust control, fire prevention and size, height and configuration of the storage piles.
8. The final disposal of MOSS on the site shall be prohibited.
9. As part of the approval granted herein, the applicant may use used concrete and asphalt products as a part of the operation. Stockpiling area for these materials shall be as noted on the approved plans.

10. Bituminous Roadways shall prohibit all drivers of trucks from using Rich Valley Boulevard north of Cliff Road except in those instances where materials are being taken to a project located within the City's regulatory authority. Bituminous Roadways shall post an advisory to all drivers to the same effect at exits from the site.
11. The site shall be kept clear, at all times, of windblown debris.
12. The foundry sand in the southeast berm shall be left undisturbed.
13. Bituminous Roadways shall bring no additional foundry sand onto the site.
14. The berms which cover the foundry sand shall be maintained in vegetative cover to control erosion of the foundry sand.
15. The stockpiled MOSS, shingle scrap, recycled asphalt, and concrete pavement will not be disposed at the site.
16. Stock piles of recycled asphalt, MOSS, shingles, and concrete shall be limited in size to amount that will be used that year.
17. Backfill material shall be either clean fill material that was stripped off the site or other clean fill material which is brought in from offsite.
18. Spent bag house bags will be disposed of in a lined landfill permitted or approved to accept such materials.
19. A restoration bond shall be in an amount to cover the costs of restoration of the site, as determined by the City Engineer, prior to City Council approval.
20. Bituminous Roadways shall obtain and maintain the necessary licenses and approvals from Dakota County and Minnesota Department of Natural Resources. Terms and conditions of the license and approval shall be hereby incorporated into this City approval.
21. Bituminous Roadways shall obtain and maintain the necessary Minnesota Pollution Control Agency permits including two air quality permits and one industrial storm water permit. The terms and conditions of those permits shall be hereby incorporated into this City approval.
22. All reports which are required to be submitted to Dakota County under a Hazardous Waste Generators License and a Processing License shall also

be submitted to the City, including the required annual and quarterly reports.

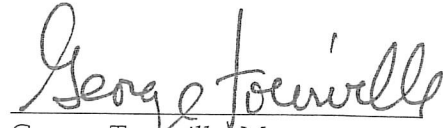
23. All reports which are required to be submitted to the Minnesota Pollution Control Agency shall also be submitted to the City, including annual emissions inventory report, semi-annual deviations report, annual compliance certification report, and annual report.
24. Monitoring shall be conducted at the single water well that consists of arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, DRO, GRO, phenol, pH, electric conductivity and alkalinity. The monitoring shall occur with half the wells every other year. Parameters and protocols shall be as agreed to by Dakota County, the City and Bituminous Roadways.
25. Monitoring of the storm water ponds and wells shall be conducted every other year and shall be tested for the same elements as listed in condition #24 per the proposed testing schedule identified on the Water Testing Map.
26. All buildings shall be removed from the site within three (3) months of the closure of the facility.
27. Bituminous Roadways shall enter into a Host Community Agreement with the City of Inver Grove Heights including the payment of host community fees, within three (3) months of the State Legislature providing the City with the Authority to enter into such an agreement.
28. Restoration shall be conducted in phases at the site. As portions of the mining area are completed, the areas will be backfilled, graded, topsoil applied and vegetation established.
29. The operator is responsible for obtaining all required permits for the wash water well from the appropriate state and or county agencies and must meet all DNR requirements, obligations and protocols for a well appropriations permit, including responsibilities and protocols for any remedial actions and those responsibilities and protocols for any compensation or damages from the loss of well use affected neighboring properties. Any change or any application for an appropriation permit for an aquifer different than the one that has been identified would require an amendment to the conditional use permit.
30. Bituminous Roadways shall provide a voluntary well interference protocol agreement for neighboring properties within ½ mile of the well

requesting to be a party thereto. The agreement shall be prepared by Bituminous Roadways and shall stipulate procedures to follow should well problems occur. The agreement between the parties is strictly voluntary and not required for the well to be operational.

31. The southern access to the site shall be allowed as a secondary driveway for the operation provided it is used by no more than 10% of the truck traffic for the site.

Enacted and ordained into an Ordinance this 9th day of October, 2017.

Ayes: 5
Nays: 0


George Tourville, Mayor

ATTEST:



Michelle Tesser, City Clerk

TOPOGRAPHY IN THE CENTRAL PORTION
OF SITE FROM DRONE SURVEY BY USA
DRONE, DATED 12/20/22.

TOPOGRAPHY OF THE NORTHERN AND
SOUTHERN PORTION OF SITE FROM 2016
LIDAR DATA.

BOUNDARY INFORMATION FROM SUNDE
LAND SURVEYING, LLC.

MINNESOTA NORTHERN
NATURAL GAS COMPANY
12" PIPELINE.
APPROXIMATE LOCATION
ONLY. FIELD VERIFY.

PROPERTY
BOUNDARY

STORMWATER
PONDS. WATER
TEST ID "D"

SLOPED AND VEGETATED

EXISTING TOPSOIL
SCREENING BERM
(Approx. 40,000 CY)

METAL BUILDING
SALT STORAGE

RAINBOW WELL TEST ID "A"
(MN UNIQUE WELL NO.
608018)

EXISTING
DRAINFIELD AND
SEPTIC TANK

PRIMARY
SITE ACCESS

LOCATION WHERE MINOR
AMOUNT OF FOUNDRY SAND
USED AS FILL (HAS REMAINED
IN PLACE SINCE 1998)

ASPHALT TESTING
BUILDING

EXISTING DRAINFIELD
AND SEPTIC TANK

ASPHALT PLANT
OPERATIONS AREA

WICKER
PROPERTY

WICKER WELL TEST ID "B"
(MN UNIQUE WELL NO.
847817)

EXISTING TOPSOIL
SCREENING BERM

WASHPLANT
SUPPLY PONDS.
WATER TEST ID "E"

CURRENT CONVEYOR
PLACEMENT FOR
MINING SAND/ROCK

OLD FARMSTEAD WELL.
SEALED 2000 WELL
SEALING No. 163359

SECONDARY
SITE ACCESS

OLD FARMSTEAD WELL.
SEALED IN NOV. 2022.
WELL SEALING No. 347873

EXISTING TOPSOIL
SCREENING BERM

EARTHEN
SAFETY BERM

L. PLAN WELL
SEALED 2018

R. PLAN WELL
TEST ID "C"
(MN UNIQUE
WELL. NO.
207296)

LOW AREAS ARE NOT
JURISDICTIONAL WETLANDS
PER WETLAND REPORT BY
SEH DATED MAY 20, 2002.

HIGH CAPACITY
WELL
(UNIQUE
WELL NO.
780331)

APPROXIMATE
LOCATION OF
EXISTING TREES

EXISTING TOPSOIL
SCREENING BERM

WASHPLANT
OPERATIONS AREA

APPROXIMATE
LOCATION OF
EXISTING TREES

SAFETY FENCE

MINING LIMITS
50' SETBACK
FROM PIPELINE

APPROXIMATE
EDGE OF TREES

APPROXIMATE
EDGE OF TREES

379.55
N89°44'35"E

S89°56'30"W
1281.69

17TH ST EAST

ARNOLD AVE

AUSTIN AVE

CSA# NO. 7 (ROCK VALLEY BLD. FKA CO. HWY. NO. 5)

N

200 0 200 400
SCALE IN FEET

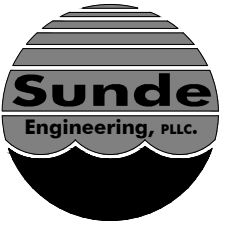
#

T. , R. , S.

DRAWING: \\kirstensoldpc\DWG\Bituminous Roadways IGH\2022 Permit Reissuance\2022-11-16 Revisions\C1 - Existing Conditions.dwg

LAYOUT: C-1

XREF: 2000005A001-ESMT_05162011; XREF: 2022 basemap surface contours; XREF: USA Drone Topo



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BITUMINOUS
ROADWAYS INC.
INVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE

DATE	REVISION
11/17/2022	Site Clarifications
3/9/2023	Add Unique Well Numbers/Sealing Records

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.

Kirsten Pauly
Kirsten Pauly
DATE: 3/9/2023 REG. NO.: 21842

INFORMATION:

PROJECT NO.:	87-185
DRAWN BY:	mw
CHECKED BY:	kp
APPROVED BY:	kp
SCALE:	graphic
DATE:	08/05/2022

DESCRIPTION:

EXISTING
CONDITIONS

SHEET NO.

C-1

Technical Memorandum

To: Ally Sutherland and Allan Hunting
From: Ray Wuolo, P.E., P.G., Samantha Schirmer, and Jeff Ubl, P.E.
Subject: Bituminous Roadways, Inc. (BRI) – Environmental Review of Proposed Expansion
Date: February 28, 2023
Project: 2319-0218

This memorandum provides Barr Engineering Co.'s (Barr) second review of potential environmental-related impacts from BRI's proposed expansion of their sand-and-gravel mining operation located on Rich Valley Boulevard and includes replies to four questions posed by the Inver Grove Heights Planning Commission.

Background

Barr's September 29, 2022 memorandum provided an initial review of potential environmental-related impacts from BRI's proposed mine expansion. The review focused on potential impacts related to air quality, groundwater quality and quantity, surface-water quality, and noise. In that memorandum, Barr recommended that the City's Conditional Use Permit require that soil used to backfill the mine be clean, non-organic soil and that a Spill Prevention, Control, and Countermeasure (SPCC) Plan be developed and submitted to the City.

Subsequently, the Inver Grove Heights Planning Commission met on November 1, 2022 to review and consider the BRI proposed mine expansion. Following that meeting, the Planning Commission had several questions and the City assigned four of those questions to Barr for evaluation and response.

Barr's understanding of the proposed BRI expansion, a response to each of the four Planning Commission questions assigned to Barr, and our conclusions and recommendations are provided below.

Proposed Expansion

Barr's understanding of the proposed BRI sand-and-gravel expansion is based on:

- The Conditional Use Permit (CUP) application and seven-sheet plan set, both dated August 5, 2022, and prepared by Sunde Engineering, PLLC (Sunde)
- The September 22, 2022, virtual meeting with BRI, Sunde, and City staff

From this information, we understand the following:

- The proposed maximum mining depth will increase by 40 feet from elevation 840 feet to elevation 800 feet
- The water-table aquifer beneath the site flows generally from west to east
- The proposed expansion will increase the life of the mine by approximately 10 years
- The same equipment currently in use at the mine will continue to be used for the expansion with no increase in equipment number, size, or type
- The mining rate will remain the same for the expansion, including the frequency of truck trips to and from the operations
- The proposed operating aerial footprint of the mine will not increase for the proposed expansion
- The location and quantity of fuel, asphalt cement, and other chemical storage will not change from the current operation
- Backfilling of the mine is expected to consist of (1) excess sand from the operation and (2) clean soil from off-site BRI construction projects
- Per Minnesota Rules 4410.4300, subpart 12, the proposed expansion does not trigger a mandatory Environmental Assessment Worksheet (EAW)
- After mining operations are completed, topsoil will be placed over the site, the area will be re-vegetated, and the end use will include agriculture and potentially residential lots

Evaluation of Planning Commission Questions

As indicated above, several questions were posed by the Inver Grove Heights Planning Commission following the Commission's November 1, 2022 meeting. The City requested that Barr review and evaluate four of the Planning Commission questions. For reference, each of the four unedited questions are re-stated in italic text below and are followed by Barr's evaluation and response.

Question #1:

A third image from the same location West from the East Access looking north shows what appears to be wet sand caused by contact with the Prairie Duchenne aquifer. This is concerning as there is foundry sand being stored near this location. It appears that the Barr report incorrectly has identified the water level or BR has excavated below the approved depth at this time. Barr report PDF page 54.

Barr's Evaluation and Response to Question #1:

The location of the foundry sand stockpile is located on the east-central portion of the BRI site. The image referenced in the Question #1 is provided as Figure 1 of this memorandum. A cross-sectional view of the current and proposed expanded mine depth in relation to the water table, and the top of the Prairie du Chien-Jordan aquifer and top of the Tunnel City-Wonewoc aquifer is shown on Figure 2.

As indicated in Barr's September 2022 memorandum, the elevation of the water table at the site is approximately 800 feet above mean sea level (msl). Static water levels measured in wells close to the BRI site, as reported in the Minnesota Well Index (MWI), range in elevation from 785 feet msl (Well No. 159480) to 792 feet msl (Well No. 821155). The current lowest depth of mining is approximately

840 feet and the proposed depth of mining is approximately 800 feet. The darker soils shown on Figure 1 may be due to higher moisture in the soil but darker soils could also be due to other factors. However, the darker soil in the photograph provided by the Planning Commission is at least 40 feet above the water table. Dark and/or moist soil conditions can be caused by many different activities and conditions that have nothing to do with the water table. Given that there is 40-plus feet of separation between the water table and the elevation of the soil shown in the photograph, we can say with certainty that the darker soils are not due to intersection or close proximity to the top of the water table.

Question #2:

Page 2 of the Sept 29th Barr, PDF page 55 mentions the "Groundwater Quality" Barr states dewatering isn't required and Nearby wells wont be negatively impacted, there is no mention of the High Volume Well installed in 2012 that removes 450 GPM. A scientist from the DNR present at the public meeting in 2012 describes this well as the perfect storm. Well tests have been required on these and several other wells in the area and the City has been provided copies of the report as IGH is the RGA

Barr's Evaluation and Response to Question #2:

The "High Volume Well" (i.e., wash-plant well) was actually installed in May 2013 (Well No. 780331). The wash-plant well was drilled to a depth of 645 feet below ground surface and cased from ground surface to a depth of 465 feet. The open-hole section of the wash-plant well (depth of 465 to 645 feet) is in the Tunnel City-Wonewoc aquifer, as shown in the cross section (Figure 2). The wash-plant well is used for sand-and-gravel washing at BRI's wash plant. The wash-plant well was designed to achieve a maximum instantaneous pumping capacity of 450 gallons per minute (gpm) and was tested during a pumping test in May 2013 at a sustained rate of 700 gpm for 4 hours with a drawdown in the wash-plant well of 130 feet.

The DNR scientist referenced was hydrogeologist Scott Pearson. Mr. Pearson used the term "perfect storm" in the context of overall high water usage in Dakota County following a period in the 2000s when below-average rainfall, combined with higher use of groundwater for lawn irrigation in Dakota County, was resulting in a general trend of lowering of the potentiometric surface for the Prairie du Chien-Jordan aquifer. The wash-plant well proposed by BRI was originally planned to be completed in the Prairie du Chien-Jordan aquifer. Mr. Pearson expressed concern that the proposed wash-plant well would further stress the Prairie du Chien-Jordan aquifer because it is the most used aquifer in northern Dakota County and the source of water for the City of Inver Grove Heights' wells. Nearby Flint Hills Refinery was also producing water from Prairie du Chien-Jordan wells. The DNR was encouraging the new wash-plant well to be completed deeper, in the lightly used Tunnel City-Wonewoc aquifer (formerly called the Franconia-Ironton-Galesville aquifer). The City and BRI agreed to complete the proposed wash-plant well in the Tunnel City-Wonewoc aquifer. To be clear, the reason for completing the wash-plant well in the Tunnel City-Wonewoc aquifer was to not add to the overall water demand in the Prairie du Chien-Jordan aquifer in this portion of Dakota County. There

were no concerns or issue expressed that a wash-plant well in the Tunnel City-Wonewoc aquifer would have any effect on groundwater quality.

We have performed a groundwater modeling analysis of the effects of pumping BRI's wash-plant well. The results of the modeling are present in the response to Question #4.

Question #3:

*The well water testing reports provided indicate a series of mishandling problems with the water collection protocols used. Several time samples were not collected properly, seals were not intact, Time span from collection did not meet requirements for proper testing. Additionally the amounts of toxic chemicals seem to be increasing over time. The required discrepancy reports have not been made available **Attached is a PDF** indicating the rules that were agreed to in the overlay agreement. I think the city should address who is responsible for monitoring the reports received from BW in the past and what actions, if any, were taken to assure compliance with ordinances and to mediate, protect the groundwater and nearby wells.*

Can an explanation of what is the responsibility of the RGA and who holds this duty in regard to the BR Mine

Barr's Evaluation and Response to Question #3:

As part of this review, BRI provided analytical reports associated with sampling events conducted from 2012 through 2022 for the purposes of evaluating the data quality and comparing against hazard index criteria. The documentation provided was scanned PDFs of laboratory reports and field notes from the timeframe noted, not the analytical reports in their original form. Review of the documentation was limited to what was provided to Barr for these purposes and may not be inclusive of all the available data for this time span.

All data was reviewed using Barr standard operating procedures (SOPs) for data review which are based, in part, on elements found in the EPA's National Functional Guidelines and/or the guidance provided within the accepted analytical methods. Modifications were made as necessary to accommodate for the types of data quality measures provided for review.

Table 1 presents the groundwater and surface water analytical results from 2012 through 2022.

Hold Times and Sample Handling

The pH analysis conducted at the laboratory and submitted with each sampling event was analyzed past the recommended method holding time (within 15 minutes). As a practical consideration, pH analysis completed at the laboratory (not in the field) will always be outside of recommended hold times. Following standard practices, affected samples were qualified accordingly.

Diesel Range Organics (DRO) and Gasoline Range Organics (GRO) results associated with the 2022 report were analyzed past the recommended method holding times. Affected 2022 samples were

qualified accordingly. The remaining DRO and GRO analyses from 2012-2022 were performed within recommended hold times.

In several cases, samples were received at the laboratory above 6°C; however, the samples arrived within 6 hours of sampling and most arrived on ice. Thus, no qualification was required.

Certain sample containers submitted for GRO analysis contained headspace. GRO sample results associated with headspace were qualified accordingly as estimated values, potentially being biased low (J-).

In a single instance, a sample submitted for Specific Conductance analysis was not filtered within the 24 hours, as specified by the method. The sample result was qualified accordingly as analyzed outside of hold and should be considered an estimated value.

Blanks

Laboratory blanks are a measure of potential contamination introduced in the laboratory, either during the analysis, the preparation work leading to analysis, or storage conditions at the laboratory. All method blanks associated with the data provided were below method detection limits for all target analytes.

Trip blanks were submitted and reviewed as part of each sampling event. Trip blanks represent the potential sample contamination as a part of sample transport conditions and typically used to monitor volatile organic compounds (VOCs). All trip blanks were below method detection limits for all target VOCs (including GRO).

General Precision and Accuracy Observations

Laboratory control sample (LCS) and Laboratory Control Sample Duplicate (LCSD) are samples of analyte-free media spiked with known concentrations of target analytes that are carried through the same sample preparation and analytical procedures. LCS recoveries are used to estimate overall analytical method accuracy independent of sample matrix effects. The calculated Relative Percent Difference (RPD) between the LCS and LCSD is used to assess overall analytical method precision. All LCS/LCSD recoveries and RPD values met acceptance criteria unless otherwise specified.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) samples are two aliquots of a sample to which known quantities of analytes are added (spiked) in the laboratory. The MS and MSD are prepared and analyzed exactly like their original/source sample aliquot. The purpose of the MS and MSD is to quantify the bias and precision caused by the sample matrix. All MS/MSD recoveries and RPD values met acceptance criteria unless otherwise specified.

A laboratory duplicate is a second aliquot of a sample that is treated the same as the original sample to determine the precision of the method. All calculated laboratory duplicate RPD values met acceptance criteria unless otherwise specified.

Surrogate standards are added to each sample for organic analyses (method blanks, spiked samples, project samples, and quality control samples) prior to sample extraction (DRO and GRO). Surrogates are similar to analytes of interest in chemical composition, extraction, and chromatography but are not typically found in environmental samples. Surrogate recoveries are used to evaluate the analytical method efficiency. All surrogate recoveries met acceptance criteria unless otherwise specified.

Analytical reports from 2016 through 2020 had missing quality control results and criteria for the parameters reported. Furthermore, in a single instance, trip blank results were not included in the 2018 report as documented with the sample receipt information. For reports for which neither quality results nor criteria were available, the available data was reviewed.

Analytical reports from 2021 and 2022 had the following quality control criteria missing from the analytical reports: (1) laboratory duplicate criteria for Specific Conductance, Total Alkalinity, and pH analyses, and (2) MS/MSD criteria for EPA 200.7, EPA 200.8, Total Recoverable Phenolics, and EPA 7470A analyses. The quality control results associated with this missing criterion were compared to method requirements and were determined to be acceptable; thus, no qualification was required. Where laboratory control limits were available for review, all met laboratory acceptance criteria except as noted above with respect to recommended hold times associated with various target parameters.

The associated method blank, LCS/LCSD, MS/MSD, sample surrogate, and laboratory duplicate results for the report parameters were reviewed for accuracy and precision. Specific field quality control samples were neither included nor evaluated in the reports.

No exceptions were noted concerning data quality and integrity, except for those mentioned above. All sample results submitted for review are acceptable as reported and qualified, based on the available quality control information provided for review.

Summary of Data Quality Review

It is our opinion that the water-quality analyses are generally acceptable and reliable. Greater care should be exercise in collecting volatile organic samples such as DRO and GRO to ensure that there is no head space in the sample vials. We also recommend that the City require BRI to submit an annual report of sampling and analyses results for review. The report should include a discussion of QA/QC review and time-series plots of analytes in order to determine if there are increasing concentration trends.

Water Quality Trends

Time-series of plots of barium, copper, lead, and zinc concentrations in pond water and monitored wells are presented in Figure 3 through Figure 6. These are naturally occurring metals but are also often associated with spent foundry sand. Barium, copper, and lead have US EPA primary drinking water standards (Maximum Contaminant Limits or "MCLs") based on toxicity profiles. Zinc has only a secondary drinking water standard, based on taste and odor. There have not been any exceedances of MCLs. However, in 2016 and 2017, the laboratory's maximum quantifiable detection limit for lead for

the stormwater pond was 20 µg/L, which is greater than the MCL of 15 µg/L. Similarly, the laboratory's maximum quantifiable detection limit for lead in 2017 was 20 µg/L. It is important to note that lead was not detected in these instances but the laboratory maximum quantitation detection limit was greater than the MCL. Therefore, in the time-series plots, the maximum quantifiable detection limit is plotted although lead was not detected. In the future, laboratory quantification limits should be lower than the MCLs. To date, the data do not show any temporal trends that would suggest increasing concentrations over time.

Question #4:

*The High Volume industrial well that was installed after much public discussion, was agreed that this well would be placed at a depth of approx 600' below grade drawing water from the tunnel city confined aquifer rather than the proposed 183' that would have put this well in the Prairie du Chien-Jordan unconfined aquifer. **PDF Side View elevation of water levels attached, also attached as a PDF is a description of 3 aquifers most impacted***

Barr's Evaluation and Response to Question #4:

The "PDF Side View" referenced appears to be a three-dimensional potentiometric surface map of the Prairie du Chien-Jordan aquifer in Hennepin County, generated using the geostatistical program Surfer®. Without knowing the source (who created it), when it was created, what data were used, etc., it is difficult to say much more about this, except to note that it does not appear to include the Inver Grove Heights area. While it has a scale, it has no north arrow or geographic features to orient oneself.

The pdf "description of 3 aquifers most impacted" is an excerpt from the Metropolitan Council's report on Metro Model 3. Metro Model 3 (initially completed in 2014) is the most up-to-date and comprehensive groundwater flow model of the 11-County metro area. It was developed by Barr for the Metropolitan Council and has undergone extensive peer review by hydrogeologists from state and federal agencies, Dakota County, University of Minnesota, and private consultants. It continues to undergo regular updating and recalibration and is used by or for MPCA, MDNR, Metropolitan Council, USGS, local governments, and consultants to address groundwater and water appropriations issues. The report excerpted was prepared by Barr for the Metropolitan Council.

The question implies that there are three aquifers impacted (presumably by the wash-plant well completed in 2013 and described in our response to Question #2). Barr interprets this question to be a concern that the operation of the wash-plant well is adversely impacting groundwater levels and groundwater flow directions. We used Metro Model 3 to address this concern.

Confined aquifers are under pressure, which means that when a well is drilled into a confined aquifer (but not pumped), the water level in the well rises to an elevation that is above the top of the aquifer. This water level is referred to as "potentiometric head" or "piezometric head." A water-table aquifer is under only atmospheric pressure. When a well is drilled into a water-table aquifer, the water level in the unpumped well is the same as the water level in the aquifer adjacent to the well (i.e., the static

water level elevation measured in the well is the same as the water table). When we refer to a “water-table aquifer,” we are referring to an aquifer in which there is no confining layer. In the metro area, the uppermost aquifer is almost always a water-table aquifer and all aquifers below it are confined aquifers. The Tunnel City-Wonewoc aquifer is confined in the vicinity of the BRI site. All of these aquifers are represented in Metro Model 3.

We assigned a steady-state pumping rate to the wash-plant well in the model simulation. The pumping rate used in the model is the average of the annualized pumping rates reported to the MDNR (2013 through 2021); 29.2 million gallons per year (55 gpm).¹ The model calculates the change in “groundwater levels” (potentiometric heads for all the confined aquifers and aquitards and the water-table elevation for the unconfined aquifer). The change in groundwater levels due to pumping is termed “drawdown.” Drawdown is greatest in the aquifer being pumped (Tunnel City-Wonewoc aquifer) immediately adjacent to the pumping well and decreases logarithmically moving away from the well. Drawdown in a confined aquifer can also induce drawdown in overlying and underlying aquifers by inducing leakage through confining units. When a well ceases pumping, water levels recover (i.e., “rebound”) to pre-pumping conditions. In a confined aquifer (such as the Tunnel City-Wonewoc aquifer), recovery is very rapid—typically measured in hours or days. We used the model to examine these conditions.

Contours of the predicted drawdown in the Tunnel City-Wonewoc aquifer that result from pumping the BRI wash-plant well are shown on Figure 7. The drawdown (i.e., the lowering of the potentiometric surface) in the Tunnel City-Wonewoc aquifer is predicted to be less than about 2 to 4 feet beyond the boundaries of the BRI facility. The nearest water-supply well completed in the Tunnel City-Wonewoc aquifer is located within the Flint Hills Refinery and is predicted to experience a drawdown of less than 0.5 feet due to pumping of the BRI wash-plant well and would not experience any measurable reduction in well yield, given the several hundred feet of available drawdown in the Flint Hills Tunnel City-Wonewoc well.

The model also predicted drawdowns in the overlying Jordan Sandstone, Prairie du Chien Group, and the Quaternary sand-and-gravel aquifer. We do not present contour maps of these drawdowns because there is virtually no predicted drawdown in these aquifers in response to pumping of the BRI wash-plant well (i.e., the drawdowns are so small that there is nothing to contour). This is because the St. Lawrence Formation (which separates the Tunnel City Formation from the Jordan Sandstone, Prairie du Chien Group, and Quaternary sand-and-gravel aquifer) is a regional confining layer with very low permeability. The St. Lawrence Formation essentially prevents the effects of pumping of the BRI wash-plant well from propagating to these shallower aquifers. Nearly all of the wells in this part of Inver Grove Heights are completed in either the Quaternary sand-and-gravel aquifer or in the Prairie

¹ Annual pumping rates range from 19.0 MGY (2015) to 39.3 MGY (2019).

du Chien-Jordan aquifer. The modeling predicts that none of these wells will be affected by pumping of the BRI wash-plant well.

BRI proposes to deepen their mining within the same mine footprint from approximately 840 feet msl to 800 feet msl (a deepening of 40 feet). The water table at the BRI site is about 8 to 15 feet below the proposed 800-foot elevation for the mine pit. The proposed change in mining depth will not change the rate of groundwater recharge to the water table, nor will it not result in pumping or leakage from the water-table aquifer. Therefore, groundwater flow direction in the water-table aquifer and the Prairie du Chien-Jordan aquifer will remain the same after the mine is deepened to 800 feet msl.

The direction of groundwater flow in the water-table aquifer and in most confined aquifers in this part of Dakota County is east, toward the Mississippi River. The Mississippi River is the regional discharge zone for all aquifers, with the exception of the very deep Mt. Simon-Hinckley aquifer. We used Metro Model 3 to simulate the direction and rate (velocity) of groundwater flow in the water-table aquifer originating from beneath the footprint of the BRI site. Groundwater flow directions are shown on Figure 8 for groundwater times-of-travel from the BRI site of 1, 5, 10, and 20 years. A cross-sectional depiction of groundwater flow is shown on Figure 9. Groundwater flows under the Pine Bend/SKB landfill and discharges into the Mississippi River in about 50 years. This flow rate and time-of-travel is for groundwater—not contaminants/solutes. Dissolved solutes, such as metals, flow in water at a much slower rate due to natural attenuation processes. Groundwater from the BRI facility flows eastward, beneath Pine Bend Landfill and discharges into the Mississippi River. Groundwater originating at the BRI facility does not move downward into bedrock aquifers. With the exception of the two Wicker wells (one sealed in 2020 and a new well installed in 2020), we have not identified any residential or water-supply wells along the groundwater flow paths from the BRI facility to the Mississippi River. The Wicker well that was sealed in 2020 had exceedances of the EPA secondary drinking water standard for aluminum and iron in 2019. Aluminum and iron were not analyzed at any other ponds or wells at BRI from 2012 through 2022. No other parameters in the wells or ponds exceeded standards (EPA Maximum Contaminant Level, EPA Secondary Drinking Water Standard, and Minnesota Department of Health, Health-Based Values). It should be noted that EPA Secondary Drinking Water Standards are guidelines for contaminants that may cause cosmetic or aesthetic effects in water such as taste, odor, and color. EPA does not require drinking water systems to comply with secondary standards.

Other parameters (arsenic, calcium, copper, lead, magnesium, manganese, nickel, sodium, and zinc) were detected (but at concentrations below standards) in one or both of the Wicker wells. Six parameters (aluminum, calcium, iron magnesium, manganese, and sodium) were analyzed at one or both of the Wicker wells but were not analyzed at other BRI ponds or wells. Out of all other parameters (arsenic, copper, lead, nickel, and zinc) detected in one or both of Wicker wells only copper was detected at a concentration greater than other BRI ponds or wells.

It is difficult to meaningfully compare water-quality data for the Wicker wells, before and after the April 2020 replacement of the original Wicker well. The replacement Wicker well is approximately 60 feet deeper than the original Wicker well, which means that the two wells likely sample different depths of the sand-and-gravel aquifer. The reasons for replacement of the well are not known. The deeper screen interval of the new Wicker well makes it much less likely to draw and sample water originating from the BRI facility than a shallower well and is therefore more likely to not be affected by water infiltrating to the water table at the BRI facility. The greater depth of the replacement Wicker well provides greater protection for the users of the well with respect to potential groundwater impacts from the BRI facility. However, the Wicker well as it is currently constructed does not provide a reliable monitoring point for water-quality impacts from the BRI facility because it almost certainly does not intersect the likely groundwater flow paths from BRI (the flow paths will be right at the top of the water table and not at the screen depth).

Conclusions and Recommendations

We have attempted to answer the City's questions as best we can, using the most up-to-date tools and data that are available to us. Based on the analyses described in this memorandum, the following conclusions and recommendations are provided.

Conclusions

1. Any moist or discolored soils at the BRI site that have been observed are not the result of intersecting or otherwise contacting the water table. Currently, the water table is about 50-65 feet below the floor of the mine pit. There will be less separation between the ultimate floor of the mine pit and the water table at full depth but at the proposed full depth there will still be 8-15 feet of separation between the pit floor and the water table.
2. None of the water-quality data that have been collected show that primary drinking water standards have been exceeded for constituents analyzed. Furthermore, there are no indications of increasing trends. Temporal variability in water-quality parameter data is typical for naturally occurring concentrations. Data quality standards for analytes have generally been met.
3. Based on the analytical data review, we believe there is a need for a more formal submittal of data to the City on an annual basis. Water-quality data review needs to be conducted annually that includes not only laboratory procedures but sampling procedures and sample handling.
4. In 2012, the City required that BRI's wash-plant well be completed in the Tunnel City-Wonewoc aquifer to ensure that existing groundwater users would not be adversely impacted. Our analyses shows that no well users are being affected by the operation of this well. The drawdown effects from the well are localized within the Tunnel City-Wonewoc aquifer and do not extend into the Prairie du Chien-Jordan aquifer nor the water-table aquifer.

5. Groundwater flow direction is naturally eastward toward the Mississippi River. Groundwater flow directions and rates in the water-table aquifer are unaffected by pumping of the BRI wash-plant well and water infiltrating within the footprint of the BRI facility is not moving downward into bedrock aquifers. Deepening mining from current depths to an elevation of 800 feet msl will not affect the rate or direction of groundwater flow. Groundwater originating at the BRI facility flows eastward underneath Pine Bend Landfill and discharges into the Mississippi River after approximately 20 years. With the exception of the Wicker well installed in 2020, we have not identified any groundwater users between the BRI facility and the Mississippi River.

Recommendations

1. Barr recommends that BRI submit an annual report to the City that includes water-quality and water-use data for the reporting year, as well as previously collected data. A QA/QC review of water-quality data should be included. We also recommend requiring the inclusion of time-series graphs of monitored parameters (referenced to applicable standards). Quantitative detection limits must be well-below any applicable standards. We also recommend that the City require BRI to perform an assessment of suitability and reliability of current groundwater monitoring wells and make recommendations for replacement or additions of wells.
2. We recommend that an annual report be submitted to the City that includes time-series trend analyses, QA/QC review, a summary of operations (including pumping records), and water-level data. This report should not simply be a “data dump” but include analyses and explanations of data trends.
3. The City’s CUP contains requirements for soil backfilling. For soil backfill material, Barr recommends only non-organic, compactable soil material be used that is free of contamination, recycled or salvaged aggregate, asphaltic pavement, crushed concrete, scraps of shingles, debris, rubbish, frozen soil, boulders over 1 inch in diameter, logs, wood chips or other objectionable material. Backfill soil should be free of stumps, roots, and branches over 1.5 inches in diameter. Backfill soils should not be placed over frozen subgrade.

Contaminated soil should not be used as fill or brought to the site. If the source of imported fill will be from a location where soil contamination is known, suspected, or can be expected (e.g., soils from gas stations, certain industrial sites, etc.), that soil should not be used for backfilling. Therefore, it is further recommended that offsite backfill soil come from only BRI projects and include a manifest from each site indicating that no contaminants are suspected to be in the soil material. A copy of the manifest could be submitted to the City.

4. Barr recommends that BRI review and amend the SPCC Plan as appropriate and submit a copy to the City. The SPCC Plan should document practices, personnel, equipment, and resources available to prevent a spill and what actions to take if a spill were to occur.

5. The Wicker well installed in April 2020 is a deeper well than the sealed Wicker well and is completed in the sand-and-gravel aquifer that likely provides added protection against the likelihood that the water quality of this well will be impacted by water originating as infiltration across the BRI facility. However, the new Wicker well should no longer be used as an indicator of downgradient water quality from the BRI facility because this well is now too deep to intersect groundwater flow paths from BRI. This well can continue to be sampled but the water-quality data from the well should not be used as an early indicator of groundwater impacts from the BRI facility. If the City wishes to have a well to provide early detection of groundwater impacts from BRI at this central location, a monitoring well with a well screen intersecting the water table should be installed.
6. Periodically sample all BRI wells and ponds for metals commonly associated with foundry sand including arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, copper, nickel, and zinc.
7. Prepare a Sampling and Analysis Plan using Minnesota Pollution Control Agency guidance that would include sample parameters, sample schedule and requirements for purging wells to stabilize prior to sampling, and field filtering of samples if appropriate.

To: Ally Sutherland and Allan Hunting
From: Ray Wuolo, P.E., P.G., Samantha Schirmer, and Jeff Ubl, P.E.
Subject: Bituminous Roadways, Inc. (BRI) – Environmental Review of Proposed Expansion
Date: February 28, 2023
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Table

Table 1
2012-2022 Water Analytical Results
Bituminous Roadways, Inc.
Inver Grove Heights, MN

						Location Date	Epond 5/14/2012	Plan Well 5/16/2013	Plan Well 10/16/2015	Plan Well 6/18/2019	Plan Well 8/3/2021	Rainbow Well 5/21/2012
Parameter	Analytical Method	Units	EPA Maximum Contaminant Levels	EPA Secondary Drinking Water Standards	MDH Human Health- Based Water Guidance Table							
Last Updated			03/01/2018	03/01/2018	03/24/2022							
Exceedance Key			No Exceedances	Bold	No Exceedances							
Alkalinity, total, as CaCO3	SM 2320B	ug/l				56000	270000	275000	254000	249000	260000	
pH	SM 4500-H+B	pH units		6.5 - 8.5		7.54 H	6.98 H	7.5 H	7.8 H	8.0 H	7.29 H	
Solids, total suspended	USGS-I-3765-85	ug/l				--	--	--	--	--	--	--
Specific conductance @ 25 °C	SM 2510 B	umhos/cm				--	--	--	642	615	--	--
Specific conductance @ 25 °C	EPA 120.1	umhos/cm				140	670	665	--	--	690	
Total Metals												
Aluminum	EPA 200.8	ug/l		50 (1)		--	--	--	--	--	--	--
Antimony	EPA 200.8	ug/l	6		6 HRL93	--	--	--	--	--	--	--
Arsenic	EPA 200.7	ug/l	10			--	--	< 20.0 U	--	--	--	--
Arsenic	EPA 200.8	ug/l	10			--	--	--	< 1.5 U	< 0.50 U	--	--
Arsenic	EPA 6010C	ug/l	10			< 20 U	< 20 U	--	--	--	< 20 U	--
Barium	EPA 200.7	ug/l	2000		2000 HRL93	--	--	75.3	77.9	68.3	--	--
Barium	EPA 6010C	ug/l	2000		2000 HRL93	73	80	--	--	--	71	--
Beryllium	EPA 200.8	ug/l	4		0.08 HRL93	--	--	--	--	--	--	--
Cadmium	EPA 200.7	ug/l	5		0.5 HRL15 (1)	--	--	< 3.0 U	--	--	--	--
Cadmium	EPA 200.8	ug/l	5		0.5 HRL15 (1)	--	--	--	< 0.30 U	< 0.080 U	--	--
Cadmium	EPA 6010C	ug/l	5		0.5 HRL15 (1)	< 2.0 U	< 2.0 U	--	--	--	< 2.0 U	--
Calcium	EPA 200.8	ug/l				--	--	--	--	--	--	--
Chromium	EPA 200.7	ug/l	100		100 CR HRL93	--	--	< 10.0 U	< 10.0 U	< 10.0 U	--	--
Chromium	EPA 200.8	ug/l	100		100 CR HRL93	--	--	--	--	--	--	--
Chromium	EPA 6010C	ug/l	100		100 CR HRL93	13	< 5.0 U	--	--	--	< 5.0 U	--
Cobalt	EPA 200.8	ug/l				--	--	--	--	--	--	--
Copper	EPA 200.7	ug/l	1300 TT(12)	1000		--	--	84.9	13.9	18.4	--	--
Copper	EPA 200.8	ug/l	1300 TT(12)	1000		--	--	--	--	--	--	--
Copper	EPA 6010C	ug/l	1300 TT(12)	1000		15	12	--	--	--	< 10 U	--
Iron	EPA 200.8	ug/l		300		--	--	--	--	--	--	--
Lead	EPA 200.7	ug/l	15 TT(12)			--	--	< 10.0 U	--	--	--	--
Lead	EPA 200.8	ug/l	15 TT(12)			--	--	--	< 0.50 U	0.3	--	--
Lead	EPA 6010C	ug/l	15 TT(12)			10	< 10 U	--	--	--	< 10 U	--
Magnesium	EPA 200.8	ug/l				--	--	--	--	--	--	--
Manganese	EPA 200.8	ug/l		50	100 HBV20	--	--	--	--	--	--	--
Mercury	EPA 245.1	ug/l	2			--	--	< 0.20 U	--	--	--	--
Mercury	EPA 7470A	ug/l	2			< 0.20 U	< 0.20 U	--	< 0.10 U	< 0.20 U	< 0.20 U	--
Nickel	EPA 200.7	ug/l			100 HRL93	--	--	< 20.0 U	13.6	< 20.0 U	--	--
Nickel	EPA 200.8	ug/l			100 HRL93	--	--	--	--	--	--	--
Nickel	EPA 6010C	ug/l			100 HRL93	9.5	< 5.0 U	--	--	--	< 5.0 U	--

Table 1
2012-2022 Water Analytical Results
Bituminous Roadways, Inc.
Inver Grove Heights, MN

						Location Date	Epond 5/14/2012	Plan Well 5/16/2013	Plan Well 10/16/2015	Plan Well 6/18/2019	Plan Well 8/3/2021	Rainbow Well 5/21/2012
Parameter	Analytical Method	Units	EPA Maximum Contaminant Levels	EPA Secondary Drinking Water Standards	MDH Human Health- Based Water Guidance Table							
Last Updated			03/01/2018	03/01/2018	03/24/2022							
Exceedance Key			No Exceedances	Bold	No Exceedances							
Phenol	EPA 420.4	ug/l			4000 HRL93	--	--	< 10.0 U	--	--	--	--
Phenolics	EPA 420.1	ug/l				--	--	--	< 60.0 U	< 60.0 U	--	--
Phenolics	EPA 420.4	ug/l				< 10 U	< 10 U	--	--	--	< 10 U	--
Selenium	EPA 200.7	ug/l	50		30 HRL93	--	--	--	--	--	--	--
Selenium	EPA 200.8	ug/l	50		30 HRL93	--	--	--	--	--	--	--
Selenium	EPA 6010C	ug/l	50		30 HRL93	< 20 U	< 20 U	--	--	--	< 20 U	--
Silver	EPA 200.7	ug/l		100	30 HRL93	--	--	< 10.0 U	--	--	--	--
Silver	EPA 200.8	ug/l		100	30 HRL93	--	--	--	< 0.20 U	< 0.50 U	--	--
Silver	EPA 6010C	ug/l		100	30 HRL93	< 5.0 U	< 5.0 U	--	--	--	< 5.0 U	--
Sodium	EPA 200.8	ug/l				--	--	--	--	--	--	--
Thallium	EPA 200.8	ug/l	2		0.6 HRL94	--	--	--	--	--	--	--
Zinc	EPA 200.7	ug/l		5000	2000 HRL94	--	--	399	178	275	--	--
Zinc	EPA 200.8	ug/l		5000	2000 HRL94	--	--	--	--	--	--	--
Zinc	EPA 6010C	ug/l		5000	2000 HRL94	30	120	--	--	--	75	--
Total Petroleum Hydrocarbons												
Diesel Range Organics, C10-C28	WI DRO/WI DRO Modified	ug/l				580	< 100 U	< 130 U	< 100 U	< 100 U	220	--
Gasoline Range Organics, C6-C10	WI GRO/WI GRO Modified	ug/l				< 100 U	< 100 U	< 100 U	< 100 UJ-	< 100 U	< 100 U	--

Table 1
2012-2022 Water Analytical Results
Bituminous Roadways, Inc.
Inver Grove Heights, MN

Parameter	Analytical Method	Units	EPA Maximum Contaminant Levels	EPA Secondary Drinking Water Standards	MDH Human Health-Based Water Guidance Table	Location	Rainbow Well	Rainbow Well	Rainbow Well	Rainbow Well	Rainbow Well	Stormwater Pond
						Date	6/20/2014	10/5/2016	7/16/2018	6/1/2020	5/17/2022	10/5/2016
Last Updated			03/01/2018	03/01/2018	03/24/2022							
Exceedance Key			No Exceedances	Bold	No Exceedances							
Alkalinity, total, as CaCO3	SM 2320B	ug/l					260000	251000	269000	258000	260000	66600
pH	SM 4500-H+B	pH units		6.5 - 8.5			7.09 H	7.7 H	7.9 H	7.8 H	7.8 H	8.0 H
Solids, total suspended	USGS-I-3765-85	ug/l					--	--	--	--	--	52000
Specific conductance @ 25 °C	SM 2510 B	umhos/cm					--	628	--	642	642	213
Specific conductance @ 25 °C	EPA 120.1	umhos/cm					620	--	632 H	--	--	--
Total Metals												
Aluminum	EPA 200.8	ug/l		50 (1)			--	--	--	--	--	--
Antimony	EPA 200.8	ug/l	6		6 HRL93		--	--	--	--	--	--
Arsenic	EPA 200.7	ug/l	10				< 20 U	< 25.0 U	--	--	--	< 25.0 U
Arsenic	EPA 200.8	ug/l	10				--	--	< 1.0 U	1.5	0.79	--
Arsenic	EPA 6010C	ug/l	10				--	--	--	--	--	--
Barium	EPA 200.7	ug/l	2000		2000 HRL93		64	61.5	68.6	69.2	65.8	52.8
Barium	EPA 6010C	ug/l	2000		2000 HRL93		--	--	--	--	--	--
Beryllium	EPA 200.8	ug/l	4		0.08 HRL93		--	--	--	--	--	--
Cadmium	EPA 200.7	ug/l	5		0.5 HRL15 (1)		< 2.0 U	< 20.0 U	--	--	--	< 20.0 U
Cadmium	EPA 200.8	ug/l	5		0.5 HRL15 (1)		--	--	< 0.20 U	< 0.20 U	< 0.080 U	--
Cadmium	EPA 6010C	ug/l	5		0.5 HRL15 (1)		--	--	--	--	--	--
Calcium	EPA 200.8	ug/l					--	--	--	--	--	--
Chromium	EPA 200.7	ug/l	100		100 CR HRL93		< 5.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Chromium	EPA 200.8	ug/l	100		100 CR HRL93		--	--	--	--	--	--
Chromium	EPA 6010C	ug/l	100		100 CR HRL93		--	--	--	--	--	--
Cobalt	EPA 200.8	ug/l					--	--	--	--	--	--
Copper	EPA 200.7	ug/l	1300 TT(12)	1000			< 10 U	< 10.0 U	96.8	26.6	15.3	< 10.0 U
Copper	EPA 200.8	ug/l	1300 TT(12)	1000			--	--	--	--	--	--
Copper	EPA 6010C	ug/l	1300 TT(12)	1000			--	--	--	--	--	--
Iron	EPA 200.8	ug/l		300			--	--	--	--	--	--
Lead	EPA 200.7	ug/l	15 TT(12)				< 10 U	< 20.0 U	--	--	--	< 20.0 U
Lead	EPA 200.8	ug/l	15 TT(12)				--	--	13.8	1.5	< 0.50 U	--
Lead	EPA 6010C	ug/l	15 TT(12)				--	--	--	--	--	--
Magnesium	EPA 200.8	ug/l					--	--	--	--	--	--
Manganese	EPA 200.8	ug/l		50	100 HBV20		--	--	--	--	--	--
Mercury	EPA 245.1	ug/l	2				< 0.20 U	--	< 0.11 U	--	--	--
Mercury	EPA 7470A	ug/l	2				--	--	--	< 0.10 U	< 0.20 U	--
Nickel	EPA 200.7	ug/l			100 HRL93		< 5.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 20.0 U	< 10.0 U
Nickel	EPA 200.8	ug/l			100 HRL93		--	--	--	--	--	--
Nickel	EPA 6010C	ug/l			100 HRL93		--	--	--	--	--	--

Table 1
2012-2022 Water Analytical Results
Bituminous Roadways, Inc.
Inver Grove Heights, MN

Location Date						Rainbow Well 6/20/2014	Rainbow Well 10/5/2016	Rainbow Well 7/16/2018	Rainbow Well 6/1/2020	Rainbow Well 5/17/2022	Stormwater Pond 10/5/2016
Parameter	Analytical Method	Units	EPA Maximum Contaminant Levels	EPA Secondary Drinking Water Standards	MDH Human Health- Based Water Guidance Table						
Last Updated			03/01/2018	03/01/2018	03/24/2022						
Exceedance Key			No Exceedances	Bold	No Exceedances						
Phenol	EPA 420.4	ug/l			4000 HRL93	--	< 10.0 U	--	--	--	< 10.0 U
Phenolics	EPA 420.1	ug/l				--	--	< 60.0 U	< 60.0 U	< 60.0 U	--
Phenolics	EPA 420.4	ug/l				< 10 U	--	--	--	--	--
Selenium	EPA 200.7	ug/l	50		30 HRL93	< 20 U	--	--	--	--	--
Selenium	EPA 200.8	ug/l	50		30 HRL93	--	--	--	--	--	--
Selenium	EPA 6010C	ug/l	50		30 HRL93	--	--	--	--	--	--
Silver	EPA 200.7	ug/l		100	30 HRL93	< 5.0 U	< 10.0 U	--	--	--	< 10.0 U
Silver	EPA 200.8	ug/l		100	30 HRL93	--	--	< 0.20 U	< 0.20 U	< 0.50 U	--
Silver	EPA 6010C	ug/l		100	30 HRL93	--	--	--	--	--	--
Sodium	EPA 200.8	ug/l				--	--	--	--	--	--
Thallium	EPA 200.8	ug/l	2		0.6 HRL94	--	--	--	--	--	--
Zinc	EPA 200.7	ug/l		5000	2000 HRL94	180	132	730	994	336	< 20.0 U
Zinc	EPA 200.8	ug/l		5000	2000 HRL94	--	--	--	--	--	--
Zinc	EPA 6010C	ug/l		5000	2000 HRL94	--	--	--	--	--	--
Total Petroleum Hydrocarbons											
Diesel Range Organics, C10-C28	WI DRO/WI DRO Modified	ug/l				< 100 U	< 110 U	< 120 U	< 94 U	< 100 UH	330
Gasoline Range Organics, C6-C10	WI GRO/WI GRO Modified	ug/l				< 100 UJ-	< 100 UJ-	< 100 UJ-	< 100 U	< 100 UH	< 100 UJ-

Table 1
2012-2022 Water Analytical Results
Bituminous Roadways, Inc.
Inver Grove Heights, MN

Parameter	Analytical Method	Units	EPA Maximum Contaminant Levels	EPA Secondary Drinking Water Standards	MDH Human Health-Based Water Guidance Table	Location	Stormwater Pond	Stormwater Pond	Stormwater Pond	Wash Plant Pond	Wash Plant Pond	Wash Plant Pond
						Date	10/23/2017	6/18/2019	8/3/2021	6/20/2014	7/16/2018	6/1/2020
Last Updated			03/01/2018	03/01/2018	03/24/2022							
Exceedance Key			No Exceedances	Bold	No Exceedances							
Alkalinity, total, as CaCO3	SM 2320B	ug/l					92900	66000	56200	88000	105000	124000
pH	SM 4500-H+B	pH units		6.5 - 8.5			8.1 H	8.3 H	10.0 H	7.73 H	8.6 H	8.5 H
Solids, total suspended	USGS-I-3765-85	ug/l					--	--	--	--	--	--
Specific conductance @ 25 °C	SM 2510 B	umhos/cm					205	271	166	--	--	315
Specific conductance @ 25 °C	EPA 120.1	umhos/cm					--	--	--	190	273 H	--
Total Metals												
Aluminum	EPA 200.8	ug/l		50 (1)			--	--	--	--	--	--
Antimony	EPA 200.8	ug/l	6		6 HRL93		--	--	--	--	--	--
Arsenic	EPA 200.7	ug/l	10				< 50.0 U	--	--	< 20 U	--	--
Arsenic	EPA 200.8	ug/l	10				--	< 1.5 U	5.9	--	< 1.0 U	< 1.0 U
Arsenic	EPA 6010C	ug/l	10				--	--	--	--	--	--
Barium	EPA 200.7	ug/l	2000		2000 HRL93		49.2	27.2	25.2	33	30.4	35
Barium	EPA 6010C	ug/l	2000		2000 HRL93		--	--	--	--	--	--
Beryllium	EPA 200.8	ug/l	4		0.08 HRL93		--	--	--	--	--	--
Cadmium	EPA 200.7	ug/l	5		0.5 HRL15 (1)		< 20.0 U	--	--	< 2.0 U	--	--
Cadmium	EPA 200.8	ug/l	5		0.5 HRL15 (1)		--	< 0.30 U	< 0.080 U	--	< 0.20 U	< 0.20 U
Cadmium	EPA 6010C	ug/l	5		0.5 HRL15 (1)		--	--	--	--	--	--
Calcium	EPA 200.8	ug/l					--	--	--	--	--	--
Chromium	EPA 200.7	ug/l	100		100 CR HRL93		< 10.0 U	< 10.0 U	< 10.0 U	< 5.0 U	< 10.0 U	< 10.0 U
Chromium	EPA 200.8	ug/l	100		100 CR HRL93		--	--	--	--	--	--
Chromium	EPA 6010C	ug/l	100		100 CR HRL93		--	--	--	--	--	--
Cobalt	EPA 200.8	ug/l					--	--	--	--	--	--
Copper	EPA 200.7	ug/l	1300 TT(12)	1000			< 10.0 U	< 10.0 U	< 10.0 U	< 10 U	< 10.0 U	< 10.0 U
Copper	EPA 200.8	ug/l	1300 TT(12)	1000			--	--	--	--	--	--
Copper	EPA 6010C	ug/l	1300 TT(12)	1000			--	--	--	--	--	--
Iron	EPA 200.8	ug/l		300			--	--	--	--	--	--
Lead	EPA 200.7	ug/l	15 TT(12)				< 20.0 U	--	--	< 10 U	--	--
Lead	EPA 200.8	ug/l	15 TT(12)				--	< 0.50 U	0.25	--	0.67	< 0.50 U
Lead	EPA 6010C	ug/l	15 TT(12)				--	--	--	--	--	--
Magnesium	EPA 200.8	ug/l					--	--	--	--	--	--
Manganese	EPA 200.8	ug/l		50	100 HBV20		--	--	--	--	--	--
Mercury	EPA 245.1	ug/l	2				< 0.20 U	--	--	< 0.20 U	< 0.11 U	--
Mercury	EPA 7470A	ug/l	2				--	< 0.10 U	< 0.20 U	--	--	< 0.10 U
Nickel	EPA 200.7	ug/l			100 HRL93		< 10.0 U	< 10.0 U	< 20.0 U	< 5.0 U	< 10.0 U	< 10.0 U
Nickel	EPA 200.8	ug/l			100 HRL93		--	--	--	--	--	--
Nickel	EPA 6010C	ug/l			100 HRL93		--	--	--	--	--	--

