



Freeway Landfill and Dump Closure – Dig and Haul Design Basis Report

Prepared for
Minnesota Pollution Control Agency

June 2021

Freeway Landfill and Dump Closure – Dig and Haul

Design Basis Report

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Contents

1.0	Introduction.....	4
1.1	Design Objective.....	4
1.2	Background.....	4
1.3	Project Schedule.....	5
1.4	Site Access.....	6
1.5	Report Organization.....	6
2.0	Existing Conditions.....	7
2.1	Location.....	7
2.2	Freeway Landfill – Existing Conditions.....	7
2.3	Freeway Landfill – Water and Groundwater.....	8
2.4	Freeway Dump – Existing Conditions.....	9
2.5	Freeway Dump – Water and Groundwater.....	10
3.0	General Design Items.....	1
3.1	Deliverables.....	1
3.2	Specifications/Contracting.....	1
3.3	Coordinate System.....	1
3.4	CAD/Drawings Standards.....	2
3.5	CAD Existing Conditions.....	2
3.6	Property Access and Future Use.....	2
4.0	Permitting.....	3
4.1	Permitting Requirements and Assumptions.....	3
4.2	Wetlands.....	4
4.3	ARARs.....	4
4.4	US EPA Coordination.....	4
5.0	Demolition and Removals.....	5
5.1	Applicable Codes and Standards.....	5
5.2	Deliverables.....	5
5.3	Landfill.....	5

5.4	Dump.....	5
5.5	Tree removal.....	6
6.0	Excavation and Waste Relocation.....	7
6.1	Applicable Codes and Standards.....	7
6.2	Deliverables.....	7
6.3	Waste/Material Screening.....	7
6.4	Waste Removal Limits.....	7
6.5	Waste Removal Volume Estimates.....	8
6.6	Cover and Fill Soils Estimates.....	7
6.7	Rock Removal/Blasting.....	9
7.0	Stormwater Management.....	10
7.1	Applicable Codes and Standards.....	10
7.2	Deliverables.....	10
7.3	Design Requirements.....	10
7.4	Existing Drainage Areas.....	10
7.5	Storm Events.....	11
7.6	Dewatering.....	11
8.0	Flood Protection.....	13
8.1	Deliverables.....	13
8.2	Design Requirements.....	13
8.3	Freeway Landfill – Temporary Flood Control Berm Geometry.....	13
8.4	Freeway Dump – Temporary Flood Control Berm Geometry.....	13
9.0	Restoration.....	15
9.1	Deliverables.....	15
9.2	Basis of Restoration.....	15
9.3	Restoration Profile.....	15
9.4	Seeding, Planting, and Screening.....	15
10.0	Transportation/Site Access.....	16
10.1	Applicable Codes and Standards.....	16
10.2	Deliverables.....	16
10.3	Design Requirements.....	16
10.4	Site Access - General.....	16
10.5	Transfer Station Access Road.....	17
10.6	McGowan Quarry Access.....	17
10.7	Haul Route.....	18

11.0	Construction Staging, Sequencing, and Requirements.....	20
11.1	Applicable Codes and Standards.....	20
11.2	Deliverables.....	20
11.3	Construction staging.....	20
11.4	Construction Sequencing.....	20
11.5	Construction Requirements.....	Error! Bookmark not defined.
12.0	References.....	21

List of Figures

Figure 2-1	Site Overview
Figure 3-1	Parcel Impacts – During and After Project
Figure 7-1	Existing Drainage Areas

1.0 Introduction

This Design Basis Report (DBR) documents the design basis for one of the remedial options under consideration at the Freeway Landfill (Landfill) and Freeway Dump (Dump) (collectively the Site). The Minnesota Pollution Control Agency (MPCA) is the project owner and has engaged Barr to develop plans that will be used to obtain construction bids for two remedial options: (1) the Dig and Line option, and (2) the Dig and Haul option. This DBR aggregates data and assumptions required to design the Dig and Haul option for the Landfill and Dump.

1.1 Design Objective

The overall objectives of the project were presented in the Focused Feasibility Study (FFS; Barr 2019b), which generally involves remediation of the Landfill and Dump, which are both unlined disposal areas containing primarily municipal solid waste (MSW) and construction debris (CD), along with coal ash and other miscellaneous types of refuse. The Dig and Haul option involves excavating the waste from the Site and transporting it offsite for disposal in a permitted solid waste disposal facility (or multiple facilities).

This remediation will address the current and future risks associated with the presence of unlined waste materials at the Site. In general, the remediation will address the currently inadequate waste containment, which will also help reduce risks associated with direct contact with the waste, groundwater migration of contaminants from the waste, and landfill gas generation from the waste (Barr, 2019b). The groundwater migration pathway risks include existing concerns with periodic flooding and groundwater inundation of the unlined waste, plus future migration concerns related to the higher groundwater conditions that will occur when the Kraemer Quarry dewatering ends south of the Landfill (Barr, 2015 and 2019b).

As the design work advances, the design documents produced through this work will also support:

- Permitting
- Closure construction cost estimating
- Construction bidding
- Public participation in decision-making
- Legislative decision-making around project selection and funding

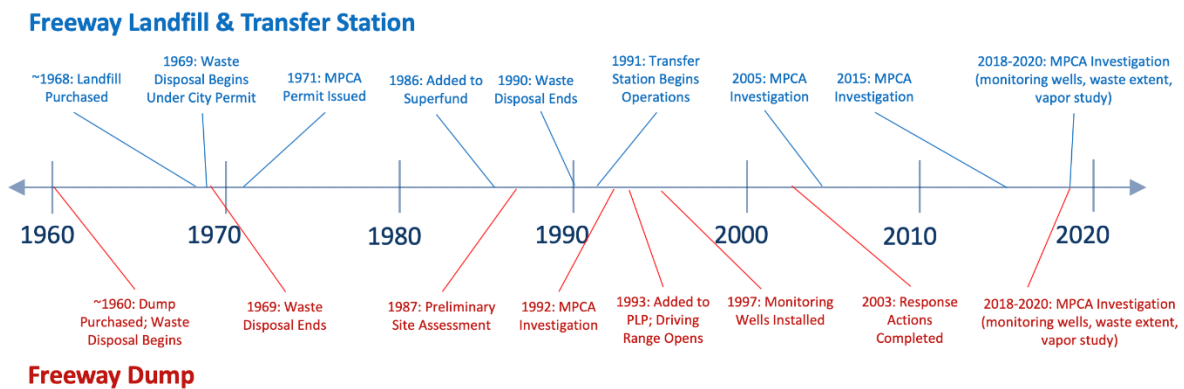
This design is an interim remedy, focused on addressing immediate impacts associated with the presence of waste without adequate containment. MPCA acknowledges that wider-ranging topics, such as current or future groundwater conditions or surrounding land uses are beyond the objective of this project, but it is also recognized that waste removal will be an important component to reduce overall risks when wider risk pathways are evaluated and addressed in the future.

1.2 Background

The Site is located in Burnsville, Dakota County, Minnesota, on the south side of the Minnesota River near Interstate 35W (with the Landfill located west of Interstate 35W and the Dump located east of Interstate 35W). The current and anticipated Site conditions are outlined in the Focused Remedial Investigation

Report (Barr, 2019). The Site is unique in that current Site hydrogeological conditions are highly influenced by groundwater pumping at the adjacent KMM quarry, and consideration has been given to both current conditions and the anticipated future conditions when the quarry pumping operations cease. Additional Site background, history, and project details are presented in the Focused Remedial Investigation Report (Barr, 2019a) and Focused Feasibility Study (FFS, Barr, 2019b).

Based on historical landfill records, files provided by the MPCA, and historical aerial imagery the following approximate chronology of significant milestones has been developed for the Site.



Based on the results from investigations conducted to date, the MPCA has determined that additional waste management efforts are needed for the Landfill and Dump. As the Site conditions have been assessed, the MPCA has maintained on-going consultation with US Environmental Protection Agency (US EPA), Dakota County, the City of Burnsville, and other stakeholders. Although there is some variation between those parties as to a specific course of action for additional waste management at the Site, all parties have been in agreement that additional waste management efforts are needed to address existing and anticipated future Site risks.

The FFS (Barr, 2019b) was developed with remedial action objectives to:

- Prevent direct contact with MSW
- Restrict infiltration into the MSW
- Restrict groundwater contact with MSW (includes current conditions, flood conditions for the Minnesota River, and the anticipated future conditions of higher groundwater when the dewatering ends at the adjacent quarry)
- Restrict leachate migration from the MSW towards groundwater and surface water receptors
- Prevent migration of MSW-generated landfill gas into nearby buildings

1.3 Project Schedule

The following table presents the anticipated project schedule, based on information provided by the MPCA. As the project develops, the schedule may be adjusted.