Table 1
2012-2022 Water Analytical Results
Bituminous Roadways, Inc.
Inver Grove Heights, MN

						Stormwater Pond 10/23/2017	Stormwater Pond 6/18/2019	Stormwater Pond 8/3/2021	Wash Plant Pond 6/20/2014	Wash Plant Pond 7/16/2018	Wash Plant Pond 6/1/2020
Parameter	Analytical Method	Units	EPA Maximum Contaminant Levels	EPA Secondary Drinking Water Standards	MDH Human Health- Based Water Guidance Table						
Last Updated			03/01/2018	03/01/2018	03/24/2022						
Exceedance Key			No Exceedances	Bold	No Exceedances						
Phenol	EPA 420.4	ug/l			4000 HRL93	--	--	--	--	--	--
Phenolics	EPA 420.1	ug/l				< 60.0 U	< 60.0 U	< 60.0 U	--	< 60.0 U	< 60.0 U
Phenolics	EPA 420.4	ug/l				--	--	--	< 10 U	--	--
Selenium	EPA 200.7	ug/l	50		30 HRL93	--	--	--	< 20 U	--	--
Selenium	EPA 200.8	ug/l	50		30 HRL93	--	--	--	--	--	--
Selenium	EPA 6010C	ug/l	50		30 HRL93	--	--	--	--	--	--
Silver	EPA 200.7	ug/l		100	30 HRL93	< 10.0 U	--	--	< 5.0 U	--	--
Silver	EPA 200.8	ug/l		100	30 HRL93	--	< 0.20 U	< 0.50 U	--	< 0.20 U	< 0.20 U
Silver	EPA 6010C	ug/l		100	30 HRL93	--	--	--	--	--	--
Sodium	EPA 200.8	ug/l				--	--	--	--	--	--
Thallium	EPA 200.8	ug/l	2		0.6 HRL94	--	--	--	--	--	--
Zinc	EPA 200.7	ug/l		5000	2000 HRL94	< 20.0 U	< 20.0 U	< 20.0 U	< 20 U	< 20.0 U	< 20.0 U
Zinc	EPA 200.8	ug/l		5000	2000 HRL94	--	--	--	--	--	--
Zinc	EPA 6010C	ug/l		5000	2000 HRL94	--	--	--	--	--	--
Total Petroleum Hydrocarbons											
Diesel Range Organics, C10-C28	WI DRO/WI DRO Modified	ug/l				180	630	260	500	320	98
Gasoline Range Organics, C6-C10	WI GRO/WI GRO Modified	ug/l				< 50.0 UJ-	< 100 UJ-	< 100 U	< 100 U	< 100 UJ-	< 100 U

Table 1
2012-2022 Water Analytical Results
Bituminous Roadways, Inc.
Inver Grove Heights, MN

Parameter	Analytical Method	Units	EPA Maximum Contaminant Levels	EPA Secondary Drinking Water Standards	MDH Human Health-Based Water Guidance Table	Location	Wash Plant	Wicker	Wicker	Wicker	Wicker	Wpond
						Date	Pond	Well (Well ID 435227)	Well (Well ID 435227)	Well (Well ID 435227)	Well (Well ID 847817)	
						5/17/2022	5/16/2013	10/16/2015	6/18/2019	8/3/2021	5/14/2012	
Last Updated			03/01/2018	03/01/2018	03/24/2022							
Exceedance Key			No Exceedances	Bold	No Exceedances							
Alkalinity, total, as CaCO3	SM 2320B	ug/l				168000	270000	275000	276000	260000	60000	
pH	SM 4500-H+B	pH units		6.5 - 8.5		8.3 H	7.81 H	7.8 H	7.8 H	8.2 H	8.29 H	
Solids, total suspended	USGS-I-3765-85	ug/l				--	--	--	--	--	--	
Specific conductance @ 25 °C	SM 2510 B	umhos/cm				390	--	--	676	626	--	
Specific conductance @ 25 °C	EPA 120.1	umhos/cm				--	640	644	--	--	120	
Total Metals												
Aluminum	EPA 200.8	ug/l		50 (1)		--	--	--	64.6	--	--	
Antimony	EPA 200.8	ug/l	6		6 HRL93	--	--	--	< 0.50 U	--	--	
Arsenic	EPA 200.7	ug/l	10			--	--	< 20.0 U	--	--	--	
Arsenic	EPA 200.8	ug/l	10			0.68	--	--	< 1.5 U	1.2	--	
Arsenic	EPA 6010C	ug/l	10			--	< 20 U	--	--	--	< 20 U	
Barium	EPA 200.7	ug/l	2000		2000 HRL93	47.4	--	< 10.0 U	< 10.0 U	< 10.0 U	--	
Barium	EPA 6010C	ug/l	2000		2000 HRL93	--	< 10 U	--	--	--	130	
Beryllium	EPA 200.8	ug/l	4		0.08 HRL93	--	--	--	< 0.20 U	--	--	
Cadmium	EPA 200.7	ug/l	5		0.5 HRL15 (1)	--	--	< 3.0 U	--	--	--	
Cadmium	EPA 200.8	ug/l	5		0.5 HRL15 (1)	< 0.080 U	--	--	< 0.30 U	< 0.080 U	--	
Cadmium	EPA 6010C	ug/l	5		0.5 HRL15 (1)	--	< 2.0 U	--	--	--	< 2.0 U	
Calcium	EPA 200.8	ug/l				--	--	--	223	--	--	
Chromium	EPA 200.7	ug/l	100		100 CR HRL93	< 10.0 U	--	< 10.0 U	< 10.0 U	< 10.0 U	--	
Chromium	EPA 200.8	ug/l	100		100 CR HRL93	--	--	--	< 1.5 U	--	--	
Chromium	EPA 6010C	ug/l	100		100 CR HRL93	--	< 5.0 U	--	--	--	33	
Cobalt	EPA 200.8	ug/l				--	--	--	< 0.20 U	--	--	
Copper	EPA 200.7	ug/l	1300 TT(12)	1000		< 10.0 U	--	31.5	226	< 10.0 U	--	
Copper	EPA 200.8	ug/l	1300 TT(12)	1000		--	--	--	225	--	--	
Copper	EPA 6010C	ug/l	1300 TT(12)	1000		--	< 10 U	--	--	--	22	
Iron	EPA 200.8	ug/l		300		--	--	--	313	--	--	
Lead	EPA 200.7	ug/l	15 TT(12)			--	--	< 10.0 U	--	--	--	
Lead	EPA 200.8	ug/l	15 TT(12)			< 0.50 U	--	--	3	0.13	--	
Lead	EPA 6010C	ug/l	15 TT(12)			--	< 10 U	--	--	--	12	
Magnesium	EPA 200.8	ug/l				--	--	--	109	--	--	
Manganese	EPA 200.8	ug/l		50	100 HBV20	--	--	--	2.6	--	--	
Mercury	EPA 245.1	ug/l	2			--	--	< 0.20 U	--	--	--	
Mercury	EPA 7470A	ug/l	2			< 0.20 U	< 0.20 U	--	< 0.10 U	< 0.20 U	< 0.20 U	
Nickel	EPA 200.7	ug/l			100 HRL93	< 20.0 U	--	< 20.0 U	< 10.0 U	< 20.0 U	--	
Nickel	EPA 200.8	ug/l			100 HRL93	--	--	--	0.88	--	--	
Nickel	EPA 6010C	ug/l			100 HRL93	--	< 5.0 U	--	--	--	19	

Table 1
2012-2022 Water Analytical Results
Bituminous Roadways, Inc.
Inver Grove Heights, MN

						Location Date	Wash Plant Pond 5/17/2022	Wicker Well (Well ID 435227) 5/16/2013	Wicker Well (Well ID 435227) 10/16/2015	Wicker Well (Well ID 435227) 6/18/2019	Wicker Well (Well ID 847817) 8/3/2021	Wpond 5/14/2012
Parameter	Analytical Method	Units	EPA Maximum Contaminant Levels	EPA Secondary Drinking Water Standards	MDH Human Health- Based Water Guidance Table							
Last Updated			03/01/2018	03/01/2018	03/24/2022							
Exceedance Key			No Exceedances	Bold	No Exceedances							
Phenol	EPA 420.4	ug/l			4000 HRL93	--	--	< 10.0 U	--	--	--	--
Phenolics	EPA 420.1	ug/l				< 60.0 U	--	--	< 60.0 U	< 60.0 U	--	--
Phenolics	EPA 420.4	ug/l				--	11	--	--	--	< 10 U	--
Selenium	EPA 200.7	ug/l	50		30 HRL93	--	--	--	--	--	--	--
Selenium	EPA 200.8	ug/l	50		30 HRL93	--	--	--	< 1.0 U	--	--	--
Selenium	EPA 6010C	ug/l	50		30 HRL93	--	< 20 U	--	--	--	< 20 U	--
Silver	EPA 200.7	ug/l		100	30 HRL93	--	--	< 10.0 U	--	--	--	--
Silver	EPA 200.8	ug/l		100	30 HRL93	< 0.50 U	--	--	< 0.20 U	< 0.50 U	--	--
Silver	EPA 6010C	ug/l		100	30 HRL93	--	< 5.0 U	--	--	--	< 5.0 U	--
Sodium	EPA 200.8	ug/l				--	--	--	169000	--	--	--
Thallium	EPA 200.8	ug/l	2		0.6 HRL94	--	--	--	< 0.020 U	--	--	--
Zinc	EPA 200.7	ug/l		5000	2000 HRL94	< 20.0 U	--	238	416	< 20.0 U	--	--
Zinc	EPA 200.8	ug/l		5000	2000 HRL94	--	--	--	377	--	--	--
Zinc	EPA 6010C	ug/l		5000	2000 HRL94	--	43	--	--	--	--	40
Total Petroleum Hydrocarbons												
Diesel Range Organics, C10-C28	WI DRO/WI DRO Modified	ug/l				140 H	< 100 U	< 120 U	< 100 U	< 100 U	120	
Gasoline Range Organics, C6-C10	WI GRO/WI GRO Modified	ug/l				< 100 UH	< 100 UJ-	< 100 U	< 100 UJ-	< 100 U	< 100 U	

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Not analyzed/Not available.
H	Recommended sample preservation, extraction or analysis holding time was exceeded.
U	The analyte was analyzed for, but was not detected.
J-	The result is an estimated quantity and may be biased low.

EPA Maximum Contaminant Levels

(12)	Copper action level 1.3 mg/l; lead action level 0.015 mg/l.
TT	Treatment technique.

EPA Secondary Drinking Water Standards

(1)	The guidance provides a range for Aluminum as 0.05 to 0.2 mg/l.
-----	---

MDH Human Health-Based Water Guidance Table

(1)	Value is representative of the lowest exposure duration published in the Minnesota Department of Health Human Health Advisory Table.
CR	Value represents the criteria for Chromium, hexavalent
HBV20	Health Based Value 2020.
HRL15	Health Risk Limit 2015.
HRL93	Health Risk Limit 1993.
HRL94	Health Risk Limit 1994.

To: Ally Sutherland and Allan Hunting
From: Ray Wuolo, P.E., P.G., Samantha Schirmer, and Jeff Ubl, P.E.
Subject: Bituminous Roadways, Inc. (BRI) – Environmental Review of Proposed Expansion
Date: February 28, 2023
Page: 23

Figures

To: Ally Sutherland and Allan Hunting
From: Ray Wuolo, P.E., P.G., Samantha Schirmer, and Jeff Ubl, P.E.
Subject: Bituminous Roadways, Inc. (BRI) – Environmental Review of Proposed Expansion
Date: February 28, 2023
Page: 24



Figure 1 Photograph of possible wet soil provided by Planning Commission

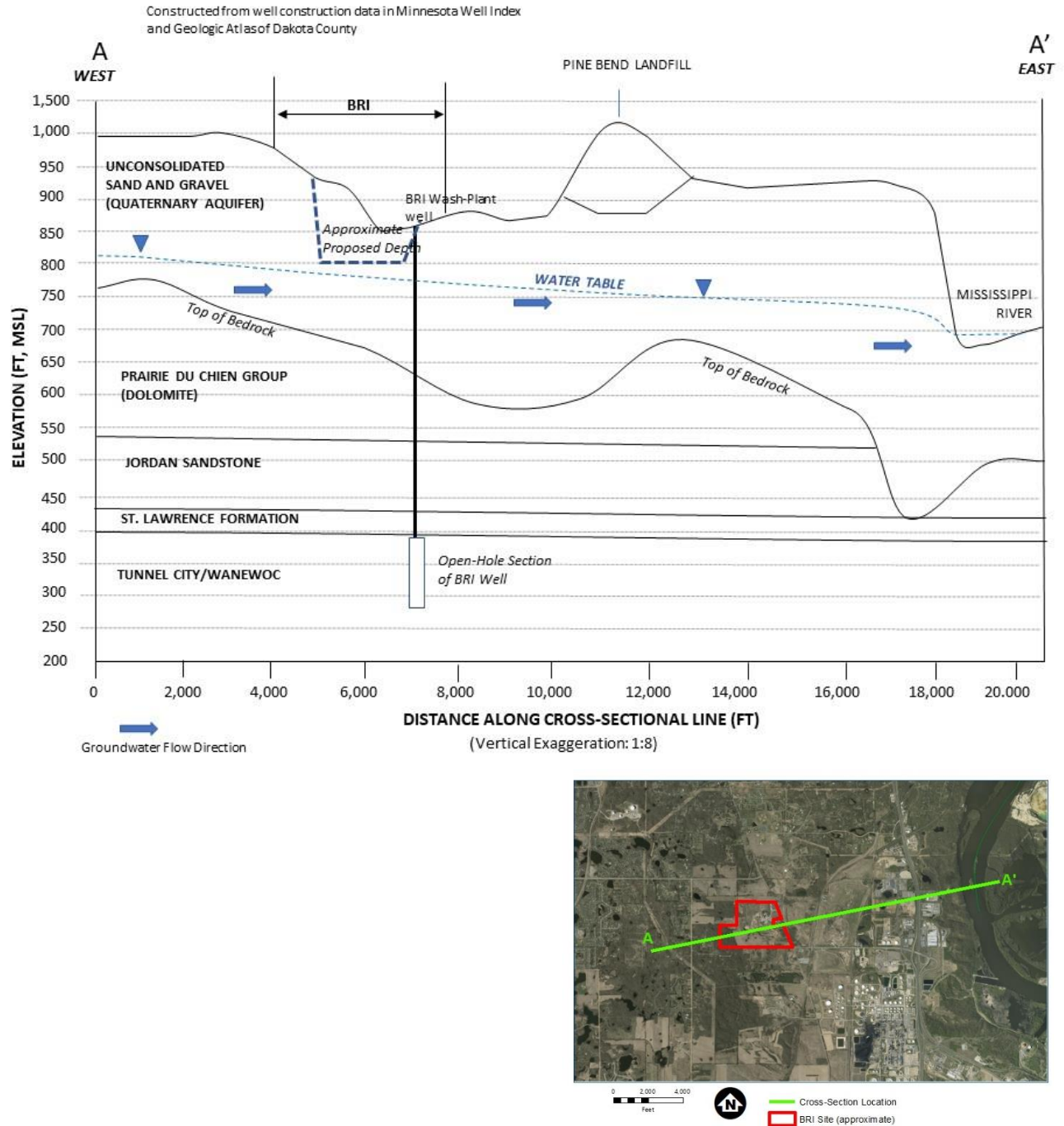
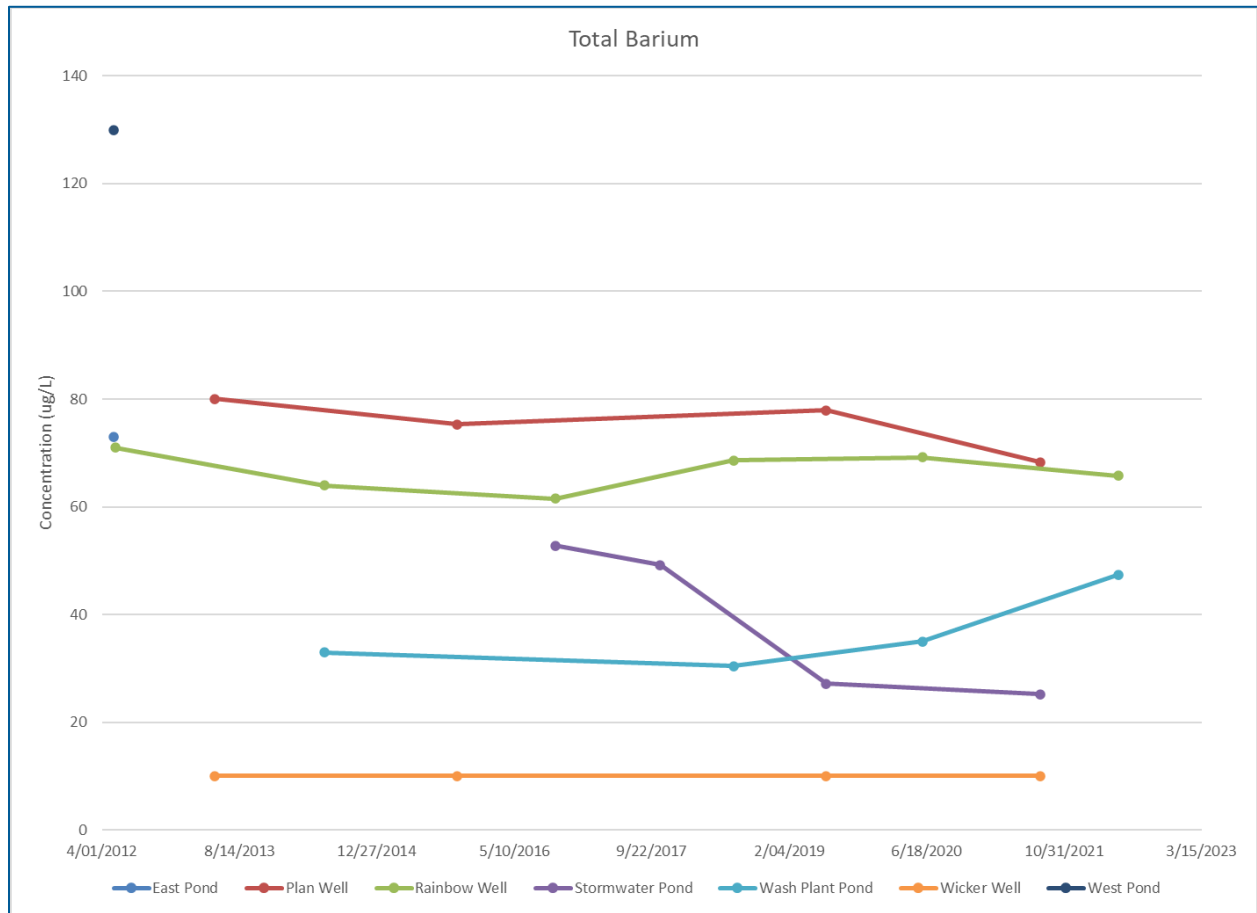
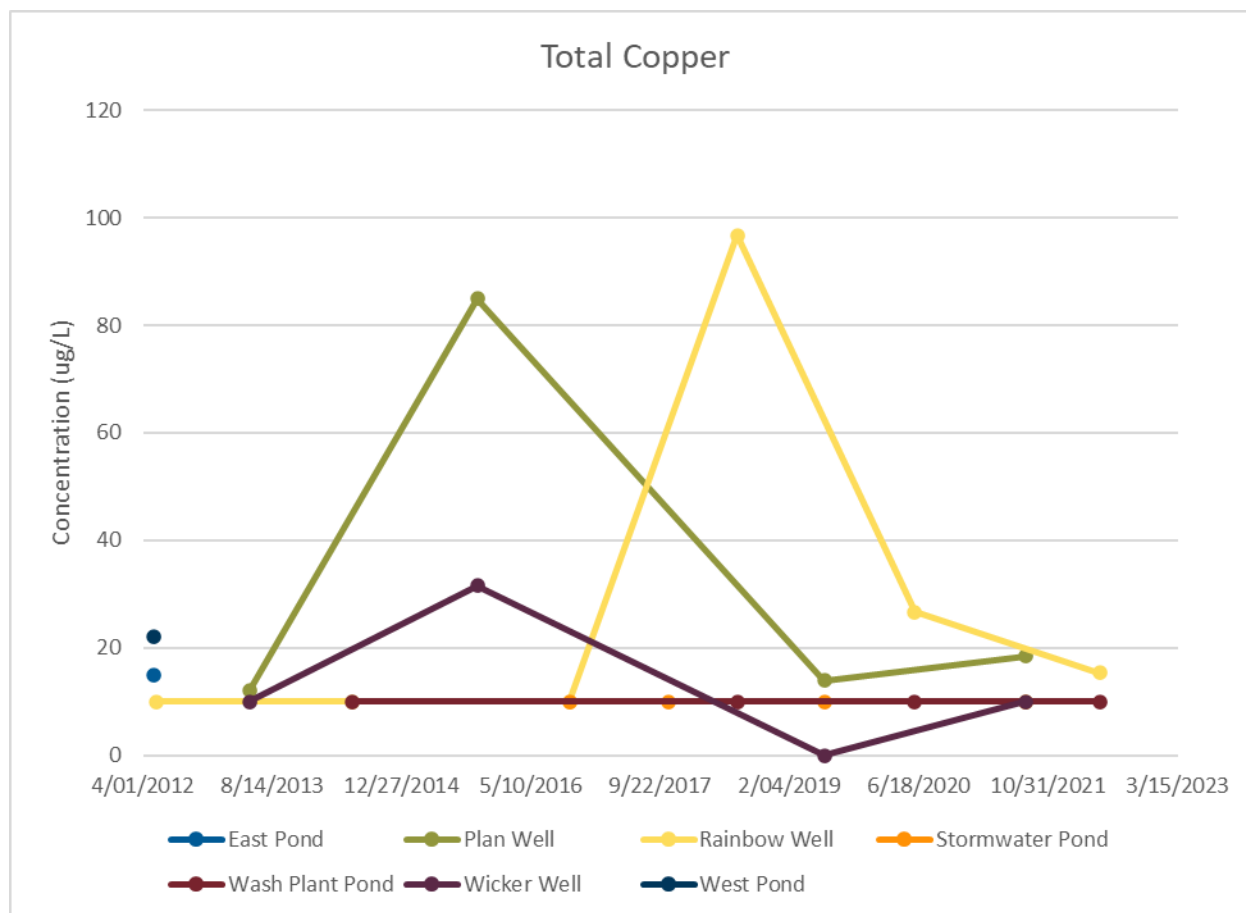


Figure 2 West-to-East Geologic Cross Section Along Groundwater Flow Path Through BRI Facility



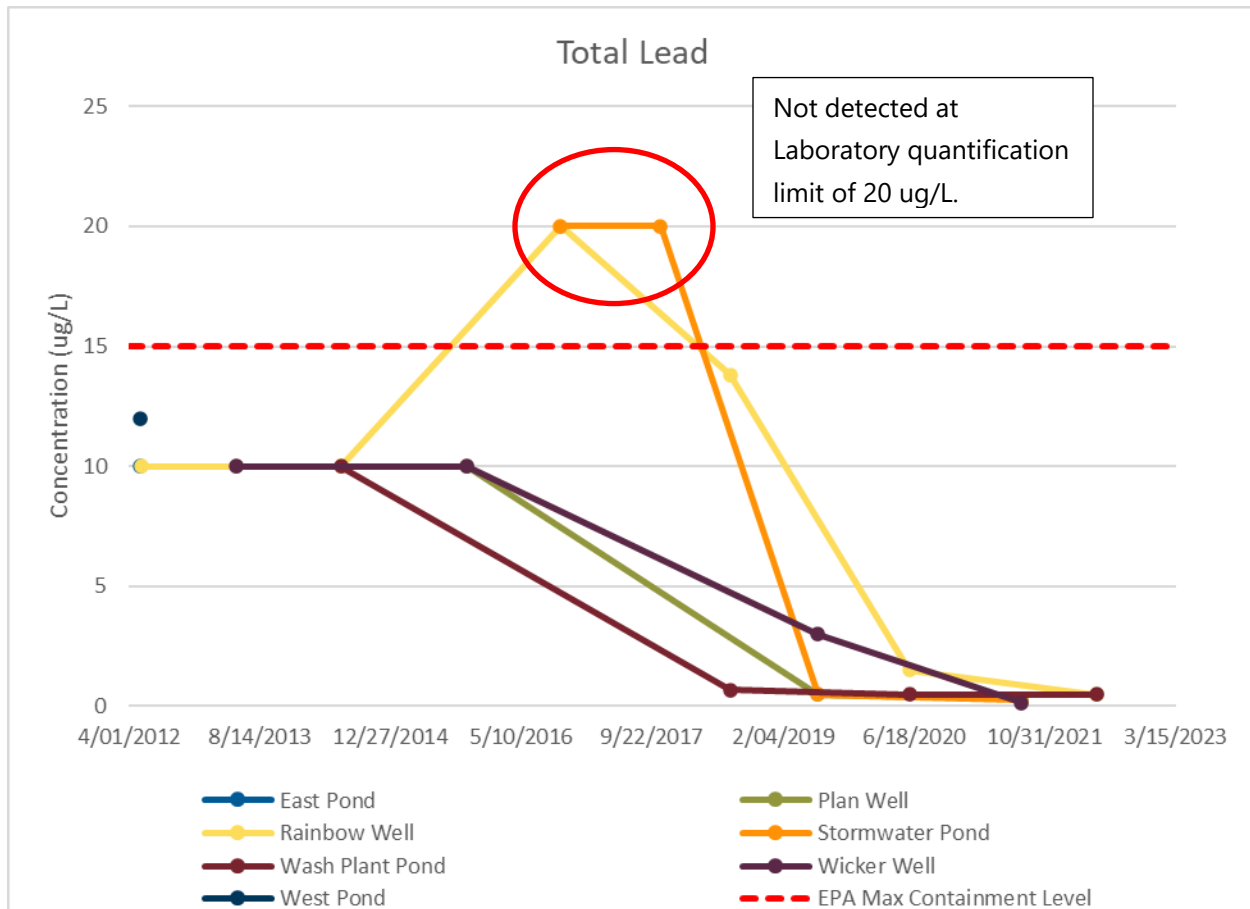
Note: EPA Maximum Contaminant Level (MCL) for Barium is 2,000 ug/L

Figure 3 Time-Series Plot of Barium Concentrations



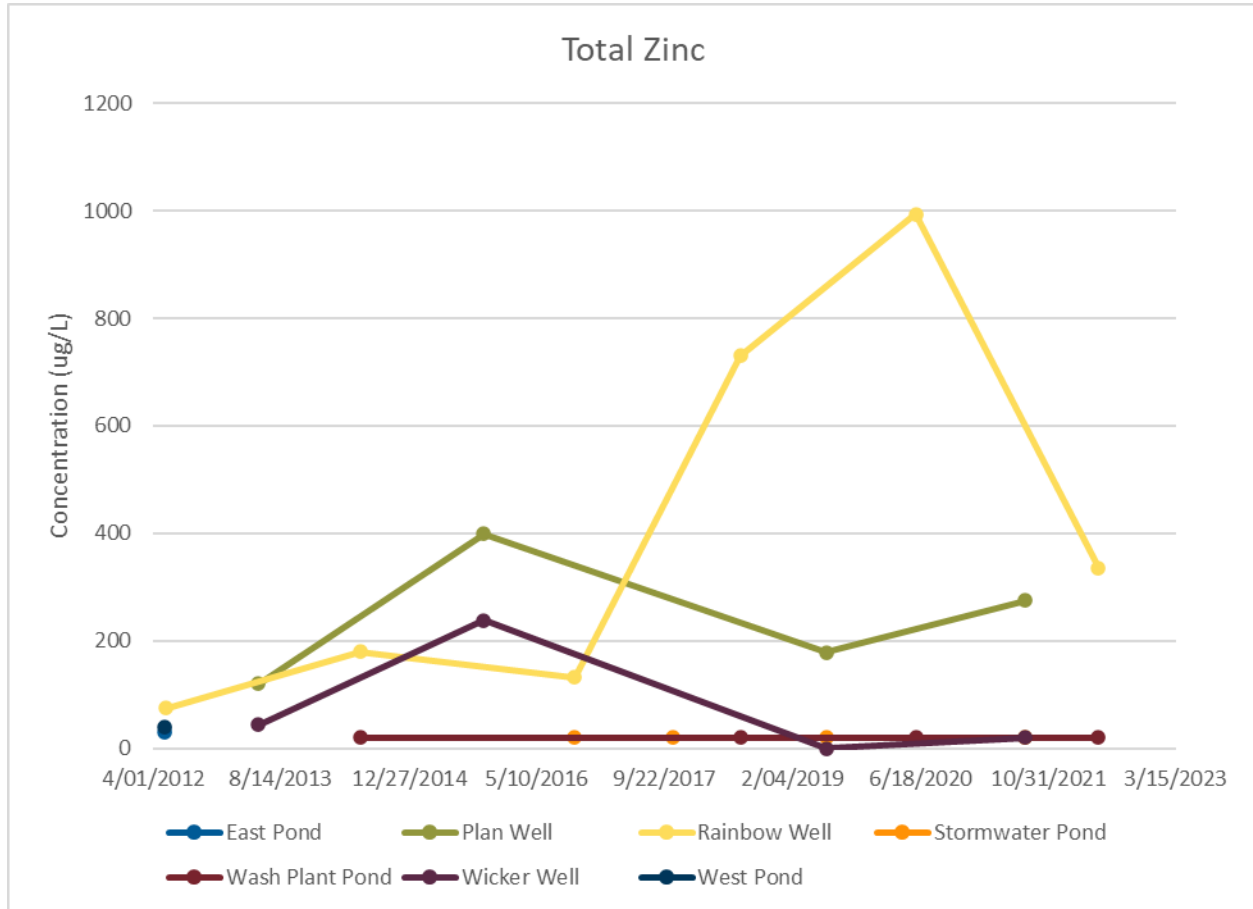
Note: EPA Maximum Contaminant Level (MCL) for Copper is 1,300 ug/L

Figure 4 Time-Series Plot of Copper Concentrations



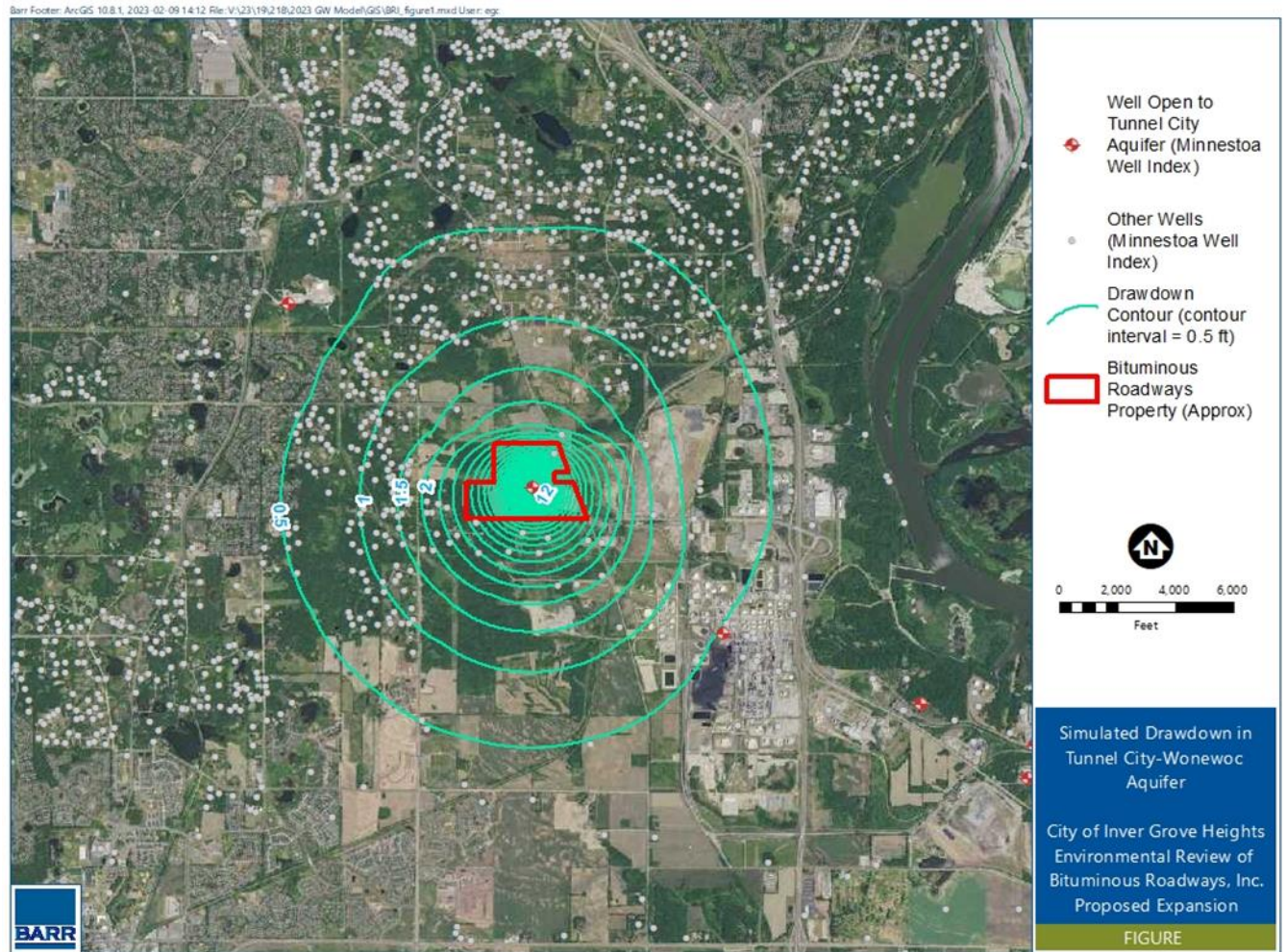
Note: EPA Maximum Contaminant Level (MCL) for Lead is 15 ug/L. In 2016 and 2017, the laboratory quantification limits were higher than the MCLs for the stormwater pond and Rainbow well – but this does not mean that concentrations in water exceeded the MCL.

Figure 5 Time-Series Plot of Lead Concentrations



Note: EPA Secondary Drinking Water Standard for Zinc is 5,000 ug/L. (for taste and odor). There is no MCL for Zinc.

Figure 6 Time-Series Plot of Zinc Concentrations



Simulation using Metro Model 3 (Metropolitan Council). Grid-mesh refinement to 15.625 m x 15.625 m in vicinity of pumping well.

Figure 7 Model Simulation of Steady-State Drawdown (feet) in the Tunnel City-Wonewoc Aquifer Resulting from Pumping of BRI Wash-Plant Well at Average Pumping Rates

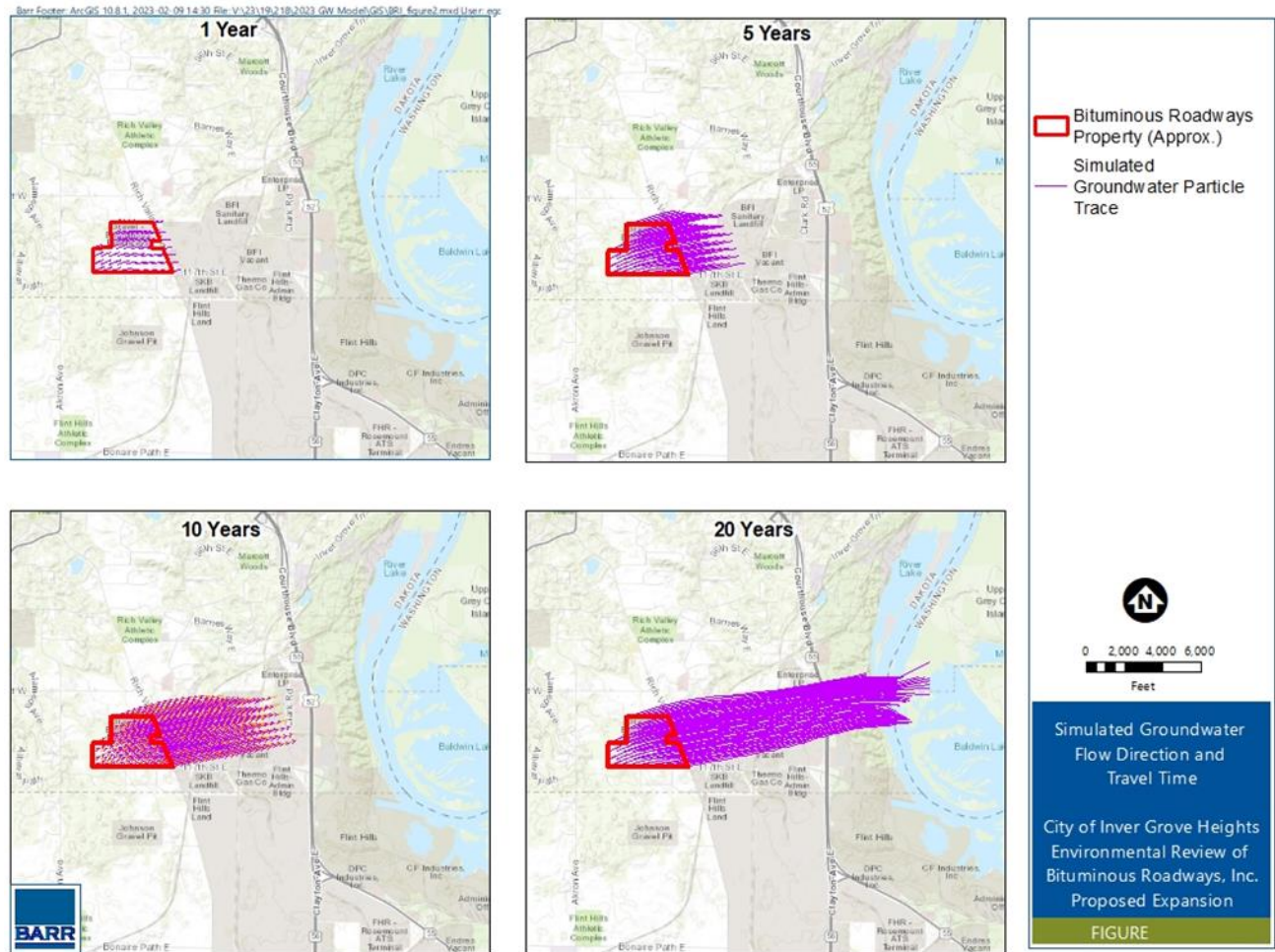


Figure 8 Model Simulation of Groundwater Time-of-Travel in the Water-Table Aquifer from BRI Facility Using Metro Model 3

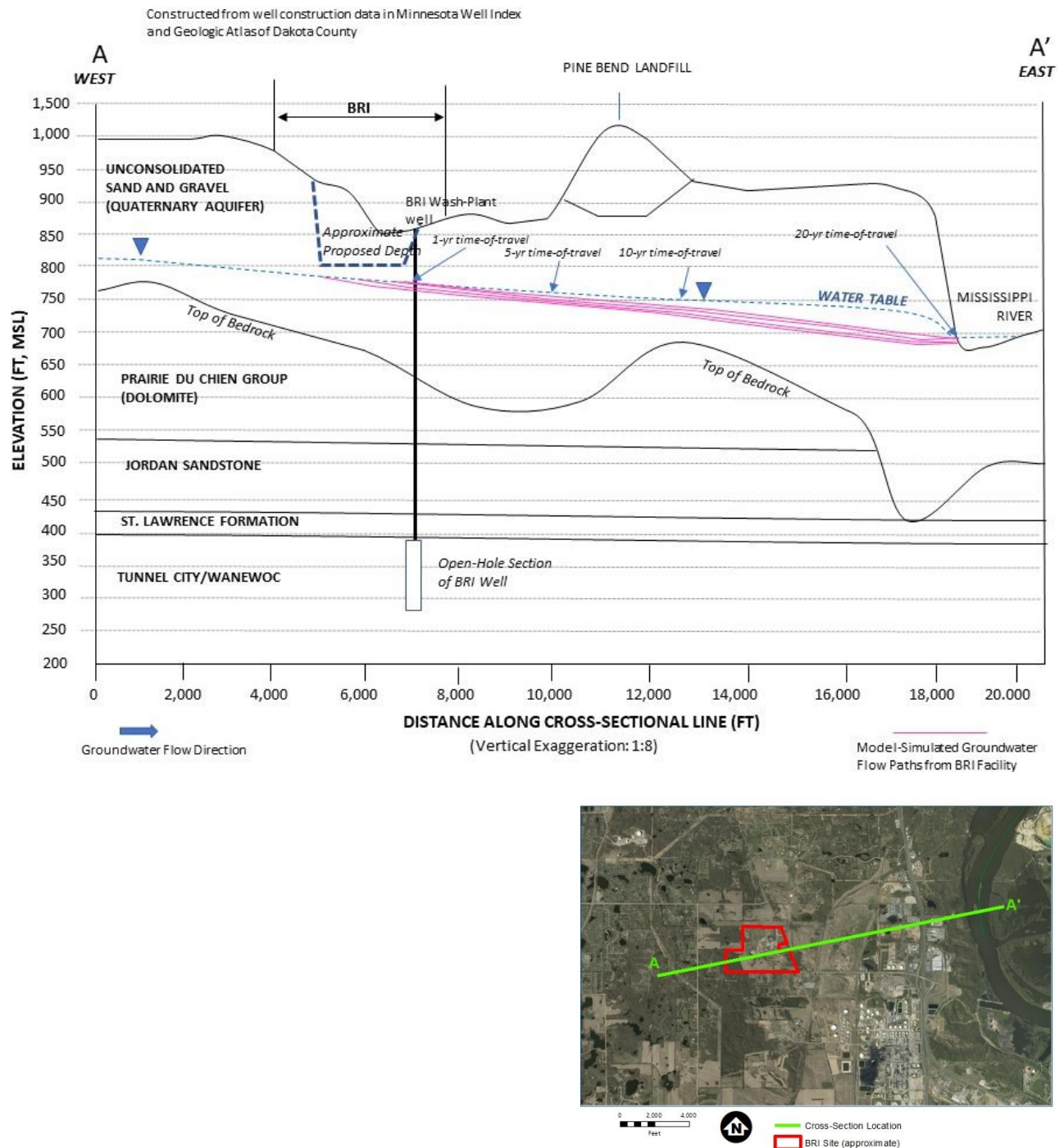


Figure 9 Cross Section Showing Model Simulation of Groundwater Time-of-Travel in the Water-Table Aquifer from BRI Facility Using Metro Model 3

Sunde Engineering, PLLC.
10830 Nesbitt Avenue South
Bloomington, MN 55437-3100
Phone: (952) 881-3344
Fax: (952) 881-1913



MEMORANDUM

To:	Allan Hunting, City Planner City of Inver Grove Heights	Date: 11/18/2022
From:	Michaelea Whelan, Sunde Engineering Kent Peterson, Bituminous Roadways, Inc.	Responses by Sunde/BRI in blue Responses to be addressed by Barr/City in red
Subject:	Bituminous Roadways 2022 CUP Application Response to Planning Commission Comments	
CC:		

This memorandum is to provide the applicant response to Commissioners questions and comments from the November 1, 2022 Planning Commission meeting and from emails of various dates sent to City staff by Commissioner Heidenreich. Plan sheet C-1, Existing Conditions, has been updated to clarify some site-related questions and is attached.

Response to Question from 11/01/22 Planning Commission Meeting from Planning Commissioner Challeen:

- 1) *Commissioner Challeen's questions during the 11/01/2022 Planning Commission Meeting regarding definitions of terms*
 - a. *Definition of Clean soils:*
Bituminous Roadways response: Backfill material is described in section IV.2 of the permit application materials. Clean soils is described as "only non-organic compactable soil material that is free of contamination, recycled or salvaged aggregate, asphaltic pavement, crushed concrete, scraps of shingles, debris, rubbish, frozen soil, boulders over 1-inch in diameter, logs, wood chips or other objectionable material." "BRI will maintain a manifest from each off-site soil source indicating where soils are imported from. The manifest will include a statement that no contaminants are suspected to be in the soil material, information regarding location of where the soils are placed on Site, and an approximate volume of material imported. Manifest records will be maintained by BRI and made available to the City upon request."
 - b. *Rapid Response:*
Bituminous Roadways response: BR's response to a measurable spill is outlined in the Site's SPCC Plan. Section 2.5 of the Plan outlines the procedures and the on-site and outside Emergency Contacts (attached is section 2.5 from the SPCC plan). "A trained responder is to take immediate action to prevent further spillage and to confine the spill to the smallest practical area." Depending on the size and nature of the spill, outside response contractors may be called in. The MN Duty Officer is to be notified for spills that exceed 5 gallons. Records are to be kept for all measureable spill incidents.

Bituminous Roadways, Inc. 2022 CUP Application
Memo Response to Planning Commission Comments

Response to Questions submitted by Planning Commissioner Robert Heidenreich via. email on
10/31/2022:

- 1) There are two wells that have not been identified on the plans we were provided. I attached actual photos and the site plans we were provided.
 - a. Bituminous Roadways response: The wells identified are in the location of the farmstead that was on the SE location of the south portion of the property. One well was sealed prior to BR purchasing the south property. The buildings were demolished after Bituminous Roadways purchased the property. Mining activity was initiated in this area when the second, unsealed well was discovered. This unsealed well is in the process of being cleaned and abandoned in accordance with Minnesota State Statutes by a MN licensed well contractor. The sealing record will be provided once it is complete. Below is the well disclosure certificate showing the first well was sealed in 2000.



MINNESOTA DEPARTMENT OF HEALTH
WELL DISCLOSURE CERTIFICATE
PLEASE TYPE OR PRINT ALL INFORMATION

* Fill out a separate well information page if more than three wells are located on the property.

WELL #1				
COUNTY	QUARTER (OR GOVERNMENT LOT)	SECTION NUMBER	TOWNSHIP NUMBER	RANGE NUMBER
DAKOTA	NE 1/4 SW 1/4 &	32	27	22
WELL STATUS			YEAR WELL WAS SEALED (IF KNOWN)	
WELL IS: ☒ IN USE (1) ☐ NOT IN USE (2) ☐ SEALED BY LICENSED WELL CONTRACTOR (3)			27	
If the well has been sealed by someone other than a licensed well contractor or a licensed well sealing contractor, check the well status as not in use.			NAME OF LICENSED WELL CONTRACTOR	

WELL #2				
COUNTY	QUARTER (OR GOVERNMENT LOT)	SECTION NUMBER	TOWNSHIP NUMBER	RANGE NUMBER
Same	as above			
WELL STATUS			YEAR WELL WAS SEALED (IF KNOWN)	
WELL IS: ☐ IN USE (1) ☐ NOT IN USE (2) ☒ SEALED BY LICENSED WELL CONTRACTOR (3)			2000	
If the well has been sealed by someone other than a licensed well contractor or a licensed well sealing contractor, check the well status as not in use.			NAME OF LICENSED WELL CONTRACTOR	

Kimmes - Bauer

WELL #3				
COUNTY	QUARTER (OR GOVERNMENT LOT)	SECTION NUMBER	TOWNSHIP NUMBER	RANGE NUMBER
WELL STATUS			YEAR WELL WAS SEALED (IF KNOWN)	
WELL IS: ☐ IN USE (1) ☐ NOT IN USE (2) ☐ SEALED BY LICENSED WELL CONTRACTOR (3)				
If the well has been sealed by someone other than a licensed well contractor or a licensed well sealing contractor, check the well status as not in use.			NAME OF LICENSED WELL CONTRACTOR	

SKETCH MAP - Sketch the location of the well(s) and include estimated distances from roads, streets, and buildings.
IF MORE THAN ONE WELL ON PROPERTY, USE THE WELL LOCATION NUMBER ABOVE TO IDENTIFY EACH WELL.

- 2) *A third image from the same location West from the East Access looking north shows what appears to be wet sand caused by contact with the Prairie Duchenne aquifer. This is concerning as there is foundry sand being stored near this location. It appears that the Barr report incorrectly has identified the water level or BR has excavated below the approved depth at this time. Barr report PDF page 54*
 - a. **Barr will address**
- 3) *The location map provide on Pg 19 of the PDF labeled "Location Map Case No. 22-37SC the boundaries on this map differ from property records, and other maps and charts provided in the packet PDF pages 29,42,47,49 are specific examples*
 - a. **Staff addressed**
- 4) *Page 2 of the Sept 29th Barr, PDF page 55 mentions the "Groundwater Quality " Barr states dewatering isn't required and Nearby wells won't be negatively impacted, there is no mention of the High Volume Well installed in 2012 that removes 450 GPM. A scientist from the DNR present at the public meeting in 2012 describes this well as the perfect storm. Well tests have been required on these and several other wells in the area and the City has been provided copies of the report as IGH is the RGA*
 - a. **Barr will address**
- 5) *The permit application from Sunde engineering at BR's request states on Page 7 Paragraph 5 "Neighboring Properties" A property owners list within 1000 feet of the Site is included in Attachment 1. I am unable to locate Attachment 1 to verify if the proper neighbors have been identified and given proper notice.*
 - a. **Staff addressed**
- 6) *The PID numbers provided in the original Ordinance adopted in 2002 and renewed as of 8/18/2017 and is the subject of Tuesday's meeting, are not valid PID numbers as listed in the GIS system and additional descriptions does not describe the affected area correctly as shown in some of the charts*
 - a. **Staff addressed**
- 7) *I would like to respectfully request and be provided with all available past, and current test reports from the DNR well tests, EPA and PCA reports and violations. Additionally, The Well Abandonment/Closure data for the two exposed wells*
 - a. **Staff addressed**

Response to Questions submitted by Planning Commissioner Robert Heidenreich via email on
11/2/2022:

1) *The Polluted Foundry sand is in the documents attached and said to be in the Southeast Corner, Kent Peterson claimed several times it was in a berm on the north boundary of the property. The location of this regulated material has moved on paper several times in the past. I should think the exact location should be located, verified and professionally documented as its proximity to the wells and aquifer are important. I don't think this is a one off typo as this location is also disclosed on other public documents. The PDF copy with location written is attached.*

- a. Bituminous Roadways response: The foundry sand is located at the central east side of the site (previously the southeast corner prior to purchase of the south parcel), between the site primary access and the Wicker property. Plan Sheet C-1, Existing Conditions has been revised to show the location where the approximately 24 cubic yards of foundry sand was used as fill. This minor amount of foundry sand has been untouched since 1998. There have been tests and analysis conducted on the foundry sand periodically for years. The results have verified that the foundry sand is below hazardous waste levels. Groundwater well tests have been and continue to be tested in accordance with the conditions of the permit. No exceedances of State drinking water standards were found in the test results. No increasing trend of metals or contaminants in the samples have been noted. Documents showing the foundry sand location and test reports are attached to this Memo.

Bituminous Roadways had previously satisfied the permit conditions as noted in the Planning Report from June 19, 2007 (excerpt below).

14. The foundry sand in the northwest berm shall remain in its current location except as it is used. It is to be used in its entirety within the next four (4) years. The foundry sand in the southeast berm will be left undisturbed.

Barr Engineering conducted a site visit in May this year and determined the northwest foundry sand berm is completely gone and vegetation had been established. The southeast foundry sand berm had been undisturbed and contained a vegetative cover. This condition has been satisfied. The condition should be modified to remove the reference to the northwest berm.

15. Bituminous Roadways shall bring no additional foundry sand onto the site.

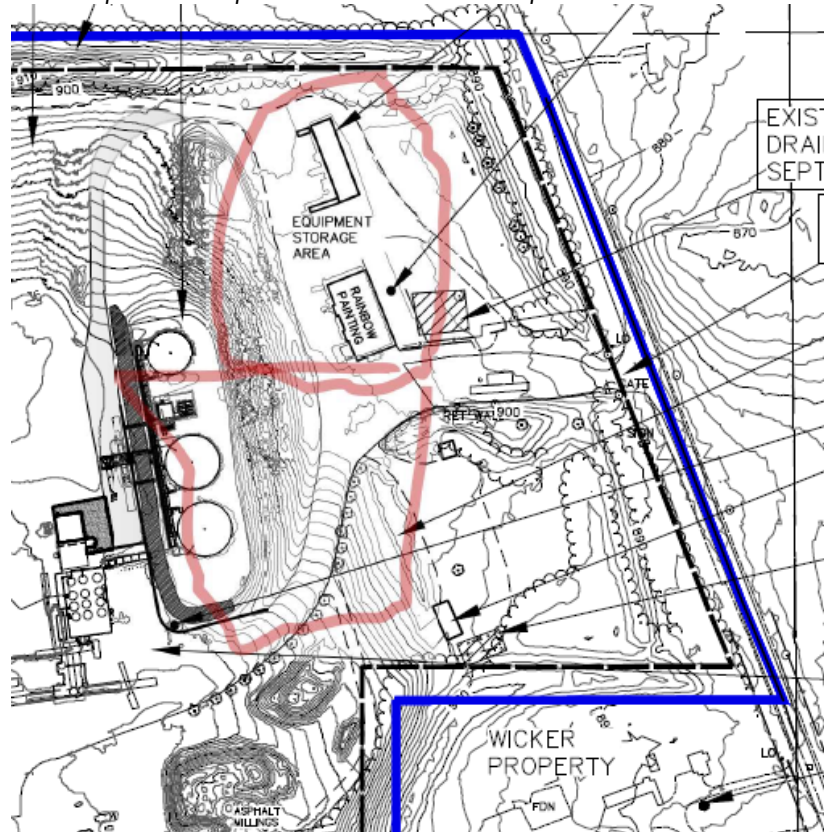
Operational condition. No additional foundry sand has been found on the site.

Planning Report – Case 07-11C
June 19, 2007
Page 6

16. The berms which cover the foundry sand shall be maintained in vegetative cover to control erosion of the foundry sand.

This condition has been satisfied.

- 2) *The reclaimed area in the North east corner in the attached PDF and circled is to the best of my knowledge a dumping location for Asphalt, concrete, steel, CCA treated wood, this area was made available to local contractors in the mid 1990's - 2000's of at the time this area grew and was graded and compacted, eventually building were placed on top of this location. This was done in violation of the backfill requirements listed in the permits. I think a few simple core samples collected in this area will provide the answers.*



- a. Bituminous Roadways response: The northeast corner of the site was not used as a dumping location in the 1990's and 2000's. The Rainbow shop was built in 1980 and the red storage building was placed in its current location in the 1990's. The asphalt cement tanks and a new water line were installed in this area last year and the soils encountered were sand and gravel. Previously recycled rubble asphalt was stockpiled in an area to the west of the Rainbow building, but has been relocated with the construction of the asphalt cement tanks and associated infrastructure.

BR has always recycled concrete and asphalt on-site and has never accepted CCA treated wood. While recycling concrete, the wire mesh and rebar is collected and disposed of off-site. Occasionally miscellaneous debris is brought to the site, but it is collected and disposed of off-site as well. The site operates under a Solid Waste Facility License issued by Dakota County. The County inspects the site annually.

b. Facility Permits

- i. CUP issued by City of Inver Grove Heights. Requires renewal and permit application every 5 years.
- ii. Sand and Gravel Overlay Ordinance approval, issued by City of Inver Grove Heights. Requires renewal and permit application every 5 years.
- iii. Water appropriations permit issued by MN DNR. Annual allowance is 42.8 million gallons. BR submits annual reports to show no exceedances.
- iv. National Pollutant Discharge Elimination System permit, MNG490000 issued by MPCA. Discharge monitoring reports (DMR) submitted quarterly to MPCA.
- v. Dakota County Solid Waste Facility License, annual license renewal is required by Dakota County. Site inspected by County annually.
- vi. Aboveground Storage Tank Facility issued by MPCA. Inspection logs submitted annually to the MPCA.

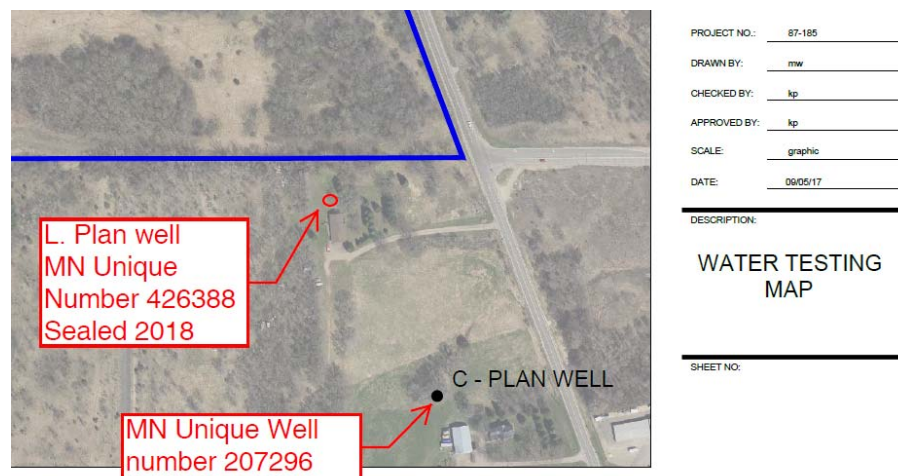
3) *The well water testing reports provided indicate a series of mishandling problems with the water collection protocols used. Several time samples were not collected properly, seals were not intact, Time span from collection did not meet requirements for proper testing. Additionally the amounts of toxic chemicals seem to be increasing over time. The required discrepancy reports have not been made available **Attached is a PDF** indicating the rules that were agreed to in the overlay agreement. I think the city should address who is responsible for monitoring the reports received from BW in the past and what actions, if any, were taken to assure compliance with ordinances and to mediate, protect the groundwater and nearby wells. Can an explanation of what is the responsibility of the RGA (RGU) and who holds this duty in regard to the BR Mine*

- a. **Barr will address.**
- b. **Staff will provide Barr earlier data, prior to 2017. Likely 2012+**
- c. **Staff provided data in the email hyperlink (2017-2022)**
 - i. **Staff noted there's a water testing protocol - private lab.**
 - ii. **Need chain of custody, lab results, who sampled**

- 4) The High Volume industrial well that was installed after much public discussion, was agreed that this well would be placed at a depth of approx 600' below grade drawing water from the tunnel city confined aquifer rather than the proposed 183' that would have put this well in the Prairie du Chien-Jordan unconfined aquifer. PDF Side View elevation of water levels attached, also attached as a PDF is a description of 3 aquifers most impacted.
- Barr will address
 - Well log, water drawn limits, water drawn record

Response to Question submitted by Planning Commissioner Robert Heidenreich via email on 11/15/2022:

- 1) We were also provided well water test reports for the required sample testing.
These reports show test results from the PLAN WELL
Unique Well ID: 426388
Sample: IGH C-Plan Well Parameters Lab ID: 10573071003 Collected: 08/03/21 13:45
Received: 08/04/21 15:55
Is it possible to test a well that was sealed 3 years prior? SEALED 12-18-2018 BY 1461
- Bituminous Roadways response: BRI tests the Robert Plan well not the Larry Plan well. The Larry Plan well, MN Unique Well Number 426388 is the well that was sealed in 2018. Larry died a number of years ago and his wife, Christine, sold their property to Flint Hills Resources (FHR). The well was sealed by FHR. The lab test report does not show MN Unique Well Numbers for the wells tested. The tested Plan well in the lab report is merely labeled as IGH C-Plan well, which is how it is labeled on the well testing map. The well noted as C-Plan well shown on the well testing map has a MN Unique Well Number of 207296. Below is an excerpt from the Water Testing Map from the 2017 permit renewal with the two Plan wells noted.



- 2) *Here is my concern(s) There are many wells on and around the Bituminous property that are known but not being disclosed in the documents we have all been provided for the permit renewal, One of these wells is located in the foundry sands storage area and isn't listed as sealed.*

➤ *Rech Well Unique well number "1000002687"*

- a. Bituminous Roadways response: The well with Unique well number "1000002687" is an unverified well, which usually means that MDH has not had GPS coordinates shot for the well, identified the well via air photos, and/or the driller's location description on the well log is insufficiently accurate to be included in the database. The address listed on the unverified well log is 1630 52nd St. E. It appears that the log has an incorrect township, range and section, which seems to be why it is shown near the BRI site on the MN Well Index map. There is a well log at that address and is labeled as Peter Rech, MN Unique Well Number 100986.

BOUNDARY INFORMATION FROM SUNDE
LAND SURVEYING, LLC.

MINNESOTA NORTHERN
NATURAL GAS COMPANY
12" PIPELINE.
APPROXIMATE LOCATION
ONLY. FIELD VERIFY.

PROPERTY
BOUNDARY

SLOPED AND VEGETATED

STORMWATER
PONDS. WATER
TEST ID "D"

SLOPED AND VEGETATED

EXISTING TOPSOIL
SCREENING BERM
(Approx. 40,000 CY)

ASPHALT CEMENT
TANK STORAGE AREA

METAL BUILDING
SALT STORAGE

RAINBOW WELL
TEST ID "A"

EXISTING
DRAINFIELD AND

PRIMARY
SITE ACCESS

LOCATION WHERE MINOR
AMOUNT OF FOUNDRY SAND
USED AS FILL (HAS REMAINED
IN PLACE SINCE 1998)

ASPHALT TESTING
BUILDING

EXISTING DRAINFIELD
AND SEPTIC TANK

ASPHALT PLANT
OPERATIONS AREA

WICKER
PROPERTY

AKER WELL
T ID "B"

EXISTING TOPSOIL
SCREENING BERM

WASHPLANT
SUPPLY PONDS.

CURRENT CONVEYOR
PLACEMENT FOR

SECONDARY
SITE ACCESS

COLD FARMSTEAD WELL.
TO BE SEALED IN 2022

OLD FARMSTEAD
WELL. SEALED 2000

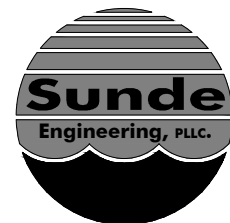
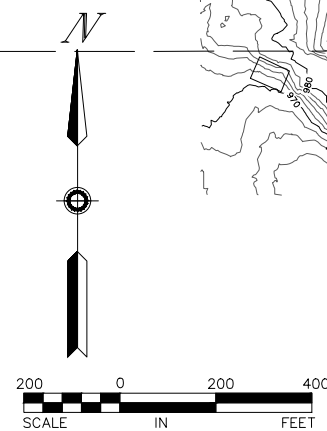
EXISTING TOPSOIL
SCREENING BERM

EARTHEN
SAFETY BERM

L. PLAN WELL
SEALED 2018

R. PLAN WELL
TEST ID "C"

LOW AREAS ARE NOT
JURISDICTIONAL WETLANDS
PER WETLAND REPORT BY
SEH DATED MAY 20, 2002



CONSULTING CIVIL ENGINEERS
10830 NESBITT AVENUE SOUTH
BLOOMINGTON, MINNESOTA 55437
(952) 881-3344 TELEPHONE
(952) 881-1913 FAX
www.sundecivil.com

BITUMINOUS
ROADWAYS INC.
INVER GROVE HEIGHTS
GRAVEL PIT

2022 PERMIT
REISSUANCE[illegible]

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

OF THE STATE OF MINNESOTA
Kirsten Pauly
DATE: 11/17/2022 REG. NO.: 2184

INFORMATION:	
PROJECT NO.:	87-185
DRAWN BY:	mw
CHECKED BY:	kp
APPROVED BY:	kp
SCALE:	graphic
DATE:	08/05/2022
DESCRIPTION:	

EXISTING CONDITIONS

SHEET NO:

C-1

Excerpt From SPCC Plan : Section 2.5

Spill Prevention Control & Countermeasure Plan
Bituminous Roadways, Inc. – Inver Grove Heights, MN

December 6, 2021

from the spill area into drainage ditches or surface waters;

- Assess the need for and if necessary, call in outside response contractors.
- All but the largest spills will be responded to by Bituminous Roadways personnel. Heavy equipment and sorbent materials are available on-site to respond to oil spills.

Emergency Contacts:	Troy Wille, Emergency Coordinator	Office 651-287-6092
		Cell 612-366-6484
	Koby Fechner Emergency Contact	Cell 612-366-3053
	Todd Smedhammer, Plant Manager	Office 651-686-7001
		Cell 612-366-0013

Emergency Numbers:	Minnesota Duty Officer	800-422-0798
	National Response Center	800-424-8802
	Inver Grove Heights Fire Department	911
	Bay West (Cleanup Contractor)	800-279-0456
	Determan (Cleanup Contractor)	612-347-0534
	Dakota Electric (Transformer Release)	800-430-9722

2.5.1 Safety

Oils and petroleum products are hazardous materials, and personnel must take measures to prevent accidental ignition of any waste materials during spill remedial activities. The following safety requirements shall be strictly enforced by the responder under the direction of the emergency coordinator. All but the largest spills will be responded to by Bituminous Roadways personnel. Heavy equipment and sorbent materials are available on-site to respond to oil spills.

- Personnel shall wear appropriate PPE devices;

Spill Prevention Control & Countermeasure Plan
Bituminous Roadways, Inc. – Inver Grove Heights, MN

December 6, 2021

from the spill area into drainage ditches or surface waters;

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2.5.1 Safety

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- Personnel shall wear appropriate PPE devices;

- Smoking shall be prohibited within 100 feet of the spill-impacted area.
- Ignition sources shall be prohibited in the spill area;
- Spark-producing equipment and tools shall be prohibited from use near spilled materials unless specifically authorized.
- No operations shall be conducted during electrical storms.

2.5.2 Disposal of Recovered Materials

The recovered spilled and containment materials shall be properly disposed of in accordance with local, state and federal regulations.

- Dispersing materials or methods shall not be used unless specifically authorized by the regulatory personnel;
- Free product shall be collected by applying absorbent materials until all free liquids are retained;
- Asphalt product unless heated is not free flowing and will harden if released.
- Soils, absorbents, temporary diking materials, and other debris contaminated during the spill or used to contain a flammable product shall be collected with non-spark-producing tools and placed in containers, which shall be sealed upon filling. Containers shall be labeled "FLAMMABLE";

2.5.3 Reporting

If oil is discharged into or upon the navigable waters of the United States, or adjoining shorelines, or into or upon the waters of the contiguous zone in quantities which violate applicable water quality standards, cause a film or sheen on the U.S. waters or adjoining shorelines, or cause a sludge or emulsion to be deposited beneath the surface of the water or upon the adjoining shorelines, then the Facility shall.

Spill Prevention Control & Countermeasure Plan
Bituminous Roadways, Inc. – Inver Grove Heights, MN

December 6, 2021

1. Notify the National Response Center by telephone by 800-424-8802 (24 hours a day/7-days a week) of the discharge.
2. Notify the State Duty Officer, 800-422-0798.
3. Notify the USEPA Region V Spill Phone, (312) 353-2318.
4. The verbal notification report will include the following information regarding the spill:
 - a. The location, time and date.
 - b. The material and quantity.
 - c. Name of stream involved.
 - d. The company name, address, and phone numbers and/or responsible party.
 - e. The spill reporter's name, address, and phone number.
 - f. Action taken and disposal site.
 - g. Secondary problems (i.e., water supply affected, fish kill, excavation, etc.).

2.5.4 Spill Incident Mitigated On-Site

The following notification and reporting procedures are followed in the event of an incident which is mitigated on-site without implementation of the SPCC Plan:

- The employee who identifies the spill shall notify the Emergency Coordinator of the spill incident;
- A determination will be made by the Emergency Coordinator as to whether the incident is reportable; and
- If the spill is either reportable or non-reportable to State and Federal Agencies, a report documenting the incident will be maintained at the facility by the Emergency Coordinator, Troy Wille

2.5.5 Record Keeping Requirements

Carlson McCain, Inc.

Page 12



CONSULTANTS
• ENVIRONMENTAL
• GEOTECHNICAL
• MATERIALS
• FORENSICS

August 25, 2006

Bituminous Roadways
9050 Jefferson Trail
Inver Grove Heights, MN 55077

Attn: Mr. Dusty Ordorff

RE: Environmental Testing Services
Bituminous Roadways Asphalt Plant
Rich Valley Boulevard
Rosemount, Minnesota
AET Project #03-02711

Dear Mr. Ordorff:

American Engineering Testing, Inc. (AET) has completed our environmental testing services for the above-referenced site in Rosemount, Minnesota. Our methods and results are summarized below.

Background and Purpose

AET was contacted on August 9, 2006 to perform soil sampling of a mixed soil stockpile on the above referenced site. The purpose of our services was to determine if contamination was present in the soil after foundry sand was mixed with native sand. The laboratory analytical results were compared to the Minnesota Pollution Control Agency (MPCA) Tier I Residential Soil Reference Values (SRVs) and Soil Leaching Values (SLVs).

Soil Sampling Procedures

Soil sampling activities were performed by an AET geologist. Soil samples collected were screened with a photoionization detector (PID) for the presence of organic vapors with ionization potentials less than the lamp voltage. The PID was calibrated for direct reading in parts-per-million-volume (PPMv) of a benzene equivalent. Soil samples were collected and screened according to the bag-headspace field screening procedure, which consists of placing freshly collected soil into a polyethylene Whirl-Pak or freezer baggie (i.e., bag), sealing the bag to contain an air pocket (i.e., headspace), and allowing 10 to 20 minutes for vapors to disperse from the soil to the headspace. Excessive moisture, temperature extremes, ambient vapors, or other unusual field circumstances can affect screening results.

This document shall not be reproduced, except in full, without written approval of American Engineering Testing, Inc.

550 Cleveland Avenue North • St. Paul, MN 55114

Phone 651-659-9001 • Toll Free 800-972-6364 • Fax 651-659-1379 • www.amengtest.com

Offices throughout Florida, Minnesota, South Dakota & Wisconsin
AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

Soil samples obtained for chemical analysis were collected into laboratory-prepared containers with appropriate preservatives, according to laboratory protocols. The samples were delivered to the analytical laboratory within prescribed holding times, accompanied by proper chain-of-custody forms.

Results

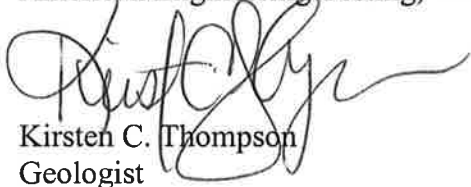
AET collected one soil sample on August 9, 2006. It was collected from a pile in the center of the site containing mixed materials identified as foundry sand mixed with natural sand at a 1:9 ratio, respectively.

The soil samples were field screened using a PID. No detections were noted while screening with the PID. The samples were submitted to Legend Technical Services (Legend), Inc. for laboratory analysis of diesel range organics (DRO), volatile organic compounds (VOCs), 8 Resource Conservation and Recovery Act (RCRA) Metals and polyaromatic hydrocarbons (PAHs). All of the concentrations measured were either non-detect or below Tier I Residential SRVs and SLVs. The lab report is attached.

Remarks

We appreciate the opportunity to have been of service to you on this project. If you have any questions regarding the information presented in this letter, or if we can be of additional service, please contact me at.

Prepared by,
American Engineering Testing, Inc.


Kirsten C. Thompson
Geologist

Phone: (651) 659-1332
Fax: (651) 659-1370
Email: kthompson@amengtest.com

Reviewed by,
American Engineering Testing, Inc.


Kathryn J. Kleiter, P.G.
Principal Hydrogeologist

Phone: (651) 659-1319
Fax: (651) 659-1379
Email: kkleiter@amengtest.com

Attachments:

Legend Laboratory Report



88 Empire Drive
St Paul, MN 55103
Tel: 651.642.1150
Fax: 651.642.1239

August 22, 2006

Ms. Kirsten Thompson
American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul, MN 55114

Reviewed by: KAT
Date: 8/24/06

Work Order Number: 0603624
RE: 03-02711 Bituminous Roadway

Enclosed are the results of analyses for samples received by the laboratory on 08/09/06. If you have any questions concerning this report, please feel free to contact me.

All samples will be retained by LEGEND, unless consumed in the analysis, for 30 days from the date of this report and then discarded unless other arrangements are made.

Minnesota Certification # 027-123-295

Prepared by,
LEGEND TECHNICAL SERVICES, INC

A handwritten signature in black ink, appearing to read "Terri Olson", written over a horizontal line.

Terri Olson
Project Manager
tolson@legend-group.com

A handwritten signature in black ink, appearing to read "Shanna Miller", written over a horizontal line.

Shanna Miller
Client Representative
smiller@legend-group.com



88 Empire Drive
St Paul, MN 55103
651.642.1150

American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul MN, 55114

Project: 03-02711 Bituminous Roadway
Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Blended	0603624-01	Soil	08/09/06 00:00	08/09/06 12:18

Shipping container information

Default Cooler

Temperature:

Received on ice: Yes
Received on melt water: No
Custody seals: No

Temperature blank was not present
Ambient: No

Received on blue ice: No
Acceptable (IH/ISO only): No

Case Narrative:



88 Empire Drive
St Paul, MN 55103
651.642.1150

American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul MN, 55114

Project: 03-02711 Bituminous Roadway
Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

DRO/8015B
Legend Technical Services, Inc

Analyte	Result	Reporting		MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit									
Blended (0603624-01) Soil Received: 08/09/06 12:18 Sampled: 08/09/06 00:00											
Diesel Range Organics	<10	10	2.3		mg/kg dry	1	B6H2105	08/21/06	08/21/06	Wisc Mod DRO	
Surrogate: C-30	107				67.6-130	%	"	"	"	"	



88 Empire Drive
St Paul, MN 55103
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American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul MN, 55114

Project: 03-02711 Bituminous Roadway
Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

TOTAL METALS ANALYSIS
Legend Technical Services, Inc

Analyte	Reporting			Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Result	Limit	MDL							
Blended (0603624-01) Soil Received: 08/09/06 12:18 Sampled: 08/09/06 00:00										
Mercury	<0.10	0.10	0.0030	mg/kg dry	1	B6H1605	08/16/06	08/16/06	EPA 7471A	
Arsenic	1.5	0.52	0.089	mg/kg dry	1	B6H1603	08/16/06	08/16/06	EPA 6010B	
Barium	13	1.0	0.15	mg/kg dry	1	"	"	"	"	
Cadmium	<0.26	0.26	0.078	mg/kg dry	1	"	"	"	"	
Chromium	9.0	0.52	0.021	mg/kg dry	1	"	"	"	"	
Lead	2.6	1.0	0.027	mg/kg dry	1	"	"	"	"	
Selenium	<1.0	1.0	0.10	mg/kg dry	1	"	"	"	"	
Silver	<0.26	0.26	0.019	mg/kg dry	1	"	"	"	"	



88 Empire Drive
St Paul, MN 55103
651.642.1150

American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul MN, 55114

Project: 03-02711 Bituminous Roadway
Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

PAH 8270C
Legend Technical Services, Inc

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Blended (0603624-01) Soil Received: 08/09/06 12:18 Sampled: 08/09/06 00:00										
BaP Equivalents	0.0			mg/kg dry	1	[CALC]	08/10/06	08/10/06	Calculation	
2-Chloronaphthalene	<0.43	0.43	0.044	mg/kg dry	1	B6H1003	"	"	EPA 8270C	
2-Methylnaphthalene	<0.43	0.43	0.10	mg/kg dry	1	"	"	"	"	
Acenaphthene	<0.43	0.43	0.069	mg/kg dry	1	"	"	"	"	
Acenaphthylene	<0.43	0.43	0.044	mg/kg dry	1	"	"	"	"	
Anthracene	<0.43	0.43	0.048	mg/kg dry	1	"	"	"	"	
Benzo (a) anthracene	<0.43	0.43	0.091	mg/kg dry	1	"	"	"	"	
Benzo (a) pyrene	<0.43	0.43	0.056	mg/kg dry	1	"	"	"	"	
Benzo (b) fluoranthene	<0.43	0.43	0.050	mg/kg dry	1	"	"	"	"	
Benzo (g,h,i) perylene	<0.43	0.43	0.066	mg/kg dry	1	"	"	"	"	
Benzo (k) fluoranthene	<0.43	0.43	0.061	mg/kg dry	1	"	"	"	"	
Chrysene	<0.43	0.43	0.095	mg/kg dry	1	"	"	"	"	
Dibenz (a,h) anthracene	<0.43	0.43	0.061	mg/kg dry	1	"	"	"	"	
Fluoranthene	<0.43	0.43	0.091	mg/kg dry	1	"	"	"	"	
Fluorene	<0.43	0.43	0.076	mg/kg dry	1	"	"	"	"	
Indeno (1,2,3-cd) pyrene	<0.43	0.43	0.061	mg/kg dry	1	"	"	"	"	
Naphthalene	<0.43	0.43	0.043	mg/kg dry	1	"	"	"	"	
Phenanthrene	<0.43	0.43	0.047	mg/kg dry	1	"	"	"	"	
Pyrene	<0.43	0.43	0.095	mg/kg dry	1	"	"	"	"	
Surrogate: 2-Fluorobiphenyl	67.3			50.8-85.9	%	"	"	"	"	
Surrogate: Nitrobenzene-d5	68.4			49.2-95.3	%	"	"	"	"	
Surrogate: Terphenyl-d14	88.5			61.6-90.8	%	"	"	"	"	

LEGEND

Technical Services, Inc.

88 Empire Drive
St Paul, MN 55103
651.642.1150

American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul MN, 55114

Project: 03-02711 Bituminous Roadway
Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

VOC GCMS 8260B Legend Technical Services, Inc

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Blended (0603624-01) Soil Received: 08/09/06 12:18 Sampled: 08/09/06 00:00										
1,1,1,2-Tetrachloroethane	<0.26	0.26	0.045	mg/kg dry	1	B6H1013	08/10/06	08/10/06	EPA 8260B	
1,1,1-Trichloroethane	<0.26	0.26	0.034	mg/kg dry	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	<0.26	0.26	0.020	mg/kg dry	1	"	"	"	"	
1,1,2-Trichloroethane	<0.26	0.26	0.058	mg/kg dry	1	"	"	"	"	
1,1,2-Trichlorotrifluoroethane	<0.26	0.26	0.066	mg/kg dry	1	"	"	"	"	
1,1-Dichloroethane	<0.26	0.26	0.052	mg/kg dry	1	"	"	"	"	
1,1-Dichloroethene	<0.26	0.26	0.055	mg/kg dry	1	"	"	"	"	
1,1-Dichloropropene	<0.26	0.26	0.045	mg/kg dry	1	"	"	"	"	
1,2,3-Trichlorobenzene	<0.52	0.52	0.50	mg/kg dry	1	"	"	"	"	
1,2,3-Trichloropropane	<0.26	0.26	0.044	mg/kg dry	1	"	"	"	"	
1,2,4-Trichlorobenzene	<0.52	0.52	0.049	mg/kg dry	1	"	"	"	"	
1,2,4-Trimethylbenzene	<0.26	0.26	0.017	mg/kg dry	1	"	"	"	"	
1,2-Dibromo-3-chloropropane	<0.52	0.52	0.12	mg/kg dry	1	"	"	"	"	
1,2-Dibromoethane (EDB)	<0.26	0.26	0.050	mg/kg dry	1	"	"	"	"	
1,2-Dichlorobenzene	<0.26	0.26	0.017	mg/kg dry	1	"	"	"	"	
1,2-Dichloroethane	<0.26	0.26	0.061	mg/kg dry	1	"	"	"	"	
1,2-Dichloropropane	<0.26	0.26	0.046	mg/kg dry	1	"	"	"	"	
1,3,5-Trimethylbenzene	<0.26	0.26	0.025	mg/kg dry	1	"	"	"	"	
1,3-Dichlorobenzene	<0.26	0.26	0.029	mg/kg dry	1	"	"	"	"	
1,3-Dichloropropane	<0.26	0.26	0.044	mg/kg dry	1	"	"	"	"	
1,4-Dichlorobenzene	<0.26	0.26	0.038	mg/kg dry	1	"	"	"	"	
2,2-Dichloropropane	<0.52	0.52	0.066	mg/kg dry	1	"	"	"	"	
2-Butanone	<2.1	2.1	0.19	mg/kg dry	1	"	"	"	"	

Legend Technical Services, Inc

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Technical Services, Inc.

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St Paul, MN 55103
651.642.1150

American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul MN, 55114

Project: 03-02711 Bituminous Roadway
Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

VOC GCMS 8260B Legend Technical Services, Inc

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Blended (0603624-01) Soil Received: 08/09/06 12:18 Sampled: 08/09/06 00:00										
2-Chlorotoluene	<0.26	0.26	0.050	mg/kg dry	1	B6H1013	08/10/06	08/10/06	EPA 8260B	
4-Chlorotoluene	<0.26	0.26	0.024	mg/kg dry	1	"	"	"	"	
Acetone	<2.1	2.1	0.17	mg/kg dry	1	"	"	"	"	
Allyl chloride	<0.52	0.52	0.045	mg/kg dry	1	"	"	"	"	
Benzene	<0.26	0.26	0.020	mg/kg dry	1	"	"	"	"	
Bromobenzene	<0.26	0.26	0.028	mg/kg dry	1	"	"	"	"	
Bromochloromethane	<0.26	0.26	0.054	mg/kg dry	1	"	"	"	"	
Bromodichloromethane	<0.26	0.26	0.056	mg/kg dry	1	"	"	"	"	
Bromoform	<0.52	0.52	0.057	mg/kg dry	1	"	"	"	"	
Bromomethane	<0.52	0.52	0.15	mg/kg dry	1	"	"	"	"	
Carbon tetrachloride	<0.26	0.26	0.070	mg/kg dry	1	"	"	"	"	
Chlorobenzene	<0.26	0.26	0.040	mg/kg dry	1	"	"	"	"	
Chloroethane	<2.6	2.6	0.36	mg/kg dry	1	"	"	"	"	
Chloroform	<0.26	0.26	0.042	mg/kg dry	1	"	"	"	"	
Chloromethane	<0.26	0.26	0.056	mg/kg dry	1	"	"	"	"	
cis-1,2-Dichloroethene	<0.26	0.26	0.054	mg/kg dry	1	"	"	"	"	
cis-1,3-Dichloropropene	<0.26	0.26	0.035	mg/kg dry	1	"	"	"	"	
Dibromochloromethane	<0.26	0.26	0.055	mg/kg dry	1	"	"	"	"	
Dibromomethane	<0.26	0.26	0.058	mg/kg dry	1	"	"	"	"	
Dichlorodifluoromethane	<0.52	0.52	0.053	mg/kg dry	1	"	"	"	"	
Dichlorofluoromethane	<0.26	0.26	0.047	mg/kg dry	1	"	"	"	"	
Ethyl ether	<0.52	0.52	0.060	mg/kg dry	1	"	"	"	"	
Ethylbenzene	<0.26	0.26	0.035	mg/kg dry	1	"	"	"	"	

Legend Technical Services, Inc

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



88 Empire Drive
St Paul, MN 55103
651.642.1150

American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul MN, 55114

Project: 03-02711 Bituminous Roadway
Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

VOC GCMS 8260B
Legend Technical Services, Inc

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Blended (0603624-01) Soil Received: 08/09/06 12:18 Sampled: 08/09/06 00:00										
Hexachlorobutadiene	<1.0	1.0	0.14	mg/kg dry	1	B6H1013	08/10/06	08/10/06	EPA 8260B	
Isopropylbenzene	<0.26	0.26	0.033	mg/kg dry	1	"	"	"	"	
m,p-Xylene	<0.52	0.52	0.031	mg/kg dry	1	"	"	"	"	
Methyl isobutyl ketone	<0.52	0.52	0.15	mg/kg dry	1	"	"	"	"	
Methyl tert-butyl ether	<0.26	0.26	0.040	mg/kg dry	1	"	"	"	"	
Methylene chloride	<1.0	1.0	0.054	mg/kg dry	1	"	"	"	"	
Naphthalene	<0.52	0.52	0.017	mg/kg dry	1	"	"	"	"	
n-Butylbenzene	<0.26	0.26	0.041	mg/kg dry	1	"	"	"	"	
n-Propylbenzene	<0.26	0.26	0.026	mg/kg dry	1	"	"	"	"	
o-Xylene	<0.26	0.26	0.071	mg/kg dry	1	"	"	"	"	
p-Isopropyltoluene	<0.26	0.26	0.036	mg/kg dry	1	"	"	"	"	
sec-Butylbenzene	<0.26	0.26	0.010	mg/kg dry	1	"	"	"	"	
Styrene	<0.26	0.26	0.030	mg/kg dry	1	"	"	"	"	
tert-Butylbenzene	<0.26	0.26	0.034	mg/kg dry	1	"	"	"	"	
Tetrachloroethene	<0.26	0.26	0.058	mg/kg dry	1	"	"	"	"	
Tetrahydrofuran	<2.1	2.1	0.14	mg/kg dry	1	"	"	"	"	
Toluene	<0.26	0.26	0.019	mg/kg dry	1	"	"	"	"	
trans-1,2-Dichloroethene	<0.26	0.26	0.034	mg/kg dry	1	"	"	"	"	
trans-1,3-Dichloropropene	<0.26	0.26	0.050	mg/kg dry	1	"	"	"	"	
Trichloroethene	<0.26	0.26	0.045	mg/kg dry	1	"	"	"	"	
Trichlorofluoromethane	<0.26	0.26	0.053	mg/kg dry	1	"	"	"	"	
Vinyl chloride	<0.26	0.26	0.040	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	126			78.3-121	%	"	"	"	"	S-GC

Legend Technical Services, Inc

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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St Paul, MN 55103
651.642.1150

American Engineering Testing, Inc.
550 Cleveland Ave N
St. Paul MN, 55114

Project: 03-02711 Bituminous Roadway
Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

VOC GCMS 8260B
Legend Technical Services, Inc

Analyte	Reporting		MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Result	Limit								
Blended (0603624-01) Soil Received: 08/09/06 12:18 Sampled: 08/09/06 00:00										
Surrogate: Dibromofluoromethane	111			78.1-120 %		B6H1013	08/10/06	08/10/06	EPA 8260B	
Surrogate: Toluene-d8	111			77.2-120 %		"	"	"	"	



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Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

DRO/8015B - Quality Control
Legend Technical Services, Inc

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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Batch B6H2105 - Sonication (Wisc DRO)

Blank (B6H2105-BLK1)

Prepared & Analyzed: 08/21/06

Diesel Range Organics

<10

10 mg/kg wet

Surrogate: C-30

13.9

mg/kg wet 16.0

86.9 67.6-130



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Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

TOTAL METALS ANALYSIS - Quality Control
Legend Technical Services, Inc

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	%RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	----------------	---------------	-------

Batch B6H1603 - EPA 3050B

Blank (B6H1603-BLK1)

Prepared: 08/16/06 Analyzed: 08/17/06

Arsenic	<0.50	0.50	mg/kg wet					
Barium	<1.0	1.0	mg/kg wet					
Cadmium	<0.25	0.25	mg/kg wet					
Chromium	<0.50	0.50	mg/kg wet					
Lead	<1.0	1.0	mg/kg wet					
Selenium	<1.0	1.0	mg/kg wet					
Silver	<0.25	0.25	mg/kg wet					



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Date Reported:
August 22, 2006

Batch B6H1605 - EPA 7471A

Blank (B6H1605-BLK1)

Prepared & Analyzed: 08/16/06

Mercury

<0.10

0.10 mg/kg wet



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Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

PAH 8270C - Quality Control
Legend Technical Services, Inc

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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Batch B6H1003 - EPA 3545 ASE Extraction

Blank (B6H1003-BLK1)

Prepared & Analyzed: 08/10/06

2-Chloronaphthalene	<0.33	0.33	mg/kg wet							
2-Methylnaphthalene	<0.33	0.33	mg/kg wet							
Acenaphthene	<0.33	0.33	mg/kg wet							
Acenaphthylene	<0.33	0.33	mg/kg wet							
Anthracene	<0.33	0.33	mg/kg wet							
Benzo (a) anthracene	<0.33	0.33	mg/kg wet							
Benzo (a) pyrene	<0.33	0.33	mg/kg wet							
Benzo (b) fluoranthene	<0.33	0.33	mg/kg wet							
Benzo (g,h,i) perylene	<0.33	0.33	mg/kg wet							
Benzo (k) fluoranthene	<0.33	0.33	mg/kg wet							
Chrysene	<0.33	0.33	mg/kg wet							
Dibenz (a,h) anthracene	<0.33	0.33	mg/kg wet							
Fluoranthene	<0.33	0.33	mg/kg wet							
Fluorene	<0.33	0.33	mg/kg wet							
Indeno (1,2,3-cd) pyrene	<0.33	0.33	mg/kg wet							
Naphthalene	<0.33	0.33	mg/kg wet							
Phenanthrene	<0.33	0.33	mg/kg wet							
Pyrene	<0.33	0.33	mg/kg wet							
Surrogate: 2-Fluorobiphenyl	4.33		mg/kg wet	6.67		64.9	50.8-85.9			
Surrogate: Nitrobenzene-d5	4.34		mg/kg wet	6.67		65.1	49.2-95.3			
Surrogate: Terphenyl-d14	5.35		mg/kg wet	6.67		80.2	61.6-90.8			



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Date Reported:
August 22, 2006

VOC GCMS 8260B - Quality Control Legend Technical Services, Inc

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	%REC	%RPD Limit	%RPD	Notes
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Batch B6H1013 - Volatiles

Blank (B6H1013-BLK1)

Prepared & Analyzed: 08/10/06

1,1,1,2-Tetrachloroethane	<0.25	0.25	mg/kg wet							
1,1,1-Trichloroethane	<0.25	0.25	mg/kg wet							
1,1,2,2-Tetrachloroethane	<0.25	0.25	mg/kg wet							
1,1,2-Trichloroethane	<0.25	0.25	mg/kg wet							
1,1,2-Trichlorotrifluoroethane	<0.25	0.25	mg/kg wet							
1,1-Dichloroethane	<0.25	0.25	mg/kg wet							
1,1-Dichloroethene	<0.25	0.25	mg/kg wet							
1,1-Dichloropropene	<0.25	0.25	mg/kg wet							
1,2,3-Trichlorobenzene	<0.50	0.50	mg/kg wet							
1,2,3-Trichloropropane	<0.25	0.25	mg/kg wet							
1,2,4-Trichlorobenzene	<0.50	0.50	mg/kg wet							
1,2,4-Trimethylbenzene	<0.25	0.25	mg/kg wet							
1,2-Dibromo-3-chloropropane	<0.50	0.50	mg/kg wet							
1,2-Dibromoethane (EDB)	<0.25	0.25	mg/kg wet							
1,2-Dichlorobenzene	<0.25	0.25	mg/kg wet							
1,2-Dichloroethane	<0.25	0.25	mg/kg wet							
1,2-Dichloropropane	<0.25	0.25	mg/kg wet							
1,3,5-Trimethylbenzene	<0.25	0.25	mg/kg wet							
1,3-Dichlorobenzene	<0.25	0.25	mg/kg wet							
1,3-Dichloropropane	<0.25	0.25	mg/kg wet							
1,4-Dichlorobenzene	<0.25	0.25	mg/kg wet							
2,2-Dichloropropane	<0.50	0.50	mg/kg wet							
2-Butanone	<2.0	2.0	mg/kg wet							
2-Chlorotoluene	<0.25	0.25	mg/kg wet							
4-Chlorotoluene	<0.25	0.25	mg/kg wet							
Acetone	<2.0	2.0	mg/kg wet							
Allyl chloride	<0.50	0.50	mg/kg wet							
Benzene	<0.25	0.25	mg/kg wet							
Bromobenzene	<0.25	0.25	mg/kg wet							
Bromochloromethane	<0.25	0.25	mg/kg wet							
Bromodichloromethane	<0.25	0.25	mg/kg wet							



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Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

VOC GCMS 8260B - Quality Control

Legend Technical Services, Inc

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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Batch B6H1013 - Volatiles

Blank (B6H1013-BLK1)

Prepared & Analyzed: 08/10/06

Bromoform	<0.50	0.50	mg/kg wet
Bromomethane	<0.50	0.50	mg/kg wet
Carbon tetrachloride	<0.25	0.25	mg/kg wet
Chlorobenzene	<0.25	0.25	mg/kg wet
Chloroethane	<2.5	2.5	mg/kg wet
Chloroform	<0.25	0.25	mg/kg wet
Chloromethane	<0.25	0.25	mg/kg wet
cis-1,2-Dichloroethene	<0.25	0.25	mg/kg wet
cis-1,3-Dichloropropene	<0.25	0.25	mg/kg wet
Dibromochloromethane	<0.25	0.25	mg/kg wet
Dibromomethane	<0.25	0.25	mg/kg wet
Dichlorodifluoromethane	<0.50	0.50	mg/kg wet
Dichlorofluoromethane	<0.25	0.25	mg/kg wet
Ethyl ether	<0.50	0.50	mg/kg wet
Ethylbenzene	<0.25	0.25	mg/kg wet
Hexachlorobutadiene	<1.0	1.0	mg/kg wet
Isopropylbenzene	<0.25	0.25	mg/kg wet
m,p-Xylene	<0.50	0.50	mg/kg wet
Methyl isobutyl ketone	<0.50	0.50	mg/kg wet
Methyl tert-butyl ether	<0.25	0.25	mg/kg wet
Methylene chloride	<1.0	1.0	mg/kg wet
Naphthalene	<0.50	0.50	mg/kg wet
n-Butylbenzene	<0.25	0.25	mg/kg wet
n-Propylbenzene	<0.25	0.25	mg/kg wet
o-Xylene	<0.25	0.25	mg/kg wet
p-Isopropyltoluene	<0.25	0.25	mg/kg wet
sec-Butylbenzene	<0.25	0.25	mg/kg wet
Styrene	<0.25	0.25	mg/kg wet
tert-Butylbenzene	<0.25	0.25	mg/kg wet
Tetrachloroethene	<0.25	0.25	mg/kg wet
Tetrahydrofuran	<2.0	2.0	mg/kg wet



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VOC GCMS 8260B - Quality Control
Legend Technical Services, Inc

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	------	---------------	-------

Batch B6H1013 - Volatiles

Blank (B6H1013-BLK1)

Prepared & Analyzed: 08/10/06

Toluene	<0.25	0.25	mg/kg wet							
trans-1,2-Dichloroethene	<0.25	0.25	mg/kg wet							
trans-1,3-Dichloropropene	<0.25	0.25	mg/kg wet							
Trichloroethene	<0.25	0.25	mg/kg wet							
Trichlorofluoromethane	<0.25	0.25	mg/kg wet							
Vinyl chloride	<0.25	0.25	mg/kg wet							
Surrogate: 4-Bromofluorobenzene	66.0		ug/L	61.0		108	78.3-121			
Surrogate: Dibromofluoromethane	67.2		ug/L	61.0		110	78.1-120			
Surrogate: Toluene-d8	66.5		ug/L	61.0		109	77.2-120			



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Project Number: 03-02711
Project Manager: Ms. Kirsten Thompson

Date Reported:
August 22, 2006

Notes and Definitions

S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

< Less than value listed

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference



9685

ADDRESS:

#0603624

PAGE 1 OF 1

AET JOB NUMBER 03-0271
 JOB NAME/LOCATION Bituminous Roadway
 AET PROJECT MANAGER Kirsten Thompson
 SEND REPORT TO K. Thompson

SAMPLED BY (PRINT): *John Thompson*
 SAMPLER SIGNATURE: *[Signature]*
 REQUESTED TURNAROUND TIME: ☒ NORMAL ☐ RUSH
 DATE NEEDED BY: *2 Wk TH*

PRESERVATIVES	UNPRESERVED	FIELD FILTERED Y/N
	MeOH	
	HCL	
	H ₂ SO ₄	
	HNO ₃	

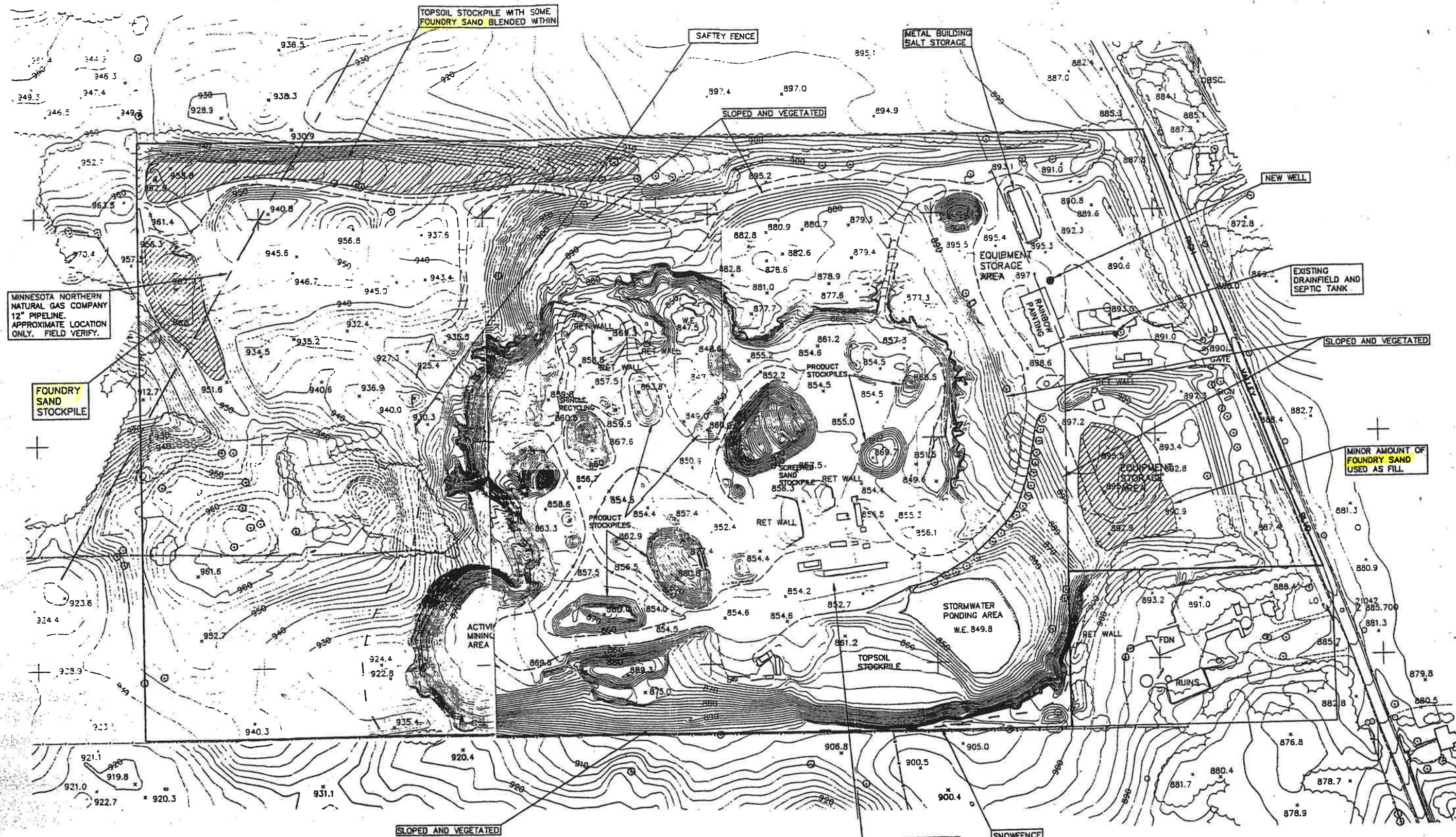
ANALYSIS	REMARKS
the voc pH 8000 metals	

[illegible]

no. 1000
- Vagale
Blanc
Ficelle
goudron

located within the City's regulatory authority. Bituminous Roadways shall post an advisory to all drivers to the same effect at exits from the site.

12. The site shall be kept clear, at all times, of windblown debris.
13. The foundry sand in the northwest berm shall remain in its current location except as it is used. It is to be used in its entirety within the next five years. The foundry sand in the southeast berm will be left undisturbed.
14. Bituminous Roadways shall bring no additional foundry sand onto the site.
15. The berms which cover the foundry sand shall be maintained in vegetative cover to control erosion of the foundry sand.
16. The stockpiled MOSS, shingle scrap, recycled asphalt, and concrete pavement will not be disposed at the site.
17. Stock piles of recycled asphalt, MOSS, shingles, and concrete shall be limited in size to amount that will be used that year.
18. Backfill material shall be either clean fill material that was stripped off the site or other clean fill material which is brought in from offsite.
19. Spent bag house bags will be disposed of in a lined landfill permitted or approved to accept such materials.
20. A restoration bond shall be in an amount to cover the costs of restoration of the site, as determined by the City Engineer, prior to City Council approval.
21. An annual Excavation Permit shall be required to be obtained for the operation.
22. Bituminous Roadways shall obtain and maintain the necessary licenses and approvals from Dakota County. Terms and conditions of the license and approval shall be hereby incorporated into this City approval.
23. Bituminous Roadways shall obtain and maintain the necessary Minnesota Pollution Control Agency permits including two air quality permits and one industrial storm water permit. The terms and conditions of those permits shall be hereby incorporated into this City approval.
24. All reports which are required to be submitted to Dakota County under the two Hazardous Waste Generators License and the one Processing License shall also be submitted to the City, including the required annual and quarterly reports.
25. All reports which are required to be submitted to the Minnesota Pollution Control Agency shall also be submitted to the City, including annual emissions inventory report, semi-annual deviations report, annual compliance certification report, and annual report.



NOTES:

1. Base map by Martinez Corporation, compiled by photogrammetric methods from photography dated July 22, 1998.
2. Boundary from original plans by McKie and Associates.

I HEREBY CERTIFY THAT THIS PLAN OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

GERALD M. SUNDE, P.E.
DATE 12/23/98 REG. NO. 8734

DATE	REVISION
12/23/98	1999 PERMIT REISSUANCE

BITUMINOUS ROADWAYS, INC.
INVER GROVE HEIGHTS GRAVEL PIT

Sunde Engineering, Inc.
4200 West Old Shakopee Road, Suite 230
Bloomington, Minnesota 55437
(612) 881-3244

**1998 EXISTING
CONDITIONS**

C1
1 of 3

100 0 100 200
SCALE IN FEET

**Bituminous Roadways, Inc.
Final Question/Answer Report**

**Prepared for
City of Inver Grove Heights**

by

Barr Engineering Company

dated

September 10, 1999

Q. 1. The groundwater level elevation for the site is reported from the Geologic Atlas of Dakota County. Is data available for the water level in the water supply well on the eastern portion of the site?

A. 1. The records for the wells installed in the pit in 1980 and on the east side of the site in 1998 indicates that groundwater elevation was measured at approximately 800 feet above mean sea level (M.S.L.) in both wells. This correlates reasonably well with the information that Barr obtained from the Geologic Atlas of Dakota County which indicates that groundwater elevation at the site is between 800 and 850 feet above M.S.L. The Geologic Atlas of Dakota County also indicates that groundwater flow at the site is eastward toward the Mississippi River and has a gradient (slope) of 0.02 feet per foot (2 feet per 100 feet).

For comparison purposes, the bottom of the sand and gravel mining operation at the site is at an elevation of approximately 850 feet above M.S.L. Therefore, available information indicates that the groundwater flow is east towards the Mississippi River and that groundwater elevation at the site is within approximately 50 feet of the current bottom of the sand and gravel pit.