Deliverable/Task	Deliverable/Task Date
30% Design Submittal	Completed (February 2020)
Public Comment Period	Completed (April 2020)
90% Design Submittal	Completed (March 2021)
Final Design Submittal	October, 2021
Bidding Starts	October, 2021
Bidding Ends	Early 2022
Construction Starts	Spring/Summer 2022

1.4 Site Access

The MPCA is seeking access from property owners to finalize remaining field investigations and on-site permitting activities that will be conducted as the design is advanced, and to complete project construction. Delays in securing access will delay the Project Schedule.

1.5 Report Organization

The report is organized into sections that encompass both administrative and technical aspects of the design. It is intended to succinctly present the design basis components, and is therefore presented in brief, bullet-style format to illustrate key assumptions and design decisions that have been established by MPCA and Barr, with input from other stakeholders. Substantial supporting information is presented in other sources, which are cited throughout this report.

2.0 Existing Conditions

2.1 Location

The Site is comprised of two project areas: the Landfill and Dump. Multiple parcels are associated with the Site and are controlled by various ownership entities, including the R.B. McGowan Company, Inc., Freeway Transfer, Inc., Quarry Property, LLC, Michael B. McGowan, and Trustees of the Richard B. McGowan irrevocable Trust Agreement, dated October 22, 1997. For the remainder of this DBR, those various entities will be referred to as the Site Owner. Property boundaries and ownership in the vicinity of the Site are presented in the FFS (Barr, 2019b) and are shown on Figure 2-1.

The limits and depth profiles of the waste are based on soil borings, test trenches, historical aerial photographs, and topography. The limits of waste associated with both the Dump and Landfill extend beyond parcels owned by the Site Owner and onto adjacent properties. Additional information on the limits and depth profiles are presented within the FFS (Barr, 2019b). The following sections describe the two project areas.

2.2 Freeway Landfill – Existing Conditions

- Adjacent/Related Property Uses – Owned by Site Owner
 - Freeway Transfer Station – within eastern portion Landfill site
 - Dumpsters, and various material and equipment storage – on top of existing waste cover near site roads
 - Quarry to the west – outside of waste footprint
 - Area: ~29 acres
 - Base elevation: ~672 ft
 - Existing conditions: exposed bedrock, usually mostly dry
 - Current use: concrete crushing operations, material stockpiles
- Adjacent Property Uses – Not by Site Owner
 - Port Marilyn LLC (salt storage and barge transfer systems) to the north
 - Kraemer Quarry to the south
 - I-35W to the east
 - Minnesota River to the north
- Age of waste: Accepted sanitary waste between 1969 and 1990
- Area of waste extent: ~140 acres
- Liner: none
- Cover: vegetated soil covered over the majority of the area. Trees present on the east and south sides.
- Surface and Subsurface Information:
 - Topography: The maximum elevation of the Landfill is approximately 750 ft at its peak near the center of the property. The ground surface slopes downward in all directions to an elevation of approximately 700 ft at the property limits. This slope is relatively gentle, generally ranging from 2% to 4%, with the exception of the east and south edges where

steeper 20-30-foot-long slopes up to approximately 30% are present. The ridge on the east side of the Landfill is adjacent to an intermittent surface water channel that runs north to the river, between the Landfill and Highway 35W.

- Estimated Volumes:
 - Volume of waste: ~5,300 KCY (maximum depth ~51 ft, average depth ~22.9)
 - Volume of cover soils: ~1,400 KCY (maximum depth ~29 ft, average depth ~6.0)
 - Volume of material beneath waste (above bedrock): ~1,400 KCY (maximum depth ~47 ft, average depth ~6.1 ft)
- Soil Quality: Cover soil and material beneath waste is assumed to be generally free of impacts, largely meets the MPCA definition of Unregulated Fill, and is acceptable for soil re-use on-site as part of restoration
- Bottom of waste elevation: ~698 ft average (varies from 684 ft to 714 ft)
- Bedrock elevation: ~691 ft average (varies from 654 ft to 703 ft)
- Sources:
 - Ground surface developed from data presented in Section 3.5 (aerial survey)
 - Subsurface data (top of waste, bottom of waste, and bedrock) developed from the following sources:
 - Soil borings by Gorman Surveying, Inc. in May 2005
 - Monitoring wells completed by Conestoga-Rovers and Associates in June 2015
 - Soil borings and test trenches by Barr in April 2018
 - See Section 6.5 for additional assumptions

2.3 Freeway Landfill – Water and Groundwater

- Minnesota River Design Assumptions:
 - Normal water level: 689.1 ft
 - Source: estimated based on USGS gage data at Ft. Snelling, and adjusted for distance upstream
 - Ordinary High Water Level (OHWL): 700.0 ft
 - Source: Technical memo prepared by Barr Engineering Co., *OHWL Determination at Black Dog Generating Plant*, June 20, 2014
 - 10% annual chance flood elevation: 707.2 ft
 - Source: Dakota County Flood Insurance Study, March 16, 2016
 - 2% annual chance flood elevation: 713.5 ft
 - Source: Dakota County Flood Insurance Study, March 16, 2016
 - 1% annual chance flood elevation: 716.2 ft
 - Source: Dakota County Flood Insurance Study, March 16, 2016
 - 0.2% annual chance flood elevation: 722.0 ft
 - Source: Dakota County Flood Insurance Study, March 16, 2016
- Existing Groundwater Elevation beneath Landfill (with KMM pumping):
 - Minnesota River at normal water level: ~667 ft average (varies from 633 ft to 693 ft)
 - Minnesota River at flood conditions: ~677 ft average (varies from 647 ft to 715 ft)

- Flood condition represents 1% annual chance flood with a total flood time of 120 days (based on review of previous floods of similar magnitude, 60-day rise and 60-day fall)
- Future Predicted Groundwater beneath Landfill (with future mine pit lake operating at elevation 690 ft as desired by the City of Burnsville):
 - Minnesota River at normal water level: ~696 ft average (varies from 691 ft to 703 ft)
 - Minnesota River at flood conditions: ~700 ft average (varies from 693 ft to 715 ft)
 - Flood condition represents 1% annual chance flood with a total flood time of 120 days (based on review of previous floods of similar magnitude, 60-day rise and 60-day fall)

2.4 Freeway Dump – Existing Conditions

- Current Property Use by Site Owner
 - Driving range over the majority of the area
- Adjacent Property Uses – Not by Site Owner
 - Vacant land/wetlands (Black Dog Preserve Wildlife Refuge) to the north and east, owned by Northern States Power Company (Xcel Energy) and US Fish and Wildlife Services
 - Allstate Self Storage facility to the south and southeast
 - Public bike path to the immediate west
 - I-35W to the west beyond bike path
 - Black Dog Lake to the north beyond the wildlife refuge
- Age of waste: Accepted sanitary waste in the 1960's
- Area of waste extent: ~34 acres
- Liner: none
- Cover: vegetated soil covered. Trees and gravel parking lot present on the south side. Shrubs present on the east, north, and west edges.
- Surface and Subsurface Information:
 - Topography: The majority of the Dump is a generally flat-top mound that sits above the surrounding wetland at elevations ranging from approximately 720 ft to 730 ft. The raised elevation of the Dump extends beyond the north and east boundaries of the Dump property. The surrounding wetland is located at an elevation ranging from approximately 700 ft along the north perimeter to about 710 ft to the southeast of the Dump.
 - Estimated Volumes:
 - Volume of waste: ~860 KCY (maximum depth ~31 ft, average depth ~15.7 ft)
 - Volume of cover soils: ~140 KCY (maximum depth ~23 ft, average depth ~2.6 ft)
 - Volume of material beneath waste (above bedrock): ~130 KCY (maximum depth ~14 ft, average depth ~2.3 ft)
 - Soil Quality: Cover soil and material beneath waste is assumed to be generally free of impacts, largely meets the MPCA definition of Unregulated Fill, and is acceptable for soil re-use on-site as part of restoration
 - Bottom of waste elevation: ~706 ft average (varies from 690 ft to 716 ft)
 - Bedrock elevation: ~702 ft average (varies from 687 ft to 716 ft)

- Sources:
 - Ground surface developed from data presented in Section 3.5
 - Subsurface data (top of waste, bottom of waste, and bedrock) developed from the following sources:
 - Monitoring wells completed by Bergerson-Caswell in November of 1997.
 - Monitoring wells, soil borings, and test trenches completed by Barr in March 2018, March 2019, and May 2019.
 - See Section 6.5 for additional assumptions