Q. 2. Were leach tests performed on the foundry sand in the berms on the northwest and southeast sides of the pit?

A. 2. Bituminous Roadways Inc. (Bituminous Roadways) blends the foundry sand with rubble concrete at a ratio of 1: 10 (foundry sand : concrete). The blend is crushed and utilized as roadbase aggregate. Bituminous Roadways does not use foundry sand as an ingredient in the hot mix asphalt it produces. Bituminous Roadways indicates that foundry sand was last brought to the site in 1996 and that there is currently approximately 25,000 to 30,000 cubic yards of foundry sand at the site. Almost all of the foundry sand at

the site is in the northwest berm. Bituminous Roadways estimates that only approximately 24 cubic yards of foundry sand is contained in the southeast berm.

Bituminous Roadways estimates that all of the foundry sand in the northwest berm will be utilized within the next 5 to 6 years. Bituminous Roadways has no plans to bring in additional foundry sand to the site.

Testing of the foundry sand brought to the site was conducted periodically for many years. These tests results are on file at Bituminous Roadways. Barr has reviewed the most recent of these test results (conducted in 1997) from the two foundries which indicate that the foundry sand is below hazardous waste levels.

Additionally, in 1998 four samples were collected from the foundry sand berm located at the northwest portion of the site under the direction of Dakota County staff (no samples were collected from the southeast berm because of the small quantity of foundry sand in the berm). These four samples were analyzed by Braun Intertec, Inc. for eight metals using the toxicity characteristics leaching procedure (TCLP). The results of this testing indicated that the material was below hazardous waste levels.

Q. 3. Were the leach tests adequately conducted on the foundry sand? Are the results below hazardous waste limits? Does the foundry sand pose a threat to human health or the environment? Is the vegetative cover on the foundry sand stockpile adequate?

A. 3. The contaminants of concern in foundry sand vary depending upon the processes that are used at the foundry. Potential contaminants of concern in foundry sand typically include heavy metals and phenols. The processes that can influence the characteristics of the foundry sand are the type of metal being poured (iron, steel, aluminum, brass/bronze), the type of casting process (sand casting, investment casting), the type of furnace (induction, electric arc, cupola) and the type of finishing process (grinding, blast, cleaning, coating). The foundry sand at the site came from two Minneapolis foundries (Smith and Prospect Foundries). These two foundries both pour iron, use sand casting, have electric induction furnaces and perform finish grading. Published information was not researched regarding the expected characteristics of foundry sands from foundries such as these because direct measurements can be obtained through testing of the foundry sand at the site.

Barr has reviewed the four TCLP test results from samples collected from the foundry sand in the northwest berm in 1998. Bituminous Roadways has indicated that all of the four samples were collected from the northwest foundry sand berm and that no samples were collected from the southeast berm.

However, Bituminous Roadways also indicated that only a very small amount of foundry sand is contained

in the southeast berm. The four samples were collected by Braun Intertec staff under the direction of Dakota County staff on-site. Braun Intertec performed the analysis. Barr has reviewed the data and data quality information (analytical method, holding times, matrix spikes) for these four samples and have concluded that the test results are accurate.

The test results indicate that the foundry sand is below the TCLP criteria used to determine whether the material is a characteristic hazardous waste for metals. However, there are numerous wastes in Minnesota that are not classified as hazardous but still are required to be disposed of in a lined landfill because they contain other constituents of concern. For example, there are potentially additional metals of concern in foundry sand (namely copper, nickel and zinc) than were analyzed for in the above referenced four TCLP tests.

The TCLP test results from the northwest stockpile indicate the foundry sand is not hazardous but sometimes contains cadmium measured at a concentration above the drinking water standard. Therefore, although Barr believes that it is unlikely that the foundry sand has adversely affected groundwater at the site, Barr recommends that the two site wells be tested as discussed in answer #5 below.

Barr observed the vegetative cover on the northwest foundry sand berm during the site visit conducted on May 20, 1999. Most of the berm surface was adequately vegetated; however, there were a few areas where minor erosion had occurred. Barr recommends that these areas be regraded and reseeded as soon as possible in 1999.

Q. 4. Should the foundry sand stockpile be limited as to its size and location?

A. 4. Foundry sand brought to the site was not used in asphalt production as fast as it was brought in. All of the foundry sand not used in asphalt production has been temporarily stored in a stockpile on the northwest portion of the site except for approximately 24 cubic yards contained in the southeast berm. Bituminous Roadways plans to utilize all of the stockpiled foundry sand from the northwest berm within 5 to 6 years. Barr observed no problems with the size or location of the current foundry sand stockpiles during the site visit on May 20, 1999.

Q. 5. The water supply well on the eastern portion of the site has been tested for petroleum-related compounds. Since a metal was detected in the leach test of the foundry sand at a concentration above the State Health Risk Limit for groundwater (cadmium), should metals also be tested in the well? Should other indicator-type parameters like conductivity, pH, etc., also be analyzed?

- A. 5. The testing performed on the well installed in 1998 on the eastern portion of the site was conducted under the direction of Dakota County staff. Samples were collected by Dakota County staff and the analysis was performed by Spectrum Labs, Inc. The analyses conducted were gasoline and diesel range organics compounds, alkalinity, laboratory pH, specific conductivity, appearance and volatile organics compounds (Minnesota Department of Health 465E list). Barr's review of the data and data quality information indicates that the results are accurate. None of the results showed any indication of contamination. However, tests were not conducted for metals and phenolic compounds which are potentially of concern in foundry sand.

Given the relatively low levels of contaminants measured in the foundry sand and the generally low mobility in soils and groundwater of the contaminants of concern, Barr believes it is unlikely that the foundry sand stockpiles have adversely affected groundwater at the site. However, a direct approach to determining if the foundry sand stockpiles have had an adverse effect on groundwater is to collect and analyze groundwater samples. Since the two wells at the site are downgradient (east) of the largest foundry sand stockpile, Barr recommends that samples from each of these wells be collected and analyzed for dissolved metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, copper, nickel, zinc), total phenol, diesel range organics, gasoline range organics, pH, electric conductivity and alkalinity.

Barr recommends that this monitoring be conducted at these two wells once per year for two years in different seasons to allow for seasonal fluctuations. If no contamination is detected, Barr recommends that sampling be scaled back to once every other year.

- Q. 6. Will additional foundry sand be brought to the site in the future after the current stockpile is exhausted?

- A. 6. Bituminous Roadways has indicated that they have no plans to bring additional foundry sand to the site once the current stockpile on the northwest portion of the site is used. It is planned that the foundry sand contained in the berm on the southeast portion of the site will remain at that location.

- Q. 7. What environmental concerns are there with stockpiling and reusing manufactured organic shingle scrap, glass, recycled asphalt and concrete pavement? Is there an environmental concern regarding the stockpile size and storage time for these materials. Will any of these materials be disposed of at the site?

- A. 7. Bituminous Roadways has indicated that none of the materials mentioned (shingle scrap, glass, recycled asphalt, and concrete pavement) will be disposed of at the site. All of these materials are added to the hot

Foundry Sand Sampling and Analysis Investigation Report

Bituminous Roadways

Prepared for

**Bituminous
Roadways, Inc.**



Wenck

November 2000

Foundry Sand Sampling and Analysis Investigation Report

Bituminous Roadways

Wenck File #0425-08

Prepared for:

BITUMINOUS ROADWAYS, INC.
9050 Jefferson Trail
Inver Grove Heights, Minnesota 55077

Prepared by:

WENCK ASSOCIATES, INC.
360 North Robert Street
Suite 414
St. Paul, Minnesota 55101
(651) 228-1939

November 2000



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TABLES

1	Stockpile Characterization Data –Metals by Toxic Characterization Leaching Procedure, Mercury, Total Phenolics, and DRO
2	Stockpile Characterization Data – Metals by Synthetic Precipitation Leaching Procedure

FIGURE

1	Site Location Map
---	-------------------

APPENDIX

A	Site Photographs
B	Pace Analytical, Inc. Laboratory Data

1.0 Foundry Sand Investigation

1.1 BACKGROUND

A stockpile of approximately 30,000 cubic yards of foundry sand imported from the Prospect Foundry and Smith Foundry is located at the Bituminous Roadways aggregate mining and processing facility in the City of Inver Grove Heights (Figure 1). The stockpile was placed at the location in approximately 1987. The intention was to use the material as an aggregate substitute, thereby minimizing the use of virgin sands from their aggregate resource pit.

The stockpile is presently stabilized by a healthy vegetative cover of alfalfa and grass.

1.2 OBJECTIVES

The objectives of this investigation were:

- To collect and analyze stockpile samples that will characterize the foundry wastes located at the Bituminous Roadways, Inc. Inver Grove Heights facility.
- To ensure that the number and spatial location of samples collected during this investigation are based on a reasonable, statistically based approach to be representative of the overall characteristic of the material.
- To generally characterize the potential risk to human health, welfare and the environment resulting from the foundry wastes.

1.3 HISTORIC INVESTIGATIONS

In May 1998, Braun Intertec Corporation collected samples from the stockpile and analyzed them for Toxic Characteristic Leaching Procedure (TCLP). Results were presented in a May 28, 1998 letter from P. Terhaar (Braun) to M. Jorgenson (Bituminous Roadways) and included as part of Wenck's Foundry Sand Sampling and Analysis Work Plan dated August 2000. All detections were below the regulatory limit at which the material would be considered hazardous for the toxicity characteristic.

In September 1999, Wenck conducted a water quality investigation to screen surface and groundwater for several parameters including the 8 RCRA metals, copper, nickel, zinc, diesel range organics (DRO), gasoline range organics (GRO), pH, conductivity, and alkalinity. Results indicated that the foundry sands had not impacted surface water or groundwater. The sampling event was repeated in August 2000. Those results are also included in Wenck's above-mentioned Work Plan dated August 2000.

1.4 SOIL SAMPLE TARGET ANALYTES

Based on previous results and the nature of foundry wastes, the parameters of concern for this investigation included the following metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, copper, nickel and zinc. DRO and total phenolics were also parameters of concern. With regard to metals, each sample was analyzed for total metals and metals utilizing a synthetic precipitation leaching procedure (SPLP), which determines the degree of mobility that the metals may have under non-landfill conditions.

1.5 SAMPLING LOCATIONS

The stockpile of foundry sands is approximately 150 by 400 feet, with a height of 20 to 25 feet. Since the maximum heights are located along the long axis (centerline) of the pile, the sample locations were selected along this axis to maximize the depth profiling that is achieved with each individual sample location. An auger was advanced at each sampling location to obtain soil samples (see next section for more detailed discussion of sampling methods). Grab samples were obtained from the 4-, 8-, 12-, and 16-foot depths and composited into one sample for laboratory analysis, thus providing a representative vertical profile at each sampling location. Photographs of the foundry sand pile and representative sampling locations are included as Appendix A.

1.6 SAMPLE COLLECTION METHODS

The four samples were collected using truck-mounted, 4-inch (nominal) diameter flight auger equipment. This equipment was driven onto the top of the pile to collect the samples described in the previous section. Augers were advanced to the four desired sample depths to obtain the four grab samples for each four-part composite sample. As the auger reached each sample depth, two cups of sand were collected from the flight auger cuttings and placed in a stainless steel bowl. When the four equal-volume (two cup) grab samples were placed into the bowl, the four grab samples were thoroughly mixed using a stainless steel spoon. After mixing, the samples for laboratory analysis were collected from the mixed sands.

1.7 ANALYTICAL METHODS

Each of the four samples collected were analyzed by the four methods described below.

1.7.1 Total Metals

All soil samples were analyzed using EPA Method 6010 employing Inductively Coupled Plasma (ICP) with the exception of mercury, which will be analyzed by Cold Vapor Atomic Absorption (CVAA), EPA Method 7470A/7471A. One 8-ounce amber-glass jar of soil was collected for each sample. No sample preservation was required other than to cool the samples to 4°C.

1.7.2 Synthetic Precipitation Leaching

The SPLP was conducted using SW846 Method 1312. A separate 8-ounce amber-glass jar was collected for each sample. No sample preservation was required other than to cool the samples to 4°C.

1.7.3 Diesel Range Organics (DRO)

Samples for DRO analyses were collected using an EnCore™ sampling unit (consistent with the revised EPA SW-846 5035 sampling methodology) and submitted for Wisconsin Modified DRO analysis. Samples were cooled on ice to 4°C as above.

1.7.4 Total Phenolics

Total phenolics were analyzed by EPA Method 420.2/9066. A separate 2-ounce glass jar was collected for each sample. No sample preservation was required other than to cool the samples to 4°C.

1.8 FIELD SCREENING

No organic vapor monitoring was performed. Field observations were recorded as noted in the sample collection protocols. No significant field observations were made. The foundry sands were dark in color, and had the appearance of a rich sandy loam soil high in organics.

1.9 QUALITY ASSURANCE/QUALITY CONTROL PLAN

Quality assurance/quality control (QA/QC) procedures were of prime importance to this investigation to ensure quality of the data collected, and thus the interpretations made from the data. The Wenck corporate QA/QC program, which mandates the use of industry-wide accepted procedures and practices, was followed throughout the investigation.

Project-specific measures taken included:

- One field rinse blank sample. The blank duplicate will verify the reliability of the soil sample collection procedures to assure that no contaminants were introduced as a function of the sampling methodology. Analysis included the four analytical methods described in Section 1.7.

2.0 Analytical Results

Table 1 shows concentrations for soil samples for metals by TCLP, mercury, total phenolics, and DRO. Laboratory results did not exceed the Tier 1 Soil Reference Values (SRVs) or the Soil Leaching Values (SLVs). Pace Analytical Services, Inc. laboratory data are included as Appendix B.

No SRV or SLV exists for DRO, however, if Minnesota Pollution Control Agency Leaking Underground Storage Tank guidelines are used (50 mg/kg) there were DRO exceedances in samples from FS-1, FS-2, and FS-4. It must be emphasized, however, that the DRO guideline is not based on human health or ecological risk evaluation, but rather derived as a field “action level” for the purpose of the Leaking Underground Storage Tank (LUST) program. MPCA attempts to quantify DRO risk-based cleanup standards have generally yielded numbers higher than 50 mg/kg.

Table 2 shows analytical results for metals by Synthetic Precipitation Leaching Procedure (SPLP) and comparisons to State of Minnesota Health Risk Levels (HRLs) for groundwater. This laboratory procedure is an indication of the degree of mobility of these metals under non-landfill conditions, that is, conditions more representative of rainwater infiltration. Metals by SPLP are reported in micrograms per liter (ug/l) and so are compared to Health Risk Limits published by the Minnesota Department of Health rather than the SRVs and SLVs used for TCLP. As with the TCLP analysis of the same soils, there were no exceedances of samples analyzed by SPLP.

3.0 Recommendations

Laboratory analysis of the characteristics of the 30,000 cubic yards of foundry sand indicated that there were no exceedances of Tier 1 Soil Reference Values or Soil Leaching Values detected in the soil samples. Therefore, the material does not pose a threat of leaching metals compounds or phenolic compounds into surfacewater or groundwater if it remains at the site. The best indication of this is that the material did not leach high concentration of metals even when tested by strongly acidic conditions (i.e., the TCLP analyses of previous sampling work).

Three of the four samples had DRO exceedances when compared to MPCA underground storage tank guidelines. We recommend that the soil be land applied to a thickness of approximately six inches to promote more rapid microbial degradation and natural attenuation of these residual hydrocarbons, however, from a standpoint of risk-based decision-making, no action is necessary based on the detected concentrations and the current land use scenario.

Based on the information in this report, no additional investigation is recommended.

Table 1
Stockpile Characterization Data - Toxic Characterization Leaching Procedure and Others
Foundry Waste Stockpile
Bituminous Roadways, Inc. Inver Grove Heights Facility

Metals	Soil Leaching		Tier 1 Soil		FS-1		FS-2		FS-3		PRL		FS-4		PRL Units	
	Value	Reference Value														
Arsenic	25	10			4.8	1.33	ND	1.33	ND	1.35	ND	1.35	ND	1.31	mg/kg	
Barium	12500	1200			34.5	2.66	48.2	2.66	60	2.69	58.2	2.69	58.2	2.62	mg/kg	
Cadmium	250	35			ND	0.266	ND	0.266	ND	0.269	ND	0.269	ND	0.262	mg/kg	
Chromium	100000	34300			25.5	2.66	84.1	2.66	27.7	2.69	55.5	2.69	55.5	2.62	mg/kg	
Copper	9000	100			43.7	1.33	90.7	1.33	28.1	1.35	57.2	1.35	57.2	1.31	mg/kg	
Lead	700	400			10.7	0.798	8.27	0.798	62	0.808	15.3	0.808	15.3	0.796	mg/kg	
Mercury	2	0.7			0.151	0.0219	ND	0.0201	0.027	0.0213	0.0278	0.0213	0.0278	0.0206	mg/kg	
Nickel	3000	520			22.4	5.32	115	5.32	21.4	5.39	59.1	5.39	59.1	5.24	mg/kg	
Selenium	1250	170			ND	1.33	ND	1.33	ND	1.35	ND	1.35	ND	1.31	mg/kg	
Silver	1250	170			ND	2.66	ND	2.66	ND	2.69	ND	2.69	ND	2.62	mg/kg	
Zinc	70000	8700			28.4	5.32	33.2	5.32	31.9	5.39	29.1	5.39	29.1	5.24	mg/kg	
Phenolics Total in Soil																
Phenol	26800	1100			ND	27.4	6.18	5.49	ND	5.39	ND	5.39	ND	5.37	mg/kg	
GC Semivolatiles																
Diesel Range Organic Compounds		50*			150	32	140	6.5	45	6.1	180	6.1	180	7.4	mg/kg	

* = MPCA Leaking Underground Storage Tank guidelines

Table 2

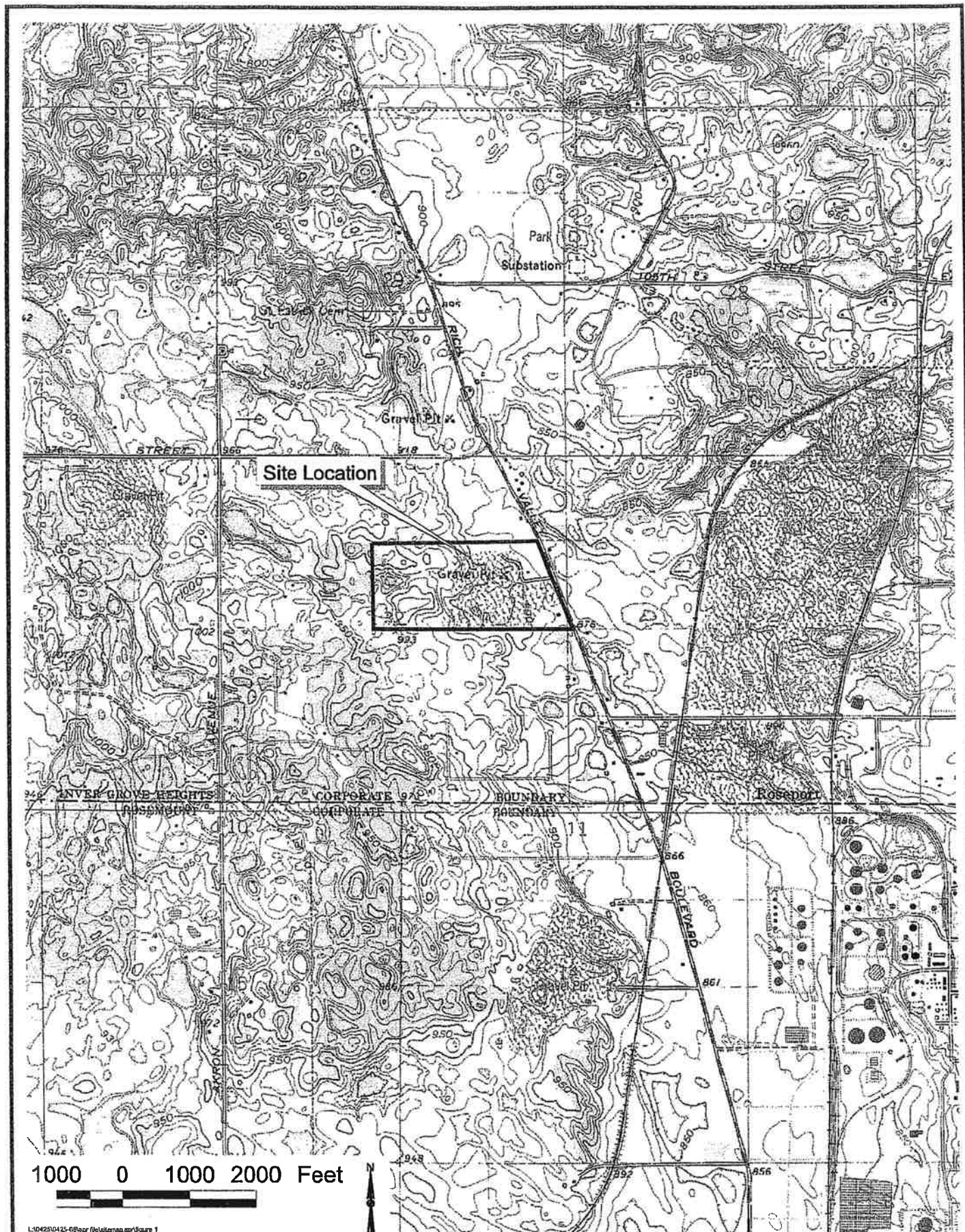
Stockpile Characterization Data - Metals by Synthetic Precipitation Leaching Procedure

Foundry Waste Stockpile
Bituminous Roadways, Inc., Inver Grove Heights Facility

Metals	Minnesota		Federal MCL	Health Risk Level	FS-1 PRL	FS-2 PRL	FS-3 PRL	FS-4 PRL	Units
SPLP on Solid, ICP Metals									
Arsenic	50 ⁽¹⁾				ND	ND	15	ND	15 ug/l
Barium		2000			ND	ND	30	127	30 ug/l
Cadmium		4			ND	ND	3	ND	3 ug/l
Chromium		20000			ND	ND	30	ND	30 ug/l
Copper	1000				ND	ND	15	28.2	15 ug/l
Lead	15 ⁽¹⁾⁽²⁾				ND	ND	9	118	9 ug/l
Mercury	2				ND	ND	0.8	ND	0.8 ug/l
Nickel		100			ND	ND	60	ND	60 ug/l
Selenium		30			ND	ND	15	ND	15 ug/l
Silver		30			ND	ND	30	ND	30 ug/l
Zinc		2000			ND	ND	60	60.2	60 ug/l

⁽¹⁾ = Federal Action Level⁽²⁾ = Lead (Pb) concentration sampled at the tap

MCL = Maximum Contaminant Level



BITUMINOUS ROADWAYS - Inver Grove Heights

Site Location Map

Wenck
Wenck Associates, Inc. 1800 Pioneer Creek Center
Environmental Engineers Maple Plain, MN 55359-0429

NOV 2000

Figure 1

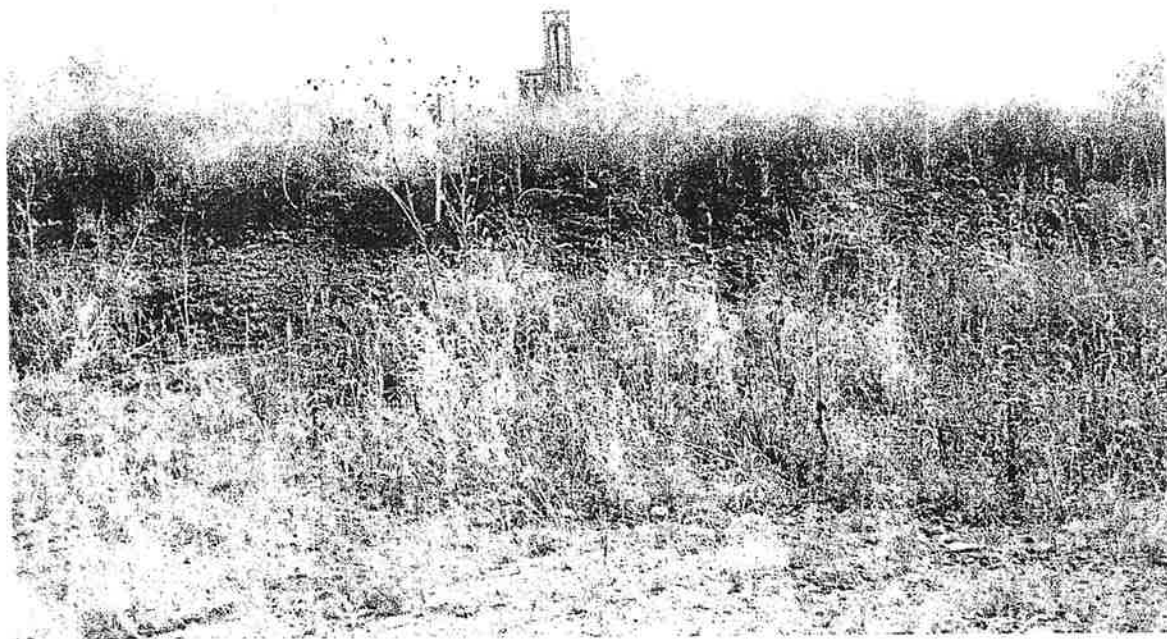


Photo 1: View facing east along axis of foundry sand pile. Marker Station 00 in the foreground.



Photo 2: View of flight auger at first sampling location.

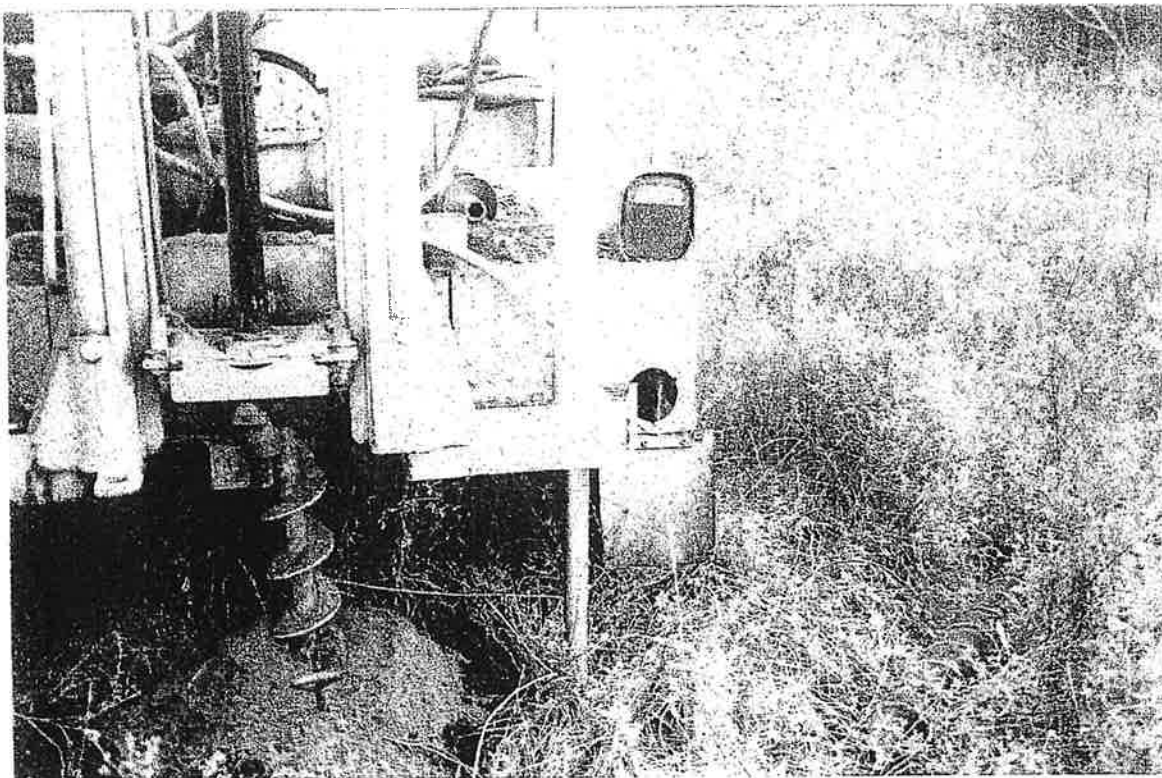


Photo 3: View of flight auger at sampling location #4. Underlying native soils (brown, sandy) are visible having been encountered at approximately 13.5' below grade.

Appendix B

Pace Analytical, Inc. Laboratory Data



Pace Analytical Services, Inc.
 1700 Elm Street, Suite 200
 Minneapolis, MN 55414
 Phone: 612.607.1700
 Fax: 612.607.6444

DATE: 11/13/00
 PAGE: 1

Rock Associates, Inc.
 100 N. Robert St. Ste. 414
 Paul, MN 55101

Pace Project Number: 1037418
 Client Project ID: Bituminous Roadways

Client: Mr. Joe Otte
 Phone: (651)228-1939

All results are reported on a dry weight basis

Sample No:	102315520	Date Collected:	10/04/00	Matrix:	Soil
Parent Sample ID:	FS-1	Date Received:	10/05/00		

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

Organics Prep

Percent Moisture	Method:		Prep Method:
Percent Moisture	8.8	%	10/09/00 JMZ

Metals

PLP on Solid, ICP Metals	Method: EPA 6010	Prep Method: EPA 3010
Arsenic	ND ug/l 15	10/23/00 BDA 7440-38-2
Barium	ND ug/l 30	10/23/00 BDA 7440-39-3
Cadmium	ND ug/l 3	10/23/00 BDA 7440-43-9
Chromium	ND ug/l 30	10/23/00 BDA 7440-47-3
Copper	ND ug/l 15	10/23/00 BDA 7440-50-8
Lead	ND ug/l 9	10/23/00 BDA 7439-92-1
Nickel	ND ug/l 60	10/23/00 BDA 7440-02-0
Selenium	ND ug/l 15	10/23/00 BDA 7782-49-2
Silver	ND ug/l 30	10/23/00 BDA 7440-22-4
Zinc	ND ug/l 60	10/23/00 BDA 7440-66-6
Date Digested		10/13/00

Metals, Trace ICP	Method: EPA 6010	Prep Method: EPA 3050
Arsenic	4.8 mg/kg 1.33	10/23/00 BDA 7440-38-2
Barium	34.5 mg/kg 2.66	10/23/00 BDA 7440-39-3
Cadmium	ND mg/kg 0.266	10/23/00 BDA 7440-43-9
Chromium	25.5 mg/kg 2.66	10/23/00 BDA 7440-47-3
Copper	43.7 mg/kg 1.33	10/23/00 BDA 7440-50-8
Lead	10.7 mg/kg 0.798	10/23/00 BDA 7439-92-1
Nickel	22.4 mg/kg 5.32	10/23/00 BDA 7440-02-0
Selenium	ND mg/kg 1.33	10/23/00 BDA 7782-49-2

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DATE: 11/13/00
PAGE: 2

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

Sample No: 102315520
Sample ID: FS-1

Date Collected: 10/04/00
Date Received: 10/05/00

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Silver	ND	mg/kg	2.66	10/23/00	BDA	7440-22-4	
Zinc	28.4	mg/kg	5.32	10/23/00	BDA	7440-66-6	
Date Digested				10/16/00			
PLP, Mercury		Method: EPA 7470			Prep Method: EPA 7470		
Mercury	ND	ug/l	0.8	10/17/00	BDA	7439-97-6	
Mercury, CVAAS		Method: EPA 7471			Prep Method: EPA 7470		
Mercury	0.151	mg/kg	0.0219	10/17/00	BDA	7439-97-6	
Chemistry							
Phenolics Total. in Soil		Method: EPA 420.1 Modified			Prep Method: EPA 420.1 Modified		
Phenol	ND	mg/kg	27.4	10/09/00	JB1	108-95-2	
PLP on Solid, ICP Metals		Method: EPA 6010			Prep Method: EPA 1312		
Date Prepared				10/10/00			
PLP, Mercury		Method: EPA 7470			Prep Method: EPA 1311		
Date Prepared				10/12/00			
Semivolatiles							
WI DRO in Soil		Method: TPH DRO Wisconsin			Prep Method: TPH DRO WI extracti		
Diesel Range Organic Compounds	150	mg/kg	32	10/18/00	BM1		
n-Triacontane (S)	57	%		10/18/00	BM1	638-68-6	
Date Extracted				10/12/00			

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DATE: 11/13/00
PAGE: 3

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

Ice Sample No:	102315538	Date Collected:	10/04/00	Matrix:	Soil
Test Sample ID:	FS-2	Date Received:	10/05/00		

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

Organics Prep

Percent Moisture	Method:		Prep Method:
Percent Moisture	9.5	%	10/09/00 JMZ

Metals

SPLP on Solid, ICP Metals	Method: EPA 6010	Prep Method: EPA 3010
Arsenic	ND ug/l 15	10/23/00 BDA 7440-38-2
Barium	ND ug/l 30	10/23/00 BDA 7440-39-3
Cadmium	ND ug/l 3	10/23/00 BDA 7440-43-9
Chromium	ND ug/l 30	10/23/00 BDA 7440-47-3
Copper	ND ug/l 15	10/23/00 BDA 7440-50-8
Lead	ND ug/l 9	10/23/00 BDA 7439-92-1
Nickel	ND ug/l 60	10/23/00 BDA 7440-02-0
Selenium	ND ug/l 15	10/23/00 BDA 7782-49-2
Silver	ND ug/l 30	10/23/00 BDA 7440-22-4
Zinc	ND ug/l 60	10/23/00 BDA 7440-66-6
Date Digested		10/13/00

Trace Metals, Trace ICP	Method: EPA 6010	Prep Method: EPA 3050
Arsenic	ND mg/kg 1.34	10/23/00 BDA 7440-38-2
Barium	48.2 mg/kg 2.68	10/23/00 BDA 7440-39-3
Cadmium	ND mg/kg 0.268	10/23/00 BDA 7440-43-9
Chromium	84.1 mg/kg 2.68	10/23/00 BDA 7440-47-3
Copper	90.7 mg/kg 1.34	10/23/00 BDA 7440-50-8
Lead	8.27 mg/kg 0.804	10/23/00 BDA 7439-92-1
Nickel	115 mg/kg 5.36	10/23/00 BDA 7440-02-0
Selenium	ND mg/kg 1.34	10/23/00 BDA 7782-49-2
Silver	ND mg/kg 2.68	10/23/00 BDA 7440-22-4
Zinc	33.2 mg/kg 5.36	10/23/00 BDA 7440-66-6
Date Digested		10/16/00

SPLP, Mercury	Method: EPA 7470	Prep Method: EPA 7470
Mercury	ND ug/l 0.8	10/17/00 BDA 7439-97-6
Mercury, CVAAS	Method: EPA 7471	Prep Method: EPA 7470
Mercury	ND mg/kg 0.0201	10/17/00 BDA 7439-97-6

Met Chemistry

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Pace Analytical Services, Inc.
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Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DATE: 11/13/00
PAGE: 4

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

Sample No:	102315538	Date Collected:	10/04/00	Matrix:	Soil	
Client Sample ID:	FS-2	Date Received:	10/05/00			
Parameters	Results	Units	PRL	Analyzed	Analyst CAS#	Footnotes
Phenolics Total. in Soil	Method: EPA 420.1	Modified			Prep Method: EPA 420.1	Modified
Phenol	6.18	mg/kg	5.49	10/09/00	JB1 108-95-2	
SPLP on Solid, ICP Metals	Method: EPA 6010				Prep Method: EPA 1312	
Date Prepared				10/10/00		
SPLP, Mercury	Method: EPA 7470				Prep Method: EPA 1311	
Date Prepared				10/12/00		
IC Semivolatiles						
WI DRO in Soil	Method: TPH DRO Wisconsin				Prep Method: TPH DRO WI extracti	
Diesel Range Organic Compounds	140	mg/kg	6.5	10/16/00	BM1	
n-Triacontane (S)	59	%		10/16/00	BM1 638-68-6	
Date Extracted				10/12/00		

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QUALITY CONTROL DATA

DATE: 11/13/00
PAGE: 20

rick Associates, Inc.
10 N. Robert St. Ste.414
Paul, MN 55101

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

In: Mr. Joe Otte
Phone: (651)228-1939

Batch ID: 50856
Analysis Method: EPA 6010
Associated Pace Samples: 102315520 102315538 102315553 102315561
QC Batch Method: EPA 3010
Analysis Description: SPLP on Solid, ICP Metals

Method BLANK: 102329430
Associated Pace Samples:

		102315520	102315538	102315553	102315561
			Method Blank		
Parameter	Units	Result	PRL	Footnotes	
Asenic	ug/l	ND	5		
Barium	ug/l	17	10		
Cadmium	ug/l	ND	1		
Chromium	ug/l	ND	10		
Copper	ug/l	ND	5		
Lead	ug/l	ND	3		
Nickel	ug/l	ND	20		
Selenium	ug/l	ND	5		
Silver	ug/l	ND	10		
Zinc	ug/l	ND	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 102329448 102329455									
Parameter	Units	102315520	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Asenic	ug/l	0	1000	931.2	93.1	923.1	92.3	1	
Barium	ug/l	9.504	1000	966.6	95.7	958.8	94.9	1	
Cadmium	ug/l	0	1000	950.1	95.0	942.6	94.3	1	
Chromium	ug/l	3.378	1000	954.9	95.2	944.4	94.1	1	
Copper	ug/l	4.131	1000	948.9	94.5	941.1	93.7	1	
Lead	ug/l	0.09180	1000	942.0	94.2	931.5	93.1	1	
Nickel	ug/l	4.689	1000	930.6	92.6	923.7	91.9	1	
Selenium	ug/l	0	1000	948.3	94.8	934.5	93.5	1	
Silver	ug/l	3.810	1000	944.4	94.1	937.2	93.3	1	

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QUALITY CONTROL DATA

DATE: 11/13/00
 PAGE: 21

Pace Project Number: 1037418
 Client Project ID: Bituminous Roadways

ATRIX SPIKE & MATRIX SPIKE DUPLICATE: 102329448 102329455									
Parameter	Units	102315520	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
inc	ug/l	7.062	1000	959.7	95.3	948.0	94.1	1	

LABORATORY CONTROL SAMPLE: 102329463

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Asenic	ug/l	1000	1058	106	
rium	ug/l	1000	983.8	98.4	
dmium	ug/l	1000	992.0	99.2	
hromium	ug/l	1000	988.9	98.9	
pper	ug/l	1000	1021	102	
ad	ug/l	1000	995.3	99.5	
ickel	ug/l	1000	966.4	96.6	
elenium	ug/l	1000	1056	106	
lver	ug/l	1000	1024	102	
nc	ug/l	1000	1040	104	

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QUALITY CONTROL DATA

DATE: 11/13/00
PAGE: 22

Rock Associates, Inc.
100 N. Robert St. Ste. 414
Paul, MN 55101

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

Attention: Mr. Joe Otte
Phone: (651)228-1939

Batch ID: 50896
Analysis Method: EPA 7471
Associated Pace Samples: 102315520 102315538 102315553 102315561
QC Batch Method: EPA 7470
Analysis Description: Mercury, CVAAS

Method Blank: 102333713
Associated Pace Samples:

	102315520	102315538	102315553	102315561
		Method Blank		
Parameter	Units	Result	PRL	Footnotes
Mercury	mg/kg	ND	0.02	

RIX SPIKE & MATRIX SPIKE DUPLICATE: 102333739 102333747									
			Spike	Matrix	Matrix	Spike			
Parameter	Units	102314929	Conc.	Spike Result	% Rec	Sp. Dup. Result	Dup % Rec	RPD	Footnotes
Mercury	mg/kg	4.462	0.5860	4.756	50.2	4.720	44.0	13	3

LABORATORY CONTROL SAMPLE: 102333721

		Spike	LCS	Spike	
Parameter	Units	Conc.	Result	% Rec	Footnotes
Mercury	ug/l	5.000	5.295	106	

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Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

QUALITY CONTROL DATA

DATE: 11/13/00
PAGE: 23

Black Associates, Inc.
50 N. Robert St. Ste.414
Paul, MN 55101

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

Client: Mr. Joe Otte
Phone: (651)228-1939

Batch ID: 50903 QC Batch Method: EPA 7470
Analysis Method: EPA 7470 Analysis Description: SPLP, Mercury
Associated Pace Samples: 102315520 102315538 102315553 102315561

Method Blank: 102333861
Associated Pace Samples:

	102315520	102315538	102315553	102315561
		Method Blank		
Parameter	Units	Result	PRL	Footnotes
Mercury	ug/l	ND	0.8	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 102333879 102333887									
			Spike	Matrix		Matrix	Spike		
Parameter	Units	102315520	Conc.	Spike Result	Spike % Rec	Sp. Dup. Result	Dup % Rec	RPD	Footnotes
Mercury	ug/l	0	20	21.52	108	21.23	106	1	

LABORATORY CONTROL SAMPLE: 102333895

		Spike	LCS	Spike	
Parameter	Units	Conc.	Result	% Rec	Footnotes
Mercury	ug/l	20	21.48	107	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

DATE: 11/13/00
PAGE: 24

Clark Associates, Inc.
100 N. Robert St. Ste. 414
Paul, MN 55101

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

Lab: Mr. Joe Otte
Phone: (651)228-1939

Batch ID: 50913
Analysis Method: EPA 6010
QC Batch Method: EPA 3050
Analysis Description: Metals, Trace ICP
Associated Pace Samples: 102315520 102315538 102315553 102315561

Method Blank: 102334273
Associated Pace Samples:

	102315520	102315538	102315553	102315561
		Method Blank		
Parameter	Units	Result	PRL	Footnotes
Lead	mg/kg	ND	0.25	
Mercury	mg/kg	ND	0.5	
Antimony	mg/kg	ND	0.05	
Chromium	mg/kg	ND	0.5	
Copper	mg/kg	ND	0.25	
Cadmium	mg/kg	ND	0.15	
Cobalt	mg/kg	ND	1	
Vanadium	mg/kg	ND	0.25	
Silver	mg/kg	ND	0.5	
Iron	mg/kg	ND	1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 102334281 102334299									
Parameter	Units	102315520	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Lead	mg/kg	4.796	51.7	52.24	91.8	55.23	93.9	2	
Mercury	mg/kg	34.47	51.7	88.11	104	87.94	99.5	4	
Antimony	mg/kg	0	51.7	44.28	85.7	47.41	88.3	3	
Chromium	mg/kg	25.50	51.7	73.56	93.0	75.24	92.6	0	
Copper	mg/kg	43.70	51.7	84.34	78.6	84.08	75.1	5	3
Cadmium	mg/kg	10.72	51.7	55.78	87.2	59.07	90.0	3	
Cobalt	mg/kg	22.39	51.7	65.73	83.8	65.59	80.4	4	
Vanadium	mg/kg	0.3761	51.7	43.94	84.3	48.27	89.1	6	
Silver	mg/kg	0.3506	51.7	45.67	87.7	48.73	90.0	3	

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QUALITY CONTROL DATA

DATE: 11/13/00
PAGE: 25

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 102334281 102334299									
Parameter	Units	102315520	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
inc	mg/kg	28.36	51.7	73.98	88.2	75.16	87.1	1	

LABORATORY CONTROL SAMPLE: 102334307

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
arsenic	mg/kg	1.000	0.8901	89.0	
barium	mg/kg	1.000	0.9235	92.4	
cadmium	mg/kg	1.000	0.8819	88.2	
chromium	mg/kg	1.000	0.9124	91.2	
copper	mg/kg	1.000	0.9135	91.4	
lead	mg/kg	1.000	0.8825	88.3	
nickel	mg/kg	1.000	0.8650	86.5	
selenium	mg/kg	1.000	0.8478	84.8	
silver	mg/kg	1.000	0.8975	89.8	
zinc	mg/kg	1.000	0.8792	87.9	

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DATE: 11/13/00
PAGE: 26

Pace Project Number: 1037418
Client Project ID: Bituminous Roadways

QUALITY CONTROL DATA PARAMETER FOOTNOTES

consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

) Not Detected

: Not Calculable

Pace Reporting Limit

- Relative Percent Difference

3) Surrogate

Phenol was detected in the blank. However, all samples were non-detect.

The surrogate and/or spike recovery was outside acceptance limits.

3] The spike recovery was outside acceptance limits for the MS and /or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.

REPORT OF LABORATORY ANALYSIS

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Sunde Engineering, PLLC.
10830 Nesbitt Avenue South
Bloomington, MN 55437-3100
Phone: (952) 881-3344
Fax: (952) 881-1913



MEMORANDUM

To:	Allan Hunting, City Planner City of Inver Grove Heights	Date: 12/21/2022
From:	Michaelea Whelan, Sunde Engineering Kent Peterson, Bituminous Roadways, Inc.	Responses by Sunde/BRI in blue
Subject:	Bituminous Roadways 2022 CUP Application Response to Planning Commission Comments	
CC:		

Response to Questions submitted by Planning Commissioner Robert Heidenreich via. email on 11/22/2022:

The recently discovered "old farmstead" well in the SE area of the mine has now been sealed. Attached is the well sealing record #347873. Both "old farmstead" wells on the site have now been sealed.

Some of the details conflict with previously reported data, and publicly documented known information.

Bituminous Roadways response: We are unaware of the conflicting information. What information, specifically, is conflicting?

1) I understand now how I thought the Plan well was Unique number 426388 vs 207290 there are two wells on file described as "PLAN"

Bituminous Roadways response: There are two "PLAN" wells, but on the water testing map, the well labeled "C-PLAN WELL" is the Robert Plan well, ID 207296, that is tested.

2) I still have some confusion as to the well listed as Wicker #241 #435227 as it relates to the test data and schedule provided. Wicker well #847817 seems one was sealed and a new one drilled in April of 2020 If that's the case then the reported data is flawed.

Bituminous Roadways response: Todd Wicker installed a new well (ID 847817) in April of 2020 and sealed the old well (ID 435227). The groundwater samples from the Wicker property were taken from the active well on the property at the time the sample was retrieved. The new well at the Wicker property is constructed approximately 60 feet deeper than the previous well with both, the sealed and active, wells being finished in the sand and gravel aquifer. The results of the well water samples from the active well that was tested represent the groundwater quality in the sand and gravel aquifer that is downstream from the BRI mine site. The results are not flawed. The well log for well ID 847817 and the well sealing record for well ID 435227 are attached.

3) It would be very helpful to have the actual well numbers that are being tested on those dates rather than just the names of the property owners as using names alone can be confusing.

Bituminous Roadways response: The Unique well ID numbers will be added to future well water tests and the testing report.

Well number clarification?

1) *Wicker #435227 #241 and Wicker well #847817 This data seems to indicate that the wells being tested today are not the same wells that were tested in the past.*

Bituminous Roadways response: Figure 10 of the 2020 EAW documents was prepared in early 2020. The Wicker well ID 435227 was sealed in April 2020 and Wicker well ID 847817 was constructed in April 2020. The well logs had not been updated at the time that Figure 10 was prepared and well #241 (well ID 435227) was the known active well at the time. Groundwater samples are retrieved from the active well at the Wicker property. Samples from the active well at the Wicker property represent the groundwater quality in the sand and gravel Aquifer.

2) *780331 #242, 227766 #243 These wells show an elevation on multiple documents as having an elevation of 825' ASL installed in 2013 the current mining limit is only allowed to be 840' ASL when I drove onto property on November 1st 2022 my GPS also showed that the mine was well below the allowed mining limits and very close to the documented static water levels of the surrounding residential wells.*

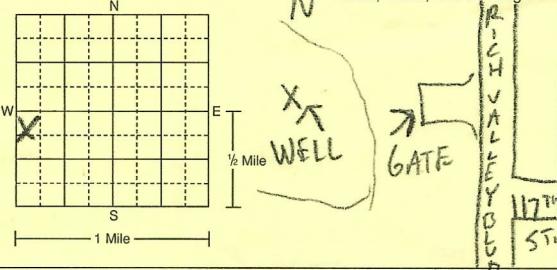
Bituminous Roadways response: #243 well ID 272766 was the test bore-hole that is now sealed, #242 well ID 780331 is the active high capacity well at the site that is used at the wash plant. The ground elevation shown on the well logs are incorrect. The ground elevation at this well is shown on the plan sheet C-1 from a field survey at elevation 851.13 feet above msl.



A small area in the southeast portion of the mine was excavated slightly below the mining limits to take samples of the material below the current mining limits for this permit application. Groundwater was not encountered. This area has been backfilled and brought back up to the allowed mining elevation. The approximate static water level of the new Wicker well (ID 847817) is ~790 feet above msl, approximately 50 feet below the mine floor elevation. The GPS elevation tools on phones are not very accurate and can vary by 20 feet, more or less.

3) *The well(s) described as Rainbow all show as sealed without the specific well numbers that are being tested there is not a valid way to verify which well is being tested and if it changes over time similar to Wicker well data.*

Bituminous Roadways response: The rainbow well that is tested is well ID# 608018. This well has been active since 1998 and is the only "Rainbow" well that has been tested to date. The MN well index does show one Bituminous Roadways well that has been sealed, ID #174673. This well was not part of the groundwater monitoring.

WELL OR BORING LOCATION					MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING SEALING RECORD Minnesota Statutes, Chapter 103I		Minnesota Well and Boring Sealing No. Minnesota Unique Well No. or W-series No. (Leave blank if not known)		H 347873									
County Name DAKOTA					Township Name I.G.H.		Township No. 27		Range No. 22		Section No. 33		Fraction (sm. → lg.) N 1/4 N 1/4 W 1/4 W 1/4		Date Sealed 11-26-2022		Date Well or Boring Constructed UNKNOWN	
GPS LOCATION – decimal degrees (to four decimal places) Latitude _____ Longitude _____										Depth at Time of Sealing 272 ft.				Original Depth N/A ft.				
Numerical Street Address or Fire Number and City of Well or Boring Location 11201 RICH VALLEY BLVD I.G.H.										☒ Single Aquifer ☐ Multiaquifer ☒ WELL/BORING ☒ Water-Supply Well ☐ Monit. Well ☐ Env. Bore Hole ☐ Other _____				☒ Measured Date Measured 11-23-2022 ☐ Estimated 33 ft. ☒ below ☐ above land surface				
Show exact location of well or boring in section grid with "X." 										CASING TYPE(S) ☒ Steel ☐ Plastic ☐ Tile ☐ Other _____				WELLHEAD COMPLETION Outside: ☐ Pitless Adapter/Unit ☐ At Grade ☐ Well Pit ☒ Other 6" CUT-OFF CASING ☐ Buried Inside: ☐ Basement Offset ☐ Well House ☐ Well Pit ☐ Buried ☐ Other _____				
PROPERTY OWNER'S NAME/COMPANY NAME BITUMINOUS ROADWAYS INC. Property owner's mailing address if different than well location address indicated above 1520 COMMERCE DR. MENDOTA HEIGHTS MN										CASING(S) Diameter 6 in. from 0 to 230 ft. Set in oversized hole? ☐ Yes ☐ No Annular space initially grouted? ☐ Yes ☐ No ☐ Unknown								
WELL OWNER'S NAME/COMPANY NAME										SCREEN/OPEN HOLE Screen from _____ to _____ ft. Open Hole from 230 to 272 ft.								
Well owner's mailing address if different than property owner's address indicated above										OBSTRUCTIONS ☒ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction Type of Obstructions (Describe) 105' OF 1" DROP PIPE, WIRE & PUMP								
GEOLOGICAL MATERIAL										Obstructions removed? ☒ Yes ☐ No Describe FISHED OUT WITH OVERSHOT								
If not known, indicate estimated formation log from nearby well or boring.										PUMP ☐ Not Present ☒ Present, Removed Prior to Sealing ☐ Other _____ Type 1 H.P. SUBMERSIBLE								
DRIFT BROWN SOFT 0 230 LIMEROCK YELLOW HARD 230 272										METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE ☒ No Annular Space Exists ☐ Annular Space Grouted with Tremie Pipe ☐ Casing Perforation/Removal Casing Diameter _____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed _____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed Type of Perforator _____								
										VARIANCE Was a variance granted from the MDH for this well? ☐ Yes ☒ No TN# _____								
										GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.) Grouting Material NEAT CEMENT from 272 to 0 ft. 78 bags								
										OTHER WELLS AND BORINGS Other unsealed and unused well or boring on property? ☐ Yes ☒ No How many? _____								
REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING										LICENSED OR REGISTERED CONTRACTOR CERTIFICATION This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge. TERRY MAHER WELL DRILLING INC. 1908 Licensee Business Name License or Registration No. ML n L 4564 11-28-2022 Certified Representative Signature Certified Rep. No. Date MIKE BANASTZEWSKI / PAT MAHER Name of Person Sealing Well or Boring								
IMPORTANT-FILE WITH PROPERTY PAPERS-WELL OWNER COPY										H 347873								

HE-01434-15 ID# 53159

WELL OR BORING LOCATION

County Name

Dakota

Township Name

Inver Grove Heights

Township No.

27

Range No.

22

Section No.

32

Fraction (sm. N lg.)

S 5 E 1/4 E 1/4 E 1/4

GPS LOCATION (decimal degrees (to four decimal places))

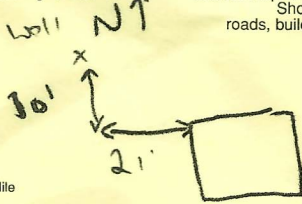
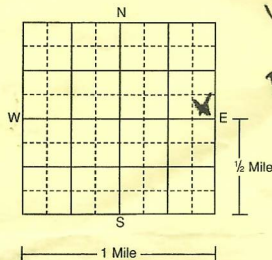
Latitude 44.7835 Longitude 91.0657

House Number, Street Name, City, and ZIP Code of Well Location

11479 Rich Valley Blvd IGH 55077

Show exact location of well/boring in section grid with "X."

Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.



PROPERTY OWNER'S NAME/COMPANY NAME

Todd Wicker

Property owner's mailing address if different than well location address indicated above.

WELL OWNER'S NAME/COMPANY NAME

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
Clay	Brown	S	0	5
Sand w/ clay	Brown	S	5	95
Fine Sand	Brown	S	95	240
Coarse Sand	Brown	m	240	245

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

Terry Maher Well Drilling will seal the old well

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING CONSTRUCTION RECORD

Minnesota Statutes, chapter 103I

MINNESOTA UNIQUE WELL
AND BORING NO.

847817

WELL/BORING DEPTH (completed)

245

DATE WORK COMPLETED

ft. 4/7/2020

DRILLING METHOD

- ☐ Cable Tool
☐ Auger
☐ Other

- ☐ Driven
☒ Rotary

- ☐ Dual Rotary
☐ Rotasonic

DRILLING FLUID

Water

WELL HYDROFRACTURED? ☐ Yes ☒ No

From _____ ft. To _____ ft.

USE

- ☒ Domestic
☐ Noncommunity PWS
☐ Community PWS
☐ Elevator

- ☐ Monitoring
☐ Irrigation
☐ Dewatering

- ☐ Heating/Cooling
☐ Industry/Commercial
☐ Remedial

CASING MATERIAL

- ☒ Steel
☐ Plastic

Drive Shoe? ☒ Yes ☐ No

- ☐ Threaded ☒ Welded

HOLE DIAM.

CASING Diameter

4

Weight

11

Specifications

in. To 240

ft.

lbs./ft.

6 1/2

in. To 195

ft.

SCREEN

Make Johnson

Type Stainless Steel

Slot Size 10

Set between 240 ft. and 245 ft.

OPEN HOLE

From _____ ft. To _____ ft.

Diam. 3 inch

Length 5 ft

Fittings 2 ft. back, K pack

STATIC WATER LEVEL

100

ft.

☒ Below ☐ Above land surface

Date measured 4-7-20

Dry hole ☐ Yes ☒ No

PUMPING LEVEL (below land surface)

ft. after

hrs. pumping

g.p.m.

WELLHEAD COMPLETION

☒ Pitless/adaptor manufacturer Mess

Model

☐ Casing protection☐ 12 in. above grade☐ At-grade ☐ Well House ☐ Hand Pump

GROUT INFORMATION (specify bentonite, cement-sand, neat-cement, concrete, cuttings, or other)

Material Bentonite

From 0

To 195

ft.

6

Yds.

☒ Bags

Material

From

To

ft.

Yds.

☐ Bags

Material

From

To

ft.

Yds.

☐ Bags

Driven casing seal

From

To

Bags

One bag = 94 lbs. cement or 50 lbs. bentonite

NEAREST KNOWN SOURCE OF CONTAMINATION

Well is 51 feet NW

direction from Sewerline type

Well disinfected upon completion? ☒ Yes ☐ No

PUMP

☒ Not installed Date installed

Manufacturer's name

Model Number

HP

Volts

Length of drop pipe

ft.

Capacity

g.p.m.

Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐

ABANDONED WELLS

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

VARIANCE

Was a variance granted from the MDH for this well? ☐ Yes ☒ No TN#

WELL CONTRACTOR CERTIFICATION

This well was drilled under my supervision and in accordance with Minnesota Rules, chapter 4725. The information contained in this report is true to the best of my knowledge.

Hartmann Well Drilling 1622

Licensee Business Name

Lic. or Reg. No.

A. N. V. t.

1099

4/14/2020

Certified Representative Signature

Certified Rep. No.

Date

Pat Schatz

Name of Driller

FILE WITH PROPERTY PAPERS WELL OWNER COPY

847817

HE-0

Sunde Engineering, PLLC.
10830 Nesbitt Avenue South
Bloomington, MN 55437-3100
Phone: (952) 881-3344
Fax: (952) 881-1913



MEMORANDUM

To: Allan Hunting, City Planner
City of Inver Grove Heights

Date: 3/27/2023

From: Michaelea Whelan, Sunde Engineering, PLLC
Kent Peterson, Bituminous Roadways, Inc.

Subject: Bituminous Roadways 2022 CUP Application
Response to Planning Commission Document

CC:

This memorandum is provided in response to the Planning Commission comments from the document titled "Bituminous Roadway and its Environmental Impact" by Inver Grove Heights Planning Commissioner Robert Heidenreich received via. email on February 10, 2023 (PC Comments). Previous Planning Commission questions and comments from the November 1st Planning Commission meeting and subsequent emailed questions and comments have been responded to in two separate memorandums submitted to Allan Hunting, City Planner, dated 11/18/2022 and 12/21/2022.

Introduction:

Bituminous Roadways, Inc. (BRI) has applied for the five year renewal of their CUP and sand and gravel ordinance at their sand and gravel mine located at 11201 Rich Valley Boulevard in Inver Grove Heights, MN (Site). During the initial Planning Commission meeting on November 1, 2022 Commissioners had questions and comments that requested additional information to be provided by BRI and the City's consulting engineering firm, Barr Engineering.

The Site has been actively mined since 1963 and the asphalt production facility has been permitted since 1980. BRI has always complied with all permit regulations associated with the mine Site, the asphalt plant, and associated mining activities. BRI operates in good standing with all active permit authorities including the MPCA, the MNDNR, Dakota County and the City. No violations have been issued by any permitting authority to date. Any issues that may have come up have been responded to and resolved as quickly as possible.

BRI is proposing to lower the mining depth by 40 feet to an elevation of approximately 800 feet above mean sea level (MSL) in the remaining phases of the Site. The areas that have previously been mined and reclaimed will remain as they are today. The current floor of the mine Site where the wash plant and high capacity well is located is at about elevation 850 feet MSL (high capacity well No. 780331 well log is labeled with an incorrect land elevation). The groundwater flow across the Site flows from west to east and is approximately at elevation 790 feet MSL at the Site. Barr Engineering has provided a cross-section view of

the mine Site showing the 800 feet MSL proposed mine floor elevation in relation to the water table in Figure 9 of their Technical Memorandum – Bituminous Roadways, Inc. (BRI) – Environmental Review of Proposed Expansion, dated February 28, 2023 (Barr’s Environmental Review). This figure shows approximately 8-15 feet of separation between the proposed mine floor and the water table. Barr’s Environmental Review also explains that water infiltrating at the Site is not moving downward and into bedrock aquifers, but eastward underneath Pine Bend Landfill and toward the Mississippi River. Also, that the lowering of the mine floor to 800 feet MSL will not have an impact on the groundwater flow rate or direction.

This increase in mining depth will provide a more efficient use of this resource which is vital to meet the ongoing demand for construction aggregate in the surrounding area. The material will be available for use in important public infrastructure projects, road improvement projects, schools, housing and other building construction needs. Sand and gravel for construction industry is a vital resource for the City of Inver Grove Heights and the state of Minnesota.

Response to Planning Commission Comments:

The following is BRI’s response to each topic from the PC Comments document. The original, unedited statements from the PC Comments are re-stated at the start of each section below in italics followed by BRI’s response.

Topic #1: Foundry Sands

A stockpile of approximately 30,000 cubic yards of foundry sand imported from the Prospect Foundry and Smith Foundry is located at the Bituminous Roadways aggregate mining and processing facility in the City of Inver Grove Heights (Figure 1). The stockpile was placed at the location in approximately 1987. The intention was to use the material as an aggregate substitute, thereby minimizing the use of virgin sands from their aggregate resource pit.

Why is Foundry Sand concerning? The contaminants of concern in foundry sand vary depending upon the processes that are used at the foundry. Potential contaminants of concern in foundry sand typically include heavy metals and phenols. The processes that can influence the characteristics of the foundry sand are the type of metal being poured (iron, steel, aluminum, brass/bronze), the type of casting process (sand casting, investment casting), the type of furnace (induction, electric arc, cupola) and the type of finishing process (grinding, blast, cleaning, coating). The foundry sand at the Bituminous Roadway Site came from two Minneapolis foundries (Smith and Prospect Foundries). These two foundries both pour iron, use sand casting, have electric induction furnaces, and perform finish grading. Published information was not researched regarding the expected characteristics of foundry sands from foundries such as these because direct measurements can be obtained through testing of the foundry sand at the Site.

Location of Foundry Sand on Site.

*A stockpile of approximately 30,000 cubic yards of foundry sand was imported from the Prospect Foundry and Smith Foundry. The Foundry sands are located in three known locations. Northwest Berm, Southeast Berm, West property line boundary edge stockpile.
See Exhibit #1*

Disposition of Foundry sand on-Site.

Several explanations have been provided as to the amount and location of the foundry sand on the BR property, the reports provided at the 2022 CUP renewal claim the sand is only in the southeast berm. Case number 22-37ZC; pages 5 & 6; lines 12 -14, indicates that the foundry sands have remained undisturbed and claim all conditions have been satisfied. The aerial and satellite images in Exhibit #2 will show a different conclusion. The west and largest stockpile had not been disturbed since 1998 until approximately 2020-2022. Between these years, aerial images appear to show major regrading and the relocation of this foundry sand. Sand and stormwater test results also show increasing contamination levels of DROs and phenols typically related to Foundry Sands. See Exhibit #3 for Test Results.

Bituminous Roadways' Response to Topic #1: As documented in the June 19th, 2007 planning report, Barr Engineering conducted a Site visit in May of that year and determined the northwest foundry sand berm was completely gone and vegetation had been established. This was, by far, the bulk of the foundry sand that had been placed on Site. The southeast foundry sand berm, which only contained approximately 24 cubic yards of foundry sand, has been left undisturbed and contained a vegetative cover since at least 1998. It was determined in 2007 that the condition regarding the removal of the foundry sand within the four year time period in the northwest berm had been satisfied. The foundry sand that was stated to be in the southeast berm is now considered to be in the eastern central area of the Site as the gravel pit has been expanded to the south with the purchase and permitting of the adjacent south property.

The aerial images show grading in the northwest area of the Site, because this area was being filled to final grade as shown on plan sheet C-1 of the 2017 permit renewal. Grading in this area was allowed after the 2007 permit renewal. The aerial images do not clearly show evidence of foundry sand stockpiles. There is a vegetated topsoil screening berm located along portions of the north property line. The removal of the 30,000 cubic yards of foundry sand is well documented.

The foundry sand that was on the Site had been thoroughly tested and analyzed by environmental and engineering companies (including Braun Intertec, Wenck and AET) for many years after it was brought to the Site originally in 1987. The results of the soil testing concluded that all of the concentrations measured were either non-detect or below the MPCA's Tier I Residential Soil Reference Values (SRVs) and Soil Leaching Values (SLVs) and that the material had not impacted surface waters or groundwater. Since the main 30,000 cubic yard foundry sand stockpile hasn't been present on the Site since at least 2007, it is not a valid concern that the material could impact the soil and/or groundwater quality at the Site or neighboring properties. BRI will continue to sample and monitor the groundwater as required in their current and future permits.

Topic #2: Well Water Testing

Well and pond water testing is a requirement of the Conditional Use Permit. A test schedule has been created and published, which is shown on Exhibit #4.

Of Major concern with the well water testing is the identity of the actual well being tested, for example, the map and surveys show locations for the Rainbow, Wicker, and Plan wells but don't include the unique well number identifier. See Exhibit #5 for the testing tables. The unique well ID number is important in that without it it's not clear what well is really being tested.

The Wicker Well is of major concern. The well-testing results show High levels of contamination of Arsenic, Sodium The source of these contaminants seems clear. What's not clear is why a new well was installed but not disclosed and why a testing plan adjustment was not made and remedial action was not initiated. This failure shows a clear lack of transparency.

The Water sample test data provided at the November 2nd planning meeting showed results where past well water test samples have consistently arrived with broken seals, missing samples, chain of custody broken, temperature, and hold times outside of expected values.

Bituminous Roadways' Response to Topic #2: The current/active wells at the on-site Rainbow building, the Wicker property and the Robert Plan property have been sampled and tested in accordance with the CUP. The original purpose of monitoring the downgradient residential wells was not as an early detection point, but rather to test the water quality of the drinking water supply itself. Todd Wicker and Robert Plan can verify the sampling has been done at their properties. Unique well numbers had not been used in identifying well samples in the past, but this step can be added to the sampling procedure. The sample collection is performed by a trained BRI employee. Each time a sample is collected the property owner is notified and the water sample is obtained directly from the exterior spigot on the house/building. Prior to collecting the sample the water is run out of the faucet for a period of approximately 5-10 minutes. The samples are then collected in the appropriate containers (provided by the testing lab which is usually Pace Analytical Services, LLC), capped (or sealed), and put in the cooler with ice. The cooler is directly delivered to the accepting lab where the chain of custody form is completed by BRI and the lab. The sample collection and the testing are done with the utmost care and attention to detail. Barr's Environmental Review provided their evaluation of the analytical results from sampling events from 2012-2022 and while some minor issues appear with the collecting and handling of the samples, it is noted that the analyses are generally acceptable and reliable. BRI is willing to follow the recommendations of Barr and the City regarding future and ongoing groundwater monitoring at the Site. Attached is a map of the area wells labeled with MN Unique well numbers and/or well sealing record numbers.

The current/active wells that are scheduled for future sampling and testing are the following:

Well Unique ID #	Well install date	Owner/common name	Address*	Approx. ground elev.(ft. above MSL)	Static Water level at time of well installation	Approximate groundwater elevation (ft. above MSL)
608018	03/17/1998	Bituminous Roadways/Rainbow	11201 RVB	890'	100'	790'
847817	04/07/2020	Wicker	11479 RVB	890'	100'	790'
207296	03/01/1958	R. Plan	11889 RVB	851'	60'	791'

*Rich Valley Boulevard (RVB)

BRI's closest neighbor Todd Wicker had a new well installed (ID #847817) on his property at 11479 Rich Valley Boulevard in April of 2020 and the old well was sealed (ID #435227, sealing ID #H347863). Wicker's replacement well was constructed about 60 feet deeper than the old well, but this doesn't change the purpose of testing the well. Wicker's replacement well will continue to be sampled and tested in accordance with the permit conditions to quantify the quality of their domestic drinking water supply.

Topic #3: Requirements as Listed in the Conditional Use Permit Documents

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25. Monitoring of the east and west storm water ponds, both wash water ponds, and three wells shall be conducted every other year and shall be tested for the same elements as listed in condition #24 per the proposed testing schedule identified on the Water Testing Map. Disclosure and accurate descriptions of all well and test protocols.

Examples would be:

- *Rainbow Well*

There are actually several wells called the Rainbow well in the MDH well registry

Well # H118525; Sealed in 1998

Well# H153094; Sealed in 1998

- *Plan Well*

There are actually several wells called the Plan well in the MDH well registry

Well # 426388; Sealed in 2018 Larry Plan

Well# H307162; Sealed in 2013 Robert Plan

- *Wicker Well*

There are actually several wells called the Wicker well in the MDH well registry

Well # 847817; Drilled 4-7-2020

Well# 435227; Sealed in 4-15-2020

Bituminous Roadways' Response to Topic #3: BRI has complied with all well and surface water testing conditions as required in the CUP. BRI has submitted well test results to the City as required in the CUP on an annual basis. Some clarification of the well testing and active vs. sealed wells that are shown on either the MN Well Index and/or Dakota County GIS site is provided below.

Rainbow well

- Well No. H118525 (sealed on 5/29/1998) was the original well at the Rainbow building that was being replaced (originally installed in 1985). A new well was attempted to be installed and it appeared the install failed, i.e. well No. H153094 sealed on 3/6/1998 on the same day installation was attempted (based on data that appears on the Dakota County GIS website).
- Well No. 608018 is the active "Rainbow" well installed in March of 1998. This is the well that has been consistently sampled and tested as part of the BRI groundwater monitoring program.

Plan well

- Well No. 207296 is the Robert Plan well located at 11889 Rich Valley Blvd. This is the well that has been consistently sampled and tested for groundwater monitoring.
- Well No. 426388 (sealing record #H362539) is the Larry Plan well located at 11815 Rich Valley Blvd. and was sealed in 2018.
- Well No. H307162 is a sealed well located at 11771 Rich Valley Blvd. The property is currently owned by Flint Hills Resources and previously owned by M. Morzinski. This well was never part of BRI's testing procedure.

Wicker well

- Well No. 435227 is the Wicker well located at 11479 Rich Valley Blvd. The Wicker's had a new well installed (well No. 847817) in April of 2020 and the old well was sealed. Testing of the groundwater supply at the Wicker property is currently part of BRI's groundwater monitoring program.

Topic #4: Source of Well Water Pollutants

The source of the well water pollution appears to be directly related to the mining, and product storage on site. Arsenic is a naturally occurring metal found in the soil. Undisturbed it is stable, but exposure to oxygen and water can cause Redox Conditions. Arsenic can be released to (or removed from) the groundwater as a result of redox reactions. See https://pubs.usgs.gov/sir/2007/5036/pdf/sir20075036_web.pdf for the full report. The high levels of sodium in the test results at the Wicker site appear to be coming from the Salt storage facility north and

west of the Wicker well site. Report Exhibit #3 dated 6-18-2019 shows Sodium at 169000 ug/L the reportable limit is 2000 ug/L. This amount is 84 times the reportable limit. The well was sealed but no known remediation of the issue was disclosed. The lack of transparency on this only raises more questions about what is and isn't being shared with the Planning Commission and city staff

Bituminous Roadways' Response to Topic #4: The groundwater monitoring test results of the water supply wells tested to date show no evidence of concentrations exceeding the EPA's Maximum Contaminant Levels (MCL) or the MDH's Health Risk Limits (HRL), nor do the results show an increasing trend in concentrations over time as noted in Barr's Environmental Review. These results have been submitted to the City annually as required in the CUP.

Sodium chloride in groundwater generally comes from salts used for de-icing, water softeners and fertilizers, and is a naturally occurring element in the soil. There is no Federal or State established drinking water quality standard for sodium chloride. The US EPA has established a secondary maximum contaminate level (SMCL) guideline for chloride of 250 mg/l (250,000 ug/l) for aesthetic considerations. The concentration of sodium at the Wicker well from the sample collected on 6-18-2019 was at 169,000 ug/l. This is equivalent to 169 mg/l which is below the SMCL guideline set by the US EPA.

Furthermore, BRI has not been in the snowplowing business since 2014 and has not stored salt in the red building or anywhere else on the Site since that time. In addition, salt was stored inside to keep it from being exposed to moisture/weather and this would prevent the salt from collecting in runoff and infiltrating into the groundwater.

Arsenic is naturally occurring in rocks and soil across Minnesota and can dissolve in groundwater. There have been no arsenic levels above detection limits in the analyzed samples to date. While the detection limits the lab has used for some of analysis were above the EPA's MCL of 10 ug/l, the detection limits used in the analysis since 2018 have been lower than the EPA's MCL and the results of the arsenic levels are either non-detect or below the EPA's MCL in all of the water and groundwater samples collected since 2018. BRI will ensure that all future testing will be analyzed based on current EPA and MDH water quality standards and regulations.

Topic #5: Allowable Depth of Mine

Excerpt from CUP Report: Bituminous Roadways is currently permitted to mine to an elevation of 840 feet above sea level. This is a mining depth of 60-90 feet based on the site, based on ground elevation. The applicant is proposing to mine to a depth of 800 feet which would allow Bituminous Roadways to increase the maximum mining depth by 40 feet and extract up to an additional 3.4 million cubic yards of sand and gravel material. However, two of the wells on the property are 825 feet above sea level. See Exhibit #7 for an elevation view. The increase in the mining depth is estimated to add approximately 10 years to the life of the mine. The expected duration of mining is 30 years in total. Actual life will depend upon market demand.

Bituminous Roadways' response to Topic #5: Well #243 (well No. H315697) was the test bore-hole that is now sealed, well #242 (well No. 780331) is the active high capacity well at the Site that is used for the wash plant and draws water from the Tunnel City/Wonewoc Aquifer. The ground elevation shown on the well logs for the high capacity well and sealed bore-hole are incorrect. The ground elevation at this well is shown on the plan sheet C-1, Existing Conditions, from a field survey at elevation 851.13 feet MSL. The topography on sheet C-1 is from a drone-aerial survey completed in December 2022. The aerial topography shows the ground elevation near the wash plant and high capacity well around 851 feet MSL. The aerial topography shows that the wash ponds that are adjacent to the well are between elevations 842 and 848 feet MSL, nowhere near elevation 825 feet MSL. Another source of Site topography is available on the Dakota County GIS website which shows the ground elevation around 850 feet MSL near the wash plant and high capacity well on the Site. Exhibit #7 prepared by Commissioner Heidenreich does not accurately show the ground elevation at active high capacity well and the sealed bore-hole, nor does it show the correct groundwater flow pattern. Groundwater flows generally from west to east across the Site and does not flow from the high capacity well on the BRI Site to the south towards the Larry Plan well (sealed well No. 362539) or the Robert Plan well (well No. 207296).

Topic #6: Concerns with Increasing the Mining Depth

Based on previous reports from Barr Engineering, MDH well records, and regional static water levels, the known upper surface level of the Prairie du Chien-Jordan aquifer is indicated by the average static water level at the time each well was installed. The average static water level based on seasonal fluctuations is between 825'-845' ASL.

Map ID #72 618538 Elevation: 1005 Static: 840'

Map ID #73 658996 Elevation: 1004 Static: 804'

Map ID #86 561788 Elevation: 1021 Static: 821'

Map ID #241 Wicker Well Elevation: 889' Static: 789'

Important note: The actual elevation based on the wicker property survey and Well Data is the original surface of the land before mining was 889' ASL since at least 2013 MDH well records show the depth of the mine is already past the 840' permitted depth. Unique well numbers and Map ID Numbers 780331 #242 and 272766 #243 show the depth at 825' 15' below the allowable 840. This is not a typo, as suggested in previous conversations; the scanned handwritten well records recorded at the MDH by different licensed drillers confirm the true value.

Bituminous Roadways response to Topic #6: The first 3 wells (well Nos. 618538, 658996, and 561788) are all finished in the Prairie Du Chien-Jordan Aquifer. These three wells are located approximate $\frac{3}{4}$ of a mile to the west of the Site. It is well known that the water table flows from west to east, therefore the water table west of the Site will be higher than it is at the Site. The water table elevation at the Site is provided in the cross-section Figure 9 from Barr's Environmental Review. This figure shows the water table to be 8-15 feet below elevation 800 feet MSL.

Well ID #243 (well No. 272766) was the test bore-hole that was drilled to investigate the stratigraphy prior to installation of the actual high capacity well and the bore-hole is now

sealed. Well ID #242 (well No. 780331) is the active high capacity well at the Site that is used at the wash plant. The ground elevation shown on the well logs are incorrect. The ground elevation at this well is shown on the plan sheet C-1 at elevation 851.13 feet MSL which was located during construction staking by a Minnesota licensed land surveyor. Not many well installations have the locations and elevations of the installed wells surveyed and GPS or quad map elevations are not very accurate. Unfortunately mistakes do happen and some of the well logs available on the MDH well index and the Dakota County GIS website are incorrectly located and/or reported. There was an error with the ground elevation on the original well application and this error has carried through to the hand-written well log and available documentation on the MDH and Dakota County well inventory sites. The ground elevation of 851.13 feet MSL at the high capacity well number 780331, has been confirmed in the past by Minnesota licensed land surveyors, Sunde Land Surveying, LLC. This can be re-surveyed to be re-validated on-site, if necessary.

Topic #7: Why Mining Depth Matters

As previously discussed, aquifers and local wells are protected by the separation of sand and gravel acting as a filter medium, the mining operation is removing this media and the effect of washing gravel, DRO contamination, and REDOX is concentrating the arsenic and other pollutants in the remaining soil to easily mix with the aquifer, Images taken on October 1st, 2022 show what appears to be the surface of the Prairie du Chien-Jordan aquifer, the meteorological conditions prior to the date indicated we were in severe drought conditions. You can see the water on the surface of the sand.

Bituminous Roadways' response to Topic #7: The image taken on October 1st, 2022 does not show the surface of the Prairie du Chien-Jordan aquifer. This is just damp sand. There is moisture naturally retained in the deep sand and when disturbed the sand appears damp even in dry conditions. It has been confirmed in Barr's Environmental Review that the water table is approximately 50-65 feet below the mine floor.

Barr's Environmental Review has also concluded that increasing the allowed mining depth to 800 feet MSL will not adversely affect the rate or direction of groundwater flow. The groundwater flows from east to west and per Barr's Environmental Review the only groundwater user downgradient of the BRI Site is the Wicker well (well No. 847817). Since this well is screened 140 feet below the water table it is highly unlikely that any potential groundwater impacts at the BRI site would reach the water supply at the new Wicker well. Barr has recommended some additional permit conditions to further protect the groundwater below the Site. BRI is willing to work with the City in providing measures to ensure that the Site is operated and managed to protect the groundwater and environment to the maximum extent practicable.

Topic #8: Unsealed Wells on the Bituminous Property and Nearby Lands

*Under State law, the discovery of an unsealed well must be reported to the MDH
103I.301 WELL SEALING REQUIREMENTS.*

Subdivision 1. Wells and borings. (a) A property owner must have a well or boring sealed if:

- (1) The well or boring is contaminated or may contribute to the spread of contamination;*
 - (2) The well or boring was attempted to be sealed but was not sealed according to the provisions of this chapter;*
or
 - (3) The well or boring is located, constructed, or maintained in a manner that its continued use or existence endangers groundwater quality or is a safety or health hazard.*
- (b) A well or boring that is not in use must be sealed unless the property owner has a maintenance permit for the well.*
- (c) The property owner must have a well or boring sealed by a licensed person authorized to seal the well or boring, consistent with provisions of this chapter.*

Topic #9: Why Sealing a Well Matters

An Unsealed well or one that has been damaged can allow toxins to easily and directly enter the groundwater supply.

In this case, several unsealed wells were identified on October 31st, 2022 these wells were easily visible to anyone yet no report was made nor was there an attempt to seal them, they appear to have been damaged several times by heavy equipment and sections of casings were removed over time, See Exhibit #7; Images 2 & 3 and Exhibit #2 aerial images.

The failure to notify and correct this violation contributes to the concerns, regarding the lack of transparency to the Regulating Government Authorities (RGA) and the citizens of Dakota County and the City of IGH.

Bituminous Roadways' Response to Topics #8 and #9: There was one unsealed well discovered in the fall of 2022 located in the south-east area of the mine Site. This well was part of the homestead on the south expansion property. This well was exposed along with a sealed well (well No. H163359, sealed in 2000) while mining the area in the fall of 2022. This discovery has since been reported to MDH and has been sealed in accordance with State well sealing ordinances by licensed well driller, Terry Maher Well Drilling, Inc. on November 26th, 2022 (well sealing record No. H347873).

Topic #10: Observations and Recommendations

It is my strong recommendation that this CUP be denied to Bituminous Roadways at this time. The property owners have allowed frequent and continued violations of the current CUP, they have endangered the Prairie du Chien-Jordan aquifer and likely other nearby aquifers. Wells in the area have become unusable, the depth of the mine has long exceeded the allowable limits. While I think we can all agree that the community needs a source for gravel to create, replace and improve our roads, we need to ask ourselves: "At what cost?"

Two other questions we should ask:

- Is there a higher and better use for this property?*
- Can the gravel be sourced from another location at a similar cost?*

The answer to both these questions is YES!! In its current location, the Bituminous Roadway property is preventing the City and County from making the needed arterial connection and realignment of the Cliff Road to

117th St. artillery connection and the realignment of the Akron ave "Plan D" connection. The high growth rate in Rosemount, Empire, and Eagan requires that some action be taken soon. The community cannot wait 30-plus years of continued environmental destruction.

The current method of checks and balances for monitoring this site isn't working, I would also suggest that oversight be given to the City Environmental commission for annual review. Notices of strong action should be filed with the MDH, MNPCA, US EPA, and Dakota County Environmental commission.

Bituminous Roadways' Response to Topic #10: There are no records of any violations filed with the City, County or State. The Site has been actively mined since 1963 and the asphalt production facility has been permitted since 1980. BRI has always complied with all permit regulations associated with the mine Site, the asphalt plant, and associated mining activities. BRI operates in good standing with all active permit authorities including the MPCA, the MNDNR, Dakota County and the City. Any issues that may have come up have been responded to and resolved as quickly as possible.

BRI has complied with the CUP conditions in testing downgradient and neighboring wells. The test results have shown no exceedances of primary drinking water standards in concentrations of analytes tested.

BRI's site is located in a highly commercial and industrial area. All but a few of the neighboring residential properties are located to the west of the Site with the closest neighbor over 500 feet away from the mining limits and most at least ¼ mile away. The west side of the Site is well buffered by distance and with heavy tree coverage. This Site utilized as a sand and gravel mine is indeed a necessary and valuable use of the property.

The Importance of High Quality Aggregate Resources: The availability of high quality aggregate resources within the seven-county metropolitan area is rapidly diminishing. Development pressure removes the potential to access aggregate resources through land development and zoning decisions. This only serves to increase the demand for construction aggregates. The Metropolitan Council and the Minnesota Geological Survey have recognized the value of identifying and preserving those remaining aggregate resources. On a local scale, when potential aggregate resources are not permitted for extraction and utilization of the resource, the aggregates must be shipped from further distances creating a burden on public infrastructure, increased greenhouse gas emissions, and increased costs due to the high environmental and economic cost of importing aggregates from more distant locations. The cost of all projects requiring aggregates increases with the increased distance from the source. Larger projects such as airport runways, road construction, schools, local streets, community centers, and medical facilities are impacted the most.

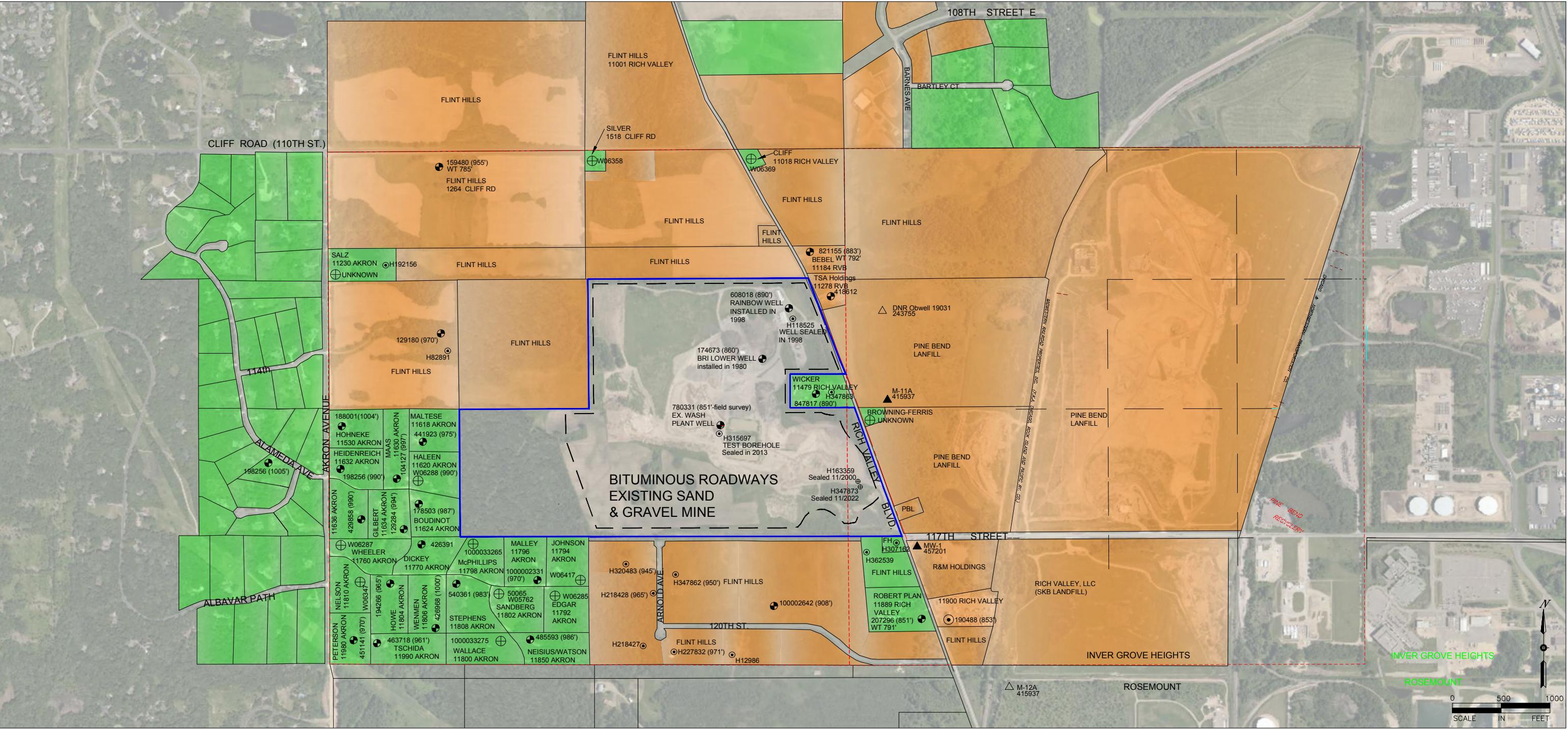
The state, as well as local governments including counties, cities, and townships, depend on a continual supply of aggregate materials for road building and other community infrastructure. It is estimated that 10 tons of aggregate are consumed per person per year.

Aggregates are used in growing communities in a number of applications including concrete and asphalt mixes, foundations for highways and structures, railroad ballast, road shoulder stabilization, gravel roads, driveways, riprap/erosion control, shoreland stabilization, snow and ice control, drainfields, golf course sand, infield mix, recreational trails, landscape rock, engineered backfill, retaining wall blocks and beaches.

It is a challenge to find good aggregate sources. Sand and gravel deposits have to be clean enough - lacking significant amounts of clay and fine material associated with the majority of glacial till deposits and not have significant amounts of deleterious materials that impact quality. The Bituminous Roadways Mine is mapped by the Minnesota Geological Survey on Plate 9 of 9 of the Dakota County Geologic Atlas¹ as being a Primary Sand and Gravel Resource. To qualify as a primary sand and gravel resource, the deposit must be located in an area where the deposit is more than 35% gravel, thicker than 20 feet, and less than 10 feet of overburden. Geological processes are responsible for the distribution of sand and gravel deposits and the quality of the deposit. Primary sand and gravel deposits that are economically viable are where they are. Humans can't control that. It is important to identify where these resources are, so that land use decisions can be made that recognize the value of this rapidly diminishing resource and ensure that it can be utilized before urbanization occurs. The 2000 Aggregate Resources Inventory of the Seven County Metropolitan Area, prepared by the Minnesota Geological Survey and the Metropolitan Council² estimated that available deposits would be depleted in the seven-county metropolitan area by 2030 if efforts were not made to identify and protect deposits for extraction prior to urbanization. It is, therefore, sound land use planning to allow the extraction of this available high quality resource under the on-going authority of the Conditional Use Permit and interim sand and gravel zoning overlay ordinance.

¹ Balaban, N.H.; Hobbs, H.C. (1990). C-06 Geologic atlas of Dakota County, Minnesota. Minnesota Geological Survey. Retrieved from the University of Minnesota Digital Conservancy, <https://hdl.handle.net/11299/58494>.

² Southwick, D.L., Jouseau, M., Meyer, G.N., Mossler, J.H., and Wahl, T.E., 2000, Aggregate resources inventory of the seven-county metropolitan area, Minnesota: Minnesota Geological Survey Information Circular 46.



LEGEND

- ACTIVE WELL WITH KNOWN UNIQUE WELL INDEX NUMBER (Approximate Land Surface Elevation) and WATER TABLE ELEVATION (WT) of Quaternary Aquifer if available
*Sources Dakota County GIS and MN Well Index
- ⊕ ACTIVE WELL (Approximate location, unique well ID number unknown and/or no log available)
- ⦿ SEALED WELL (With MN well and boring sealing number and approximate land surface elevation if available)
- ▲ MONITORING WELL (PINE BEND OR DNR)

BITUMINOUS ROADWAYS INC.
INVER GROVE HEIGHTS GRAVEL PIT
2022 PERMIT REISSUANCE

AREA WELL
LOCATION MAP

Bituminous Roadway and its Environmental Impact

Robert Heidenreich

Abstract

In this report, I would like to express my concerns with the request for the renewal of the CUP for Bituminous Roadways' continued mining of sand and gravel from its current location. My research has shown that the information provided in the reports and test results provided by Bituminous Roadways to the city of Inver Grove Heights, MDH, EPA, neighbors, and citizens are erroneous, flawed, less than transparent. The potential impacts on the environment caused by this mining operation are incredibly disturbing. My findings should be a wake-up call for all of us to be aware and question what's actually in the groundwater we drink from our wells.

Keywords: test reports, groundwater, environment impact, renewal

Method

Documentation

All of the documentation provided in this report is publicly available on the EPA website, Landsat Image files, MDH well registry, Dakota County Well registry, and google searches.

Assessments and Measures

This report is conditioned on data provided by many sources. The interpretation of this data is based on empirical knowledge and my beliefs about the subject matter presented.

Foundry Sands

A stockpile of approximately 30,000 cubic yards of foundry sand imported from the Prospect Foundry and Smith Foundry is located at the Bituminous Roadways aggregate mining and processing facility in the City of Inver Grove Heights (Figure 1). The stockpile was placed at the location in approximately 1987. The intention was to use the material as an aggregate substitute, thereby minimizing the use of virgin sands from their aggregate resource pit.

Why is Foundry Sand concerning? The contaminants of concern in foundry sand vary depending upon the processes that are used at the foundry. Potential contaminants of concern in foundry sand typically include heavy metals and phenols. The processes that can influence the characteristics of the foundry sand are the type of metal being poured (iron, steel, aluminum, brass/bronze), the type of casting process (sand casting, investment casting), the type of furnace (induction, electric arc, cupola) and the type of finishing process (grinding, blast, cleaning, coating). The foundry sand at the Bituminous Roadway site came from two Minneapolis foundries (Smith and Prospect Foundries). These two foundries both pour iron, use sand casting, have electric induction furnaces, and perform finish grading. Published information was not researched regarding the expected characteristics of foundry sands from foundries such as these because direct measurements can be obtained through testing of the foundry sand at the site.

Location of Foundry Sand on site.

A stockpile of approximately 30,000 cubic yards of foundry sand was imported from the Prospect Foundry and Smith Foundry. The Foundry sands are located in three known locations. Northwest Berm, Southeast Berm, West property line boundary edge stockpile.

See Exhibit #1

Disposition of Foundry sand on-site.

Several explanations have been provided as to the amount and location of the foundry sand on the BR property, the reports provided at the 2022 CUP renewal claim the sand is only in the southeast berm. Case number 22-37ZC; pages 5 & 6; lines 12 -14, indicates that the foundry sands have remained undisturbed and claim all conditions have been satisfied. The aerial and satellite images in Exhibit #2 will show a different conclusion. The west and largest stockpile had not been disturbed since 1998 until approximately 2020-2022. Between these years, aerial images appear to show major regrading and the relocation of this foundry sand. Sand and stormwater test results also show increasing contamination levels of DROs and phenols typically related to Foundry Sands.

See Exhibit #3 for Test Results.

Well Water Testing

Well and pond water testing is a requirement of the Conditional Use Permit. A test schedule has been created and published, which is shown on Exhibit #4.

Of Major concern with the well water testing is the identity of the actual well being tested, for example, the map and surveys show locations for the Rainbow, Wicker, and Plan wells but don't include the unique well number identifier. See Exhibit #5 for the testing tables. The unique well ID number is important in that without it it's not clear what well is really being tested.

The Wicker Well is of major concern. The well-testing results show High levels of contamination of Arsenic, Sodium The source of these contaminants seems clear. What's not clear is why a new well was installed but not disclosed and why a testing plan adjustment was not made and remedial action was not initiated. This failure shows a clear lack of transparency.

The Water sample test data provided at the November 2nd planning meeting showed results where past well water test samples have consistently arrived with broken seals, missing samples, chain of custody broken, temperature, and hold times outside of expected values.

Requirements as Listed in the Conditional Use Permit Documents

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21. Bituminous Roadways shall obtain and maintain the necessary Minnesota Pollution Control Agency permits including two air quality permits and one industrial storm water permit. The terms and conditions of those permits shall be hereby incorporated into this City approval.

Bituminous Roadways has provided the city with copies of all of the required permits. No notices of violation have ever been issued by the MPCA. The site is in compliance with this condition.

22. All reports which are required to be submitted to Dakota County under the single Hazardous Waste Generators License and the one Processing License shall also be submitted to the City, including the required annual and quarterly reports.

During the 2012 renewal, it was discovered from Dakota County that as of 2003, the facility was no longer a hazardous waste generator and no reports were required. Conditions should be eliminated with this renewal.

23. All reports which are required to be submitted to the Minnesota Pollution Control Agency shall also be submitted to the City, including the annual emissions inventory report, semi-annual deviations report, annual compliance certification report, and annual report. Bituminous Roadways has provided the city copies of their reports submitted to the MPCA. The site is in compliance with this condition.

24. Monitoring shall be conducted at the single groundwater well that consists of arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, DRO, GRO, phenol, pH, electric conductivity, and alkalinity. The monitoring should occur with half the wells every other year. Parameters and protocols shall be as agreed to by Dakota County, the City, and Bituminous Roadways.

The staff has received copies of the well tests. According to the project narrative, the sample concentrations show levels below limits.

25. Monitoring of the east and west storm water ponds, both wash water ponds, and three wells shall be conducted every other year and shall be tested for the same elements as listed in condition #24 per the proposed testing schedule identified on the Water Testing Map.

Disclosure and accurate descriptions of all well and test protocols.

Examples would be:

- **Rainbow Well**

There are actually several wells called the Rainbow well in the MDH well registry

Well # H118525; **Sealed** in 1998

Well# H153094; **Sealed** in 1998

- **Plan Well**

There are actually several wells called the Plan well in the MDH well registry

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- **Wicker Well**

There are actually several wells called the Wicker well in the MDH well registry

Well # 847817; **Drilled** 4-7-2020

Well# 435227; **Sealed** in 4-15-2020

Source of Well Water Pollutants.

The source of the well water pollution appears to be directly related to the mining, and product storage on site. Arsenic is a naturally occurring metal found in the soil. Undisturbed it is stable, but exposure to oxygen and water can cause Redox Conditions. Arsenic can be released to (or removed from) the groundwater as a result of redox reactions.

See https://pubs.usgs.gov/sir/2007/5036/pdf/sir20075036_web.pdf for the full report. The high levels of sodium in the test results at the Wicker site appear to be coming from the Salt storage facility north and west of the Wicker well site. Report Exhibit #3 dated 6-18-2019 shows Sodium at 169000 ug/L the reportable limit is 2000 ug/L. This amount is 84 times the reportable limit. The well was sealed but no known remediation of the issue was disclosed. The lack of transparency on this only raises more questions about what is and isn't being shared with the Planning Commission and city staff

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Allowable Depth of Mine

Excerpt from CUP Report: Bituminous Roadways is currently permitted to mine to an elevation of 840 feet above sea level. This is a mining depth of 60-90 feet based on the site, based on ground elevation. The applicant is proposing to mine to a depth of 800 feet which would allow Bituminous Roadways to increase the maximum mining depth by 40 feet and extract up to an additional 3.4 million cubic yards of sand and gravel material. However, two of the wells on the property are 825 feet above sea level. See Exhibit #7 for an elevation view. The increase in the mining depth is estimated to add approximately 10 years to the life of the mine. The expected duration of mining is 30 years in total. Actual life will depend upon market demand.

Concerns with Increasing the Mining Depth.

Based on previous reports from Barr Engineering, MDH well records, and regional static water levels, the known upper surface level of the Prairie du Chien-Jordan aquifer is indicated by the average static water level at the time each well was installed. The average static water level based on seasonal fluctuations is between 825'-845' ASL.

Map ID #72 618538 Elevation: 1005 Static: 840'

Map ID #73 658996 Elevation: 1004 Static: 804'

Map ID #86 561788 Elevation: 1021 Static: 821'

Map ID #241 Wicker Well Elevation: 889' Static: 789'

Important note: The actual elevation based on the wicker property survey and Well Data is the original surface of the land before mining was 889' ASL since at least 2013 MDH well records show the depth of the mine is already past the 840' permitted depth. Unique well numbers and Map ID Numbers 780331 #242 and 272766 #243 show the depth at 825' 15' below the allowable 840. This is not a typo, as suggested in previous conversations; the scanned handwritten well records recorded at the MDH by different licensed drillers confirm the true value.

See Exhibit #6 Map ID and Locations

Why Mining Depth Matters

As previously discussed, aquifers and local wells are protected by the separation of sand and gravel acting as a filter medium, the mining operation is removing this media and the effect of washing gravel, DRO contamination, and REDOX is concentrating the arsenic and other pollutants in the remaining soil to easily mix with the aquifer, Images taken on October 1st, 2022 show what appears to be the surface of the Prairie du Chien-Jordan aquifer, the meteorological conditions prior to the date indicated we were in severe drought conditions. You can see the water on the surface of the sand.

Unsealed Wells on the Bituminous Property and Nearby Lands

Under State law, the discovery of an unsealed well must be reported to the MDH

103I.301 WELL SEALING REQUIREMENTS.

Subdivision 1. Wells and borings. (a) A property owner must have a well or boring sealed if:

- (1) The well or boring is contaminated or may contribute to the spread of contamination;
 - (2) The well or boring was attempted to be sealed but was not sealed according to the provisions of this chapter; or
 - (3) The well or boring is located, constructed, or maintained in a manner that its continued use or existence endangers groundwater quality or is a safety or health hazard.
- (b) A well or boring that is not in use must be sealed unless the property owner has a maintenance permit for the well.
- (c) The property owner must have a well or boring sealed by a licensed person authorized to seal the well or boring, consistent with provisions of this chapter.

Why Sealing a Well Matters

An Unsealed well or one that has been damaged can allow toxins to easily and directly enter the groundwater supply.

In this case, several unsealed wells were identified on October 31st, 2022 these wells were easily visible to anyone yet no report was made nor was there an attempt to seal them, they appear to have been damaged several times by heavy equipment and sections of casings were removed over time, See Exhibit #7; Images 2 & 3 and Exhibit #2 aerial images.

The failure to notify and correct this violation contributes to the concerns, regarding the lack of transparency to the Regulating Government Authorities (RGA) and the citizens of Dakota County and the City of IGH.

Observations and Recommendations

It is my strong recommendation that this CUP be denied to Bituminous Roadways at this time. The property owners have allowed frequent and continued violations of the current CUP, they have endangered the Prairie du Chien-Jordan aquifer and likely other nearby aquifers. Wells in the area have become unusable, the depth of the mine has long exceeded the allowable limits. While I think we can all agree that the community needs a source for gravel to create, replace and improve our roads, we need to ask ourselves: "At what cost?"

Two other questions we should ask:

- Is there a higher and better use for this property?
- Can the gravel be sourced from another location at a similar cost?

The answer to both these questions is YES!! In its current location, the Bituminous Roadway property is preventing the City and County from making the needed arterial connection and realignment of the Cliff Road to 117th St. artillery connection and the realignment of the Akron ave "Plan D" connection. The high growth rate in Rosemount, Empire, and Eagan requires that some action be taken soon. The community cannot wait 30-plus years of continued environmental destruction.

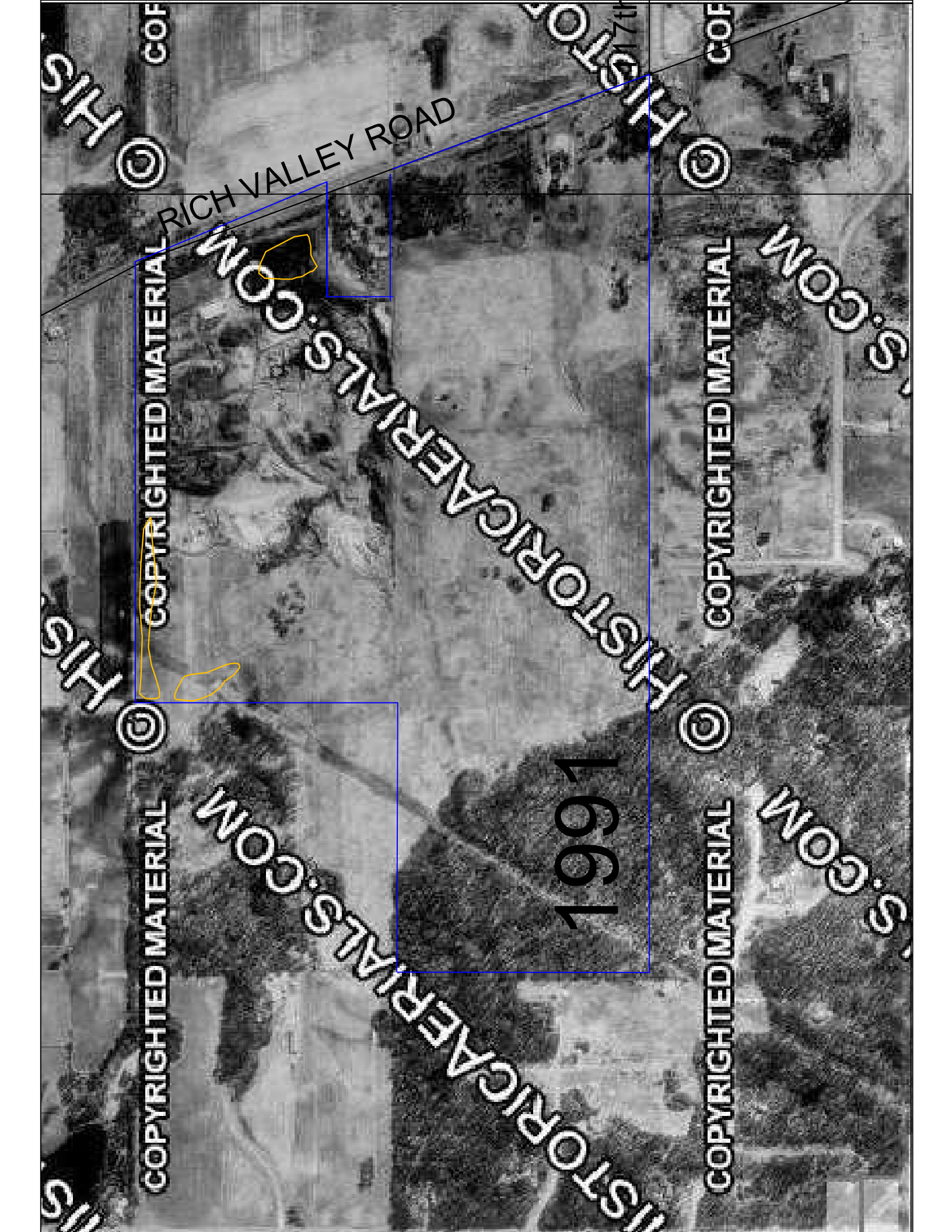
The current method of checks and balances for monitoring this site isn't working, I would also suggest that oversight be given to the City Environmental commission for annual review. Notices of strong action should be filed with the MDH, MNPCA, US EPA, and Dakota County Environmental commission.