2.5 Freeway Dump – Water and Groundwater

- Black Dog Lake Design Assumptions:
 - Normal water level: 695.5 ft
 - Source: estimated based on USGS gage data at Ft. Snelling, and adjusted for distance upstream
 - Ordinary High Water Level (OHWL): 697.0 ft
 - Source: Technical memo prepared by Barr Engineering Co., *OHWL Determination at Black Dog Generating Plant*, June 20, 2014
 - 1% annual chance flood elevation: 715.0 ft
 - Source: Dakota County Flood Insurance Study, March 16, 2016
- Existing Groundwater beneath Freeway Dump (with KMM pumping):
 - Minnesota River at El. 699 ft (June 17, 2019): ~706 ft (varies from 699 ft to 710 ft)

3.0 General Design Items

3.1 Deliverables

- Reports:
 - Design Basis Report
 - Living Document
 - Final with 90% design submittal
- Construction Drawings and Specifications
 - Construction Drawing List under separate cover
 - Specification List under separate cover
 - Select Programs/Procedures within specifications:
 - Quality Control/Quality Assurance within specifications
 - Waste Screening Procedure within specifications
 - Contingency Action Plan – Contractor to produce as submittal
 - 90% design submittal
 - Final design/bid package submittal
- Permits: See Section 4.0
- Cost Estimating
 - FFS – Completed
 - Public Comment Period/60% Design Progress – Completed
 - Final Design
- Estimated Construction Schedule
 - Public Comment Period/60% Design Progress – Completed
 - Final Design
- Construction Documentation Report
 - With construction

3.2 Specifications/Contracting

- Upfront documents: coordinate with MPCA - Admin
 - AIA Document A201 – General terms and conditions (expected to require an expanded supplementary conditions)
- Specifications: Barr Specifications using CSI MasterFormat
 - MnDOT 2018
- Bidding style:
 - Unit prices
 - Considerations to time/durations vs lump sum
 - Allowances provided for utility hookups
 - Significant bid alternatives are not anticipated

3.3 Coordinate System

- Coordinate System: Dakota County Coordinates (U.S. Survey Feet)

- Horizontal Datum: North American Datum of 1983 (NAD83) (2011 Adjustment)
- Vertical Datum: North American Vertical Datum of 1988 (NAVD88)
- Benchmarks/Control Points
 - Provided by Ayres Associates on 06-16-2020

3.4 CAD/Drawings Standards

- Barr Drawing Standards (MPCA does not have specific requirements)
- Software: Autodesk Civil 3D, 2017

3.5 CAD Existing Conditions

Item	Source	Date
Topography	LiDAR from Ayres Associates	Provided 06-12-2020
Aerial Imagery	Aerial imagery from Ayres Associates	Provided 06-12-2020
Existing Utilities	Utility locate and survey from MN DNR	Provided 05/26/2021
Land Control	Boundary survey from MN DNR	Provided 5/27/2021 (not incorporated into 90% design)
Wetlands	Barr Field Survey 2019; Technical Evaluation Panel meeting June 2021	Delineation Report October 2019
Existing Roads and Infrastructure	Linework provided from Ayres Associates (aerial imagery)	Provided 06-22-2020

3.6 Property Access and Future Use

- Access to property – TBD (MPCA to coordinate)
- Future Use: Depiction of parcel use during and after project shown on Figure 3-1

4.0 Permitting

4.1 Permitting Requirements and Assumptions

- Barr to coordinate
 - Joint Permit Application for Activities Affecting Water Resources in Minnesota, which covers the following federal and state requirements:
 - Federal – U.S. Army Corps of Engineers jurisdiction of wetland impacts under Section 404 of the Clean Water Act, which also triggers evaluations of Cultural Resources and Threatened and Endangered Species, which we believe to not be significant based on the following work completed to date:
 - Cultural Resources – a request was submitted to the Minnesota State Historic Preservation Office (SHPO). One previously recognized site was present within the project area. We believe the site is not longer present and therefore there will be no historic properties affected by the project.
 - Threatened and Endangered Species – Northern Long Eared Bat and Raptor surveys were completed and none were identified within the project area.
 - State – Wetland Conservation Act (administered by the City of Burnsville), Public Waters Work Permit (Department of Natural Resources), and MPCA requirements under Section 401 of the Clean Water Act
 - Lower Minnesota River Watershed District Individual Permit
 - Minnesota General Permit for Construction Stormwater under NPDES/SDS
 - Minnesota No Rise Certificate
- Contractor to coordinate
 - Demolition Permit
 - MnDOT Right of Way Permit
 - required for waste excavation within R.O.W.
 - Well Sealing Permit: Contractor to obtain
 - Permits associated with other discharge options
- MPCA to coordinate
 - MCES industrial discharge permit
 - MPCA Industrial Stormwater Permit
- Additional requirements
 - City of Burnsville:
 - City of Burnsville does not require any permits (grading, tree preservation, etc.) as the state process supersedes the city process (email from 12/20/2019)
 - Dakota County
 - Assumption is that the project will be considered a Nonconforming Site under Dakota County Ordinance 110. The alternatives to that assumption are to either obtain variances from certain elements of ordinance, or proceed without Dakota County approval.

-
- FEMA Letter of Map Revision (LOMR) is not required (based on No-Rise condition); however, a Conditional LOMR may be submitted following project to update flood maps

4.2 Wetlands

A wetland delineation report was completed by Barr in 2019 (Barr, 2019c) and several meetings were held with permitting agencies. Due to restrictions on accessing the site, The Technical Evaluation Panel meeting was held

The general approach to addressing wetlands as part of the design is as follows:

- Identify wetlands that require protection and/or mitigation (completed as part of the delineation)
- Minimize wetland impacts to the extent practicable
- Restore impacted wetlands to the extent practicable
- Remaining impacted wetland mitigation efforts will include purchasing wetland credits

4.3 ARARs

An evaluation of Applicable and Relevant or Appropriate Requirements (ARARs) was completed as part of the FFS (Barr, 2019b). The ARAR evaluation included a wide-ranging look at rules and permit requirements from a federal, state, and local perspective. The reader is encouraged to review that report for additional detail.

4.4 US EPA Coordination

The MPCA will coordinate with US EPA on final remedy selection (Dig & Haul vs. Dig & Line) and work to establish a Record of Decision or other determination for the selected interim remedy.

5.0 Demolition and Removals

5.1 Applicable Codes and Standards

- American National Standards Institute (ANSI) ANSI A10.6 – Safety and Health Requirements for Demolition Operations
- Minnesota Department of Health
- OSHA excavation

5.2 Deliverables

- Construction Drawings and Specifications

5.3 Landfill

- Site Owner to remove/relocate:
 - Dumpsters
 - Equipment and misc. materials/debris from existing quarry
 - If Site Owner fails to remove above, contractor will provide allowance for additional removals as necessary
- Structures: To be demolished/removed by contractor
 - Concrete slab
 - Assumes asbestos abatement not required
- Equipment: Equipment not removed by Site Owner will be demolished/removed by contractor
- Transfer Station: Salvage, protect, or replace infrastructure such as lighting, signs, and fencing
- Road surfacing: Reclaim pavement for off-site crushing as Class 7 aggregate beneficial reuse as feasible
- Monitoring wells: Abandon and remove wells within waste excavation extent. Protect wells outside of waste excavation extent.
 - New monitoring wells to establish new network after completion of landfill construction
 - Assume outside of general contract (Barr to provide MPCA a budgetary estimate)
- Utilities:
 - Protect and or salvage existing utilities, as feasible, that are associated with operations that will remain
 - Remove and replace existing sanitary and potable waterlines to transfer station in kind
- Disposal: All removed material shall be properly recycled, salvaged, or disposed of in an approved landfill
 - New lined facility is the preferred disposal location, assuming material is determined to be Acceptable, as defined by the Specifications

5.4 Dump

- Structures: To be demolished/removed by contractor
 - Office Trailer and slab

-
- Assumes asbestos abatement not required (or very minimal)
 - Equipment and light poles: To be demolished/removed by contractor
 - Fencing and gates: salvage, protect, or replace fencing and gates
 - Road surfacing: Reclaim pavement for off-site crushing as Class 7 aggregate beneficial reuse as feasible
 - Monitoring wells: Abandon and remove wells within waste excavation extent. Protect wells outside of waste excavation extent.
 - New monitoring wells to establish new, reduced network (assume not part of construction contract)
 - Utilities: remove encountered utilities
 - Disposal: All removed material shall be properly recycled, salvaged, or disposed of in an approved landfill
 - New lined facility is the preferred disposal location, assuming material is determined to be Acceptable, as defined by the Specifications

5.5 Tree removal

- Timing: require to be removed as late as possible to provide construction screening
- Removals: Offsite or chipped on-site permitted, burning prohibited (contractor select method)

6.0 Excavation and Waste Relocation

6.1 Applicable Codes and Standards

- OSHA excavation

6.2 Deliverables

- Construction Drawings and Specifications
 - Select Programs/Procedures within specifications:
 - Quality Control/Quality Assurance within specifications
 - Waste Screening Procedure within specifications
 - Contractor to submit
 - Sequence plan
 - Excavation plan (slopes and heights stamped by Professional Engineer)

6.3 Waste/Material Screening

- Contractor to establish waste profile(s) with licensed disposal facilities to cover the following material types, at a minimum
 - Mixed MSW
 - Ash
 - Mixed Industrial Waste
 - Demolition Debris
- Disposal
 - Landfill acceptance and specific waste screening procedures required by accepting landfill(s) will be responsibility of Contractor
- Material that is inconsistent with waste profiles will require special management in accordance with disposal facility requirements and regulations

6.4 Waste Removal Limits

The limits of waste associated with both the Dump and Landfill extend beyond parcels owned by the Site Owner and onto adjacent properties, as shown within the FFS (Barr, 2019b). The following list documents the assumptions around waste removal.