References

- USGCS, C. (2007). NATIONAL WATER-QUALITY ASSESSMENT PROGRAM. The Association of Arsenic With Redox Conditions, Depth, and Ground-Water Age in the Glacial Aquifer System of the Northern United States, Scientific Investigations Report 2007–5036, Page numbers.
- MN-PCA, O. (2020). Overview of the Twin Cities Metropolitan Groundwater Model. Version 1.00, July 2000 John K. Seaberg <https://www.pca.state.mn.us/sites/default/files/mm-overview.pdf>
- MN STATUTE, W. (2022). CHAPTER 1031. WELLS, BORINGS, AND UNDERGROUND USES. <https://www.revisor.mn.gov/statutes/cite/1031>
- MN RULE, 4725.3850 SEALING WELL OR BORING. <https://www.revisor.mn.gov/rules/4725.3850>

Exhibit #1: Topographical Survey of Foundry Sand Locations

Exhibit #2: Satellite Images of Foundry
Sand Excavation; 1991-2022



RICH VALLEY ROAD

1991



RICH VALLEY ROAD

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2003

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RICH VALLEY ROAD

17th

2008

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2010



RICH VALLEY ROAD

17th

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2013

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RICH VALLEY ROAD

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2017

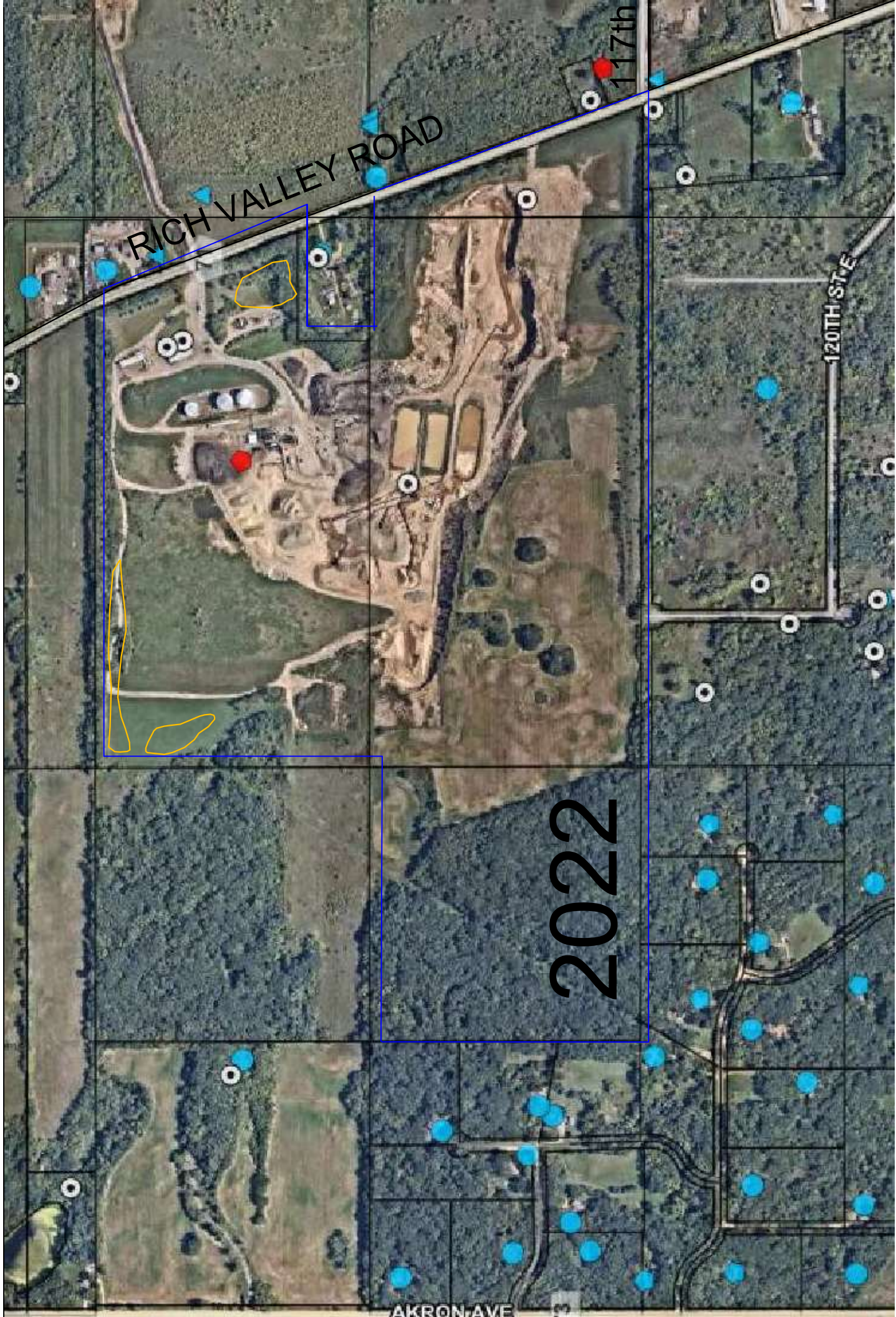
HIS

HIS

COP

7th





RICH VALLEY ROAD

117th

120TH ST. E

2022

AKRON AVE

Exhibit #3: Soil & Water Test Results

Laboratory Report

Troy Wille
Bituminous Roadways
1520 Commerce Drive
Mendota Heights, MN 55120

Report Date: 07/08/2019
Date Received: 06/20/2019

Project: Stormwater 06/20/2019

Pace Project No.: 12130833

Sample: IGH D - Stormwater Pond		Lab ID: 12130833001	Collected: 06/18/19 07:30	Matrix: Water		
Method	Parameters	Results	Units	Report Limit	Analyzed	Qualifiers
SM 2320B (1997)	Alkalinity, Total as CaCO ₃	66.0	mg/L	20.0	06/27/19 12:21	
SM 2510B	Specific Conductance	271	umhos/cm	1.0	06/26/19 15:13	
EPA 420.1 (1983 & 1993)	Phenolics, Total Recoverable	ND	ug/L	60.0	06/27/19 15:34	
SM 4500-H+B (1996)	pH at 25 Degrees C	8.3	Std. Units	0.10	06/21/19 16:12	H6
WI MOD DRO	WDRO C10-C28	0.63	mg/L	0.10	06/27/19 13:08	T6
WI MOD GRO	Gasoline Range Organics	ND	ug/L	100	07/02/19 04:38	HS
EPA 200.7	Barium	27.2	ug/L	10.0	06/28/19 10:10	
EPA 200.7	Chromium	ND	ug/L	10.0	06/28/19 10:10	
EPA 200.7	Copper	ND	ug/L	10.0	06/28/19 10:10	
EPA 200.7	Nickel	ND	ug/L	10.0	06/28/19 10:10	
EPA 200.7	Zinc	ND	ug/L	20.0	06/28/19 10:10	
EPA 200.8	Arsenic	ND	ug/L	1.5	06/28/19 13:28	
EPA 200.8	Cadmium	ND	ug/L	0.30	06/28/19 13:28	
EPA 200.8	Lead	ND	ug/L	0.50	06/28/19 13:28	
EPA 200.8	Silver	ND	ug/L	0.20	06/28/19 13:28	
EPA 7470	Mercury	ND	ug/L	0.10	07/01/19 13:55	

Sample: IGH B - Wicker Well		Lab ID: 12130833002	Collected: 06/18/19 08:00	Matrix: Water		
Method	Parameters	Results	Units	Report Limit	Analyzed	Qualifiers
SM 2320B (1997)	Alkalinity, Total as CaCO ₃	276	mg/L	20.0	06/27/19 12:27	
SM 2510B	Specific Conductance	676	umhos/cm	1.0	06/26/19 15:15	
EPA 420.1 (1983 & 1993)	Phenolics, Total Recoverable	ND	ug/L	60.0	06/27/19 15:35	
SM 4500-H+B (1996)	pH at 25 Degrees C	7.8	Std. Units	0.10	06/21/19 16:13	H6
WI MOD DRO	WDRO C10-C28	ND	mg/L	0.10	06/27/19 13:15	
WI MOD GRO	Gasoline Range Organics	ND	ug/L	100	07/02/19 05:05	HS
EPA 200.7	Barium	ND	ug/L	10.0	06/28/19 10:12	
EPA 200.7	Chromium	ND	ug/L	10.0	06/28/19 10:12	
EPA 200.7	Copper	226	ug/L	10.0	06/28/19 10:12	
EPA 200.7	Nickel	ND	ug/L	10.0	06/28/19 10:12	
EPA 200.7	Zinc	416	ug/L	20.0	06/28/19 10:12	
EPA 200.8	Aluminum	64.6	ug/L	20.0	06/28/19 13:40	
EPA 200.8	Antimony	ND	ug/L	0.50	06/28/19 13:40	
EPA 200.8	Arsenic	ND	ug/L	1.5	06/28/19 13:40	
EPA 200.8	Beryllium	ND	ug/L	0.20	06/28/19 13:40	
EPA 200.8	Cadmium	ND	ug/L	0.30	06/28/19 13:40	
EPA 200.8	Calcium	223	ug/L	100	06/28/19 13:40	
EPA 200.8	Chromium	ND	ug/L	1.5	06/28/19 13:40	
EPA 200.8	Cobalt	ND	ug/L	0.20	06/28/19 13:40	
EPA 200.8	Copper	225	ug/L	10.0	07/01/19 11:47	
EPA 200.8	Iron	313	ug/L	50.0	06/28/19 13:40	

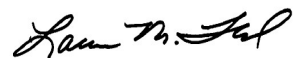
Sample: IGH B - Wicker Well		Lab ID: 12130833002	Collected: 06/18/19 08:00	Matrix: Water		
Method	Parameters	Results	Units	Report Limit	Analyzed	Qualifiers
EPA 200.8	Lead	3.0	ug/L	0.50	06/28/19 13:40	
EPA 200.8	Magnesium	109	ug/L	100	06/28/19 13:40	
EPA 200.8	Manganese	2.6	ug/L	1.0	06/28/19 13:40	
EPA 200.8	Nickel	0.88	ug/L	0.50	06/28/19 13:40	
EPA 200.8	Selenium	ND	ug/L	1.0	06/28/19 13:40	
EPA 200.8	Silver	ND	ug/L	0.20	06/28/19 13:40	
EPA 200.8	Sodium	169000	ug/L	2000	07/01/19 11:47	P6
EPA 200.8	Thallium	ND	ug/L	0.020	06/28/19 13:40	
EPA 200.8	Zinc	377	ug/L	6.0	06/28/19 13:40	
EPA 7470	Mercury	ND	ug/L	0.10	07/01/19 13:57	

Sample: IGH C - Plan Well		Lab ID: 12130833003	Collected: 06/18/19 08:30	Matrix: Water		
Method	Parameters	Results	Units	Report Limit	Analyzed	Qualifiers
SM 2320B (1997)	Alkalinity, Total as CaCO ₃	254	mg/L	20.0	06/27/19 13:11	
SM 2510B	Specific Conductance	642	umhos/cm	1.0	06/26/19 15:18	
EPA 420.1 (1983 & 1993)	Phenolics, Total Recoverable	ND	ug/L	60.0	06/27/19 15:36	
SM 4500-H+B (1996)	pH at 25 Degrees C	7.8	Std. Units	0.10	06/21/19 16:15	H6
WI MOD DRO	WDRO C10-C28	ND	mg/L	0.10	06/27/19 13:21	
WI MOD GRO	Gasoline Range Organics	ND	ug/L	100	07/02/19 05:33	HS
EPA 200.7	Barium	77.9	ug/L	10.0	07/02/19 13:21	
EPA 200.7	Chromium	ND	ug/L	10.0	07/02/19 13:21	
EPA 200.7	Copper	13.9	ug/L	10.0	07/02/19 13:21	
EPA 200.7	Nickel	13.6	ug/L	10.0	07/02/19 13:21	
EPA 200.7	Zinc	178	ug/L	20.0	07/05/19 12:32	
EPA 200.8	Arsenic	ND	ug/L	1.5	07/02/19 10:45	
EPA 200.8	Cadmium	ND	ug/L	0.30	07/02/19 10:45	
EPA 200.8	Lead	ND	ug/L	0.50	07/02/19 10:45	
EPA 200.8	Silver	ND	ug/L	0.20	07/02/19 10:45	
EPA 7470	Mercury	ND	ug/L	0.10	07/01/19 13:53	

ANALYTE QUALIFIERS

H6	Analysis initiated outside of the 15 minute EPA required holding time.
HS	Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
T6	High boiling point hydrocarbons are present in the sample.

Reviewed by:



Laura Flood

(218) 727-6380

laura.flood@pacelabs.com

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Pace Sample Number: 102315538		Client ID: FS-2		Pace Project Number: 1037418		Date Collected: 10/04/00		Date Received: 10/05/00	
Method	Parameters	Prep Method	Results	Units	PRL	Date Prepared	Analyzed	Analyst CAS #	Footnotes
EPA 420.1 Modified	Phenol	EPA 420.1 Modified	6.18	mg/kg	5.49	10/9/2000	10/9/2000 JB1	108-95-2	Phenolics tot. in soil
EPA 6010	SPLP on Solid Metals	EPA 1312	N/A	N/A	N/A	10/10/2000	N/A		
EPA 7470	SPLP Mercury	EPA 1311	N/A	N/A	N/A	10/12/2000	N/A		
TPH DRO Wisconsin	Diesel Range organic Compounds 140 n-Triacontane (S)	TPH DRO V/E extraction	59	mg/kg	6.5	10/12/2000	10/16/00 BM1	638-68-6	GC Semivolatiles

REPORT OF LABORATORY ANALYSIS:

This report shall not be reproduced except in full,
 without the written consent of Pace Analytical Services, Inc.

Exhibit #4: Proposed Testing Schedule

2017 PERMIT
REISSUANCE[illegible]

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
Christen Pady
Christen Pady

INFORMATION:
PROJECT NO.: 87-4105
DRAWN BY: rna
CHECKED BY: kp
APPROVED BY: kp
SCALE: graphic
DATE: 00/05/17
DESCRIPTION:

SHEET NO.

FIGURE 4

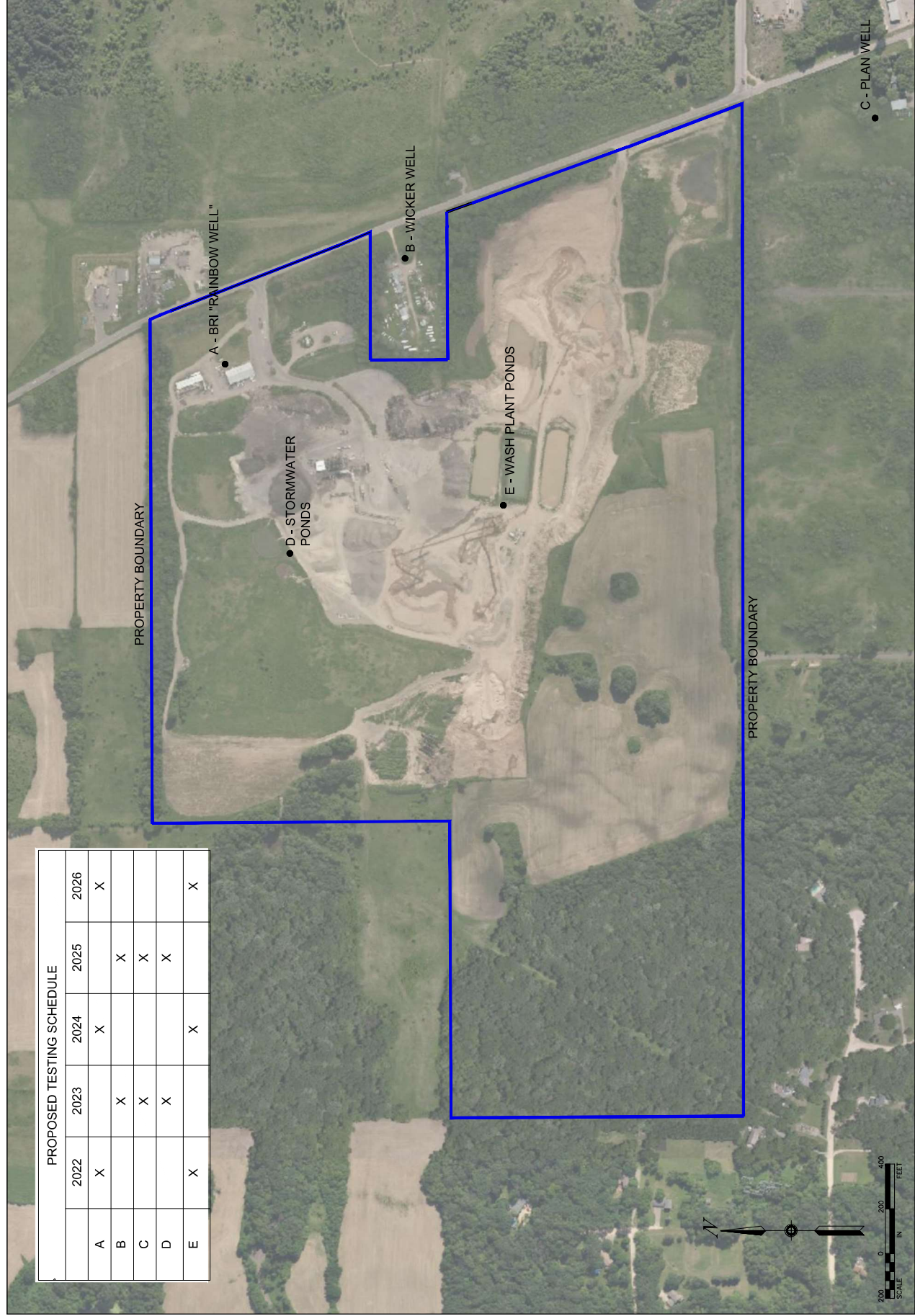
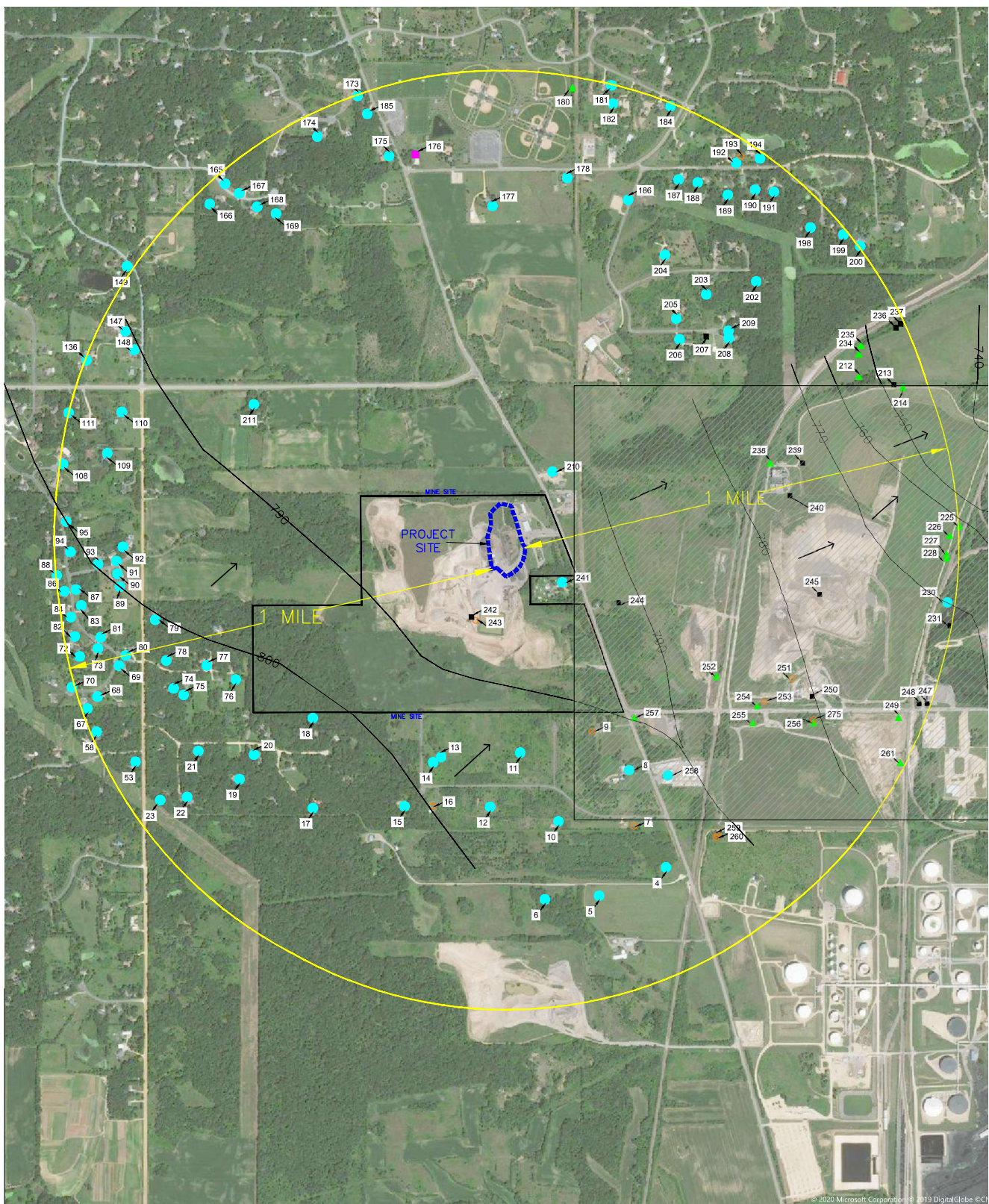


Exhibit #5: Well Map &
Index Table



KEY:

- Domestic Well
- Sealed Well
- ▲ Monitoring Well

- Irrigation Well
- Other Well
- Special Well Construction Area
Pursuant to Minnesota Rule
4725.3650

Note:
 1. No Wellhead Protection Areas are located within 1 Mile of the Site.
 2. Well locations from Minnesota Well Index.
 3. Groundwater contours from U.S. EPA's third five year review report for Pine Bend Sanitary Landfill dated February, 2010. Groundwater flows from east to west across the site.

→ Groundwater Flow Direction

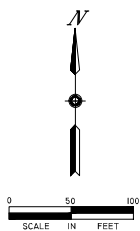


Figure 10
Wells Within 1 Mile of Site

2020 EAW
 Bituminous Roadways, Inc.
 Inver Grove Heights, Dakota County, MN



Table 1: Well Index Table

*use table in conjunction with Figure 10

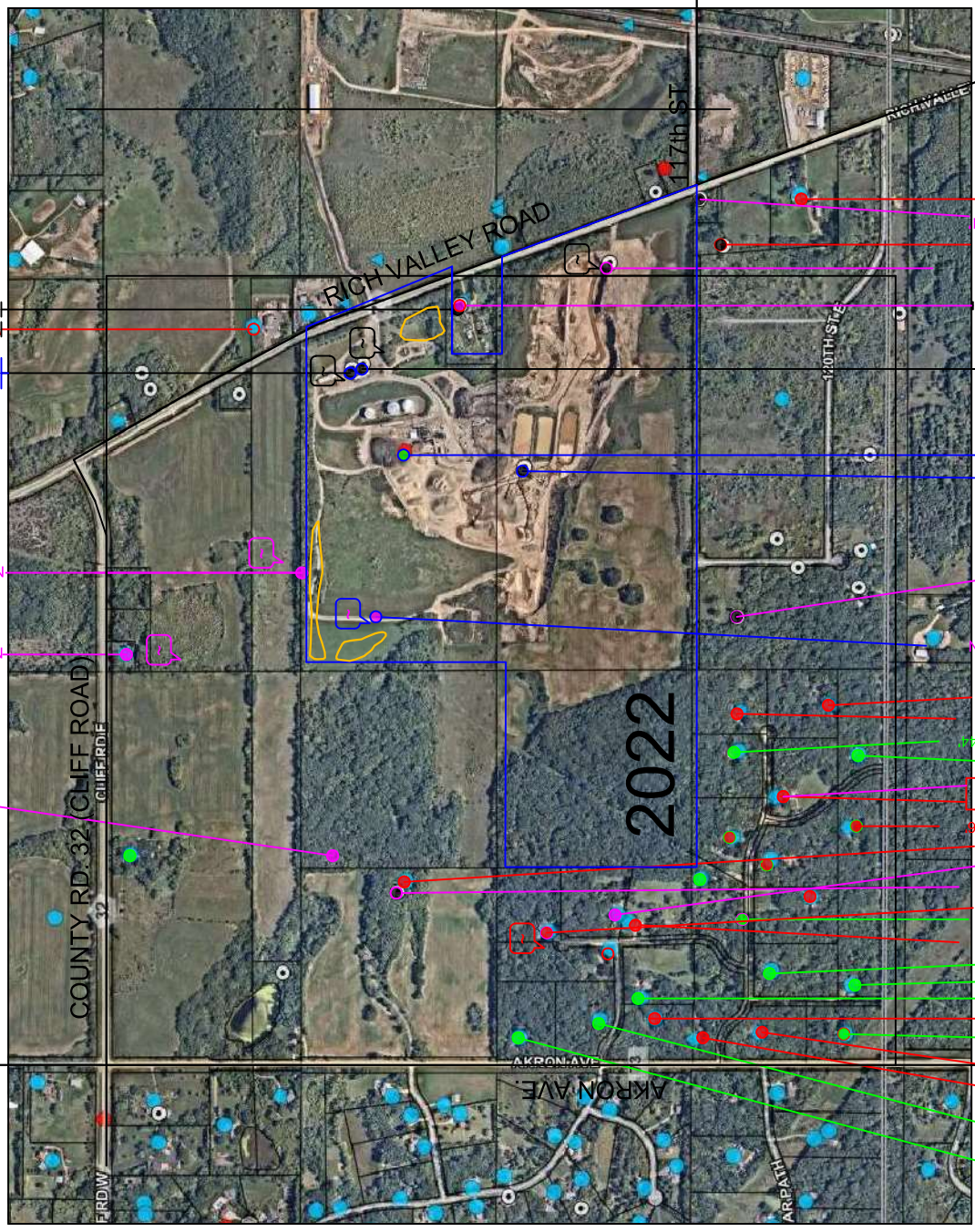
Key:		Other Well
		Irrigation Well
		Monitoring Well
		Sealed Well
		Domestic Well

MAP ID #	UNIQUE WELL NUMBER	DISTANCE TO PROJECT SITE (ft)	Well Elevation (msl in feet)
4	208395	4045	863
5	185296	4053	870
6	216474	3963	925
7	341833	3420	853
8	207296	2794	851
9	426388	2156	878
10	418677	3051	891
11	1000002642	2154	908
12	408264	2814	932
13	1000002106	2336	941
14	441870	2433	945
15	194255	3062	965
16	460151	2942	971
17	485593	3642	986
18	1000002331	2840	944
19	426968	4000	1000
20	540361	3678	983
21	194266	4210	965
22	463718	4638	961
23	451141	4927	970
53	437915	4937	1011
58	171744	5208	1023
67	608176	5211	1020
68	595100	5049	1014
69	608237	4692	991
70	595096	5315	1007
72	618538	5133	1005
73	658996	4895	1004
74	429858	4140	990
75	129284	4057	994
76	178503	3399	987
77	104127	3666	997
78	198256	4120	990
79	188001	4147	1004
80	596081	4582	994
81	591079	4839	1378
82	609807	5147	1007
83	626644	5019	1023
84	597213	5161	1023
86	561788	5214	1021
87	561634	5073	1020
88	552933	5301	1011
89	544946	4536	1007
90	546332	4560	1004
91	559253	4572	1012
92	593242	4501	1007
93	595089	4798	1007
94	587556	5137	1004
95	559252	5216	1004
108	765362	5249	1007
109	474330	4745	986
110	725082	4709	988
111	207301	5324	1000
136	608252	5263	974
147	136464	5028	975
148	668376	4840	971
149	412469	5393	971
165	783374	5144	1007
166	755293	5088	1030
167	793576	4943	997
168	768790	4676	1011
169	745826	4470	965
173	806045	5265	889
174	712710	5001	869

MAP ID #	UNIQUE WELL NUMBER	DISTANCE TO PROJECT SITE (ft)	Well Elevation (msl in feet)
175	101185	4450	885
176	686269	4383	882.5
177	460104	3631	886
178	425714	4051	883
180	804956	5135	878.3
181	481453	5269	879
182	427041	5057	900
184	437946	5255	892
185	751647	5055	896
186	186039	3991	865
187	408247	4467	850
188	451529	4547	852
189	451947	4615	852
190	190479	4863	886
191	464098	4987	877
192	768774	4996	882
193	441949	5094	883
194	402559	5205	882
198	100961	4977	863
199	159538	5223	870
200	435174	5298	880
202	420005	4046	856
203	410938	3503	866
204	494825	3583	885
205	429890	3038	886
206	437944	2881	876
207	511936	3145	873
208	634223	3343	863
209	441916	3396	876
210	821155	651	883
211	159480	3204	955
212	416161	4513	861
213	415942	4274	910
214	426270	4977	911
225	529489	5464	901
226	426264	5351	897
227	447845	5335	905
228	426261	5341	904
230	194079	5440	896
231	240189	5538	915
232	415941	6219	930
234	426265	4613	862.92
235	426266	4680	863
236	250019	5164	840
237	511905	5240	840
238	207293	3196	868
239	149795	3587	875
240	235962	3396	893
241	435227	543	889
242	780331	647	825
243	272766	651	825
244	415937	1287	878
245	207294	3671	970
247	240193	5237	905
248	194078	5145	902
249	457203	4975	901
250	100014	3903	875
251	426248	3589	887
252	623390	2750	856
253	235965	3406	865
254	207295	3363	860
255	591624	3428	863
256	506612	4067	881
257	457201	2319	857
258	190488	3115	853
259	415939	4059	847
260	415938	4081	848
261	457204	5222	896
275	457202	4044	881

Exhibit #6: Well Map ID
Numbers & Locations

- BITUMINOUS ROADWAYS WELL
- KNOWN, BUT UNLISTED WELL
- UNLISTED, UNVERIFIED WELL
- VERIFIED WELL
- SEALED WELL
- UNDISCLOSED WELL
- FOUNDRY SAND AREA



NO. 188001 WELL HEAD: 1004'

NO. 198526 WELL HEAD: 990'

NO. W06287 WELL HEAD: UNKN

NO. 429858 WELL HEAD: 990'

NO. 451141 WELL HEAD: 990'

NO. 129284 WELL HEAD: 994'

NO. 194266 WELL HEAD: 965'

NO. 463718 WELL HEAD: 961'

NO. W06628 WELL HEAD: UNKN

NO. 426931 WELL HEAD: ~990'

NO. 441923 WELL HEAD: ~990'

NO. UNKNWN: WELL HEAD UNKN

NO. W06288 WELL HEAD: ~990'

NO. 129180 WELL HEAD: ~990'

NO. 1000033275; WELL HEAD: 986'

NO. 50065 WELL HEAD: ~990'

NO. W05762 WELL HEAD: ~990'

NO. 485593; WELL HEAD: 986'

NO. 1000023331; WELL HEAD: 94'

NO. W06417 WELL HEAD: UNKN

NO. W06285 WELL HEAD: UNKN

NO. UNKNWN; WELL HEAD UNKN

H320483 WELL HEAD: 825'

NO. 272766 WELL HEAD: 825'

NO. 780331 WELL HEAD: 825'

H118525 WELL HEAD: 825'

NO. 847817; WELL HEAD: 889'

NO. UNKNWN; WELL HEAD: ~880'

NO. 426388; WELL HEAD: 851'

NO. H307162; WELL HEAD: ~851'

NO. 207296; WELL HEAD: 851'

NO. 159480; WELL HEAD: 851'

NO. UNKN; WELL HEAD UNKN

NO. W06538 HEAD UNKNOWN

NO. 100002687 WELL HEAD: 889'

H153094 WELL HEAD: 825'

WELL NO. 418612; WELL HEAD ~910'

NO. 435277; WELL HEAD: 889'

Exhibit #7: Elevations of Wells in
Proximity to Bituminous Roadways
Property



↑ WATER DIRECTION

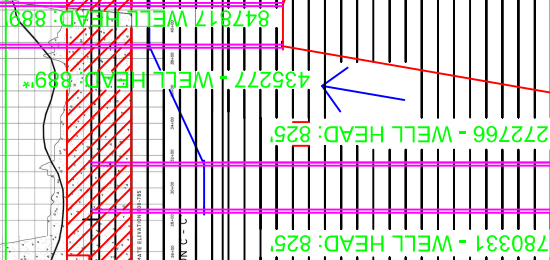
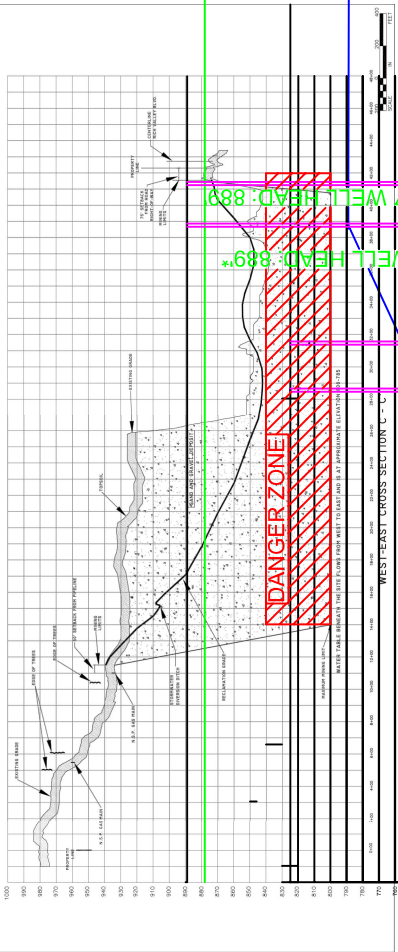


Exhibit #8: Unsealed Wells
on Site; Exposed Aquifer
Surface









Environmental Advisory Commission Staff Report

**SUBJECT: Participation in SolSmart and Submittal of Letter of
 Commitment**

MEETING DATE: April 27, 2023
ITEM TYPE: Regular Agenda
CONTACT: Ally Sutherland, Environmental Specialist, 651.604.8511

PURPOSE/ACTION REQUESTED

The Environmental Advisory Commission is asked to recommend City Council approval of SolSmart participation and submittal of a letter of commitment.

BACKGROUND

On February 13, 2023, the City Council approved the 2023 Environmental Advisory Commission (EAC) Work Plan, which includes a goal to “Support solar development in Inver Grove Heights by joining SolSmart”. Currently, city code does not explicitly define solar development requirements, which makes it challenging for residents and developers to understand how they can add solar panels to their property.

SolSmart is a certification program focused on helping communities adopt best practices for solar readiness. It is designed to recognize cities, counties, towns, and regional organizations taking steps to encourage solar energy growth at the local level. Through SolSmart, local governments receive no-cost technical assistance from a team of national experts in solar energy and local government. This technical assistance is designed to help communities meet best practices defined by “SolSmart Criteria” to help encourage solar energy growth in their jurisdictions. Communities that meet sufficient criteria receive a SolSmart designation of Bronze, Silver, Gold or Platinum.

The SolSmart Criteria is organized into five categories: Permitting and Inspection, Planning and Zoning, Government Operations, Community Engagement, and Market Development. Within each category are specific actions that municipalities can take to encourage local solar energy use. SolSmart provides clear guidance and templates to help communities put these practices into action. Technical assistance provided also includes a review of the city code and available model solar ordinance language. There are nearly 40 communities in Minnesota that have achieved SolSmart certification, including South St. Paul, Burnsville, Woodbury, Maplewood, Northfield, Red Wing and more.

Staff finds that the time needed to implement items contained within SolSmart will not exceed staff time already budgeted for environmental programming within the Community Development Department. The vast majority of staff time spent on SolSmart implementation will fall into the existing work plan of the Environmental Specialist, whose job duties include coordinating the development and implementation of sustainability projects.

FISCAL IMPACT

N/A

RECOMMENDATION

Staff recommends approval of SolSmart participation and submittal of a letter of commitment.

ATTACHMENTS

1. SolSmart Letter of Commitment
2. SolSmart Program Guide



8150 Barbara Avenue
Inver Grove Heights
Minnesota 55077

651-450-2500

www.ighmn.gov

May XX, 2023

Tim Anderson
Metropolitan Council
390 Robert St N
St. Paul, MN 55101

Sydne Tursky
Great Plain Institute
2801 21st Ave S, Suite 220
Minneapolis, MN 55407

Dear Tim and Sydne,

This letter is to notify you that the City of Inver Grove Heights is committed to joining SolSmart and becoming a SolSmart designed community. In partnership with the SolSmart team, Inver Grove Heights staff will support the solar market, making it faster, easier, and more affordable for our residents and businesses to install solar energy systems. These efforts will also increase the efficiency of local processes related to solar development, which may save our local government time and money.

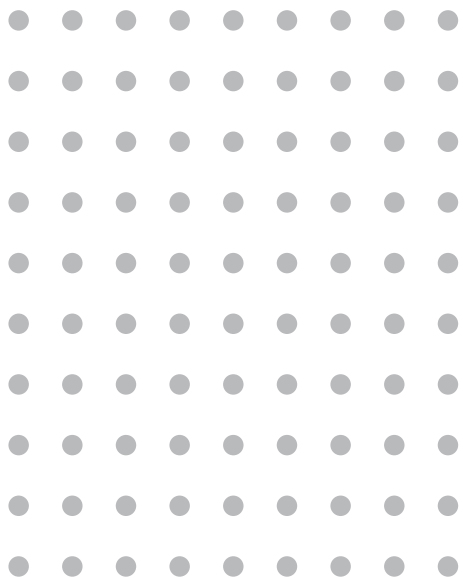
Participation in the SolSmart program supports implementation of the City of Inver Grove Heights' existing solar energy goals included the 2040 Comprehensive Plan, 2023 Inver Grove Heights Environmental Advisory Commission (EAC) Work Plan, Inver Grove Heights Energy Action Plan, and GreenStep Cities programming.

Technical assistance provided through SolSmart will help the City of Inver Grove Heights support solar development by:

- Adding language to the zoning code to clarify solar development standards
- Eliminating zoning codes that unintentionally prohibit solar development
- Creating easy-to-follow checklists of the municipal zoning and permitting approval process for solar development
- Developing materials to educate residents, business owners, and local developers about solar energy benefits

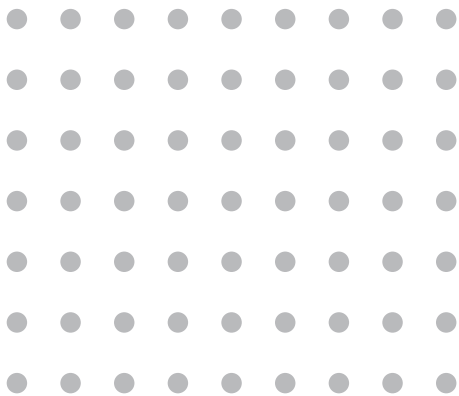
Sincerely,

Ally Sutherland
Environmental Specialist
City of Inver Grove Heights
asutherland@ighmn.gov
651-604-8511



PROGRAM GUIDE

MARCH 2023



SolSmart – Standard Pathway Program Guide

Welcome to SolSmart!

Congratulations on taking action to expand opportunities for solar in your community! In the next ten years, the amount of solar energy in the U.S. is expected grow dramatically- by 2033 there is likely to be five times more solar installed than there is today!¹ By implementing solar-friendly policies, not only can you help accelerate this transition to clean energy, but you can also ensure your community is poised to take advantage of the many benefits. Becoming SolSmart-designated means you are helping your residents save money, protecting natural resources, bolstering local resilience and increasing job opportunities in the clean energy sector. Through SolSmart, your community will get access to free technical assistance and learn how to implement strategies that make solar more affordable and accessible to all residents. Your SolSmart designation will send a signal that your community is “open for solar business,” encouraging growth of local solar companies and other sustainability-minded businesses.



Recognizing Local Solar Achievements

Since 2016, nearly 500 communities across the U.S. have received SolSmart designation. Together, we are making solar more affordable, attaining local clean energy goals and creating jobs and opportunities for all Americans to share in the benefits of clean, renewable energy!

This guide is a comprehensive resource to help you implement solar best practices in your community and gain national recognition by earning SolSmart designation! This guide will help you to navigate the “Standard Pathway,” which is applicable to most local governments that have authority over permitting, planning, zoning and/or inspection processes. Local governments that do not control these processes should refer to the SolSmart Modified Pathway Program Guide. Regional Organizations, including Regional Planning Commissions and Councils of Governments, should refer to the Regional Organization Program Guide.

The SolSmart program will connect you with solar best practices from across the country and provide clear guidance on how to implement these actions. Along the way you will receive points for the actions you take and achieve recognition as a Bronze, Silver, Gold or Platinum SolSmart-designated community! Throughout this process, our technical assistance providers are available to provide support at no cost. Please [complete this form](#) to connect with a technical assistance provider and get started on the path to SolSmart designation.

Contents

I. [SolSmart Overview](#), pg. 2

An introduction to the SolSmart Program and the designation process.

II. [Criteria Overview](#), pg. 5

A list of SolSmart criteria organized by category.

III. [SolSmart Technical Assistance and Designation Process](#), pg. 10

A summary of the designation process and how to use the information in the guide to achieve designation.

IV. [Criteria Detail and Verification Guidance](#), pg. 11

A detailed description of each SolSmart criteria with guidance and examples to assist you in implementing solar best practices and achieving points toward designation.

¹ Solar Energy Industries Association, *Solar Market Insight Report 2022 Year in Review*, March 2023, available at <https://www.seia.org/research-resources/solar-market-insight-report-2022-year-review>

I. SolSmart Overview

Across the United States, communities are increasingly using solar energy to power their homes and businesses and enjoying the benefits of clean, reliable, and affordable electricity. Rapidly declining prices for solar and related technologies have brought vast amounts of solar energy into the mainstream within a few short years. Homeowners, businesses, schools and local governments are using solar energy to drastically reduce their utility costs, while also reducing the environmental impact of their energy use. As natural disasters become more frequent and intense, distributed solar and energy storage is also bolstering energy resilience.

Local and regional governments play an important role in establishing policies, procedures and programs that impact solar deployment in communities. When local governments create barriers to solar in their local plans, permitting and other policies, either intentionally or unintentionally, they can hinder solar development. Alternately, when local governments provide a supportive environment for solar energy and take steps to streamline permitting, inspection and zoning processes, they expedite the installation of solar PV systems and help make it more affordable for residents and businesses.

Action at the local level is also fundamental to ensuring that solar programs are equitable and inclusive and ultimately deliver shared benefits to all Americans. SolSmart is committed to the goals of the federal [Justice40 initiative](#) to provide equitable opportunities for underserved communities which face barriers including fossil dependence, energy burden, environmental and climate hazards, and socio-economic vulnerabilities. SolSmart criteria reflect the importance of developing equitable and inclusive solar policies and programs.

The SolSmart program has two key components. First, the program provides no-cost technical assistance to help local governments follow national best practices to expand solar energy use in their jurisdictions. Second, it recognizes and celebrates these communities with SolSmart designations of Bronze, Silver, Gold or Platinum. SolSmart is led by the International City/County Management Association (ICMA) and the Interstate Renewable Energy Council (IREC) and funded by the U.S. Department of Energy Solar Energy Technologies Office (SETO).

Local Policies are Important to Reducing Cost

While the cost of solar panels and equipment has decreased considerably, there are still significant opportunities to reduce “soft costs.” “Soft costs” refer to business or administrative processes that increase the time and money it takes to install a solar energy system — costs that are then passed on to customers. These include costs associated with sales and marketing, permitting processes, planning, zoning considerations, financing and a wide variety of other factors. Overall, these soft costs represent about 65% of the total cost of a solar energy system.¹

The U.S. Department of Energy’s Solar Energy Technologies Office (SETO) funds [SolSmart](#), to help communities remove administrative barriers, streamline processes and improve local policies in ways that further local goals and reduce solar soft costs.

¹ U.S. Department of Energy, *Soft Costs Webpage*, available at <https://www.energy.gov/eere/solar/solar-soft-costs-basics>

Designation Levels

The SolSmart program has developed a set of designation criteria based on established best practices that encourage the growth of solar energy at the local level. The criteria for the Standard Pathway are organized into five categories – Permitting and Inspection, Planning and Zoning, Government Operations, Community Engagement and Market Development. Within each category, SolSmart provides clear guidance and templates to help communities put these practices into action. Some of the criteria are prerequisites, while others are elective. Each criterion has a corresponding point value. Upon meeting the prerequisites and reaching a sufficient number of points in each category, a participant qualifies for SolSmart designation.

There are four levels of SolSmart designation for local governments. Below are the requirements for each level. Communities that earn 60% of the available points in a category are additionally eligible for a special recognition award.



Bronze	60 Total Points	3 Prerequisite Criteria
	☐ 20 Points in Permitting & Inspection ☐ 20 Points in Planning & Zoning ☐ 20 Points from any other category	☐ Solar Statement (PR-1) ☐ Solar permitting checklist (PI-1) ☐ Zoning review (PZ-1)
Silver	100 Total Points	4 Prerequisite Criteria
	☐ Complete bronze designation requirements	☐ Permit staff training (PI-2) ☐ Inspection staff training (PI-3) ☐ Zoning clarification (PZ-4) ☐ Solar landing page (CE-1)
Gold	200 Total Points	3 Prerequisite Criteria
	☐ Complete silver designation requirements	☐ Permit turnaround time (PI-4) ☐ Zoning accessory use (PZ-5) ☐ Zoning barrier removal (PZ-6)
Platinum	350 Total Points	4 Prerequisite Criteria
	☐ Complete gold designation requirements	☐ Instant permitting (PI-5) ☐ Post metrics (PI-6) ☐ Install solar (GO-1) ☐ Community partnerships (CE-2)

Criteria Categories

Below is a summary of each category and the types of actions that are recognized as best practices in each.

Permitting and Inspection | 28 Criteria | 275 Points

Most local governments have direct oversight of the permitting and inspection policies and procedures within their jurisdiction. Communities that implement permitting best practices provide solar developers and installers with a transparent, efficient, and cost-effective approval process. Well-trained staff and simplified permit applications can reduce staff time needed to review permits which allows them to focus on other priorities. Clear inspection procedures ensure compliance with applicable state and local codes while protecting public health and safety. *Many of the criteria in the permitting and inspection category can be verified by providing information in a detailed permitting checklist. Verification of trainings for permitting and inspection staff and documented improvements to inspection processes are also part of ensuring a transparent and efficient permitting and inspection process.*

Planning and Zoning | 26 Criteria | 215 Points

Local government planning and zoning regulations can help facilitate the rapid expansion of solar energy and associated technologies, including energy storage and electric vehicles, within a community. Communities can utilize planning and zoning regulations to increase opportunities for rooftop and ground-mounted solar energy while also advancing other community goals including affordable housing, economic development, clean transportation and the protection of natural and cultural resources. Plans should set forth a vision for the community's clean energy future, while zoning codes should provide clear and transparent regulations on the development and use of solar energy within the jurisdiction. *Many of the criteria in the planning and zoning category can be verified by providing a link to a community's codes, ordinances, and community plans.*

Government Operations | 14 Criteria | 185 Points

Local governments can lead the way by installing solar energy on public facilities and land. Communities can engage with their local utility to discuss goals for solar energy, net metering, interconnection, and community solar. These actions are high impact and can directly lead to an increase in solar energy deployment. *Many of the criteria in the government operations category can be verified by providing documents demonstrating installed solar capacity such as news articles about solar installations, dashboards/metrics showing solar production, and contracts that demonstrate solar project construction.*

Community Engagement | 13 Criteria | 90 Points

Local governments can be an important and trusted source of information for residents, businesses, and solar installers. Providing clear, high-quality information, public education and inclusive engagement opportunities can help residents and businesses interested in solar energy make informed decisions. Local governments can support more equitable outcomes by partnering with community organizations and developing goals and strategies that meet the needs of disadvantaged communities. *Many of the criteria in the community engagement category can be verified by providing information about a community's solar energy goals, strategies and partnerships on a local government's solar webpage.*

Market Development | 10 Criteria | 155 Points

Local governments can collaborate and partner with organizations to promote solar development within their jurisdiction. Supporting a community solar program, promoting a solarize group-buy campaign, or partnering with a local financial institution can make solar energy more affordable and accessible for homes and businesses while improving business opportunities for solar installers. *Many of the criteria in the market development category can be verified by providing news articles about the local government's role in supporting solar development or by providing official documents that established policies or programs.*

I. Criteria Overview

The SolSmart Standard Pathway contains 92 criteria, each of which is a specific action that local governments can implement to encourage solar energy development in their community. Each criterion has a corresponding point value ranging from 5 to 20. A detailed description with relevant templates, examples and resources to help you achieve each criterion is available in Section IV.

Criteria Identifier	Criteria Points	Program Participation Prerequisite Criteria
PR-1	Req'd	Provide a document that demonstrates your local government's commitment to pursue SolSmart designation.

Criteria Identifier	Criteria Points	Permitting and Inspection Criteria
PI-1	Req'd	Post an online checklist detailing the required permit(s), submittals, and steps of your community's permitting process for residential rooftop solar PV. (Required for Bronze)
PI-2	10	Train permitting staff on best practices for permitting solar PV and/or solar and storage systems. Training must have occurred in the past two years. (Required for Silver)
PI-3	10	Train inspection staff on best practices for inspecting solar PV and/or solar and storage systems. Training must have occurred within the past two years. (Required for Silver)
PI-4	20	Post an online statement confirming a three-business day turnaround time for residential rooftop solar PV. (Required for Gold)
PI-5	20	Demonstrate pathway for instant/automatic approval of residential rooftop solar PV systems (e.g., using SolarAPP+). (Required for Platinum)
PI-6	10	Post community metrics related to the number of solar PV and solar + storage permits & inspections processed by the community annually, average annual permitting & inspection timelines. (Required for Platinum)
PI-7	5	Adopt a standard solar PV permit application form aligned with best practices.
PI-8	5	Distinguish between solar PV systems qualifying for streamlined and standard permit review.
PI-9	5	Require no more than one permit application form for a small rooftop solar PV system.
PI-10	20	Provide an online process for solar PV permit submission and approval.
PI-11	5	Receive a demonstration of an instant or automated platform (e.g., SolarAPP+) and discuss how it might be implemented in the permitting process.
PI-12	20	Exempt or waive fees for residential solar PV permit applications.
PI-13	5	Exempt or waive fees for residential solar PV permit applications for LMI customers.
PI-14	5	Demonstrate that residential permit fees for solar PV are \$500 or less.
PI-15	10	Demonstrate that commercial permit fees for solar PV are based on cost-recovery and capped at a reasonable level so fees do not become a net revenue source. (e.g. fees cover the cost of the staff time required to review and process the permit application).
PI-16	10	Post an online checklist detailing the required permit(s), submittals, and steps of your community's solar plus (e.g., battery storage, and/or electric vehicle charging) permitting process.
PI-17	10	Post an online checklist detailing the required permit(s), submittals, and steps of your community's permitting process for primary use ground-mount solar and include any additional state required permits.
PI-18	10	Post solar PV inspection requirements online, including the inspection process and what details inspectors will review.
PI-19	10	Require no more than one inspection for small rooftop solar PV.
PI-20	10	Offer inspection appointment times in lieu of appointment windows for solar PV.
PI-21	10	Provide an online process for solar PV inspection scheduling.
PI-22	10	Show that the community has implemented virtual, photo, or another innovative inspection practice with solar and/or solar plus storage.

PI-23	10	Post solar plus (e.g., battery storage and/or electric vehicle charging) inspection requirements online, including the inspection process and what details inspectors will review.
PI-24	10	Train fire and safety staff on solar PV and/or solar and storage systems. Training must have occurred in the past two years.
PI-25	10	Train fire and safety staff on specific plans and procedures for responding to an emergency at a large-scale solar PV system within the jurisdiction. (This may include a walk-through of the site, coordinated with the project's owner/operator). Training must have occurred in the past two years.
PI-26	10	Share site specific solar PV and/or solar and storage permit data, including addresses, with first responders and their departments. (e.g. through software that allows users to view searchable, filterable data about a specific site and system).
PI-27	5	Clearly identify all local amendments to model codes where local code deviates from model code for solar and solar plus storage. Summarize those local amendments on a public webpage.
PI-28	10	Demonstrate that current model code (IRC, IBC, and NEC) cycle is implemented in the community for solar and solar plus storage (codes must be the most recent editions (or penultimate edition)).

Criteria Identifier	Criteria Points	Planning and Zoning Criteria
PZ-1	Req'd	Review zoning requirements and identify restrictions that intentionally or unintentionally prohibit solar PV development. Compile findings in a memo. (Required for Bronze). Examples include: height restrictions, set-back requirements, screening requirements, visibility restrictions, etc.
PZ-2	5	Present PZ-1 memo findings to planning commission or relevant body.
PZ-3	5	Draft proposed language for changes to zoning code based on PZ-1 memo and PZ-2 dialogue. Involve planners and/or local zoning experts and/or the public (e.g., through community-based organizations) in the creation of the draft language.
PZ-4	0	Post an online document from the Planning/Zoning Department that states accessory use solar PV is allowed by-right in all major zones. (e.g. via a zoning determination letter). (Required for Silver unless Gold Requirement PZ-5 is achieved. If PZ-5 is achieved, PZ-4 is not necessary.)
PZ-5	10	Codify in the zoning ordinance that accessory use rooftop solar PV is explicitly allowed by-right in all major zones. (Required for Gold, PZ-4 is optional)
PZ-6	10	Ensure the zoning ordinance language does not include intentional or unintentional barriers to accessory use rooftop solar PV, including but not limited to aesthetic or performance standards, screening requirements, limits to visibility, excessive restrictions to system size or rooftop coverage, glare or glint regulations, and subjective design reviews. (Required for Gold, PZ-4 is optional)
PZ-7	5	Ensure the zoning ordinance permits small ground-mounted solar PV as an accessory use in at least one zoning district.
PZ-8	5	Ensure the zoning ordinance exempts small ground-mounted solar PV from certain restrictions on accessory uses (e.g. setbacks, coverage or impervious surface calculations, or other restrictions).
PZ-9	5	Ensure the zoning ordinance establishes a clear regulatory pathway for large-scale solar PV (e.g. through a special use permit or through inclusion among allowed conditional uses).
PZ-10	10	Ensure the zoning ordinance includes a native perennial vegetation and/or habitat-friendly ground cover standard for large-scale solar PV.
PZ-11	5	Ensure the zoning ordinance enables co-location of solar PV with an agricultural use such as grazing, apiaries, or crops (agrivoltaics).
PZ-12	5	Ensure the zoning ordinance requires a decommissioning plan that outlines the terms and conditions for a large-scale solar PV system's proper removal at the end of its useful life cycle or in the event of cessation of operation. (The decommissioning plan may include steps to remove the system, requirements for disposal and/or recycling of system components, and restoration as needed to allow for return to agriculture or other land use).

PZ-13	5	Ensure the zoning ordinance establishes solar energy zones and/or solar overlays for large-scale solar PV.
PZ-14	10	Require new construction to be solar ready in at least one zoning district by adopting Appendix U (International Code Council), Appendix RB (International Energy Conservation Code), or another mechanism.
PZ-15	20	Codify a solar requirement for new construction and/or retrofits meeting a specific threshold, in at least one zoning district.
PZ-16	10	Require new construction affordable housing and multifamily housing to be solar ready.
PZ-17	10	Provide clear guidance for the installation of solar PV in areas such as historic properties, flood zones or special overlay districts.
PZ-18	10	Train planning and zoning staff on best practices in planning and zoning for solar PV. Training must have occurred in the past two years.
PZ-19	5	Post an online fact sheet that provides an overview of what zoning allows for solar PV under what conditions and in which districts (e.g. types and sizes of solar systems permitted, the processes required, and other relevant information).
PZ-20	10	Include specific solar PV goals, metrics, and strategies in the most current published version of relevant local plans (e.g., energy plan, climate plan, comprehensive plan).
PZ-21	5	Draft new or updated language and provide a timeline for the inclusion of specific solar PV goals, metrics, and/or strategies into existing and/or future plans.
PZ-22	5	Share solar PV progress towards achieving targets or metrics from PZ-20 on the solar landing page.
PZ-23	10	Include specific large-scale solar PV goals, metrics, and strategies in the most current published version of relevant local plans (e.g. energy plan, climate plan, comprehensive plan).
PZ-24	20	Develop a solar PV assessment that identifies community-wide feasibility for solar PV development within a jurisdiction (differentiate between large-scale, municipal, etc.)
PZ-25	10	Enable solar rights through a local solar access ordinance.
PZ-26	20	Codify in the zoning ordinance that accessory use energy storage systems are explicitly allowed by-right in all major zones.

Criteria Identifier	Criteria Points	Government Operations Criteria
GO-1	20	Install solar PV on local government facilities and/or local government-controlled land. (Required for Platinum)
GO-2	10	Discuss community goals for solar PV, net metering, community solar, and/or interconnection processes with the local utility and explore areas for future collaboration.
GO-3	10	Coordinate with regional organizations and/or local governments to engage utilities on advancing solar policies such as utility procurement of solar PV, green tariffs, and/or interconnection process improvements.
GO-4	20	Demonstrate coordination between local government inspectors and utility staff to reduce Permission to Operate timeline for solar PV.
GO-5	10	Conduct feasibility analysis for solar PV on local government facilities and/or local government-controlled land.
GO-6	20	Install solar PV integrated with other technologies such as battery storage or electric vehicle charging on local government facilities and/or local government-controlled land.
GO-7	20	Install solar PV on local government-controlled brownfields and/or under-utilized properties.
GO-8	10	Require new local government facilities and/or facility retrofits meeting a specific threshold to be solar ready.
GO-9	20	Procure solar energy for municipal operations through an offsite physical PPA, virtual PPA, green tariff or similar structure.
GO-10	5	Obtain a Community Benefits Agreement with solar developer for solar installation.
GO-11	10	Post metrics related to the number of municipal solar PV or solar PV plus storage/EV installations and installed capacity, municipal solar PV energy procured (ownership, PPAs, community solar offtake), and percent (%) of municipal energy usage offset by renewable energy.

GO-12	10	Directly install or provide technical or financial support for the installation of solar PV on affordable housing, multifamily housing, community-based organizations, and/or resilience hubs.
GO-13	10	Train local government staff on regulatory and (where applicable) wholesale market barriers to solar deployment and potential engagement pathways to address these barriers. Training must have occurred in the past two years.
GO-14	10	Train local government staff on best practices and issues regarding solar interconnection with the local utility. Training must have occurred within the past two years.

Criteria Identifier	Criteria Points	Community Engagement Criteria
CE-1	10	Post a solar landing page on local government's website with information that may include the community's solar goals, educational materials and tools that promote solar, and resources for solar development (e.g. permitting checklist, application forms, zoning regulations, etc.). (Required for Silver)
CE-2	20	Establish partnerships with local community-based organizations or other organizations focused on serving disadvantaged communities within your community to define your community's solar equity goals, develop implementation strategies, and establish a plan for tracking and reporting on progress. (Required for Platinum)
CE-3	5	Post online resources about residential and commercial solar PV financing options and incentives.
CE-4	5	Post online resources about consumer protection and solar PV.
CE-5	5	Post an online summary of state policies related to a property owner's solar access and solar rights, including links to state-level policy.
CE-6	5	Post an online summary of state policies related to Homeowner Associations (HOAs) ability to regulate and/or restrict solar PV, including links to state-level policy.
CE-7	5	Post online resources about solar installers and/or solar quote platforms for solar PV.
CE-8	5	Post an online solar map for your community.
CE-9	5	Post an online dashboard or summary of solar PV metrics for your community, including total installed solar PV capacity, solar PV + storage installations, and community solar and/or solarize subscribers (if applicable). Metrics should identify solar PV adoption in disadvantaged communities as well.
CE-10	5	Distribute solar job training and career opportunities in coordination with local colleges and/or workforce development organizations.
CE-11	5	Demonstrate local government support for local solar projects through speeches, press releases, opinion articles, etc.
CE-12	10	Discuss solar PV goals and/or strategies for increasing solar PV development, including large-scale solar plans, solar access, and/or solar adoption in disadvantaged communities, within an appropriate committee, commission, taskforce, and/or working group. (e.g., solar is a recurring agenda item during monthly sustainability commission meetings).
CE-13	5	Support a solar informational session and/or solar tour explaining solar PV opportunities and policies. Show that session/tour was made accessible to all members of the community including those in disadvantaged communities. Session/Tour must have occurred within the last 2 years.

Criteria Identifier	Criteria Points	Market Development Criteria
MD-1	20	Demonstrate activity in state regulatory and/or legislative proceedings regarding solar PV.
MD-2	20	Support a community-wide group purchase program (e.g., Solarize). Program must have occurred within the last 2 years.
MD-3	10	Define and implement a pathway specifically for low-to-moderate income (LMI) residents to participate in a community-wide group purchase program through program design and/or financing support options.
MD-4	20	Support a community solar program.

MD-5	10	Define and implement a pathway specifically for low-to-moderate income (LMI) residents to participate in a community solar program through program design and/or financing support options.
MD-6	20	Provide residents with Community Choice Aggregation/Energy that includes solar PV as a power generation source.
MD-7	10	Provide a PACE financing program that includes solar PV as an eligible technology.
MD-8	20	Provide local incentives or locally-enabled finance (e.g. a revolving loan fund) for solar PV and/or solar PV + technologies (e.g., battery storage and/or electric vehicle charging).
MD-9	5	Provide local incentives for solar PV to low-to-moderate income (LMI) households, disadvantaged communities, Disadvantaged Business Enterprises (DBEs), Minority and Women Owned Business Enterprises (MWBEs), and/or non-profit organizations that provide community services.
MD-10	20	Partner with financial institutions and/or foundations to offer loans, rebates, grants, or other incentives for solar PV projects. (Financial institutions could include entities such as a local or regional bank, CDFI, or credit union).

Criteria Identifier	Criteria Points	Innovative Action Criteria
IA-1	Varies	The actions identified in the categories above represent many of the most common and impactful efforts communities are taking to make going solar easier and more affordable for residents and businesses. However, we know that communities across the country are developing innovative ways to promote and deploy solar energy. If your community has taken action that was not captured in any of the criteria above, please share it with us.

II. SolSmart Technical Assistance and Designation Process

Any local government, regardless of previous solar experience, is eligible for SolSmart designation. To request a call with a member of the SolSmart program, please [complete the contact form on SolSmart.org](https://www.solsmart.org/contact).

Once the local government decides to pursue SolSmart designation, they need to complete a Solar Statement and submit it to the SolSmart team. The Solar Statement demonstrates the community's commitment to work with the SolSmart program and achieve designation. The local government will be connected with one of our technical assistance providers who will work with community to review community's goals and processes. This review helps determine how close the community is to designation and any additional technical assistance to achieve designation. The local government with work with their technical assistance provider to develop a plan, identify which criteria they will meet to achieve their desired designation level, and implement best practices in the community. Once they have completed the required actions, the local government can submit for designation.

To earn national recognition from the SolSmart Program, a community must provide documentation of the actions it has implemented. This may include a combination of signed memos, web links, program materials, policy documents, etc. as appropriate. Section IV of this Program Guide provides a detailed description of each SolSmart criterion with resources to support implementation and guidance on documentation and verification that will be required by SolSmart.

Once the local government is ready for designation review, the submission is reviewed by the Designation Program Administrator within two weeks and the local government is notified of their designation by email.

Local governments are encouraged to celebrate and publicize their designations and to post information about SolSmart on their own websites. Many SolSmart designees have held events, shared photos and videos, and taken other actions to publicize their achievements. The designation email contains a Designation Toolkit with template press release, sample social media, and SolSmart Designation logos. SolSmart will also recognize local governments on the SolSmart website, on social media, and in the SolSmart newsletter.

Designation Pathways

There are three pathways to SolSmart designation:

Local governments that control permitting, inspection, planning, and zoning use the **Standard Pathway (as summarized in this guide)**.

Local governments that do not control permitting, inspection, planning, and/or zoning use the **Modified/County Pathway**. This pathway is appropriate for certain counties that do not have control over one or more of those processes.

Regional organizations such as regional councils or councils of government use the **Regional Organization Pathway**.

III. Criteria Detail and Verification Guidance

The SolSmart criteria are based on specific best practices that local governments and community stakeholders can implement to encourage solar energy development in their community. This section provides a detailed description of each criterion, recommended verification for designation review, community examples, templates, and/or resources.

The following provides an overview of the information that is provided for each SolSmart criterion:

Criterion Identifier	Criterion Points	Criterion Language	☐
Objective and description.			
Recommended Verification: Suggested options to verify how the community has achieved the criterion.			
Community Examples: Examples of how other communities have completed the criterion.			
Templates: Links to a template(s) that can help complete a criterion.			
Resources: Links to useful websites, reports, guidebooks, etc. that provide guidance related to the criterion.			

Solar Statement

PR-1	Req'd	Provide a document that demonstrates your local government's commitment to pursue SolSmart designation.	☐
Local governments interested in pursuing SolSmart designation must indicate their commitment to supporting solar development in their community by completing the PR-1 Solar Statement Prerequisite. The solar statement should be signed by a representative of the local government. It is preferred that the statement is signed by a Department executive or an elected official, but it does not need to go through an official approval process. The solar statement demonstrates your community's commitment to pursue SolSmart designation. If possible, please place the solar statement on your local government's letterhead. While the PR-1 is a commitment to the program, the best practices included in the template provided are goals to strive for and non-binding to the criteria you can pursue. The solar statement should address the items listed in the bullets below. The statement does not need to be more than one page in length.			
Recommended Verification: - Provide a signed solar statement that includes: - A commitment to participate in the SolSmart designation process - A statement of solar goals, areas of focus or community priorities (e.g. streamlining the permitting processor supporting a non-profit led solar initiative) - A statement of support for solar development to be inclusive and equitable for all residents - Past achievements or programs related to solar PV and/or renewable energy - A commitment to tracking metrics related to solar PV and/or provide a benchmark of available solar metrics (e.g. the number of installed systems, capacity, growth in residential installations, etc.) - A commitment of staff time and resources to improve the local market for solar PV			
Community Examples: Hilliard, OH SolSmart Silver Hopkins, MN SolSmart Bronze Madison, NJ SolSmart Bronze			
Templates: SolSmart Solar Statement Template SolSmart			

Permitting and Inspection

PI-1	Req'd	Post an online checklist detailing the required permit(s), submittals, and steps of your community's permitting process for residential rooftop solar PV. (Required for Bronze)	☐
Providing a set of requirements for the local solar permitting process (for both residential and commercial solar) on an easy-to-find local government webpage represents a major step toward overcoming informational barriers. An online solar permit checklist can be a simple way for a community to accelerate permit approval timelines and save staff time by reducing the number of inquiries received from solar installers and requests for additional information associated with incomplete permit applications. Such checklists typically detail all the plans and forms required for approval and system design requirements.			
Recommended Verification: • Provide a link to the online solar PV permitting checklist.			
Community Examples: • Chapel Hill, NC SolSmart Gold • Philadelphia, PA SolSmart Gold			
Templates: • SolSmart Solar Permitting Checklist Template SolSmart			
Resources: • Solar PV Systems: Job Aids for a Consistent Plan Review Process Interstate Renewable Energy Council (IREC) • California Solar Permitting Guidebook (4th Edition) (pg. 22-24) • Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments)			
PI-2	10	Train permitting staff on best practices for permitting solar PV and/or solar and storage systems. Training must have occurred in the past two years. (Required for Silver)	☐
Regular solar PV training, at least every few years, is a best practice to ensure permit technicians and plan reviewers are up-to-date on new procedures, codes, and products within the solar industry. Trainings increase staff knowledge of solar energy systems and ensures they know the best procedures for permit application review and processing to ensure applications and supporting documents are compliant with building and electrical codes. Increased staff knowledge can improve processing efficiency, thereby reducing demands on staff time and resources. Local governments can require staff to attend full or half-day workshops (either live or online) and provide resources designed to help keep staff informed about advances in solar and storage technologies.			
Recommended Verification: • Provide a signed memo with details about the permit training including name of training, name of trainer, attendees (name, title, department), date and time, location, agenda, and presentation/slides.			
Templates • SolSmart Training Verification Memo SolSmart			
Resources: • Permitting Training Module 1 IREC Solar PV Structural Plan Review – Primary Resource • Permitting Training Module 2 IREC Solar PV Electrical Plan Review– Primary Resource • Permitting Training Module 3 IREC Solar PV Plan Review Test– Primary Resource • SolSmart Workshop: Best Practices for Solar PV Permitting and Inspection (session 1, permitting I) SolSmart and Bill Brooks, P.E. • SolSmart Workshop: Best Practices for Solar PV Permitting and Inspection (session 2, permitting II) SolSmart and Bill Brooks, P.E. • SolSmart Workshop: Best Practices for Solar PV Permitting and Inspection (session 3, inspection) SolSmart and Bill Brooks, P.E. • Solar + Storage, A Guide for Local Governments SolSmart Webinar			

PI-3	10	Train inspection staff on best practices for inspecting solar PV and/or solar and storage systems. Training must have occurred within the past two years. (Required for Silver)	☐
Regular solar PV training, at least every few years, is a best practice to ensure field inspectors are up-to-date on new procedures, codes, and products within the solar industry. Trainings increase staff knowledge of solar energy systems and ensures they know the best procedures for field inspections to ensure compliance with applicable state and local building and electrical codes. Increased staff knowledge can improve inspection efficiency, thereby reducing demands on staff time and resources. Local governments can require staff to attend full or half-day workshops (either live or online) and provide resources designed to help keep staff informed about advances in solar and storage technologies.			
Recommended Verification: Provide a signed memo with details about the inspection training including name of training, name of trainer, attendees (name, title, department), date and time, location, agenda, and presentation/slides.			
Templates: SolSmart Training Verification Memo SolSmart			
Resources: Solar PV Field Inspection Basics - Series Interstate Renewable Energy Council (IREC) SolSmart Workshop: Best Practices for Solar PV Permitting and Inspection (session 1, permitting I) SolSmart and Bill Brooks, P.E. SolSmart Workshop: Best Practices for Solar PV Permitting and Inspection (session 2, permitting II) SolSmart and Bill Brooks, P.E. SolSmart Workshop: Best Practices for Solar PV Permitting and Inspection (session 3, inspection) SolSmart and Bill Brooks, P.E. Solar + Storage, A Guide for Local Governments SolSmart Webinar			

PI-4	20	Post an online statement confirming a three-business day turnaround time for residential rooftop solar PV. (Required for Gold)	☐
Implementing a streamlined permitting process for small-scale solar PV systems (≤ 10 -15 kW) along with other efforts increase process efficiency and reduce permit turnaround times can result in significant time and cost savings for staff, solar installers, and solar customers.			
Recommended Verification: Provide a link to a webpage outlining a permitting pathway for small PV systems of less than three days.			
Community Examples: Alexandria, VA SolSmart Gold Roseville, MN SolSmart Gold			
Templates: SolSmart Solar Permitting Checklist Template SolSmart			
Resources: California Solar Permitting Guidebook (4th Edition) (pg. 22-24) National Simplified Residential PV and Energy Storage Permit Guidelines Interstate Renewable Energy Council (IREC) Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments SolarTRACE National Renewable Energy Laboratory (NREL)			

PI-5	20	Demonstrate pathway for instant/automatic approval of residential rooftop solar PV systems (e.g., using SolarAPP+). (Required for Platinum)	☐
Most residential solar systems are simple and standardized, but the high volume of applications can be time consuming for local permitting departments. Online automated platforms (e.g., SolarAPP+) offer a convenient and efficient way to manage solar permitting. These platforms can help local governments to stay up to date with relevant codes, catch errors, improve communication with applicants, accelerate approval for standardized PV systems, and improve record keeping.			
Recommended Verification: - Provide a link to the online automated platform - Utilize SolSmart Solar Permitting Checklist (see PI-1) to summarize instructions for using the automated platform			

Community Examples: • Pima County, AZ SolSmart Gold • Sacramento County, CA SolSmart Gold • Sonoma County, CA SolSmart Gold	
Templates: • SolSmart Solar Permitting Checklist Template SolSmart	
Resources: • Automated Permitting Flyer SolSmart • SolarAPP+ Benefits National Renewable Energy Laboratory (NREL) • Register for SolarAPP+ National Renewable Energy Laboratory (NREL) • SolarAPP+ Communities National Renewable Energy Laboratory (NREL) • SolarAPP+ Performance Case Studies National Renewable Energy Laboratory (NREL)	

PI-6	10	Post community metrics related to the number of solar PV and solar + storage permits & inspections processed by the community annually, average annual permitting & inspection timelines. (Required for Platinum)	☒
Posting metrics publicly provides transparency and allows community members to understand how the community is progressing toward its goals. This is an important way to create accountability and will help identify the need to implement further actions if goals are not being met. Metrics must be updated annually at a minimum, but communities should strive for quarterly updates.			
Recommended Verification: • Provide a link to this information posted on the community's website or solar landing page. Include date when the information was last updated and when tracking began.			
Community Examples: • Natick, MA SolSmart Gold			
Resources: • SolarTRACE National Renewable Energy Laboratory (NREL)			

PI-7	5	Adopt a standard solar PV permit application form aligned with best practices.	☐
Developing a solar-specific permit (or combining building and electrical permits with revisions to collect information unique to solar energy systems) and posting application materials online can save time and money for those completing the forms (and their customers) and the local government staff reviewing and approving these applications.			
Recommended Verification: • Provide a link to the standard solar PV permit application form.			
Community Examples: • Evanston, IL SolSmart Gold • Salt Lake City, UT SolSmart Bronze			
Templates: • SolSmart Solar Permit Application Template SolSmart			
Resources: • New York State Unified Solar Permit Application New York State Energy and Research Development Authority (NYSERDA) • Simplified Solar Permitting Process SolSmart • National Simplified Residential PV and Energy Storage Permit Guidelines Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments			

PI-8	5	Distinguish between solar PV systems qualifying for streamlined and standard permit review.	☐
Recognizing the relative simplicity and similarities of small-scale solar photovoltaic (PV) systems (≤ 10-15 kW in size) can allow local jurisdictions to establish processes to expedite review and approval of these systems while maintaining its commitment to ensuring public safety. Establishing a separate, streamlined process for small-scale PV systems based on proven national best practices can reduce the time required to review and approve qualifying applications, saving time and money both for the local government and the solar customer.			
Recommended Verification:			

• Provide a link to a document or web page outlining a streamlined and standard permit review policy. • Provide details in an e-mail or other written documentation from a permitting official or staff member describing the policy is also acceptable.
Community Examples: • Philadelphia, PA SolSmart Gold • Putnam County, GA SolSmart Silver
Templates: • SolSmart Solar Permitting Checklist Template SolSmart
Resources: • Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments • National Simplified Residential PV and Energy Storage Permit Guidelines Interstate Renewable Energy Council (IREC)

PI-9	5	Require no more than one permit application form for a small rooftop solar PV system.	☐
Since rooftop solar energy systems impact both the structural and electrical aspects of the buildings on which they are installed, many local jurisdictions require both building and electrical permits. However, residential rooftop systems with minimal structural impacts can be safely permitted without a building permit application. Relevant design aspects for systems qualifying for only one application form include (but are not limited to): mounting system features, static and dynamic loads of the system, type of roofing material and waterproofing methods, and compliance with zoning and fire codes.			
Recommended Verification: • Provide a link to the permit application form used for small rooftop solar PV systems.			
Community Examples: • Berkeley, CA SolSmart Gold • Fitchburg, WI SolSmart Bronze			
Resources: • New York State Unified Solar Permit Application New York State Energy and Research Development Authority (NYSERDA) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments			

PI-10	20	Provide an online process for solar PV permit submission and approval.	☐
Online permit submittal, review, and approval can eliminate solar installer trips to the permitting office and reduce the amount of time permitting staff need to spend entering information from paper application forms into an online database. Online systems can also ensure all required information is submitted prior to any review, saving staff time by ensuring only completed applications are reviewed. Online permit platforms can allow for multiple staff to review materials at the same time and to track progress in the review and approval process.			
Recommended Verification: • Provide a link to the online platform and instructions for submission and approval. • If an email-based online process is used: 1) Provide details from building officials or staff describing the process. 2) Provide a copy of a sample email with personal and confidential information removed.			
Community Examples: • Madison, WI SolSmart Gold • Missoula County, MT SolSmart Silver			
Resources: • National Simplified Residential PV and Energy Storage Permit Guidelines Interstate Renewable Energy Council (IREC) • Solar Automated Permit Processing (SolarAPP+) National Renewable Energy Laboratory (NREL) • Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments			

PI-11	5	Receive a demonstration of an instant or automated platform (e.g., SolarAPP+) and discuss how it might be implemented in the permitting process.	☐
Online automated platforms (e.g., SolarAPP+) offer a convenient and efficient way to manage solar permitting. Receiving a demonstration of a platform is an opportunity to learn how it can help local governments to stay up to date with relevant codes, catch errors, improve communication with applicants, accelerate approval for standardized PV systems, and improve record keeping.			
Recommended Verification: Signed memo that includes date, attendees, presenter, summary of discussion topics and next steps			
Resources: Automated Permitting Flyer SolSmart Instant Permitting Example State of California, California Energy Commission Register for SolarAPP+ National Renewable Energy Laboratory (NREL) SolarAPP+ Communities National Renewable Energy Laboratory (NREL) SolarAPP+ Performance Case Studies National Renewable Energy Laboratory (NREL)			

PI-12	20	Exempt or waive fees for residential solar PV permit applications.	☐
In addition to state and federal incentives, local governments can also incentivize solar development within their jurisdictions. Exempting or waiving permit fees for solar energy systems can incentivize community members to install solar by lowering the overall cost of the system. Communities that receive PI-12 also receive PI-14 (but do not also receive PI-13).			
Recommended Verification: Provide a link to the permit fee schedule or other officially approved document that shows solar PV permit fees are exempt or waived.			
Community Example: Superior, CO SolSmart Bronze Boone, NC SolSmart Gold			
Resources: Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments			

PI-13	5	Exempt or waive fees for residential solar PV permit applications for LMI customers.	☐
One way to further reduce the barriers for LMI residents to install solar PV systems, is to exempt or waive permit fees. Communities that receive points for PI-12 cannot also receive points for PI-13.			
Recommended Verification: Provide a link to the permit fee schedule or other officially approved document that shows solar PV permit fees are exempt or waived with detail on the income qualifications.			
Resources: Rooftop Solar Incentives Remain Effective For Low- And Moderate-Income Adoption National Renewable Energy Lab (NREL)			

PI-14	5	Demonstrate that residential permit fees for solar PV are \$500 or less.	☐
Many local governments permit solar systems through existing permitting processes and permit fees for solar are often calculated according to value-based methods typically associated with building permits (where the fee is a certain percentage of the overall project cost). Due to the higher cost of solar installations relative to comparable projects, fees calculated by a value-based method can become expensive and exceed the cost of the staff time required to review and issue the permits. For residential systems, capping solar permit fees under \$500 or establishing a flat fee, can ensure permit fees cover staff costs without unnecessarily increasing project costs.			
Recommended Verification: Provide a link to the permit fee schedule or a document that outlines the permit fees applied to a solar installation.			
Community Examples: Naperville, IL SolSmart Silver Sacramento, CA SolSmart Gold			
Templates: SolSmart Solar Residential Fees Template Memo SolSmart			

• SolSmart Solar Permitting Checklist Template SolSmart
Resources: • National Simplified Residential PV and Energy Storage Permit Guidelines Interstate Renewable Energy Council (IREC) • Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments

PI-15	10	Demonstrate that commercial permit fees for solar PV are based on cost-recovery and capped at a reasonable level so fees do not become a net revenue source. (e.g. fees cover the cost of the staff time required to review and process the permit application).	☐
Many local governments permit solar systems through existing permitting processes and permit fees for solar are often calculated according to value-based methods typically associated with building permits (where the fee is a certain percentage of the overall project cost). Due to the higher cost of solar installations relative to comparable projects, fees calculated by a value-based method can become expensive and exceed the cost of the staff time required to review and issue the permits. For commercial systems, basing fees on a cost-recovery method can ensure permit fees cover staff costs without unnecessarily increasing project costs.			
Recommended Verification: • Provide a link to the permit fee schedule or a document that outlines the permit fees applied to a solar installation. • Provide a narrative that explains the costs incurred in processing the permits (this should include estimates of the amount of staff hours for each stage of the process and the hourly cost of staff time). This narrative should show that the fee is not significantly higher than these costs.			
Community Examples: • Naperville, IL SolSmart Silver • Sacramento, CA SolSmart Gold			
Templates: • SolSmart Solar Commercial Fees Template Memo SolSmart • SolSmart Solar Permitting Checklist Template SolSmart			
Resources: • Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments			

PI-16	10	Post an online checklist detailing the required permit(s), submittals, and steps of your community's solar plus (e.g., battery storage and/or electric vehicle charging) permitting process.	☐
Local governments can support "solar plus" technologies, including energy storage and electric vehicle charging, by providing clear information about permitting. An online permit checklist can be a simple way for a community to accelerate permit approval timelines and save staff time by reducing the number of inquiries received from installers and requests for additional information associated with incomplete permit applications. Such checklists typically detail all the plans and forms required for approval and system design requirements.			
Recommended Verification: • Provide link to online permitting checklist for solar plus, EV charging or other "solar plus" technologies.			
Community Examples: • Rocklin, CA Not Designated • Sonoma, CA Not Designated • Orlando, FL SolSmart Gold • Windsor, CA Not Designated			
Resources: • Battery Energy Storage System Model Permit New York State Energy and Research Development Authority (NYSERDA) • National Simplified Residential PV and Energy Storage Permit Guidelines Interstate Renewable Energy Council (IREC) • Solar + Storage, A Guide for Local Governments SolSmart Webinar • Storage Permitting Resources Sustainable CUNY Smart Distributed Generation Hub			

PI-17	10	Post an online checklist detailing the required permit(s), submittals, and steps of your community's permitting process for primary use ground-mount solar and include any additional state required permits.	☐
Providing a set of requirements for the local solar permitting process for primary use ground-mount solar on an easy-to-find local government webpage represents a major step toward overcoming informational barriers. An online solar permit checklist can be a simple way for a community to accelerate permit approval timelines and save staff time by reducing the number of inquiries received from solar installers and requests for additional information associated with incomplete permit applications. Such checklists typically detail all the plans and forms required for approval and system design requirements.			
Recommended Verification: • Provide a link to the online ground-mount solar PV permitting checklist.			
Community Examples: • Town of Hollis, NH Not Designated • Orange County, CA Not Designated			
Resources: • Solar@Scale Guidebook (pg. 88-100) ICMA and APA			
PI-18	10	Post solar PV inspection requirements online, including the inspection process and what details inspectors will review.	☐
Providing an online list of inspection requirements will reduce informational barriers between inspectors and solar installers, helping to ensure that all items in the inspection process have been adequately addressed before inspectors arrive on site. These checklists can be used to highlight “common mistakes” made by installers.			
Recommended Verification: • Provide a link to the online document outlining the inspection process and requirements.			
Community Example: • Harrisonburg, VA SolSmart Bronze • Ramsey County, MN SolSmart Bronze			
Templates: • SolSmart Rooftop Solar Photovoltaic (PV) System Field Inspection Checklist SolSmart			
Resources: • Model Inspection Checklist for Residential Rooftop PV Interstate Renewable Energy Council (IREC) • Inspection Checklist Institute for Building Technology and Safety (IBTS) • Field Inspection Checklist New York State Energy and Research Development Authority (NYSERDA) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments • Job Aids for a Consistent Plan Review Process Interstate Renewable Energy Council (IREC)			
PI-19	10	Require no more than one inspection for small rooftop solar PV.	☐
Inspections of standard rooftop solar energy systems installed on existing homes should be consolidated into a single inspection trip. Any inspections should be limited to the electrical, structural, and fire safety aspects of the system; excessive reviews add to the time and cost of the inspection process while doing little to ensure system efficiency or further protect public health or safety. Building and Fire Authorities can enter into agreements allowing for a single agency to conduct all inspections for systems meeting certain design standards.			
Recommended Verification: • Provide details about the solar PV inspection process that includes information on the type of inspections (and which departments are involved) and total number inspection trips required.			
Community Examples: • Lake in the Hills, IL SolSmart Gold • South St. Paul, MN SolSmart Bronze			
Templates: • SolSmart Solar Permitting Checklist Template SolSmart			
Resources: • Field Inspection Checklist New York State Energy and Research Development Authority (NYSERDA) • Job Aids for a Consistent Plan Review Process Interstate Renewable Energy Council (IREC) • Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments			

PI-20	10	Offer inspection appointment times in lieu of appointment windows for solar PV.	☐
Though inspections of standard rooftop solar PV systems can take as little as 30 minutes to complete, inspection appointment windows can be up to four or more hours long. Replacing appointment windows with scheduled appointment times will ensure the inspector and installer are both prepared for the inspection to occur when they arrive on site. This can save time and money for both the local government and the installer (and for solar customers as well).			
Recommended Verification: • Provide details about the solar PV inspection process that includes information on inspection appointment times and how to request an appointment.			
Community Examples: • Coventry, CT SolSmart Gold • Pulaski County, VA SolSmart Gold			
Templates: • SolSmart Solar Permitting Checklist Template SolSmart			
Resources: • Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments			
PI-21	10	Provide an online process for solar PV inspection scheduling.	☐
Similar to online permit submittal, review, and approval processes, an online option for scheduling and managing inspection requests can promote process efficiency and reduce demands on time and resources for local government staff.			
Recommended Verification: • Provide a link to the online platform for inspection scheduling. • If an email-based online process is used: 1) Provide details from building official or staff describing the process. 2) Provide a copy of a sample email with personal and confidential information removed.			
Community Examples: • San Leandro, CA SolSmart Silver • Raleigh, NC SolSmart Silver			
Resources: • Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained Interstate Renewable Energy Council (IREC) • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments			
PI-22	10	Show that the community has implemented virtual, photo, or another innovative inspection practice with solar and/or solar plus storage.	☐
Innovations that help to streamline the inspection process can ensure that systems are properly installed while reducing time and expense. Communities may utilize these practices for systems of a certain type (i.e., residential) or size.			
Recommended Verification: • Include details on virtual, photo, or another innovative inspection practice in the community's Inspection Checklist (PI-1); or • Describe the innovative practices in a signed memo.			
Community Examples: • Tampa, FL SolSmart Bronze • Pima County, AZ SolSmart Gold • County of Los Angeles Not designated			
Resources: • Construction Photo Resource NY- Sun • Inspection Guide for PV Systems For One- and Two- Family Dwellings County of Los Angeles			

PI-23	10	Post solar plus (e.g., battery storage and/or electric vehicle charging) inspection requirements online, including the inspection process and what details inspectors will review.	☐
Providing an online list of inspection requirements will reduce informational barriers between inspectors and energy storage installers, helping to ensure that all items in the inspection process have been adequately addressed before inspectors arrive on site. These checklists can be used to highlight “common mistakes” made by installers.			
Recommended Verification: • Provide a link to the online document outlining the inspection process and requirements.			
Community Examples: • Palo Alto, CA Not Designated			
Templates: • SolSmart Energy Storage Field Inspection Checklist Template SolSmart			
Resources: • Battery Energy Storage System Electrical Checklist New York State Energy and Research Development Authority (NYSERDA) • Solar + Storage, A Guide for Local Governments SolSmart Webinar			
PI-24	10	Train fire and safety staff on solar PV and/or solar and storage systems. Training must have occurred in the past two years.	☐
Regular solar PV training, at least every few years, is a best practice to ensure firefighters and first responders are up-to-date on new procedures, codes, and products within the solar industry. Though fires caused by rooftop solar PV systems are extremely rare, firefighters responding to fires caused by other means need to take special precautions when a solar PV system is present. Training fire safety staff on how to identify and avoid potential hazards can help ensure the safety of first responders and reduce misconceptions or discomfort around increased solar deployment.			
Recommended Verification: • Provide a signed memo with details about the fire and safety staff training including name of training, name of trainer, attendees (name, title, department), date and time, location.			
Templates: • SolSmart Training Verification Memo SolSmart			
Resources: • Firefighter Safety and Photovoltaic Systems (Training Course) UL • Photovoltaic (PV) Systems National Fire Protection Association (NFPA) • Solar + Storage, A Guide for Local Governments SolSmart Webinar • Solar PV Safety for Firefighters Interstate Renewable Energy Council (IREC) • Fire Safety for Solar PV SolSmart Webinar • Fire Safety for Solar PV SolSmart Slide Deck			
PI-25	10	Train fire and safety staff on specific plans and procedures for responding to an emergency at a large-scale solar PV system within the jurisdiction. (This may include a walk-through of the site, coordinated with the project’s owner/operator). Training must have occurred in the past two years.	☐
Though fires and other emergencies at large-scale solar PV systems are extremely rare, fire and safety staff should partner with a large-scale solar system owner/operator to ensure first responders have a standard operating procedure (SOP) outlining how to address a fire or rescue operation at the large-scale solar project. The solar system owner/operator should work with fire responder to ensure SOPs are established and that the fire and safety staff have received any necessary training. Along with a basic understanding of solar PV and fire safety, firefighters and safety staff should be familiar with the project site and characteristics, including where to enter the site, location of system components, if battery storage is present at the site, and proper shutdown procedures. First responders should also know key points of contact for the project in case of an emergency.			
Recommended Verification: • Provide a signed memo with details about emergency response plans and procedures. • Provide a link to the requirement in the community’s code of ordinances.			
Community Examples: • Putnam County, GA (e,9) SolSmart Silver • York, ME (pg. 178 – f,3) Not Designated			

Templates: • SolSmart Training Verification Memo SolSmart	
Resources: • Fire Fighter Safety and Emergency Response for Solar Power Systems The Fire Protection Research Foundation • Solar PV Safety for Firefighters Interstate Renewable Energy Council (IREC)	

PI-26	10	Share site specific solar PV and/or solar and storage permit data, including addresses, with first responders and their departments. (e.g. through software that allows users to view searchable, filterable data about a specific site and system).	☐
Fire and safety staff can benefit from having access to the locations of permitted solar PV systems. This gives fire departments advanced knowledge about homes or business that have on-site solar and allows them to development a plan before arriving onsite.			
Recommended Verification: • Provide details about the process for information sharing, including how fire and safety staff received the data. • Provide a link to the platform that allows fire and safety staff to access the data.			
Community Examples: • Adams County, CO SolSmart Gold • Freeport, IL SolSmart Gold			
Resources: • Solar PV Construction: Codes, Permitting, and Inspection SolSmart's Toolkit for Local Governments • Solar PV Safety for Firefighters Interstate Renewable Energy Council (IREC)			

PI-27	5	Clearly identify all local amendments to model codes where local code deviates from model code for solar and solar plus storage. Summarize those local amendments on a public webpage.	☐
Sometimes local codes must deviate from model codes for reasons specific to that community. Informing the public which local codes differ and why increases transparency and trust. Post on the community's website or solar landing page a table summarizing the current model code adopted by the community and list amendments relevant to solar PV and energy storage.			
Recommended Verification: • Provide a link to this information posted on the community's website or solar landing page.			

PI-28	10	Demonstrate that current model code (IRC, IBC, and NEC) cycle is implemented in the community for solar and solar plus storage (codes must be the most recent editions (or penultimate edition)).	☐
The safe and reliable installation of solar PV systems and their integration with the nation's electric grid requires timely implementation of the foundational codes and standards governing solar deployment. The codes, which are typically updated every three years, are not necessarily adopted as soon as they are published. State and local governments generally adopt the codes on schedules related to state and local governmental processes. This variability makes it more difficult (and costly) for a solar installer to operate across multiple jurisdictions. Therefore, states and localities are encouraged to update their codes to more effectively regulate solar development.			
Recommended Verification: • Provide a link to this information posted on the community's website or solar landing page.			

Planning and Zoning

PZ-1	Req'd	Review zoning requirements and identify restrictions that intentionally or unintentionally prohibit solar PV development. Compile findings in a memo. (Required for Bronze). Examples include: height restrictions, set-back requirements, screening requirements, visibility restrictions, etc.	☐
A community's zoning ordinance and land use regulations create statutory limits on what individuals may do with their property as a matter of right and often provides additional processes to consider special exceptions. Land use regulations often contain use standards that provide additional requirements for certain types of development. Local governments should be aware of any restrictions that could intentionally or unintentionally prohibit solar energy development within their community and consider removing those barriers to promote easier and more equitable solar deployment. Often, removing restrictive zoning language can save property owners time and money because they can avoid going through a more extensive process to have their solar system considered.			
Recommended Verification: • Provide a signed SolSmart Zoning Review Memo.			
Community Examples: • Gurnee, IL SolSmart Bronze			
Resources: • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			
PZ-2	5	Present PZ-1 memo findings to planning commission or relevant body.	☐
The zoning ordinance review memo can be the starting point for ordinance amendments to remove barriers to solar or add language that could promote development. Presenting the findings of the memo to a relevant commission or body can start conversations about updates to solar energy regulations within the community. If the relevant commission or body is interested in updating the zoning ordinance, they can direct staff to draft recommendations.			
Recommended Verification: • Provide meeting minutes, meeting agenda, or materials prepared for the meeting (e.g., handouts and slides) that demonstrate a discussion about the zoning review.			
Community Examples: • Gurnee, IL SolSmart Bronze • Council Bluffs, IA SolSmart Gold			
Resources: • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			
PZ-3	5	Draft proposed language for changes to zoning code based on PZ-1 memo and PZ-2 dialogue. Involve planners and/or local zoning experts and/or the public (e.g., through community-based organizations) in the creation of the draft language.	☐
A local government interested in enabling solar energy development should consider including basic solar information in the zoning ordinance such as a purpose, definitions, clarification on accessory use and primary use solar, and use standards. Zoning codes that contain no or little information about solar energy can complicate the process for homes and business that want to install a solar energy system. Including basic information about solar energy improves transparency of processes and clarity of development requirements and can enhance the growth of the local solar market in an organized and efficient manner. The local government should provide education to the public about the drafted changes to the zoning code and how that impacts residents.			
Recommended Verification: • Provide draft language of the proposed zoning ordinance changes that clarify solar energy requirements, address gaps identified by PZ-1 memo, and remove barriers to solar development.			
Community Examples: • Lafayette, CO SolSmart Gold			
Resources: • Renewable Energy Ordinance Framework: Solar PV Delaware Valley Regional Planning Commission (DVRPC) • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			

PZ-4	0	Post an online document from the Planning/Zoning Department that states accessory use solar PV is allowed by-right in all major zones. (e.g. via a zoning determination letter). (Required for Silver unless Gold Requirement PZ-5 is achieved. If PZ-5 is achieved, PZ-4 is not necessary.)	☐
Including solar energy in the zoning ordinance provides the highest level of policy certainty and clarity. A zoning ordinance change that codifies accessory use solar as an allowed or by-right use is a best-case scenario. However, this may be impractical or politically difficult to achieve in the short term, or outside of a zoning update cycle. Instead of an ordinance change, local governments may write and publish a zoning determination letter clarifying that accessory use solar is an allowed or by-right use in all major zones. This clarification removes uncertainty and can increase solar adoption and lower costs for residents and businesses.			
Recommended Verification: • Provide a link to an online document (and the parent webpage) that clarifies that accessory solar PV is an allowed or by-right use in all major zones. • This document should: 1) show that the process does not involve staff discretion, special permits, conditional permits, use permits, or variances 2) have language that demonstrates its applicability in all major zones 3) be made public; and 4) be dated and signed by a Department or Committee head.			
Community Examples: • Egg Harbor, WI SolSmart Silver • South Miami, FL SolSmart Silver			
Resources: • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			

PZ-5	10	Codify in the zoning ordinance that accessory use rooftop solar PV is explicitly allowed by-right in all major zones. (Required for Gold, PZ-4 is optional)	☐
A community's zoning ordinance and land use regulations create statutory limits on what individuals may do with their property as a matter of right. Zoning often provides additional processes, which can be long and costly, to consider special exceptions when a proposal is inconsistent with current land use regulations. Codifying solar as an accessory use and as an allowed or by-right use in all major zoning categories provides policy certainty and clarity which can promote easier and more equitable solar deployment. It can increase solar development and save property owners time and money because they can avoid going through a more extensive process to have their solar system considered.			
Recommended Verification: • Provide a link to the zoning ordinance, use table, and/or land use regulations that codify solar as an accessory use and is an allowed, permitted or by-right use. Please indicate the relevant section(s).			
Community Examples: • Lansing, MI (pg. 36) SolSmart Silver • Philadelphia, PA (Section 14-604.7.a) SolSmart Gold • Pepperell, MA SolSmart Gold			
Resources: • Best Practice Guidance for Solar and Zoning – Accessory Use SolSmart • Georgia's Model Solar Ordinance Georgia Tech Strategic Energy Institute • Model Solar Energy Local Law (NY) New York State Energy Research and Development Authority (NYSERDA) • Model Zoning for the Regulation of Solar Energy Systems Massachusetts Department of Energy Resources • Renewable Energy Ordinance Framework: Solar PV Delaware Valley Regional Planning Commission • Solar Model Ordinance Grow Solar Toolkit • Template Solar Energy Development Ordinance for North Carolina North Carolina Clean Energy Technology Center (NCCETC) • Are You Solar Ready? National Renewable Energy Laboratory (NREL) • Best Practices in Zoning for Solar National Renewable Energy Laboratory (NREL) • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			

PZ-6	10	Ensure the zoning ordinance language does not include intentional or unintentional barriers to accessory use rooftop solar PV, including but not limited to aesthetic or performance standards, screening requirements, limits to visibility, excessive restrictions to system size or rooftop coverage, glare or glint regulations, and subjective design reviews. (Required for Gold, PZ-4 is optional)	☐
While communities may set standards to further regulate the design, size, use, and placement of rooftop solar PV systems, it is important to ensure these do not intentionally or unintentionally impose barriers to accessory use rooftop solar. For example, such standards can increase system costs/reduce production (e.g. screening, visibility limits), go beyond a local government's jurisdiction (e.g. limits on electricity production/ consumption), perpetuate myths about solar PV (e.g. glare, aesthetics), be subjective (e.g. glare, aesthetics, design reviews), and/or open up the community to legal battles.			
Recommended Verification: Provide a link to the zoning ordinance or land use regulations regarding accessory use rooftop solar. Please indicate the relevant section(s) that describe the review process, standards, or related exemptions applicable to accessory use rooftop solar.			
Community Examples: Brownsville, TX SolSmart Silver Plymouth, IN (pg. 204, 210 D.2.a) SolSmart Gold Philadelphia, PA SolSmart Gold			
Resources: Best Practice Guidance for Solar and Zoning – Accessory Use SolSmart Model Zoning for the Regulation of Solar Energy Systems Massachusetts Department of Energy Resources Renewable Energy Ordinance Framework: Solar PV Delaware Valley Regional Planning Commission (DVRPC) Planning for Solar Energy American Planning Association (APA) Planning, Zoning & Development SolSmart's Toolkit for Local Governments			
PZ-7	5	Ensure the zoning ordinance permits small ground-mounted solar PV as an accessory use in at least one zoning district.	☐
Sometimes a property is not suitable for rooftop solar because the building has structural limitations, or the rooftop is shaded. In this case, a small ground-mounted solar PV system can still allow the property owner to install solar and enjoy the benefits. Permitting or allowing small ground-mounted solar PV as an accessory use in at least one zoning district can promote easier and more equitable solar deployment. It can increase solar development and save property owners time and money because they can avoid going through a more extensive process to have their solar system considered.			
Recommended Verification: Provide a link to the zoning ordinance or land use regulations that allows small ground-mounted solar PV as an accessory use. Please indicate the relevant section(s).			
Community Examples: Philadelphia, PA SolSmart Gold La Crescent, MN SolSmart Gold			
Resources: Best Practice Guidance for Solar and Zoning – Accessory Use SolSmart Model Zoning for the Regulation of Solar Energy Systems Massachusetts Department of Energy Resources Renewable Energy Ordinance Framework: Solar PV Delaware Valley Regional Planning Commission (DVRPC) Best Practices in Zoning for Solar National Renewable Energy Laboratory (NREL) Planning for Solar Energy American Planning Association (APA) Planning, Zoning & Development SolSmart's Toolkit for Local Governments			
PZ-8	5	Ensure the zoning ordinance exempts small ground-mounted solar PV from certain restrictions on accessory uses (e.g. setbacks, coverage or impervious surface calculations, or other restrictions).	☐
Opportunities for small ground-mounted PV may be limited if they are subjected to certain restrictions such as setbacks, lot coverage, and impervious surface ratios. These types of regulations are normally applied to accessory			

structures like sheds, garages, or accessory dwelling units which can have a greater impact on neighbors when built up against a lot line or covering a larger percentage of the lot. Solar is less obtrusive and contains pervious surfaces underneath the panels and it can be exempted from certain restrictions to promote easier and more equitable solar deployment.

Recommended Verification:

- Provide a link to the zoning ordinance or land use regulations that exempts small ground-mounted solar PV from certain restrictions on accessory uses. Please indicate the relevant section(s).

Community Examples:

- [Edina, MN](#) | SolSmart Gold
- [Swarthmore, PA](#) | SolSmart Bronze

Resources:

- [Best Practice Guidance for Solar and Zoning – Accessory Use](#) | SolSmart
- [Model Zoning for the Regulation of Solar Energy Systems](#) | Massachusetts Department of Energy Resources
- [Renewable Energy Ordinance Framework: Solar PV](#) | Delaware Valley Regional Planning Commission (DVRPC)
- [Planning for Solar Energy](#) | American Planning Association (APA)
- [Planning, Zoning & Development](#) | SolSmart's Toolkit for Local Governments

PZ-9	5	Ensure the zoning ordinance establishes a clear regulatory pathway for large-scale solar PV (e.g. through a special use permit or through inclusion among allowed conditional uses).	☐
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A local government should consider including large-scale solar regulations in their zoning ordinance or land use regulations to provide clarity and consistency to the development process. Including the type of district (e.g. commercial, industrial, low productivity agricultural land) where development is allowed, the type of applicable permit(s) (e.g. conditional use permits, use permits), and use standards or special regulations provide solar developers with a clear set of guidelines and a more predictable approval process.

Recommended Verification:

- Provide a link to the zoning ordinance or land use regulations that establishes a regulatory pathway for large-scale solar PV development. Please indicate the relevant section(s).

Community Examples:

- [Freeport, IL](#) | SolSmart Gold
- [La Crosse, WI](#) | SolSmart Gold
- [Chisago County, MN](#) | SolSmart Silver

Resources:

- [Model Zoning for the Regulation of Solar Energy Systems](#) | Massachusetts Department of Energy Resources
- [Renewable Energy Ordinance Framework: Solar PV](#) | Delaware Valley Regional Planning Commission (DVRPC)
- [Are You Solar Ready?](#) | National Renewable Energy Laboratory (NREL)
- [Land Use Considerations for Large-scale Solar](#) | SolSmart Issue Brief
- [Planning for Solar Energy](#) | American Planning Association (APA)
- [Solar@Scale Guidebook](#) | ICMA and APA
- [Top Five Large-scale Solar Myths](#) | National Renewable Energy Laboratory (NREL)

PZ-10	10	Ensure the zoning ordinance includes a native perennial vegetation and/or habitat-friendly ground cover standard for large-scale solar PV.	☐
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Large-scale solar projects cover many acres that can be used for the dual purpose of providing clean, renewable energy and growing native perennial vegetation or habitat-friendly ground cover. Planting native perennial vegetation under solar PV systems can improve soil health and water retention, while providing habitat for pollinators and native species.

Recommended Verification:

- Provide a link to the zoning ordinance or land use regulations that includes language about a native perennial vegetation and/or habitat-friendly ground cover requirement or standard. Please indicate the relevant section(s).