- Landfill
 - Horizontal (removed/not removed)
 - Site Owner Property
 - Stop excavation around Transfer station (edge of pavement, buffer on building)
 - Full removal of remainder of waste
 - Interstate 35W Right-of-Way
 - Full removal (requires access agreement to be obtained by MPCA)
 - Port Marilyn LLC (Salt Storage)

- Stop excavation at property boundary near buildings/infrastructure
 - Remove waste in other portions of parcel (requires access agreement to be obtained by MPCA)
 - Vertical (depth beneath and above waste)
 - Full waste recovery by standard earthwork equipment is assumed
 - Waste removal volume estimates include an average of 12 inches soil beneath waste and 6 inches of soil above waste
 - Peat beneath waste to be visually inspected to determine if material is considered waste
 - Peat assumed to be clean material and remain in place for earthwork balance
- Dump
 - Horizontal extent (removed/not removed)
 - Site Owner Property
 - Full removal
 - Interstate 35W Right-of-Way
 - Partial removal, stop extent 2 ft from bike path (note for a field call) with steeper slope (draw at 1H:1V) (requires access agreement to be obtained by MPCA)
 - Allstate Self Storage facility
 - Not removed, stop extent at property boundary (note for a field call)
 - Northern States Power Company (Xcel Energy)
 - Full removal (requires access agreement to be obtained by MPCA)
 - US Fish and Wildlife Services
 - Full removal (requires access agreement to be obtained by MPCA)
 - Vertical (depth beneath and above waste)
 - Assumed 12 inches beneath waste and 6 inches above waste
- Excavation slopes = 2H:1V (assumed for volume analysis)

6.5 Waste Excavation Volume Estimates

- Landfill ~5,200 KCY
- Dump ~860 KCY
- Total ~6,100 KCY

6.6 Cover and Fill Soils Estimates

- Onsite:
 - Landfill ~1,400 KCY
 - Dump ~140 KCY
 - Quality: Assumed to be suitable as common fill and topsoil
- Import:

-
- Quality: meet requirements of MPCA Unregulated Fill BMP and Dakota County Ordinance 110, with consideration given to accessibility and placement of soils

6.7 Rock Removal/Blasting

- Rock Removal may be required for liner and utility construction (blasting, ripping, hammering)
 - Rock Blasting may be allowed, contractor permit would be required

7.0 Stormwater Management

7.1 Applicable Codes and Standards

- Lower Minnesota River Watershed District Rules
- City of Burnsville Street and Utility Design Details
- City of Burnsville Water Resources Management Plan
- Minnesota Pollution Control Agency Solid Waste Management Rules

7.2 Deliverables

- Construction Drawings and Specifications

7.3 Design Requirements

- No increase in runoff rate for storm events listed in Section 7.5
- Future Land Use: low lying area, shallow slope (0.5%), grade to drain, likely to flood and form wetlands in the future if not managed soon after project is completed

7.4 Existing Drainage Areas

- Existing drainage areas for the Site are shown on Figure 7-1 and Proposed drainage areas are shown on Figure 7-2
- Table below summarizes existing drainage areas, curve numbers, time of concentrations, and drainage direction for the Site
- Curve numbers selected based on predominant soil types acquired from the Natural Resources Conservation Service Web Soil Survey as well as land use

Watershed	Drainage Area (Acres)	Curve Number	Time of Concentration (min)	Drainage Direction
Landfill – North	4.4	98	30	Minnesota River
	15.6	72		
	27.4	74		
Landfill – East	5.7	98	105	Wetlands prior to Minnesota River
	22.8	72		
	32.4	74		
Landfill – South	1.6	98	30	Kraemer Quarry
	1.3	72		
	14.6	74		
Landfill – West	2.2	98	30	Existing Quarry
	2.1	72		
	18.8	74		
Landfill – Total	148.9			
Dump – North	1.3	98	40	Wetlands
	9.8	65		
	17.6	74		
Dump – South	1.3	98	10	Allstate Self-Storage
	1.0	65		
	0.9	74		
Dump – Total	31.9			
Overall – Total	180.8			

7.5 Storm Events

- 1-year, 24-hour: 2.48 inches
- 2-year, 24 hour: 2.82 inches
- 10-year, 24-hour: 4.19 inches
- 100-year, 24 hour: 7.44 inches
- Source: NOAA Atlas 14, Volume 8, Version 2

7.6 Dewatering

- Restrict contact water from mixing with non-contact water or running off Site
- Volume of Dewatering:
 - Assume quantity of leachate (aka contact water) collected during construction is minimal (i.e. contact water will primarily infiltrate into existing waste and negligible ponding will occur). See Section 9.4.2.
 - No temporary lined pond/tank required

-
- MCES permit (to be obtained by Owner) to utilize a temporary hookup (temporary pipeline to manhole or transported offsite via trucks)

8.0 Flood Protection

8.1 Deliverables

- Construction Drawings and Specifications

8.2 Design Requirements

- Temporary berm around existing waste to prevent (to extent possible) river floods and/or lake floods from interacting with areas of waste handling during construction. Perimeter berms will consist of unexcavated waste areas combined with temporary soil berms constructed from on-site soils. Locations of/ extents of perimeter berm will be updated as the multi-year construction progress. Soil berm material to be utilized for fill after waste removal is completed.

8.3 Impacts on Flood Levels on Minnesota River

- Existing HEC-RAS model
 - Provided by USACE for Minnesota River as part of the Corps Water Management System (CWMS) National Implementation Effort, developed in 2016
- During Construction Conditions HEC-RAS model:
 - Existing model modified to evaluate impact of proposed temporary grading on flood levels on the Minnesota River.
 - Model predicted no change in river elevations resulting from construction of temporary perimeter berm (No-Rise).
- After Construction Conditions:
 - No fill within Floodway and thus no impacts on flood levels on the Minnesota River.

8.4 Freeway Landfill – Temporary Flood Control Berm Geometry

- Inside slope: 4H:1V
- Outside slope: 4H:1V
- Berm top width: 10 ft
- Elevation: 718 ft (roughly 2 ft freeboard on 1% annual chance flood elevation)
 - See Section 2.3 for additional flood elevations
- Note that 90% drawings were produced prior to finalizing berm geometry and are therefore inconsistent with above details

8.5 Freeway Dump – Temporary Flood Control Berm Geometry

- Inside slope: 4H:1V
- Outside slope: 4H:1V
- Berm top width: 10 ft
- Elevation: 717 ft (roughly 2 ft freeboard on 1% annual chance flood elevation)
 - See Section 2.5 for additional flood elevations

-
- Note that 90% drawings were produced prior to finalizing berm geometry and are therefore inconsistent with above details

9.0 Restoration

9.1 Deliverables

- Construction Drawings and Specifications
 - Select Programs/Procedures within specifications:
 - Quality Control/Quality Assurance within specifications

9.2 Basis of Restoration

- Future Land Use (over restored waste area and surroundings): low lying area, shallow slope (0.5%), grade to drain, likely to form wetlands in the future if not managed

9.3 Restoration Profile

- Turf establishment
- Topsoil, (respread, 6" minimum) (assumes existing onsite topsoil is adequate in quality and quantity)
- Common Fill, (6" minimum)
- Native soil/bedrock

9.4 Seeding, Planting, and Screening

- Native seed mixes, no long-term mowing or maintenance of vegetation is assumed
- No pollinator seeding required
- No replacement of trees required (trees preserved to extent possible)
- Screening
 - Transfer Station: Partially replace screening berm around transfer station per original permit
 - Approximately 280,000 CY of material import required for screening berm replacement

10.0 Transportation/Site Access

10.1 Applicable Codes and Standards

- AASHTO pavement design methods
- Burnsville Street and Utility Design Details

10.2 Deliverables

- Construction Drawings and Specifications
 - Select Programs/Procedures within specifications:
 - Quality Control/Quality Assurance within specifications

10.3 Design Requirements

- Provide safe access to Site (during and after construction)
- Avoid or minimize wetland impacts
- Minimize length of road to minimize construction costs and impervious surfacing
- Minimize dust and traffic congestion on public roads (e.g., I-35W)

10.4 Site Access - General

- See Figure 10-1 for overview of site access and transportation details
- Maintain uninterrupted access adjacent operations (during and after construction):
 - At the Landfill to:
 - Transfer station
 - Port Marilyn LLC (Salt Storage) to the north – contractor to coordinate with owner
 - Kraemer Quarry access road
 - At the Dump to:
 - Bike path
 - Allstate Self Storage facility
- Maintain access (after construction)
 - At the Landfill to:
 - McGowan Quarry to the west (no access provided during construction)
- Provide access (after construction)
 - Dump: ramp down to restored dump area for vehicle access
- Fencing
 - Landfill: replace fencing and gates around transfer station
 - Dump: replace fencing and gates at dump
- Paving
 - Existing roads to remain: replace in kind
 - Other than Embassy Road, assume no existing public roads will require repaving following construction

10.5 Transfer Station Access Road

- Permanent access from northeast corner of landfill via Black Dog Road
- Temporary access will be required while material underneath current access is excavated and removed. Temporary access from southeast corner of landfill, follow Embassy Road.
- Geometry
 - Typical road width: 30 ft
 - Bypass lane: One 18 ft wide gravel bypass lane to accommodate one semitruck (permanent transfer station access road only)
 - Typical design vehicle: Semi-truck and garbage truck
 - Typical design speed: 30 mph (15 mph at transfer station connection)
 - Maximum profile slope: 5%
 - Minimum curve/bend radius: 250 ft (100 ft at transfer station connection)
 - Minimum vertical curve length: 90 ft
 - Minimum K-value (vertical curve): 19
 - Typical road slopes: 2% (4% maximum)
 - Typical road slope direction: Crowned
 - Typical roadside slopes: 3 horizontal: 1 vertical
 - Typical culvert design storm event: 10-yr, 24 hour: 4.19 inches (source: NOAA Atlas 14, Volume 8, Version 2)
 - Typical culvert material: RCP (18 inches diameter minimum)
 - Minimum road elevation: at or above Black Dog Road access
 - Minimum road elevation at transfer station connection: 720 ft, roughly 4 ft above 1% annual chance flood elevation: 716.2 ft (Source: Dakota County Flood Insurance Study, March 16, 2016)
- Paving:
 - Transfer Station Access Road (permanent): bituminous (match existing), match existing pavement thickness (existing thickness unknown), for bidding purposes use following for pavement design:
 - Burnsville Street and Utility Design Details
 - Assumed traffic: 450 haul trucks per day
 - 400 garbage trucks per day
 - 50 semi-trucks per day
 - 6 days per week
 - Design period: 20 years
 - Assumed CBR (California Bearing Ratio): 5% (conservative based on historical borings/well logs)
 - Temporary Transfer Station Access Road: gravel
 - Assumed traffic: 450 haul trucks per day
 - 400 garbage trucks per day
 - 50 semi-trucks per day
 - 6 days per week

- Design period: 1 year (maintenance/regrading approximately every 2 months)
- Assumed CBR (California Bearing Ratio): 5% (conservative based on historical borings/well logs)

10.6 Property Owner Quarry Access

- Access from southeast corner of landfill, follow Embassy Road to new entrance
- Geometry
 - Typical road width: 25 ft
 - Typical design vehicle: Dump truck and belly dump
 - Typical design speed: 30 mph (15 mph at intersections)
 - Maximum profile slope: 5%
 - Maximum quarry ramp slope: 12% (match existing slope)
 - Minimum curve/bend radius: 100 ft (75 ft at intersection)
 - Minimum vertical curve length: 90 ft
 - Minimum K-value (vertical curve): 19
 - Typical road slopes: 2% (4% maximum)
 - Typical road slope direction: varies (mono-sloped and crowned)
 - Typical roadside slopes: 3 horizontal: 1 vertical
 - Typical culvert design storm event: 10-yr, 24 hour: 4.19 inches (source: NOAA Atlas 14, Volume 8, Version 2)
 - Typical culvert material: RCP (18 inches diameter minimum)
 - Minimum road elevation: at or above existing Embassy Road
- Paving:
 - Embassy Road: bituminous (limit dust)
 - Burnsville Street and Utility Design Details
 - Assumed traffic: 30 haul trucks per day (after construction)
 - Design period: 20 years
 - Assumed CBR (California Bearing Ratio): 5% (conservative based on historical borings/well logs)
 - Property Owner Quarry to the west: gravel, to replace existing gravel roads (existing thickness unknown)
 - Assumed traffic: 30 haul trucks per day (after construction)
 - Design period: 10 years (maintenance/regrading approximately yearly)
 - Assumed CBR (California Bearing Ratio): 5% (conservative based on historical borings/well logs)

10.7 Haul Route

- Landfill
 - Access from northeast corner of site via Black Dog Road or from southeast corner of landfill, follow Embassy Road, access 35W from Cliff Road
- Dump

-
- Access from the southwest via Cliff Road frontage road/Cliff Road and 35W

11.0 Construction Staging, Sequencing, and Requirements

11.1 Applicable Codes and Standards

- OSHA excavation

11.2 Deliverables

- Construction Drawings and Specifications
 - Select Programs/Procedures within specifications:
 - Contingency Action Plan – Contractor to produce as submittal

11.3 Construction staging

- Temporary waste stockpile must remain within existing waste limit footprint
- Property Owner Quarry may be used as staging area
- Property Owner Quarry may be used as temporary stockpile of non-waste material

11.4 Construction Sequencing

- Contractor to develop schedule/sequencing plan
 - Design/specifications to include restrictions/requirements within the submittal requirements
 - Key considerations: duration requirements, stakeholder considerations, flood protection berm, trees, ongoing operations, access road guidelines, wetlands, traffic routes
- Double handling assumptions:
 - Cover Soils
 - 10% at Landfill
 - 15% at Dump
 - Waste
 - 0% at Landfill
 - 0% at Dump

11.5 Construction Requirements

- Maintenance of SWPPP
- Environmental Requirements
 - Odor control
 - Dust control
 - Vector controls
 - Blowing trash control
- Safety
 - HAZWOPER for on-site crews that may come in contact with waste; certain roles to be exempt (e.g., truck drivers)

12.0 References

Barr, 2019a. Focused Remedial Investigation Report, Freeway Landfill and Freeway Dump. Prepared for Minnesota Pollution Control Agency. October 2019.

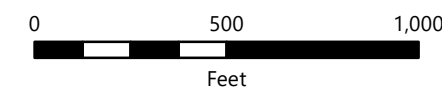
Barr, 2019b. Focused Feasibility Study Report, Freeway Landfill and Freeway Dump. Prepared for Minnesota Pollution Control Agency. October 2019.

Barr, 2019c. Wetland Delineation Report, Freeway Landfill Project. Prepared for Minnesota Pollution Control Agency. October 2019.