Community Examples:

- [Stearns County, MN](#) (6.54.1 H) | SolSmart Silver

• St. Joseph County, IN SolSmart Gold
Resources: • Minnesota Solar Model Ordinance Great Plains Institute (GPI) • Model Solar Energy Local Law (NY) New York State Energy Research and Development Authority (NYSERDA) • Land Use Considerations for Large-scale Solar SolSmart Issue Brief • State Pollinator-friendly Scorecards Fresh Energy • Pollinator Habitat Aligned with Solar Energy (PHASE) University of Illinois • Innovative Solar Practices Integrated with Rural Economies and Ecosystems (InSPIRE) National Renewable Energy Lab (NREL) • Solar Pollinator Habitat Resources AgriSolar Clearinghouse

PZ-11	5	Ensure the zoning ordinance enables co-location of solar PV with an agricultural use such as grazing, apiaries, or crops (agrivoltaics).	☐
Large-scale solar projects cover many acres that can be used for the dual purpose of providing clean, renewable energy and co-locating with forms of agriculture. Co-locating solar PV with agriculture creates an additional revenue stream for farmers and can enhance yields, soil health, and water retention while improving system efficiency by reducing air temperature near the panels. Allowing co-location of solar PV with agricultural land use can also increase resident support of renewable energy in regions where agriculture is a primary source of income.			
Recommended Verification: • Provide a link to the zoning ordinance or land use regulations that includes language enabling the co-location of solar with an agricultural use. Please indicate the relevant section(s).			
Community Examples: • Leon County, FL SolSmart Gold • San Luis Obispo County, CA (D.9) Not Designated			
Resources: • Illinois Solar Model Ordinance Great Plains Institute (GPI) • Indiana Solar Model Ordinance Great Plains Institute (GPI) • AgriSolar Clearinghouse Information Library National Center for Appropriate Technology (NCAT) • Case Studies National Center for Appropriate Technology (NCAT) • Co-Location of Solar and Agriculture Webinar National Renewable Energy Laboratory (NREL) • Land Use Considerations for Large-scale Solar SolSmart Issue Brief • Center for Pollinators in Energy Fresh Energy • Innovative Solar Practices Integrated with Rural Economies and Ecosystems (InSPIRE) National Renewable Energy Lab (NREL) • Dual-Use Solar and Agriculture University of Massachusetts Amherst			

PZ-12	5	Ensure the zoning ordinance requires a decommissioning plan that outlines the terms and conditions for a large-scale solar PV system's proper removal at the end of its useful life cycle or in the event of cessation of operation. (The decommissioning plan may include steps to remove the system, requirements for disposal and/or recycling of system components, and restoration as needed to allow for return to agriculture or other land use).	☐
A community's zoning ordinance can require a decommissioning plan that clearly outlines the roles, responsibilities, terms, and conditions to ensure the local government will not be responsible for the removal of a large-scale solar PV system. Decommissioning is the responsibility of the system owner and requiring a plan can alleviate concerns that a local government will be unnecessarily burden with system removal.			
Recommended Verification: • Provide a link to the zoning ordinance or land use regulations that includes language about a decommissioning plan for large-scale solar PV. Please indicate the relevant section(s).			
Community Examples: • La Crosse, WI SolSmart Gold • Will County, IL SolSmart Gold			
Resources: • Model Solar Energy Local Law (NY) New York State Energy Research and Development Authority (NYSERDA) • Template Solar Energy Development Ordinance for North Carolina North Carolina Clean Energy Technology Center (NCCETC)			

• A Survey of Federal and State-Level Solar System Decommissioning Policies in the United States National Renewable Energy Laboratory (NREL) • Decommissioning Solar Panel Systems New York State Energy Research and Development Authority (NYSERDA) • Land Use Considerations for Large-scale Solar SolSmart Issue Brief
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PZ-13	5	Ensure the zoning ordinance establishes solar energy zones and/or solar overlays for large-scale solar PV.	☐
A community's zoning ordinance and land use regulations could establish a solar energy zone or overlay. This strategy can encourage solar development on favorable sites and reduce the project development timeline by streamlining permitting and zoning requirements.			
Recommended Verification: • Provide a link to the zoning ordinance or land use regulations that establishes solar energy zones and/or solar overlays for large-scale solar PV. Please indicate the relevant section(s).			
Community Examples: • Framingham, MA (pg. 96) SolSmart Silver • Wellesley, MA (pg. 101) SolSmart Silver			
Resources: • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			

PZ-14	10	Require new construction to be solar ready in at least one zoning district by adopting Appendix U (International Code Council), Appendix RB (International Energy Conservation Code), or another mechanism.	☐
Local governments can proactively plan for increased solar deployment by requiring new construction to be solar ready which can reduce the installation costs if a solar system will be installed at some point in the future. Solar ready buildings are designed and engineered in such a way that allows for the easy installation of a future solar system. The International Code Council (ICC) has developed model codes and standards for solar ready construction.			
Recommended Verification: • Provide a link to the adopted code(s) or language that requires new construction to be solar ready.			
Community Examples: • El Paso, TX SolSmart Gold • Warrenville, IL SolSmart Gold			
Resources: • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments • Solar Ready Construction Guidelines Mid-America Regional Council (MARC)			

PZ-15	20	Codify a solar requirement for new construction and/or retrofits meeting a specific threshold, in at least one zoning district.	☐
Local governments can proactively promote solar development by requiring a solar installation on new construction, and/or retrofits. Installing solar on new construction is cost-effective and can rapidly increase solar deployment in a community. A solar requirement can be mandated at a local level in the code of ordinances or, as in the case of California, at the state level.			
Recommended Verification: • Provide a link to the adopted code(s) or language that requires solar on new construction or retrofits.			
Community Examples: • Santa Monica, CA SolSmart Gold • South Miami, FL (Section W) SolSmart Silver			
Resources: • Better Roofs Ordinance San Francisco Planning Department • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			

PZ-16	10	Require new construction affordable housing and multifamily housing to be solar ready.	☐
While affordable housing and multi-family housing projects may not be able to install solar at the time of construction due to upfront costs or other challenges, they can be designed and built to ensure they are ready to support solar in the future. Local governments can require these building be designed and engineered in such a way that reduces the cost and complexity of solar installation. The International Code Council (ICC) has developed model codes and standards for solar ready construction.			
Recommended Verification: Provide a link to the adopted code(s) or language that requires new construction to be solar ready.			
Community Examples: Austin, TX (pg 4) SolSmart Gold			
Resources: Appendix U International Residential Code (IRC) Appendix RB International Energy Conservation Code (IECC) Planning for Solar Energy American Planning Association (APA) Planning, Zoning & Development SolSmart's Toolkit for Local Governments Solar Ready Construction Guidelines Mid-America Regional Council (MARC)			
PZ-17	10	Provide clear guidance for the installation of solar PV in areas such as historic properties, flood zones or special overlay districts.	☐
Many communities contain historic properties or historic districts that aim to preserve a community's character and heritage. These properties and districts are often regulated by specific design guidelines that outline how a historic property may be modified. These guidelines can include the best methods to incorporate a solar energy installation while maintaining the historical nature of the structure and surrounding neighborhood and provide a clear review process.			
Recommended Verification: - Provide a link to the zoning ordinance or land use regulations that includes guidance on the installation of solar PV on historic properties and in special overlay districts. Please indicate the relevant section(s). - Provide a link to guidance for the installation of solar PV on historic properties and in special overlay districts.			
Community Examples: Ann Arbor, MI SolSmart Silver Park City, UT SolSmart Gold Pima County, AZ SolSmart Gold			
Resources: Best Practice Guidance for Solar and Zoning – Accessory Use SolSmart Implementing Solar PV Projects on Historic Buildings and in Historic Districts National Renewable Energy Laboratory (NREL) Installing Solar Panels on Historic Buildings North Carolina Clean Energy Technology Center (NCCETC) Planning for Solar Energy American Planning Association (APA) Planning, Zoning & Development SolSmart's Toolkit for Local Governments			
PZ-18	10	Train planning and zoning staff on best practices in planning and zoning for solar PV. Training must have occurred in the past two years.	☐
Regular solar PV training, at least every two years, is a best practice to ensure planning and zoning staff are up-to-date on strategies for incorporating solar into plans, ordinances, and development regulations. Training staff in planning and zoning best practices for solar can help them to evaluate the options available for reducing barriers to solar and enable them to customize these best practices to their local context. Training can help staff develop clear, transparent, well-defined, and consistent planning and zoning regulations and processes that provide certainty for property owners and solar developers. Local governments can require staff to attend full or half-day workshops (either live or online) and provide or create resources designed to help staff keep up with advances in solar planning and zoning best practices.			
Recommended Verification: Provide a signed memo with details about the planning and zoning training including name of training, name of trainer, attendees (name, title, department), date and time, location, agenda, and presentation/slides.			

Templates:	
• SolSmart Training Verification Memo SolSmart	
Resources:	
• Best Practices in Solar Planning and Zoning SolSmart Webinar • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments • Solar@Scale Webinar Series, Session 5 ICMA and APA	

PZ-19	5	Post an online fact sheet that provides an overview of what zoning allows for solar PV under what conditions and in which districts (e.g. types and sizes of solar systems permitted, the processes required, and other relevant information).	☐
A community's zoning ordinance and land use regulations create statutory limits on what individuals may do with their property as a matter of right and often provides additional processes to consider special exceptions. Land use regulations often contain use standards that provide additional requirements for certain types of development. However, these regulations can sometimes be unclear and difficult to access, especially for topics like solar PV. Posting an online fact sheet that summarizes zoning regulations for solar represents a major step toward overcoming informational barriers.			
Recommended Verification: • Provide a link to the fact sheet, zoning determination letter, or other online document that clarifies and summarizes how the zoning ordinance and land use regulations regulate solar energy.			
Community Examples: • San Diego County, CA SolSmart Gold • Sedona, AZ SolSmart Bronze			
Resources: • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			

PZ-20	10	Include specific solar PV goals, metrics, and strategies in the most current published version of relevant local plans (e.g., energy plan, climate plan, comprehensive plan).	☐
Planning documents provide the foundation for a community's vision for how and where it would like future development to occur. Development is governed largely by the components of the comprehensive plan and guided by the policies and strategies outlined in other functional plans such as a Climate Action Plan or Sustainability Plan. These planning documents should align to have solar energy goals, metrics, and strategies that promote solar development in an organized and efficient manner.			
Recommended Verification: • Provide a link to the relevant plans that incorporate solar PV goals, metrics, and/or strategies. Please indicate the relevant section(s).			
Community Examples: • Ann Arbor, MI SolSmart Silver • Philadelphia, PA SolSmart Gold			
Resources: • Integrating Solar Energy into Local Plans American Planning Association (APA) • Solar Power in Your Community Office of Energy Efficiency and Renewable Energy • Energy Transitions Playbook Office of Energy Efficiency and Renewable Energy • Local Government Strategies for 100% Clean Energy SolSmart Webinar • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			

PZ-21	5	Draft new or updated language and provide a timeline for the inclusion of specific solar PV goals, metrics, and/or strategies into existing and/or future plans.	☐
Planning documents provide the foundation for a community's vision for how and where it would like future development to occur. Comprehensive, sub-area, and functional plans also provide policy guidance to the local government as it weighs how future development aligns with other objectives. Communities that would like to promote solar development in an organized and efficient manner should draft solar energy goals, metrics, or strategies for inclusion in new or updated plans.			
Recommended Verification: • Provide draft language of the proposed plan changes that relate to solar energy and a timeline for inclusion in future plans.			

Community Examples: • Chatham County, NC SolSmart Gold • South St. Paul, MN SolSmart Bronze			
Resources: • Solar Resource Development Requirement Metropolitan Council (Met Council) • Integrating Solar Energy into Local Plans American Planning Association (APA) • Planning for Solar Energy American Planning Association (APA) • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			
PZ-22	5	Share solar PV progress towards achieving targets or metrics from PZ-20 on the solar landing page.	☐
Publicly reporting progress toward solar goals helps to create transparency and accountability. These metrics allow local governments to see the impacts of their policies and identify the need to adjust their strategies. To be meaningful, metrics should be updated annually at a minimum, but communities should strive for quarterly updates. Please specify the reporting period for which the reported metrics apply.			
Recommended Verification: • Provide a link to the relevant information on the solar landing page. Include date when the information was last updated.			
Community Examples: • Cambridge, MA SolSmart Bronze • Madison, NJ Not designated			
Resources: • State and Local Planning for Energy (SLOPE) National Renewable Energy Lab (NREL)			
PZ-23	10	Include specific large-scale solar PV goals, metrics, and strategies in the most current published version of relevant local plans (e.g. energy plan, climate plan, comprehensive plan).	☐
Planning documents provide the foundation for a community's vision for how and where it would like future development to occur. Development is governed largely by the components of the comprehensive plan and guided by the policies and strategies outlined in other functional plans such as a Climate Action Plan or Sustainability Plan. These planning documents should align to have large-scale solar energy goals, metrics, and strategies that promote solar development in an organized and efficient manner.			
Recommended Verification: • Provide a link to the relevant plans that incorporate large-scale solar PV goals, metrics, and/or strategies. Please indicate the relevant section(s).			
Community Examples: • Stearns County, MN SolSmart Silver • Santa Barbara County, CA SolSmart Bronze • City of Boise, ID SolSmart Gold			
Resources: • Solar@Scale Guidebook ICMA and APA • Planning for Utility Scale Solar Energy Facilities American Planning Association (APA) • Mapping Opportunities for land based renewable energy generation in Ontario: a guidebook for local planners and analysts Community Energy Knowledge-Action Partnership • Planning, Zoning & Development SolSmart's Toolkit for Local Governments			
PZ-24	20	Develop a solar PV assessment that identifies community-wide feasibility for solar PV development within a jurisdiction (differentiate between large-scale, municipal, etc.)	☐
Local governments can proactively identify sites that are favorable for solar PV projects. Identifying sites that have high solar potential and the best characteristics for large-scale solar development can reduce potential conflicts between solar and other land uses and speed up the project development timeline.			
Recommended Verification: • Provide a link to the PV assessment.			
Community Examples: • Mountain Iron, MN SolSmart Bronze • Santa Clara County, CA Not Designated			

Resources:

- [Solar Development on Public Facilities and Under-Utilized Land](#) | SolSmart's Toolkit for Local Governments
- [Decision Support Tools for Local Solar Planning and Development](#) | SolSmart Webinar
- [Solar Project Development Pathway- Site and Opportunity Assessment](#) | U.S. Environmental Protection Agency (EPA)
- [System Advisor Model \(SAM\)](#) | National Renewable Energy Lab (NREL)

PZ-25 10 Enable solar rights through a local solar access ordinance.

In some states, local governments have jurisdiction to enable solar rights through an ordinance. A solar rights or access ordinance protects a property owner's right to sunlight, ensuring a solar installation has access to the sunlight it needs to generate electricity. A solar access ordinance can also remove restrictive covenants for solar PV in relevant zones.

Recommended Verification:

- Provide a link to the zoning ordinance or land use regulations that protects solar rights and access. Please indicate the relevant section(s).

Community Examples:

- [Ashland, OR](#) | Not Designated
- [Freeport, IL](#) | SolSmart Gold

Resources:

- [Best Practices in Zoning for Solar](#) | National Renewable Energy Laboratory (NREL)
- [Planning for Solar Energy](#) | American Planning Association (APA)
- [Planning, Zoning & Development](#) | SolSmart's Toolkit for Local Governments

PZ-26 20 Codify in the zoning ordinance that accessory use energy storage systems are explicitly allowed by-right in all major zones.

A community's zoning ordinance and land use regulations create statutory limits on what individuals may do with their property as a matter of right. Zoning often provides additional processes, which can be long and costly, to consider special exceptions when a proposal is inconsistent with current land use regulations. Codifying residential energy storage as an accessory use and allowed or by-right use in all major zoning categories provides policy certainty and clarity which can promote easier and more equitable energy storage deployment. It can increase energy storage development and save property owners time and money because they can avoid going through a more extensive process to have their energy storage system considered.

Recommended Verification:

- Provide a link to the zoning ordinance or land use regulations that codify energy storage as an accessory use and allowed or by-right use. Please indicate the relevant section(s).

Resources:

- [Battery Energy Storage Model Law](#) | New York State Energy Research and Development Authority (NYSERDA)
- [NYC Energy Storage Systems Zoning Guide](#) | Sustainable CUNY Smart Distributed Generation Hub

Government Operations

GO-1	20	Install solar PV on local government facilities and/or local government-controlled land.	☐
Local governments can lead by example and install solar on their facilities and/or land to achieve clean energy goals. Solar installations can generate revenue for local governments, deliver electricity cost savings, and serve as an educational tool for community members. Local governments are encouraged to install solar at highly visible locations to maximize the educational value.			
Recommended Verification: Provide news articles, a press release announcing the commissioned system, or webpage that summarizes the details of the installation(s) including total number of systems, size, location, visibility and photos. A signed contract for project installation is also an acceptable form of verification.			
Community Examples: Johnson County, IA SolSmart Gold New York City, NY SolSmart Gold			
Resources: Procurement Guidance American Cities Climate Challenge Renewables Accelerator Solar Decision Support and Resources for Local Governments National Renewable Energy Laboratory (NREL) Solar Development on Public Facilities and Under-utilized Land SolSmart's Toolkit for Local Governments Solar Power Purchase Agreements: A Toolkit for Local Governments Interstate Renewable Energy Council (IREC)			
GO-2	10	Discuss community goals for solar PV, net metering, community solar, and/or interconnection processes with the local utility and explore areas for future collaboration.	☐
Local governments can leverage their relationship with electric utilities to encourage increased support for, and development of, solar energy. Local governments and utilities can partner to provide community solar programs, solar incentives, and help improve the solar interconnection process. Utilities can also help local governments meet municipal or community-wide renewable energy goals by procuring large amount of solar energy.			
Recommended Verification: Provide meeting minutes (including a list of follow-up action items), e-mail correspondence, meeting agenda, materials prepared for the meeting (e.g., handouts and slides), or other evidence that at least one meeting occurred with your local utility.			
Community Examples: Minneapolis, MN SolSmart Gold Missoula, MT SolSmart Silver			
Resources: Engagement Guidance American Cities Climate Challenge Renewables Accelerator Making Solar & Electrification Policies Mutually Beneficial SolSmart Webinar Procurement Guidance American Cities Climate Challenge Renewables Accelerator Solar & Electrification, A Beneficial Partnership SolSmart Issue Brief Utilizing City-Utility Partnership Agreements to Achieve Climate and Energy Goals World Resources Institute (WRI)			
GO-3	10	Coordinate with regional organizations and/or local governments to engage utilities on advancing solar policies such as utility procurement of solar PV, green tariffs, and/or interconnection process improvements.	☐
Local governments can find strength in numerous as they advance ambitious energy transformation goals. Collaborating with other local governments and/or regional organizations (such as Councils of Government and Regional Planning Councils) allows resources, expertise, and staff to be pooled together which can enhance efforts to work with utilities. Networks of communities and utilities can provide opportunities to share best practices and common strategies through peer-to-peer learning. They can also help build coalitions and advocate for state policy.			
Recommended Verification: Provide details about your community's participation in coordinated efforts between local governments and/or regional organizations to engage utilities with the goal of advancing solar initiatives.			

Community Examples:	
• Lake Forest, IL SolSmart Bronze • Salt Lake City, UT SolSmart Bronze	
Resources:	
• Engagement Guidance American Cities Climate Challenge Renewables Accelerator • Engagement Tracker American Cities Climate Challenge Renewables Accelerator • PJM Cities & Communities Coalition World Resources Institute (WRI) • Procurement Guidance American Cities Climate Challenge Renewables Accelerator • Utilizing City-Utility Partnership Agreements to Achieve Climate and Energy Goals World Resources Institute (WRI) • Municipal Franchise Agreements and Clean Energy Objectives National Renewable Energy Lab (NREL)	

GO-4	20	Demonstrate coordination between local government inspectors and utility staff to reduce Permission to Operate timeline for solar PV.	☐
A solar system that has not been granted permission to operate (PTO), is not allowed to produce electricity which can have economic impacts for the system owner. To reduce economic loss, local governments can coordinate with the electric utility to ensure solar PV systems can begin operation as soon as it has been confirmed that the systems are properly constructed and connected to the grid. Consolidating and/or coordinating local government inspections and utility interconnection inspections can save time and money for solar installers and property owners.			
Recommended Verification:			
• Provide details about the coordination process and explaining how this process reduces the time between inspection and Permission to Operate			
Community Examples:			
• Leon County, FL SolSmart Gold • Mount Prospect, IL SolSmart Gold			
Resources:			
• Utility Engagement SolSmart's Toolkit for Local Governments			

GO-5	10	Conduct feasibility analysis for solar PV on local government facilities and/or local government-controlled land.	☐
Local governments can lead by example and install solar PV on their facilities and/or land to achieve clean energy goals and generate electricity cost savings. The first step is conducting a feasibility analysis to discover which rooftops or grounds have the highest solar potential and best characteristic for a solar installation. A feasibility analysis can be done using outside consultants, or with tools provided by federal agencies, such as the Department of Energy (DOE). An RFP can then be issued for the most favorable sites. Communities that receive GO-6, GO-7 or GO-8 may also receive GO-5 if they completed a feasibility analysis as part of the project development process.			
Recommended Verification:			
• Provide a link to the feasibility analysis or details about the feasibility analysis that was conducted – who conducted, what were the sites, when was it conducted, what were the recommendations and next steps.			
Community Examples:			
• Asheville, NC SolSmart Gold • Mountain Iron, MN SolSmart Bronze			
Resources:			
• Decision Support Tools for Local Solar Planning & Development SolSmart Webinar • Solar Project Development Pathway - Site and Opportunity Assessment Environmental Protection Agency (EPA) • Solar Development on Public Facilities and Under-utilized Land SolSmart's Toolkit for Local Governments • System Advisor Model (SAM) National Renewable Energy Laboratory (NREL)			

GO-6	20	Install solar PV integrated with other technologies such as battery storage or electric vehicle charging on local government facilities and/or local government-controlled land.	☐
Solar can provide unique benefits when paired with other distributed energy technologies. Co-locating solar with other technologies can improve resilience, provide demand-charge reductions, and charging electric vehicles with a renewable source of energy.			

Recommended Verification: Provide a news article, a press release announcing the commissioned system, or webpage that summarizes the details of the solar installation(s) integrated with other technologies including total number of systems, size, location, technologies used, and photos.		
Community Examples: Duluth, MN SolSmart Gold Montgomery County, MD SolSmart Gold Boulder, CO SolSmart Gold		
Resources: Best Practices for Solar & Electric Bus Charging at Transit Agencies SolSmart Webinar REopt: Renewable Energy Integration & Optimization National Renewable Energy Laboratory (NREL) Solar and Electric Vehicles: A Guide for Local Governments SolSmart Solar & Electric Vehicle Best Practices for Local Governments SolSmart Webinar		

GO-7	20	Install solar PV on local government-controlled brownfields and/or under-utilized properties.	☐
As large, open spaces with limited future uses, brownfields, landfills, and other under-utilized lands are favorable locations for solar PV systems. Local governments can lease these lands for solar development to increase locally installed solar capacity while generating land lease revenue.			
Recommended Verification: Provide a news article, a press release announcing the commissioned system, or webpage that summarizes the details of the installation(s) including total number of systems, size, location, and photos.			
Community Examples: Cary, NC SolSmart Silver Eau Claire, WI SolSmart Gold			
Resources: Developing Solar on Brownfields SolSmart Webinar RE-Powering America's Land Environmental Protection Agency (EPA) Solar Development on Public Facilities and Under-utilized Land SolSmart's Toolkit for Local Governments The Guide to Developing Solar Photovoltaics at Massachusetts Landfills Massachusetts Department of Energy Resources			

GO-8	10	Require new local government facilities and/or facility retrofits meeting a specific threshold to be solar ready.	☐
Local governments can lead by example and require new facilities or those completing a retrofit to be solar ready. Solar ready construction can reduce the installation costs if a solar system will be installed at some point in the future. Solar ready buildings are designed and engineered in such a way that allows for the easy installation of a future solar system.			
Recommended Verification: Provide a link to adopted code(s) or language that require new construction and/or retrofits of local government facilities to be solar ready.			
Community Examples: Montgomery County, MD SolSmart Gold			
Resources: Solar-Ready Building Design: A Summary of Technical Considerations National Renewable Energy Laboratory (NREL)			

GO-9	20	Procure solar energy for municipal operations through an offsite physical PPA, virtual PPA, green tariff, or similar structure.	☐
To meet climate and energy goals, local governments can procure a large amount of solar energy through an appropriate structure, depending on the types of contracts allowed by state and utility regulations.			
Recommended Verification: Provide a document such as a news article, contract, press release, or similar official document containing the details how the local government has procured solar energy.			
Community Examples: Cincinnati, OH Not Designated			

• Denton, TX SolSmart Gold
Resources: • How Cities Benefit from Power Purchase Agreements Center for Climate and Energy Solutions (C2ES) • How Local Governments Can Buy Renewable Energy & Support Market Development SolSmart Webinar • Local Government Strategies for 100% Clean Energy SolSmart Webinar • Procurement Guidance American Cities Climate Challenge Renewables Accelerator • Municipal Solar Procurement SolSmart Webinar

GO-10	5	Obtain a Community Benefits Agreement with solar developer for solar installation.	☐
A community benefits agreement (CBA) is a contract between a developer and one or more community groups or organizations. The CBA outlines benefits the developer will deliver to the community in exchange for community support of the solar project. A CBA goes above and beyond a typical siting or development agreement, which commonly list annual local tax payments or local infrastructure upgrades (e.g. road repavement). Examples of common CBA benefits include jobs training programs, local hiring goals, and living wage requirements.			
Recommended Verification: • A copy of the CBA or a public document that summarizes the details of the CBA.			
Resources: • Community Benefit Agreement Toolkit U.S. Department of Energy Office of Economic Impact and Diversity			

GO-11	10	Post metrics related to the number of municipal solar PV or solar PV plus storage/EV installations and installed capacity, municipal solar PV energy procured (ownership, PPAs, community solar offtake), and percent (%) of municipal energy usage offset by renewable energy.	☐
Posting metrics publicly provides transparency and allows community members to understand how the community is progressing toward its goals. This is an important way to create accountability and will help identify the need to implement further actions if goals are not being met. Metrics must be updated annually at a minimum, but communities should strive for quarterly updates. Please specify the reporting period for which the posted metrics apply.			
Recommended Verification: • Provide a link to this information on the solar landing page. Include date when the information was last updated and date tracking began.			
Templates: • SolSmart Solar Landing Page Template SolSmart			
Community Examples: • Cambridge, MA SolSmart Gold			
Resources: • State and Local Planning for Energy (SLOPE) National Renewable Energy Lab (NREL) • Electric Vehicle Charging Station Locations Office of Energy Efficiency and Renewable Energy			

GO-12	10	Directly install or provide technical or financial support for the installation of solar PV on affordable housing, multifamily housing, community-based organizations, and/or resilience hubs.	☐
Local governments can partner with community-serving organizations, housing developers and managers of resilience hubs to support the implementation of solar. Local governments may be able to offer technical support if they have relevant expertise for example in project development, energy or project finance. In other instances, local governments may be able to offer direct financial support to these projects.			
Recommended Verification: • Provide links and/or a signed memo outlining the support provided.			
Community Examples: • Hillsborough County Not designated			
Resources: • Process Guide for City-Community Collaboration Greenlink Analytics • Clean Energy for Low Income Communities Accelerator Toolkit U.S. Department of Energy Better Buildings			

- [The Inflation Reduction Act: What does it mean for Affordable Housing \(webinar\)](#) | Enterprise Community Partners

GO-13	10	Train local government staff on regulatory and (where applicable) wholesale market barriers to solar deployment and potential engagement pathways to address these barriers. Training must have occurred in the past two years.	☐
Regular solar PV training, at least every two years, is a best practice to ensure local government staff are up to date on regulatory practices and wholesale markets. Trainings increase staff knowledge of solar energy system deployment and ensures they know the best procedures to address any barriers. Increased staff knowledge can improve involvement in the regulatory process, making their needs and concerns heard. Local governments can require staff to attend full or half-day workshops (either live or online) and provide resources designed to help keep staff informed about advances in solar and storage technologies.			
Recommended Verification: • Provide a signed memo with details about the regulatory and wholesale market training including name of training, name of trainer, attendees (name, title, department), date and time, location			
Templates: • SolSmart Training Verification Memo SolSmart			
Resources: • The Impacts of Wholesale Market Rules and Policies on Clean Energy Goals: A Primer for Local Governments World Resources Institute			

GO-14	10	Train local government staff on best practices and issues regarding solar interconnection with the local utility. Training must have occurred within the past two years.	☐
Regular solar PV training, at least every two years, is a best practice to ensure local government staff are equipped to work with the local utility on interconnection issues. Trainings increase staff knowledge of the solar interconnection process to the grid, thereby decreasing time from installation to an active PV system. Local governments can require staff to attend full or half-day workshops (either live or online) and provide resources designed to help keep staff informed about advances in solar and storage technologies.			
Recommended Verification: • Provide a signed memo with details about the interconnection training including name of training, name of trainer, attendees (name, title, department), date and time, location			
Templates: • SolSmart Training Verification Memo SolSmart			
Resources: • 2019 Model Interconnection Procedures Interstate Renewable Energy Council (IREC) • Toolkit and Guidance for the Interconnection of Energy Storage and Solar-Plus-Storage Interstate Renewable Energy Council (IREC) • Generic Technical Interconnection and Interoperability Requirements (TIIRs) EPRI • Solar PV Interconnection Guide ConEdison • Guidelines for Generator Interconnection Eversource			

Community Engagement

CE-1	10	Post a solar landing page on local government's website with information that may include the community's solar goals, educational materials and tools that promote solar, and resources for solar development (e.g. permitting checklist, application forms, zoning regulations, etc.). (Required for Silver)	☐
A solar landing page is a way to provide residents, businesses, and solar installers with important information about your community's solar energy policies, processes, goals, and metrics from one centralized location. It is also a way to educate community members about solar energy topics like financing options and consumer protection best practices. Information and resources posted should be made available in multiple languages as appropriate for your community. In addition, information and resources should be available to community members in print form if requested.			
Recommended Verification: Provide a link to the solar landing page.			
Community Examples: Olympia, WA SolSmart Gold Pulaski County, VA SolSmart Gold Tyngsborough, MA SolSmart Gold			
Templates: SolSmart Solar Landing Page Template SolSmart			
Resources: Homeowner's Guide to Going Solar (View in Spanish) U.S. Department of Energy (DOE) Residential Consumer Guide to Solar Power Solar Energy Industries Association (SEIA)			
CE-2	20	Establish partnerships with local community-based organizations or other organizations focused on serving disadvantaged communities within your community to define your community's solar equity goals, develop implementation strategies, and establish a plan for tracking and reporting on progress. (Required for Platinum)	☒
Community-based organizations can assist local governments to define and develop solar equity goals grounded in the needs and priorities of the community. Partnering with organizations that have strong ties with disadvantaged communities is an important way to ensure that solar projects and programs, as well as outreach efforts, are designed to meet the needs of those communities. For example, a local government, a CBO, and a local solar installer could come together to implement a solarize campaign customized to LMI households or to develop a targeted outreach strategy related to a community solar project. The partnership may have a scope that is broader than solar (for example, partnering on a range of climate-related goals or economic development initiatives) as long as it clearly includes solar deployment goals strategies. Developing a shared approach to tracking and reporting helps create transparency and accountability and can be an important component to building trust.			
Recommended Verification: Signed memo summarizing the names of partner organizations, scope of the partnership, defined goals, outcomes (or intended outcomes), plan for tracking progress and next steps for the partnership.			
Resources: Integrating Equity into City Clean Energy Initiatives American Cities Climate Challenge Renewables Accelerator Solar with Justice Clean Energy States Alliance From Community Engagement to Ownership Urban Sustainability Director's Network (USDN) Process Guide for City-Community Collaboration Greenlink Analytics Shared Accountability Guide and Framework 100% Accountability Cohort Justice40 Screening Tool Justice40 Initiative Clean Energy for Low Income Communities Accelerator Toolkit U.S. Department of Energy Better Buildings			
CE-3	5	Post online resources about residential and commercial solar PV financing options and incentives.	☐
Many different financing options are available for residential and commercial solar PV. Local governments can play an important role in providing access to information about available options. Information and resources posted			

should be made available in multiple languages as appropriate for your community. In addition, information and resources should be available to community members in print form if requested		
Recommended Verification:		
• Provide a link to this information on the solar landing page.		
Community Examples:		
• Walnut Creek, CA SolSmart Gold • Wood County, WI SolSmart Gold		
Templates:		
• SolSmart Solar Landing Page Template SolSmart		
Resources:		
• A Homeowner's Guide to Solar Financing: Leases, Loans and PPAs Clean Energy States Alliance (CESA) • Database of State Incentives for Renewables and Efficiency (DSIRE) North Carolina Clean Energy Technology Center (NCCETC) • Financing your solar panel system EnergySage • Homeowner's Guide to the Federal Tax Credit for Solar Photovoltaics (View in Spanish) U.S. Department of Energy (DOE)		

CE-4	5	Post online resources about consumer protection and solar PV.	☐
Solar energy can be a new and complex topic for community members. Local governments can provide online guides and resources to help community members have a clear understanding of solar PV, allowing them to make informed decisions. Information and resources posted should be made available in multiple languages as appropriate for your community. In addition, information and resources should be available to community members in print form if requested			
Recommended Verification:			
• Provide a link to a webpage containing consumer protection resources.			
Community Examples:			
• Alexandria, VA SolSmart Gold • James City County, VA SolSmart Bronze			
Templates:			
• SolSmart Solar Landing Page Template SolSmart			
Resources:			
• Consumer Solar Checklist Interstate Renewable Energy Council (IREC) • EnergySage EnergySage • Residential Issues and Existing Regulatory Framework SolSmart's Toolkit for Local Governments • Solar Customer Resource Portal Solar Energy Industries Association (SEIA) • Solar Owner's Manual (View in Spanish) Solar United Neighbors (SUN)			

CE-5	5	Post an online summary of state policies related to a property owner's solar access and solar rights, including links to state-level policy.	☐
Community members are often unaware that state policy could impact their property's solar rights. Solar rights and solar access are terms which describe the ability of property owners to utilize sunlight on their property. Each state has its own unique policy and enforcement regime. Information and resources posted should be made available in multiple languages as appropriate for your community. In addition, information and resources should be available to community members in print form if requested.			
Recommended Verification:			
• Provide a link to a webpage with summary of state policies relating to solar access and/or rights.			
Community Examples:			
• Torrance, CA SolSmart Gold • Wilmette, IL SolSmart Silver			
Templates:			
• SolSmart Solar Landing Page Template SolSmart			
Resources:			
• Homeowners Associations and Solar Access Solar United Neighbors • Database of State Incentives for Renewables and Efficiency (DSIRE) North Carolina Clean Energy Technology Center (NCCETC)			

CE-6	5	Post an online summary of state policies related to Homeowner Associations (HOAs) ability to regulate and/or restrict solar PV, including links to state-level policy.	☐
Homeowner Associations often aim to impose restrictive measures on solar PV systems. Community members should be aware of state policy that defines what HOAs are allowed and not allowed to do in terms of regulating solar PV systems.			
Recommended Verification: Provide a link to the summary of state policies relating to Homeowner Associations and solar PV.			
Community Examples: Hallandale Beach, FL SolSmart Silver Torrance, CA SolSmart Gold			
Templates: SolSmart Solar Landing Page Template SolSmart			
Resources: Homeowners Associations and Solar Access Solar United Neighbors			

CE-7	5	Post online resources about solar installers and/or solar quote platforms for solar PV.	☐
More solar companies operating in your community means residents and businesses are faced with more choices as they consider who to select for their solar project. Providing relevant local information on active solar installers can help community members make the best choice given their circumstances. Information and resources posted should be made available in multiple languages as appropriate for your community. In addition, information and resources should be available to community members in print form if requested			
Recommended Verification: Provide a link to a webpage that contains information about local solar installers and/or solar quote platforms.			
Community Examples: Denver, CO SolSmart Gold Schaumburg, IL SolSmart Silver			
Templates: SolSmart Solar Landing Page Template SolSmart			
Resources: Board Certified Professionals Directory North American Board Certified Energy Practitioners (NABCEP) EnergySage EnergySage Pickmysolar Pick My Solar Solar Buyer's Markets: Unlocking Lower Photovoltaic and Battery Prices on Online Quote Platforms National Renewable Energy Laboratory (NREL)			

CE-8	5	Post an online solar map for your community.	☐
Solar maps can be a helpful and visual way to communicate solar potential to community members. Solar maps can be customized depending on the goals and needs of the community. For example, solar maps can provide community members with an estimate of the solar potential of their rooftop, they can be used the location of solar installations within a community (which may help residents understand the extent of solar projects happening in different parts of the community), or they may be used to communicate the potential for different solar installations (i.e., residential, commercial, large-scale, community solar, etc).			
Recommended Verification: Provide a link to the solar map for your community.			
Community Examples: Los Angeles County, CA Not Designated Westminster, CO SolSmart Gold Chicago, IL SolSmart Gold			
Templates: SolSmart Solar Landing Page Template SolSmart			
Resources: Go Solar Ready Ohio-Kentucky-Indiana Regional Council of Governments NY Solar Map Sustainable CUNY Smart Distributed Generation Hub Project Sunroof Google			

CE-9	5	Post an online dashboard or summary of solar PV metrics for your community, including total installed solar PV capacity, solar PV + storage installations, and community solar and/or solarize subscribers (if applicable). Metrics should identify solar PV adoption in disadvantaged communities as well.	☐
Key solar metrics such as the number of installations and total installed capacity can help communicate progress towards local and state renewable energy goals. Other related metrics could include the percentage of municipal energy provided by solar energy, installed capacity per capita and progress towards greenhouse gas emissions targets. In order to track progress toward equity goals, communities are encouraged to disaggregate data and report rates of solar PV adoption by income level or census track, as appropriate.			
Recommended Verification: Provide a link to a webpage displaying solar PV metrics. Include date when the information was last updated and date tracking began.			
Community Examples: Boulder, CO SolSmart Gold Westminster, CO SolSmart Gold			
Templates: SolSmart Solar Landing Page Template SolSmart			
Resources: Solar Demographics Tool Lawrence Berkeley National Laboratory Justice40 Screening Tool Justice40 Initiative Clean Energy for Low Income Communities: Metrics and Indicators U.S. Department of Energy Better Buildings State and Local Planning for Energy (SLOPE) National Renewable Energy Lab (NREL) Distributed Energy Resources in Ohio Ohio Public Utilities Commission			
CE-10	5	Distribute solar job training and career opportunities in coordination with local colleges and/or workforce development organizations.	☐
Solar jobs have grown 12 times faster than the U.S. economy since 2014. As local solar markets grow, local governments can promote solar job opportunities with community colleges and workforce development organizations to ensure a well-trained, local workforce. This can be done via a jobs fair, posting solar job training information to the community and local colleges/workforce development websites			
Recommended Verification: Provide posted job descriptions, screenshots from employment websites or advertisement of job trainings.			
Community Examples: Fitchburg, WI SolSmart Bronze Washington, DC SolSmart Gold			
Templates: SolSmart Solar Landing Page Template SolSmart			
Resources: Solar Career Map Interstate Renewable Energy Council (IREC) Solar Ready Vets Interstate Renewable Energy Council (IREC) Solar Workforce Development Pilot St. Louis, MO Workforce Development Grid Alternatives			
CE-11	5	Demonstrate local government support for local solar projects through speeches, press releases, opinion articles, etc.	☐
Local governments can encourage solar market growth by highlighting solar energy goals, initiatives, and success stories through various communications strategies. Share the links and/or videos of communications efforts on the community's solar landing page.			
Recommended Verification: Provide a link to this information posted on the community's website or solar landing page.			
Templates: SolSmart Solar Landing Page Template SolSmart			
Community Examples: Fayetteville, AR SolSmart Gold Louisville, KY SolSmart Gold			

Resources:

- [Stakeholder Engagement](#) | SolSmart's Toolkit for Local Governments

CE-12	10	Discuss solar PV goals and/or strategies for increasing solar PV development, including large-scale solar plans, solar access, and/or solar adoption in disadvantaged communities, within an appropriate committee, commission, taskforce, and/or working group. (e.g. solar is a recurring agenda item during monthly sustainability commission meetings).	☐
An Environmental Advisory Council, Sustainability Committees, or Climate Action Taskforce is a great way to keep residents and key stakeholders actively engaged in community energy policy and development. These groups can assist in the development of solar energy goals and strategies, lead community-based solar initiatives, and provide communication and outreach support to inform community members about solar initiatives and plans.			
Recommended Verification: • Provide meeting minutes (including a list of follow-up action items) or materials prepared for the meeting (e.g., handouts and slides) from within the past year and provide documentation of the regularly scheduled frequency of these meetings.			
Community Examples: • Branford, CT SolSmart Bronze • Fairfield, CT SolSmart Gold			
Resources: • Stakeholder Engagement SolSmart's Toolkit for Local Governments • Solar and Resiliency: Integrative Financing Strategies for SolSmart Communities SolSmart Issue Brief • Solar Power in Your Community Office of Energy Efficiency and Renewable Energy			

CE-13	5	Support a solar informational session and/or solar tour explaining solar PV opportunities and policies. Show that session/tour was made accessible to all members of the community including those in disadvantaged communities. Session/Tour must have occurred within the last 2 years.	☐
An engaged and informed community can encourage solar market growth and increase the likelihood that local homes and businesses will pursue solar installations. Solar informational sessions and solar tours are ways to educate community members about the solar energy and the processes involved with an installation. Hosting these sessions in disadvantaged communities, providing transportation, offering tours and materials in other languages, and partnering with a CBO are a few potential ways to increase participation and make these sessions more accessible to all residents.			
Recommended Verification: • Provide a link(s) to details about the solar informational session or tour such as an agenda, date, time, and location. • Provide a signed memo describing efforts to make sessions inclusive, including presentational materials or tour itinerary, and information on the level of attendance.			
Community Examples: • Lower Merion, PA SolSmart Bronze • Sarasota County, FL SolSmart Silver			
Resources: • Solar Tour Resources National Solar Tour			

Market Development

MD-1	20	Demonstrate activity in state regulatory and/or legislative proceedings regarding solar PV.	☐
Local governments can provide an important voice into the development of state-level solar energy policy, strategies, and incentives. Government staff can track policy developments actively and develop appropriate strategies to interact with state regulators and legislators. Activities can include meetings with state regulators (PUC) or legislators, State Energy Office Officials, submitting written comment and feedback on state Requests for Information or Rulemakings, submitting formal comments or other participation in legal docketed proceedings, etc.			
Recommended Verification: Provide a link to public comments on solar energy or related energy proceedings, the minutes and/or recordings of meetings attended by representatives of the local government, or a signed memo summarizing involvement in the proceedings.			
Community Examples: Ann Arbor, MI SolSmart Silver			
Resources: Engagement Guidance American Cities Climate Challenge Renewables Accelerator Engagement Tracker American Cities Climate Challenge Renewables Accelerator The Federal and State Context: Policies Affecting Solar Energy Development SolSmart's Toolkit for Local Governments			
MD-2	20	Support a community-wide group purchase program (e.g., Solarize). Program must have occurred within the last 2 years.	☐
Local governments can support or host community group purchase programs for solar energy. Bulk purchasing can reduce the costs of solar installations for community members. These limited time-offers have had consistent success in providing discounts of up to 20% of installed costs for residential systems. To be eligible for MD-2, the local government must be an official partner and/or provide tangible support (staff time, resources, etc.) to the group purchase program.			
Recommended Verification: - Provide a link to a website where the Solarize campaign has been publicly announced. - Provide details about the status of an ongoing solarize campaign or final metrics of a completed solarize campaign.			
Community Examples: La Crosse County, WI SolSmart Bronze Montgomery County, MD SolSmart Gold			
Resources: Procurement Guidance- Solarize American Cities Climate Challenge How to Develop a Solarize Campaign SolSmart Webinar Market Development and Finance SolSmart's Toolkit for Local Governments Solarize Your Community New York State Energy and Research Development Authority (NYSERDA) Solarize Mass Massachusetts Clean Energy Center			
MD-3	10	Define and implement a pathway specifically for low-to-moderate income (LMI) residents to participate in a community-wide group purchase program through program design and/or financing support options.	☐
It can be particularly difficult for low-to-moderate income (LMI) households to participate in solar purchasing programs. These programs may require a minimum credit score, an upfront deposit, or have contract terms that present barriers for some residents. Local governments can help to identify these barriers and create strategies to overcome them, by providing incentives for income-qualified participants.			
Recommended Verification: Link to information on solar landing page or provide signed memo summarizing the forms of financing support or program design elements that support LMI residents in solar PV group purchase program.			
Community Examples: Durham, NC SolSmart Gold Philadelphia, PA SolSmart Gold			

Resources:

- [Procurement Guidance- Solarize](#) | American Cities Climate Challenge
- [Narrowing the Equity Gap through Solarize](#) | Rocky Mountain Institute
- [How to Development a Solarize Campaign](#) | SolSmart Webinar
- [Market Development and Finance](#) | SolSmart's Toolkit for Local Governments

MD-4	20	Support a community solar program.	☐
Community solar offers residents and businesses an opportunity to own or lease a portion of a solar project in exchange for economic benefits proportional to their share. These economic benefits are commonly delivered in the form of electricity bill credits. For renters, and homes or business that are not suitable sites for solar, community solar programs allow consumers to access solar without installing panels on their homes or business. Community solar can be provided by utilities, a third party, or a non-profit. To be eligible for MD-4, the local government must be an official partner and/or provide tangible support (staff time, resources, etc.) to the community solar program.			
Recommended Verification: • Provide a link to information about the community solar program, including any outreach materials and details about program design.			
Community Examples: • Austin, TX SolSmart Gold • Fort Collins, CO SolSmart Gold			
Resources: • Community Solar SolSmart's Toolkit for Local Governments • National Community Solar Partnership Technical Expertise and Capacity Building U.S. Department of Energy National Community Solar Partnership • Expanding Solar Participation through Community Solar SolSmart Issue Brief • Expanding Solar Participation through Community Solar SolSmart Webinar • Procurement Guidance American Cities Climate Challenge Renewables Accelerator • Community Solar National Renewable Energy Laboratory (NREL) • Community Solar Resources U.S. Department of Energy			

MD-5	10	Define and implement a pathway specifically for low-to-moderate income (LMI) residents to participate in a community solar program through program design and/or financing support options.	☐
Community solar provides opportunities to open access to solar to low-to-moderate income households. To fully achieve this potential, a community program should design programs and financing to support low to moderate income participation, including savings from day one. It is also important to ensure that appropriate and trusted messengers are used and that offerings are designed to be flexible without long-term commitments.			
Recommended Verification: • Provide details that explain program design elements, including outreach and financing, that support LMI resident participation in a community solar program.			
Community Examples: • Denver, CO SolSmart Gold • Washington, DC SolSmart Gold			
Resources: • Community Solar SolSmart's Toolkit for Local Governments • Design and Implementation of Community Solar Programs for Low- and Moderate-Income Customers National Renewable Energy Laboratory (NREL) • Procurement Guidance American Cities Climate Challenge Renewables Accelerator • Community Solar + Rocky Mountain Institute • National Community Solar Partnership Technical Expertise and Capacity Building U.S. Department of Energy National Community Solar Partnership • Equitable Access to Community Solar: Program Design and Subscription Considerations National Renewable Energy Laboratory (NREL)			

MD-6	20	Provide residents with Community Choice Aggregation/Energy that includes solar PV as a power generation source.	☐
In some states, local governments can increase access to solar energy for their operations and their residents through community choice aggregation. Community Choice Aggregation allows local governments to aggregate			

energy demand within their jurisdiction and procure power from an energy supplier while the local utility provides transmission and distribution services. Many local governments utilize community choice to procure more renewable energy, including solar, than would be available from their local electric utility. States must have enabling legislation for local governments to provide community choice aggregation.

Recommended Verification:

- Provide a link to details about a Community Choice program (with solar PV as a power generation source) that is available for residents.

Community Examples:

- [San Jose, CA](#) | SolSmart Gold
- [Somerville, MA](#) | SolSmart Gold

Resources:

- [Community Choice Aggregation Toolkit](#) | New York State Energy and Research Development Authority (NYSERDA)
- [Starting a New CCA](#) | California Community Choice Association (CalCCA)
- [Community Choice Aggregation](#) | SolSmart Issue Brief
- [Community Choice Aggregation: Challenges, Opportunities, and Impacts on Renewable Energy Markets](#) | National Renewable Energy Laboratory (NREL)
- [Using Community Choice Aggregation to Achieve Clean Energy Goals](#) | SolSmart Webinar

MD-7	10	Provide a PACE financing program that includes solar PV as an eligible technology.	☐
Property Assessed Clean Energy (PACE) financing is an on-bill financing mechanism which enables repayment of long-term, low-interest loans on property tax bills. PACE can be used to finance renewable energy and energy efficiency projects on residential and/or commercial properties, depending on the PACE financing program design. In order for residents and business to access PACE financing, it must be enabled at the state and local level.			
Recommended Verification:			
• Provide a link to the local ordinance creating a PACE program. • Provide a link to the PACE program webpage.			
Community Examples:			
• Deerfield Beach, FL SolSmart Silver • Grand Rapids, MI SolSmart Silver			
Resources:			
• Market Development and Finance SolSmart's Toolkit for Local Governments • Resources PACENation			

MD-8	20	Provide local incentives or locally-enabled finance (e.g. a revolving loan fund) for solar PV and/or solar PV + technologies (e.g., battery storage, and/or electric vehicle charging).	☐
In addition to state and federal incentives, local governments can also encourage solar development within their jurisdictions by providing tax exemptions, rebates, or other financial incentives. Some jurisdictions have enabled community finance through revolving loan funds or credit enhancement facilities for renewable energy projects. These actions can help lower the cost of solar for residents. To be eligible for MD-8, the incentives or financing program must be currently available to residents.			
Recommended Verification:			
• Provide a link to an ordinance creating local incentives or financing options. • Provide a link to an application or form that are required for a solar PV system to be eligible for incentives or financing.			
Community Examples:			
• Loudoun County, VA SolSmart Silver • St. Louis Park, MN SolSmart Silver			
Resources:			
• Market Development and Finance SolSmart's Toolkit for Local Governments			

MD-9	5	Provide local incentives for solar PV to low-to-moderate income (LMI) households, disadvantaged communities, Disadvantaged Business Enterprises (DBEs), Minority and Women Owned Business Enterprises (MWBEs), and/or non-profit organizations that provide community services.	☐
Local governments can support solar installations by LMI households, DBEs, and non-profit organizations by providing incentives such as low-interest loans, grants, on-bill financing and a variety of tax incentives and rebates. Local governments can expand solar programs to disadvantaged residents by implementing any number of these programs.			
Recommended Verification: • Provide a signed memo describing the local incentives and who is eligible to receive them. • Provide a link to a webpage or press release with program information.			
Community Examples: • Boulder, CO SolSmart Gold • Portland, OR Not Designated			
Resources: • Market Development and Finance SolSmart's Toolkit for Local Governments • Projects & Programs in Low-to-Moderate Income Communities SolSmart Webinar • Resources to Support Initiatives for Low-to-Moderate Income Communities SolSmart Webinar • Unlocking Solar for Low- and Moderate-Income Residents: A Matrix of Financing Options by Resident, Provider, and Housing Type National Renewable Energy Laboratory (NREL)			
MD-10	20	Partner with financial institutions and/or foundations to offer loans, rebates, grants, or other incentives for solar PV projects. (Financial institutions could include entities such as a local or regional bank, CDFI, or credit union).	☐
Loans, rebates, or grants can improve the financial prospects of a solar project, allowing more community members to install solar. Local governments can work with local financial institutions to offer and/or promote financing options for solar projects.			
Recommended Verification: • Provide link to financing options for solar energy. • Provide a signed memo detailing how the local government partnered with the financial institution to offer a financial incentive for solar energy.			
Community Examples: • Lafayette, CO SolSmart Gold • Milwaukee, WI SolSmart Gold			
Resources: • Market Development and Finance SolSmart's Toolkit for Local Governments			

Innovative Action

IA-1	Varies	The actions identified in the categories above represent many of the most common and impactful efforts communities are taking to make going solar easier and more affordable for residents and businesses. However, we know that communities across the country are developing innovative ways to promote and deploy solar energy. If your community has taken action that was not captured in any of the criteria above, please share it with us.	☐
Innovative actions will be reviewed by a team of solar experts and each action may be worth up to 20 points.			
Recommended Verification: Provide a signed memo describing the innovative action and include any supporting documentation or links that provide additional details.			
Community Examples: Grayslake, IL SolSmart Bronze - The Grayslake Sustainable Business Initiative recognizes local businesses that are choosing to be more sustainable. Solar energy is emphasized by awarding a business automatic gold designation if they have installed a solar energy system. Montgomery County, MD SolSmart Gold - Montgomery County's 4th Solar Co-op offered EV charging as an option through the solar co-op. This helps promote EV charging and can reduce costs through group purchasing.			

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