Figures



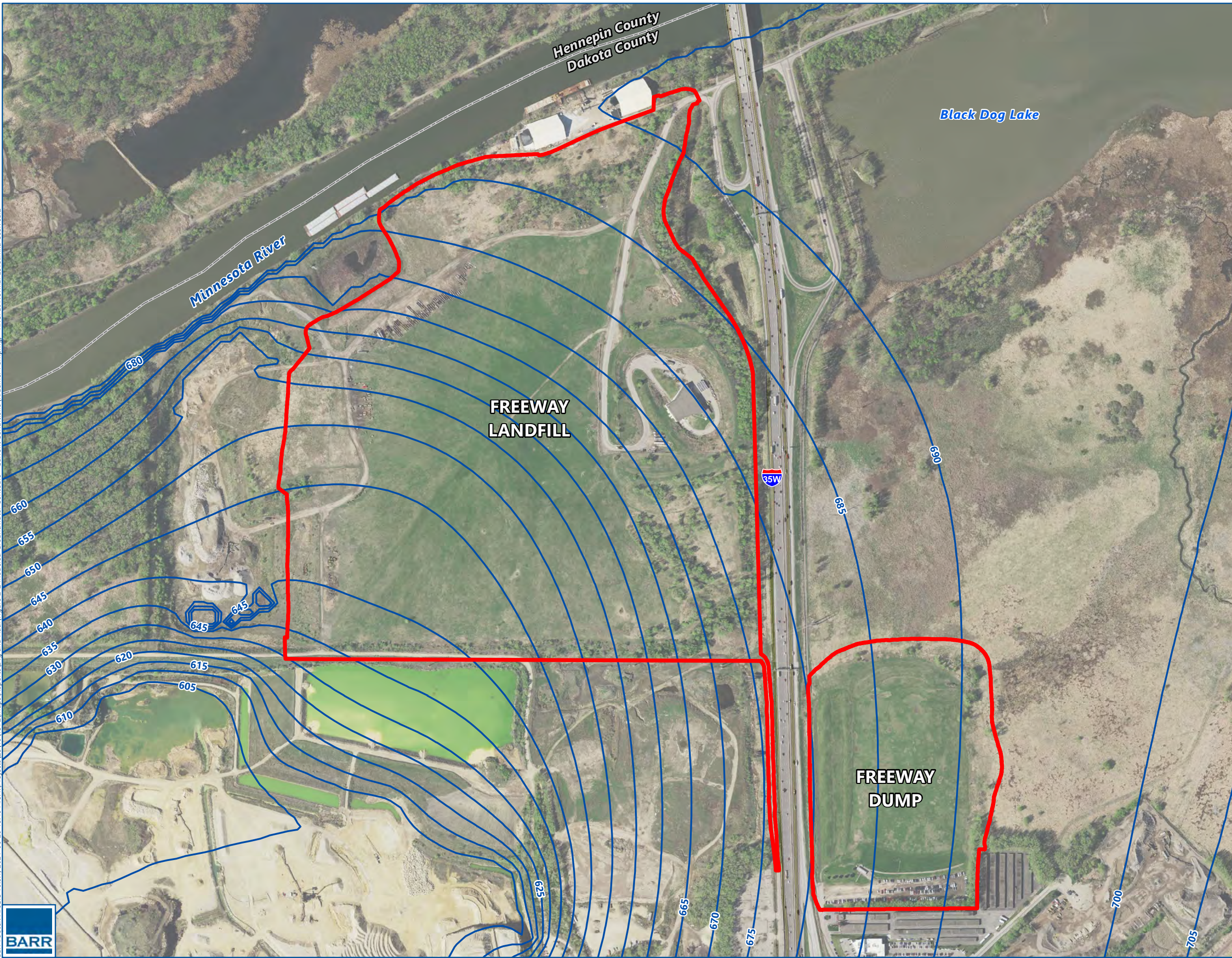
- Project Areas
- Parcel Boundary
- County Boundary






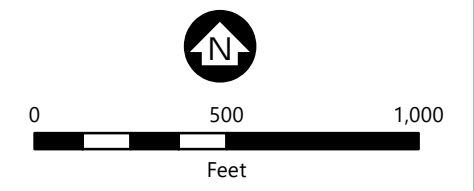
SITE OVERVIEW
 Dig and Haul Basis of Design Report
 Freeway Landfill and Dump
 Burnsville, Minnesota
FIGURE 2-1



Barr Footer: ArcGIS 10.8.1, 2021-06-29 13:48 File: I:\Projects\23\191372\Maps\Reports\Dig and Haul\Figure 2-2 Modeled Groundwater Contours - Current Conditions (Kraemer Pumping) - River at Normal Level.mxd User: sal2



-  Construction Limits (Approx)
-  Groundwater Contours Under Current Conditions (Kraemer Pumping), River at Normal Level
-  County Boundary

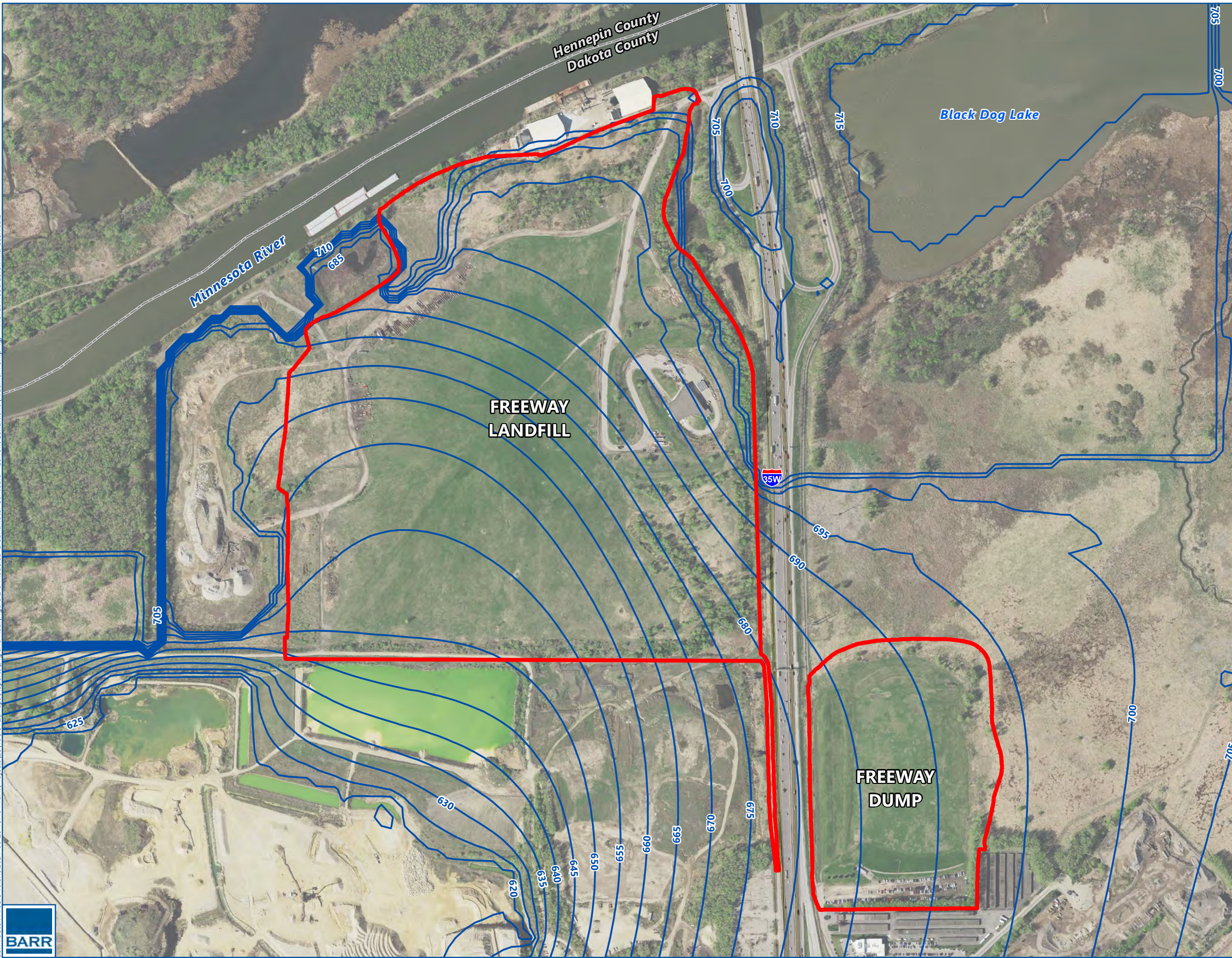


GROUNDWATER CONTOURS UNDER CURRENT CONDITIONS (KRAEMER PUMPING), RIVER AT NORMAL LEVEL
 Dig and Haul Basis of Design Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

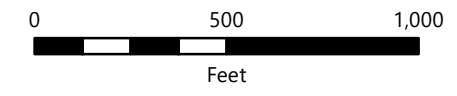
FIGURE 2-2



Barr Footer: ArcGIS 10.8.1, 2021-06-29 13:48 File: I:\Projects\23\191372\Maps\Reports\Dig and Haul\Figure 2-3 Modeled Groundwater Contours - Current Conditions (Kraemer Pumping) - River at Flood Level.mxd User: sal2



- Construction Limits (Approx)
- Groundwater Contours Under Current Conditions (Kraemer Pumping), River at Flood Level
- County Boundary



GROUNDWATER CONTOURS UNDER CURRENT CONDITIONS (KRAEMER PUMPING), RIVER AT FLOOD LEVEL
 Dig and Haul Basis of Design Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

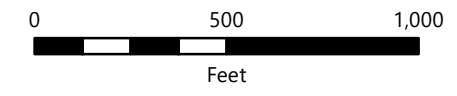
FIGURE 2-3



Barr Footer: ArcGIS 10.8.1, 2021-06-29 13:47 File: I:\Projects\23\191372\Maps\Reports\Dig and Haul\Figure 2-4 Modeled Groundwater Contours - Future Conditions (Pit at 690) - River at Normal Level.mxd User: sal2



- Construction Limits (Approx)
- Groundwater Contours Under Future Conditions (Pit at 690), River at Normal Level
- County Boundary

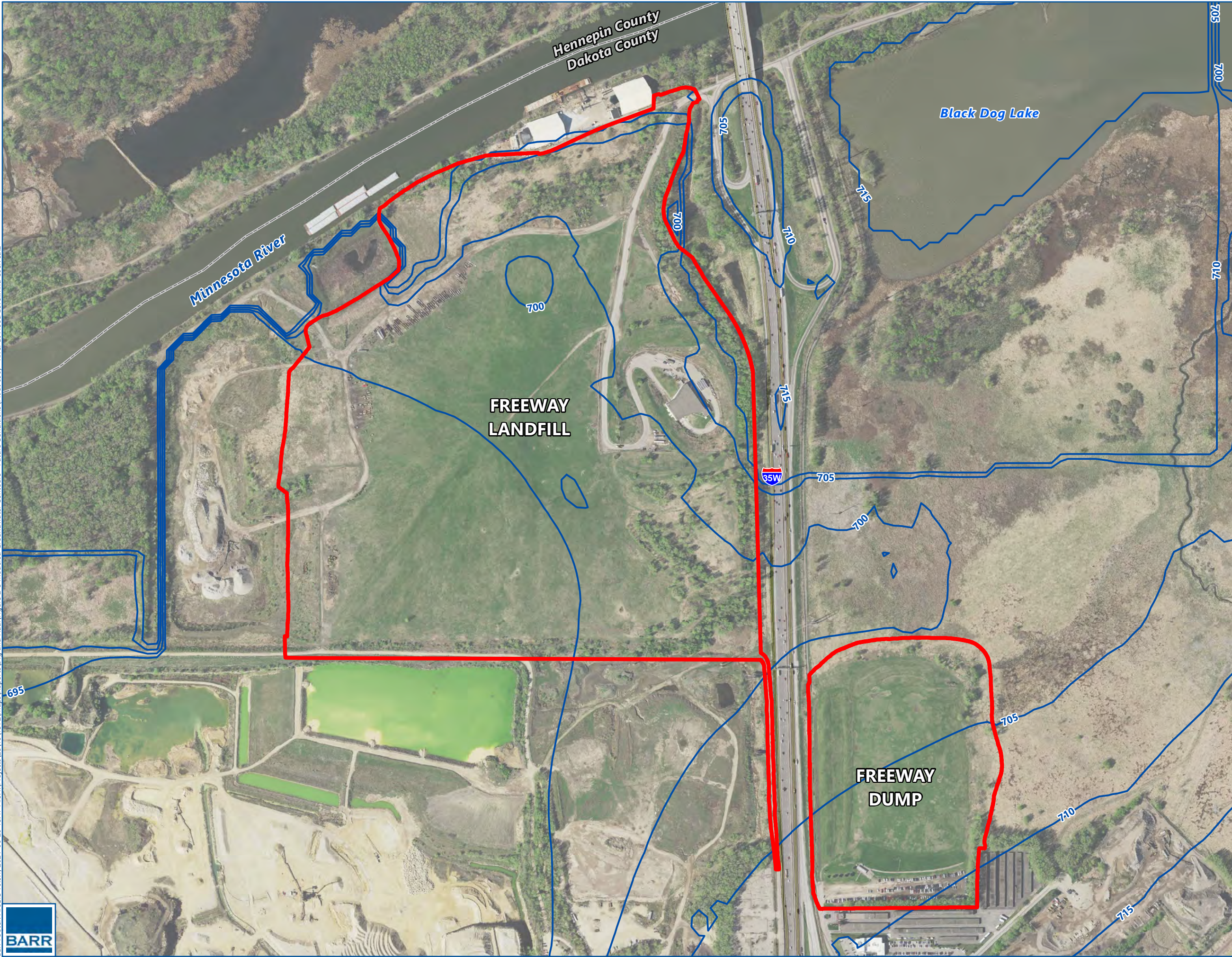


GROUNDWATER CONTOURS UNDER FUTURE CONDITIONS (PIT AT 690), RIVER AT NORMAL LEVEL
 Dig and Haul Basis of Design Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

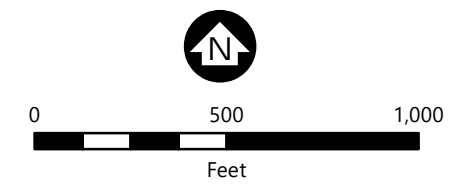
FIGURE 2-4



Barr Footer: ArcGIS 10.8.1, 2021-06-29 13:47 File: I:\Projects\23\191372\Maps\Reports\Dig and Haul\Figure 2-5 Modeled Groundwater Contours - Future Conditions (Pit at 690) - River at Flood Level.mxd User: saiz



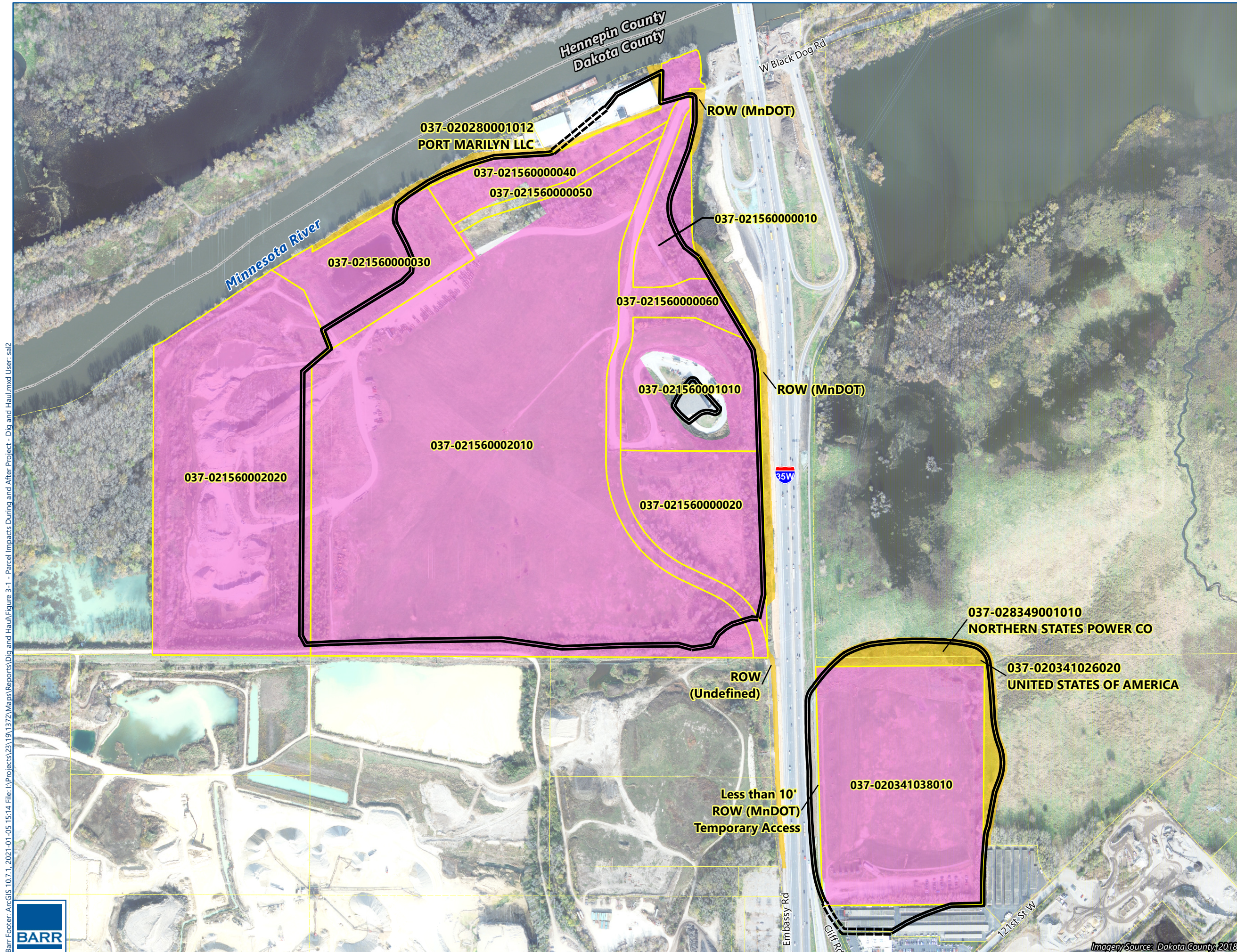
- Construction Limits (Approx)
- Groundwater Contours Under Future Conditions (Pit at 690), River at Flood Level
- County Boundary



GROUNDWATER CONTOURS UNDER FUTURE CONDITIONS (PIT AT 690), RIVER AT FLOOD LEVEL
 Dig and Haul Basis of Design Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

FIGURE 2-5

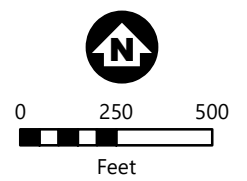




- Inferred Waste Extent
- Temporary Access, Freeway Site Owner
- Temporary Access, Other Properties
- Subject Parcels

PIN	Permanent Access	Temporary Access
037-020280001012		✓
037-020341026020		✓
037-020341038010		✓
037-021560000010		✓
037-021560000020		✓
037-021560000030		✓
037-021560000040		✓
037-021560000050		✓
037-021560000060		✓
037-021560001010		✓
037-021560002010		✓
037-021560002020		✓
037-028349001010		✓
Right Of Way (ROW)		✓

* Parcel data based on Dakota County GIS (official property boundary survey pending)



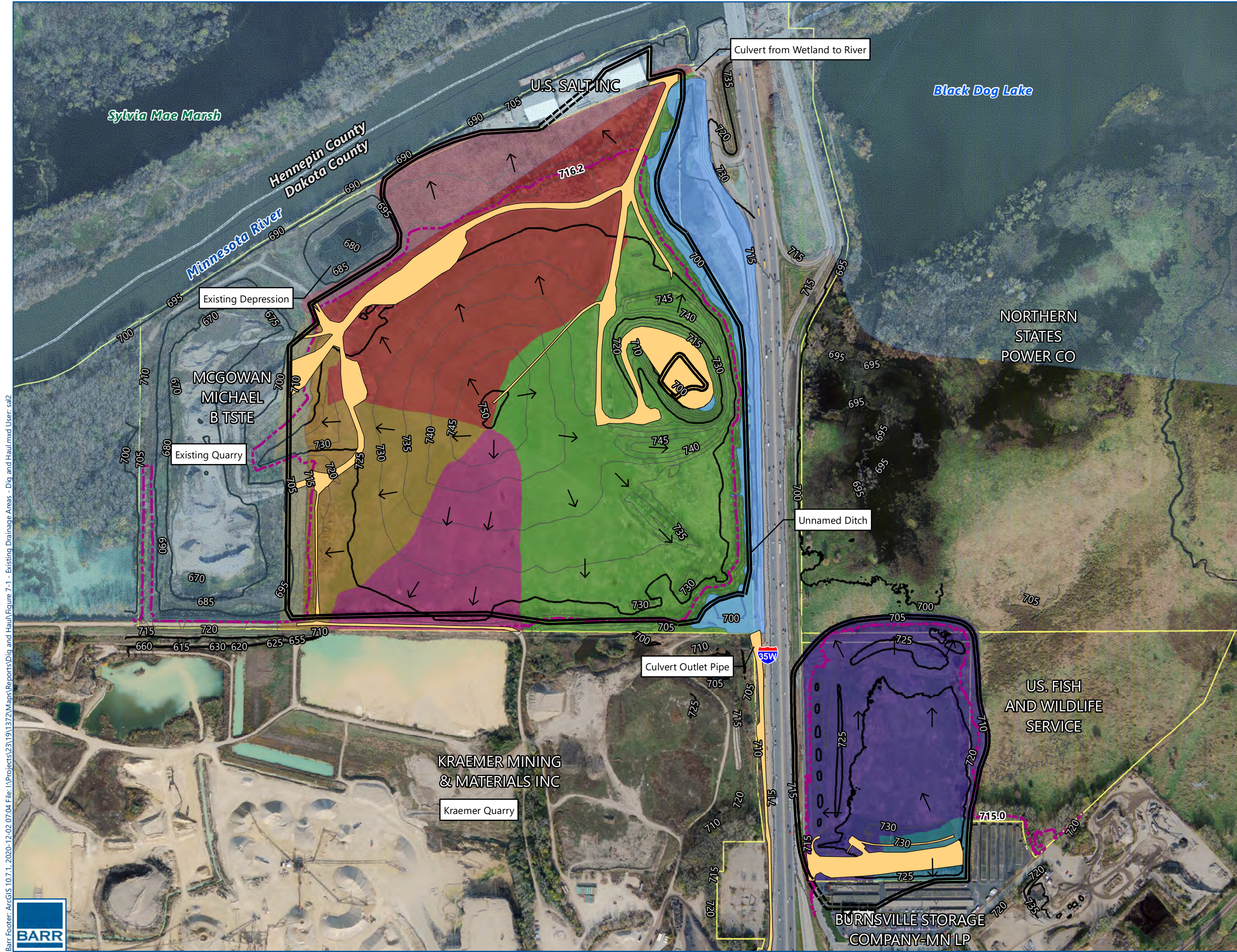
PARCEL IMPACTS DURING AND AFTER PROJECT
 Dig and Haul Basis of Design Report
 Freeway Landfill
 Burnsville, Minnesota

FIGURE 3-1

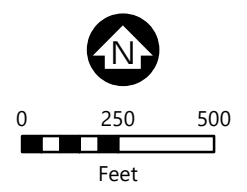
Barr Footer: ArcGIS 10.7.1, 2021-01-05 15:14, File: I:\Projects\23\19\1372\Maps\Reports\Dig and Haul\Figure 3-1 - Parcel Impacts During and After Project - Dig and Haul.mxd User: sal2



Imagery Source: Dakota County, 2018



- Approximate Limits of Waste
- Existing 25-foot Contour
- Existing 5-foot Contour
- Existing Impervious Area
- Existing Drainage Areas**
- Dump to North
- Dump to South
- Landfill to East (Drains to River)
- Landfill to Minnesota River Direct
- Landfill to South
- Landfill to West
- Delineated Wetlands
- Floodway
- Existing Floodplain
- Slope
- Parcel Boundary
- County Boundary



EXISTING DRAINAGE AREAS
 Dig and Haul Basis of Design Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

FIGURE 7-1

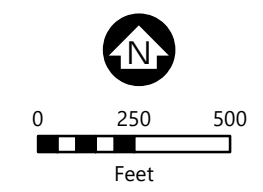
Barr Footer: ArcGIS 10.7.1, 2020-12-02 07:04 File: I:\Projects\23\191372\Maps\Reports\Dig and Haul\Figure 7-1 - Existing Drainage Areas - Dig and Haul.mxd User: sal2



Barr Footer: ArcGIS 10.8.1, 2021-06-29 11:04 File: I:\Projects\23\191372\Maps\Reports\Dig and Haul\Figure 7-2 Proposed Conditions - Permanent - Dig and Haul.mxd User: sal2



- Proposed Contours**
- 25-foot Contour
 - 5-foot Contour
 - Proposed Impervious Surfaces
 - Floodway
 - Wetlands (Post-Project)
- Proposed Drainage Areas**
- Dump to North
 - Landfill to East (Drains to River)
 - Landfill to South
 - Landfill to West
 - Proposed Floodplain
 - Existing Floodplain
 - Slope
 - Project Areas
 - Parcel Boundary
 - County Boundary



EXISTING DRAINAGE AREAS
Dig and Haul Basis of Design Report
Freeway Landfill and Dump
Burnsville, Minnesota

FIGURE 7-2

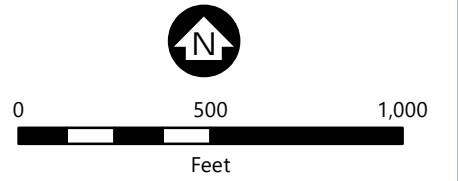


General Traffic Sequencing Plan

- Landfill construction traffic and Transfer Station traffic will initially use the existing North Entrance.
- During excavation of waste below the existing Transfer Station access road, construction and Transfer Station traffic will use the proposed South Entrance.
- After the waste has been excavated, a new permanent Transfer Station access road will be constructed. At that point, Transfer Station traffic will use the new access road and construction traffic may use either the North or South entrance.
- At the completion of the project, the quarry to the west of the landfill will be accessed via the South Entrance.
- Dump construction traffic during and post-construction will be via the existing Dump Entrance.



- Site Entrances
- Construction Limits (Approx)
- Proposed Contours**
- 25-foot Contour
- 5-foot Contour
- County Boundary



TRANSPORTATION & SITE ACCESS
 Dig and Haul Basis of Design Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

FIGURE 10-1

